APPEAL TO THE CHIEF OF THE

UNITED STATES FOREST SERVICE

Sierra Nevada Forest Protection Campaign Center for Biological Diversity Sierra Club The Wilderness Society California Trout Friends of the River Defenders of Wildlife California Native Plant Society Natural Resources Defense Council Public Employees for Environmental Responsibility, Appellants.	NOTICE OF APPEAL OF THE RECORD OF DECISION AND FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT for the SIERRA NEVADA FOREST PLAN AMENDMENT

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NOTICE OF APPEAL

This administrative appeal of the Sierra Nevada Forest Plan Amendment Final Supplemental Environmental Impact Statement (FSEIS) and Record of Decision (ROD), signed by Regional Forester Jack Blackwell on January 21, 2004, is filed on behalf of the Sierra Nevada Forest Protection Campaign, Center for Biological Diversity, Sierra Club, The Wilderness Society, California Trout, Friends of the River, Defenders of Wildlife, California Native Plant Society, Natural Resources Defense Council, and Public Employees for Environmental Responsibility, pursuant to 36 CFR part 217.

STATEMENT OF REASONS

I. INTRODUCTION

What ostensibly began as a fine-tuning of three aspects of the Sierra Nevada Forest Plan Amendment (Sierra Nevada Framework) has transmogrified into a complete overhaul of the plan. The new plan weakens virtually all of the Framework's key elements, including protection for old forests, limitations on logging to protect species like the California spotted owl and Pacific fisher, and restrictions on livestock grazing to protect the willow flycatcher and imperiled amphibians. The new decision replaces the Framework "in its entirety" (ROD, p. 33) and replaces all of the Framework's standards and guidelines. (ROD, p. 15). There is no new information or changed circumstances that would warrant such sweeping changes, and the Forest Service has failed to make a good faith effort to implement the Framework. Moreover, experts who have reviewed the new plan have concluded that it would threaten the viability of numerous species, including the California spotted owl, Pacific fisher, American marten, and willow flycatcher.

One particularly problematic aspect of the plan involves the full implementation of the Quincy Library Group (QLG) pilot project, which would greatly increase both the amount and intensity of logging in the northern Sierra Nevada. The Forest Service has previously concluded that fully implementing the project "could pose a serious risk to the viability of the owl in the planning area." (USDA Forest Service 1999a). The U.S. Fish and Wildlife Service similarly concluded that the QLG project "poses a significant threat to the long-term viability of the California spotted owl, Pacific fisher, and American marten due to the loss, degradation, and fragmentation of suitable habitat." (USDI Fish and Wildlife Service 1999, p. 16). In the absence of new information that would change these findings or justify taking this level of risk, the QLG project cannot be fully implemented consistent with applicable laws.

In sum, for the reasons detailed below, both the ROD and FSEIS must be remanded to the Regional Forester for reconsideration and revision.

A. The Framework was the Result of Over Ten Years of Work and an Enormous Amount of Scientific and Public Input.

The Sierra Nevada Framework was the culmination of ten years of research and planning efforts by the Forest Service. The planning history is briefly described in the Chief's appeal decision (USDA Forest Service 2001c, pp. D-26-28) but certain highlights deserve emphasis.

Concerns about the viability of the California spotted owl and the adequacy of existing regulatory mechanisms led the Forest Service in 1991 to convene a technical team to review the owl's status and recommend changes in management. In 1992, the team issued its report (commonly referred to as the CASPO Report), which found that existing Forest Service management plans were inadequate to ensure the owl's viability and recommended adoption of an interim strategy for managing the owl (often referred to as the CASPO policy). (Verner et al. 1992). The Forest Service prepared an environmental assessment, circulated the document for public comment, and in 1993 issued a decision notice which amended the forest plans to incorporate the CASPO policy.

At the same time, in response to the recommendations of the report, the Forest Service began the formal process of developing a long-term management plan for the owl. A draft environmental impact statement was released for public comment in 1995. However, significant new information was identified during the public comment period, and the Forest Service decided to prepare a revised draft EIS. Concerns about the revised draft EIS led the Secretary of Agriculture to convene a federal advisory committee to review the EIS and its proposed action, taking into account new information including the multi-volume report by the Sierra Nevada Ecosystem Project (Centers for Water and Wildland Resources 1996), which was submitted to Congress beginning in 1996.

The federal advisory committee issued its report in 1997, concluding that the proposed action in the revised draft EIS was insufficient either as a California spotted owl management plan or as a broader ecosystem management plan. (Philpot et al. 1997). The committee recommended that the scope of the EIS be broadened to include a range of issues in addition to the spotted owl, including old forest ecosystems, riparian ecosystems, and other issues.

In response to the committee's report, the Chief of the Forest Service instructed the Regional Forester to develop an ecosystem plan that would "significantly improve the conservation strategy for California spotted owls and all forest resources." (USDA Forest Service 2001c, p. D-26). In 1998, the Forest Service initiated the process that culminated in release of the Sierra Nevada Framework. In July 1998, the Forest Service research branch released the "Sierra Nevada Science Review," which synthesized current information regarding issues of high priority throughout the Sierra Nevada's national forests. (USDA Forest Service 1998). Based on this report, the Forest Service published a notice of intent in the Federal Register to adopt a range-wide plan addressing five urgent problem areas: (1) old forest ecosystems and species, (2) aquatic, riparian, and meadow ecosystems and species, (3) fire and fuels management, (4) noxious weeds, and (5) lower westside hardwood forest ecosystems.

In January 2001, the Forest Service released for public comment a draft EIS for the Sierra Nevada Forest Plan Amendment, which analyzed eight alternatives for addressing these five problem areas. Based on the public comment, the Forest Service in 2002 released its record of decision and final EIS adopting the Sierra Nevada Framework, a modification of Alternative 8 in the DEIS, as the final plan.

The Forest Service held approximately 60 public meetings as part of the Framework scoping process and an additional 60 meetings between release of the draft and final EIS. These included a series of multi-agency, multi-stakeholder meetings that allowed the sharing of different views and values regarding forest management, fire, wildlife protection, recreation and a variety of other resource management issues. By contrast, the Forest Service held no publicly noticed meetings to discuss proposed changes to the 2001 Framework and its notice of intent for the revised plan specifically stated that "the Forest Service is not inviting comments at this time."[1] (68 Fed. Reg. 16758 (April 7, 2003)).

B. In Denying 234 Administrative Appeals, the Chief Resoundingly Affirmed the Framework's Key Provisions.

The Chief considered 234 timely administrative appeals of the original Framework decision, and he rejected all of the appeals in their entirety. In addition to finding that the Framework "met the minimum requirements of Federal law and regulation" (USDA Forest Service 2001c, p. 5), the Chief's detailed "Response to Appeal Issues" specifically considered and rejected many of the issues now being raised by the Regional Forester as a basis for revising the Framework. Overall, the Chief found that the Framework decision was based upon the best available science, that the decision struck a careful and reasoned balance between protecting wildlife habitat and reducing the risk of stand replacing wildfire, and that the decision was well supported by the administrative record.

For example, with respect to the issue of wildfire, the Chief found that the Framework standards and guidelines "are consistent with the National Fire Plan and the Cohesive Strategy." (USDA Forest Service 2001c, p. A-12). He considered the appeal argument that the standards and guidelines were too restrictive with respect to fuels reduction and specifically found "nothing in the standards and guidelines that would prevent" the goal of reducing wildfires as predicted under the Finney effect. (Ibid., p. A-15). He also concluded that the record "supports … a 12 inch diameter limit to reduce surface and ladder fuels" in old forest emphasis areas (ibid., p. A-15), a standard that the new decision increases to 30 inches ostensibly to promote the effectiveness of fuels reduction in these areas.

With respect to wildlife, the decision consistently found that the Framework's standards and guidelines are based on the best available information. For example, with respect to the California spotted owl, the Chief found that the Regional Forester "considered all information available" and gave "reasoned consideration [to] management actions needed to maintain or

[1] The Forest Service did hold several meetings with groups the agency determined to be important interests in 2002. They were not open to the public and were limited in scope.

enhance populations." (Ibid., pp. C-62, C-64). With respect to standards for protecting the Pacific fisher and American marten, the decision concluded that the Regional Forester "considered and reasonably applied the best scientific information available." (Ibid., p. C-3). The Chief determined that limits on livestock grazing to protect the willow flycatcher "are appropriate" and reflect "the best scientific information available" (ibid., pp. C-46, C-48), and that the Regional Forester "used the best available science" in establishing standards and guidelines for the mountain yellow-legged frog and Yosemite toad (ibid., p. C-14).

With respect to the cost of implementing the Framework – a factor heavily relied upon by the current Regional Forester as a basis for increasing logging diameter limits – the Chief quoted the conclusion in the Framework ROD that "the cost of implementing this decision is realistic and reasonable" and concluded that issues related to cost and funding were "adequately discussed and … displayed" in the Framework record. (Ibid., p. A-37). The Chief also acknowledged the Regional Forester's understanding that "there would be some reduction in other resources such as timber harvesting, recreation, and grazing" and his determination that the Framework struck "the best balance between providing for the production of timber, grazing and other resources and the long-term protection and restoration of the environment." (Ibid., p. H-5). The Chief concluded "that all of the required economic efficiency and cost-benefit analyses were comprehensively and properly prepared" and that the Regional Forester "had comprehensive information to understand the trade-offs" in approving the Framework. (Ibid., p. H-12).

In sum, most of the arguments now cited by the Regional Forester as a basis for overturning the Framework were considered and rejected by the Chief in his appeal decision.

C. The Chief's Limited Remand Did Not Authorize a Complete Overhaul of the Framework.

In denying all administrative appeals of the Sierra Nevada Framework, the Chief directed the Regional Forester to undertake a limited review of the plan with respect to three elements: fuels treatments, consistency with the National Fire Plan, and implementation of the Quincy Library Group (QLG) pilot project. (USDA Forest Service 2001c). The Chief emphasized that only "certain aspects of the decision [should] be subject to additional review and analysis" and that the purpose of the review was to seek "opportunities … for refining the decision," rather than revamping the decision in its entirety. (USDA Forest Service 2001c, p. 5).

In originally describing his goals to California spotted owl scientists, the Regional Forester said that he was looking for "a little wiggle room" with respect to Framework implementation. (Verner 2003b). However, the Regional Forester now concedes that the new plan represents a "significant forest plan amendment" (ROD, p. 20), rather than the limited review called for by the Chief. The record confirms the sweeping nature of the changes. For example, the U.S. EPA stated that the new plan "significantly changes the forest management practices that were adopted in the previous ROD." (U.S. Environmental Protection Agency 2003, p. 2). Further, the owl scientists, in a joint letter, described the plan as "a substantial (if not radical) departure from the [Framework] ROD" (Franklin et al. 2003) and Dr. Jared Verner, recently retired from the Forest Service's research branch, characterized it as "a substantial overhaul" of the Framework.

(Verner 2003b). As recognized by the California Resources Agency, "under the guise of a supplement, the USFS is proposing an entirely new approach." (California Resources Agency 2003, p. 1). "It is not a refinement but a replacement of the Framework ROD." (Ibid., p. 11).

With respect to the QLG proposal, the Chief's remand directed the Regional Forester to conduct "further review" to ensure that the Framework's goals "were adequately balanced with goals of the HFQLG" and "to determine if additional opportunities exist to harmonize the goals of these two efforts." (USDA Forest Service 2001c). The new decision fails to respond to the Chief's direction. Rather than balancing or harmonizing the goals of the Framework and of the QLG project, the revised plan allows "full implementation" of the QLG project.[2] (ROD, p. 5). Given that both the Forest Service and the Fish and Wildlife Service have previously determined that full implementation of the QLG project would threaten the viability of the California spotted owl and other species, the revised plan is not only inconsistent with the Chief's request for "adequate balance" but is also contrary to law.

Finally, the revised plan addresses new issues that were not part of the Framework purpose and need and that are outside the scope of the Chief's limited remand. For example, the FSEIS includes extended discussion of issues relating to "ecosystem health" such as insects and disease (FSEIS, pp. 112-24, 199-207), despite the fact that the Chief's appeal decision found that there was "adequate direction … in existing plans" regarding this issue and that the issue was "outside the scope" of the Framework decision. (USDA Forest Service 2001c, pp. A-8-9, D-6).

D. There is No New Information that Warrants a Wholesale Revision of the Framework.

There is no sound basis in law or policy for such substantial changes. At the outset, the Forest Service has yet to make a good faith effort to implement the Framework. The agency's claim that the Framework is too difficult to implement is not based on actual experience, but rather on unfounded complaints from line officers. When Dr. Verner asked whether these concerns were "based on real field experience or just on reading the SEIS," the Forest Service staff replied that "we can't show you where it didn't work because we didn't go very far at planning these areas." (USDA Forest Service 2003b). Similarly, another Forest Service employee, in describing the concerns expressed by line officers, described them as "based upon the hypothetical rather than through IDTs trying to actually work on a piece of new ground and apply the ROD." (Yasuda 2003). "Essentially, all projects that have been implemented have either been very simple projects requiring little or no environmental analysis, or projects begun under the old direction and modified to fit the new." (USDA Forest Service 2003b, p. 14). With respect to restrictions on livestock grazing, it is uncontested that the Framework standards had yet to be implemented on the ground when the DSEIS was released. In sum, "the paucity of projects simply provides no empirical basis for assessing the feasibility of the [Framework] ROD." (California Resources Agency 2003, p. 2).

[2] In fact, as described below, in its zeal to allow "full implementation" of the QLG project the new plan fails to comply with the limitations in the Herger-Feinstein Quincy Library Group Forest Recovery Act.

Beyond that, there is no new information that would justify substantially weakening the Framework. As stated simply by the owl scientists: "There is no new science in the Proposal that justifies the fundamental departure from CASPO or the ROD." (Franklin et al. 2003). With respect to forest carnivores, leading experts Dr. Steve Buskirk and Dr. Reginald Barrett have concluded that there is no new information regarding the Pacific fisher or the American marten that would justify weakening the Framework. (Barrett 2004a; Buskirk 2003). Similarly, with respect to willow flycatcher, the new evidence points to increasing risks to the species and the need to strengthen existing standards, not weaken them. (Sanders 2004).

The Forest Service's Washington Office Director for Watershed, Fish and Wildlife reviewed the DSEIS and emphasized that the document failed to demonstrate that there was new information or changed circumstances that justified a major departure from the Framework:

> The DSEIS does not appear to provide sufficient detail to support the 'new information' cited as the reason for this revision. An example of this is the characterization of the Fish and Wildlife Service finding on the California spotted owl as 'new information,' when, in fact, that finding was based on implementation of conservation measures included in the Framework. Another example is the characterization of potential impacts to range permittees as 'new information' when it was previously analyzed and disclosed in the 2001 FEIS and ROD.[3] (Gladen 2003, p. 2)

The State of California Attorney General's Office carefully reviewed all of the claims of "new information" in the DSEIS. Based on this review, the Attorney General concluded that "none of the purported 'new information' or 'changed circumstances' justify" significant changes in the Framework. (Lockyer 2003, p. 5).

In sum, there is no sound basis in law or science for weakening, revising, or eliminating the Framework's standards and guidelines. Accordingly, it appears that the primary basis for the new plan is a change in policy by the new Administration, rather than any significant new information, which does not legally suffice as a basis for rescinding an established regulation. Motor Vehicle Manufacturers Assoc. v. State Farm Mutual Automobile Ins. Co., 463 U.S. 29 (1983); Fund for Animals v. Norton, 294 F. Supp.2d 92 (D.D.C. 2003).

II. THE PLAN SIGNIFICANTLY WEAKENS THE FRAMEWORK'S PROTECTION FOR OLD FOREST HABITAT

The Sierra Nevada Framework was developed based upon a broad recognition that old forest ecosystems and the key elements of old forests, such as large trees, large snags, and large down wood, have been significantly reduced since pre-European settlement. "Despite differences in interpretation, all estimates indicate that the abundance of old forests and the structural complexity of remaining low- to mid-elevation forests in the Sierra Nevada have declined

[3] The document goes on to question the additional claims in the DSEIS with respect to new information about private timberland management, consistency with the National Fire Plan, and aquatic, riparian and meadow ecosystems. (Gladen 2003, pp. 2-3).

significantly since post-1850 settlement, to the detriment of associated species and ecosystem functions." (USDA Forest Service 1998, p. 22). "Forest structure has been greatly simplified relative to pre-contact conditions; key structural features of late successional forests, such as large diameter trees, decadent trees, snags, and logs, are generally at low levels in the commercial forests of the Sierra Nevada." (Centers for Water and Wildland Resources 1996, Volume 1, p. 98).

The Framework was designed to protect and restore old forests and habitat for species like the California spotted owl, Pacific fisher, and American marten, while allowing thinning of smaller trees to reduce the risk of stand-destroying wildfires. Some of the key elements of the Framework that were designed to address concerns about old forests and associated wildlife include designation of 4.25 million acres of old forest emphasis areas (OFEAs) that would be managed to promote old growth forests; protection of all old growth stands 1 acre or larger; protection of California spotted owl home range core areas (HRCAs) and protected activity centers (PACs); protection of the southern Sierra fisher conservation area (SSFCA); and standards and guidelines limiting removal of medium-large trees, reduction in forest canopy cover, and removal of large snags and down logs. The new proposal would weaken or eliminate all of these protections and would replace them with a one-size-fits-all strategy that applies the same standards and guidelines to all land allocations outside of the defense zone of the wildland urban intermix (WUI), where even more intensive logging would be allowed. (ROD, pp. 49-52; FSEIS, p. 57).

The new plan would adversely affect old forests in the following ways. First, old forest emphasis areas would lose protection. Under the Framework, logging within these areas was generally restricted to removal of small (12" diameter or less) trees and forest canopy could not be reduced by more than 10 percent. (USDA Forest Service 2001b, p. A-40-41). The purpose of such restrictions was to promote development of old forest stand characteristics and provide habitat for species like the Pacific fisher across the landscape. (USDA Forest Service 2001c, p. D-10). The new proposal would apply the same standards and guidelines to OFEAs as to general forest lands, thereby allowing logging of trees up to 30" diameter and reduction of canopy cover by up to 30 percent. (ROD, pp. 50-51). The same changes apply to spotted owl home range core areas, which were managed like OFEAs under the Framework. (USDA Forest Service 2001b, p. A-44). In effect, as the Forest Service's own Science Consistency Review concluded, "it does not appear that land allocations such as OFEAs and HRCAs have any meaning under S2 because a single thinning prescription will be used." (Stine and Keane 2003, p. 5).

Second, the Framework required that the Forest Service identify all old growth stands of 1 acre or larger and manage these stands with the same standards and guidelines as OFEAs. (USDA Forest Service 2001b, p. A-26). Research indicates that these small inclusions of large trees are important for old forest associated wildlife like the California spotted owl (Blakesley 2003; Moen and Gutierrez 1997), Pacific fisher (FSEIS, p. 139), and American marten. "Pacific fishers, American martens, and California spotted owls use small aggregates of large trees for denning, resting, and nesting sites," even within larger stands that do not constitute old growth. (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.2, p. 131). The new plan would entirely eliminate protection for small old growth stands. Failure to protect these small but

important stands could degrade potential owl nesting habitat and reduce the likelihood of nesting success (Verner 2003b, p. 4; Blakesley and Noon 2003) and eliminate potential denning and resting sites for fisher (Barrett 2004a).

Third, the Framework established the southern Sierra fisher conservation area for the purpose of protecting and restoring the fisher's currently occupied habitat, in part by requiring management for a high proportion of relatively dense canopy forests in all watersheds. (USDA Forest Service 2001b, p. A-45). The new proposal would delete this requirement (ROD, p. 62) and would eliminate any meaningful protection for the southern Sierra fisher conservation area. (Barrett 2004a).

Fourth, the new plan weakens the Framework's protection of owl protected activity centers. Whereas the Framework precluded logging (other than hand removal of trees less than 6" dbh) in PACs outside of the defense zone of the wildland urban intermix (WUI) (USDA Forest Service 2001b, p. A-35), the revised plan allows logging of trees up to 30" dbh within the threat zone of the WUI as well. (ROD, p. 60). The new plan also allows PAC boundaries to be adjusted to facilitate logging (ROD, p. 59), despite the fact that the current PAC boundaries "have been refined … to incorporate the best available current information on vegetation conditions and owl locations" (FSEIS, p. 144) and that there are "limited opportunities for replacing acres of PACs … with adjacent acres of comparable quality." (FSEIS, Vol. 2, p. 99). As stated by the Forest Service's Science Consistency Review, "it is difficult to know what, if any, suitable acres will be available to 'replace' acres that are treated" within PACs. (Stine and Keane 2003, p. 8).

Finally, the Framework's standards and guidelines designed to limit logging and promote development of large trees, large snags, and ample canopy closure throughout the planning area would be weakened across the board. (See generally ROD, pp. 50-52). The new plan increases the logging diameter limit (from 12"-20" up to 30"), decreases protection for canopy cover (from 50 percent to 40 percent or even lower in some circumstances), allows greater reduction in canopy cover (from 10-20 percent to 30 percent), and transforms the Framework's legally binding standards for large snags and large woody debris into "general guidelines" that could be weakened at the project level. In eastside pine forests, the Framework's 24" diameter limit would be increased to 30", and the Framework's requirement that a minimum of 30 percent canopy cover be retained would be eliminated entirely.

Given these changes, the U.S. EPA concluded in its comments that "the impacts of these management actions appear inconsistent with the underlying SNFPA purpose and need to address fuels, restore old forest habitat, and prevent listings of old forest-dependent species." (U.S. Environmental Protection Agency 2003b, p. 4). As described below, the cumulative impact of these changes would be to threaten imperiled species associated with these forests, including the California spotted owl, Pacific fisher, and American marten, contrary to law.

III. THE PLAN WOULD THREATEN THE VIABILITY OF NUMEROUS IMPERILED SPECIES, CONTRARY TO THE NATIONAL FOREST MANAGEMENT ACT

The National Forest Management Act (NFMA) directs the Forest Service to "provide for diversity of plant and animal communities" in the planning process. 16 USC 1604(g)(3)(B). The Forest Service's regulations that implement this statutory mandate require that "[f]ish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species." 36 CFR 219.19. "For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area." (Ibid.) With respect to Forest Service designated sensitive species, the agency is further required "to ensure their viability and to preclude trends toward endangerment that would result in the need for Federal listing." (Forest Service Manual 2672.1).

As described in this section, the revised plan would threaten the viability and distribution of numerous species, including the California spotted owl, Pacific fisher, American marten, willow flycatcher, and Yosemite toad. Moreover, the plan would contribute to a trend towards federal listing of these same species, contrary to law.

A. California Spotted Owl.

The new plan substantially weakens the Framework's protection for the California spotted owl and its habitat. The plan allows logging of medium and large trees, reduction in canopy cover, and removal of large snags and down logs throughout all land allocations, and eliminates or weakens protection for protected activity centers, spotted owl home range core areas, old forest emphasis areas, and stands of old forest 1 acre or larger.

The Forest Service's Science Consistency Review concluded that the new plan "incurs greater risk" to the owl than does the Framework:

> Alternative S2 likely incurs greater risk to owl persistence because of: (1) potential to treat more PACs (51% of total PACs); (2) canopy cover reduction in PACs; (3) more aggressive vegetation treatments compared to S1 (lower canopy cover retention, increased harvest of mid-sized trees <30" dbh); (4) full implementation of HFQLG; and (5) unquantified amounts of Forest Health treatments. Given continued concern regarding owl population trends Alternative S2 likely incurs greater risk. (Stine and Keane 2003, p. 9, emphasis added).

As stated by the Forest Service's Washington Office Director of Fish and Wildlife, "one can only conclude that standards in S2 are a prescription for continued owl population declines." (Gladen 2003, p. 11).

The spotted owl biologists who have reviewed the plan have been uniformly critical. The owl scientists have concluded that implementation of the new plan is likely to increase threats to the

owl's viability, contributing to a trend towards federal listing. (Verner 2003b; Blakesley and Noon 2003; Noon 2004; Peery 2004; Bond 2003; Franklin et al. 2003). Moreover, according to the owl scientists, "there is no new science in the Proposal that justifies the fundamental departure from CASPO or the ROD." (Franklin et al. 2003). Therefore, the owl scientists have urged the Forest Service to withdraw the revised plan and to implement the Framework or a similarly conservative approach. (Noon 2004; Verner 2004; Blakesley and Noon 2004).

1. Overview of the California Spotted Owl's Status and Habitat Associations in the Sierra Nevada.

a. The California Spotted Owl is closely associated with relatively dense, older forests.

Research has documented that the California spotted owl utilizes and selects habitat at three different spatial scales: nest, roost, or foraging stand; home range or core area; and landscape. (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 72). At all three scales, the owl is associated with forests characterized by large trees, large snags and down wood, and relatively dense, multi-storied canopies. There is no new evidence since release of the Framework FEIS to modify these conclusions; rather, Blakesley (2003) provides additional confirmation of the owl's strong relationship to old forest structures. (Blakesley and Noon 2003).

i. Nesting and roosting habitat.

"In general, stands suitable for nesting and roosting have (1) two or more canopy layers, (2) dominant and codominant trees in the canopy averaging at least 24 inches in dbh, (3) at least 70 percent total canopy cover (including the hardwood component), (4) higher than average levels of very large, old trees, and (5) higher than average levels of snags and downed woody material." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 73). "Nesting habitat for California spotted owls is generally described as stands with an average dominant and codominant tree diameter greater than 24 in and canopy cover of greater than 70 percent." (USDI Fish and Wildlife Service 2003a, p. 7589). "Nest trees are often large, over 89 cm (35 in) average dbh … and larger than other trees in the same stand…. Although old, large trees are important to California spotted owls, intermediate-sized [11-24 in and 20-30 in] trees were also selected" by nesting, roosting, and foraging owls. (Ibid.). Therefore, trees with diameters 20-30", which were generally protected by the Framework but which are available for logging under the new plan, are an important component of owl nesting and roosting habitat. (Peery 2004, pp. 2-3; Bond 2003; Blakesley and Noon 1999).

ii. Foraging habitat.

"In general, stands suitable for owl foraging have (1) at least two canopy layers, (2) dominant and codominant trees in the canopy averaging at least eleven inches in dbh, (3) at least 40 percent canopy cover in overstory trees, … and [4] higher than average numbers of snags and downed woody material." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 73). Although canopy cover down to 40 percent was considered suitable for foraging in the 1992

Technical Report (Verner et al. 1992), stands with less than 50 percent canopy cover are now considered "only marginally" adequate for foraging. (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 73; USDI Fish and Wildlife Service 2003a, p. 7589).

Research from the Sierra National Forest, cited in the Framework FEIS, shows that owls preferentially forage in stands with greater than 50 percent canopy cover, while only utilizing stands with 40-50 percent cover in proportion to their availability. (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 73). The research further shows that there is a "huge spike" in California spotted owl foraging when canopy cover "is over 50-60%." (USDA Forest Service 2003b). Hunsaker et al. (2002) demonstrated that productive owl sites have more area with canopy cover greater than 50 percent than unproductive sites, and that "the threshold between canopy cover values that contribute to or detract from occurrence and productivity is a value near 50 percent" (p. 699).[4] Moreover, they found that "changes in canopy-cover composition of less than 10 percent can significantly affect occupancy." (Ibid.). The original recommendation in the CASPO Technical Report was that owl foraging stands include a minimum of 50 percent canopy cover. (Verner et al. 1992, p. 96). Thus, 50 percent is now widely considered to constitute the minimum canopy cover preferred by owls for foraging. (USDA Forest Service 2003b).

Owls prefer to forage in stands dominated by trees greater than 20-24 inches diameter. "Studies on the Tahoe and Eldorado National Forests found that owls foraged in stands with large diameter trees (defined as trees greater than 24 inches in dbh in one study and trees 20 to 35 inches in dbh in the other) significantly more than expected based on availability." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 72). Owls tend to select elevated perches and to drop from the perch to forage in the understory. (Verner et al. 1992, p. 68). Owl scientists agree that trees under 30 inches dbh, which will be targeted for logging under the new plan, contribute significantly to owl foraging habitat. (Peery 2004, p. 2; Bond 2003).

iii. Home range and core area habitat.

Estimates of the spotted owl's home range size in the Sierra Nevada ranges from 2,500 acres in the southern Sierra to 9,000 acres in the northern Sierra. (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 75). Within these home ranges, the mean size of nest stands, including adjacent suitable habitat, is about 300 acres. (Ibid.). Bingham and Noon (1997) found that owls preferentially utilize core areas within their home ranges, which constitute approximately 20 percent of the home range where 60% of the use occurs. These core areas therefore require special protection to ensure that management activities near the nest stand do not adversely impact nesting and foraging habitat where it is most important. (Ibid.).

Blakesley (2003) studied the relationship between site occupancy and habitat within the owl's nest area and home range core area on the Lassen National Forest. She found that "site occupancy was positively correlated with the amount of the nest area dominated by large trees

[4] Although Danny Lee, in an unpublished paper, has criticized certain aspects of the Hunsaker et al. research, he has not challenged the use of 50 percent canopy cover as an appropriate bellwether for owl foraging habitat. As recognized by the Fish and Wildlife Service, both Hunsaker et al. 2000 and Lee "found that canopy cover of at least 50 percent was desirable." (USDI Fish and Wildlife Service 2003a, p. 7601).

and high canopy cover within the nest area." (Ibid., p. iii). "Although owls were found nesting and roosting in a variety of forest stand types, site occupancy, apparent survival, and nesting success all increased with increasing amount of forest cover types known to be selected by the owl at the landscape scale." (Ibid., p. 15). These selected cover types, as described by Verner et al. (1992), include timber strata 4N and 4G, i.e., forests characterized by trees greater than 24" dbh with canopy closure 40 percent or greater.[5]

Analysis by Bart (1995) of the relation between the proportion of a pair's home range that is in suitable habitat and the productivity and survivorship of northern spotted owls "suggests that removing any suitable habitat within the vicinity of the nest tends to reduce the productivity and survivorship of the resident owls." The Forest Service has stated: "In the absence of clear reasons why these results would not apply to the California spotted owl as well, they need to be considered in planning for the owls in the Sierra Nevada." (USDA Forest Service 1998, p. 24). This suggests that reducing canopy cover below 50 percent and removing medium and large trees from within the owl's home range would likely reduce the productivity and survivorship of California spotted owls.

b. The owl's conservation status in the Sierra Nevada is precarious.

The California spotted owl has been a focus of management concern on national forests since at least the 1980s. In response to this concern, demographic studies were initiated in four locations in the Sierra Nevada beginning in 1986. A primary purpose of these demographic studies has been to understand the life-history structure of this species and estimate values of demographic parameters – survivorship, fecundity, mortality – that could be used to compute rates of population change. Consideration of these population characteristics over time is especially important since the California spotted owl is known to be long-lived and to successfully fledge young at irregular intervals. (Gutierrez et al. 1995). The most recent analysis of this research concluded that "all the demographic evidence available – such as estimated vital rates, rates of population change, and differences between paired studies – suggest substantial caution in owl conservation and management efforts." (Franklin et al. 2004, p. 41).

Estimating the rate of population change is of particular interest because it has been used in the past to make inferences about the health of a population. (Franklin et al. 1999). The metric used to represent the rate of population change is lambda (λ). Simply stated, values of λ equal to 1 represent a stable population, those less than 1 represent a declining population, and those greater than 1 represent an increasing population. (Sandercock and Beissinger 2002, p. 590). Different methods have been used to calculate λ for the studies in the Sierra Nevada. Reports and published papers of the individual demographic studies utilized one method (Blakesley et al. 2001; Seamans et al. 2001; Steger et al. 2000), whereas the recently completed analysis of all the demographic studies used a different method. (Franklin et al. 2004). The underlying definitions of λ for these two methods, along with respective assumptions and limitations, are slightly

[5] Blakesley utilized Forest Service maps, which categorize all stands with 40-70 percent canopy cover together. Therefore, her methodology was unable to distinguish the owl's use of stands greater than or less than 50 percent canopy cover. However, Blakesley noted that Hunsaker et al. (2002) "found a threshold of 50% canopy cover to be important to spotted owl reproduction." (Blakesley 2003, p. 17).

different. For the demographic studies published individually, λ characterizes the rate at which the female population is replacing itself, whereas the report that evaluated all the studies together characterizes the rate at which the population is being replaced. (Franklin et al. 2004). The first method focuses on the capacity of nesting birds to replace themselves through their own reproductive effort. The second method focuses on whether or not the birds in a given area are replaced by any mechanism, e.g., by their own reproduction or through immigration.

For the individually reported or published demographic studies, λ was found for each of the study areas to be less than and significantly different than 1 ($p<0.05$). The report of all studies (the meta-analysis), using a different methodology, found that the means of all but one of the study areas were less than 1. "However, the 95% [confidence intervals] for all estimates included 1, indicating that all of the populations were stationary or the estimates of λ were not sufficiently precise to detect declines if they occurred. That latter point was important because point estimates for four of the five study areas indicated annual population declines of 2-4%, but the estimates were not sufficiently precise to differentiate those estimates from stationary populations." (Franklin et al. 2004, p. 33, emphasis added). Because the method used to calculate λ in the meta-analysis allows the estimate of lambda by year, a trend over time in lambda for each study could be examined. Two of the Sierra Nevada studies showed no trend with time for λ. A negative trend in lambda was observed for both the Eldorado and Sierra study areas. "This was cause for concern on the [Sierra study] because it suggested an accelerated rate of decline in the owl population on [this study] during most of the study period." (Franklin et al. 2004, p. 33).

In addition to considering λ the meta-analysis found that rates of adult survivorship were similar across all studies except that the one in Sequoia-Kings Canyon National Park was higher. These rates "were less than those reported in a meta-analysis of the declining Northern Spotted Owl," which was a cause of "concern." (Franklin et al. 2004, pp. 35, 40). Moreover, the fact that the owl appeared to be faring significantly worse on national forest lands within the Sierra study area than on national park lands in the nearby Sequoia-Kings Canyon study area suggested that logging on national forest lands was contributing to reduced survivorship and declining populations. (Franklin et al. 2004, pp. 37-38, 40).

Owl scientists who participated in the demographic studies offer the following perspectives on the results from all the studies:

> Although only the Sierra National Forest demographic study shows significant decline in lambda by both models used to analyze it, existing data on lambda for the Lassen study are generally negative and don't give reason to believe that population is being maintained. Even results from the Eldorado demographic study, which show a positive lambda value by the latest analysis, are questionable. The lambda values have been negative since 1997, and the apparent population increases prior to that may be artifacts of sampling intensity (Mark Seamans, personal communication) and the possibility that extensive clearcutting on private lands surrounding the Eldorado study area has resulted in displacement of owls there and their moving into the demographic study area (Rocky Gutiérrez, personal communication). (Verner 2003c, p. 4).

> Finally, regardless of differences in lambda estimated from the …[two methods]…, changes in abundance for the Eldorado Density Study Area indicated a population decline from 1997 through 2000 (the years for which I have access to data). From 1997, abundance declined each successive year from 74, 69, 56, to 52 occupied territories in our study area. Survey effort remained the same or increased on the study area during this time period, both spatially and in total quantity. (Bond 2003, p. 3).
>
> Although estimated population trend from the meta-analysis did not provide overwhelming statistical evidence of spotted owl population declines throughout the Sierra Nevada, there was compelling evidence that spotted owls did decline on the Sierra National Forest (NF) study area. Adding to our concerns about the status of California spotted owls is the fact that estimated apparent adult survival probability for spotted owls on the Lassen, Eldorado and Sierra NFs was lower than that of northern spotted owls …, a subspecies currently listed as threatened under the Endangered Species Act. Furthermore, there was no evidence for increasing spotted owl populations in the Sierra Nevada (no point estimates of lambda over long time periods exceeded 1.0). We reiterate a conclusion of the meta-analysis that caution be taken in owl management efforts. (Blakesley and Noon 2003, p. 2).

In conclusion, the results from the demographic analyses, regardless of how λ is calculated, are interpreted by owl scientists to indicate there is substantial cause for concern regarding the stability of the California spotted owl population in the Sierra Nevada and that a conservative approach to management is warranted.

2. <u>The Plan Threatens the Owl's Viability and Distribution in the Sierra Nevada.</u>

The new plan weakens the Framework's restrictions on logging throughout national forest lands, but especially within old forest emphasis areas, owl home range core areas, and owl protected activity centers. The DSEIS acknowledged that "Alternative S2's standards and guidelines for mechanical thinning … could result in removal of habitat attributes that provide quality nesting and foraging habitat" for owls (DSEIS, p. 186), and the same conclusion applies to the final decision.[6] Because these standards will be applied in virtually all land allocations, the effect of this "one size fits all" plan would be to fragment and degrade owl habitat, potentially isolating owl populations and threatening the owl's distribution and viability in the planning area. As the Forest Service concluded in the DSEIS:

> Alternative S2 tends to disrupt the continuity of habitat conditions (i.e. habitat structure and distribution) over the 20 year time period. This disruption may lead to increases in fragmentation and habitat patchiness. <u>The increases in fragmentation and patchiness are likely to isolate subpopulations and limit the opportunity for interactions across NFS lands</u>. (DSEIS, p. 193, emphasis added).

[6] Although this language has been removed from the final SEIS, there is no new information or analysis that would change the statement in the DSEIS.

Increasing forest fragmentation, and therefore nearest-neighbor distance, is precisely the negative outcome that owl scientists have been warning against since the 1992 CASPO Technical Report. As stated in that report: "Future management activities, for example, must not increase the mean nearest-neighbor distance among suitable pair sites. Subtle factors that uniformly decrease habitat quality, or increase fragmentation, will act to reduce population density and incrementally increase the uncertainties associated with successful dispersal and mate-finding." (Verner et al. 1992, p. 184.)

The Forest Service's Science Consistency Review concluded that the new plan "incurs greater risk" to the owl than the Framework. (Stine and Keane 2003, p. 9), and the agency's Washington Office Director of Fish and Wildlife found that the new plan is "a prescription for continued owl declines." (Gladen 2003, p. 11). The owl scientists who have reviewed the plan have uniformly concluded that the plan increases the risks to the owl's population, threatening the owl's viability and distribution and contributing to a trend towards federal listing under the Endangered Species Act. See, for example, Noon 2004, p. 2 ("the current proposal is such a dramatic shift from the Framework that I believe it increases the risks to viability of species associated with old forests and fails to meet the viability requirements of NFMA"); Verner 2003b, p. 1 (the plan "may lead to a trend toward listing of the California spotted owl"); Blakesley and Noon 2003 (the plan "fails to meet the legal requirements of the National Forest Management Act" with respect to viability); Peery 2004, p. 5 ("the new plan would significantly threaten the owl's present distribution and population, which is inconsistent with the agency's legal duty to ensure viability and avoid contributing to a trend towards federal listing under the Endangered Species Act"); Bond 2003, p. 2 (the proposed changes "will contribute to the decline of the California spotted owl, strengthening the need to list the subspecies under the ESA"). To the best of our knowledge, not a single owl scientist supports the new plan.

The revised plan would adversely affect the owl and its habitat in the following respects:

a. <u>Logging of medium and large trees.</u>

The new plan increases logging diameter limits from the existing 12-20" to 30" in all land allocations. However, research indicates that 20-30" diameter trees are an important component of owl foraging and nesting habitat. For example, Call et al. (1992) showed that owls strongly select stands with a high basal area of trees between 20.7-35.4 inches for foraging. In fact, the basal area of trees in this size class was the second most important variable (out of 54) for discriminating owl foraging stands from random stands. Bias and Gutierrez (1992) found that a greater basal area of trees in the 20.7-35.4 inch size class occurred in owl nest stands than in random stands. Blakesley (2003) documented greater nest success in stands and greater survival in territories dominated by medium and large trees. The 1992 CASPO report found that nearly 25 percent of owl nest trees were less than 30" dbh. (Verner et al. 1992, p. 92). In sum, as the U.S. Fish and Wildlife Service has expressed, "a significant number of potential nest trees could be removed" by logging trees less than 30" dbh. (USDI Fish and Wildlife Service 1999, p. 7).

Dr. Noon, in his review, described the proposal to log trees up to 30" dbh as "perhaps one of the most poorly justified components of the new management plan." (Noon 2004, p. 2). "Not only does this exacerbate unnatural stand structures by further reducing the number of large diameter trees and put old growth wildlife species at increased risk, it is not a justified priority under any scientifically credible fuels reduction plan." (Ibid.). "Without any information to the contrary, management plans should assume that 20-30 inch trees constitute an important component of Spotted Owl habitat and that removing significant numbers of these trees could have a negative effect on Spotted Owl population viability." (Peery 2004, p. 2; Bond 2003).

Removing trees under 30" diameter also has the effect of "making large tree recruitment in the future more uncertain," according to the Forest Service's Washington Office. (Gladen 2003, p. 11). Owl scientists have similarly concluded that new plan "fails to ensure adequate recruitment of large trees, which are a critical component of owl nesting habitat, once the stock of mature and old-growth trees becomes reduced due to natural mortality." (Peery 2004, pp. 2-3; Verner 2003b, p. 3).

In its response to public comments, the Forest Service argues that the new plan's 40 percent basal area retention standard "has the effect of limiting the number of larger trees less than 30" dbh that can actually be removed." (FSEIS, Vol. 2, p. 50). The FSEIS further states that "in most cases, except for previously thinned stands, the basal area retention rule will lead to lower limits than the 30-inch maximum." (FSEIS, App. B, p. 401). However, the FSEIS fails to include sufficient information to allow the reader or the decision maker to translate the basal area retention standard into dbh limits for typical forest stands in the Sierra Nevada. The Science Consistency Review expressed this same concern:

> The effects of the S2 prescriptions are difficult to quantify or interpret. What does retention of 40% of the basal area in the largest trees typically result in? It would be helpful to illustrate this with some examples in different kinds of owl habitat. (Stine and Keane 2003, p. 3).

Regardless of the precise impact of the basal area retention standard, it is undisputed that the revised plan will allow logging of a significant proportion of 20-30" trees, which are an important element of owl habitat.

b. Reduction in canopy cover and simplification of multi-layered canopies.

The new plan reduces the Framework's canopy retention standards from 50 percent to 40 percent (or possibly even lower in some circumstances), while also increasing the amount of canopy reduction allowed from 10-20 percent to 30 percent.[7] According to Verner (2003b, p. 2),

[7] Although the plan would ostensibly retain 50 percent canopy cover as a goal, it would allow canopy cover to be reduced to 40 percent whenever "project objectives require additional canopy modification," such as to "design cost efficient treatments." (ROD, p. 51). Moreover, the ROD also states that "where existing vegetative conditions are at or near 40 percent canopy cover, projects are to be designed [to] remove the material necessary to meet fire and

reducing canopy cover to 40 percent "would markedly reduce the suitability of owl habitat, with much uncertainty about the overall effects on the owl population." The effect is to reduce canopy cover in primary owl habitat "to levels providing only marginal habitat, or worse, for foraging and clearly unsuitable for nesting." (Verner 2004, p. 3).

The reduction in the standard from 50 percent to 40 percent represents a substantial departure from the Framework, one that owl scientists do not support. (Verner 2003b; Blakesley and Noon 2004; Peery 2004). Blakesley and Noon (2004, p. 2) emphasize that owl scientists raised concerns about reducing canopy cover in suitable owl habitat "at three separate meetings" with the interdisciplinary team. As stated by Dr. Verner in his comments on the DSEIS: "In spite of many efforts by owl scientists to emphasize the importance of canopy cover to the owls, the present Draft seems to ignore most of these concerns." (Verner 2003b, p. 3).

The Review Team justified lowering allowable canopy levels by arguing that dense canopy is not as important as assumed in the FEIS. (USDA Forest Service 2003a, pp. 37-40). However, the owl scientists disagree with this interpretation, and it is based on a reanalysis of published research that has not been peer-reviewed and is not widely available for public scrutiny. (See Blakesley and Noon 2004, p. 3 for a critique of this unpublished study.) "Thus, the only peer-reviewed analyses relating Spotted Owl demographics in the Sierra Nevada to canopy attributes suggest that reducing canopy protection will have a negative impact on owl population viability." (Peery 2004, p. 3).

Owl scientists have consistently stated the need to "increase retention and recruitment of large trees and retention of closed canopy conditions throughout the Sierra Nevada landscape." (Blakesley and Noon 1999, p. 24). The new plan is plainly inconsistent with these recommendations. As stated in the DSEIS, "potentially more open overstory can be created with Alternative S2 than with S1" (DSEIS, p. 190), the effect of which will be to degrade owl nesting and foraging habitat. According to the Forest Service's Washington Office Director of Fish and Wildlife, the new plan's canopy cover limits provide "at best marginal habitat, less preferred by owls resulting in less productivity than stands of 50% or more canopy closure." (Gladen 2003, p. 10).

In addition, several studies have identified canopy layering as an important structural characteristic associated with preferred foraging sites for the northern spotted owl. (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 72). North et al. (2000) also found that high foliage volume was a key factor in selection of nest sites for spotted owls on the Sierra National Forest. The effect of the new plan will be to simplify the canopy, promoting forests with little or no understory, "which could affect owl reproductive output." (DSEIS, p. 187).

c. Removal of large snags and down wood.

Large snags and large woody debris on the forest floor have been repeatedly documented to be important components of habitat selected by California spotted owls. (Verner et al. 1992, p. 96;

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fuel objectives." (ROD, p. 50). The implication of this standard is that canopy cover can be reduced to below 40 percent in such situations, where necessary "to provide for an effective fuels treatment." (ROD, p. 50).

see Bond 2003 for a summary of research.) The new plan weakens the Framework's retention standards for snags and down wood in at least two important respects. First, the Framework's minimum standards have become discretionary "general guidelines" and can be modified at the individual project level without any apparent criteria to guide this decision. (ROD, p. 51). In other words, the plan no longer establishes minimum snag and down wood retention standards and it is reasonable to assume that retention levels for individual projects will be lower in some cases. Second, within OFEAs, the Framework's even stronger snag retention standards have been eliminated. As summarized by Bond (2003, p. 11), "large trees, snags, and large down woody debris are a vital component of old forest ecosystems," and "it is therefore inappropriate to remove large trees and snags and reduce canopy cover from any potential spotted owl habitat."

d. Increased logging within PACs.

Verner et al. (1992) considered the establishment of PACs around all known owl nest sites to be a critical component of a management strategy designed to stabilize owl habitat and populations. "The PACs were designated by the CASPO team as a means of preserving the high canopy cover so consistently associated with owl nesting sites." (Verner 2003b, p. 7). "The loss of available nest sites … may preclude population expansion following breeding pulses. This, in turn, may result in declining populations with lower likelihood of persistence over time." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 84). The owl scientists have repeatedly cautioned the Forest Service not to conduct logging within PACs, at least until further research on the impacts of such logging is undertaken. (Blakesley and Noon 2004, p. 2). Therefore, "PACs should be viewed as 'centerpieces' of protected habitat for Spotted Owls in the Sierra Nevada and should not be rendered unsuitable by management activities." (Peery 2004, p. 3).

The new plan significantly increases the potential adverse impacts to PACs from logging. The Framework only allowed logging in PACs within the defense zone of the WUI, whereas the new plan allows logging in PACs within both the defense and threat zones. In addition, the plan allows a greater number of PACs to be entered by allowing 10 percent of PAC acreage to be logged per decade, whereas the Framework allowed 10 percent of the total number of PACs (by number, rather than by acreage) to be entered by logging per decade. (FSEIS, p. 264). Consequently, the FSEIS projects that the plan would treat approximately 80 more PACs within the next two decades than would the Framework (FSEIS, p. 266), including more logging within the PACs (FSEIS, p. 265).[8]

Under the new plan, PACs within the defense and threat zones can be logged pursuant to the standards and guidelines for mechanical thinning treatments in mature forest stands. Yet the DSEIS concedes that such logging "could result in removal of habitat attributes that provide quality nesting and foraging habitat" for owls. (DSEIS, p. 186). "Allowing this much of the owl's core nesting habitat to be logged significantly increases the likelihood that the owl's distribution and population will decline." (Peery 2004, p. 4). As stated by Dr. Verner: "In my

[8] In fact, the actual amount of logging within PACs could be significantly greater than forecast in the FSEIS, since the FSEIS predicts that only 4 percent of PAC acres will be logged over twenty years (FSEIS, p. 266), whereas the new plan explicitly allows 20 percent of PAC acres to be logged over the same time period. However, the potential impact of logging this greater acreage of PACs is not considered in the FSEIS.

professional opinion, to degrade this attribute of the PACs [i.e., canopy cover] would be a major risk for the owl." (Verner 2003b, p. 7).

e. Weakening protection for owl home range core areas (HRCAs) and old forest emphasis areas (OFEAs).

The new plan negates the value of HRCAs and OFEAs by applying the same logging standards and guidelines to these areas as to general forest. "The new plan would eliminate meaningful protection for HRCAs, OFEAs, and all old growth stands of 1 acre or larger by allowing the same kind of logging within these areas as within the general forest." (Peery 2004, p. 4). As stated by the Science Consistency Review, "it does not appear that land allocations such as OFEAs and HRCAs have any meaning under S2 because a single thinning prescription will be used." (Stine and Keane 2003, p. 5).

The Framework strictly limited logging within HRCAs based on the recognition that spotted owls preferentially use core areas within their home ranges (Bingham and Noon 1997) and that degrading habitat within HRCAs will likely reduce survival and reproductive success (Bart 1995; USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, pp. 92-93). As stated in the Framework FEIS, "increasing the number of owl sites with desired amounts of habitat is likely important to stabilizing current population declines." (Ibid., p. 92). The FSEIS recognizes that "California spotted owl occurrence and productivity appears to be significantly correlated with canopy cover composition within own home ranges." (FSEIS, p. 270). Yet the new plan would allow logging in owl home range core areas pursuant to the same standards used in general forest, which "could result in the removal of habitat attributes that provide quality nesting and foraging habitat." (FSEIS, p. 270). The FSEIS projects that 20 percent of total HRCA acres would be logged within the first two decade (FSEIS, p. 270), though nothing in the new plan would prohibit even more logging.[9] As the Forest Service has concluded, the new plan "would reduce the amount of multi-story canopy, stand complexity and canopy closure" within owl home range core areas, "which could affect owl reproductive output." (DSEIS, p. 187).

The new plan's removal of protection for old growth stands of 1 acre or larger has been criticized by the Fish and Wildlife Service and by the Forest Service's Washington Office. The Washington Office specifically cited this weakening of the Framework as a factor in its conclusion that the new standards "do not maintain owl habitat and substantially increase the risk that self sustaining owl populations will not be maintained." (Gladen 2003, pp. 10-11). According to the Fish and Wildlife Service, this change may "have significant effects on old forest habitats used by the owl" by allowing "reduction of structural complexity within treated habitats," which "could allow stands of potential owl nesting habitat to be removed." (USDI Fish and Wildlife Service 2003c, pp. 4-5).

[9] The FSEIS fails to reveal how many HRCAs might be logged or to estimate how much suitable habitat might be degraded within individual HRCAs, despite the fact that the Science Consistency Review found this to be important information that should be included in the EIS. (Stine and Keane 2003, pp. 4, 6).

f. Increased logging within geographic "areas of concern."

The new plan allows significant habitat degradation within the "areas of concern" (AOCs) identified by Verner et al. (1992). These are vulnerable areas where habitat is already fragmented, threatening the owl's distribution and range. Verner et al. (1992) expressly cautioned against increasing fragmentation in the AOCs. Yet the FSEIS acknowledges that the new plan "increases risk of continued declines in owl density within areas of concern due to more intensive thinning based on application of the forest-wide standards and guidelines for mechanical treatments in mature forest stands and HRCAs. This increases the risk identified for widening gaps between habitat parcels, potentially resulting in reduced owl densities and reduction in distribution of owls and owl habitat in AOCs." (FSEIS, p. 272, emphasis added). The FSEIS acknowledges concerns about the impacts on AOCs within the QLG pilot project area (FSEIS, p. 272) but the ROD shows "apparent indifference … to maintaining sufficient suitable habitat" in the AOCs. (Verner 2004, p. 3).

More specifically, the FSEIS projects that logging could occur in an additional 52 PACs within the AOCs under the new plan. (FSEIS, p. 274). As acknowledged in the DSEIS, such logging would result in a "low probability of retaining important structural attributes of spotted owl habitat." (DSEIS, p. 189). According to Dr. Verner, "the concern is that these areas might impede easy and safe dispersal of the owls throughout the Sierra Nevada, potentially affecting overall viability of the population." (Verner 2003b, p. 4). For this reason, the plan "could significantly affect the owl's dispersal and reduce recruitment into the territorial population, potentially leading to the isolation of subpopulations and a reduction in the owl's distribution." (Peery 2004, pp. 4-5).

g. Full implementation of the Quincy Library Group (QLG) pilot project.

The Chief's appeal decision denying the administrative challenges to the Sierra Nevada Framework requested "further review" to ensure that the Framework's goals "were adequately balanced with goals of the HFQLG" and "to determine if additional opportunities exist to harmonize the goals of these two efforts." (USDA Forest Service 2001c). The new decision fails to respond to the Chief's direction. Rather than balancing or harmonizing the goals of the Framework and of the QLG project, the revised plan allows "full implementation" of the QLG project. (ROD, p. 5). Given that both the Forest Service and the Fish and Wildlife Service have previously determined that full implementation of the QLG project would threaten the viability of the California spotted owl and other species, the revised plan is not only inconsistent with the Chief's request for "adequate balance" but is also contrary to law.

The Herger-Feinstein Quincy Library Group Forest Recovery Act directed the Forest Service to implement the QLG pilot project subject to important limitations. First, the project can only be implemented "consistent with applicable Federal law" (Section 401(c)(3)); nothing in the Act "exempts the pilot project from any Federal environmental law." (Section 401(l)). Second, the project must comply with "the standards and guidelines for the conservation of the California spotted owl as set forth in the California Spotted Owl Sierran Province Interim Guidelines or the

subsequently issued guidelines, whichever are in effect." (Section 401(c)(3)). Because the QLG project must comply with all Federal environmental laws, it is subject to the mandate of the Forest Service's regulations that forests "shall be managed to maintain viable populations of existing native … vertebrate species in the planning area" (36 CFR 219.19), including the California spotted owl.

The Forest Service prepared an EIS and biological assessment/biological evaluation (BA/BE) to analyze the impacts of implementing the QLG project, which found that the project would significantly degrade owl habitat. (USDA Forest Service 1999b). Of all the alternatives considered, full implementation of the QLG project posed the greatest overall risks to the spotted owl. (USDA Forest Service 1999a, p. 82). The BA/BE concluded as follows:

> Alternative 2 [the pilot project] would reduce the amount of California spotted owl … nesting habitat by 7% over the life of the pilot project, and reduce the amount of foraging habitat by 8.5%. Such reductions in suitable habitat would decrease the number of owl home ranges with more than 50% suitable habitat by 11% over the term of the project. Alternative 2 also rated the lowest among the alternatives in minimizing habitat fragmentation and impacting spotted owl Areas of Concern.
>
> In light of the recent demographic studies showing declining spotted owl populations, such impacts to owl habitat could pose a serious risk to the viability of the owl in the planning area, thereby making the implementation of Alternative 2 inconsistent with the National Forest Management Act and its implementing regulations.
>
> In order to minimize the threat to the viability of the owl in the planning area, it is necessary to add mitigation, beyond the minimum CASPO interim guideline requirements to maintain suitable habitat within the planning area. (USDA Forest Service 1999a, emphasis added).

The BA/BE therefore recommended that "no timber harvesting … be permitted in suitable owl habitat unless and until a new owl strategy for the Sierra Nevada is released." (Ibid.).

The U.S. Fish and Wildlife Service reviewed the QLG project in response to the Forest Service's request for comments and consultation. (USDI Fish and Wildlife Service 1999). The Fish and Wildlife Service expressed concerns "that the proposed action will negatively affect spotted owl survival and/or reproduction for the following reasons: (1) habitat loss, (2) habitat fragmentation, and (3) changes in prey base." Specifically, the Fish and Wildlife Service set forth the following concerns:

- "The Service is concerned that loss of spotted owl habitat will occur through DFPZ construction, thinning, individual tree selection and group selection treatments." (pp. 6-7)
- Protecting only PACs and SOHAs "may result in the loss of suitable habitat in a significant portion of an owl's home range and in dispersal habitat outside and between

home ranges. The Service agrees that management actions that reduce habitat suitability within home ranges can accelerate population declines." (p. 7)

- The project "does not take into account the juxtaposition of suitable nesting, roosting, and foraging habitat and other vegetation types, which may result in assemblages of habitat that do not promote fitness of owls." (p. 7)
- "A reduction in habitat quality could reduce owl densities …, limiting successful mate finding and dispersal and increasing nearest-neighbor distance." (p. 7)
- "The Service is concerned that reduction of suitable configurations of nesting, roosting, and foraging habitats in combination with declining populations and unforeseen contingencies (e.g., fire, disease and insect outbreaks, and drought) within spotted owl home ranges will have significant adverse effects on spotted owl population viability." (p. 8)
- "The Service is concerned that implementation of [the pilot project] may cause negative impacts to California spotted owls due to habitat fragmentation." (p. 9)
- "Due to the level of snag and large woody debris removal as proposed, the Service is concerned that [the pilot project] will remove suitable den sites and food sources of northern flying squirrels and consequently reduce the prey base for California spotted owls." (p. 10)

In sum, the Fish and Wildlife Service concluded as follows: "The Service believes the implementation of Alternative 2 poses a significant threat to the long-term viability of the California spotted owl, Pacific fisher, and American marten due to the loss, degradation, and fragmentation of suitable habitat." (USDI Fish and Wildlife Service 1999, p. 16, emphasis added).

The Record of Decision approving the QLG project reiterated these concerns about owl viability and adopted the mitigation measure recommended in the BA/BE. Specifically, the ROD found that fully implementing the QLG project "could pose a serious risk to the viability of the California spotted owl in the planning area." (USDA Forest Service 1999c).

The Forest Service reconsidered the impacts of fully implementing the QLG project during the process of adopting the Sierra Nevada Framework. The FEIS again concluded that fully implementing the QLG project would significantly increase the risks to the owl, compared to the Framework alternative. In particular, the FEIS found as follows:

- "Over the 5-year timeframe of this project, there would be greater potential for increasing nearest neighbor distances between owl sites on these forests, increasing uncertainties associated with effective dispersal and mate-finding." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 86).
- "If management activities reduce owl occupancy and productivity across this area (as expected under alternative 2 of the HFQLG), opportunities to stabilize population declines could be substantially compromised." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 94).

- "Population declines that would occur within the three geographic areas of concern located within the HFQLG project area, exacerbate the overall risk to spotted owl population…. Actions proposed under Alternative 2 of the HGQLG will widen gaps between habitat parcels and probably reduce the densities of owls within [Area of Concern 1." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 94).
- Overall, the FEIS concluded with respect to the QLG project: "The high rates of vegetation treatments occurring over a short time period would result in substantial risk to the distribution and abundance of California spotted owls and owl habitat in the northern Sierra Nevada." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 99).

Regional Forester Brad Powell, in the Framework ROD, stated his intention "to carry out as much of the [QLG] pilot project as possible." (USDA Forest Service 2001b, p. 50). However, he concluded that "the entire level of management activity specified in the HFQLG legislation cannot be implemented without degrading owl habitat without increasing risk to owl viability. The provisions for excessive canopy closure reductions, large tree removals, and substantial acreages in group selection treatments are factors contributing to this conclusion." (USDA Forest Service 2001b, p. 51).

The current Regional Forester, in his apparent zeal to fully implement the QLG project, now seeks to ignore or undo all of these past finding and conclusions, in the absence of any new information that would justify changing them. The Forest Service now attempts to characterize the earlier findings as reflecting only "the then Regional Forester's belief that limiting the Pilot Project was 'necessary … to maintain viable populations of spotted owls….'" (FSEIS, Vol. 2, pp. 43-44). However, as just discussed, the concerns about viability expressed by the Regional Forester in the Framework ROD were based on substantial evidence, including the Forest Service's biological evaluation of the QLG project, the Fish and Wildlife Service's review of the QLG project, and the conclusions of the Forest Supervisors that approved the QLG project. All of these prior findings concluded that full implementation of QLG would threaten the owl's viability.

Second, the Forest Service describes the earlier findings as representing a "'worst case' approach to evaluating effects of the Pilot Project on owls." (FSEIS, Vol. 2, p. 44). For example, the Forest Service questions whether all group selection and DFPZ logging under the pilot project would render spotted owl habitat unsuitable, as assumed in the previous analysis in the BE. However, there is no reason to believe that these previous assumptions were unrealistic.[10] For example, group selection would remove all trees under 30" diameter, with no protection for canopy cover. (ROD, p. 51). DFPZs only need to comply with the minimum standards in the revised Framework, such as 40 percent canopy cover and the 30" dbh limit. As described earlier,

[10] To the contrary, the oft-quoted conclusion that the pilot project would result in a 7 percent decline in nesting habitat and an 8.5 percent decline in suitable habitat is based only on DFPZs and area treatments and fails to account for group selection or individual selection logging. Including group and individual selection in the analysis "could result in an additional 2 to 4% of suitable habitat potentially impacted" by the pilot project. (USDA Forest Service 1999b, p. 73). Thus, the quoted figures appear to be underestimates, rather than overestimates.

there is ample evidence that such standards allow significant degradation in owl nesting and foraging habitat.

The owl biologists have consistently expressed serious concerns about fully implementing the QLG project. See, for example, Blakesley and Noon 1999 (expressing "particular concern" about planned logging within QLG pilot project area); Verner 2003b, p. 6 (implementation of QLG project "will lower the viability of the owl population in affected national forests); Blakesley and Noon 2003, p. 5 (full implementation of QLG project deemed "inexplicable" and "unacceptable"); Peery 1999, 2004. To the best of our knowledge, no owl biologist has expressed support for fully implementing the QLG project. Moreover, both the Science Consistency Review and the Washington Office review cited the plan's full implementation of the QLG project as an important factor in their determinations that the new plan would increase the risk to the owl's population. (Gladen 2003, pp. 10-11; Stine and Keane 2003, p. 9).

In sum, there is substantial evidence in the record indicating that full implementation of the QLG project would threaten the viability of the California spotted owl and other species, contrary to law.

h. Summary of impacts on California spotted owls and their habitat.

In conclusion, the new plan would have a significant, adverse impact on spotted owl habitat in the Sierra Nevada at multiple spatial levels. See, for example, DSEIS, p. 184 (Alternative S2 would allow substantially more logging of PACs), p. 186 (Alternative S2 "could result in the removal of habitat attributes that provide quality nesting and foraging habitat"), p. 187 ("Alternative S2 would reduce the amount of multi-story canopy, stand complexity and canopy closure which could affect owl reproductive output"), p. 188 (Alternative S2 would result "in reduced owl densities and reduction in distribution of owls and owl habitat" in geographic areas of concern, as well as "increased fragmentation" in these areas). Overall, the DSEIS concludes (p. 193) that Alternative S2 is "likely to isolate subpopulations and limit the opportunity for interactions across NFS lands."[11] The owl scientists have uniformly concluded that the plan would threaten the owl's distribution and viability, contrary to the agency's legal duty to ensure viability and avoid contributing to a trend towards federal listing under the Endangered Species Act. (Noon 2004; Verner 2003b; Blakesley and Noon 2003; Peery 2004; Bond 2003).

3. There is No New Information that Warrants a Substantial Departure from the Existing Owl Conservation Strategy.

The Forest Service contends that there is "new information" that justifies taking increased short-term risks to the owl and its habitat to promote a long-term fuels reduction strategy. (FSEIS, p. 27). This assertion is unpersuasive. First, as a general matter, the owl scientists agree that "there is no new science in the Proposal that justifies the fundamental departure from CASPO or the ROD." (Franklin et al. 2003). Beyond that, the information cited by the Forest Service in the

[11] We note again that many of these conclusions from the DSEIS were softened or eliminated in the FSEIS. However, in the absence of new information that warrants changing the analysis and findings in the DSEIS, the earlier findings remain valid.

FSEIS (pp. 142-147) does not justify the sweeping changes in the owl strategy incorporated into the new plan.[12]

a. Owl meta-analysis.

"Estimates of California spotted owl population trends are available from demographic studies conducted at four study areas across the range of the owl in the Sierra Nevada…. All four studies reported statistically significant declining trends over the duration of each study based on estimates of lambda. These estimates suggest rates of decline during the periods of study that range from 6 to 11 percent per year." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 71).

In the Framework FEIS, the Forest Service analyzed these studies and determined that there was reason to believe that the estimated declining trends in population might be overstated. Even so, the Forest Service concluded that "the demographic studies strongly suggest population declines in California spotted owls. The declines are sufficiently severe to warrant concern, even in light of uncertainties in the magnitude of the declines." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 72).

The Forest Service now cites the recent meta-analysis, which utilized a new methodology for analyzing owl population trends, as a basis for reconsidering "judgments about the current population status and risks of actions to reduce hazardous fuels." (FSEIS, p. 27). However, as the Forest Service concedes, "in general both methods [of calculating lambda] show a declining trend in populations." (FSEIS, p. 143).

A fair assessment of all the research on the owl's demography indicates that there are still serious concerns regarding the status of the California spotted owl in the Sierra Nevada. For example, the meta-analysis detected a negative trend in lambda for both the Eldorado and Sierra study areas, which was a particular cause for concern on the Sierra study area "because it suggested an accelerated rate of decline in the owl population … during most of the study period." (Franklin et al. 2004, p. 33). Further, the study found rates of adult owl survivorship that "were less than those reported in a meta-analysis of the declining Northern Spotted Owl," which was a cause of "concern." (Franklin et al. 2004, pp. 35, 40). Finally, the study found that the owl is faring significantly worse on national forest lands within the Sierra study area than on national park lands in the nearby Sequoia-Kings Canyon study area, suggesting that logging on national forest lands was contributing to reduced survivorship and declining populations. (Franklin et al. 2004, pp. 37-38, 40).

[12] In the DSEIS, the Forest Service cited several additional factors, including the contributions of private timberland and an alleged "pulse" in the owl's breeding in 2002, to justify the new decision. Because the ROD and FSEIS no longer rely upon these factors, we do not address them in this appeal. However, our comments on the DSEIS demonstrate that neither factor is persuasive. (Sierra Nevada Forest Protection Campaign et al. 2003, pp. 15-18). The DSEIS and FSEIS (p. 146) also discuss southern California drought-related mortality. However, this information does not relate to the Sierra Nevada and therefore does not provide a legitimate reason for increasing logging in the Sierra Nevada.

In sum, Franklin et al. (p. 41) concluded "that all the demographic evidence available – such as estimated vital rates, rates of population change, and differences between paired studies – suggest substantial caution in owl conservation and management efforts." Therefore, the new information in the meta-analysis does not warrant making sweeping changes in the Framework's owl conservation strategy.

b. Owl listing decision.

The FSEIS (pp. 27, 147) cites the Fish and Wildlife Service's decision not to list the California spotted owl under the Endangered Species Act as further information justifying the new owl plan. However, that decision was based upon the Fish and Wildlife Service's conclusion that "only a small amount of spotted owl habitat" would be rendered unsuitable under the Sierra Nevada Framework. (USDI Fish and Wildlife Service 2003a, p. 7600). The 2003 decision specifically noted that the Forest Service was is in the process of amending the Framework, stated that this effort "could substantially affect California spotted owls," and indicated that the Service "will monitor the development of management direction … and review the effects at a later date, if necessary." (USDI Fish and Wildlife Service 2003a, p. 7604).

The Fish and Wildlife Service's decision was based upon the assumption that logging on national forest lands would be regulated by the Framework, an assumption that no longer stands. Specifically, it is no longer the case that "only a small amount of spotted owl habitat" would be rendered unsuitable under the revised plan. As described above, the new plan is likely to degrade far more owl habitat than would the Framework. The revised plan would allow significant degradation of owl nesting and foraging habitat, owl PACs and HRCAs, and geographic areas of concern. Based on these impacts, the owl scientists who have reviewed the plan agree that it is likely to adversely affect the owl, contributing to a trend towards federal listing.

In sum, the Fish and Wildlife Service's decision in no way justifies wholesale revision of the Framework. To the contrary, the Forest Service's decision to weaken the Framework pulls the legs out from under the listing decision and strengthens the case for listing the owl under the Endangered Species Act.[13]

c. Relationship between fire and spotted owl habitat.

The FSEIS cites to purportedly new information regarding the loss of spotted owl habitat, particularly owl PACs, to wildfire. (FSEIS, pp. 143-45). However, as demonstrated by Monica Bond, the lead author of a recent paper assessing the short-term effects of wildfire on the spotted owl (Bond et al. 2002), the discussion in the SEIS "is seriously misleading." (Bond 2003, p. 4). This is particularly disturbing because the problems with the analysis were pointed out in our comments on the DSEIS (Sierra Nevada Forest Protection Campaign et al. 2003, pp. 18-19) and

[13] As the California Resources Agency (2003, p. 5) concluded in its comments, "citing the decision of the USFWS not to list the California spotted owl as a basis for relaxing forest management constraints, when in fact that decision is in large measure based on the existence of those very constraints, is the height of sophistry, bordering on deception."

in Bond's independent critique (Bond 2003), yet the Forest Service failed to respond to these comments or to correct the analysis in the FSEIS. In particular, there is no significant information in the FSEIS "that supports the assertion that wildfires have led to the widespread loss of PACs in the Sierra Nevada." (Bond 2004, p. 2).

For example, the FSEIS presents Table 3.2.2.3b, which ostensibly identifies those PACs "significantly diminished by wildfire" between 1999 and 2002, including PACs "considered to be lost due to fire effects." (FSEIS, p. 145). However, a careful examination of that table and of the related table in the DSEIS (p. 114) reveals that of 24 PACS that have been affected by nine recent wildfires, 11 are occupied, 11 are of unknown status, and only 2 are known to be unoccupied.[14] Moreover, of the 18 PACs "considered to be lost due to fire effects," 8 are known to be occupied, 1 is known to be unoccupied, and the status of the others is "unknown." Given this information, it is inexplicable how the Forest Service concluded that all of these PACs are now "lost due to fire effects."

The DSEIS shows that 501 PACs were influenced by fire between 1970 and 1993. (DSEIS, p. 113). Given that the PACs were not even identified as occupied owl sites until 1993, this information indicates that the fires within these PACs did not result in loss of occupancy. Rather, "one could assume the 'influence' was a positive one, contributing to owl survival from 1970 to 1993 when the PAC delineation process occurred, because those 501 owls survived the fire history of the area." (Bond 2003, p. 5). However, rather than respond to this point raised by Bond, the Forest Service simply omitted this information from the FSEIS.

A recent study (Bond et al. 2002), not cited in the DSEIS or FSEIS, "supports the conclusion that wildfire in a Spotted Owl PAC or HRCA does not necessarily render the habitat unsuitable." (Bond 2003, p. 5). The study examined owl occupancy, site fidelity, mortality, and reproductive success both before and after wildfires occurred within owl sites. The paper also includes an exhaustive literature search on impacts of fire on spotted owls. Based on their research, the authors suggest "that wildfires may have little short-term impact on survival, site fidelity, mate fidelity, and reproductive success of spotted owls." (Bond et al. 2002). Despite the fact that this report was cited in our comments on the DSEIS and in Bond's critique, the FSEIS fails to cite the report or to explain why it does not undermine the conclusion in the FSEIS that new information on fire and PACs justifies increasing logging in the Sierra.

The DSEIS reported that "the annual rate of loss [from wildfire] is approximately 0.2 percent of the PACs/SOHAs [in] the Sierra Nevada over the past 8 years" (DSEIS, p. 185), and the FSEIS states that since 1998 there has been "an annual loss [of PACs] of approximately 0.34% per year." (FSEIS, p. 145). However, not only is the assumption of PACs being "lost" overstated as explained above, but the rate of loss is not a serious concern. (Verner 2003b; Bond 2004, p. 3).

[14] The table in the DSEIS included a column entitled "PAC status," which indicated which PACs were occupied, which were unoccupied, and which were of "unknown" status after the fires. (DSEIS, p. 114). Rather than respond to Bond's critique of this information (Bond 2003), the Forest Service simply deleted this column from the table in the FSEIS.

In short, there is no new information regarding the relationship between wildfire and spotted owl habitat that justifies increasing short-term risks from logging to the owl or its habitat.

B. Pacific Fisher.

The new plan poses a particular threat to the Pacific fisher, a forest carnivore closely associated with closed canopy, late-successional forests. In part due to past logging, the fisher's distribution in the Sierra Nevada has been reduced to a small, isolated population in the southern Sierra, and the U.S. Fish and Wildlife Service has recently found that the west coast population of the fisher warrants protection under the Endangered Species Act.[15] The plan substantially weakens the Framework's protection for fisher habitat, particularly within the southern Sierra fisher conservation area and within old forest emphasis areas, but also within areas further north that are not currently occupied but that are an essential part of any fisher recovery strategy.

Forest carnivore experts who have reviewed the DSEIS and FSEIS have concluded that the revised plan will substantially increase risks to the fisher and its habitat, further threatening the fisher's viability in the Sierra Nevada and contributing to the present trends towards extinction. (Barrett 2004a; Kucera 2004; Lewis 2003a, 2003b; Buskirk 2003). Furthermore, according to fisher experts, there is no new information that would warrant weakening the Framework's protection for this species; to the contrary, the new information supports strengthening protection for the fisher and its habitat. (Barrett 2004a; Buskirk 2003). We are not aware of any forest carnivore experts who support the new plan.

1. Overview of the Fisher's Status and Habitat Associations in the Sierra Nevada.

a. The fisher is closely associated with late-successional, closed canopy forests.

"The fisher is among the most habitat-specific mammals in North America, and changes in the quality, quantity, and distribution of available habitat can affect their distributional range in California (Buskirk and Powell 1994)." (USDA Forest Service 2001, Volume 3, Chapter 3, part 4.4, p. 2; USDI Fish and Wildlife Service 2001, p. 84). "Fishers in the western United States are habitat specialists associated with mature and late-successional forests with an abundance of large trees, snags and logs (greater than 100 cm), conifers and oaks with broken tops and cavities, coarse woody-debris, multiple canopy layers, high canopy closure, and few openings." (USDI Fish and Wildlife Service 2001, p. 83). In particular, "fisher denning and resting sites are forest stands with complex structural characteristics that are typical of late-successional forests." (USDI Fish and Wildlife Service 2003b, p. 41170). "It is unlikely that early and mid-successional forests, especially those that have resulted from timber harvest, will provide the same prey resources, rest sites, and den sites as more mature forests." (Powell and Zielinski 1994, p. 52; USDI Fish and Wildlife Service 2003b, p. 41170).

[15] Although the Fish and Wildlife Service found that the west coast population of the fisher warrants listing under the Endangered Species Act, the Service concluded that listing at the present time was precluded by budget constraints and higher priority listings. Therefore, the fisher population is currently included on the candidate list. (USDI Fish and Wildlife Service 2004).

New information, including the Fish and Wildlife Service's recent determination that the fisher warrants protection under the Endangered Species Act, confirms and strengthens the fisher's association with large trees and dense canopy cover, particularly in the southern Sierra Nevada. According to the Fish and Wildlife Service:

- "Numerous studies have documented that fishers in the western United States utilize stands with certain forest characteristics for resting and denning such as large trees and snags, coarse woody-debris, dense canopy closure and multiple-canopy layers, large diameter hardwoods, and steep slopes near water." (USDI Fish and Wildlife Service 2004, p. 18774).
- "The most influential variables affecting rest site selection in California fisher populations include maximum tree sizes and dense canopy closure, but other features are important to rest site choice as well, such as large diameter hardwoods, large conifer snags, and steep slopes near water." (Ibid.).
- "Complex down woody material including large down logs, and multi-layered vegetative cover are important habitat elements for fishers." (Ibid., p. 18775).
- "The key aspects of fisher habitat are best expressed in forest stands with late-successional characteristics. Fishers use habitat with high canopy closure, large trees and snags, large woody debris, large hardwoods, multiple canopy layers, and avoidance of areas lacking overhead canopy cover." (Ibid.).

Research on fisher habitat use in the Sierra Nevada confirms the fisher's association with the structural elements of old forests, such as large trees, dense canopy cover, and large snags and down logs. A recent study in the southern Sierra found that fisher "rest sites had greater canopy cover, log cover, basal area, crown volume, and canopy layering than random sites," as well as "higher large snag occurrence." (Mazzoni 2002, p. 24) The study noted the fisher's "selection overall for areas with a high density of large trees and snags." (Ibid., p. 40). Similarly, Truex et al. (1998) found that all located natal dens are "located in cavities of large diameter trees" (p. ii) and noted the fisher's "consistent use of large diameter trees for resting" (p. 63). In addition, canopy cover at all natal and maternal rest sites was extremely high, averaging 92.5 percent. (Ibid., p. 89, Table 7).

Not only are large trees important, but research demonstrates that medium-large trees (12-24" dbh) are also an important element of fisher habitat, particularly in the southern Sierra. At the home range scale, forests dominated by medium-large trees (12-24" dbh) "composed the greatest proportion of home ranges" in the Sierra study area. (Zielinski et al. in press A, p. 23). At the rest site scale, the same authors found that 12-24" dbh trees constitute the most frequent size classes surrounding fisher rest sites. (Zielinski et al. in press B). The authors emphasize (in the home range study) that "it is likely that historical landscapes had higher proportions of late-seral vegetation … than fishers experience today." (Zielinski et al. in press A). Therefore, medium-large and large trees are a particularly important habitat element:

> Large live trees are among the most slowly-renewing elements of the forest and are 'dominant' elements … in forest communities. It may take hundreds of years for conifers

> and hardwoods to develop the size and the decadence necessary to be used by fishers for resting. Because the large live trees and large snags are less abundant in the Sierra Nevada and the Pacific Northwest than historically … every management activity should be evaluated as to whether it enhances or reduces the availability or development of large live and dead trees and large logs. (Zielinski et al. in press B, emphasis added).

A recent study of fisher home ranges in the southern Sierra found that fishers select for high canopy closure and that on average 66 percent of fisher home ranges in the southern Sierra are characterized by canopy closure of 60 percent or greater. (Zielinski et al. in press A; USDA Forest Service 2001a, Vol. 3, Chap. 3, part 4.4, p. 11). Another recent study in the southern Sierra found that fisher "rest sites had greater canopy cover … and canopy layering than random sites," as well as "higher large snag occurrence." (Mazzoni 2002, p. 24). With respect to rest sites, Zielinski et al. (in press B) found that average canopy closure was greater than 90 percent, and that "resting fishers place a premium on continuous overhead cover, as reported previously."

There is less research available on fisher foraging habitat. Even so, "several studies have characterized foraging habitat which, similar to resting habitat, is often typified by characteristics associated with mature and late-successional forests." (USDI Fish and Wildlife Service 2001, p. 18774). Research has indicated that denning and resting habitat, not foraging and travel habitat, appears to be the limiting factor for fisher.

> Fishers have at least one daily resting bout and often use a different resting structure for each occasion. Resting locations protect forest mustelids from unfavorable weather and predators, thus choosing a resting site may be one of the most important choices made outside the breeding season. Previous work indicates that fishers and American martens … are most selective about choosing natal den and resting sites, and the least selective about foraging locations. This suggests that resting and denning sites may be the most limiting habitat element across the species' range. (Zielinski et al. in press B, emphasis added, citations omitted).

Moreover, "re-use of rest sites is relatively low …, indicating that habitats providing suitable resting structures need to be widely distributed throughout home ranges of fishers … and spatially interconnected with foraging habitats." (USDI Fish and Wildlife Service 2004, p. 18774).

A Forest Service literature review, considered by the agency in 1999 to constitute "the best available information applicable to the Sierra" (USDA Forest Service 1999a, p. 124), highlights the importance to the fisher of large trees, large snags, large down logs, dense canopy cover, and other elements associated with late-seral forests. The report finds that the fisher's "preferred habitat is characterized by dense (60-100% canopy) multi-storied, multi-species late seral stage coniferous forests with a high number of large (>30 inch dbh) snags and downed logs." (Freel 1991, p. 2). High quality habitat is characterized by greater than 80 percent canopy closure (p. 3), with "the maximum number of vertical layers possible" (p. 15).

In sum, the best available research indicates that the fisher is closely associated with older forests characterized by large old trees, medium-large trees, large snags and downed wood, and dense, multi-storied canopy. As demonstrated below, the new plan allows significant degradation of all these habitat attributes, despite the fact that the fisher is already threatened with extinction in the Sierra Nevada.

b. The isolated fisher population in the southern Sierra Nevada is ecologically important and highly vulnerable to extirpation.

The U.S. Fish and Wildlife Service, in its recent finding that the west coast population of the fisher warrants listing under the Endangered Species Act, also confirmed the imperiled status of the Sierra Nevada population. "Preliminary analyses indicate West Coast fisher populations, particularly in the southern Sierra, may be at significant risk of extinction because of small population size and factors consequent to small population size such as isolation, low reproductive capacity, demographic and environmental stochasticity." (USDI Fish and Wildlife Service 2004, p. 18789). Fishers "appear to occupy less than half of their known historic range in the Sierra" and are likely "absent on the west, and probably east, side of the range north of Yosemite National Park." (USDA Forest Service 1998, p. 28). The southern Sierra population appears to be one of only two "extant native populations of the fisher remaining" in the Pacific coast states and appears to be "genetically distinct from fishers in the remainder of North America (Drew et al. 2003)." (USDI Fish and Wildlife Service 2003b, p. 41171).

According to the Forest Service, the fisher's failure to recolonize the central and northern Sierra, despite a moratorium on fisher trapping since 1945, is likely due to a combination of insufficient denning habitat, poor quality and fragmented dispersal habitat, and the small size of the fisher's population in the southern Sierra. (USDA Forest Service 1998, p. 28). "The most common opinion among scientists is that loss of structurally complex forest rangewide, the loss of well-distributed large conifers and hardwoods, and the fragmentation of habitat by roads and residential development are responsible for the loss of fishers from the central and northern Sierra and the failure of dispersing animals to recolonize the area." (Ibid.).

In general, "fishers are highly prone to localized extirpation" because they "are long-lived, have low reproductive rates, large home ranges (for carnivores of their size), and exist in low densities throughout their range." (USDI Fish and Wildlife Service 2001, p. 86). Additional factors contributing to the risk of the fisher's extinction include small and isolated populations and the inability of remaining fisher populations "to colonize currently unoccupied areas within their historic range." (USDI Fish and Wildlife Service 2003b, p. 41174).

These risk factors apply directly to the fisher in the Sierra Nevada. "The fisher population in the southern Sierra Nevada is thought to be at substantial risk because of several factors, including isolation, small population size, demographic and environmental stochasticity, and low reproductive capacity, in addition to ongoing habitat loss." (USDI Fish and Wildlife Service 2003b, p. 41174; Lamberson et al. 2000). In particular, "high annual mortality rates" among female fishers in the southern Sierra "raise concerns about the long-term viability of this population." (Truex et al. 1998, p. ii).

The Fish and Wildlife Service, citing a report co-authored by leading Forest Service biologists, stated that the southern Sierra fisher population "has a very high likelihood of extinction given reasonable assumptions with respect to demographic parameters." (USDI Fish and Wildlife Service 2004, pp. 18790-91, citing Lamberson et al. 2000). The vulnerability of the southern Sierra fisher population is a particular concern because of the ecological importance of the population for the viability of the fisher throughout the Sierra Nevada and the Pacific states:

> The southern Sierra Nevada population is considered vulnerable to disturbance yet essential for the survival and recovery of the Pacific fisher. This is the only remaining Sierra Nevada population and represents the southernmost extent of the species' range. The southern Sierra Nevada population is therefore the population with the highest potential to recolonize the central and northern Sierra Nevada. Range expansion to previously occupied habitat, reestablishment of connectivity with California's northwestern subpopulations, and future reintroduction efforts, if they are to be successful, all depend on a robust southern Sierra Nevada population. (USDI Fish and Wildlife Service 2001, p. 86, emphasis added).

A meeting of Forest Service and other forest carnivore experts convened by the Forest Service in 1999 concluded with respect to the southern Sierra fisher population: "Conservation biology tells us that the likelihood of this population being extirpated is high…. In a population this imperiled, loss of a few reproductive females may contribute toward a downward population spiral that culminates in extirpation." (Macfarlane and Frolli 1999, emphasis in original). As the Forest Service recognized in the Framework FEIS: "Given the current low density of fishers in the Sierra Nevada, the loss of even a small number of individuals … could significantly impact the population." (USDA Forest Service 2001a, Vol. 3, Chap. 3, part 4.4, p. 9).

In sum, the fisher population in the southern Sierra Nevada is small, isolated, ecologically important, and vulnerable to extirpation. Forest Service fisher researchers recommend that "long-term management of fisher habitat in California should aim to retain and recruit large structural elements necessary for resting and denning while maintaining stands with high canopy closure." (Truex et al. 1998, p. 11). "Ultimately, long-term planning to restore the connectivity, extent and quality of old forest conditions should be the foundation for fisher recovery in the Sierra Nevada." (Lamberson et al. 2000, p. 12). Unfortunately, the new plan moves in precisely the opposite direction, weakening existing protection for the key elements of fisher habitat and further threatening the viability of the fisher population in the Sierra Nevada. (Barrett 2004a; Kucera 2004; Lewis 2003b).

2. The Plan Threatens the Fisher's Viability in the Sierra Nevada, Contributing to a Trend Towards Federal Listing.

The new plan will allow substantial degradation of fisher denning and resting habitat and would further threaten the fisher's viability in the Sierra Nevada. First, the plan weakens protection within currently occupied habitat, thereby increasing habitat fragmentation and the risk of mortality within the southern Sierra fisher conservation area (SSFCA). Second, the plan also

weakens protection for potential fisher habitat in the central and northern Sierra Nevada, which is the area that must be recolonized for the fisher to have a realistic chance of surviving in the Sierra Nevada over the long term.

a. The plan weakens protection for currently occupied habitat.

The first step in any sound conservation strategy is to protect the fisher's currently occupied habitat in the southern Sierra, within the southern Sierra fisher conservation area. "Any defensible conservation and recovery strategy for the fisher in the Sierra Nevada must, at a minimum, provide effective protection for currently occupied habitat in the southern Sierra." (Barrett 2004a, p. 3). The proposed plan weakens the Framework's protection for currently occupied fisher habitat in a number of important respects.

First, the southern Sierra fisher conservation area (SSFCA) will effectively lose all meaningful protection. The Framework established the SSFCA for the specific purpose of protecting and restoring habitat currently occupied by the fisher. Within this area, which covers the currently occupied habitat, the Framework required that 60% of each watershed contain forests with medium-large or greater trees and 60% or greater canopy closure. (USDA Forest Service 2001b, p. A-45). This requirement was based on current research on the Sequoia National Forest, which shows that "66 percent of the average fisher home range was in 60 percent or greater canopy closure." (Zielinski et al. in press A; USDA Forest Service 2001a, Vol. 3, Chap. 3, part 4.4, p. 11). In fact, the research indicates that 72 percent of female home ranges contain forests with 60 percent or greater canopy cover. (Zielinski et al. in press A).

The new plan eliminates this standard and guideline and allows the SSFCA to be logged utilizing the same standards and guidelines as for general forest. (ROD, p. 62). The new plan relegates the Framework's management standard for the SSFCA to a non-binding "desired condition" and further weakens it by aiming only for a minimum of 50 percent of the forested area within each fisher home range (or watershed) with at least 60 percent canopy cover, rather than 60 percent of each watershed with 60 percent canopy cover as under the Framework. (ROD, p. 41). Not only is the reduction from 60 percent to 50 percent significant, but the new guideline also weakens the Framework standard by managing for 60 percent canopy cover within a given percentage "of the forested area," rather than within each watershed. [16]

The FSEIS justifies the weakening of the standard by referring to unpublished data and analysis that allegedly indicate "that the majority of sub watersheds … do not have 50% of the forested

[16] The new plan manages for 50 percent "of the forested area" in canopy cover of 60 percent or greater (ROD, p. 41), compared to the Framework standard which requires that 60 percent of each watershed be managed for 60 percent canopy cover. (USDA Forest Service 2001b, p. A-45). The research upon which the Framework standard was based found that 60 percent of each watershed, not of the forested area within each watershed, was covered by dense canopy forest. (Zielinski et al. in press A). Given that "forested area" only covers a portion of each watershed, managing for a given percentage "of the forested area" within each watershed is likely to include substantially less area than managing for the same percentage of each watershed. For example, in the SSFCA as a whole, the "forested area" covers approximately 83 percent of the total area, with non-vegetated areas, grasses, and brush-shrubs covering the rest. (FSEIS, p. 248). Using this percentage, the new standard of 50 percent "of the forested area" translates to 41.5 percent of each watershed, compared to the Framework's standard of 60 percent.

area of the watershed in 60% canopy closure." (FSEIS, p. 139). However, this explanation is not persuasive, as noted by Dr. Barrett. (Barrett 2004a, p. 5). First, the SSFCA was explicitly based on published research of fisher home ranges in the southern Sierra Nevada. Second, the Framework standard is supported by local data from watersheds containing fisher den sites, which indicates that 83 percent of the fisher den PACs and 61 percent of the subwatersheds containing these PACs have 60 percent or greater canopy cover. (Sequoia National Forest 2003, Acreage Table). Finally, even assuming that many watersheds in the southern Sierra do not currently meet the standard does not justify the Forest Service's failure to manage for complying with the standard. Given that the fisher's status is indisputably imperiled, weakening an existing standard and aiming for a "desired condition" that falls short of the guidelines suggested by the best available research is unjustified.

The Fish and Wildlife Service has cited the Framework's protections within the SSFCA as important measures designed to improve habitat conditions for the fisher, stating that "[r]etaining suitable fisher habitat within and outside the southern Sierra Fisher Conservation Area is necessary to maintain linkage between the southern Sierra Nevada population and the population in northwestern California." (USDI Fish and Wildlife Service 2001, pp. 132, 134). By allowing significant logging within the SSFCA, the plan will reduce the amount and quality of fisher habitat, increasing the threat to the fisher's viability and leading the species closer to extinction.

b. <u>The plan weakens protection for old forest emphasis areas and smaller old growth stands.</u>

The new plan eliminates the Framework's protection for old forest emphasis areas and smaller old growth stands. These areas currently provide potential denning and resting habitat for the fisher as well as facilitate movement and connectivity and potential range expansion for the species. The OFEAs were designed, in substantial part, to provide habitat for old forest associated species like fisher and to promote habitat connectivity and species dispersal. The size of OFEAs was based on the ability to support 14 female and 7 male fisher, and the spacing was designed to be within the fisher's dispersal distance. (USDA Forest Service 2001c, p. D-10). However, by managing OFEAs utilizing the same standards and guidelines as general forest, the revised plan "substantially threatens the ability of these areas to support fisher denning, resting, and foraging." (Barrett 2004a, p. 5).

The elimination of protection for old growth stands of 1 acre or larger will significantly degrade fisher denning and resting habitat. (Barrett 2004a, p. 5). Research consistently shows that the fisher preferentially selects for resting and denning habitat characterized by large trees, large snags, and dense canopy cover. Where fisher are found on private timberlands that are not generally characterized by old forest structures, the areas "provide some of the habitat elements important to fisher, such as relatively large trees, high canopy closure, large legacy trees, and large woody debris." (USDI Fish and Wildlife Service 2004, p. 18775). This suggests that relatively small inclusions of old forest structure may serve a critical role for fisher by providing

resting and denning habitat within forested areas that may otherwise lack the necessary structure.[17]

c. The plan's standards and guidelines allow substantial degradation of fisher denning and resting habitat.

The new plan substantially weakens the Framework's standards and guidelines that protect the key elements of fisher habitat, including medium-large trees, dense and multi-storied canopy, and large snags and down wood. The Fish and Wildlife Service, in its recent finding that listing the fisher is warranted, concluded that logging and fuels reduction, including thinning, can adversely affect fisher habitat. "Fuels reduction treatments, including thinning and the removal of down woody debris, dense understory, snags, and low overstory tree crowns may significantly affect fishers in the immediate area." (USDI Fish and Wildlife Service 2004, p. 18779). "Clearcutting, selective logging, and thinning change the suitability of fisher habitat by removing overhead cover and insulating canopy, exposing the site to the drying effects of sun and wind or to increased snow deposition, removing prime resting and denning trees, and increasing exposure of the fisher to predators." (Ibid.). Logging and fuels reduction allowed under the new plan will affect the fisher and its habitat in the following ways:

i. Medium-large trees.

The new plan allows widespread logging of medium and large trees that are currently protected by the Framework. The plan would substitute a 30" diameter limit for the existing 12" and 20" limits in westside forests, and for the existing 12", 20", and 24" limits in eastside forests. In effect, a substantial number of 20-30" dbh trees will be logged. According to Dr. Barrett, "these medium-large trees, in combination with larger trees and snags and dense canopy closure, comprise an important element of high quality fisher habitat, and their removal could significantly degrade existing and potential fisher habitat." (Barrett 2004a, p. 4).

Recent research on the fisher's habitat use in the southern Sierra Nevada confirms the importance of medium-large trees. At the home range scale, forests dominated by medium-large trees (12-24" dbh) "composed the greatest proportion of home ranges" in the Sierra study area. (Zielinski et al. in press A, p. 23). The authors state that this establishes "guidelines for local managers to use when planning for fisher habitat needs and for evaluating the effects of vegetation management on fisher habitat." Similarly, at the rest site scale, the same authors found that 12-24" dbh trees constitute the most frequent size classes surrounding fisher rest sites.

[17] The FSEIS (p. 139) cites research from private timberlands which indicates that fisher may use more open landscapes "where legacy elements comprising patches of dense habitat provide suitable rest sites." According to the FSEIS, the same study found that "0.1-2 acre clumps with high canopy closure are often found within stands classified as having 25-40% canopy closure" on private lands. Eliminating protection for old growth stands of 1 acre or larger will make it less likely that such clumps of denser vegetation with large legacy elements will remain, thereby reducing the likelihood that an area will provide resting or denning habitat for fisher. (Barrett 2004a, p. 5). Paradoxically, the FSEIS acknowledges that "managing vegetation to retain stands of larger trees, or to retain highly variable stands with clumps of denser vegetation focused around large trees, may provide lower vulnerability to stand replacing fire while meeting fisher habitat needs over the long term" (FSEIS, p. 139), while at the same time the revised plan eliminates the Framework's protection for such small old growth stands.

(Zielinski et al. in press B). Based on this research, it is clear that removing medium-large trees could degrade an important element of fisher rest sites and home ranges in the Sierra Nevada.

ii. Canopy cover.

The plan allows canopy cover to be reduced by as much as 30 percent, down to a minimum of 40 percent or even lower. The lower limit provides, at best, poor habitat for the fisher, and the effect would be to allow high quality resting and denning habitat to be reduced to poor quality habitat. As a general matter, "all habitats used disproportionately by fishers have high canopy closure, and fishers avoid areas with low canopy closure." (Powell and Zielinski 1994, p. 53). In the Sierra Nevada, fisher rest sites are characterized by very high canopy cover (averaging over 90 percent, according to Truex et al. 1998), and fishers preferentially select for dense canopy cover (in excess of 70 percent) (Mazzoni 2002). Freel (1991) describes high quality fisher habitat as having greater than 80 percent canopy cover and low quality habitat as characterized by 40-60 percent closure (p. 3), and states that "cover less than 30% is considered unsuitable for use." (p. 16).

The Fish and Wildlife Service states, "reduction in canopy closure … down to 50 percent overall … is below that observed over large areas of fisher home ranges in the southern Sierra." (USDI Fish and Wildlife Service 2001, p. 133). By contrast, the new plan allows canopy cover to be reduced to 40 percent or below. By diminishing canopy cover, the new plan "will significantly reduce the suitability of these habitats for fishers where they occur," according to fisher expert Jeff Lewis. (Lewis 2003a, p. 2). In sum, the plan's canopy cover standard would allow significant degradation of habitat that is currently suitable for fisher denning and resting. [18] (Barrett 2004a, p. 4).

Suitable fisher habitat is characterized not only by dense canopy cover, but also by multi-storied canopies. According to Freel (1991, p. 15), high quality fisher habitat is characterized by "the maximum number of vertical layers possible." Similarly, Mazzoni's (2002) study of habitat use versus availability found that the fisher selects for canopy layering, and that rest sites are characterized by "multiple crown layers" (p. 36). The effect of the new standards and guidelines would be to remove virtually all of the lower and mid-story canopy, leaving a single canopy layer which is not consistent with the fisher's habitat needs. (Barrett 2004a, p. 5).

iii. Large snags and down logs.

The new plan provides the Forest Service with broad discretion to weaken the Framework's standards relating to protection of large snags and down logs. The fisher's association with large snags and large down woody material is well documented. (Powell and Zielinski 1994). In the Sierra Nevada, Mazzoni (2002) found that fishers preferentially selected for rest sites areas with higher large snag occurrence and log cover than random sites. As the Fish and Wildlife Service

[18] The FSEIS (p. 247) states that "forty percent canopy closure is within the range of canopy cover in habitats used by fisher for foraging and dispersal." However, the FSEIS fails to provide any support for this assertion, and Dr. Barrett states that he is "aware of no research from the Sierra Nevada" that supports this claim. (Barrett 2004a, p. 4).

has stated, "for the fisher and marten, the removal of 'legacy elements' such as large snags and logs is of particular concern because these elements are important denning and/or travel areas." (USDI Fish and Wildlife Service 1999, p. 11). There is good reason to believe that fuels treatments will reduce the densities of snags and down logs, because these forest structures are often cited as contributing to the risk of stand-replacing wildfires. Thus, by providing broad leeway to weaken large snag and down wood retention standards at the local level, the new plan threatens an important component of fisher habitat. (Barrett 2004a, p. 5).

iv. Impacts of roads and recreation.

The new plan eliminates the Framework's limited operating period (LOP) surrounding fisher den sites for all activities other than vegetation management. (ROD, p. 61). The administrative record indicates that recreation and other activities can disrupt fisher behavior, and that the LOP in the Framework was based upon "the best scientific information available." (USDA Forest Service 2001c, pp. C-3-4). Therefore, there is no basis for weakening the LOPs under the plan. (Barrett 2004a, p. 6).

The new plan will also substantially increase new road construction, particularly within the QLG area. (FSEIS, p. 325). The Fish and Wildlife Service, in its recent 12-month finding, concluded that roads have a variety of adverse effects on fisher:

> The adverse effects of roads include direct loss of habitat, displacement from noise and human activity, direct mortality, secondary loss of habitat due to the spread of human development, increased exotic species invasion, and creation of barriers to fisher dispersal. The impacts of these effects on low density carnivores like fishers are more severe than most other wildlife species due to their large home ranges, relatively low fecundity, and low natural population density … and their general avoidance of non-forested habitats. (USDI Fish and Wildlife Service 2004, pp. 18779-80).

Research from the Sierra Nevada has found that areas occupied by fisher are negatively associated with road density. (Campbell 2004). Moreover, the Forest Service has cited "fragmentation of habitat by roads" as a significant factor contributing to the loss of fishers from the central and northern Sierra Nevada and the fisher's failure to recolonize the area. (USDA Forest Service 1998, p. 28). Therefore, the increase in road construction under the new plan, particularly in the northern Sierra Nevada, is likely to further reduce the likelihood that fisher will disperse to and recolonize the area.

v. Conclusion

The FSEIS (pp. 247-48) projects that approximately 145,000 acres, or 31 percent of the SSFCA containing greater than 50 percent canopy closure, would be logged under the new plan. "Given that such logging is likely to reduce canopy closure to below 50 percent, as well as remove medium-large trees, snags and down logs, the effect of such logging would be to degrade potential fisher denning and resting habitat to a condition that is no longer suitable for these purposes…. Given that the fisher's status in the southern Sierra Nevada is imperiled, the effect

of the new plan will be to further threaten the fisher's viability and distribution and to contribute to the present trend towards extinction." (Barrett 2004a, p. 6, emphasis added).

d. The plan weakens protection for fisher habitat in the central and northern Sierra, particularly within the QLG pilot project area.

There is widespread agreement that the southern Sierra fisher population is not viable in the long term in the absence of efforts to expand the current range and to connect the population with the fisher population in northwestern California. (Barrett 2004a, p. 6; Buskirk 2003). "The inability of extant fisher populations to support one another demographically, including those that are isolated by relatively small distances, or to colonize currently unoccupied areas within their historical range, are significant conservation concerns." (Aubry and Lewis 2003, p. 88). "Recolonization of the central and northern Sierra Nevada may be the only way to prevent fisher extinction in the isolated southern Sierra Nevada population." (Truex et al. 1998, p. ii).

Facilitating the fisher's dispersal to, and recolonization of, the central and northern Sierra Nevada requires that habitat be provided to promote connectivity and reduce fragmentation. "Retaining suitable habitat within and outside of the Southern Sierra Fisher Conservation Area is necessary to maintain linkage between the southern Sierra Nevada population and the population in northwest California." (U.S. Fish and Wildlife Service 2001, p. 134). "To facilitate recolonization, the Forest Service must provide sufficient habitat for fisher denning, resting, and foraging, and that habitat must be located in a manner that will promote the fisher's occupation of, and movement throughout, the region." (Barrett 2004a, p. 6). "The curtailment of habitat connectivity and genetic interchange between the southern Sierra Nevada fisher population and those in northwestern California … may also result in the isolation of the southern Sierra Nevada fisher population, subjecting it to stochastic events and possible extirpation." (U.S. Fish and Wildlife Service 2001, p. 134, emphasis added).

The need to promote fisher habitat in the central and northern Sierra is particularly acute given that old forests are "considerably more vulnerable" in this region and generally "occur in scattered, isolated blocks and small patches." (USDA Forest Service 2000, p. 3-7). "The central Sierra Nevada is the most fragmented [region in the Sierra Nevada] with a high number of highway crossings and several areas burned by large, severe wildfires, sometimes occurring across multiple ownerships." (Ibid., p. 3-46). "The loss of structurally complex forest and the loss and fragmentation of suitable habitat by roads and residential development have likely played significant roles in both the loss of fishers from the central and northern Sierra Nevada and the fisher's failure to recolonize these areas." (USDI Fish and Wildlife Service 2004, p. 18778). The Fish and Wildlife Service states in its positive 90-day finding, "the analysis of connectivity of old forests in the Sierra Nevada noted that 'checkerboard' land ownership patterns in the central Sierra Nevada (where there is considerable intermingling of private land with National Forest System land), coupled with assumptions about reasonably foreseeable timber harvesting on private lands, make the retention of connectivity 'problematic' in these areas." (USDI Fish and Wildlife Service 2003b, p. 41172).

The new plan would significantly weaken protection of fisher habitat in the central and northern Sierra. As a general matter, as described above, the new standards and guidelines allow significant degradation of potential resting and denning habitat throughout the Sierra Nevada. The likely impact will be to reduce the likelihood of the fisher's recolonization of the central and northern Sierra Nevada.[19] (Barrett 2004a, pp. 6-8). As forest carnivore expert Jeff Lewis concluded: "Fuel reduction treatments … to the north of the occupied fisher area … could prevent the expansion and recovery" of the southern Sierra population. (Lewis 2003a, p. 2).

More specifically, the plan allows full implementation of the QLG pilot project, which will significantly increase the amount and intensity of logging in the northern Sierra Nevada beyond that allowed even under the new plan's standards and guidelines. The U.S. Fish and Wildlife Service has expressed its view that full implementation of the QLG project "poses a significant threat to the long-term viability of the California spotted owl, Pacific fisher, and American marten due to the loss, degradation, and fragmentation of suitable habitat." (USDI Fish and Wildlife Service 1999, p. 16). As stated by the Fish and Wildlife Service in its consultation on the QLG pilot project, "the proposed action will disproportionately affect suitable habitat for [the fisher]…. The Service is concerned that the proposed project will preclude recovery of this species within the project area and throughout the Sierra Nevada." (Ibid., p. 11). The Service expressed concerns regarding habitat loss, habitat fragmentation, and effects on prey species. (Ibid., p. 11). The Service expressed particular concerns about construction of DFPZs in the QLG area, which may fragment habitat and limit fisher movement and dispersal, "limiting population expansion and colonization of unoccupied habitat …, thus precluding future recovery options." (Ibid., pp. 11-12).

The FSEIS (pp. 243, 250) contends that logged areas will continue to provide habitat connectivity for fisher and that DFPZs will not create barriers to fisher movement. However, not only is this assertion inconsistent with the finding of the Fish and Wildlife Service, but it also inconsistent with previous Forest Service conclusions and the best available research. As acknowledged in the QLG FEIS, DFPZs "would usually appear as relatively open stands" and "the forest floor would usually be relatively open, with the exception of occasional large logs." (USDA Forest Service 1999a, p. 2-20). By removing most vegetation near the ground, DFPZs will create forest structure that discourages fisher travel and dispersal. As the Forest Service previously recognized with respect to marten (a close relative of the fisher), DFPZs have the potential to fragment habitat and to "create open forest conditions that are no longer suitable for

[19] The FSEIS (p. 244) claims that each of the national forests has developed mesocarnivore networks or strategies, which result in "well distributed and connected habitats based on habitat availability and current or historic detections for marten and fisher, including eastside habitats." In fact, other than the Lassen National Forest, none of the national forests in the Sierra has incorporated such networks or strategies into their land management plans. Because the strategies are not incorporated into land allocations or standards and guidelines, they are not legally binding. For example, "although the Plumas and Tahoe National Forests include forest carnivore networks, no management direction is in place to guide for management of networks." (USDA Forest Service 1999b, p. 3-108). In addition, within the QLG pilot project area, "the forest carnivore network has already been fragmented by road access." (USDI Fish and Wildlife Service 1999, p. 12). As the Fish and Wildlife Service concluded in its review, "most individual Forest LRMPs do not provide any additional protections to fisher or fisher habitat" other than that provided in the Framework plan. (USDI Fish and Wildlife Service 2004, pp. 18782-83).

marten, and are large enough to serve as potential barriers to movement" (USDA Forest Service 1999b, p. 123), and the same conclusion holds with respect to the fisher. (Barrett 2004a, p. 7).

In sum, by allowing significantly increased logging in the central and northern Sierra Nevada, particularly within the QLG pilot project area, the plan will reduce the likelihood of the fisher's dispersal to and recolonization of this area, thereby threatening the viability of the fisher throughout the Sierra Nevada.

e. The plan fails to protect eastside habitat.

The fisher inhabits eastside pine habitat within the SSFCA (DSEIS, p. 175), and historically inhabited eastside habitat in the central and northern Sierra (Grinnell et al. 1937). Yet, "on a regional basis, eastside pine has lost more late successional attributes in the last century than any other forest type." (Centers for Water and Wildland Resources 1996, Volume 1, p. 106). The plan weakens the Framework by abandoning any protection for canopy cover in eastside forests and by raising the maximum diameter limit of trees that can be cut from 24 inches to 30 inches. The Fish and Wildlife Service has expressed serious concerns about intensive logging of eastside forests under the QLG proposal, which will be exacerbated by the new plan's abandonment of canopy cover protection for eastside pine forests:

> The Service is also concerned that recovery options for the fisher will be precluded in east side forests because a landscape spotted owl strategy will not be applied in those areas. Maj and Garon (1994) provide maps of fisher observations from 1961 to 1982 and from 1983 to 1993 which show fisher locations in eastside habitats. The unrestricted reduction in canopy cover and significant reduction of snags and logs on the eastside would reduce potential forest carnivore denning and resting sites, and may preclude further options for the development of a long-term management strategy to protect the fisher. (USDI Fish and Wildlife Service 1999, p. 12; USDI Fish and Wildlife Service 2001, p. 136).

The FSEIS (p. 243) states that "historic fisher occupancy is limited to Westside forest except within a small portion of the Southern Sierra Fisher Conservation Area, thus eastside forests are not addressed in detail for the remainder of the Sierra Nevada bioregion." However, the historical evidence indicates that fisher formerly occupied eastside forests in the central and northern Sierra. (Grinnell et al. 1937). Moreover, as recognized by the Fish and Wildlife Service, "Maj and Garon (1994) provide maps of fisher observations from 1961 to 1982 and from 1983 to 1993 which show fisher locations in eastside habitats." (USDI Fish and Wildlife Service 1999, p. 12; USDI Fish and Wildlife Service 2001, p. 136). Because, as the Forest Service has conceded, "there are no guidelines in place that would adequately protect remaining fisher habitat within this vegetation type" under the new plan (DSEIS, p. 175), the failure to protect eastside forests contributes to the plan's overall failure to ensure the fisher's viability throughout the Sierra. (Barrett 2004a, p. 8).

f. Conclusion.

The Fish and Wildlife Service, in its comments on the DSEIS, expressed concerns about the weakening of the Framework's standards and guidelines, stating that the new plan "creates greater uncertainty that sufficient habitat and habitat connectivity will be retained for the southern Sierra fisher population." (USDI Fish and Wildlife Service 2003c, p. 6). Based on these concerns, the Service recommended that logging be constrained to avoid areas with dense canopy cover "to ensure connectivity by maintaining a continuous distribution of denning/resting and travel/foraging habitat." (Ibid.) However, these recommendations were disregarded in the final decision.

In sum, the fisher experts who have reviewed the plan have all concluded that the plan will significantly increase risk to this imperiled species, contributing to the present trend towards extinction. (Barrett 2004a; Kucera 2004; Buskirk 2003; Lewis 2003a, 2003b).

C. American Marten.

Like the Pacific fisher, the American marten is a forest carnivore closely associated with relatively closed canopy and late-successional forests. The new plan significantly weakens the Framework's protection for marten habitat, particularly within the QLG pilot project area and in eastside forests. These impacts have led forest carnivore experts to conclude that the plan "is likely to threaten the viability and distribution of the marten in the northern Sierra Nevada, potentially leading to local extirpation." (Barrett 2004a, p. 11; Barrett 1999; Kucera 2004). As marten expert Dr. Steve Buskirk concluded in his review, the plan "would substantially weaken protections for the fisher and for the American marten," and "marked declines in population size and in fitness can reasonably be foreseen if the proposal is implemented." (Buskirk 2003). These impacts are not adequately disclosed or analyzed in the FSEIS, and the conclusion in the FSEIS that the plan will not significantly affect the marten is unsupported and unfounded.

1. Overview of the Marten's Status and Habitat Associations in the Sierra Nevada.

a. The marten is closely associated with late-successional forests, which are generally depleted in the Sierra.

"The marten is among the most habitat-specific mammals in North America, and changes in the quality, quantity and distribution of available habitat could affect their distributional range in California (Buskirk and Powell 1994)." (USDA Forest Service 2001, Volume 3, Chapter 3, part 4.4., p. 23). "In most studies of habitat use, martens were found to prefer late-successional stands of mesic coniferous forest, especially with complex physical structure near the ground (Buskirk and Powell 1994)." (USDA Forest Service 1999a, p. 114). "Habitat alteration, primarily by logging of late-successional conifer forests, has been listed as the primary cause of the population decline in areas where martens have become extinct or are currently threatened." (Bull and Heater 2001, p. 1).

In the Sierra Nevada, "martens prefer coniferous forest habitat with large diameter trees and snags, large down logs, moderate-to-high canopy closure, and an interspersion of riparian areas and meadows." (USDA Forest Service 2001, Volume 3, Chapter 3, part 4.4, p. 19). "In the Lake Tahoe basin, martens were most frequently detected … in late seral stage conifer stands." (Murphy and Knopp 2000, p. O-82).

With respect to canopy cover, a study in Yosemite National Park found that "martens avoided areas lacking overhead cover and preferred areas with 100 percent overhead cover, especially when resting (Hargis and McCullough 1984)." (USDA Forest Service 2001, Volume 3, Chapter 3, part 4.4, p. 19). In a study of eastside forests on the Tahoe National Forest, "martens selected stands with 40 to 60 percent canopy closure for both resting and foraging and avoided stands with less than 30 percent canopy closure (Spencer et al. 1983)."[20] (USDA Forest Service 2001, Volume 3, Chapter 3, part 4.4, p. 19).

"Marten natal dens … occur in structurally complex, late successional forests (Buskirk and Ruggiero 1994). Canopy cover and the number of large old trees in these patches exceed levels available in the surrounding suitable habitat." (USDA Forest Service 2001, Volume 3, Chapter 3, part 4.4, pp. 21-22). "Large and coarse woody debris, including especially large snags and large down woody material, is an important habitat component." (USDA Forest Service 1999a, p. 114). A study on the Tahoe National Forest showed that the marten preferentially rested in stands with higher basal area, snag basal area, and down log abundance than stands not utilized. (Spencer et al. 1983).

A Forest Service literature review, considered by the agency in 1999 to constitute "the best available information applicable to the Sierra" (USDA Forest Service 1999a, p. 124), highlights the importance to the marten of large trees, large snags, large down logs, dense canopy cover, and other elements associated with late-seral forests. (Freel 1991). Freel finds that the marten's "preferred habitat is characterized by dense (60-100% canopy), multi-storied, multi-species late seral coniferous forests with a high number of large (>24 inch dbh) snags and down logs."

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[20] The FSEIS (p. 255) cites "Kucera (2000)" in support of the assertion that because martens may be found in areas with less than 20% canopy closure, "including areas above treeline in eastside habitats," habitat changes resulting from the plan will have no effect on them. As demonstrated in Dr. Kucera's critique, this assertion is misleading:

> First, the citation "Kucera (2000)" is not in the literature cited; I do not have any marten papers from 2000. If the FSEIS was referring to my final report to the Inyo National Forest (Kucera 1997), I did report marten use of rest sites (<u>not</u> home ranges, as is claimed on p. 255) in relatively open forests, some with 20% canopy closure. However, those are high elevation, relatively dry forests, and some rest sites were above treeline, by definition with zero forest canopy. These areas however are different ecologically from those in the northern Sierra Nevada. (My more recent data from the Inyo National Forest, soon to be submitted to the USFS, indicate that marten rest sites are in relatively closed areas of the otherwise relatively open forest.) Spencer (1981) and Spencer et al. (1983) conducted research in the northern Sierra Nevada, on the eastern slope of the Tahoe National Forest, and found that martens did avoid forests with less than 30% canopy cover, as is stated on p. 255 of the FSEIS. It is this research that has most relevance to marten habitat evaluation in the northern Sierra Nevada, especially that affected by the HFQLG plan. (Kucera 2004, p. 5).

The marten's close association with late-successional forests gives cause for concern, given that relatively little old growth forest remains in the Sierra Nevada. The Forest Service estimates that "most forest types of the Sierra Nevada … have considerably lower amounts of old forests than occurred in the recent past," and that national forests currently contain between 2 and 20 percent old growth compared to 50-90 percent historically. (USDA Forest Service 2001, Volume 2, Chapter 3, part 3.2, p. 149). Old growth is particularly depleted in the northern Sierra, within the QLG pilot project area. The Forest Service estimates that only 5 percent of the Plumas National Forest, 9 percent of the Tahoe, and 10 percent of the Lassen contain old growth forest, compared to a rangewide estimate of 15 percent. (Ibid., p. 138). "With only 5 percent of the old-growth forest left on the Plumas National Forest, it perhaps should not be surprising to find large gaps in marten distribution there." (Kucera 2004, p. 2). In addition, the marten utilizes "eastside mixed-conifer and eastside pine forests" within the QLG area, which "are the types most deficient in high quality late successional forest relative to their potential and to pre-settlement conditions." (USDA Forest Service 1999b, p. 3-62).

b. There is a significant gap in the marten's distribution in the northern Sierra, placing the viability of the species in the region at increased risk.

As a general matter, "three factors make marten vulnerable to local extirpation and extinction: (1) low reproductive potential; (2) an affinity for overhead cover and avoidance of extensive open areas, especially in winter; and (3) very large home ranges." (USDA Forest Service 2001, Volume 3, Chapter 3, part 4.4, pp. 22-23). Because the species "may not be common anywhere," and because of its limited ability to disperse over great distances, "marten populations could be at risk through habitat alteration and the hazards associated with small, isolated populations." (Ibid., p. 27). More particularly, as stated in the Sierra Nevada Science Review, "the combination of relatively low, natural population sizes and association with habitat that is vulnerable to additional losses (old-forest conifer ecosystems) makes martens particularly vulnerable to activities that decrease canopy closure or remove large-diameter standing and downed material from forest lands." (USDA Forest Service 1998, pp. 28-29).

A number of recent studies have demonstrated that the marten is highly sensitive to forest fragmentation. Thompson and Harestad (1994, p. 363) developed a habitat suitability model for marten, which predicted that "once logging reaches a particular threshold, which we predict at about 20-30% removal, … carrying capacity for American martens declines precipitously." This model was subsequently confirmed by studies in different regions of the United States. For example, Chapin et al. (1998), in their study in Maine, found that martens "tolerated a median of only 20% regenerating clearcuts in their home ranges." Hargis et al. (1999), in a study in Utah, found that "martens were nearly absent from landscapes having >25% non-forest cover, even though forest connectivity was still present." The U.S. Fish and Wildlife Service, in its comments on the QLG EIS, states that "marten are … sensitive to forest openings, tolerating a landscape that has no greater than 20-25 percent openings." (USDI Fish and Wildlife Service 1999). The Forest Service, summarizing available research, states that "martens have not been found in landscapes with greater than 25 percent of the area in openings, even where suitable habitat connectivity exists." (USDA Forest Service 2001, Volume 3, Chapter 3, part 4.4, p. 19).

Because the marten is highly sensitive to forest fragmentation, relatively small losses in habitat may have an exponential impact on the marten's population:

> Andren (1994) suggested that as landscapes become fragmented, there is a negatively synergistic combination of increasing isolation and decreasing patch size of suitable habitat that compounds the results of simple habitat loss. For some species, this may result in a decrease of greater magnitude than can be explained solely by the loss of suitable habitat. Marten may be a species that demonstrates this pattern of exponential population declines at relatively low levels of fragmentation (Bissonette et al. 1997). (USDA Forest Service 2001, Volume 3, Chapter 3, part 4.4, p. 23).

As we noted in our comments on the DSEIS, the assertion that "martens currently appear to be well distributed throughout their historic range in the Sierra Nevada" (DSEIS, p. 180) is incorrect and misleading. Over the past decade, the Forest Service has undertaken a rangewide effort to detect forest carnivores, including the marten. The survey information reveals that the marten's distribution in the northern Sierra appears to be significantly reduced compared to historic records, particularly outside of national parks and wilderness areas. (Zielinski 2002; Kucera 2003; Kucera 2004, p. 4). The marten's apparent absence from portions of the northern Sierra was originally noted in 1995 (Kucera et al. 1995), and was subsequently confirmed and reiterated in the QLG biological assessment (USDA Forest Service 1999, p. 113) and in the Framework FEIS (USDA Forest Service 2001, Volume 3, Chapter 3, part 4.4, p. 22).

The FSEIS attempts to respond to this issue by stating that "martens are believed to exist" in the areas where the surveys did not detect them and that "insufficient survey effort across the bioregion make it difficult to estimate the current distribution." (FSEIS, p. 141). However, the fact remains that the best available research, including published articles cited above and the Forest Service's own statements from the QLG administrative record, indicate that there is a gap in the marten's distribution within the QLG pilot project area. The FSEIS fails to cite any evidence for the bare statement that "martens are believed to exist" in this area and we are aware of none. Beyond that, the Forest Service is legally required to "utilize the best available data" in the planning process, which "may require that special inventories or studies be prepared." 36 CFR 219.12(d). Therefore, if the Forest Service believes existing surveys are inadequate, the agency should undertake more complete surveys before authorizing greatly increased logging in the area. (Kucera 2004, pp. 4-5; Barrett 2004a, p. 11).

The fact that martens appear to be absent from much of their historic range in the northern Sierra Nevada increases the likelihood that remaining populations are isolated from one another and therefore more prone to extirpation.

> Thus, small, isolated populations of [marten] may be particularly susceptible to extirpation resulting from stochastic demographic or environmental events, because recolonization of these areas may not be possible. Local extirpations from portions of a species' range results in the further isolation of remaining populations. (Lyon et al. 1994, p. 136).

In sum, the marten is closely associated with the structural attributes of late-successional forests, which are significantly depleted in Sierra Nevada national forests, particularly in the northern Sierra. The marten's apparent absence from a significant portion of its historic range in the northern Sierra is a cause for substantial concern, increasing the likelihood that remaining populations will become isolated and extirpated. (Kucera 2004; Barrett 2004a, p. 11).

2. The Plan Threatens the Marten's Distribution and Viability in the Northern Sierra.

The new plan significantly weakens the Framework's protection for the marten and its habitat throughout the Sierra Nevada, but especially within the QLG pilot project area and within eastside forests. As described earlier, the plan would substantially weaken protection for large trees, canopy cover, large snags, and down wood throughout the general forest. In a radical departure from the Framework, the plan allows the same kind of logging to occur within old forest emphasis areas and remnant old growth stands as within the general forest, effectively eliminating the Framework's critical protections for old forest habitat. In eastside pine forests, one of several forest types "considered to be of most importance" to the marten (USDA Forest Service 1999, p. 114), the logging diameter limits would be increased from 24" dbh to 30" dbh, and protection for canopy cover would be eliminated entirely. Of particular concern to the marten, the plan allows full implementation of the QLG pilot project in the northern Sierra, despite the fact that the marten has apparently been extirpated from a portion of its range in this area.

Specifically, the plan would adversely affect all of the following key attributes of suitable marten habitat (see generally Kucera 2004):

- Large trees. The plan allows widespread logging of medium and large trees that are currently protected by the Framework. The plan would substitute a 30" diameter limit for the existing 12" and 20" limits in westside forests, and for the existing 12", 20", and 24" limits in eastside forests. According to the Forest Service, trees greater than 24" dbh constitute large trees and provide a key element of high quality marten habitat (USDA Forest Service 1999a, p. 127; Freel 1991, p. 15); furthermore, research on eastside forests on the Inyo "documents that trees from 24 to 30 inches in diameter contribute significantly to high-quality marten habitat." (Kucera 2004, p. 2). Thus, removal of these trees will contribute to the further degradation of marten habitat.

- Canopy cover. The plan allows greater reductions in canopy cover than permitted by the Framework and also reduces the minimum permissible canopy cover. In westside forests, the canopy cover limit would be reduced from 50 percent to 40 percent; in eastside forests, the existing 30 percent limit would be entirely eliminated. As described above, there is ample research demonstrating the marten's association with and preference for dense canopy cover. Even within eastside forests, "Spencer et al. (1983) found marten to prefer stands with 40-60% canopy closure for both resting and foraging and avoid stands with less than 30% canopy closure." (USDA Forest Service 1999a, p. 114; USDA Forest Service 2001, Volume 3, Chapter 3, part 4.4, p. 19). Freel (1991) describes high quality

marten habitat as having greater than 70 percent canopy cover and low quality habitat as characterized by 40 percent or lower closure, and states simply that "cover less than 30% is considered unsuitable for use." (p. 16). In other words, the plan allows marten habitat to be reduced from high quality to low quality in westside forests, and from high quality to unsuitable in eastside forests.

- Large snags and down logs. The plan provides the Forest Service with broad discretion to weaken the Framework's standards relating to protection of large snags and down logs. Researchers have repeatedly found that the marten prefers complex physical structure near the ground (Buskirk and Powell 1994; Buskirk and Ruggiero 1994), and the Forest Service has confirmed that "large and coarse woody debris, including especially large snags and large down woody material, is an important habitat component" for the marten. (USDA Forest Service 1999a, p. 114). As described above, the Forest Service is likely to remove snags and down wood during fuels reduction projects because these structures are believed to contribute to the risk of stand replacing wildfire. As the Forest Service has noted, "a reduction in … down, woody material … can influence the distribution and abundance of marten prey" (FSEIS, pp. 141-42), and therefore degrade marten habitat.

The plan eliminates the limited operating period (LOP) surrounding marten den sites for all activities other than vegetation management. (FSEIS, p. 255). The administrative record indicates that recreation and other activities can disrupt marten behavior, and that the LOP in the Framework was based upon "the best scientific information available." (USDA Forest Service 2001c, pp. C-3-4). Therefore, there is no basis for weakening the LOPs under the plan.

These changes in management are particularly troubling within the QLG pilot project area, where intensive logging would be allowed and where the marten is already imperiled, and within eastside forests, where existing habitat protection would be essentially eliminated. Full implementation of the QLG project would dramatically increase both the amount of logging and the intensity of logging compared to the Framework. The U.S. Fish and Wildlife Service has already concluded that full implementation of the QLG project "poses a significant threat to the long-term viability of the … American marten due to the loss, degradation, and fragmentation of suitable habitat" (USDI Fish and Wildlife Service 1999, p.16), and according to marten experts "there is no new information that would change these conclusions." (Barrett 2004a, p. 11).

Full implementation of the QLG pilot project would have the following adverse impacts on the marten and its habitat:

- Reduction in suitable habitat. The pilot project would potentially log over 50 percent of the currently suitable denning and resting habitat for the marten in eastside forests, including 41,569 acres of DFPZs and 21,750 acres of group selection. (USDA Forest Service 1999a, pp. 121-124; Barrett 1999, p. 3). Forest types "such as eastside mixed-conifer and eastside pine forests are the types most deficient in high quality late successional forest relative to their potential and to pre-settlement conditions." (USDA Forest Service 1999b, p. 3-62). Most of the logged areas will likely be rendered unsuitable for the marten, given the new standards allowing logging of large trees and

eliminating protection for canopy closure. As expressed by the Fish and Wildlife Service, "the unrestricted reduction in canopy cover and significant reduction of snags and logs on the eastside would reduce potential forest carnivore denning and resting sites." (USDI Fish and Wildlife Service 1999, p. 12).

- Increase in forest openings. The plan allows 8,700 acres per year of group selection openings in the QLG area. (FSEIS, p. 259). As described above, martens are highly vulnerable to forest fragmentation and are generally not found "in landscapes with greater than 25 percent of the area in openings, even where suitable habitat connectivity exists." (USDA Forest Service 2001, Volume 3, Chapter 3, part 4.4, p. 19). Moreover, the QLG planning records acknowledge that "the red fir and eastside pine forest types are characterized by an abundance of naturally occurring openings" (USDA Forest Service 1999a, p. 129), and that eastside pine stands "have far more and larger anthropogenic openings (wildlife burns, regeneration cuts, roads, skid trails, landings) today than those caused" by natural factors. (USDA Forest Service 1999b, p. 3-58). As summarized by Dr. Kucera, as a result of the group selection openings, "any martens that may occur in these forests will be negatively affected, and such fragmentation will inhibit or prevent future recolonization." (Kucera 2004, p. 3). Despite these findings and research, the FSEIS fails to acknowledge, much less analyze, the adverse impacts on the marten of greatly increasing the percentage of forest openings.

- Construction and maintenance of DFPZs. The plan allows construction of tens of thousands of acres of DFPZs throughout the pilot project area, reducing and degrading suitable habitat and further fragmenting the remaining habitat. First, DFPZs are expected to result in "relatively open stands" in which "the forest floor would usually be relatively open, with the exception of occasional large logs" (USDA Forest Service 1999b, p. 2-20), which is antithetical to suitable marten resting and foraging habitat. (Barrett 1999, p. 6). If the pilot project is fully implemented, "the eastside forest types would be targeted for proposed treatments," and the DFPZ treatments "would likely compromise later seral values." (USDA Forest Service 1999b, pp. 3-58, 3-59). In general, "the creation of DFPZs could potentially decrease denning and foraging habitat within the Pilot Project Area. With DFPZ maintenance, this decrease in habitat would be perpetuated." (USDA Forest Service 2003, p. 83). Second, "constructing the DFPZs will also result in significant road construction, which will additionally fragment marten habitat and potentially lead to an increase in marten mortality from vehicles." (Kucera 2004, p. 3). The Fish and Wildlife Service expressed concerns that "marten may not move across linear DFPZs, limiting population expansion and colonization of unoccupied habitat … thus precluding future recovery options." (USDI Fish and Wildlife Service 1999, p. 12). As a consequence, "the pilot project could lead to the isolation and local extirpation of marten." (Barrett 1999, p. 6).

- DFPZs in red fir forests. Although the FSEIS misrepresents the issue, the QLG administrative record emphasizes that full implementation of the pilot project "has the potential to fragment high elevation red fir vegetation with linear DFPZ's located within checkerboard ownership lands on the Sierraville District. This increased fragmentation

of habitat could create open forest conditions that are no longer suitable for marten, and are large enough to serve as potential barriers to movement." (USDA Forest Service 1999a, p. 123, emphasis added). The FSEIS states that "red fir types would not generally be subject to fuel treatments" (FSEIS, p. 260), a claim that appears to be plainly wrong given that the revised plan allows full implementation of the QLG project.

- Construction of new roads. Full implementation of the QLG project will involve approximately 100 miles of new road construction. (FSEIS, p. 325). The best available research indicates that roads can directly affect marten through road-related mortality and indirectly affect marten by fragmenting habitat and discouraging marten movement. As acknowledged in the Framework FEIS: "Roads can impact martens in the following ways: (1) vehicles can kill animals and potentially increase mortality rates; (2) roads can fragment habitat and affect the ability of animals to use otherwise suitable habitat on opposing sides of the road; (3) roads, and the presence of vehicles and humans, can cause wildlife to modify their behavior in the vicinity of roads; and (4) roads allow human access to wildlife habitat and can increase the direct impacts of human activities." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 27). Therefore, alternatives that increase road density increase risk to martens. (Ibid., p. 30). The FSEIS entirely fails to assess this issue and instead asserts that new roads "would not be expected to induce substantially increased traffic or support speeds that increase roadkill of marten." (FSEIS, p. 256). However, as Dr. Kucera concludes, this assertion is unsupported. (Kucera 2004, p. 6).

In short, by significantly increasing both the amount and intensity of logging in the northern Sierra, and by weakening existing protection for marten habitat in the QLG area and in eastside forests, the new plan threatens the viability and distribution of the marten in the planning area, contrary to law. According to marten expert Dr. Steve Buskirk, "the proposed changes would substantively weaken protection … for the American marten. Marked declines in population size and fitness can be reasonably foreseen if the proposal is implemented." (Buskirk 2003). As summarized by Dr. Kucera:

> The plan would change management to increase logging and allow reduction in the number of medium- and large-sized trees, reduction of canopy cover, and reduction of snags and logs. These are precisely the habitat characteristics associated with later-seral stage forests and the presence of martens…. Taken together, these changes would further degrade marten habitat in the northern Sierra, leading to a significant risk of adverse impacts to marten reproduction, survival, and occupancy of the area. Given that the marten's population is already depleted in the northern Sierra Nevada, the proposal would further threaten the marten's viability and distribution in the area." (Kucera 2004, pp. 2-3, emphasis added).

D. Willow Flycatcher

Direction in the new decision weakens the protection of willow flycatcher established in the Framework ROD in ways that increase the likelihood of nest disturbance and habitat degradation

for this imperiled species. The marked changes from the Framework ROD to the new decision led willow flycatcher expert Dr. Susan Sanders to conclude:

> The standards and guidelines described in the January 2004 ROD will result in a continued decline in the abundance and range of willow flycatchers in the Sierra Nevada, increasing the likelihood that this species will be extirpated as a breeding bird in the Sierra Nevada. I believe that the threat of extirpation would have been significantly reduced if the Forest Service had adopted the willow flycatcher standards and guidelines from Alternative S1 in the DSEIS, although even those management recommendations fall short of the efforts needed for a genuine recovery of this species in the Sierra Nevada. (Sanders 2004, p. 2).

Despite numerous comments from experts on the inadequacy of the DSEIS to conserve willow flycatcher and protect it from extirpation, the ROD adopts the same management approach proposed in the DSEIS which jeopardizes the persistence of this species in the Sierra Nevada.

1. Overview of Willow Flycatcher's Status and Habitat Associations in the Sierra Nevada

a. The willow flycatcher is closely associated with wet meadows which support riparian shrubs in the Sierra Nevada.

"The two willow flycatcher subspecies that are the focus of this analysis … breed in shrubby vegetation and riparian communities." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 143). The foliage on the shrubs is "moderate to high and uniform from the ground to the shrub canopy." (Ibid., p. 144). "There is usually some surface water or saturated soil within defended territories during the early part of the breeding season (Valentine 1987, Sanders and Flett 1989, Bombay 1999)." (Ibid.). "Recent habitat selection modeling confirmed these observations that willow flycatchers are significantly more likely to be detected at sites where the herbaceous community is consistent with high water tables and late seral conditions, and riparian deciduous shrubs are abundant (Bombay 1999)." (Ibid.).

"In the Sierra Nevada bioregion, the willow flycatcher breeding season occurs from late May or early June (territory establishment) to the middle of September (fledgling independence." (Ibid.). Recent nesting data indicates that "willow flycatchers fledge young between approximately July 15 and August 31 and fledglings remain in territories for 2 or 3 weeks post-fledgling." (Ibid.). The ROD shortens the nesting season to August 15 at which point livestock grazing is allowed, whereas the Framework ROD does not allow grazing at all in occupied meadows. The shortening of the nesting season and the allowance of grazing in occupied habitat places adults and juveniles at greater risk of disturbance or mortality. (Sanders 2003, p. 3).

Brood parasitism of willow flycatcher nests by brown-headed cowbirds has been observed in the Sierra Nevada and affects the nesting success of this species. (Green et al. 2003, p. 33). In Sierra Nevada meadows within the range of willow flycatcher, Brown-headed cowbirds are often associated with areas disturbed by humans and livestock. (Ibid.). The impacts resulting from

brown-headed cowbirds led the recent conservation assessment to conclude that "even at high elevations, cowbirds can greatly influence flycatcher productivity on a local level." (Ibid.).

Wet meadows of the type used by willow flycatchers are limited in extent in the Sierra Nevada. (FSEIS, p. 291). "Past and recent land management, primarily grazing, has likely reduced habitat capability of otherwise suitable meadows by reducing or eliminating the willow or woody shrub component and changing meadow hydrology." (Ibid.)

b. The willow flycatcher is highly vulnerable to extirpation in the Sierra Nevada.

The willow flycatcher was listed in 1991 as endangered under the California Endangered Species Act. Since that time, demographic studies in the north central portion of the Sierra Nevada have shown alarming declines of territories in the study area and willow flycatchers have not been located in well-known breeding areas. The FSEIS identifies that in recent studies commissioned by the Forest Service:

> Recent data available from the demographic and monitoring study in the north-central Sierra Nevada is not encouraging with regard to willow flycatcher population trends. The total number of territories at 15 monitoring sites declined from 62 in 1998 to 45 in 2001, and to only 37 territories in 2002 (Bombay and Morrison 2003). Perrazo Meadows on the Tahoe National Forest has been consistently surveyed since 1997. The number of territories there has declined from a high of 12 in 1997 to a current low of only 2 (in 2002) (Bombay and Morrison 2003). Consistent survey efforts on the Sierra and Stanislaus National Forests in the past several years show a lack of willow flycatchers at a number of well-known breeding areas in the central and southern Sierra Nevada. In addition, three years of surveys on the Sequoia National Forest have failed to re-confirm earlier occupancy by willow flycatchers. (FSEIS, p. 151).

The FSEIS also identified that "habitat and population conditions currently restrict the potential distribution of this species, which is highly isolated. Potential abundance is very low. Gaps, where the likelihood of population occurrence is low, are large enough that little or no possibility of interactions, strong potential for potential for extirpations, and little likelihood of recolonization prevail." (FSEIS, p. 292). All monitoring and assessment efforts to date indicate that "the current population status of the willow flycatcher in the Sierra Nevada is that of a population in peril." (Green et al. 2003, p. 42).

2. The Management Direction in the ROD Threatens the Viability of Willow Flycatcher in the Sierra Nevada.

As indicated above, the decline of this species and the threats to willow flycatcher persistence in the Sierra Nevada are well documented. Rather than taking a hard look at how to increase conservation of this species, the ROD seeks only to weaken conservation measures currently in place for this species. As summarized in the table below, there are numerous areas in which the standards in the new ROD are changed to allow increased grazing at the expense of the species.

Table 1. Comparison of some of the management practices for willow flycatcher. (Taken from USDA Forest Service 2001b, pp. A-61 to A-62 and FSEIS, pp. 56-58).

Management Area	Framework ROD (Alt. S1)	ROD (Alt. S2)
Grazing in presently occupied sites	Prohibited for the season	Allowed after August 15
Grazing in historically occupied sites	Allowed after August 30	Allowed all season
Definition of nesting period	Ends August 30	Ends August 15
Surveys	Required by a time certain or grazing limited to late season	No deadline for completion
Modification of standards	Allowed under adaptive management with research group	Allowed in a site specific management plan designed by district

The increased impacts resulting from the plan adopted in the ROD led the California Department of Fish and Game to conclude:

> Allowing grazing, including late season grazing, in occupied meadows is incompatible with stabilization of existing numbers and eventual recovery of the willow flycatcher population and meadow restoration. (California Department of Fish and Game 2003, p. 2).

Similarly, other experts found that the new plan would not protect willow flycatcher. Dr. Susan Sanders stated that:

> …implementing the standards and guidelines in the January 2004 ROD will result in a continued decline in the abundance and range of willow flycatchers in the Sierra Nevada, increasing the likelihood that this species will be extirpated as a breeding bird in the Sierra Nevada. I believe that the threat of extirpation would have been significantly reduced if the Forest Service had adopted the willow flycatcher standards and guidelines from Alternative S1 in the DSEIS, although even those management recommendations fall short of the efforts needed for a genuine recovery of this species in the Sierra Nevada. (Sanders 2004, p. 2).

And finally, Dr. Peter Brussard concluded with respect to the ROD that "the precautionary principle should prevail. Grazing can always be reinstated, but extinction is permanent." (Guldin and Stine 2003, p. 12).

a. Cattle grazing in meadows with breeding willow flycatchers.

The ROD allows late season grazing to occur in meadows that support breeding and nesting birds (ROD, p. 58), whereas the Framework ROD prohibited season long grazing from such meadows. (USDA Forest Service 2001b, p. A-61). "Allowing grazing in occupied meadows,

including late season grazing, has significant potential to harm nesting willow flycatchers." (Sanders 2004, p. 3) "Aside from potential direct impacts of cattle knocking over nests, the substantial, negative impact of grazing on flycatcher habitat is well documented in the conservation assessment (Green et al. 2003). Grazing early or late increases willow browsing, retarding regeneration and recruitment of young shrubs as well as negatively affecting the form and structure of mature willows." (Sanders 2003, p. 3). The California Department of Fish and Game also identified that cattle grazing in meadows which supported breeding and nesting will impede recovery of this species:

> Allowing grazing, including late season grazing, in occupied meadows is incompatible with stabilization of existing numbers and eventual recovery of the willow flycatcher population and meadow restoration. The substantial, negative impact of grazing on flycatcher habitat is well documented in the Conservation Assessment, as is the role cattle play in attracting cowbirds to breeding locations. (California Department of Fish and Game 2003, p. 2).

As indicated above, allowing season long grazing at all in meadows that currently support nesting is a problem. Given that, the situation is only exacerbated by the ROD's adoption of a date – August 15 – on which grazing in occupied habitat can begin that overlaps with known dates of willow flycatcher nesting. "Allowing late season grazing endangers approximately 10 percent of willow flycatcher nests that on average fledge after August 15th." (Sanders 2004, p. 3)

In addressing the potential loss in the success of 10 percent of the nests, the FSEIS attempts to minimize the importance of those fledging later by stating that "there is some speculation that late fledging individuals (after July 15) may have a lower survival rate than early-fledging individuals." (FSEIS, p. 148). However, "[m]ost willow flycatchers fledge between July 15th and August 31st, so July 15th is actually just when fledging begins for many individuals. The use of the term "late" fledgers for birds leaving the nest after July 15th is misleading, and subtly implies that late birds are unlikely to survive anyway, so late season grazing would not have much effect one way or another. If survivorship is indeed lower for individuals fledging after July 15th, that provides all the more reason to manage any factor, including grazing, to enhance the survivorship of these young birds. Also, this section glosses over the fact that weather, predation, and brood parasitism can result in multiple re-nesting attempts, resulting in much later nesting and fledging." (Sanders 2004, p. 11).

Concern about grazing in occupied meadows was also raised in the Science Consistency Review. In reference to willow flycatcher and Yosemite toad, Dr. Peter Brussard noted:

> Allowing grazing and most recreational activities to continue in areas occupied or historically occupied by any of these species is almost certainly incompatible with population recovery and meadow restoration. (Guldin et al. 2003, p. A-4).
>
> The precautionary principle should prevail. Grazing can always be reinstated, but extinction is permanent. (Guldin and Stine 2003, p. 12).

With respect to the management activities proposed in Alternative S2 (and adopted in the new plan), Dr. Sanders concluded, "Given the precariously small number of willow flycatchers in the Sierra Nevada, even the loss of a few breeding territories could lead to loss of viability for populations in the planning area and a trend toward federal listing." (Sanders 2003, p. 3)

b. The Site Specific Management Plans and Monitoring Adopted in the ROD Are Inadequate

The ROD waives the limitation on late season grazing in meadows occupied by willow flycatcher if a site specific management strategy is developed. (ROD, p. 58). In contrast, the Framework ROD only allowed for its direction to be modified under a formal adaptive management study developed in cooperation with the Pacific Southwest Research Station. (USDA Forest Service 2001b, p. A-62).

There are a number of challenges that the "increased flexibility" desired by the new plan introduces. "[L]ocal decision-making provides flexibility for grazing management decisions, but this flexibility comes at the expense of an informed, comprehensive effort to apply consistent standards to that decision-making. Even if every line officer making management decisions is knowledgeable about recent willow flycatcher research and management activities, it is unlikely that adequate staff time would be allocated to develop and then monitor numerous individual plans. The FSEIS and ROD provide no mechanism for a coordinated assessment of how individual, local management plans are affecting willow flycatchers in the Sierra Nevada region." (Sanders 2004, p. 4). Difficulties with local management plans were also identified during the Science Consistency Review:

> While I am generally supportive of giving local managers latitude in carrying out fuels treatments, I am afraid that flexibility in local resource management has a high probability of leading to further decline of many of these species. Almost all sensitive species issues need to be addressed on a regional scale, and species management must be coordinated across ranger districts and national forest boundaries. Managing small and declining populations is challenging, and to do so successfully under local control requires that each district ranger and his/her staff be completely informed about recent research on every species of concern in the district. (Dr. Peter Brussard in Guldin et al. 2003, p. A-3).

Monitoring would be an essential component of any local management strategy, but its inclusion is not specifically mentioned in the "site-specific meadow management strategy" cited in the ROD. (FSEIS, p. 58). Similarly, the mechanism that triggers a reconsideration of the activities allowed in the strategy given undesirable monitoring results is not defined or identified as a requirement of the "strategy" offered in the ROD. Each of these elements is, however, included in the formulation of an adaptive management plan that is allowed in the Framework ROD "to test new and innovative management techniques as a part of formal research projects." (USDA Forest Service 2001b, p. 15).

The practice of monitoring and the subsequent changes in course correction present specific challenges that the new plan fails to address. "Effective management also requires careful monitoring that goes beyond simply documenting status and trend but instead focuses on identifying the factors that are responsible for the species' decline. Under local control, monitoring activities will vary in quality and intensity from administrative unit to administrative unit and be very difficult to coordinate across the species range. This lack of coordination will make viability evaluation very difficult since cumulative effects will be very hard to assess. Finally, once the factors causing species decline are identified, managers need to work to reduce or eliminate them. This usually requires unpopular decisions that are even more difficult to implement at a local level." (Dr. Peter Brussard in Guldin et al. 2003, p. A-3).

As a result of adopting management strategies that are not coordinated regionally with a monitoring program that is uncertain, the risk to this species increases significantly.

c. Surveys of Emphasis Habitats are not Likely to Occur Under the New Plan

Under the new plan, the surveying of emphasis habitat within 5 miles of occupied habitat is limited to the project planning process. (ROD, p. 58). In contrast, the Framework ROD required that emphasis habitat be surveyed within 3 years of signing the ROD and that if the surveys were not completed within 5 years, only late season grazing would be allowed on these allotments. (USDA Forest Service 2001b, pp. A-61-62).

In practice, the project planning process (or NEPA process) is notoriously behind schedule and many active allotments currently operate with grossly outdated NEPA documents. A recent review of allotments in the Sierra Nevada reported that of the 499 active allotments on Sierra Nevada national forests, the NEPA analyses were current on only 108 of these allotments. (CalTrout and California Native Plant Society 2001, p. 12). Although there is congressional direction to complete all allotment management plans (and associated NEPA analyses) by 2008, there is no schedule or commitment from Region 5 to bring these allotment management plans up to date in the near future. Further, there is no expectation that Region 5 will be able to complete any allotment planning in the next few years due to budget constraints. A process that delays surveying emphasis habitat until NEPA analyses are undertaken will result in essentially no surveys being completed. Since there are no direct management consequences of not completing the surveys, sites that are currently occupied but unknown to the Forest Service will be improperly managed. The result is that individuals of this species which are a part of a "population in peril" (Green et al. 2003, p. 42) will be placed at greater risk under the new decision compared to the Framework ROD.

d. The ROD Does Not Take the Appropriate Steps to Ensure Recovery of Willow Flycatcher.

Presently, the number of sites known to support willow flycatcher is extremely limited. (FSEIS, p. 292). Despite the acute concern expressed about management of this species by numerous

experts including the California Department of Fish and Game, the ROD fails to adopt several other actions that could retard or reverse the decline in this species.

First, meadow and habitat restoration is focused too narrowly. Alternative S2 only requires consideration of habitat restoration in historically occupied habitats that are determined to be degraded. (ROD, p. 58). "Restoring only the relatively few known occupied and historically occupied willow flycatcher sites on Forest Service lands does not constitute habitat restoration at a bioregional scale, and will not by itself enlarge or possibly even sustain a viable willow flycatcher population. Such a recovery would require habitat restoration and management activities that extend well beyond the limited number of sites that are recently or historically occupied." (Sanders 2004, p. 11). "As clearly summarized in the conservation assessment [(Green et al. 2003)], meadow restoration should be a priority activity of the USFS, yet a coordinated meadow restoration plan and monitoring program is not part of Alternative S2." (Sanders 2003, p. 4). "Without a comprehensive plan that identifies priority locations for restoration and other actions, managers can not develop local management plans that reflect the overall needs of the willow flycatcher. Without such a Conservation Strategy, the decline of the species will likely continue." (California Department of Fish and Game 2003, p. 2, emphasis added).

Second, reference is made to the development of a conservation strategy for willow flycatcher in the FSEIS (p. 78); however, this aspect of Alternative S2 has not been adopted in the ROD. Rather, the Regional Forester directed staff to assess "whether and/or how" to adjust the existing program of work to address this as well as other recommendations listed in the FSEIS in Chapter 2. (ROD, p. 13; FSEIS, pp. 71-88). "Developing a conservation strategy is a worthwhile goal, as is creating a conservation agreement, but we already have sufficient information about the factors affecting willow flycatchers to provide effective management actions on most of these issues. Furthermore, there is no indication in the FSEIS or ROD that site-specific management strategies, or any other standards and guidelines, would be required to abide by management recommendations included in future conservation strategies or agreements. No timeline is offered for completion of the conservation strategy and agreement. Volume II of the FSEIS (page 55) notes that this conservation strategy will be completed by May 2005, but there is no such commitment in the ROD. Proposing the conservation strategy allows the Forest Service to postpone actions that we know would benefit willow flycatchers (i.e., excluding livestock from known willow flycatcher sites, controlling cowbirds, restoring damaged meadows). By presenting these management actions as uncertain issues requiring further analysis in a conservation strategy delays implementation of management that should be taken now to halt the downward spiral of willow flycatcher populations in the Sierra Nevada." (Sanders 2004, p. 7).

Lastly, management direction for the control of cowbirds is ignored in the ROD, whereas the Framework ROD (USDA Forest Service 2000a, Volume 4, Appendix D1, p. 28) included direction on consideration of the impacts of cowbirds associated with concentrated stock areas

within 5 miles of occupied willow flycatcher habitat.[21] "The Conservation Assessment (Green et al. 2003) noted that cowbirds can be a serious problem for willow flycatcher reproductive success in the Sierra Nevada, noting (page 33): "Consequently, even at high elevations, cowbirds can greatly influence flycatcher productivity on a local level." Loffland et al. (2004) state: "Although cowbird parasitism rates are below those thought to substantially impact songbird populations (i.e., ~25-30%), our data clearly indicate that steps must be taken to increase fecundity. As such, removing the direct and indirect effects of cowbird parasitism could partially meet the goal of raising nesting success." The FSEIS leaves the reader with the impression that cowbird controls would be ineffective or are at such low rates that they are not warranted. Chapter 4, page 290, states: "The willow flycatcher conservation assessment determined that brood parasitism does occur in the Sierra Nevada but does not appear to be a significant problem at this time…. The conservation strategy that will be developed for this species will help to evaluate and prioritize the concern for brown-headed cowbird brood parasitism and will be used to inform local management decisions." (Sanders 2004, p. 9). However, as Dr. Sanders concludes, this argument is unpersuasive:

> Increasing nest success is the best opportunity we have to positively affect recruitment and survival, and implementing active cowbird controls (and precluding new concentrated stock areas within 5 miles of willow flycatcher habitat) is a highly feasible and immediate way to improve nest success. To postpone such management actions until development of a non specific conservation strategy misses an important opportunity to help reverse the willow flycatchers' precipitous population decline and is inconsistent with the Forest Service's duty to manage species habitat to promote viability. (Sanders 2004, p. 9).

e. <u>The Successive plans adopted by the Forest Service consistently decrease the protection for willow flycatcher</u>.

The Framework ROD adopted management direction for willow flycatcher that was less likely to protect populations and habitat than the preferred alternative (Alternative 8) described in the DEIS. (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, pp. 192 and 195). The management direction chosen in 2001 sought to balance additional risks and uncertainties with the adoption of a research and adaptive management that could support future adjustments to management. (<u>Ibid.</u>, p. 176). In seeking this balance, the Framework ROD omitted the inclusion of several important conservation measures relating to control of brown-headed cowbirds (<u>Ibid.</u>, p. 185), specific direction on habitat restoration that included identification of Important Bird Areas (<u>Ibid.</u>, p. 182), and annual surveys in emphasis habitats (<u>Ibid.</u>, p. 181). By the adoption of Alternative S2, the ROD placed willow flycatcher at even greater risk by increasing the exposure of individuals and essential habitat to disturbance from grazing and by failing to adopt a rigorous research and adaptive management program to refine management direction in the future.

[21] For reasons that we cannot determine, the Forest Service failed to include this standard in the characterization of the Framework ROD included in the DSEIS or FSEIS. This omission calls in to question whether or not the Framework ROD in total was even considered in the analysis contained in the FSEIS.

Simultaneous with our increasing understanding of the decline of this species, the Forest Service has made decisions that progressively erode the protection afforded for willow flycatcher.

f. Conclusion

New information available since 2001 strengthens the conclusion in the Framework FEIS that "under existing conditions willow flycatchers are likely still experiencing a declining population trend in the Sierra Nevada bioregion." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 152). Studies and conservation assessments commissioned by the Forest Service all point to the need to develop a management strategy that preserves and enhances currently occupied and historically occupied habitat. The Science Consistency Review and the California Department of Fish and Game each identified inadequacies in the new plan that threatens the persistence of this species. In the face of these important findings, the new plan contains less management certainty, poses greater risk to willow flycatcher and increases the likelihood of extirpation of this species from the planning area. (Sanders 2004, p. 2). Thus, the new plan violates the Forest Service's duty to maintain viable populations of this species across the planning area.

E. Yosemite Toad

1. Overview of Yosemite Toad's Habitat Associations and Status in the Sierra Nevada

a. The Yosemite toad is closely associated with wet meadows in the Sierra Nevada.

"Yosemite toads use meadow habitats of the high Sierra Nevada." (USDI Fish and Wildlife Service 2003d, p. 6). "Breeding habitat includes the edges of wet meadows and slow flowing streams (Jennings and Hayes 1994). Tadpoles have also been observed in shallow ponds and shallow areas of lakes (Mullally 1953). Moist upland areas such as seeps and springheads are important summer non-breeding habitats for adult toads (David Martin, University of California, Santa Barbara, pers. comm. 2002, cited in 67FR75834)." (USDI Fish and Wildlife Service 2003c, p. 184).

"Eggs are typically deposited in shallow water with silty bottoms (Karlstrom 1962)…. Eggs hatch within 3-6 days depending on water temperature (Jennings and Hayes 1994), although they may take over 15 days." (Ibid., p. 185). Tadpoles generally transform within 40-50 days and are not known to overwinter. (Ibid.)

The habitat of Yosemite toad coincides with meadows used for the grazing of livestock and packstock. Risks due to habitat modification and direct loss of individuals have been recognized.

(Ibid., p. 228). It is widely recognized by experts that livestock grazing poses a serious threat to Yosemite toad. These threats led Dr. Peter Brussard to conclude "…there is ample evidence that livestock do have extensive negative impacts on these species habitats. Thus, the precautionary principle should prevail. Grazing always can be reinstated, but extinction is permanent. (Guldin and Stine 2003, p. 12). The severity of threats to Yosemite toad also led the US Fish and Wildlife Service (2003c, p. 262) and others (Guldin et al. 2003, p. 3; Guldin and Stine 2003, p. 3, 14, and 15) to recommend that measures be taken to exclude livestock from occupied Yosemite toad habitat.

The ROD and the Framework decision are similar in that both require that livestock be managed "by excluding livestock grazing from standing water, saturated soils in wet meadows, stream channels, and springs in occupied toad habitat" during the breeding and rearing period. (FSEIS, p. 302). Beyond this, the new decision differs from the Framework decision in ways that increase the impacts on Yosemite toad. The new decision limits this standard to livestock whereas management of pack and saddle stock were included in the Framework. (FSEIS, p. 302). The failure of the ROD to include pack and saddle stock potentially exposes all life stages to impacts from grazing animals when there is no evidence to suggest that the approach to pack and saddle stock merits any difference. (Guldin and Stine 2003, p. 3). The Framework ROD left undefined the term "rearing" and as such it could be interpreted broadly to include vulnerable stages that have newly emerged on to land. The new decision adopts a definition of rearing that limits it to life stages up to the point where individuals emerge on to land. (FSEIS, p. 302). This exposes the life stage to mortality from such things as trampling and stranding in holes left by hoof prints. (FSEIS, p. 303). A final significant weakening of the Framework is the failure of the new decision to adopt an adaptive management strategy that involves research scientists. Instead, the ROD requires that site specific management plans be implemented if the standard to excluded livestock is not adopted. For the reasons described below, site specific management plans are deemed by the US Fish and Wildlife Service (2003d, p. 7) and experts (Guldin and Stine 2003, p. 4) to be inadequate to address the coordinated management required for this imperiled species.

b. The Yosemite toad warrants listing under the Endangered Species Act.

The U.S. Fish and Wildlife Service determined in 2002 that the listing of Yosemite toad was warranted, though precluded by budget constraints and other agency priorities. This decision was based on documented declines in Yosemite toad populations and identified threats to the species' habitat and range. (USDI Fish and Wildlife Service 2002). The notice specifically cited livestock grazing as contributing to direct loss of toads and resulting in adverse modification of habitat.

2. The Management Direction in the ROD Threatens the Viability of Yosemite Toad.

a. Livestock grazing in meadows with breeding frogs.

Direct impacts from grazing have been identified for all life stages of Yosemite toad. "Livestock and packstock grazing is likely to cause reduction in suitability of breeding habitat for and direct mortality of Yosemite toads." (USDI Fish and Wildlife Service 2003c, p. 228). "Livestock have been observed to trample eggs in such habitats, and to disturb eggs such that they are moved into deeper water where they can not survive (67FR75834). Cattle have been observed to trample metamorph and adult Yosemite toads and cause water pollution that may adversely affect tadpole development (67 FR75834)." (Ibid.)

The ROD limits the interaction between Yosemite toads and grazers "by excluding livestock grazing from standing water, saturated soils in wet meadows, stream channels, and springs in occupied toad habitat" during the breeding and rearing period. (FSEIS, p. 302). "If physical exclusion of livestock from these water features is impractical, then livestock would be excluded from the entire meadow until it has been dry for two weeks." (Ibid.). The breeding and rearing season is defined as ending with the emergence of tadpoles from their breeding pools. (Ibid.).

In comments provided on the DSEIS, the US Fish and Wildlife Service stated that this definition of rearing season would leave "metamorphs vulnerable to trampling" and recommended that "the period when livestock are excluded from breeding habitat be extended, so as to protect metamorph Yosemite toads." (USDI Fish and Wildlife Service 2003d, p. 7). The FSEIS acknowledges that "metamorphs, juveniles, and adult frogs are highly exposed to direct trampling mortality as a result of livestock grazing anywhere in meadows after the breeding and rearing season have ended. The risk is highest from July through October." (FSEIS, p. 302). Further, the FSEIS identifies that metamorphs can become entrapped in deep livestock hoof prints. (Ibid., p. 303).

The effect of trampling on metamorphs was also identified in the Science Consistency Review as increasing risks for this species:

> Relative to S1, S2 would likely exacerbate the conflicts that likely currently exist between livestock and Yosemite toads. While eggs and tadpoles are confined to small breeding areas, metamorphs are found throughout meadows, and are thus likely to be more vulnerable to direct mortality from livestock than are eggs and tadpoles. As such, there is no justification for only excluding livestock during the breeding and rearing season. This would allow potentially deleterious effects of grazing on the most vulnerable life stage of Yosemite toads. (Dr. Ruth Kern in Guldin and Stine 2003, p. 14).

Despite the recognition in the FSEIS and from experts that the definition of rearing season would increase the likelihood that individuals of all life stages would be killed, the new decision fails to adopt the more protective measure.

Beyond the effects that grazing may have on metamorphs, the comment from Dr. Ruth Kern also suggests that the exclusion of grazing from the entire meadow may be more appropriate. This suggestion was made by other Science Consistency Reviewers as well:

> The basic message here is that livestock grazing and Yosemite toads/mountain yellow-legged frogs do not mix. (Dr. Mark Jennings in Guldin et al. 2003, p. A-17).
>
> While there are no published studies specific to the issue of livestock grazing impacts on Yosemite toads, the natural history of the toad provides plenty of justification for excluding livestock from toad habitat. Breeding occurs in very shallow meadow pools that can be altered by even slight modifications in meadow hydrology. Numerous studies document the role of grazing in causing such changes. Metamorphs are widespread throughout meadows (even dry areas), making them susceptible to trampling. Metamorphs and adults utilize rodent burrows for shelter, and these burrows can be collapsed by grazing. All of this suggests that excluding livestock from portions of meadows occupied by toads will be ineffective. (Guldin and Stine 2003, p. 3).
>
> …there is ample evidence that livestock do have extensive negative impacts on these species habitats. Thus, the precautionary principle should prevail. Grazing always can be reinstated, but extinction is permanent. (Dr. Peter Brussard in Guldin and Stine 2003, p. 12).
>
> …the only approach I see as being implementable and effective is to phase out grazing of mountain meadows within the range of the Yosemite toad that contain potentially suitable habitat. (Ruth Kern, in Guldin and Stine 2003, p. 15).

Comments from the US Fish and Wildlife Service on the DSEIS echo the concerns raised by the Science Consistency Reviewers. In their conservation recommendations, the Service states:

> Eliminate livestock grazing from Yosemite toad habitat throughout the year to prevent the degradation of upland habitats, the introduction of sediments and pollutants into toad breeding sites, trampling of upland refugial habitat, removal of dispersing cover for juvenile and adult toads, and alteration of meadow, stream and spring hydrology." (USDI Fish and Wildlife Service 2003c, p. 262).

Contrary to comments from experts and recommendations from the US Fish and Wildlife Service, the new plan allows grazing in meadows that support Yosemite toad and increases the exposure of this species to activities that can have an adverse impact.

b. Pack and Saddle Stock Grazing

The new plan specifically excludes the grazing of pack and saddle stock from the Yosemite toad standards and guidelines. (ROD, p. 56). In the absence of specific management direction, evaluation of the impacts of this grazing on Yosemite toad will be limited to times when existing permits are renewed or new permits are issued. Then in cases where project review is

undertaken, practices that exclude pack or saddle stock grazing from occupied habitat are not required nor is specific monitoring required in areas where grazing will occur. In contrast, the Framework ROD (USDA Forest Service 2001b, p. A-54) regulates the management of pack and saddle stock grazing under the same standard as livestock grazing.

The Science Consistency Review concluded that "there is no evidence that pack stock and livestock have different impacts on habitat or directly on toads." (Guldin and Stine 2003, p. 3). This suggests that there should be no fundamental difference in the management objectives or requirements between livestock and pack/saddle stock grazing. This exception made in the ROD for pack and saddle stock grazing is contrary to the recommendations and conclusions of experts. The US Fish and Wildlife Service recommended the elimination of "livestock grazing from Yosemite toad habitat throughout the year to prevent the degradation of upland habitats" (USDI Fish and Wildlife Service 2003c, p. 262) and a member of the Science Consistency Review concluded that "the only approach I see as being implementable and effective is to phase out grazing of mountain meadows within the range of the Yosemite toad that contain potentially suitable habitat." (Guldin and Stine 2003, p. 15). The ROD's failure to regulate pack and saddle stock grazing stock increases the likelihood of adverse impacts to a species that is already imperiled, and is contrary to expert opinion.

c. <u>The Site Specific Management Plans and Monitoring Adopted in the ROD Are Inadequate</u>

The new plan allows the limited restriction on grazing in occupied habitat to be waived with the adoption of a site specific management plan. This approach was adopted in place of the requirement under the Framework that the standards could only be changed under an adaptive management study initiated in cooperation with Pacific Southwest Research Station. (FSEIS, Appendix A, p. 347).

The US Fish and Wildlife Service in comments on the DSEIS recommended that "site specific management plans only be implemented in association with formal adaptive management studies capable of detecting livestock effects on toad populations." (USDI Fish and Wildlife Service 2003d, p. 7). Concerns about study design, replication and the ability to detect effects also were raised in the Science Consistency Review:

> Critical to the comfort that scientists have on WIFL and YT are the plans that are, or will be, put in place regarding the monitoring of populations of these species and the commitment to changes in management should that monitoring suggest population declines. There is also concern that the number of ungrazed controls for such an adaptive approach is limited and inadequate. (Guldin and Stine 2003, p. 4).

These reviewers identified inadequacies with an approach that uses site specific management plans outside of a research context. Outside of a research context, there is no basis against which to compare the effects of the management activity since the site specific plans will have not have any controls and this will hamper the detection of effects.

In addition, the management plans under the ROD allow interdisciplinary teams to develop these strategies as a mechanism to "minimize the impacts to toad and its habitat by managing movement around wet areas." (ROD, p. 56). The ROD fails to require that consultation with experts be part of this process as required under the Framework, which suggests that the rigor provided by that expert participation is not desired. Beyond this, the standard cites a low threshold of mitigation that only requires that impacts be "minimized" and not reduced to less than significant or eliminated.

Thus, the implementation of the site-specific management plans will increase the likelihood of impact to this species and provide at best anecdotal information of the effects of the chosen management practices on Yosemite toad.

d. The Standard to Complete Surveys is not Enforceable.

The new plan also fails to establish any timeline for the completion of Yosemite toad surveys and more importantly removes any consequences of failing to complete the surveys. The US Fish and Wildlife Service identified this as an inadequacy and recommended that "surveys be completed by January 2007, and that if any habitat remains unsurveyed thereafter, it be assumed occupied." (US Fish and Wildlife Service 2003d, p. 7). In the absence of a time certain for completion of surveys (and consequences for not meeting the date), there is a significant risk that Yosemite toads and habitat may be adversely affected. In contrast, the Framework ROD adopted the approach recommended by the US Fish and Wildlife Service.

Again, the new plan only serves to weaken conservation measures for a species now considered by the USFWS to be warranted for listing under the Endangered Species Act. Such a plan is clearly inconsistent with the Forest Service's legal duty to ensure species viability and to avoid a trend towards federal listing.

e. Conclusion

The decline in Yosemite toad populations is sufficiently acute to warrant listing under the Endangered Species Act. The US Fish and Wildlife Service and the Science Consistency Reviewers all made recommendations targeted at reducing the risks of grazing on this imperiled species. In spite of this feedback from experts, the Regional Forester adopted a plan that jeopardizes the persistence of Yosemite toad in the Sierra Nevada, in violation of the National Forest Management Act.

IV. THE FOREST SERVICE HAS FAILED TO DEMONSTRATE THAT THE NEW PLAN IS NECESSARY TO ACHIEVE FUELS REDUCTION OBJECTIVES

Fire and fuels management was one of the five problem areas addressed in the SNFPA FEIS. One of the purposes of the Framework was to increase consistency in management across national forests, incorporate wildland fire, and set priorities for fire management to balance the need to "restore fire as a key ecosystem process while minimizing the threat fire poses to structures, lives and resources." (USDA Forest Service 2001b, Volume 1, Summary, pp. 4-5).

The FEIS also recognized that while certain fuel treatments might improve the fire resiliency of a stand, they could also have detrimental effects on sensitive habitats and species:

> Therefore it is assumed that the alternatives that treat the most acres in a strategic manner can potentially reduce future wildland fires the greatest and maintain the greatest amount of habitat. This assumption can only be true if the treatments themselves do not compromise habitat. If the treatments themselves compromise habitat and habitat is considered lost or temporarily unusable, then effects of the treatments that were designed to protect habitat from loss are similar to the effects from losing habitat to wildfire. (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.5, p. 281).

Thus, the Framework ROD sought to balance fuels management and species conservation:

> My decision strikes a balance between (1) the uncertainty of the effects of management activities on old forest habitat caused while treating fuels in an attempt to protect old forest conditions from catastrophic fire, and (2) the risk of wildfire loss to areas with old forest conditions where no fuel treatments are employed to protect existing forest structure…. Alternative Modified 8 provides the necessary balance that I seek by allowing for mechanical treatments as well as prescribed fire, thus providing for the necessary management tools while still imposing conservative habitat protection measures. (USDA Forest Service 2001b, p. 29).

Ultimately, this approach was affirmed in the Chief's appeal decision:

> I find that the record supports the Regional Forester's decision to implement the fuels strategies in Modified Alternative 8. The record supports his decision to impose a 12-inch diameter limit to reduce surface and ladder fuels for mechanical treatments in old forest emphasis areas. The uncertainty of fully implementing the fuels strategy in these areas is recognized and addressed in the adoption of the adaptive management strategy incorporated into the decision. (USDA Forest Service 2001c, p. A-13).

Whereas the Framework sought to balance habitat and species protection with the need to manage for fuel reduction, the new plan emphasizes increased resource extraction in ways that are not necessary to reduce wildfire risk and that come at the expense of sensitive species and habitats. As Dr. Verner concluded in his review, "the FSEIS takes an unnecessarily <u>aggressive</u> approach that ... goes way beyond the needs of our fire and fuels concerns." (Verner 2004, p. 1).

> A. <u>The Forest Service does not need to remove trees greater than 20 inches in diameter and reduce canopy cover to 40 percent in order to reduce the risk of catastrophic fire.</u>

The new plan allows the removal of trees up to 30 inches in diameter and reductions in canopy cover to 40 percent in the name of increasing the effectiveness of fuels treatments. As will be shown below, current research does not support the requirement to remove medium to large diameter trees or significantly reduce canopy cover in order to increase fire resiliency.

It is generally recognized by fires scientists that fire resiliency largely is achieved by removing surface fuels and small diameter material. "Most of the trees that need to be removed to reduce accumulated fuels are small in diameter and have little or no commercial value." (U.S. General Accounting Office 1999, p. 44). "When thinning is used for restoration purposes in dry forest types, removal of small diameter material is most likely to have a net remedial effect. Brush, small trees, along with fine dead fuels lying on top of the forest floor, constitute the most rapidly ignited component of dry forest." (Christensen et al. 2002, p. 2). Thus, "surface fuels are the means by which crown fires are sustained.... Without heavy surface fuels, crown fires are almost always absent, regardless of canopy cover, size class distribution, or the height to live crown." (Rice 2003, p. 2). As acknowledged in the FSEIS (Volume 2, p. 106): "It is the smaller trees that are making Sierra Nevada forests overly dense and prone to destructive wildfire…."

Recent studies of the effects of fuel treatments on fire behavior also support the conclusion that fuel reduction that focuses on ladder fuels and small diameter material is effective in reducing catastrophic fire. Stephens (1998) examined a number of fuel treatments and used the model FARSITE to evaluate their efficacy. In all cases, the most successful fuel treatments included prescribed fire. Further, prescribed fire alone was as effective in reducing fire risk as treatments with logging and prescribed fire combined. "These treatments resulted in fuel structures that will not produce extreme fire behavior at 95th percentile conditions." (Ibid., p. 32). Further, the vegetative conditions in the watershed where the fire effects were modeled included canopy cover conditions of up to 100 percent cover. The prescribed burning treatments did not reduce in any way the canopy cover of the dominant and co-dominant trees, yet these treatments were as effective as the thinning/biomass/prescribed burn treatments in which canopy cover was reduced to 50 percent in some areas of the watershed. Thus, no change in canopy cover of the dominant and co-dominant trees was necessary to meet the fuel objective under extreme weather conditions. Furthermore, reducing canopy in some areas to 50 percent did not result in any additional benefit. Similar results were reported by van Wagtendonk (1996) which again emphasized that removal of the surface and ladder fuels is effective in changing fire behavior. These studies demonstrate that it is not necessary to remove medium to large diameter trees or alter canopy cover in order to prevent crown fire and other extreme fire behaviors.

Observations on the behavior of wildfire at Black's Mountain Experimental Forest also support the conclusion that a crown fire depends on surface fuels. In testimony before the Resources Subcommittee on Forests and Forest Health (House Resources Committee on Natural Resources, U.S. House of Representatives), UC Berkeley fire ecologist Dr. Scott Stephens reported the following:

> When the wildfire entered the high diversity unit that had also been prescribe burned, it transitioned from a high severity crown fire to a very low intensity surface fire in about 200 feet. The treated forest almost stopped the wildfire in this unit. In the low diversity unit that had been prescribed burned a similar change in fire behavior occurred, from a severe crown fire to a low intensity surface fire in less than 200 feet. When the wildfire moved into the low diversity unit that had not been prescribe burned, the wildfire changed from a severe crown fire to a severe surface fire. The severe surface fire burned the majority of the unit and this killed approximately 60-80 percent of the trees. The

> wildfire burned in this unit because the activity and natural fuels were sufficient to carry the wildfire. If this treatment had also left the sub- merchantable trees on the ground as activity fuels, I am sure the whole unit would have experienced almost complete mortality. This occurred even though canopy cover, crown bulk density, and ladder fuels were very low in the low diversity units. Trees were widely spaced by the low diversity treatment and no crowns were overlapping. It simply provides more support that the target of almost all fuel treatments in mixed conifer, ponderosa pine, and Jeffrey pine forests must be the surface fuels. (Stephens 2004, p. 4, emphasis added).

Dr. Stephens also concluded that with respect to the revision of the Framework:

> Removal of moderately sized trees (20- 30 inches in diameter) can produce revenue and wood products for California, but in the majority of cases, it will not significantly reduce potential fire behavior. Removal of trees of this size will only reduce canopy bulk density and this will have a small affect on potential fire behavior in most forest stands. The target of fuels projects must be the surface and ladder fuels. (Ibid., p. 4, emphasis added).

Lastly, fire specialists participating in the Science Consistency Review made similar conclusions:

> The lowest priority is to treat the overstory trees (CROWN fuels). Generally, the larger trees are more resistant to fire damage than are smaller trees, regardless of species. Additionally, from a FIRE HAZARD perspective, if surface and ladder fuels are adequately treated, there is often little need to treat large, overstory trees (e.g., Megram Fire) because independent crown fires are very rare in California type forests. (Dr. Carl Skinner, PSW fire scientist in Guldin and Stine 2003, p. 8).

> Only under the very most unusual circumstances will a fire move through the crowns without a surface fire to keep it going. Remove the surface fuels AND the ladder fuels (i.e., the standing live trees up to 6 inches in diameter). Treat the surface and ladder fuels, and you have reduced the risk of an active crown fire to an insubstantial level. (Dr. Jan van Wagtendonk, fire scientist with the National Park Service in Guldin and Stine 2003, p. 8).

> Active crown fires are created when the surface and crown fires are linked as one structure. It is very rare to have independent crown fires in the Sierra, crown fires are almost always linked to high intensity surface fires. Without the high intensity surface fire the fire will drop from the tree crowns. (Dr. Scott Stephens, UC Berkeley fire scientist, in Guldin and Stine 2003, p. 8).

Thus, the overwhelming evidence provided by recent studies and observations from fire experts who work in the Sierra Nevada is that reducing surface and ladder fuels, rather than logging of medium-large trees and reducing canopy cover, is the most effective means to reduce the risk of crown fire in mixed conifer, ponderosa pine, and Jeffrey pine forests in the Sierra Nevada.

Fire scientists have also clearly addressed the negative effects on fire behavior that can result from the reduction of canopy cover. "Thinning or otherwise opening a stand allows more solar radiation and wind to reach the forest floor. The net effect, at least during periods of significant fire danger, is usually reduced fuel moisture and increased flammability. (Countryman 1955). The greater the stand opening, the more pronounced the change in microclimate is likely to be." (Weatherspoon 1996, p. 1173). Weatherspoon and Skinner (1995) observed that uncut stands, with no treatment of natural fuels, burned less intensely than partial-cut stands with no fuel treatment or partial-cut stands with fuel treatments. They determined that the partial cuttings created a warmer, drier microclimate compared with that of the uncut stands and that fuel treatments of surface fuels might have been only partially effective. Even where thinning logging occurs in combination with fuels treatments, the warming and drying of the stand has potential to offset the reduced fuel loading. (Stephens 2003, p. 3). Thus, the "removal of more mature trees can increase fire intensity and severity, either immediately post-logging or after some years." (Christensen et al. 2002, p. 2).

The FSEIS fails to consider information from experts on the fire ecology of the Sierra Nevada and instead relies to a large extent on general observations about fire in forested systems elsewhere in the United States (Graham and McCaffrey 2003) or on results of a study that includes sites from Louisiana, Colorado, New Mexico and California (Omi and Martinson 2002). The FSEIS (p. 219) appears to rely heavily on a conclusion in Omi and Martinson (2002) that "a reduction in crown fuels outweighs any increase in surface fire hazard" to justify the removal of the forest canopy. However, this conclusion is in direct conflict with the findings of over 12 ecologists (Christensen et al. 2002) and comments submitted on the DSEIS by Dr. Scott Stephens, UC Berkeley fire scientist who specializes in Sierra Nevada ecosystems. (Stephens 2003).

When the results specific to the Sierra Nevada are examined in Omi and Martinson (2002, Table 5), one finds that the stand structure in the treated and untreated stands used in the analysis were significantly different only with respect to stand density (trees per acre) and tree diameter. Other factors linked in the paper to crown fire hazard (i.e. basal area, crown bulk density, height to live crown) were not significantly different between treated and untreated stands. On average there was a three-fold difference in the density of trees on the untreated site relative to the treated site. This was accompanied by a mean tree diameter on the untreated site that was about 5 inches less than the treated site. These stand metrics indicate that on average the untreated sites had a very high number of trees with diameters likely less than the mean value of about 15 inches. Since estimates of crown fuels (i.e. basal area and crown bulk density) were not significantly different between treated and untreated stands (Ibid.), the difference between treated and untreated can not be attributes to a change in crown fuels. Instead, the difference can only be attributed to the combined effects of an increase in basal area and a difference in average stand diameter. Thus, the results presented from the California portion of the Omi and Martinson (2002) study do not support their general conclusions about the importance of reducing crown fuels. And more importantly, the results specific to California in Omi and Martinson (2002) do not support the conclusion made in the FSEIS that "their research demonstrates that the potential increase in surface fire from canopy reduction is outweighed by the benefit of reduced crown fire potential." (FSEIS, p. 219).

In sum, the findings of recent studies and fire experts all identify the importance of removing surface and ladder fuels to reduce the risk of catastrophic fire in mixed conifer, ponderosa pine and jeffrey pine forests in the Sierra Nevada. The removal of more mature trees (>20" diameter) and the reduction of canopy cover to 40 percent is not required to improve fire resiliency and may well increase the adverse effects from fire. The FSEIS fails to consider the overwhelming evidence, specific to Sierra Nevada systems, which addresses these issues and that was presented during the comment period for the DSEIS. Instead, the FSEIS relies upon the generalized conclusions presented in an overview of fire behavior (Graham and McCaffrey 2003) and conclusions drawn from an aggregate of case studies from throughout the nation (Omi and Martinson 2002) to promote the contention, which is unsupported in the Sierra Nevada, that crown fuels must be removed to reduce the risk of catastrophic fire.

> B. The FSEIS recognizes that the removal of trees greater than 20 inches in diameter and the reduction of canopy cover to 40 percent are not necessary to reduce the losses from catastrophic fire.

The modeling framework in the FSEIS is built on the premise that all treatments, with the exception of light underburn and the removal of trees 6 inches or less, are "effective" in reducing the fuel load. (FSEIS, p. 405-406). As such, treatments that only remove material up to 20 inches in diameter and maintain canopy cover near 50 percent were determined by the Forest Service to be as effective in reducing wildfire as treatments that allow the removal of trees up to 30 inches in diameter with canopy reductions down to 40 percent. (FSEIS, pp. 406-410). Thus, the primary purpose of reducing canopy cover to 40 percent and removing trees over 20 inches in diameter cannot be to increase the effectiveness of the fuel treatment.

Other analyses completed by the Forest Service confirm this as well. The environmental assessment for the Borda Project (Tahoe National Forest 2003) compares the fire behavior of two alternatives proposed to treat mixed-conifer and eastside pine stands. The analysis concludes that there is essentially no increased benefit to fire resiliency from cutting trees over 20 inches in diameter or by reducing canopy closure to 40 percent. The results of the Middle Fork Cosumnes analysis completed by the Review Team also demonstrated that significant reductions in the severity of the effects of wildfire resulted from applying the Framework standards. Even though approximately 93 percent of this landscape was limited to treatments that removed trees 12 inches in diameter or less (USDA Forest Service 2003a, p. 26), lethal and mixed lethal fire in the analysis area was reduced by over 50 percent. (Ibid., p. 29). A second landscape analysis completed for the Middle Fork Cosumnes area found that treatments that complied with the Framework reduced fire size, reduced the number of acres severely burned, and reduced flame lengths when post-treatment fire was modeled in the analysis. (Eldorado National Forest 2002).

In sum, the Forest Service's own analyses recognize that effective fuel reduction is not dependent on the removal of material greater than 20 inches in diameter or a reduction in canopy cover below 50 percent.

C. Minor differences in acres severely burned among alternatives indicate that there is little benefit to the removal of trees greater than 20 inches in diameter.

As indicated elsewhere in this appeal, there are numerous reasons to question the veracity of the results of the forest modeling. However, based on the generic assumptions in the modeling, the FSEIS estimates that in the first decade an additional 2,500 acres will be severely burned in Alternative S1 compared to S2. (FSEIS, p. 218). To accomplish this additional reduction of about 2,500 acres in area severely burned, Alternative S2 "costs" significantly more in natural and economic resources compared to Alternative S1. For example, Alternative S2:

- Removes larger trees than Alternative S1. (FSEIS, p. 10).
- Allows canopy to be reduced to lower levels than Alternative S1.
- Results in adverse effects to imperiled species (as described in other sections of this appeal).
- Treats 188,091 more acres during the first decade than Alternative S1. (FSEIS, p. 225).
- Costs over $90 million dollars more to implement in the first decade compared to Alternative S1. (FSEIS, p. 225).

The minor reduction in area severely burned combined with the high financial and biological "costs" indicates that the "benefit" described for Alternative S2 by the Forest Service is dubious at best. The FSEIS fails to take a hard look at the actual performance of Alternative S2 (i.e. only 2,500 fewer acres severely burned) compared to the multiple costs of implementation.

D. The Forest Service does not need to remove trees greater than 20 inches in diameter and reduce canopy cover to 40 percent in order to meet the fuel management standard in the ROD.

The ROD (p. 50, Standard 5) directs the design of fuel reduction treatments in conifer forests to meet the following standards:

- an average 4-foot flame length under 90th percentile fire weather conditions.

- surface and ladder fuels removed as needed to meet design criteria of less than 20 percent mortality in dominant and co-dominant trees under 90th percentile weather and fire behavior conditions

- crowns thinned to meet design criteria of less than 20 percent probability of initiation of crown fire under 90th percentile weather conditions

Following a review of this standard, fire specialist Ms. Carol Rice concluded that the standards in the ROD "can be achieved through reduction of surface fuels, ladder fuels, and through thinning of trees that have a diameter less than 20 inches." (Rice 2004, p. 1). Allowing the removal of trees greater than 20 inches in diameter is not necessary to achieve the standards in the ROD. (Ibid.).

"Surface fuels determine the surface fire behavior, as modeled by the FBPS [Fire Behavior Prediction System]. Surface fuels are also crucial to determining whether the fire will transition into a crown fire. Alexander (1987) notes that the five factors involved in determining the conditions for the onset of crowning are: 1) Initial surface fire intensity; 2) Foliar moisture content; 3) Live crown base height; 4) Crown bulk density; and 5) Rate of fire spread. Alexander (1987) states: 'The first three quantities determine whether a surface fire will ignite the coniferous foliage. The last two quantities determine whether or not a continuous flame front can be sustained within the crown fuel layer.' While one cannot substantially increase foliar moisture on a large scale, there is no doubt that forest treatments can vastly reduce surface fire intensity and raise the height to live crown." (Ibid.). The reduction of surface fire intensity and raising the height to live crown are essential to reducing the likelihood that a crown fire can be initiated. (Gulden and Stine 2003, p. 8).

"In the analysis of the effects on fire behavior by various forest treatment types, the surface fire behavior is predicted first. The model compares the fire intensity or flame length with the height of live crown, and only when the threshold is reached will crowning be initiated." (Rice 2004, p. 1). Thus, the first consideration given to assessing the potential for a crown fire to initiate is whether or not the flames are sufficiently tall to reach the tree canopy. The following table compares the flame lengths and heights to live crowns that are associated with crown fire initiation. The length of flame necessary to initiate a crown fire, in a stand with a certain height to live crown, increases as the moisture in the tree crown increases.

Table 2. Flame lengths associated with critical levels of fireline intensity that are associated with initiating crown fire, using Byram's (1959) equation.

Foliar Moisture Content (%)	Height of Crown Base in meters and feet							
	2 meters 6 feet		6 meters 20 feet		12 meters 40 feet		20 meters 66 feet	
	m	ft	m	ft	m	ft	m	ft
70	1.1	4	2.3	8	3.7	12	5.3	17
80	1.2	4	2.5	8	4.0	13	5.7	19
90	1.3	4	2.7	9	4.3	14	6.1	20
100	1.3	4	2.8	9	4.6	15	6.5	21
120	1.5	5	3.2	10	5.1	17	7.3	24

In stands were the surface fuels have been treated to achieve a 4-foot flame length (as is required in the ROD), the density of the crown is only a concern when the height to the live crown is less than about 6 ft. (Ibid., p. 2). This remains true even if the moisture content of the foliage is very low. (Ibid.) These relationships demonstrate that harvest treatments that focus on increasing the height to live crown (i.e. removing the ladder fuels) combined with the reduction of surface fuels can prevent the initiation of crown fire.

The ROD also directs the removal of sufficient surface and ladder fuels "to meet design criteria of less than 20 percent mortality in dominant and co-dominant trees" under specific weather conditions. (ROD, p. 50). The First Order Fire Effects Model (FOFEM) can be used to predict the mortality of trees given a fire with a specific flamelength. (Rice 2004, p. 2). Mortality varies by tree species and is largely related to the thickness of the bark. The figures below show that the probability of mortality of both thin-barked species (such as white fir) and thick-barked species (such as Ponderosa pine) is well below 20 percent when the species is 20 inches in diameter or greater. (Ibid., p. 2-3). This relationship indicates that surface and ladder treatments that achieve the flamelength standard in the ROD (i.e. 4-foot flame length) will also result in meeting the standard that addresses minimizing mortality in the dominant and codominant trees. (Ibid., p. 2).

Figure 1. Graph of mortality of white fir by diameter class, assuming a 4-ft flame length. The curves are, from left to right, 8-in, 10-in, 20-in and 30-in diameters.

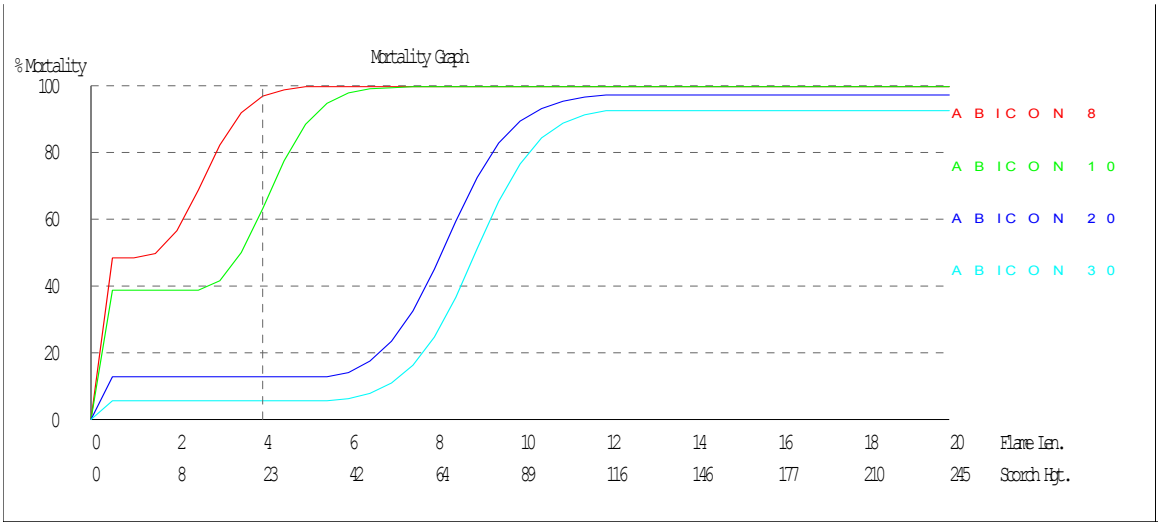
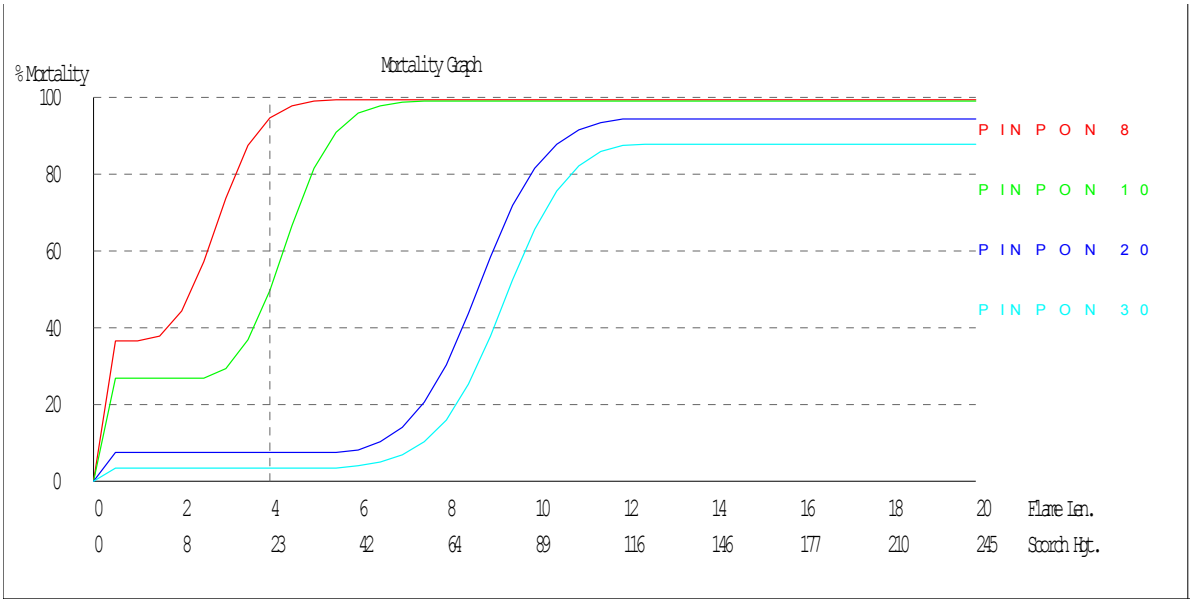


Figure 2. Graph of mortality of Ponderosa pine by diameter class, assuming a 4-ft flame length. Graph of mortality of white fir by diameter class, assuming a 4-ft flame length. The curves are, from left to right, 8-in, 10-in, 20-in and 30-in diameters



In sum, the fire effects modeling systems commonly used by fire specialists (including the Forest Service) clearly identify that an assessment of fire behavior and effects begins with an evaluation of surface fuels. Given that these surface fuels are present in sufficient quantities to allow fire to reach into the crowns of the trees, a crown fire could be initiated. Whether or not a crown fire is initiated, depends on a comparison of the flamelength and the height to live crown in the stand. Lastly, the mortality of trees affected by a 4-foot flame length is concentrated in trees with diameters well below 20 inches. Completing surface and ladder treatments that achieve a 4-foot flame length will also result in meeting the standard that addresses minimizing mortality in the dominant and codominant trees.

As noted in the Science Consistency Review, the most important components of the fuel profile to treat are the surface fuels followed by the ladder fuels. (Guldin and Stine 2003, p. 8). These conclusions are supported by fire behavior relationships described above and that are commonly accepted in the scientific community. These principles of fire behavior do not support the assertion canopy cover must be reduced to 40 percent or that trees 20 to 30 inches in diameter must be removed to achieve the objectives stated in Standard 5 of the ROD.

E. <u>There is No New Information Related to Fire and Fuel Management that Warrants a Wholesale Revision of the Framework.</u>

The FSEIS refers to the need to change the Framework ROD to ensure that treatments are effective and to comply with the National Fire Plan (NFP). (FSEIS, p. 4). The FSEIS cites the

Review Team recommendations as containing "aspects of the existing management direction that must be refined to achieve this goal." (FSEIS, p. 4). The Review Team raised several areas of concern. (USDA Forest Service 2003a, pp. 45-51). Below we identify the inconsistencies in the information presented and the lack of support in the project record for these conclusions made by the Review Team and summarized in the FSEIS. In all cases, the issues raised by the Review Team are not new or are not supported by their own analyses.

1. Contrary to the conclusions of the Review Team, the Framework complies with the National Fire Plan.

The National Fire Plan is a plan for action that outlines national priority setting, funding allocations and accomplishments, and accountability mechanisms all aimed at improving the fire resiliency of federal lands. (FSEIS, p. 125). With respect to the Framework, the Review Team recommendations state:

> The expected outcomes that are inconsistent with the NFP [National Fire Plan] are predicated on the limited use of mechanical treatments. (USDA Forest Service 2003a, p. 46).

Yet to the contrary, the appeals decision for the ROD concluded:

> After my review of the ROD, FEIS and the Administrative Record, I find that the standards and guidelines for fire and fuels treatment are consistent with the National Fire Plan and the Cohesive Strategy. The standards and guidelines offer managers broad discretion in implementation of fuels projects. They apply to the entire forest and allow managers to set priorities in each land allocation, be it mapped or unmapped. The scale and pace of fuel treatments comply with national direction. (USDA Forest Service 2001c, p. A-11).

As will be shown below, there is no support for the claim that the actual application of mechanical fuels treatments in the Framework is so limited as to preclude achievement of the goals in the National Fire Plan.

a. Reduction in acres burned by high severity fire

Reducing the number of acres burned by severe wildfire is one of the performance objectives in the NFP. The Review Team recommendations report:

> One of the measures of success (performance measure) in attaining this goal is the number of high severity acres burned by unplanned and unwanted wildland fires. The analysis of the Middle Fork Cosumnes landscape provides evidence that the current direction will perform poorly under this measure since successful performance is predicated on reducing the number of acres burned. (USDA Forest Service 2003a, p. 46)

However, evidence provided by the Forest Service in the Middle Fork Cosumnes (MFC) analysis indicates that Alternative S1 does result in fewer acres burned and therefore does not support their claim of inconsistency with the NFP.

The Middle Fork Cosumnes (MFC) analysis demonstrated that fewer acres would burn and the intensity of burning would be less when treatments followed the Framework ROD. (USDA Forest Service 2003a, p. 29). The mixed-lethal and lethal acres burned would be reduced by more than 50 percent and total acres burned would be reduced by about 30 percent. Further the distribution of acres burned by severity class would shift to more than 50 percent of the area burning in a non-lethal condition. This increase in non-lethal area burned is important since low severity fire reduces fuel loading in ways that are beneficial. This positive phenomenon was identified in the Framework FEIS: "many wildfires result in the kinds of fuels reductions that the prescribed treatments are trying to create." (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.1, p. 85). The MFC analysis demonstrated that a significant and positive shift in fire resiliency would occur under the Framework ROD.

The analysis in the FSEIS also demonstrates that Alternative S1 results in a decrease in total acres burned and in the acres severely burned by wildfire. (FSEIS, Volume 1, pp. 217-218). And given that there remain serious questions about whether the appropriate prescriptions were applied to stands with canopy cover between 50 and 60 percent during the modeling of S1, there would likely be additional reductions in the area affected by wildfire under Alternative S1. Even without additional reductions in size and severity of area burned, the results presented in the FSEIS support the goal in the NFP to reduce the number of acres burned by high severity fire.

In sum, the Forest Service does not provide any new information to support their finding that Alternative S1 is not consistent with the NFP. In the absence of new information, there is no basis for setting aside the findings in the appeal decision.

b. <u>The cost of treatments is high</u>.

Consideration of treatment costs is not new to the FSEIS. Treatment costs were fully considered in the FEIS and the Regional Forester concluded the following:

> I believe the cost of implementing this decision is realistic and reasonable. I also believe that successful implementation will require supplemental support through volunteers, matching funds, and other methods in order to complete the work. This is especially true for tasks that involve collection of monitoring and inventory information and other scientific studies. (USDA Forest Service 2001b, p. 30).

Further, the Appeals Decision affirmed this:

> After my review of the ROD, FEIS, and the Administrative Record, I find that there is the potential for existing wood product mills to reconfigure to handle small diameter material, for other new facilities to be built, and new technologies to be deployed to utilize biomass and small diameter forest products. Possible funding sources to manage

the fuels program envisioned by the Regional Forester are adequately discussed and costs displayed. (USDA Forest Service 2001b, p. A-32).

The ROD points to input from district rangers and the Review Team on the economic infeasibility of implementing the Framework ROD. (ROD, p. 8). However, the actual demonstration of this infeasibility is absent from the FSEIS. Responses from the District Rangers indicate that many had not implemented the Framework. Forest Supervisor Steve Eubanks, who was an integral part of the review process, stated "We looked at several areas and didn't spend time on planning because it wasn't worthwhile to implement it. We can't show you where it didn't work because we didn't go very far at planning these areas." (USDA Forest Service 2003b, p. 11). This was also confirmed in email exchanges between other members of the Review Team. (Yasuda 2003).

As was considered in the FEIS, the FSEIS considers the use of commercial forest products to off-set the cost of the fuel reduction treatments. The FSEIS concluded that "including only a few medium-sized trees can make an economic impact on the economic viability of a given project." (FSEIS, p. 50). Even if one accepts the notion that the sale of commercial products should pay for the treatments, the modifications proposed in Alternative S2 go far beyond including a "few medium-sized trees" and allow the logging of trees up to 30 inches in diameter with few or no limits.

The Review Team recommendations and FSEIS fail to provide any additional information on the cost of implementing the alternatives relative to the budget available to do so. Thus, there is no new information presented to evaluate whether or not "the cost of implementing the decision is realistic and reasonable."

c. Changing condition class

One of the objectives under the National Fire Plan is to move areas from high risk to low risk condition classes. The Review Team recommendations suggest that the ROD fails to achieve this, yet provides no objective analysis of this outcome. To demonstrate that the ROD will not reduce acres to lower condition classes, they point to the statement in the Framework ROD which identifies that under Alternative Modified 8 "homogenous vegetation structure [would increase] across the landscape over time." (USDA Forest Service 2001b, p. 24). The Review Team also points to the "belief" supplied by the District Rangers that the forests will be in an "unnaturally dense state." (USDA Forest Service 2003a, p. 47). How these "beliefs" are linked to assessment of condition class is not made clear.

In fact, the FSEIS retreats entirely from analyzing changes in condition class or the use of this metric in priority setting in the larger Sierra Nevada region. (FSEIS, p. 219). Instead, the Forest Service focuses on recommendations from Aplet and Wilmer (2003) to set community protection as a focus of fuel treatment. The FSEIS concludes that "both S1 and S2 intend to treat aggressively in the WUI" and that "both these strategies include locally determined condition class as a factor in deciding where to treat and to assist prioritization." (Ibid.). Thus, reduction

in condition class is no longer considered to be a metric that is relevant directly to the analysis in the FSEIS.

2. The Review Team alleges an unrealistic use of prescribed fire in the ROD

Prescribed fire is used as an initial and follow up treatment in both Alternative S1 and S2. (FSEIS, pp. 394-395). The Review Team concluded: "Using prescribed fire to the extent envisioned under the ROD, is not realistic given the regulations limiting smoke generation, existing vegetative condition, and the availability of fire fighter resources for burning during the declared fire season. (USDA Forest Service 2003a, p. 48). This concern is reiterated in the FSEIS (p. 29). However, in fact the ROD and FSEIS estimate that prescribed burning would occur on significantly more area under the new plan when compared to the Framework. The Framework envisioned the application of 25,252 acres of prescribed fire. (USDA Forest Service 2001a, Volume 1, Summary, p. 41). In the development of Alternatives S1 and S2 in the DSEIS, the Forest Service then increased the area allocated to prescribed fire in the DSEIS by approximately 30 to 40% in each alternative. Next, the FSEIS proposes applying prescribed fire to even more acres than proposed in the DSEIS. (FSEIS, p. 98). In the end, the FSEIS proposes treating a far greater number of acres than was considered in the Framework FEIS – an increase from 25,252 acres in the FEIS to 42,020 acres for Alternative S2 in the FSEIS. (FSEIS, p. 98). Despite the exhortations by the Review Team, the Review Team recommended and the ROD adopts an alternative that relies upon far more area treated with prescribed fire. (Ibid.). As in other cases, this appears to have been raised by the Review Team and the Regional Forester to make the case against the Framework ROD where none exists.

3. Salvage logging

The District Rangers requested additional direction on salvage logging because they "found the current direction made it difficult for local interdisciplinary teams to balance the amount of standing and down woody material left with long-term watershed health." (USDA Forest Service 2003a, p. 50). Ironically, the direction in the Framework ROD on salvage logging gives broad discretion to the ranger districts to complete projects. For non-Old Forest Emphasis Areas the Framework ROD states:

> Following stand-replacing events (as a result of wildland fire, insects, or diseases), do not conduct salvage harvest in at least 10 percent of the total area affected by the stand-replacing event. This unsalvaged acreage should be comprised of stands classified as California Wildlife Habitat Relationship (CWHR) size class 5 or 6 (average dbh of overstory trees (snags) greater than 24 inches). As needed, use stands classified as CWHR size class 4 (average dbh of overstory trees (snags) between 11 and 24 inches) to reach the 10-percent level. This standard and guideline does not apply to the defense zone of the urban wildland intermix zone. (USDA Forest Service 2001b, p. A-28).

For Old Forest Emphasis Areas:

> Retain all snags 15 inches or greater following stand-replacing events except to address imminent hazards to human safety. Following stand-replacing events, dead trees may be removed to the extent that project analysis recommends removal to benefit landscape conditions for old forest structure and function. Conduct the project analysis to determine varying snag retention levels, considering landscape position and site conditions (such as riparian areas and ridgetops), avoiding uniformity across large areas. (USDA Forest Service 2001b, p. A-42).

Much like the management style touted in Alternative S2, the direction on salvage in the Framework either gives few limitations for the general forest or directs that projects in Old Forest Emphasis Areas be designed to remove dead trees "to the extent that project analysis recommends removal to benefit landscape conditions for old forest structure and function." In spite of the requests from the ranger districts for increased flexibility in management, when actually faced with the difficult choices that come with managing to achieve objectives or desired conditions, they ask for more direction. Such a response only affirms the concern that the ranger districts are not capable of managing to achieve desired conditions or objectives.

4. Insects and disease

The Review Team recommendations identify the absence of direction on treating insect and drought conditions to be a serious omission in the Framework ROD. This point was addressed explicitly in the Appeal Decision:

> The purpose and need for the SNFPA to forest plans did not include the potential build up of insects and disease as part of the five problems to be analyzed. Adequate direction is contained within the existing land and resource management plans (forest plans) to detect and control insect and disease outbreaks. Analysis of the effects of implementing alternatives with regard to the potential buildup of insect and disease is outside the scope of the SNFPA FEIS and ROD. (USDA Forest Service 2001c, p. A-8).

Thus, the Forest Service is claiming the need for direction when the Chief indicated that current direction was sufficient to address the issue. Beyond that, the reviewing officer identified that addressing the issue, other than through existing direction, was outside the scope of the project. Given this conclusion, the addition of forest health to the issues considered in the FSEIS significantly changes the purpose and need for action, and thereby requires scoping and a more thorough analysis than was completed for the FSEIS.

E. Conclusion

The revisions to the Framework ROD allegedly were proposed in order to "allow more flexibility to strategically locate fuel treatments to and implement effective fuel treatments." (ROD, p. 8). Feedback from District Rangers and modeling efforts at a watershed scale were cited by the Forest Service as justifying the need for change. However, as admitted by the Forest Service, they never actually implemented the Framework ROD and watershed analysis actually demonstrated that the Framework ROD would reduce the number of acres burned and the

intensity of the area burned. Thus, the Forest Service has failed to demonstrate that the Framework cannot be implemented. Beyond that, claims that the treatments allowed in the Framework ROD would not be effective in substantially reducing the risk of stand destroying fire are not supported by current knowledge of fire behavior in the Sierra Nevada. Fire experts familiar with Sierra Nevada systems unequivocally state that treatment of the surface and ladder fuels is sufficient to reduce the fire risk. Lastly, fire experts and the fire literature demonstrate that the removal of trees that are 20 to 30 inches in diameter and reduction of canopy cover to 40 percent are not required to achieve the desired fire resiliency in Sierra Nevada forests.

V. THE FSEIS FAILS TO COMPLY WITH THE NATIONAL ENVIRONMENTAL POLICY ACT

A. The FSEIS Fails to Take A Hard Look at the Plan's Likely Impacts on Old Forest Associated Wildlife.

1. California Spotted Owl.

The analysis in the FSEIS underestimates and fails to disclose the plan's likely adverse impacts on the owl in several important respects.

a. Failure to analyze short-term impacts on owl habitat.

First, as a general matter, the FSEIS overlooks or understates the plan's likely impacts on the owl's habitat in the short term, i.e., within the next twenty years. NEPA requires that an EIS analyze "direct effects," which are "caused by the action and occur at the same time and place," as well as assessing indirect effects that occur in the future. (40 CFR 1508.8). As recognized by the Science Consistency Review:

> Short term effects of management activities are probably more relevant to owl population persistence than long-term projections in habitat change. The latter are more uncertain and will undoubtedly be subject to subsequent changes in management direction as well as unforeseen ecological circumstances. Changes in habitat condition due to directed forest stand management and subsequent fires over then next 10 to 20 years probably results in the most relevant forces affecting owl population persistence for this analysis. (Stine and Keane 2003, p. 4).

[25] Although the Regional Forester acknowledges that longer term modeling is not certain or reliable and states that he "did not rely on these longer term projections in my decision" (ROD, p. 12), much of the information in the FSEIS consists of the results of modeling projections. If these results are excluded from consideration, the remaining information and analysis is spotty at best.

This point was reiterated by the Washington Office Director of Watershed, Fish and Wildlife, who also found that the DSEIS failed adequately to consider short-term impacts:

> There are numerous examples in the SDEIS where effects to species from 'short-term risks' are not addressed. For example, the analysis of habitat structure for owls and other key species at the 20 year mark and then the 100 year plus mark is important, but it is also necessary to analyze the potential of species and populations to remain present or to be able to repopulate areas through periods of habitat disturbance. A primary component missing from the habitat evaluation is an evaluation of how the activities will potentially affect the retention of species while their habitat is being "improved." (Gladen 2003, p. 5, emphasis added).

The Director's review continues, with particular emphasis on the owl analysis:

> The entire effects analysis relies on untested model outputs that have no expression of associated error for both 20 year and 130 years outputs. Furthermore, no data are presented for any of the analyses. The entire analysis rests on what will grow and remain in 20 and 130 years (high uncertainty), not what structure is retained and left on the land after fuel treatments (low uncertainty). This should be made clear to the reader and decision maker, and the document should disclose this uncertainty. At the very least, the contrast of 'what is left on the land' after treatment under both S1 and S2 standards should be displayed and relate these conditions to owl suitability and productivity. (Gladen 2003, p. 10, emphasis added).

Virtually all of the analysis in the FSEIS reflects an outcome of habitat modeling, which fails adequately to address short-term impacts. As stated by the Washington Office review, "concluding that 'in the short-term, none of the vegetation models or fire projections show a significant difference in ecological outcomes' … is a reflection of the inadequacies of the effects analysis." (Gladen 2003, pp. 4-5).

For example, the model projects that both alternatives would result in "a general increase in large tree availability" and that any differences between the alternatives would be insignificant. (FSEIS, p. 276). However, as raised in the Washington Office review, given that the Framework would protect medium-large trees and the revised plan would allow these trees to be logged, "it is unclear how these alternatives could not differ greatly in the large tree component and how the number of large trees could increase in S2 when they will be subjected to commercial harvest, especially in the short term." (Gladen 2003, p. 12). In other words, this "direct effect" of the plan on an important element of owl habitat is essentially ignored in the FSEIS, contrary to NEPA's requirements.

Similarly, with respect to canopy closure, the FSEIS reports only very slight differences between the two alternatives "for the first three decades." (FSEIS, p. 275). The Science Consistency Review questioned this conclusion and asked that the analysis be "discussed, quantified, and linked to scientific sources." (Stine and Keane 2003, p. 7). Given that canopy cover of 50 percent or greater is recognized as an important element of owl nesting and foraging habitat

(FSEIS, p. 275), and that the new plan would allow canopy cover to be reduced to 40 percent or lower whereas the Framework established a standard of 50 percent, it is indisputable that logging under the new plan will have adverse impacts on owl habitat, as demonstrated above. Yet the FSEIS fails to disclose these direct impacts or to assess their implications for the distribution of owl habitat and owl viability.

Finally, with respect to snags and down wood, the FSEIS projects that the impacts of the alternatives will be essentially the same. (FSEIS, p. 277). This ignores the fact that the new plan provides the Forest Service with broad discretion to weaken the Framework's snag and down log retention standards at the local level, which is likely to result in removal of these habitat elements. Because, as described above, large snags and down logs are important aspects of owl habitat, removing these structures is likely to further degrade owl nesting and foraging habitat. Yet the FSEIS entirely fails to analyze these direct impacts.

b. Failure to analyze impacts at the home range and landscape scale.

It is well established that the California spotted owl utilizes and selects for habitat at a variety of spatial scales, including at the home range and landscape scales. As stated in the Framework FEIS: "Conservation measures must consider habitat distribution, abundance, and quality at the landscape, home range, and stand-level scales." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 82). Yet inexplicably, the FSEIS fails to consider the effect of eliminating spotted owl habitat, as allowed under Alternative S2, at either the home range or the landscape scale.

At the home-range scale, sufficient suitable foraging and nesting habitat must be available for individual owl pairs to survive and reproduce. Nevertheless, the FSEIS provides no estimates of the number of owl home ranges that will be affected by timber harvesting or how much habitat will be lost within individual home ranges (except in lands affected by the QLG project). The FSEIS does provide estimates of the number of PACs that will be affected, but home ranges are an order of magnitude larger than PACs and many more will likely be affected. Thus, it is not possible to assess the effect of the habitat reduction called for by the proposed action at the home-range scale. (Peery 2004, pp. 6-7).

The Science Consistency Review emphasized the importance of assessing impacts at the home range core area scale (Stine and Keane 2003, p. 4) and urged an improved analysis of these impacts in the FSEIS:

> The current draft summarizes acres by habitat class cumulatively across PACs and HRCAs. It would be informative to present existing habitat within PACs and HRCAs on an individual basis. This would allow assessment of amounts and distribution of important habitat classes…. This could then be compared with projected habitat conditions within PACs and HRCAs under S1 and S2. These data on changes in habitat composition within PACs and HRCAs, in conjunction with overall landscape changes, provides a more defensible and comprehensive base of information for assessing possible future outcomes. (Stine and Keane 2003, p. 6).

At the landscape scale, suitable habitat must be distributed across the Sierra Nevada in a manner that is consistent with spotted owl life history. The spatial distribution of owl home ranges was an important consideration in the development of both the conservation strategy for the northern Spotted Owl (Thomas et al. 1990) and the interim guidelines for the California Spotted Owl (Verner et al. 1992). Both plans considered it important that enough home ranges be located in close proximity so that dispersing juveniles had a high probability of locating vacant territories and recruiting into the population.

Nevertheless, the FSEIS does not assess the effect of Alternative S2 on spotted owls and their habitat within a spatial context. "For example, will the proposed action result in loss of occupied owl nest sites and an increase in nearest-neighbor distance? Will the degradation of owl habitat within areas of concern interfere with owl dispersal, potentially isolating subpopulations and reducing the owl's current distribution? Such landscape-scale questions need to be addressed if the effect of the proposed action on Spotted Owl viability is to be assessed in a rigorous manner." (Peery 2004, p. 7).

c. Critical conclusions in the DSEIS have been removed from the FSEIS without adequate basis.

The DSEIS, more forthrightly than the FSEIS, acknowledged that Alternative S2 would likely have significant, negative impacts on owl habitat. See, for example, DSEIS, p. 186 (Alternative S2 "could result in the removal of habitat attributes that provide quality nesting and foraging habitat"), p. 187 ("Alternative S2 would reduce the amount of multi-story canopy, stand complexity and canopy closure which could affect owl reproductive output"), p. 188 (Alternative S2 would result "in reduced owl densities and reduction in distribution of owls and owl habitat" in geographic areas of concern, as well as "increased fragmentation" in these areas). Overall, the DSEIS concludes (p. 193) that Alternative S2 is "likely to isolate subpopulations and limit the opportunity for interactions across NFS lands." All of these conclusions have either been weakened or eliminated entirely from the FSEIS, despite the fact that there is no new information or analysis to justify changing the conclusions in the DSEIS. This failure to reveal the plan's likely impacts in the FSEIS violates NEPA.

2. Pacific Fisher.

The FSEIS fails to take a hard look at the plan's likely adverse impacts on the fisher and its habitat as required by NEPA. As detailed below, the FSEIS makes unwarranted assumptions, sweeps important issues under the rug, and is not based upon the best available research. As a result, neither the public nor the Regional Forester was fully informed about the plan's likely environmental consequences.

Most fundamentally, the FSEIS fails to acknowledge that logging pursuant to the new plan's standards and guidelines will degrade fisher denning and resting habitat and to analyze the likely consequences of such degradation on the fisher. As stated in the review by the Forest Service's Washington Office, "there is no clear discussion [in the EIS] of … short-term effects to current

occupied habitat quality, nor to fisher viability within the SSFCA." (Gladen 2003, p. 11). Further, the review questioned the EIS's claim that the environmental impacts of the new plan would not differ significantly from those of the Framework and stated that "this conclusion is not consistent with the analysis provided." (Gladen 2003, p. 12).

As demonstrated above, the plan's standards and guidelines allow logging of medium-large trees, reduction in canopy cover to 40 percent, and removal of large snags and down logs, all of which are important elements of fisher rest sites and home ranges. The best available research indicates that "resting and denning sites may be the most limiting habitat element across the species' range" (Zielinski et al. in press B), and therefore that "habitats providing suitable resting structures need to be widely distributed throughout home ranges of fishers." (USDI Fish and Wildlife Service 2004, p. 18774). The FSEIS ignores all of this evidence and baldly states that "treatments would create habitat conditions that are within the range of habitats used by fisher and would not therefore involve an irreversible or irretrievable commitment of resources." (FSEIS, p. 246). This conclusion is unsupported by the record and effectively ignores the likelihood that the plan will have a significant negative impact on fisher habitat in the short term. (Barrett 2004a, pp. 8-10).

The FSEIS goes on to state that Alternatives S1 and S2 would have "nearly indistinguishable effects over the next 20 years" with respect to large trees. (FSEIS, p. 246). However, the FSEIS ignores the fact that the new plan will allow logging of significant numbers of medium-large trees (20-30" dbh), which research indicates are an important component of fisher rest sites and home ranges. (Zielinski et al. in press A; Zielinski et al. in press B). The impact on fisher resting and denning habitat of intensively thinning these medium-large trees is simply overlooked in the FSEIS. Beyond that, as noted previously, the prediction that the number of large trees will not differ between the two alternatives is questionable, given that such trees "will be subjected to commercial timber harvest, especially in the short term," under the new plan. (Gladen 2003, p. 12).

The analysis of canopy cover in the FSEIS is misleading and disingenuous. The fact that the new plan will allow high quality denning and resting habitat (with canopy cover of 60-70 percent or greater) to be degraded to low quality habitat that is at best suitable for foraging (canopy cover of 40 percent or less) is barely mentioned, much less analyzed. The FSEIS states that "effects on denning and resting habitat would vary by project" (FSEIS, p. 247) but makes no effort to assess the amount of denning and resting habitat that would be degraded or the potential impacts on fisher home ranges. Instead, the FSEIS indicates that "projected average canopy closure across the SSFCA indicates that no significant differences between Alternatives S1 and S2 would develop after 20 years." (FSEIS, p. 247). The basis for such "averages" is not disclosed; in any event, relying entirely on averages across a large area serves to obscure the likelihood of significant adverse effects in the thousands of acres that will be subject to logging. For example, the FSEIS discloses that 145,363 acres of forest that currently have canopy cover in excess of 50 percent are "projected for treatment" under the new plan. (FSEIS, p. 248, Table 4.3.2.1a). Yet the FSEIS fails to analyze the likely consequences to the fisher of degrading this amount of relatively high quality habitat.

With respect to snags and down logs, the FSEIS states that the impacts of the new plan will be "essentially the same" as under the Framework. (FSEIS, p. 248). However, this assertion ignores the fact that there are important differences between Alternatives S1 and S2 with respect to snags and down wood. As described above, the new plan makes the Framework's standards discretionary and allows them to be modified and weakened at the project level. (ROD, p. 51). Because snags and down wood have been identified as contributing to the risk of stand-replacing wildfire, there is a high likelihood that these structures will be targeted for removal during fuels treatments. The failure of the EIS to analyze "the loss of dead and down material … is a very significant omission." (Lewis 2003a, p. 2; see also Barrett 2004a, p. 9).

The FSEIS states that "Alternatives S1 and S2 include the same standards and guidelines to manage and evaluate fragmentation effects at both the project and landscape scale and therefore are projected to have similar outcomes for old forest conditions." (FSEIS, p. 249). This assertion simply ignores the fact that the new plan has eliminated the Framework's standards and guidelines for protecting old forest emphasis areas and small old growth stands. An important purpose of these Framework standards was to promote habitat connectivity and reduce habitat fragmentation, particularly for fisher (USDA Forest Service 2001c, p. D-10), and the effect of eliminating these standards will likely be to degrade habitat quality and reduce habitat connectivity. (Barrett 2004a, p. 9). Moreover, as described above, the Fish and Wildlife Service has concluded that the likely result of fully implementing the DFPZ program under the QLG pilot project will be to fragment habitat and limit fisher movement and dispersal, "thus precluding future recovery options." (USDI Fish and Wildlife Service 1999, pp. 11-12). The FSEIS fails to address either of these issues and therefore its consideration of habitat fragmentation and connectivity issues is incomplete and misleading.

As described below, the cumulative effects on the fisher of logging on private timberlands and within the Giant Sequoia National Monument are also ignored, despite the fact that we raised this issue in our comments on the DSEIS and that the cumulative impacts are likely to be significant.

Overall, the FSEIS utilizes modeling to project long-term improvements in habitat, in part through projected reductions in stand-replacing wildfires, while minimizing or ignoring adverse impacts to habitat from logging in the short term.[25] But as stated by the Fish and Wildlife Service: "Potential effects of fire are unpredictable…. However, the immediate effects of fuel treatments to reduce the risk of such fires could also effectively reduce the quality of habitat available for fishers, particularly for resting and denning." (USDI Fish and Wildlife Service 2001, p. 134). By failing to analyze these direct effects in detail, the Forest Service has failed to comply with NEPA.

The FSEIS concludes that Alternative S2 would improve the fisher's habitat, whereas the Framework "would maintain the status quo," and that implementing the new plan "would significantly improve population outcomes" for the fisher. (FSEIS, p. 253). These conclusions are simply wrong. As stated in the Washington Office review, the conclusion that Alternative S2 would not have significantly more impacts than the Framework "is not consistent with the analysis provided" in the EIS. (Gladen 2003, p. 12). In general, "the description of the environmental consequences is not consistent with the overall conclusions of effects that there is

little difference between S1 and S2, particularly for short term effects." (Ibid., p. 11). As acknowledged more forthrightly in the DSEIS (p. 175), "the direction in Alternative S2 does not provide the level of detail to support a high level of confidence that fisher will persist in the southern Sierra." The FSEIS fails to cite any new information or analysis that would change this conclusion.

In sum, it bears emphasis that the west coast population of the fisher warrants protection under the Endangered Species Act (USDI Fish and Wildlife Service 2004), that resting and denning sites "may be the most limiting habitat element" (Zielinski et al. in press B), and that loss of even a few individuals could accelerate the fisher's extirpation in the southern Sierra (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 9). By failing to analyze the impacts on the fisher of planned logging across the Sierra Nevada that will degrade fisher denning and resting habitat, the Forest Service has failed to comply with its minimum obligations under the National Environmental Policy Act.

3. American Marten.

The Forest Service is required by the National Environmental Policy Act and its own planning regulations to utilize the best available information and to disclose and analyze all significant environmental impacts in the FSEIS. In this case, as summarized below, the agency has fallen far short of complying with these duties in its assessment of the plan's likely impacts on the marten.

First, as described above, the FSEIS fails to disclose or analyze the apparent gap in the marten's distribution in the northern Sierra Nevada. Not only has the Forest Service failed to utilize the best available data as required by NEPA and the agency's planning regulations, but the FSEIS cites "insufficient survey effort" (FSEIS, p. 141) as a basis for claiming that there is no gap in the marten's distribution, which flies in the face of its legal duty to undertake "special inventories or studies" as part of the planning process. 36 CFR 219.12(d). As explained by Dr. Kucera, the marten's apparent absence from significant portions of the QLG pilot project area is "important information that must be disclosed and assessed in the EIS, because it renders the remaining marten population more vulnerable to isolation and extirpation and bears directly on the issue of the marten's distribution and viability in the northern Sierra Nevada." (Kucera 2003, p. 4; see Barrett 2004a, p. 11).

Second, the FSEIS fails to analyze forest openings and their likely impact on the marten. As described earlier, a number of independent studies have confirmed that the marten is highly vulnerable to forest openings and fragmentation, generally tolerating a landscape with no more than 20-25 percent forest openings. (Chapin et al. 1998; Hargis et al. 1999; Thompson and Harestad 1994; USDI Fish and Wildlife Service 1999). Furthermore, the Forest Service has previously acknowledged that, in the QLG area, the red fir and eastside pine forest types are already characterized by an abundance of forest openings, due to logging and natural factors. (USDA Forest Service 1999a, p. 129; USDA Forest Service 1999b, p. 3-58). Therefore, there is a significant risk that the proposal to fully implement the QLG project, which will create tens of thousands of acres of group selection openings and will greatly reduce canopy closure in eastside

forests, will exceed the marten's threshold for forest openings, leading to isolation and local extirpation of the population. (Kucera 2004, p. 3; Barrett 1999). Yet this issue is not even mentioned, much less analyzed, in the FSEIS. This failure to consider a significant environmental impact violates NEPA and the agency's duty to use the best available data in planning. (Kucera 2004, p. 6; Barrett 2004a, p. 11).

Third, the FSEIS's discussion of the impacts on the marten of fully implementing the QLG project is inadequate. In particular, the FSEIS fails adequately to acknowledge the potential for adverse impacts to the marten in eastside forests. For example, the FSEIS fails to analyze the impacts on marten habitat of removing trees up to 30" dbh, leaving only 30 percent basal area on site, and reducing canopy cover to low levels. As Dr. Kucera concludes, "the efforts in the FSEIS (pp. 258-59) to downplay the adverse impacts of the QLG project on the marten are unpersuasive and unfounded." (Kucera 2004, p. 6).

Finally, like the analysis with respect to the owl and fisher, the FSEIS fails to take a hard look at the plan's impacts on the key structural attributes of marten habitat. For example, the FSEIS asserts that Alternatives S1 and S2 "would result in similar amounts of large and very large trees" (FSEIS, p. 254), but the impacts of removing medium-large trees (20-30" dbh) are not mentioned. With respect to large trees in eastside pine forests, the FSEIS acknowledges that "Alternative S2 may result in a greater risk to large tree retention" (FSEIS, p. 254), but the EIS fails to analyze how many acres of marten habitat may be degraded by removal of such trees or what the potential impacts on the marten's population and distribution may be.[26]

Similarly, with respect to canopy cover, snags, and large woody debris, the FSEIS asserts that there will be little difference between the alternatives. (FSEIS, pp. 254-55). As described above in the NEPA section on owl and fisher, these generalized assertions serve to sweep under the rug the likelihood of significant adverse impacts on the marten and its habitat.

The FSEIS concludes by conceding that "Alternative S2 would involve more intensive treatments at local scales compared to Alternative S1, which may lead to a greater risk to important marten habitat components, including canopy closure, large tree density, snag and down log recruitment, and multi-storied structural diversity." (FSEIS, p. 260). However, not only is this admission inconsistent with the Forest Service's insistence elsewhere in the FSEIS that there are essentially no differences between the alternatives with respect to large trees, canopy cover, and snags and down wood, but the FSEIS utterly fails to analyze the amount of marten habitat that may be degraded or how such degradation and fragmentation may affect the marten's distribution and viability. Given that there is apparently a gap in the marten's distribution in the northern Sierra, where intensive logging will occur pursuant to the QLG plan,

[26] The FSEIS declares that the increase in diameter limit in eastside pine from 24" in the Framework to 30" in the new plan "will likely be offset by the requirement to retain 30% of the existing basal area in the largest trees available." (FSEIS, p. 254). However, this claim is entirely unsubstantiated. For example, the FSEIS fails to present any analysis of the effect of applying the 30 percent basal area retention standard in typical eastside pine stands. Without such analysis, there is no way of knowing to what extent, if any, the standard will "offset" the new plan's increased diameter limit. The Forest Service's claim that the new plan's elimination of canopy cover in eastside pine forests "may be offset" by the basal area retention standard is similarly unsupported.

and that the plan will remove key elements of marten habitat, it is reasonable to expect impacts on the marten's distribution and viability. But these issues are essentially ignored in the FSEIS, contrary to NEPA.

B. The FSEIS Fails to Take a Hard Look at the Plan's Impacts on Imperiled Species Associated with Riparian and Meadow Habitats.

1. Willow Flycatcher.

The majority of the discussion in the environmental consequences section for willow flycatcher focuses on simply describing the alternatives and not disclosing and comparing effects the alternatives are likely to have on this species and its habitat. Beyond this, the portrayal of Alternative S1 is not accurate and leads a failure to adequately disclose and compare the differences among the alternatives.

a. The FSEIS fails to disclose the effects of the alternatives on willow flycatcher.

In many cases, the FSEIS fails to examine fundamental differences between the two alternatives. Among the most egregious omissions is the failure to examine how the basic restrictions on grazing practices differ between the alternatives. These differences between the alternatives are significant. As can be seen from the table below (Table 3), Alternative S1 restricts the interaction between grazing and willow flycatcher nesting to a far greater extent than Alternative S2.

Table 3. Comparison of some of the management practices for willow flycatcher. (Taken from USDA Forest Service 2001b, pp. A-61 to A-62 and FSEIS, pp. 56-58).

Management Area	Alternative S1	Alternative S2
Grazing in presently occupied sites	Prohibited for the season	Allowed after August 15
Grazing in historically occupied sites	Allowed after August 30	Allowed all season
Definition of nesting period	Ends August 30	Ends August 15
Surveys	Required by a time certain or grazing limited to late season	No deadline for completion
Modification of standards	Allowed under adaptive management with research group	Allowed in a site specific management plan designed by district

Despite these obvious differences, the analysis fails to compare a number of significant aspects of these alternatives including:

- The effects of a season long prohibition on grazing (Alternative S1) versus the allowance of late season grazing (Alternative S2) in sites that are currently occupied by willow flycatcher;

- Relative differences in the effect of grazing (season long versus late-season) in historically (but not presently) occupied willow flycatcher sites;

- Differences between adaptive management in cooperation with research versus a site-specific management plan created by the district.

Specific concerns were raised about each of these factors by the California Department of Fish and Game and other experts. Dr. Susan Sanders identified that "Allowing grazing in occupied meadows, including late season grazing, has significant potential to harm nesting willow flycatchers." (Sanders 2004, p. 3). The direct impacts of nest disturbance and substantial, negative impact of grazing on flycatcher habitat is well documented in the conservation assessment (Green et al. 2003) recently commissioned by the Forest Service. The specific effects of late season grazing were identified by Dr. Susan Sanders:

> Grazing early or late increases willow browsing, retarding regeneration and recruitment of young shrubs as well as negatively affecting the form and structure of mature willows. (Sanders 2003, p. 3).

The California Department of Fish and Game also identified that cattle grazing in meadows which supported breeding and nesting will impede recovery of this species:

> Allowing grazing, including late season grazing, in occupied meadows is incompatible with stabilization of existing numbers and eventual recovery of the willow flycatcher population and meadow restoration. The substantial, negative impact of grazing on flycatcher habitat is well documented in the Conservation Assessment, as is the role cattle play in attracting cowbirds to breeding locations. (California Department of Fish and Game 2003, p. 2).

Concern about grazing in occupied meadows was also raised in the Science Consistency Review. In reference to willow flycatcher and Yosemite toad, Dr. Peter Brussard noted:

> Allowing grazing and most recreational activities to continue in areas occupied or historically occupied by any of these species is almost certainly incompatible with population recovery and meadow restoration. (Guldin et al. 2003, p. A-4).
>
> The precautionary principle should prevail. Grazing can always be reinstated, but extinction is permanent. (Guldin and Stine 2003, p. 12).

As indicated above, allowing season long grazing at all in meadows that currently support nesting is a problem. Given that, the situation is only exacerbated by the ROD's adoption of a date – August 15 – on which grazing in occupied habitat can begin that overlaps with known

dates of willow flycatcher nesting. "Allowing late season grazing endangers approximately 10 percent of willow flycatcher nests that on average fledge after August 15th." (Sanders 2004, p. 3).

In addressing the potential loss in the success of 10 percent of the nests, the FSEIS attempts to minimize the importance of those fledging later by stating that "there is some speculation that late fledging individuals (after July 15) may have a lower survival rate than early-fledging individuals." (FSEIS, p. 148). However, "If survivorship is indeed lower for individuals fledging after July 15th, that provides all the more reason to manage any factor, including grazing, to enhance the survivorship of these young birds. Also, this section glosses over the fact that weather, predation, and brood parasitism can result in multiple re-nesting attempts, resulting in much later nesting and fledging." (Sanders 2004, p. 11). With respect to the management activities proposed in Alternative S2 (and adopted in the new plan), Dr. Sanders concluded, "Given the precariously small number of willow flycatchers in the Sierra Nevada, even the loss of a few breeding territories could lead to loss of viability for populations in the planning area and a trend toward federal listing." (Sander 2003, p. 3)

The FSEIS also fails to evaluate the important differences between the implementation of an adaptive management plan in coordination with research (Alternative S1) and a locally developed, site-specific management plan (Alternative S2). "[L]ocal decision-making provides flexibility for grazing management decisions, but this flexibility comes at the expense of an informed, comprehensive effort to apply consistent standards to that decision-making…The FSEIS and ROD provide no mechanism for a coordinated assessment of how individual, local management plans are affecting willow flycatchers in the Sierra Nevada region." (Sanders 2004, p. 3). Difficulties with local management plans were also identified during the Science Consistency Review:

> While I am generally supportive of giving local managers latitude in carrying out fuels treatments, I am afraid that flexibility in local resource management has a high probability of leading to further decline of many of these species. Almost all sensitive species issues need to be addressed on a regional scale, and species management must be coordinated across ranger districts and national forest boundaries. Managing small and declining populations is challenging, and to do so successfully under local control requires that each district ranger and his/her staff be completely informed about recent research on every species of concern in the district. (Dr. Peter Brussard in Guldin et al. 2003, p. A-3).

Further, monitoring or the mechanism that triggers a reconsideration of the activities allowed in the strategy given undesirable monitoring results is not defined or identified as a requirement of the "strategy" offered in the ROD. (FSEIS, p. 58). Each of these elements is, however, included in the formulation of an adaptive management plan that is allowed in the Framework ROD "to test new and innovative management techniques as a part of formal research projects." (USDA Forest Service 2001b, p. 15). As a result of adopting management strategies that are not coordinated regionally with a monitoring program that is uncertain, the risk to this species increases significantly.

These known and likely impacts on willow flycatcher were raised by experts in comments on the DSEIS, yet the Forest Service failed to address them in the FSEIS. In the absence of disclosing these effects, the environmental analysis in the FSEIS cannot support the new plan adopted in the ROD.

b. The portrayal of Alternative S1 is not accurate and logical comparisons are not made among the alternatives.

The FSEIS also mischaracterized the nature of Alternative S1 and in turn failed to consider the differences between the alternatives. The FSEIS claims that there are no differences between the alternatives with respect to brown-headed cowbird management. (FSEIS, p. 290). This is inaccurate. The Framework ROD (Alternative S1) includes direction on the consideration of the impacts of cowbirds associated with concentrated stock areas within 5 miles of occupied willow flycatcher habitat. (USDA Forest Service 2001a, Volume 4, Appendix D1, p. 28). As noted previously in this appeal, "precluding new concentrated stock areas within 5 miles of willow flycatcher habitat) is a highly feasible and immediate way to improve nest success." (Sanders 2004, p. 9).

The FSEIS also makes comparisons among alternatives that are not logical or supported by the available information. For instance, the FSEIS discusses at some length the nature of nesting that occurs late in the season and how this might apply to the grazing allowed in occupied sites under Alternative S2. (FSEIS, p. 289). The analysis concludes that "Standards and guidelines for management of willow utilization, and direction to remove livestock once they switch to browsing on willows, should also minimize this risk and result in little difference between alternatives." (Ibid.). This statement suggests that the effects of grazing in "occupied" habitats will be similar in both alternatives. However, the analysis fails to make the distinction that occupied habitats will not be grazed at all in Alternative S1. There is no rational explanation offered to support the conclusion that the absence of season long grazing is the same as late season grazing. In fact, comments raised by the California Department of Fish and Game (2003, pp. 2-3) and the Science Consistency Review (Guldin et al. 2003, p. A-4; Guldin and Stine 2003, p. 12) clearly indicate the contrary.

In comparison of the survey completion requirements for the two alternatives, the FSEIS makes assumptions about project level planning that are not supported by experience. The FSEIS assumes that by conducting surveys of emphasis habitat as a part of project planning it would only apply to "emphasis habitat in inactive allotments or outside of allotments." (FSEIS, p. 290). This conclusion is based on the assumption that project planning (i.e. NEPA analysis) actually occurs on grazing allotments. However, there is strong evidence to suggest that project planning is not occurring in any regular fashion on the national forests in the Sierra Nevada. As of 2001, project planning and NEPA analyses were out of date on 391 of the 499 active allotments in the Sierra Nevada. (CalTrout and California Native Plant Society 2001, p. 12). Since that time, no significant progress has been made to complete NEPA analyses on the national forests. (Emily Roberson, pers. com.). Although there is a Congressional mandate to bring all the grazing allotments into compliance with NEPA, the grazing budget in Region 5 for this and next year

show no reasonable progress in meeting that deadline. Because of the lack of regularity of project level planning on grazing allotments, any dependence on project level planning triggering an action is likely to result in no action (i.e. surveying of emphasis habitat) taking place. This obvious limitation to Alternative S2 was overlooked in the FSEIS.

c. Conclusion

The Forest Service and other experts all agree that the willow flycatcher population in the Sierra Nevada is declining. Further, the FSEIS admits that "habitat and population conditions currently restrict the potential distribution of this species." (FSEIS, p. 292). The numbers of this species have reached such low numbers that experts have concluded that removal of cattle from occupied sites is necessary to prevent extirpation. The Science Consistency Review and the California Department of Fish and Game all identified inadequacies in Alternative S2 as presented in the DSEIS that threaten the persistence of this species. These identified inadequacies have not been remedied in the new plan nor has an explanation for leaving them unchanged been disclosed. As such, the Forest Service has failed to meet its obligations under the National Environmental Policy Act.

2. Yosemite Toad

a. The FEIS fails to disclose the effects of the alternatives on Yosemite toad.

In several important areas, the effects of the ROD on Yosemite toad were not adequately disclosed in the FSEIS. First, the effect that the grazing of pack and livestock has on Yosemite toad was determined by the FSEIS to be unknown. (FSEIS, p. 302). However, there were analyses that could have been completed to better estimate the magnitude of suitable habitat affected by such grazing. For instance, pack and saddle stock gathering locations are known or can be estimated from existing permits. Suitable habitat has been identified for Yosemite toad.[27] The intersection of these two land areas can suggest the extent to which pack and saddle stock grazing areas overlap with suitable habitat for Yosemite toad. If such analysis produces a high overlap between these land areas, then a much greater degree of risk is associated with deferring surveys and management action until project review. Thus, information was available to assess the effects of not restricting the grazing of pack and saddle stock on Yosemite toad, yet it was not disclosed.

Second, the FSEIS fails to analyze the differences in the alternatives with respect to the application of pesticides. Alternative S1 directs that the application of pesticides be avoided within 500 feet of an occupied site of Yosemite toad unless the pesticides are needed to restore or enhance habitat. (USDA Forest Service 2001b, p. A-54). In contrast, the ROD directs that

[27] The FSEIS (p. 161) also indicates that there is knowledge of where pack stock are grazed: "Many of the areas of suitable habitat used by recreational pack stock occur in remote high country areas. Surveys of some of these areas have been completed; however, surveys will likely not be completed until at least 2006 for all these areas."

pesticide applications be designed to "avoid adverse effects to individuals and their habitats." Obviously, since the Forest Service proposed different wording for this standard they must interpret some difference in application. The effects related to Alternative S1 were disclosed in the FEIS which concluded:

> While this approach addresses local applications, it does not address possible drift or downstream movements of these chemicals. It thus provides some improvement over existing direction, but probably does not go far enough to eliminate this risk. (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 219).

Even though there was a change in the standard, the FSEIS failed to compare the difference between the two alternatives.

Third, the FSEIS does not address the differences between adaptive management in cooperation with research versus a site-specific management plan created by ranger districts. As noted in the Science Consistency Review, locally developed and implemented management plans present specific challenges and risks. (See for example Guldin et al. 2003, p. A-3). These constraints of implementing a locally developed plan must be evaluated in order to make a fair comparison among the alternatives.

b. <u>The FSEIS is not consistent with other findings made by the Forest Service</u>.

The FSEIS presents conclusions in the cumulative effects analysis that are inconsistent with those presented in the FEIS, yet no explanation is offered about why the new findings are justified. In particular, the FSEIS concludes for both alternatives that "suitable habitats for Yosemite toads would be either broadly distributed or highly abundant across the historical range of the species on national forests." (FSEIS, p. 304). In contrast, the FEIS primarily found that for Modified Alternative 8 (or the Framework ROD): "Suitable environments are frequently distributed as patches or they exist at low abundance or both." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 221).

The FSEIS appears to claim that Yosemite toads are "broadly distributed or highly abundant" whereas the FEIS identifies that suitable habitats are patchy or in low abundance. There is no new information to justify the statements in the FSEIS. Accordingly, the FSEIS underestimates the new plan's likely adverse impacts on Yosemite toad, contrary to NEPA.

C. The FSEIS Fails to Consider a Reasonable Range of Alternatives

The requirement to address a full range of alternatives is at "the heart of the environmental impact statement." 40 CFR 1502.14. The Forest Service is required to "rigorously explore and objectively evaluate all reasonable alternatives." 40 CFR 1502.14(a). As such, the agency must "devote substantial treatment to each alternative … so that reviewers may evaluate their comparative merits." 40 CFR 1502.14(b). Moreover, "the degree of analysis devoted to each alternative in the EIS is to be substantially similar to that devoted to the 'proposed action.'" (Council on Environmental Quality 1981, Question 5(b)). In short, all reasonable alternatives must receive "comparable treatment" in the EIS. (Ibid.). The purpose of these requirements is to "provid[e] a clear basis for choice among options for the decisionmaker and the public." 40 CFR 1502.14.

The FSEIS fails to evaluate a full range of alternatives, and those alternatives that are described do not receive comparable treatment. Only two alternatives, S1 and S2, receive detailed consideration in the FSEIS. A third option, Alternative S3, received cursory treatment in the DSEIS but was dropped entirely from the FSEIS. As stated by the Forest Service's Director of Wildlife: "Although Alternative S3 is identified in Chapter 2 [of the DSEIS] as one of the alternatives analyzed in detail, the analysis of this alternative in Chapter 4 is contained within a single paragraph on page 240. From a NEPA perspective, the deciding official would appear to have insufficient information to make an informed selection based on the differences between alternatives." (Gladen 2003, p. 13, emphasis added).

1. The Alternatives in the Framework FEIS Cannot Be Directly Compared to the Two Alternatives Addressed in the FSEIS.

The DSEIS and FSEIS purported to incorporate the full suite of alternatives considered in the Framework FEIS. However, these Framework alternatives are infrequently discussed in the environmental consequences section, are omitted from important tables and figures, and are clearly not given equal consideration in the SEIS.

As described in the comments submitted by the U.S. Environmental Protection Agency (2003b), the State of California Attorney General (Lockyer 2003), and the Sierra Nevada Forest Protection Campaign (2003), the Framework alternatives were not assessed using the same analytic and modeling tools applied to Alternative S1 and S2, because there are significant changes in analysis and modeling between the Framework FEIS and the FSEIS. For example, the FSEIS utilizes new vegetation data for some forests, different mapping of the wildland-urban interface, different assumptions about placement of fuels treatments, and changed assumptions about the effectiveness of fuels treatments. These analytical differences are summarized in the table below (Table 4).

Table 4. Differences in the analytical approaches between the FEIS and FSEIS. Information on approaches extracted from the FSEIS (pp. 392-393, 405-406).

Issue	Approach in FEIS	Approach in FSEIS	Possible Result of Change
Vegetation Data	Inventories current as of 2000	New inventories for the Eldorado, Plumas and Tahoe national forests	Changes in results of habitat and timber volume outputs
Adjustments to goshawk, owl, great gray owl PACs and owl home range cores	Delineations current as of 2000	Shifts in locations of the zones	Magnitude of change unknown
Updated wildland urban interface area	Delineations current as of 2000	Shifts in location of zone; area covered about the same	Potential to include more PACs or OFEAs; effect of doing so not disclosed
Location of SPLATS	Located on upper 2/3 of south facing slopes	More evenly distributed across the landscape	Moves effects down slope and closer to stream channels; moves effects to denser forests on north facing slopes; may affect habitat in closed canopied forests more frequently
Modification of fire effects coefficients	All treatments except underburn treatment considered effective	All treatments except underburn and those that treat only material 6 inches dbh and under considered effective	A significant amount of the planning area for some alternatives does not receive "effective" treatments in the FSEIS analysis.
Changes in prescriptions	Forest health treatments not modeled	Includes a prescription that schedules forest health treatments	Lack of definition in ROD precludes estimating the effect this will have

These differences in analysis and assumptions affect the environmental consequences in two ways. First, they affect the results of the modeling. The following serves as an example. The FSEIS assumes that logging only trees 6" dbh and under will not effectively modify fuel treatment (FSEIS, p. 401), whereas the FEIS assumes that such logging will be effective (USDA Forest Service 2001a, Volume 4, Appendix B, pp. 44 and 63). The FSEIS assumes that there are many acres within Alternative S1 to which this limitation applies. (FSEIS, p. 401). However, this new interpretation of treatment effectiveness has not been applied to Alternatives F2-F8 and would produce different modeled results for these alternatives. Thus, the modeled results between the FEIS and FSEIS are not comparable because the interpretation of what was an "effective treatment" to reduce fire hazard changed significantly between the Framework FEIS and the FSEIS.

Second, the differences affect the evaluation of effects because the spatial location changed for some of the mapped resources and land allocations. As an example, the area fuel treatments (SPLATS) in the FEIS were to be placed on the upper two-thirds of south facing slopes (FSEIS, 392) whereas the FSEIS allocates these areas more evenly across the landscape. This change in spatial location will likely result in area treatments being located down slope and closer to stream courses. Similarly, shifting the placement of area treatments to include north facing slopes is

likely to increase habitat disturbance for species that inhabit the generally cooler, denser forests in these areas. Only by comparing the differing locations of the treatments in one comprehensive analysis can it be determined if there is a notable difference due to this change in spatial location of area treatments among alternatives.

The FSEIS alternatives were never reconsidered utilizing these new analytic and modeling approaches. Therefore, the FEIS alternatives cannot be directly compared to Alternatives S1 and S2, demonstrating that the FEIS alternatives did not receive "comparable treatment" as required by NEPA. For these reasons, the U.S. EPA concluded in its comments on the DSEIS that "these procedural problems hinder the document's ability to support a decision under NEPA" and recommended that "the FSEIS should include a comparative analysis of all the alternatives, with each alternative analyzed at the same level of detail." (U.S. Environmental Protection Agency 2003b, p. 5).

The alternatives included in the Framework FEIS and those addressed in the FSEIS are also not comparable because the Forest Service significantly changed its methodology for analyzing wildlife viability, which is a critical issue in both EISs. The Framework FEIS utilized a specific methodology which resulted in a ranking of all alternatives with respect to projected outcomes with respect to habitat and population of key species, together with a detailed rationale for such rankings. (See, for example, USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, pp. 16-18 (Pacific fisher), 104-11 (California spotted owl)). By contrast, the FSEIS fails to utilize this approach, instead using a more descriptive assessment that did not result in comparable ratings with respect to habitat and population outcomes. Therefore, in this important respect, the alternatives in the Framework FEIS and those in the FSEIS cannot be directly compared.

2. The FSEIS Fails to Analyze A Reasonable Range of Alternatives, Including Alternatives that Address the New Purpose and Need.

Beyond adequate consideration of the alternatives from the Framework FEIS, the Forest Service is legally required to develop new alternatives for the SEIS because the SEIS is based on a different purpose and need and includes additional management objectives not addressed in the Framework FEIS. As stated in the ROD, the Framework's "basic strategy is broadened to include other management objectives such as reducing stand density for forest health, restoring and maintaining ecosystem structure and composition, and restoring ecosystems after severe wildfires and other large catastrophic disturbance events."[29] (ROD, p. 4). For example, the FSEIS (pp. 112-24, 199-207) includes a detailed discussion of forest health issues, such as insects and disease, and the ROD includes new authority to log for the purpose of "controlling stand densities" (ROD, p. 51), despite the fact that the Chief found in ruling on the Framework appeals that this issue was "outside the scope" of the Framework decision. (USDA Forest Service 2001c, pp. A-8-9, D-5-6).

[29] The Forest Service's intention to broaden the Framework's management objectives was established even before release of the DSEIS as part of the internal management review process. (USDA Forest Service 2003a, pp. 91-93, 106, 160; see discussion in Sierra Nevada Forest Protection Campaign 2003, pp. 91-92). Therefore, there is no reason that a full range of alternatives addressing these new objectives was not considered in the DSEIS, much less in the FSEIS.

The range of alternatives that must be discussed in an EIS is "dictated by the nature and scope of the proposed action." Idaho Conservation League v. Mumma, 956 F.2d 1508, 1520 (9th Cir. 1992). Given that the scope of the SEIS is considerably broader than the scope of the Framework, it is incumbent upon the Forest Service to develop a full range of alternatives that address the new purpose and need. The alternatives described in the Framework FEIS do not address the new and broader objectives established in the SEIS, and therefore do not suffice to meet NEPA's purpose of presenting a full range of choices for consideration by the decision maker and the public.

A number of reasonable alternatives have been suggested by sister agencies and members of the public, but have not been considered in the FSEIS. For example, the Environmental Protection Agency suggested that the SEIS include additional alternatives, including one that applies Alternative S2's standards and guidelines throughout the planning area (including the QLG pilot project), and "at least one alternative that incorporates a lower diameter limit (e.g. 20" or 24" dbh) outside of defense zones." (U.S. Environmental Protection Agency 2003a). The owl scientists proposed an "adaptive management" alternative that would apply new standards and guidelines to a limited area utilizing a research approach (USDA Forest Service 2003b), but this alternative is also not assessed in the FSEIS. The California Resources Agency urged consideration of an alternative that would change particular standards and guidelines, rather than overhauling the entire plan, as well as alternatives focused on adaptive management and alternative funding mechanisms. (California Resources Agency 2003, pp. 15-20). The State of California's Attorney General's Office also suggested a number of alternatives in their comments on the proposal. (Lockyer 2003). Even assuming the need for additional flexibility in the Framework's standards and guidelines, the FSEIS fails to consider intermediate approaches between Alternatives S1 and S2 that would allow larger trees to be removed in certain circumstances without making wholesale and major changes in the logging diameter limits.

Not only did the Forest Service fail to include additional alternatives in the FSEIS as requested by sister agencies and the public, but the agency dropped from consideration one alternative (S3) that was mentioned in the DSEIS. The Fish and Wildlife Service stated that "it does not appear that Alternative S3 is given fair treatment in the comparison of alternatives" in the DSEIS and recommended that the Forest Service "conduct a more explicit and thoughtful analysis of S3." (USDI Fish and Wildlife Service 2003c, pp. 8-9). Similarly, EPA's comments mentioned the inadequate treatment of Alternative S3 and recommended that "the FSEIS should include a comparative analysis of all the alternatives, with each alternative analyzed at the same level of detail." (US Environmental Protection Agency 2003, p. 5).

In effect, the FSEIS only gives serious consideration to two alternatives, the proposed action (Alternative S2) and no action (Alternative S1). This clearly does not represent a reasonable range of alternatives and fails to comply with NEPA's mandate that "all reasonable alternatives" be rigorously explored and evaluated.

D. The FSEIS Fails Adequately to Consider Cumulative Impacts.

NEPA requires that an EIS consider the environmental impacts of federal agency actions, including the cumulative impacts of all federal and non-federal activities. The CEQ regulations define "cumulative impact" as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." (40 CFR 1508.7).

The Forest Service's Director of Watershed, Fish and Wildlife was highly critical of the treatment of cumulative effects in the DSEIS, and his comments remain applicable to the FSEIS:

> The cumulative effects analysis in this document needs to be improved…. The combination of the effects of WUI, splats, and other treatments on Federal and non-Federal lands needs to be analyzed in a cumulative effects analysis…. It is not enough to merely say there will be no cumulative effects or that the effects will be within the range discussed in the Framework. This document needs to discuss the effects of the activities on the environment. This would include effects on the riparian and stream environment, fisheries, listed species, water quality and quantity, sediment, and habitat fragmentation.[30] (Gladen 2003, p. 7).

As described below, the consideration of cumulative impacts in the FSEIS is legally inadequate, particularly with respect to the effects of private land management and the Giant Sequoia National Monument management plan.

1. Logging on Private Lands.

Approximately 36 percent of the land within the planning area is privately owned. (USDA Forest Service 2001a, Volume 2, Chapter 3, part 1.3, p.14), and approximately 17 percent of the owl PACs are on private lands (ROD, p. 7). In certain areas, such as the checkerboard lands on the Eldorado and Tahoe National Forests, private timberlands are intensively intermingled with national forest lands. As the Fish and Wildlife Service has found, "the analysis of connectivity of old forests in the Sierra Nevada noted that 'checkerboard' land ownership patterns in the central Sierra Nevada (where there is considerable intermingling of private land with National Forest System land), coupled with assumptions about reasonably foreseeable timber harvesting on private lands, make the retention of connectivity 'problematic' in these areas." (USDI Fish and Wildlife Service 2003b, p. 41172). Particularly within such areas, any analysis of the impacts of Forest Service activities that excludes the contribution of private timberland management will necessarily be incomplete.

[30] His comments go on to criticize the DSEIS for deferring "most of the analysis requirements down to the project level … which will have the effect of confounding cumulative effects analyses. This should be a significant concern for the Forests of the Sierra Nevada. The original [Framework] document emphasized being able to conduct analyses across boundaries and the importance of addressing cumulative effects. This is a major change that is not explicitly shown in the DSEIS." (Gladen 2003, pp. 7-8).

The California Spotted Owl Federal Advisory Committee, in reviewing the RDEIS, found that consideration of intermingled ownerships was inadequate. "Conditions and activities on non-Forest Service lands within and adjacent to the national forests were not considered in analysis of species viability, cumulative effects on watershed values, and in the evaluation of proposed roads. Without consideration of such effects it is difficult to assess the quality of owl habitat within the national forests or the effect of the proposed activity on watershed or aquatic health." (Philpot et al. 1997, p. 3-4). The Committee found that, where information about private land management was not available, "at the very least, assumptions about non-public lands must be explicit in order to complete adequate cumulative effects analysis in the EIS." (Ibid.).

The Forest Service's internal review of the Framework DEIS also emphasized the need to consider cumulative effects, particularly the effects of private land management, in assessing species viability:

> Consider cumulative effects, combining conditions on Forest Service lands with conditions on non-Forest Service lands and other "off-site" stressors outside control of the Forest Service. Where little information is available on other lands, be clear about the assumptions being made concerning those lands, and how that assumption affects the projection of likelihood of maintaining populations on Forest Service lands. Such analysis is necessary NEPA disclosure of cumulative effects. It also is important to determining how, under different alternatives, National Forest System lands might serve as "anchors" or "strongholds," providing for certain species in ways that might maintain more management flexibility on non-federal lands. (Iverson 1999b, emphasis added).

Dr. Noon, in his review, criticized the FSEIS for failing "to fully acknowledge changes to the forested landscape that are occurring on private lands." (Noon 2004, p. 2). As stated by Dr. Noon, who was a member of the 1999 Committee of Scientists reporting to the Secretary of Agriculture on such issues, "accelerated rates of timber harvest on private lands, often by use of clear cutting, increase the need for federal public lands to compensate for lost ecological goods and services." (Ibid., pp. 2-3).

The FSEIS considered the possibility that private timberlands might positively contribute to owl habitat, but determined that such an assumption was untenable: "Since the long-term distribution and suitability of habitat on private timberlands is unknown, the presence of this privately held habitat was not assumed to mitigate effects of vegetation management on National Forest System lands." (FSEIS, p. 147). However, the FSEIS entirely failed to consider the extent to which planned and projected logging on private timberlands is likely to degrade habitat and affect species. Thus, the FSEIS failed to analyze "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions" on private timberlands, as required by NEPA. (40 CFR 1508.7).

Without a doubt, the current and proposed practices on private lands are relevant to an assessment of the cumulative impacts on California spotted owl and its habitat. There are about 3.0 million acres of private forest land in the Sierra Nevada. (Britting 2002, p. 12). Of these, about 1.8 million acres are industrial forest lands. (Britting 2002, p. 12). In the central Sierra

Nevada, the trend in harvest prescription has shifted from uneven-aged management (e.g., selection harvest) to even-aged management (e.g., clear cutting).[31] (Britting 2002, p. 8). Stand rotations are generally at about 80 year intervals (see for example Sierra Pacific Industries 1999), which is very unlikely to support nesting or roosting habitat for the California spotted owl or high quality habitat for the fisher.

> This means that over time the intention is to have no trees in the treated landscape that are greater than 80 years in age. North et al. (2000, Table 3) found that mean nest tree age in mixed conifers was greater than 229 years for CSO within the demographic study on the Sierra National Forest and Sequoia-Kings Canyon National Park. Similarly, Blakesley (2003) found that in the Lassen demographic study area, trees greater than 36" DBH were used 75 percent of the time. In this same study, 29 nest trees 30" DBH and greater were cored and tree age estimated. Three hundred-ten years was the average estimated age for the sample. Given these estimates, the large, old trees utilized as nest trees are not likely to be available in even-aged forests with rotations of 80 years or less. (Britting 2002, p. 10).

Thus, management prescriptions used on private timber lands have the potential to degrade suitable owl and fisher habitat in the short and long term.

A recent review of clear cutting practices on private lands in the central Sierra Nevada examined the intensity of clear cutting during the period 1990 to 2002. For several small watersheds in El Dorado and Calaveras counties during this period, as much as 26 percent of the private land in a given watershed was proposed for clear cutting. (Britting 2003, p. 6). In one watershed, when the harvest data was extended to include plans from about 1987 to 2002, approximately 36 percent of the private lands in a particular watershed had been cut or were proposed to be harvested using clear cutting. (Britting 2003, p. 10). At these rates of harvest, the rotation ages for the private lands would be less than 50 years. As a result, large, old trees for nesting (North et al. 2000, Blakelsey 2003) and mature forest suitable for roosting and foraging (USDI Fish and Wildlife Service 2003a, p. 7589; USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 73) are unlikely to be present in these landscapes.

Even if such rates are not sustained over time, this intensity of clear cutting over a short period of time can result in a landscape in which the amount of habitat is insufficient to sustain nesting owls. For example, Britting (2003) reviewed the database of owl sightings on SPI lands (Sierra Pacific Industries 2002) and a recent timber harvest plan submission. The Buckshot THP (4-00-82/ELD-44) was submitted in 2000 and includes 533 acres of clear cutting in the Gaddis Creek sub-basin in El Dorado County. This THP identifies the presence of two owl territories in the Gaddis Creek sub-basin. The THP reports that since 1996, CSO has not been sighted in this area. The SPI data base on owl sightings identifies three territories in the sub-basin. As clear

[31] Even under harvest prescriptions where forest structure is retained, the minimum levels of retention required by state law are far below those recommended for nesting, roosting or foraging habitat for the California spotted owl. (Britting 2002, p. 9).

cutting harvest increased in this sub-basin and the surrounding area, owl activity that had been noted previously in these territories was absent.

With respect to the fisher, "an estimated 25 percent of the historical range of the fisher in the Sierra Nevada is on non-federal land, and approximately 60 percent of the private land is managed as industrial forest" where logging is more intensive and old forest conditions are predicted to decrease. (USDI Fish and Wildlife Service 2003b, p. 41171). According to fisher experts, "continued logging on private lands represents a serious threat to the persistence of the fisher in the Pacific states and in combination with continued loss of habitat on federal lands, necessitates listing of the fisher as an endangered species." (Buskirk et al. 2003). "Thus, logging on private timberlands is likely to have a significant adverse effect on habitat fragmentation and connectivity, and these impacts need to be considered in the FSEIS to provide a complete picture of how the plan will impact the fisher." (Barrett 2004a, p. 10).

The FSEIS entirely fails to analyze the cumulative impacts of implementing the revised plan on national forest lands together with planned and reasonably foreseeable logging on private lands. With respect to the fisher, an adequate assessment of cumulative impacts should include an estimate of the number of acres of suitable habitat that will be degraded, impacts on habitat fragmentation and connectivity, the number of individual fishers likely to be adversely affected, and the overall effects to the viability of the fisher population. (Barrett 2004a, p. 10). A similar analysis should be undertaken with respect to the owl and other species and habitats of concern.

In our comments on the DSEIS, we challenged the Forest Service's failure adequately to consider the cumulative effects of logging on private lands. (Sierra Nevada Forest Protection Campaign et al. 2003, pp. 15-18, 23, 32-33, 98-99). In response, the Forest Service states that "cumulative effects related to private lands are discussed in the [Framework] FEIS" and that such effects "do not vary by alternative, have not changed since the FEIS was completed, and are not sensitive to changes being proposed in this SEIS." (FSEIS, Vol. 2, pp. 82-83). However, given that Alternative S2 was not considered in the Framework FEIS, the cumulative impacts of implementing Alternative S2 together with planned and proposed logging on private lands could not possibly have been considered in the earlier EIS. In other words, the Framework FEIS could not, and did not, examine issues such as the cumulative amount of owl and fisher habitat likely to be degraded, the cumulative number of owl and fisher home ranges likely to be effected by logging, and the cumulative impacts on owl and fisher viability of implementing both the revised plan and private land logging.

In sum, the failure of the FSEIS to address the cumulative environmental impacts of logging on private lands represents a clear violation of NEPA.

2. Giant Sequoia National Monument Plan.

The Giant Sequoia National Monument (GSNM) covers 327,760 acres, or approximately 24 percent of the fisher's currently occupied habitat. Before the revised plan was signed, the Forest Service released its final management plan for the GSNM. As described in detail in our administrative appeal of the GSNM plan and the supporting reviews by owl and fisher experts,

the GSNM plan is likely to have significant adverse impacts on both the fisher and the owl by removing medium-large trees, reducing canopy cover, simplifying forest canopy, and removing large snags and down wood.[32] (Sierra Nevada Forest Protection Campaign et al. 2004; Barrett 2004b). However, despite the likelihood of such impacts, the FSEIS entirely fails to consider the cumulative acreage that may be affected by implementing both plans, the cumulative number of owl or fisher home ranges that may be degraded, the cumulative effects on fisher or owl viability, or any other cumulative impacts of implementing both plans.

The FSEIS includes a general description of a draft of the Giant Sequoia National Monument plan, which only briefly addresses the plan's projected positive impacts. (FSEIS, pp. 252-53). The FSEIS entirely fails to acknowledge that implementing the GSNM plan could have significant negative environmental consequences, and does not address "the impact on the environment which results from the incremental impact of" implementing the revised plan "when added to" the impacts of implementing the GSNM plan, as required by law. 40 CFR 1508.7. Dr. Reginald Barrett, one of the leading fisher researchers in California, has concluded that the Giant Sequoia National Monument plan would threaten the fisher's viability by reducing, degrading, and fragmenting suitable habitat. (Barrett 2004b). "At a minimum it is essential that the Forest Service consider the combined impacts of the GSNM plan and the Sierra Nevada Framework revisions in one document." (Barrett 2004a, p. 9; see Barrett 2004b, p. 6).

E. <u>The FSEIS Relies on Uncertain Data and Questionable Assumptions In Its Modeling Analysis and Fails to Disclose the Limitations of Doing So.</u>

The modeling of forest growth and wildfire provides the foundation for the analysis contained in the FSEIS. In fundamental ways, the assumptions made and the parameters used in the models affect the estimated outcomes in the short and long term. The FSEIS attempts to provide a context for interpreting the results stating that the modeling was intended "to provide indication of direction of change, estimates of magnitude of change, and time frames surrounding such change" as opposed to providing precise information. (FSEIS, Appendix B, p. 391). The ROD goes on to state:

> Longer term forecasts (e.g. 120-years) have greater uncertainty and reliability. The longer term modeling is useful to identify general trends, and not quantifiable targets. Hence, I did not rely upon these longer term projections in my decision. (ROD, p. 12).

Even if the ROD does not rely upon long term projections to support the decision,[33] it still utilizes forest modeling to estimate short term effects. These efforts suffer from the same challenges inherent to any model – short term, long term or otherwise. The uncertainty about the modeling is compounded by two factors: 1) the information and assumptions in the modeling process, and 2) the lack of ability to accurately predict future conditions. Because of these

[32] We hereby incorporate the GSNM appeal and its attachments into the present administrative appeal record.
[33] The Forest Service, in a brochure developed to explain why it was important to adopt the 2004 ROD, relied heavily on the utilization of long term modeling projections and historic trends to promote the decision. This action calls into question the claim made in the 2004 ROD that long term modeling was not used to support the decision. Additional discussion on this point will be addressed later in this section.

limitations, the ability of the forest growth model to estimate the likely "future consequences" of management actions, even in a short time frame, is very low.

As will be shown below, fundamental assumptions made in the analysis lead to increased uncertainty about the results. These uncertainties affect our ability to make even relative comparisons among alternatives. In many cases the assumptions for which there is the greatest uncertainty are directly related to the projection of the effects of wildfire. Since the major premise of the FSEIS is the need to revise the Framework ROD because it was not effective in reducing the risk of catastrophic fire, it is crucial that the limitations of the forest modeling be disclosed to allow a fair comparison among alternatives.

1. The FSEIS Failed to Analyze Uncertainty Associated with the Forest Modeling.

The FSEIS relies heavily on modeling to assess the relative effects of the alternatives on changes in habitat quality, value of timber produced, effectiveness of fuels treatments and more. The results of the analysis are used to evaluate differences among the alternatives and ultimately to balance benefits of any alternative against the risks. The models used in the FSEIS contain a large number of parameters, some of which were not estimated from empirical data. (FSEIS, p. 391). Moreover, some of the modeled processes, such as wildfires, are inherently complex and stochastic, making them difficult to predict. It is well established that environmental stochasticity and relatively small levels of bias and sampling error in parameters can dramatically affect predictions from models (Saether and Engen 2002), particularly when long-term forecasting is conducted (Brook et al. 2000). "Consequently, it is likely that model predictions in the DSEIS, such as the acreage of spotted owl habitat affected by wildfires, are characterized by high levels of uncertainty, especially when vegetation conditions are forecasted 130 years into the future." (Peery 2003, p. 6).

NEPA requires that the Forest Service disclose and analyze uncertainty in predicting environmental impacts in an EIS. Yet the FSEIS does not explicitly take into account and discuss uncertainty in model predictions. For example, the FSEIS fails to provide a range of model outcomes, such as minimum and maximum values that take into account modeling uncertainty. The Response to Comments on the DSEIS claims that "the DSEIS use[s] the best available science to inform decision makers and the public." (FSEIS, Volume 2, p. 8). "However, no modeling exercise can be considered a 'best effort,' or even an adequate effort, if uncertainties in model predictions are not quantified and evaluated." (Peery 2003, p. 6).

Concerns also were raised about modeling during the Science Consistency Review. Forest Service scientists noted that:

> Modeling appears to be a major tool used to evaluate effects. In addition to quantifying the error around outputs derived from modeling, be sure to explain the assumptions and limitations imbedded in these modeling efforts. … We need to understand the parameters that govern these models in order to evaluate the consequences inferred from the results. This refers to modeling used for both habitat and fire. Results for increases or decreases

> in both habitat and fire over time are apparently based on deterministic projections of a single set of parameter values, yielding a single estimate of future outcomes. However, all input parameters are characterized by various degrees of variation or uncertainty. (Stine and Keane 2003, p. 5).

Although the response that the FSEIS provides to the general notion of the quality of the data and modeling process claims that "Comments from the reviews subsequent to issuance of the Draft SEIS have been incorporated into the Final SEIS" (FSEIS, Volume 2, p. 8), the actual incorporation of their concerns and solutions did not occur. Instead, the FSEIS deflects the issues raised by the reviewers with the following responses:

> The parameters and sensitivity of models used in analysis for the FSEIS is discussed in Appendix B-3. Risk, uncertainty and ambiguity is also analyzed and disclosed. (FSEIS, Appendix E, p. 447)

> It was identified within the FSEIS that the modeling is only an estimate, and that it should be considered as such. Uncertainty around these estimates has been addressed within the document. (Ibid., p. 452).

In reality, there were no changes made between draft and final SEIS in the modeling appendix in response to the reviewers concerns. And, in those few cases were sensitivity analysis was completed, the results have not been disclosed. (FSEIS, Appendix B, p. 391; USDA Forest Service 2001a, Appendix B, p. 30).

Instead of providing the information on error and sensitivity analysis requested by experts and the public, the FSEIS states that "detailed characterizations of uncertainty are likely to be difficult to understand and present, and consequently may not be useful to the public or to decision makers." (FSEIS, p. 39). Blakesley and Noon (2003, p. 3) "take strong exception" to this statement:

> On the contrary, explicit characterization of all sources of uncertainty is important to science and essential to responsible decision making. Failing to make the public aware of the uncertainty that accompanies the outcome of forest management is professionally dishonest.

Similarly, the owl scientists "have complained repeatedly (and been totally ignored repeatedly) that the models used to project vegetation changes and the amounts of suitable owl habitat over time have failed to reveal the magnitude of variation around the values displayed." (Verner 2003b, p. 6). More recently Dr. Verner again expressed his concerns in a letter to the Regional Forester:

> You have continued to rely on results of the models used to project vegetation changes over time throughout the national forests of the Sierra Nevada. These are deterministic models that display only one outcome. That in itself makes irrefutable the case for their lack of scientific credibility. They are not buttressed by any scientific foundation, they

> do not display multiple outcomes based on estimates of parameter variability, and they have not been subject to peer reviews or endorsements by qualified modelers. The models are based on numerous assumptions about many factors that would affect vegetation changes (e.g., fire frequency and intensity, the assumed effects of the Finney models, effectiveness of vegetation treatments on fire, etc.) *Nowhere in the FSEIS or the ROD has any scientific foundation been presented to support the numerous assumptions in the vegetation models.* Nor have any scientific underpinnings ever been brought fourth in meetings between Regional planning teams and owl scientists over the years. This in spite of the fact that these concerns have been raised by our group of owl scientists at least as far back as 1994! So what, in fact, is the real place of science in this planning effort?
>
> You offer a weak justification of the vegetation models in the third complete paragraph on page 12 of the ROD: "Another area of uncertainty that surfaced in the science consistency report and in other public comments relates to the long-term projections for vegetation conditions and events like wildfire. The forecast period of the first 20 years, used during the analysis is a fair projection of these conditions and events and are used to identify near term effects." If the model's assumptions are flawed (and they are almost certainly flawed, as no model is perfect), how flawed are they? No one can tell us. Are they sufficiently flawed to have major effects on projected outcomes even out to 10 or 20 years? No one knows, and neither the FSEIS nor the ROD makes any effort to address this question. Your reliance on the model's projections, even out to 20 years, is completely without scientific foundation, so it is my opinion that you have violated your commitment to insist "that this amendment be scientifically credible." This is the more serious given the fact that accurate projections of vegetation change are at the heart of all the planning and analysis done for the FSEIS.
>
> The FSEIS attempts to dismiss the issue of error analysis by suggesting that it will be too complicated for people to understand. As has been demonstrated repeatedly in comments from experts and interested publics, there is a high level of interest in reviewing such information and the technical and intellectual capacity to do so. (Verner 2004, pp. 4-5).

Similarly, upon review of the FSIES and ROD, Drs. Blakesley and Noon conclude:

> …statistical error estimates are still not presented in the FSEIS for fire or forest management projections or estimates. This omission leaves the public unable to rigorously evaluate decisions made by the Forest Service to choose one forest management strategy over another or to determine whether purported increasing trends over recent time in fire effects are valid. (Blakesley and Noon 2004, p. 3).

As intimated by Dr. Verner (2004, p.4) and Dr. Noon (2004, p. 1), the issue of characterizing modeling uncertainty is not a new one. In addition to concerns raised by owl scientists as early as 1994, the failure to address modeling uncertainty was identified as a problem by the California Spotted Owl Federal Advisory Committee in 1997. In language fully applicable to the FSEIS,

the Committee criticized the Forest Service's use of "point estimates" and its failure to conduct sensitivity analyses that reveal the range of potential modeling outcomes:

> The Committee therefore believes the agency should consider testing the sensitivity of its estimates to the fire assumptions and report those sensitivity analyses. Further sensitivity analysis is probably necessary for other variables that we have not identified. Neither the public nor decisionmakers can use the RDEIS until such an analysis has been completed, because the proposed RDEIS is based upon a particular set of modeling assumptions. (Philpot et al. 1997, p. 3-12, emphasis added).

The FSEIS itself identifies that "scientific uncertainty is often expressed as a calculated or estimated confidence interval around a predicted value or outcome." (FSEIS, pp. 38-39). However, as pointed out in a review of the DSEIS completed by staff specialists at the Washington Office of the Forest Service:

> The DSEIS does not follow this premise because it fails to provide any estimate of variability or confidence around any model outputs reported in the Environmental Consequences. The Modeling section does not address confidence intervals around any modeled estimates. This is a significant omission because the numerous variables in each model (each with an associated error), the number of different embedded models and the artifact of compounding errors. The DSEIS presents model outputs in all Environmental consequences as absolute values. This is clearly not the case and presents misleading information to the public without assigning any confidence (statistical error) to these numbers. (Gladen 2003, p. 5).

We also requested the completion of a sensitivity analysis for key parameters in our comments on the DSEIS. (Sierra Nevada Forest Protection Campaign et al. 2003). The response to this comment stated that "The Final SEIS includes an appendix that more fully discloses potential errors in the modeling projections and the associated range of outcomes for a given alternative." (FSEIS, Volume 2, p. 85). However, the discussion on error and variability in the appendix on modeling is no different than that which was presented in the DSEIS. Additional information has not been provided.

Numerous experts external and internal to the Forest Service have raised questions about the estimation of error and uncertainty in the modeling, yet the FSEIS ignores these requests and continues to rely on unqualified modeling results. The FSEIS asks us to accept that uncertainty exists in the estimates from the forest model and then, without revealing the magnitude of that variation, asks us to compare the relative differences in these estimates between alternatives. There may be no relative differences between the alternatives if in fact the variability or error in the point estimates causes them to be indistinguishable. Thus, the failure of the FSEIS to describe the uncertainty surrounding the modeling estimates prevents a fair comparison among the alternatives and violates the full disclosure requirements of NEPA.

2. There is no evidence to support using the rate of acres burned in the past to predict acres burned in the future.

Wildfire acres burned in the future under each alternative can be compared to two values presented in the FSEIS. One is the average number of acres burned annually for the period 1910 to 1980 (FSEIS, p. 216) and the other is a projection into the future of the rate that acres burned during the period 1970 to 2003. (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.5, p. 279-280; FSEIS, p. 217). The FSEIS fits a trend line to the fire data then applies this trend to estimate the future acres to be burned by wildfire. This latter estimate of future area burned is used to drive the forest modeling that supports the analysis of effects.

a. The FSEIS Relies on Wildfire Data that Fails to show a Statistically Significant Trend.

The area burned each year by wildfire from 1970 to 2003 is displayed in the FSEIS. (FSEIS, p. 129, Figure 3.1.3a). Although the FSEIS applies a trend line to this data set, it fails to use even the simplest of statistics to describe how well the trend line actually "fits" the data. We completed a statistical evaluation of this line and found that for this data set, "year" is a very poor predictor of how many acres are burned and that the reputed "increase" in acres burned over time reflected by the trend line in the FSEIS is not statistically significant. (Britting 2004). Thus, the increasing trend relied upon in the modeling is not significantly different than zero or a flat line. Unfortunately, the analysis in the FSEIS uses this rate of increasing area burned to drive how much area is burned in the future. (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.5, p. 280). Based on the finding that an increasing rate is not statistically significant, the Forest Service at a minimum should have run the model assuming a constant amount of acres burned from year to year as a basis for comparison.

Generally speaking, "parameters which cause a significant change in a model's behavior should be estimated well." (Johnson 2001, p. 111). Because our ability to estimate the area burned from year to year is highly unreliable, it is important that it be disclosed how sensitive the forest model is to changes in the area burned each year. The modeling description in the Framework FEIS identifies that the "fire probabilities based on a constant amount vs. a trend based on running 10 year Fire probability rates based on the last 80+ years were analyzed vs (sic) those based on the last 25-years. The IDT selected the last 25 years since these most closely reflects (sic) the present and projected conditions as related to fuels and fire suppression ability." (USDA Forest Service 2001a, Appendix B, p. 30). Thus, the analysis examined two aspects of estimating the probability of fire: 1) a constant versus increasing trend in area burned, and 2) setting the rate of area burned based on the last 80 or 25 years of fire history. Although the IDT identified a reason why they chose to accept a specific characterization of fire probability that is limited to the last 25 years, they failed to disclose the results of the sensitivity analysis. Beyond that, they failed to even address why the selection of a constant amount of acres burned each year was not appropriate and how the forest model might respond given different constant values for area burned in the future. These disclosures are essential to understanding the nature of the modeling used in the FSEIS. Given a constant rate of area burned, there may be little to no difference in the outputs modeled for each alternative.

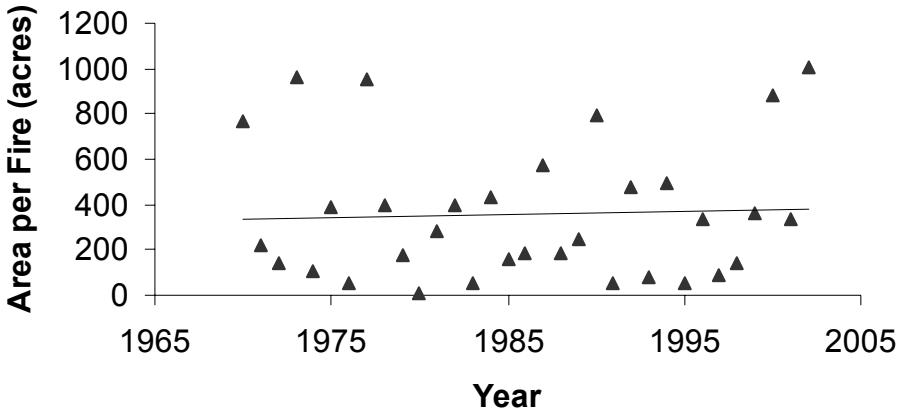
b. The FSEIS's support for an increase in area burned in the future is not supported by evidence and is unconvincing.

The FSEIS acknowledges that "significant uncertainty surrounds projections of future wildfire acreages and percentages burned at high severity." (FSEIS, p. 216). The FSEIS then goes on to cite assertions by Bonnickson (2003) and Beighley et al. (2003) who claim the existence of "unnaturally hot wildfires" (Bonnickson 2003) and that "observations over the past decade indicate an increasing frequency of large and intense fires" that supports the belief of scientists that "we have very likely crossed a threshold of conditions throughout the West that results in increasingly severe wildfire behavior." (Beighley et al. 2003). Neither of the documents cited offer data or studies specific to the Sierra Nevada to support these views. In fact, there is data presented by the Forest Service and elsewhere that supports a conflicting view.

One of the primary conclusions of the Sierra Nevada Ecosystem Project (SNEP), a comprehensive study commissioned by Congress in 1992 and completed in 1996, was that "the commonly expected consequences of decades of fire suppression – that large, infrequent fires are becoming larger and small, infrequent fires smaller – is generally not confirmed by the records for the twentieth century Sierran forests." (Centers for Water and Wildland Resources 1996, Summary, p. 4).

Further, detailed analysis in the SNEP report identifies that "the fire acreage was quite variable from year to year and showed no time trend in yearly area burned." (McKelvey and Busse 1996, p. 1120). An analysis of the historic fire data used in the FSEIS and data supporting the public relations materials developed by the Forest Service (USDA Forest Service 2004a) supports these conclusions as well. As shown below (Figure 3), the average number of acres burned per fire between 1970 and 2003 is highly variable from year to year. A statistical analysis of this data supports this conclusion of year to year variability and indicates that fire size is independent of the year of burning. (Britting 2004).

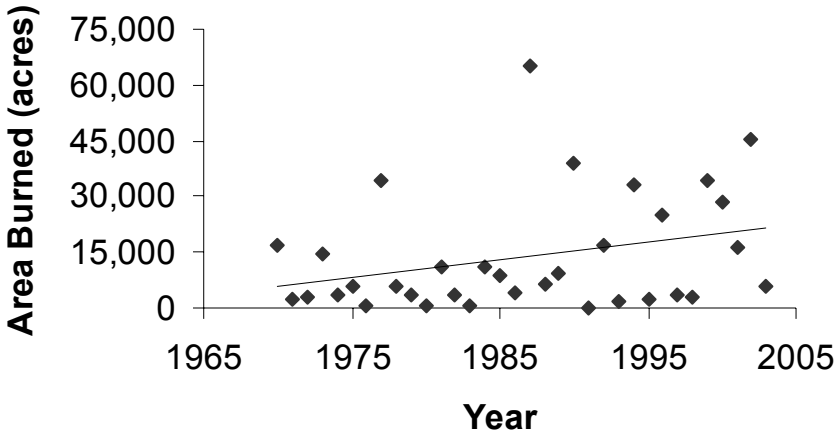
Figure 3. Average area burned per fire by year on national forests in the Sierra Nevada.



These data do not support the conclusion that fire size is increasing for the Sierra Nevada during this period and challenges in part the conclusions forwarded by Beighley et al. (2003).

With respect to an increase in acres severely burned over time, data from the Forest Service does not support this claim either. The Forest Service presented past and future trends in the area severely burned by fire in a publicly distributed brochure. (USDA Forest Service 2004b). We obtained the data underlying this characterization in order to examine the relationship between area severely burned by wildfire and time. Again, we found that for the period 1970 to 2003 (Figure 4) there was no statistically significant increase in the area severely burned during the period 1970 to 2003. (Britting 2004).

Figure 4. Total area severely burned each year on national forests in the Sierra Nevada.



Again, these data do not support the conclusion that the area severely burned by fire is increasing for the Sierra Nevada during this period and challenges the conclusions reached by Bonnickson (2003) and Beighley et al. (2003). In sum, the claims about increased fire size and increased severity of fire in the last decade made by Beighley et al. (2003) and cited elsewhere in discussion in the FSEIS are not supported by information generated by the Forest Service that is specific to the Sierra Nevada region.

Dr. Barry Noon also challenges the veracity of the fire data and concludes that the information presented had not been critically reviewed:

> Management directions in the ROD are justified in the FSEIS with reference to data that are assumed to clearly show "increases in catastrophic fires over time", and projections that old growth and spotted owl habitat is expected to increased significantly by 2080. As part of a lengthy discussion during one of your meetings with the spotted owl scientists we could not have been more clear in stating that both of these analyses were highly suspect, were characterized by great uncertainty, and had not been critically evaluated by the scientific community. As such, they should not form the basis of

extensive changes in management practices as proposed in the ROD. (Noon 2004, pp. 1-2).

Lastly, we objected to the use of a projection that shows increased acres burned over time. (Sierra Nevada Forest Protection Campaign et al. 2003). The Response to Comments section of the FSEIS appears to have characterized this concern as "9.4.34. Public Concern: The FSEIS should provide accurate fire modeling data to compare the fire effects of the alternatives." (FSEIS, Volume 2, p. 105). The response to this concern evades the central question about the fire modeling data (i.e. is it accurate or not and how does that circumstance affect the modeling outputs) and merely describes how one ought to interpret the modeling results as "projected trajectories to compare the alternatives." (Ibid.)

3. The Overestimation of Fire Severity and Its Effect on the Modeling Outcomes Was Not Disclosed.

For each acre burned in the forest model, the severity of the fire affecting that acre was estimated. Fire severity parameters were estimated from the Large Fire Analysis completed for the FEIS. (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.5, p. 243). The severity of the fire was inferred from the present condition of the vegetation within the perimeters of fires for the analysis period. Areas within the fire perimeters that had stands of an age less than the time since the fire were considered lethal fire, areas that were poorly stocked (a mixture of older trees and younger trees) were classified as mixed-lethal fire, and areas within the fire perimeter that were well stocked were considered to be non-lethal fire. As was identified by Hermit (1996, p. 4), "the stand replacement and intermediate severity rates may be overstated somewhat because other disturbance agents including management practices can be responsible for changing the structure of the forest stands." Failure to consider site class and productivity also contribute to an overestimation of severity. "Using the methods in the FSEIS fire severity analysis, all areas of low stocking were assumed to have a mixed lethal fire. However, areas of low productivity and low stocking which experienced fire are likely to have had non-lethal fires, maintaining the already low stocking level and canopy closure." (Rice 2003, p. 2).

The projection of fire severity particularly is important since tree mortality in the FSEIS is linked to the effects produced by fire of varying severity (USDA Forest Service 2001a, Volume 3, Chapter 3, part 3.5, p. 271) and the majority of the large trees that die in the model are killed by fire (USDA Forest Service 2001a, Volume 3, Chapter 3, part 3.5, p. 278). As fire severity increases, the likelihood that large trees will die increases. Thus, the overestimation of lethal and mixed-lethal fires will lead to an overestimate in the numbers of large trees killed and in turn negatively affect predictions about the development of late seral forests.

In sum, the information in the project record acknowledges that there is a fair degree of uncertainty associated with the fire severity estimates used in the forest growth model. Aspects of these methods result in an overestimation of area affected by lethal and mixed-lethal fire. Because the Forest Service relies upon the models to interpret "the magnitude of change" (FSEIS, p. 391), an understanding of the model's sensitivity to changes in the fire severity coefficients that were applied is essential to any interpretation of the "magnitude of change"

between the alternatives with respect to acres severely burned by wildfire. However, such information was not analyzed or disclosed in the FSEIS.

4. The modeling of alternatives is held to a lower analysis standard than other analytical methods considered in the FSEIS

The failure of the FSEIS to analyze and reveal uncertainty with respect to modeling changes in wildlife habitat and other factors stands in stark contrast to the Forest Service's focus on characterizing the uncertainty surrounding owl population modeling.

The Forest Service commissioned a study of all the demographic results using a new modeling methodology specifically intended to address bias and uncertainty. The point estimates from the new methodology indicated that there was a population decline in all but one of the study areas. (FSEIS, p. 143). However, the FSEIS characterizes these results as not "statistically significant" because of the uncertainty surrounding the results.[34] (FSEIS, p. 143). In contrast, quantification of "statistical significance" is never applied to any of the model estimates from the forest modeling; rather, we are expected to accept these at face value.

Blakesley and Noon (2003, pp. 3-4) raise a similar point in their comments on the DSEIS:

> All data analyses, parameter estimates, and modeling outputs should be required to include measures of uncertainty. For example, results from fire spread modeling and forest growth modeling which contributed significantly to the DSEIS should be held to the same standards and be subjected to the same level of scrutiny as wildlife population models.

Dr. Verner also emphasizes the arbitrary and inconsistent treatment of uncertainty in the DSEIS (Verner 2003b, p. 6):

> Why is it that the owl scientists have been held to the strictest of statistical analyses of the owl data, but the projection models used in the DSEIS are deterministic, pay no attention whatever to likely variability in parameter values, and confidently incorporate untested hypotheses? In my opinion, *this problem renders the results of all the model runs highly suspect and therefore unreliable for evaluating the effects over time of proposed treatments on vegetation changes and the effects of these changes on owl habitat, fire behavior, etc*.

Drs. Blakelsey and Noon again address this point in comments on the FSEIS:

[34] "It should be recognized that, although the meta-analysis did not demonstrate statistically significant ($P<0.05$) population declines, the sampling error for lambda was at least quantified and was in fact quite small (CV's = 0.03-0.05). White et al. (1982) suggested that estimates of population parameters with CV's < 0.10 were good estimates. Moreover, all model parameters considered in the meta-analysis were estimated directly from empirical data and competing models were evaluated with objective model selection criteria. In contrast, there is no such discussion or analysis for the habitat modeling in the DSEIS. Clearly, the meta-analysis was held to a much higher standard than the habitat modeling in the DSEIS." (Peery 2003, p. 7).

> To reiterate our comment in our September 2003 letter: if spotted owl research scientists had ignored measures of error in reporting population trend, the Forest Service and others would be forced to conclude unequivocally that California spotted owl populations are declining. Given this conclusion, the Fish and Wildlife Service may well have listed the owl as a threatened subspecies under the Endangered Species Act. (Blakesley and Noon 2004, p. 3).

The FSEIS responds to this issue of holding some studies to a higher analysis standard with the following (FSEIS, Volume 2, p. 84):

> The comment suggests that equal consideration is being given in the SEIS to issues that cannot be analyzed with the same degree of accuracy and certainty. There is a very high degree of uncertainty about California spotted owl population trends in the Sierra Nevada as they relate to historic owl numbers and structural changes in habitat. Fire behavior responses to fuel conditions and other factors are similarly very complicated and incompletely understood.

This response evades the primary issue, which is that sensitivity analysis and error estimation could have been completed for the forest modeling estimates, but the interdisciplinary team chose to not complete them or to not disclose them.

In sum, the failure of the FSEIS to describe the uncertainty surrounding the modeling estimates of wildlife habitat and other attributes, particularly when the FSEIS emphasizes issues of uncertainty with respect to the owl population trend estimates, is arbitrary and capricious and violates the full disclosure requirements of NEPA.

> 5. <u>The FSEIS fails to accurately model treatment prescriptions in Alternative S1 thereby underestimating the benefit of this alternative to fuels reduction</u>.

The logging prescriptions that can be applied to CWHR types 4M and 5M under Alternative S1 are knowingly misrepresented in the FSEIS.[35] The standard in Alternative S1 requires that canopy coverage not be reduced when it is in the range of 40 to 49 percent, whereas canopy cover in the range of 50 to 59 percent can be reduced to 50 percent. (FSEIS, Appendix A, p. 374). This means that those CWHR type 4M and 5M stands with greater than 50 percent canopy cover can be mechanically treated with the removal of material up to 12 inches or 20 inches in diameter depending on location (USDA Forest Service 2001b, Appendix A). Such treatments would be considered effective fuels treatments using the methodology in the FSEIS.

However, the description of the modeling in the FSEIS reports that for all land allocations, prescription code 27 was applied to all CWHR type 4M and 5M stands, with the exception of eastside pine. (FSEIS, Appendix B, p. 394, Table B-1.3a). Prescription code 27 is defined as "6-

[35] The use of "knowingly" is relevant here because we notified the Forest Service at meetings in December 2002 and February 2003 that this was an issue.

inch diameter rule – No mech – Rx Fire may be substituted" (FSEIS, Appendix B, p. 395) and "Hand treatment of material less than 6-inch followed by an underburn based on a 2-ft flame length with 3-years. In most dense stands, this Rx does not convert the stand to desired fuel conditions because insufficient ladder and/or crown fuels are removed." (Ibid., p. 405). Thus, tree removal in stands between 50 and 60 percent canopy cover under Alternative S1 was limited to those trees less than 6 inches in diameter, contrary to the assertion in the Response to Comments. (FSEIS, Volume 2, p. 112). As a result of incorrectly interpreting Alternative S1, the FSEIS fails to evaluate the full potential of Alternative S1 to modify forest fuels.

Given the assumption that the removal of material 6 inches in diameter or less is not an effective fuel treatment, the modeling protocol improperly predicts a poorer performance for Alternative S1 than actually exists. As indicated in our comments on the DSEIS (Sierra Nevada Forest Protection Campaign et al. 2003), this misconceived application of a treatment in the modeling could well apply to many thousands of acres. As a result of this approach to Alternative S1, the FSEIS fails to adequately analyze the effects of the alternatives on the environment and fails to provide a reasonable comparison among the alternatives. Any conclusions about the alleged "poor" performance in achieving the fuel objectives for Alternative S1 relative to S2 are therefore not supported by adequate analysis.

6. The Analysis of Alternative S2 in the FSEIS Does Not Accurately Reflect the Standards and Guidelines.

Nothing in Alternative S2 or in its standards and guidelines requires that the volume or acreage of logging be constrained to the extent projected by the model. "The only binding management direction for forest plan implementation are the standards and guidelines … and a set of mapped land allocations." (Iverson 1999a). Therefore, as a practical matter, the amount of logging under Alternative S2 could well exceed the outputs predicted by the modeling. This would result in substantially fewer large trees and less old forest habitat in the future than projected.

In particular, decisions made by the interdisciplinary team restrict the application of the standards and guidelines in the forest modeling of Alternative S2. As stated in the DSEIS:

> Neither alternative pushes the treatment units to the maximum amount of product that could be produced, instead incorporating the desired prescriptions for the land allocations. This means for the purpose of this analysis, the defense zone prescriptions did not remove all stems up to 30-inches. Rather, the prescription was limited to only remove the stems needed to alter fuels to meet a desired fuel condition for the zone. (FSEIS, p. 402).

Although this assumption may reflect the intentions of the interdisciplinary team, there is nothing in the ROD that requires any "stems" be left in the defense zone or for limitations to remove only that which was needed to meet the fuel desired fuel conditions. With respect to the defense zone, the ROD simply states "design projects to retain all live conifers 30 inches dbh or larger." (ROD, p. 50). There are numerous assumptions imbedded in the modeling prescriptions for Alternative S2 that are not reflected in the ROD. If the assumptions made by the

interdisciplinary team are not implemented in each project, more intensive treatment and land disturbance could occur than was estimated in the FSEIS.

Examples of limitations not required by the ROD but included in the modeling are presented in the table below (Table 5).

Table 5. Comparison of the prescriptions described in the modeling appendix (FSEIS, Appendix B, pp. 405-411) and the relationship of these constraints to direction in the ROD.

Prescription	Modeling Limitation	How addressed in the ROD
Rx-31: MechT1 Developed for use in SPLATs	No giant sequoia removed	No reference in ROD
	No sugar pine greater than 6 inches DBH removed	No reference in ROD
	Use FOFEM to estimate trees to remove in thin from below.	Thin from below not specified in any standard.
	20-inch diameter limit	30-inch diameter limit
Rx-33: MechT2 Developed for use in DFPZs and Defense Zones	No giant sequoia removed	No reference in ROD
	No sugar pine greater than 6 inches DBH removed	No reference in ROD
	Use FOFEM to estimate trees to remove in thin from below.	Thin from below not specified in any standard.
	24-inch diameter limit	30-inch diameter limit
Rx-35: ForHlt Developed to address stand density	No giant sequoia removed	No reference in ROD
	No sugar pine greater than 6 inches DBH removed	No reference in ROD
	Use FOFEM to estimate trees to remove in thin from below.	Thin from below not specified in any standard.
	Reduce basal area to meet stand density index (SDI)	SDI levels or use not specified
	30-inch diameter limit	Same as ROD
Rx-43: OldFor Designed for Old Forest Emphasis Areas	First applies Rx-31 with the exception of a 24-inch diameter limit	No reference in ROD
	50% canopy closure if it exists	No reference in ROD
	Remove only enough fuels to make burning safe	No reference in ROD
Rx-51: MnTbr1 Produce timber products at a minimum amount	First applies Rx-31, then if canopy cover is greater than 40% apply listed constraints, otherwise no tree removal	No reference in ROD
	Proportionally thin stand	No reference in ROD
	No more than 3,000 mbf per acre	No reference in ROD
Rx-61: MaThn 1	First applies Rx-31, then if canopy cover is greater than 50% apply listed constraints, otherwise no tree removal	No reference in ROD
	Proportionally thin stand	No reference in ROD
Rx-67: MAThn2	First applies Rx-33, then if canopy cover is greater than 40% apply listed constraints, otherwise no tree removal	No reference in ROD
	Proportionally thin stand	No reference in ROD
Rx-73: DefZon Additional limits on tree thinning	First applies Rx-33, then if more than 60% basal area remains apply listed constraints	No reference in ROD
	Proportionally thin stand	No reference in ROD

One particularly important constraint applied in the modeling that is absent from the direction in the ROD is the sequence of treatments applied in the modeling. For prescriptions Rx-43, Rx-51, and Rx-61, the model first applies Rx-31 which has a 20 inch diameter limit. If after applying

Rx-31 and if the canopy cover is at or below a specified limit, harvest stops. This means that the treatments are first initiated by only removing trees less than 20 inches in diameter and in some cases where canopy cover limits have been met, only trees less than 20 inches in diameter will have been removed. A similar limitation is imposed in Rx-67 and Rx-73. In these cases, the first model that is applied is Rx-33 which has a 24 inch diameter limit. Thus, the "rules" of operation for the model limit the number of trees between 20 and 30 inches that can be removed by focusing the first round of treatments on the smaller diameter material. However, the ROD does not require that treatment be focused on trees less than 20 inches in diameter nor does the ROD specify limits on the removal of trees between 20 and 30 inches in diameter (other than the basal area retention standard, which is not at issue here). Therefore, Alternative S2 is likely to result in far greater removal of trees greater than 20" diameter than assumed in the modeling and FSEIS.

Another important variance between the modeling and the actions allowed in the ROD relates to management to achieve forest health objectives. First, the ROD refers to achieving "stand densities necessary for healthy forests during drought conditions" (ROD, p. 49) with no additional definition of what level of stand density is acceptable or to what types of stands this concept should be applied. The modeling drives its application of forest health management using a stand density index (SDI). (FSEIS, Appendix B, p. 407). The source of the selected index is not disclosed in the FSEIS. Regardless of source, the modeling in the FSEIS used a specific metric to assess stand density and a decision process to select areas in which to apply these treatments. The ROD, however, provides no specific direction on how, when or where to apply forest health treatments other than to consider them in the design of area treatments outside of home range core areas. (ROD, p. 49-51).

This distinction is important for three reasons. First, there is debate in the scientific community about how best to characterize stand density, which calls into question the long held use of Reinke's indices.[36] (Ducey and Larson 2003). Absent direction in the ROD, it cannot be known what approach will be taken to implementing the direction to "significantly reduce stand density." (Ibid., p. 51). Second, the approach taken can have significant effects on important wildlife habitat and older forests. As stated in the FSEIS, "stand density guidelines for forest health, which have been developed in younger forests, may not be directly applicable to older forest. Older forests may be able to develop greater basal areas than younger forests having similar terrain conditions." Third, the location of forest health treatments is not defined in the ROD. The ROD (p. 49) provides direction on the placement of fuel treatments, but it does not specifically limit the forest health treatments to these areas. The Forest Service has previously estimated that over 3.2 million acres are "characterized by a high risk pest-drought condition" (DSEIS, p. 187) indicating that a significant area has been identified as potentially needing to receive forest health treatments. There is nothing in the ROD that establishes restrictions on the location of forest health treatments or the number of acres that can be harvested with this objective. In contrast, the modeling limits treatments to areas that are targeted for fuel reduction.

[36] Reinke's index is a metric used to characterize stand density. The metric is a function of tree per acre and basal area of the stand. (Ducey and Larson 2003, p. 1).

(FSEIS, p. 402). Thus, the questions of how, when and where to apply forest health treatments are not resolved in the scientific literature or the ROD.[37]

As can be seen in Table 5, there are a number of actions that can be taken which are consistent with the ROD, yet conflict with the modeling assumptions. They include:

- a focus on removing trees 20 to 30 inches in diameter in the Defense Zone;
- reduction of Old Forest Emphasis Area stands to less than 50 percent canopy cover;
- removal of trees greater than 24 inches in diameter in Old Forest Emphasis Areas;
- removal of medium to large trees in OFEAs to meet stand density goals that may not be appropriate for older stands; or
- removal of more trees in the larger size classes (20 to 30 inches in diameter) with less attention paid to the small trees.

These approaches are not precluded by the ROD and would result in the harvest of more and larger trees, and a greater reduction in canopy cover than assumed in the model or projected in the FSEIS.

In sum, the analysis in the FSEIS underestimates the type of disturbance that is permitted by the ROD. The full potential for the decision to alter the environment has not been disclosed.

7. <u>The Regional Forester's Claim That He Did Not Rely Upon Long Term Modeling Projections Is Unconvincing</u>.

In the ROD, the Regional Forester claims that he did not rely upon longer term projections to make his decision. He states:

> Longer term forecasts (e.g. 120-years) have greater uncertainty and reliability. The longer term modeling is useful to identify general trends, and not quantifiable targets. Hence, I did not rely upon these longer term projections in my decision. (ROD, p. 12).

This statement is, however, in direct conflict with actions the Regional Forester took to promote his new decision to the public at large.

In December 2003, the Regional Forester retained a public relations firm (Thompson 2004) to "help us explain complex questions." (Regional Forester Jack Blackwell in Martin 2004). The firm proposed and the Forest Service adopted a strategy to introduce the new decision to the public with the goal of providing "the public … a better opportunity to appreciate the importance, quality and responsiveness of the upcoming Record of Decision." (OneWorld 2003). The strategy included, among other things, the development of brochures and press releases to be distributed to various audiences. These brochures contained narrative, photos and

[37] As indicated elsewhere in our comments, this uncertainty about density management for forest health objectives supports the identification of this issue as significant. Because this significant issue was outside the scope of the FEIS, formal scoping for the SEIS should have been completed.

many graphs. The graphs depicted changes in historic tends and projected trends in area with old growth trees, area burned by severe fire, and nesting habitat for spotted owl. The time period covered by these graphs was from 1950 to 2080.

The consistent message in these brochures is that under the new plan, wildfire acres will decrease and habitat values will increase. This message is characterized in the brochure and Forest Service press release with a variety of phrases:

> The graph shows what would happen if the management of the Sierra Nevada forest were left at status quo. (USDA Forest Service 2004b)
>
> This campaign expects to reduce acres lost to catastrophic wildfires more than 30% within the next fifty years. We also expect the habitat of wildlife, such as spotted owl, and old growth areas to double in the same period. (USDA Forest Service 2004b).
>
> Forests Destroyed By Catastrophic Fire Each Year (USDA Forest Service 2004b).
>
> The action campaign and the final Framework plan being announced today will reduce the acres burned by severe wildfires by more than 30 percent within the next 50 years. (US Forest Service 2004c).

The explanation of "complex problems" provided in Regional Forester Blackwell's brochures violates two important assumptions underlying the analysis of information in the FSEIS and ROD. First, the narrative and graphic presentation imply a degree of certainty that all, including the Forest Service, agree is absent. Certainty is implied by both the words that are used (i.e. "would happen", "will reduce", "reduce loss", "double in same period") and the representation of specific numbers of acres affected. The second violation in the brochure of the assumptions that underlie the ROD is the use of long term modeling. Regional Forester Blackwell unequivocally stated "I did not rely upon these longer term projections in my decision." (ROD, p. 12). However, the brochures produced by Regional Forester Blackwell rely entirely on long term projections to develop the message in support of the ROD. The presentation in these public relations materials misrepresents significant issues raised about the quality of the data, error analysis, and uncertainty that were raised repeatedly in the development of the FSEIS.

Dr. Barry Noon raised this issue as well in his comments on the FSEIS:

> Further, it was recently been brought to my attention that these "analyses" appear in a marketing brochure the Forest Service produced to generate public support for the new Sierra Nevada management plan (Frankly, I had never heard of the Forest Service doing such a thing and it seems highly inappropriate). I was able to get a copy of this brochure

> to read over this past weekend. The message in the brochure is clear—implement the proposed plan and everything will get better. What is not disclosed is that all of the proposed time trends in the illustrated graphs are accompanied by great uncertainty. In addition to inherent uncertainty about the future state of the Sierra Nevada ecosystems, the vegetation projection models used for the majority of these analyses are of unknown validity because they have not been critically reviewed by the scientific community. I cannot reconcile continued reliance on insights from models and analyses that may be critically flawed with your assertion that you insisted on scientific credibility. It is my opinion that the public has been mislead. (Noon 2004, p. 2).

Either the Regional Forester misstated his intent not to use long term projections in his decision or he mistakenly used long term projections in his public relations campaign. In either case, the inconsistencies between the FSEIS and the brochures and press releases call in to question the Regional Forester's use of long term modeling in his decision making.

F. The Analysis in the FSEIS Assumes Adoption of an Adaptive Management Plan, but the ROD Fails to Incorporate Such a Plan.

Adaptive management uses information derived from research and monitoring to revise management plans as a continual, adaptive feedback loop. (Noss et al. 1997, p. 186). Adaptive management is characterized as "experimental and cautious and leaves options for change open." (Ibid., p. 187). Adaptive management provides a structured approach to implementing management decisions in the face of risk and uncertainty about management outcomes. (FSEIS, p. 64). The elements of an adaptive management program as described in the FEIS (USDA Forest Service 2001a, Volume 1, Chapter 2, p. 23) include:

- Well-defined questions
- Monitoring
- Measures of change that are sensitive to the management issues of greatest concern
- Describes how monitoring information will be evaluated and interpreted
- Defines procedure to respond to monitoring results and how they will be included in future decision making

The last two elements listed above essentially are what distinguish an adaptive management program from a monitoring program. An adaptive management program specifically identifies the thresholds of change that will trigger a reconsideration of the management actions.

The ROD fails to establish an adaptive management program that is capable of addressing the uncertainty of the effects of management actions inherent to the decision. This failing is emphasized repeatedly in the Science Consistency Reviews and elsewhere. (Guldin et al. 2003; Stine and Keane 2003; Verner 2004). The FSEIS bases the analysis of effects of Alternative S2 on the assumption that an adaptive management plan will be adopted. Yet the ROD failed to adopt an adaptive management plan and as a result the environmental consequences of the new plan have not been adequately disclosed.

1. The ROD does not adopt an adaptive management plan.

Adaptive management has been discussed at length in the FSEIS (FSEIS, p. 64-88), been the focus of many interagency meetings (e.g. the September 2003 meeting and many prior meetings), and discussed among numerous experts. The Science Consistency Review generally recommended the adoption of an adaptive management program and specifically indicated that:

> Any revision of the DSEIS should address in greater detail both the question about what level of detail is appropriate in an EIS with regard to the different kinds of research and monitoring associated with situations of scientific risk and uncertainty, and the nature of the adaptive management process that would be triggered in the event that research and monitoring reveals unintended or unanticipated effects. (Guldin and Stine 2003, p. 8).

In a minor way, the FSEIS addresses some of the points raised above. There is more information in the FSEIS on ongoing research and management questions were formulated for specific resource concerns. (FSEIS, pp. 71-88). There is, however, no indication of the process that would trigger a course correction given that monitoring reveals unintended or unanticipated effects. Fundamental questions about the detail required of a legitimate adaptive management program were raised in the Science Consistency Review:

> … the specifics of this monitoring program are not well developed. What exactly is to be monitored? What monitoring results and thresholds will trigger changes in management? Who will determine these thresholds? Who will do this monitoring and how will it be funded? (Dr. Mark Reynolds in Guldin and Stine 2003, p. A-34).
>
> This change in focus requires a substantial revision of the adaptive management approach presented in the FEIS with a greater attention to monitoring designed to rapidly evaluate effects of the more aggressive and locally determined management of the SEIS and to recommend and adapt specific changes in management. (Dr. Mark Reynolds in Guldin and Stine 2003, p. A-34).
>
> The document needs to give more guidance on how local flexibility will be made compatible with adaptive management. (What variables, indicators, performance criteria, measures, etc. are going to be imposed on local experiments to support scientific assessment? Who is going to coordinate them? How will they be made responsive to management information needs? Who will do the analysis and how will it be incorporated into an information management system and made available to management?) (Dr. James Quinn in Guldin and Stine 2003, p. A-28).
>
> While there is provision in the ROD and in S1 for collection of monitoring data, I don't see a means to effectively integrate the results into management practices in the appropriate time scale. I want to repeat this point because I consider it to be the most important weakness in the planning documents: There is no mechanism provided for monitoring leading to adaptive management. (Dr. David Graber in Guldin et al. 2003, p. A-7).

The US Fish and Wildlife, in its comments on the DSEIS, offered an approach that would directly address the issue of thresholds and triggers:

> …thresholds of concern (for example treatment within PACs or development of site-specific management plans that allow increased grazing in willow flycatcher habitat) would trigger post-project monitoring of certain projects. The Sierra-level Management Team would then review the results of project implementation and monitoring and could recommend conservation measures if the team determined that such measures were needed to limit effects of future projects on sensitive species. We commend the USFS' commitment to collection of monitoring data and establishment of teams that will facilitate interagency coordination. However, in order to ensure that conservation goals are being met, we believe the process needs a stronger feedback loop."[39] (USDI Fish and Wildlife Service 2003c, p. 3).

The US Fish and Wildlife Service then suggested a specific application of this team approach:

> We believe an interagency strategic planning process approach is also needed to ensure that conservation and adaptive management goals are met through planning of fuels treatments. We recommend a process in which representatives of USFS, the Service, and possibly State and local agencies will cooperate in the placement of fuels treatments at a watershed planning level (these tasks could be accomplished by the Forest-level Technical Teams). We expect that some treatments can be implemented with minimal conservation concerns, while others will create significant concerns. When an interagency team identifies a project with significant conservation concerns, the team could recommend alteration of the project to minimize those concerns, and/or plan additional monitoring of or formal adaptive management studies on the project. (Ibid., p. 4).

Further, the Biological Assessment defined a framework for thresholds and triggers that was included in proposed action evaluated in the biological assessment (USDA Forest Service 2003c, p. 99-101??) that where a subject of the biological opinion (USDI Fish and Wildlife Service 2003d, pp. 104-107). However, any reference to this approach appears to have been abandoned in the FSEIS.

The Resources Agency of the State of California offered similar, detailed proposals on how adaptive management could be applied on national forests in the Sierra Nevada. (California Resources Agency 2003, pp. 26-30). Even when presented with a specific framework to address the formulation of a credible adaptive management program, the FSEIS and ROD fail to adopt the suggested measures or seriously respond to the issues they raised.

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[39] The reference to "Sierra-level Management Team" derives from working papers and discussions that as stated in the DSEIS were "currently ongoing among the State of California, US Fish and Wildlife Service, Forest Service and others to develop scientific guidelines for Adaptive Management, Monitoring and Strategic Planning." (DSEIS, p. 57). The DSEIS committed to "include these guidelines in the Final SEIS" (ibid.), but no such guidelines were finalized.

Instead, the ROD simply commits to taking some actions that support monitoring or commits to completing annual monitoring of forest plans (ROD, p. 12), which by law the Forest Service is already required to complete. The ROD avoids the adoption of the management questions and recommendations presented in Alternative S2 (FSEIS, pp. 71-88) and merely refers the subject to a team "to develop recommendations on whether and/or how to adjust existing research and monitoring work" in order to include the concepts in a program of work. (ROD, p. 13). As noted by Drs. Blakesley and Noon:

> …adaptive management is *not* integrated into the current decision; the ROD stops short of a commitment to any specific adaptive management program. Rather, it states that recommendations for an Adaptive Management will be completed within 6 months, and "it may be easier to promise than it is to deliver" (ROD p. 12). (Blakesley and Noon 2004, p. 1).

Even in this "follow up" direction to staff, the Regional Forester fails to request additional recommendations on the most fundamental aspects of adaptive management – How will monitoring results trigger changes in management? And who will determine the relevant threshold for the triggers?

Even if the ROD had adopted the management questions and recommendations from the FSEIS (as opposed to considering the recommendation in 6 months), an adaptive management plan would still not be in effect since fundamental questions about how monitoring triggers changes in management and who makes the decisions on those triggers have not been determined. Basically, the ROD opens the door to timber and grazing practices for which there are known risks and substantial uncertainty about their effects on imperiled species. This ROD identifies that some monitoring, as yet to be fully determined, will take place in the future. In the meantime, habitats for at risk species will be altered in ways that are adverse to these species. A similar point was made by Dr. Verner (2004, p. 3) in reference to California spotted owl:

> Meanwhile, using the standards and guidelines tabulated in Appendix A of the ROD, vegetation treatments will be applied in projects on national forests throughout the Sierra Nevada. I'm deeply concerned for the spotted owl, given that canopy cover in some of their primary habitat can be reduced to levels providing only marginal habitat, or worse, for foraging and clearly unsuitable for nesting.

Even if the appropriate thresholds and triggers had been identified, there remains a problem with the adaptive management proposal presented in the FSEIS. The proposal as conceived allows treatments that follow the ROD to occur throughout the landscape. In some cases, monitoring will be done to determine the effects of the action; these would be called adaptive management studies. At the same time and in areas outside of the adaptive management studies, the same standards would be implemented. The result is that uncertain actions would be "tested" in adaptive management studies while these same treatments were implemented broadly across the landscape. Dr. Verner (2004, p. 2) suggests that "In concept, I suggest that this would be analogous to the FDA's approving an experimental drug for use in the general population on the

condition that its direct effects and side effects would be studied in only a small subset of people. The consequences could be dire if ill effects were unforeseen and did not surface in time in the small study." On this same point, Dr. Jim Quinn, a science consistency reviewer, noted:

> In short, adaptive management, as defined by the literature and the technical community, can provide powerful tools for management to identify successful practices and remove uncertainty, but it also significantly constrains local flexibility. It is not clear that the S2 discussion has addressed the constraints. (And if there are really no constraints envisioned, it isn't adaptive management, and the document should drop the use of the term.) (Guldin et al. 2003, p. A-29).

Drs. Blakesley and Noon also identified particular context for adaptive management which establishes constraints and addresses triggers:

> Given that the FSEIS promotes a fire management/timber harvest strategy (Strategically Placed Area Treatments; SPLATs, or "the theoretical Finney strategy" [FSEIS p. 71]) that has never been tested on actual landscape, it is irresponsible to proceed with this plan on such a large scale without treating the strategy as an experiment. We have been supportive of testing the SPLAT strategy in the Wildland Urban Intermix (WUI) and have expressed our eagerness to participate in a study of the effects of the proposed thinning on spotted owls in the WUI. It would be prudent to evaluate the effectiveness of the SPLAT strategy for changing fire behavior as well as the effects on vital rates of spotted owls and other wildlife species in a limited area (e.g. the WUI) *before* the SPLAT strategy is implemented forest-wide. <u>We believe it was premature to release the ROD and FSEIS without commitment by the Forest Service to a *completed* adaptive management strategy that includes incremental implementation of the SPLAT program with built-in trigger points for program (standard and guideline) modification</u>. (Blakesley and Noon 2004, pp. 1-2, additional emphasis added).

In the absence of addressing fundamental issues raised about adaptive management in the Science Consistency Review and elsewhere, the ROD does nothing more than to make a commitment to monitor the results of the decision. It adopts no mechanism or commitments to adapt future management to the results of monitoring, which is the hallmark of adaptive management.

2. <u>The Environmental Consequences of Not Adopting the Adaptive Management Program Described in Alternative S2 Have Not Been Disclosed.</u>

The analysis of Alternative S2 is based on the assumption that a specific adaptive management program is included in the alternative. The environmental consequences section relies on the adaptive management program to reduce uncertainty and therefore reduce adverse impacts to species. With respect to California spotted owl, the FSEIS (p. 279) states: "These risks to habitat are tempered by the adaptive management and monitoring strategy included in Alternative S2 and described in Chapter 2." The discussion on willow flycatcher identifies that specific actions are a part of the adaptive management strategy described in Alternative S2 and

"these efforts will reduce the uncertainty about effects of management and increase our understanding of complex meadow ecosystems." (FSEIS, p. 291). In responding to comments on the DSEIS, the FSEIS refers to the adoption of an adaptive management program to address a variety of species conservation issues. With respect to Yosemite toad, the response states "In addition, the Final SEIS description of Alternative S2's adaptive management and monitoring strategy includes provisions for adaptive management studies in four to six grazing allotments most heavily impacted by Yosemite toad grazing exclusion standards." (FSEIS, Volume 2, p. 18). Regarding California spotted owl, the response states: "Both alternatives also include an adaptive management strategy that is intended to improve scientific knowledge regarding the fire and fuels strategy as well as habitat relationships and vegetation management effects on California spotted owls." (FSEIS, Volume 2, p. 41). These statements indicate that there was an expectation that adaptive management would be implemented as part of the decision to reduce risk and uncertainty for at risk species.

Alternatives that do not incorporate adaptive management were not evaluated in the FSEIS. The effect of not reducing uncertainty and thereby not addressing risks to imperiled species due to uncertain knowledge was not considered in the FSEIS. As a result, the environmental impacts of the decision actually adopted in the ROD have not been analyzed in the SEIS as required by NEPA.

VI. THE FOREST SERVICE HAS FAILED TO COMPLY WITH OTHER IMPORTANT LEGAL REQUIREMENTS

A. The Forest Service Has Failed To Comply With the Procedural Requirements for a Significant Forest Plan Amendment.

The Regional Forester has found that the new plan represents "a significant forest plan amendment." (ROD, p. 20). When the Forest Service proposes a significant plan amendment, the agency must "follow the same procedure as that required for development and approval of a forest plan." (36 CFR 219.10(f)). In this case, the Forest Service did not follow the required procedures because the agency failed to conduct a scoping process and failed to carry out other important planning procedures described in the Forest Service's regulations.

The process for forest planning is set out at 36 CFR 219.12. The first sentence reads: "The preparation, revision, or significant amendment of a forest plan shall comply with the requirements established in this section." As detailed, this section calls for a ten step planning process, including "at least those actions set forth in paragraphs (b) through (k) of this section." The rule also notes that the EIS process under NEPA is a separate requirement. The ten steps as

entitled in the section are logical for sound planning, beginning with the "identification of purpose and need" and ending with "monitoring and evaluation."

The Forest Service did not follow the detailed requirements laid out in 36 CFR 219.12. For example, to the extent that an "analysis of the management situation" took place,[46] it did not include monetary benchmarks with present net value for resources like timber or recreation with established market or assigned value. Likewise, alternatives were not formulated and effects were not estimated to allow for the comparison of present net value for management standards and resource outputs. So too the evaluation of alternatives did not include an analysis of present net value using the planning criteria. There does not appear to have been the functional equivalent of many of these detailed requirements in the plan amendment process.

The Forest Service also failed to follow the procedures required in developing forest plans by failing to conduct a public scoping process. The Forest Service's notice of intent for the plan amendment (68 Fed. Reg. 16758 (April 7, 2003)) states that "scoping is not required" and that "the Forest Service is not inviting comments at this time." The Forest Service rules require the identification of purpose and need at the outset of the planning for a significant plan amendment. To accomplish this, the rule says that the "interdisciplinary team shall identify and evaluate public issues, management concerns and resource use and development opportunities, including those identified throughout the planning process during public participation activities." (36 CFR 219.12(b)). The rules further state that "public participation in the preparation of environmental impact statements for planning begins with the publication of a notice of intent in the Federal Register." (36 CFR 219.6(b)). In this case, the Forest Service failed to provide for such "public participation activities" by not only omitting scoping, but by stating in the Federal Register that "the Forest Service is not inviting comments at this time."

The Forest Service Handbook states that "[t]he use of scoping applies to all proposed actions which require environmental analysis" (FSH 1909.15, Chapter 10.3.2) and refers to scoping as "an integral part of environmental analysis" (FSH 1909.15, Chapter 11). According to the Handbook, scoping serves a number of important purposes including refining the proposed action, identifying relevant environmental issues, determining the kind of analysis needed, and exploring possible alternatives and their environmental impacts. Scoping is also used to "determine the type and level of public participation" (FSH 1909.15, Chapter 10.2(f)) and to "keep the public informed of the progress of environmental analyses and decisionmaking" (FSH 1909.15, Chapter 10.3.2(b)).

By omitting the scoping process, the Forest Service denied the public and interested parties an opportunity to shape the EIS process. As a result, important issues like the scope and format of the EIS, additional information and analysis that needs consideration, issues to be addressed, and alternatives to the proposed action have not been addressed through a NEPA scoping process.

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[46] To the best of our knowledge, there was no formal "analysis of the management situation" in connection with the plan amendment. However, to the extent that the management review process could be considered the functional equivalent, that process did not address the elements required by the planning regulation.

As stated in guidance issued by the Council on Environmental Quality (incorporated by reference in the Forest Service Handbook, FSH 1909.15 Chapter 65.13):

> Scoping helps insure that real problems are identified early and properly studied; that issues that are of no concern do not consume time and effort; that the draft statement when first made public is balanced and thorough; and that the delays occasioned by redoing an inadequate draft are avoided. Scoping does not create problems that did not already exist; it ensures that problems that would have been raised anyway are identified early in the process.

An additional reason for scoping in this case is that the plan amendment changed the Framework's purpose and need by including additional issues and objectives. As stated in the ROD (p. 4), the plan amendment broadens the Framework "to include other management objectives such as reducing stand density for forest health, restoring and maintaining ecosystem structure and composition, and restoring ecosystems after severe wildfires and other large catastrophic disturbance events." As noted by the Forest Service's Director of Wildlife, the SEIS includes a new section on "forest ecosystem health" that was not an issue addressed during the Framework and was not "provided to the public for input during scoping" as part of the Framework process. "This appears to be a new issue which should have been presented to the public during scoping." (Gladen 2003, p. 3, emphasis added).

The notice of intent asserts that "scoping is not required for supplements to environmental impact statements," citing the CEQ regulations. (40 CFR 1502.9(c)(4)). However, those regulations also specify that agencies "shall revise" the scope of the EIS "if substantial changes are made later in the proposed action, or if significant new circumstances or information arise which bear on the proposal or its impacts." (40 CFR 1501.7(c)). The scoping process for the Sierra Nevada Framework took place five years ago, and is not adequate to serve as a basis for significant plan amendments at this time, in part because the plan's purpose and need has been substantially broadened. Therefore, the Forest Service should have undertaken a new scoping process before proceeding with the EIS and final decision.[47]

For the foregoing reasons, the Forest Service must follow the procedures required by law for significant plan amendments, which include but are not limited to a scoping notice and process that solicit public participation. To proceed directly to a supplemental EIS truncates the public participation process required by law.

B. The revised plan fails to comply with the Herger-Feinstein Quincy Library Group Forest Recovery Act.

The Herger-Feinstein Quincy Library Group Forest Recovery Act directed the Forest Service to implement the QLG pilot project subject to important limitations. Specifically, activities

[47] Scoping is independently required under NEPA because of the major changes in purpose and need between the Framework FEIS and the DSEIS. In effect, the SEIS represents a new or revised EIS, rather than a true supplement, which must be preceded by a scoping process.

pursuant to the project must comply with "the standards and guidelines for the conservation of the California spotted owl as set forth in the California Spotted Owl Sierran Province Interim Guidelines or the subsequently issued guidelines, whichever are in effect." (Section 401(c)(3)). The QLG project was never intended to constitute a conservation plan for the California spotted owl; rather, the Act requires the project to comply with either the interim guidelines (the CASPO policy) or a revised owl plan.

In several important respects, logging sanctioned under the revised Framework within the QLG pilot project area fails to comply either with the interim guidelines or with any subsequently issued guidelines for the owl, contrary to the Act. First, with respect to group selection logging, the plan only requires retention of live trees greater than 30" dbh, without also imposing a basal area retention standard or a canopy cover retention standard. (ROD, p. 68). Therefore, the plan is not consistent with the interim CASPO guidelines, which also imposed a canopy cover standard and/or basal area retention standard on logging, depending upon the timber strata involved. (USDA Forest Service 1993). Nor is such group selection logging consistent with the owl conservation plan included in the revised Framework, which also requires canopy cover and basal area retention. (ROD, pp. 50-51). Finally, such logging is also inconsistent with Alternative 2 in the QLG FEIS, which purported to fully implement the pilot project. (USDA Forest Service 1999b, p. 2-19). The QLG FEIS clearly states that group selection logging pursuant to the pilot project would comply with "interim California spotted owl direction," including restrictions relating to "tree size, basal area retention, and crown cover." (USDA Forest Service 1999b, p. 2-5).

In sum, group selection logging in the absence of a canopy cover and basal area retention standard is not consistent with any owl conservation plan that the Forest Service has adopted. Therefore, this aspect of the revised plan is inconsistent with the QLG Act.

Second, nothing in the revised plan precludes the Forest Service from logging within the same stand more than once. The interim CASPO report specified that "stands may only be entered once for commercial logging." (USDA Forest Service 1993, p. III-3). As recommended in the CASPO report, both "selected" and "other" timber strata "may be entered only once for commercial logging prior to implementing a long-term strategy for managing the California spotted owl on public lands." (Verner et al. 1992, p. 21). With respect to the QLG lands, the Forest Service has yet to implement "a long-term strategy for managing the California spotted owl"; the revised Framework, which is intended to serve as such as strategy, will not apply to the QLG lands until after the pilot project is completed. (ROD, p. 67). Therefore, logging pursuant to the QLG project must comply with the interim CASPO guidelines, which prohibit multiple entries.[48]

[48] This is an important concern because repeated logging of a stand pursuant to the interim guidelines would result in forest structure that is not consistent with the owl's habitat needs. As described by Forest Service biologist Dawn Lipton, there are a large number of stands that have already been logged using the interim guidelines:

> A retention of 40% of the basal area in the largest trees during a second CASPO treatment would be the same as having retained only 20% of the basal area in the largest trees. Even greater impact could occur within the CWHR 4M, 4D, 5M or 5D stands that were reduced below 40% canopy cover in the initial

In sum, in at least these two respects, the revised plan fails to comply with the QLG Act by sanctioning logging within the pilot project area that is not consistent with the interim CASPO guidelines or any subsequently adopted conservation plan for the owl.

C. The revised plan fails to comply with the Healthy Forests Restoration Act.

Section 102(e)(3)(B) of the Healthy Forests Restoration Act requires that the Framework revision comply with section 102(e)(2) of the Act, which states: "In carrying out a covered project, the Secretary shall fully maintain, or contribute toward the restoration of, the structure and composition of old growth stands according to the pre-fire suppression old growth conditions characteristic of the forest type, … and retaining the large trees contributing to old growth structure."

Logging authorized by the revised plan fails to comply with these requirements in several respects. First, the plan fails to "fully maintain, or contribute to the restoration of, the structure and composition of old growth stands." The plan allows widespread logging of trees up to 30" dbh, which in many stands includes dominant and co-dominant trees that are an important part of the structure of old growth stands. Removing these trees is therefore inconsistent with maintaining or restoring old growth structure. Similarly, the plan allows removal of large snags and large down logs, despite the fact that there is currently a deficit of such large structures in the Sierra Nevada and that they are also an important component of old growth forests. Second, and more specifically, the plan fails to "retain[] the large trees contributing to old growth structure" by allowing dominant and co-dominant trees up to 30" dbh to be logged. As demonstrated in this appeal, removing trees up to 30" diameter and removing large snags and large logs will degrade the habitat of species associated with old growth forests, like the California spotted owl and Pacific fisher, rather than maintaining or restoring such habitat.

The Act and its legislative history make clear that Congress intended logging to emphasize removal of brush and small trees, not logging of medium-large and large trees as allowed by the revised plan. Therefore, the revised plan is inconsistent with both the language and intent of the Healthy Forests Restoration Act.

CASPO harvest. The only requirement within these stands would be the retention [of] 30" dbh trees. One can easily see how a substantial cumulative reduction in owl habitat could occur. (Lipton 2003).

VII. CONCLUSION AND REQUEST FOR RELIEF

For the foregoing reasons, both the revised plan and the FSEIS fail to comply with the minimum requirements of law and policy. Therefore, both the ROD and the FSEIS should be remanded to the Regional Forester for reconsideration. Should the Regional Forester determine to continue with the plan amendment process, he should be directed to initiate a new scoping process and to issue a revised draft EIS that includes a full range of alternatives and complies with NEPA and NFMA in all respects. In the interim, the Regional Forester should be directed to implement the 2001 Sierra Nevada Framework.

Respectfully submitted,

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IX. ATTACHMENTS

1. Barrett, R. H. 1999. Declaration for Herger-Feinstein Quincy Library Group Final Environmental Impact Statement.

2. Barrett, R.H. 2004a. A critique of the Sierra Nevada Forest Plan Amendment final supplemental environmental impact statement and record of decision. April 25, 2004.

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