Sierra Nevada
Forest Protection Campaign

COMMENTS

OF THE

SIERRA NEVADA FOREST PROTECTION CAMPAIGN
THE CENTER FOR BIOLOGICAL DIVERSITY
THE WILDERNESS SOCIETY
SIERRA CLUB
FRIENDS OF THE RIVER
CALIFORNIA NATIVE PLANT SOCIETY
CALTROUT
DEFENDERS OF WILDLIFE
NATURAL RESOURCES DEFENSE COUNCIL

ON THE

SIERRA NEVADA FOREST PLAN AMENDMENT
DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

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TABLE OF CONTENTS

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I. INTRODUCTION

What ostensibly began as a fine-tuning of the carefully balanced Sierra Nevada Forest Plan Amendment (Sierra Nevada Framework) has transmogrified into nothing less than a major overhaul of the existing plan. Virtually all of the Framework's key elements – 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 imperiled amphibians – would be substantially weakened under the proposed plan. There is no significant 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 existing plan. Because the proposed plan would threaten the viability of numerous species, and because the DSEIS fails to take a careful and full look at the likely environmental consequences, the entire proposal needs to be returned to the drawing board.

The Chief of the Forest Service, in denying all administrative appeals of the Sierra Nevada Framework, 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). In describing his goals to owl scientists, the Regional Forester said that he was looking for "a little wiggle room" with respect to Framework implementation. (Verner 2003b). The changes were characterized as a "non-significant" amendment to the existing plan.

A more careful look at Alternative S2 and its environmental consequences reveals that the proposed changes are anything but "non-significant." For example, owl scientists, in a joint letter, described the plan as "a substantial (if not radical) departure from the ROD" (Franklin et al. 2003) and Dr. Jared Verner, recently retired from the Forest Service's research branch, characterizes it as "a substantial overhaul" of the Framework. (Verner 2003b). Forest carnivore experts have found that the proposed plan "would significantly weaken protection for old forests and forest carnivores throughout the Sierra Nevada." (Barrett 2003; Kucera 2003). The Forest Service's Review Team acknowledged that "any new decision is likely to entail a significant rewrite of the ROD" and that "entire Chapters of the ROD have been rewritten." (USDA Forest Service 2003, p. 95).

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 existing plan. 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.

Beyond that, there is no important new information that would justify substantially weakening the current plan. 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, Dr. Barrett concludes, "there is no new information regarding the Pacific fisher or the American marten that would justify weakening the existing Sierra Nevada Framework." (Barrett 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 2003).

Not only are the proposed changes unfounded, but they would also violate the National Forest Management Act. Experts who have reviewed Alternative S2 and the DSEIS have concluded that the proposal is likely to threaten the viability or contribute to the need for federal listing of the California spotted owl (Verner 2003b; Blakesley and Noon 2003; Peery 2003; Bond 2003), the Pacific fisher (Barrett 2003; Kucera 2003), the American marten (Kucera 2003; Barrett 2003), and the willow flycatcher (Sanders 2003) in all or part of the planning area. These same experts have concluded that the DSEIS fails adequately to disclose and assess the plan's likely environmental consequences, contrary to the National Environmental Policy Act.

One particularly problematic aspect of the proposed 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 proposed action and the DSEIS are fundamentally flawed and must be entirely reconsidered.

II. OLD FOREST ECOSYSTEMS

The Sierra Nevada 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 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; protection of the southern Sierra fisher conservation area; and standards and guidelines limiting removal of medium-large

trees and excessive reduction in forest canopy cover. The new proposal would weaken or eliminate all of these protections. As a result, the proposal would threaten the viability and distribution of species associated with old forests, including the California spotted owl, Pacific fisher, and American marten.

A. Overview

The proposed amendments would adversely affect old forests in the following ways. First, old forest emphasis areas (OFEAs) would lose protection. Under the Framework, logging within these areas would be generally restricted to removal of small (12" diameter or less) trees and forest canopy could not be reduced by more than 10 percent. 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. The same changes apply to spotted owl home range core areas (HRCAs). In effect, both the OFEA and HRCA land allocations would be rendered meaningless. (Verner 2003b, pp. 3-4; Blakesley and Noon 2003, p. 2).

Second, the Framework requires 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. 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). The new proposal would entirely eliminate this requirement. 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).

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 relatively dense canopy forests in all watersheds. The new proposal would delete this requirement and would eliminate any meaningful protection for the southern Sierra fisher conservation area. (Barrett 2003).

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. The new proposal would increase the logging diameter limit (from 12"-20" up to 30"), decrease protection for canopy cover (from 50 percent to 40 percent), allow greater reduction in canopy cover (from 10-20 percent to 30 percent), and transform the legally binding standards for large snags and large woody debris into discretionary standards that could be weakened at the project level. (DSEIS, pp. 268, 270). In eastside pine forests, protection for canopy cover would be eliminated entirely. (DSEIS, p. 53, Table Ga).

As described below, the cumulative impact of these proposed changes would be to threaten imperiled species associated with these forests, including the California spotted owl, Pacific fisher, and American marten.

B. California Spotted Owl

The proposed action would substantially weaken existing protection for the California spotted owl and its habitat. The proposal would allow logging of medium and large trees, reduction in canopy cover, and removal of large snags and down logs throughout all land allocations, and would eliminate or weaken protection for protected activity centers (PACs), spotted owl home range core areas, old forest emphasis areas (OFEAs), and stands of old forest 1 acre or larger. According to spotted owl biologists, the cumulative effect of these changes would likely be to threaten the status of the California spotted owl in the Sierra Nevada, contributing to a trend towards federal listing. (Verner 2003b; Blakesley and Noon 2003; Peery 2003; Bond 2003).

Although the Forest Service has characterized the proposal as an insignificant change from the existing plan, the spotted owl scientists who have studied the plan describe it as "a substantial (if not radical) departure" from the Framework ROD. (Franklin et al. 2003). Furthermore, according to the owl scientists, "there is no new science in the Proposal that justifies the fundamental departure from CASPO or the ROD." (Ibid.) Accordingly, it appears that the primary basis for the new proposal 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).

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 are generally protected by the existing Framework but which would be available for logging under the proposed action, are an important component of owl nesting and roosting habitat. (Peery 2003; Bond 2003).

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.[1] (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 73). Similarly, 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).[2] 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 by owl biologists to constitute the minimum canopy cover preferred by owls for foraging.[3]

Owls also 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

[1] 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).
[2] 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).
[3] According to Dr. Verner, "50% should still be the standard." (USDA Forest Service 2003b).

scientists agree that trees under 30 inches dbh, which will be targeted for logging under the proposed action, contribute significantly to owl foraging habitat. (Peery 2003; 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 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 and 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.[4]

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 would suggest that reducing canopy cover below 50 percent, and removing medium and large trees, 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

[4] 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" (17).

important since the California spotted owl is known to be long-lived and to successfully fledge young at irregular intervals. (Gutierrez et al. 1995). To date, the results of these demographic studies indicate "that caution is advised in planning conservation strategies for the California spotted owl." (Franklin et al. 2003, p. 2).

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. 2001), whereas the recently completed analysis of all the demographic studies used a different method. (Franklin et al. 2002). The underlying definitions of λ for these two methods, along with respective assumptions and limitations, are slightly 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. 2002). 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, using a different methodology, found that the means of three 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 8_t were not sufficiently precise to detect declines if they occurred. This latter point was important because point estimates for [3 of the 4] 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. 2002, p. 29). Because the method used to calculate λ in the report of all studies 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 8_t 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. 2002, p. 29).

In addition to considering λ the studies found that rates of adult survivorship were similar across all studies but the one in Sequoia-Kings Canyon National Park, which was higher. (Franklin et al. 2002). These rates, with the exception of the Sequoia-Kings Canyon study, were found to be lower than those reported for the Northern Spotted Owl, a subspecies listed as threatened under the Endangered Species Act. According to the Forest Service, such a low survivorship rate indicates "concern for population stability." (USDA Forest Service 2003a, p. 36).

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 (Franklin et al. 2003), 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 cause for concern regarding the stability of the California spotted owl population in the Sierra Nevada and that a cautious approach to management is warranted.

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

The proposed action would weaken existing restrictions on logging throughout national forest lands, but especially within old forest emphasis areas, owl home range core areas, and owl protected activity centers (PACs). The DSEIS acknowledges 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). Because these standards will be applied in virtually all land allocations, the effect of this "one sized fits all " plan would be to fragment owl habitat, isolate owl populations, and threaten the owl's distribution and viability in the planning area.

> 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. The increases in fragmentation and patchiness are likely to isolate subpopulations and limit the opportunity for interactions across NFS lands. (DSEIS, p. 193, emphasis added).

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.)

These findings demonstrate that the proposed action is inconsistent with the Forest Service's legal duty to ensure that the owl's population remains "well distributed in the planning area" and that "habitat must be well distributed so that [owls] can interact with others in the planning area." 36 CFR 219.19; see, for example, Peery 2003, p. 6 ("the proposed 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"); 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); 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").

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

a. Logging of medium and large trees.

Alternative S2 would increase logging diameter limits from the existing 12" or 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. Moreover, Blakesley (2003) documented greater nest success in stands and greater survival in territories dominated by medium and large trees. "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 2003, p. 2; Bond 2003).

The proposed plan only retains 40 percent of the basal area in the largest trees and allows the harvesting of trees less than 30" diameter. Applying these standards in typical stands constituting spotted owl habitat will generally result in the removal of all trees <25 inches and sometimes result in the removal of all trees <30 inches. (Verner et al. 1992, Table 1G). Consequently, Alternative S2 would allow logging of a significant proportion of 20-30" trees, which are an important element of owl habitat. As a further result, Alternative S2 "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 2003, p. 2; Verner 2003b, p. 3).

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

Alternative S2 would reduce the Framework's existing canopy retention standards from 50 percent to 40 percent, while also increasing the amount of canopy reduction allowed from 10-20 percent to 30 percent.[5] According to Verner (2003b, p. 2), 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 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; Peery 2003; Blakesley and Noon 2003 (expressing "concern" about proposal)). 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).

Although Verner et al. (1992) described canopy cover of 40 percent as suitable foraging habitat, subsequent research has shown that 40 percent is now considered "only marginally suitable" for owl foraging. (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 73; USDI Fish and Wildlife Service 2003a, p. 7589). This research served as the basis for the Framework's standard of 50 percent canopy cover. The Review Team justified lowering allowable canopy levels by arguing that dense canopy is not as important as assumed in the FEIS.[6] (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. "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 2003, p. 3).

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[5] Although Alternative S2 would ostensibly retain 50 percent canopy cover as a goal, the proposed standard would allow canopy cover to be reduced to 40 percent whenever "site-specific project objectives cannot be met" utilizing the 50 percent standard, for example to "design cost efficient treatments." (DSEIS, p. 281). The legal standard would be 40 percent.

[6] The reanalysis discussed in the Review Team report is not included as new information in the DSEIS chapter on the California spotted owl (DSEIS, pp. 111-115) and has not been summarized or incorporated into the DSEIS. The Review Team report is not a NEPA document and has not been circulated for public comment, and a discussion in that report does not meet NEPA's purposes or requirements.

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 et al. 1999, p. 24). The proposed 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.

In addition, several studies have identified canopy layering as an important stand 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 proposed action would 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; see Bond 2003 for a summary of research.) Alternative S2 would weaken the Framework's retention standards for snags and down wood in at least two important respects. First, the overall standards would be made discretionary and could be modified at the individual project level without any apparent criteria to guide this decision. The effect of this change would likely be to retain fewer large snags and logs. Second, within OFEAs, the Framework's even stronger snag retention standards would be eliminated. (DSEIS, p. 278). 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). 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 2003, p. 4).

The proposed action would significantly increase both the number and acreage of PACs that could be degraded by logging. The Framework only allows logging in PACs within the defense zone of the WUI (17 percent of all PACs), whereas the proposed plan allows logging in PACs within the defense and threat zones (51 percent of all PACs). (DSEIS, p. 184). In addition, the proposal would allow a greater number of PACs to be entered by allowing 10 percent of PAC

acreage to be logged per decade, whereas the Framework allows 10 percent of PACs (by number, rather than by acreage) to be entered by logging per decade. (DSEIS, p. 184). Finally, the DSEIS reflects a significant expansion in the acreage of the wildland-urban interface compared to the Framework, resulting in additional PACs being included within the threat and defense zones. Consequently, the DSEIS projects that the proposed plan would treat a far greater number and acreage of PACs than would the Framework.[7] (DSEIS, p. 184, Table 4.3.2.3a).

Under Alternative S2, PACs within the defense and threat zones can be logged pursuant to the standards and guidelines for mechanical thinning treatments in mature forest stands.[8] 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 2003, p. 4). As stated by Dr. Verner: "In my 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).

Alternative S2 would render essentially meaningless the Framework's land allocations for HRCAs and OFEAs by applying the same logging standards and guidelines to these areas as to general forest. "The proposed action 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 2003, p. 4). As stated by another owl biologist, "the distinction between OFEA and general forest has disappeared." (USDA Forest Service 2003b, statement of Jennifer Blakesley).

The Framework strictly limits 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). Yet, despite this admonition, Alternative S2 "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).

[7] In fact, the actual amount of logging within PACs could be significantly greater than forecast in the DSEIS, since the DSEIS predicts that only 9 percent of PAC acres will be logged over twenty years, whereas Alternative S2 explicitly allows 20 percent of PAC acres to be logged over the same time period. (DSEIS, p. 184).

[8] Although Alternative S2 adopts a "replacement acre" concept (DSEIS, p. 189) where unmanaged acres would be added to PACs that had been disturbed by mechanical fuel treatments, it is important to recognize that the PACs, as currently delineated, contain the best available habitat surrounding nest sites and replacement acres will likely be of lower quality. (Verner 2003b, pp. 4-5; Peery 2003, p. 4).

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

The proposed action will allow 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." (DSEIS, p. 188). Yet the DSEIS acknowledges that the proposed plan "increases the risk identified for widening gaps between parcels, resulting in reduced owl densities and reduction in distribution of owls and owl habitat in AOCs." (DSEIS, p. 188). More specifically, the proposal "could potentially affect 52 PACs within geographic AOCs," resulting 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). Alternative S2 "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 2003, p. 5).

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

The proposed plan would allow full implementation of the QLG pilot project, utilizing the CASPO interim guidelines. The CASPO guidelines were not intended as a long-term strategy to ensure owl viability and allow significant degradation of owl nesting and foraging habitat. The QLG project "would result in a 7 percent decline in nesting habitat … by 2007 and an 8.5 percent decline in suitable habitat." (DSEIS, p. 186). These figures do not include additional habitat loss from the planned 39,200 acres or more of group selection logging. Moreover, the QLG project would exacerbate distributional gaps in areas of concern in the northern Sierra Nevada, which may reduce recruitment into the territorial population. (Peery 2003).

Because of these adverse impacts, the Biological Assessment and Evaluation for the QLG pilot project concluded that full implementation of the QLG project "could pose a serious risk to the viability of the owl in the planning area." (USDA Forest Service 1999a). Similarly, the Framework Record of Decision (ROD) determined 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." (USDA Forest Service 2001b, p. 51).

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. 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"); see also Blakesley and Noon 1999 (expressing "particular concern" about planned logging within QLG pilot project area).

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

In summary, Alternative S2 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." Based on these findings, owl scientists have concluded that the proposed 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. (Peery 2003; Bond 2003; Verner 2003b; Blakesley and Noon 2003).

3. There is No Significant 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. This assertion is unfounded. 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). As stated by Blakesley and Noon (2003), "we are aware of no evidence since the ROD that habitat associations of the California spotted owl in the Sierra Nevada province are other than previously reported."

Second, the specific information cited by the Forest Service in the DSEIS (pp. 28-29, 111-115) and elsewhere does not justify taking additional short-term risks with the owl.

a. Owl meta-analysis.

The Forest Service cites the recent meta-analysis for the proposition that the owl's rate of population decline "may not be as great as originally predicted" and "is not statistically different" from a stable population. DSEIS, p. 112. However, the DSEIS also concedes that the new methodology, like the old, shows "a declining trend in populations." (Ibid.). In particular, the meta-analysis detected a negative trend in lambda 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. 2002, p. 29). Further, the study found rates of adult owl survivorship that were lower than those reported for the Northern Spotted Owl, a subspecies listed as threatened under the Endangered Species Act, which indicates "concern for population stability." (Franklin et al. 2002, p. 36). There is also reason to believe that the new methodology overestimates the actual population

trend because it does not account for immigrants to the study area. (USDA Forest Service 2003b, comments of Dr. Jared Verner).

In sum, the recent meta-analysis concluded "that caution is advised in planning conservation strategies for the California spotted owl." (Franklin et al. 2003, p. 2). Thus, there is no sound basis for assuming that the owl's population is significantly more robust than previously assumed.

b. Owl listing decision.

The DSEIS (p. 29) cites the Fish and Wildlife Service's decision not to list the California spotted owl under the Endangered Species Act (USDI Fish and Wildlife Service 2003a) as "important pieces of information" that warrants taking additional short-term risks with respect to the owl. However, that decision was premised upon a lengthy analysis of the Sierra Nevada Framework, which supported a conclusion that "only a small amount of spotted owl habitat" would be rendered unsuitable under the Framework. (Ibid., p. 7600). The 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 owl scientists who have reviewed the DSEIS agree that the proposed action is likely to adversely affect the owl, contributing to a trend towards federal listing. (Peery 2003; Bond 2003; Verner 2003b; Blakesley and Noon 2003). Specifically, Alternative S2 is likely to render a substantial amount of owl habitat unsuitable over the short term. In other words, adopting Alternative S2 would undermine the basis for the Fish and Wildlife Service's decision, contributing to a finding that listing is warranted. Therefore, the Fish and Wildlife Service's decision not to list the owl in no way supports weakening existing protection for the owl as proposed in Alternative S2.

c. Pulse in owl reproduction in 2002.

The DSEIS notes that there was "a pulse in reproduction" of the California spotted owl in 2002. (DSEIS, p. 28). However, the owl scientists agree that this information, standing alone, is simply not relevant to an assessment of the owl's status or population trend. (Blakesley and Noon 2003, p. 2; Bond 2003, pp. 2-3). Moreover, the DSEIS fails to note that 2003 was "a very poor year for reproduction." (Blakesley and Noon 2003, p. 2). In sum, the 2002 results need to be analyzed and considered in context to have any bearing on owl population trends.

d. Contribution of private timberlands to owl habitat.

The DSEIS asserts that "circumstances surrounding the use and availability of owl habitat on private lands have also changed," requiring consideration of "the potential supply of private lands when evaluating the cumulative effect of Forest Service management activities." (DSEIS, p. 29). However, not only is there no new information with respect to owl habitat on private

lands, but there is no basis for assuming that private lands will make any substantial contribution to owl habitat in the future.

In parts of the Sierra Nevada, private forest lands are intermingled among national forest lands. Many of these areas of mixed ownership fall within the range of California spotted owl. Harvest practices on private lands are governed by the Forest Practice Act and implemented through the Forest Practice Rules. Since the California spotted owl is not listed under the State or Federal Endangered Species Act, the FPR do not contain specific protections for this species.

The DSEIS claims that "the recent trend in the Forest Practice Rules has been to provide increasing protection for water, fish, and wildlife. Additional protections are now being contemplated by the Board of Forestry and the California Legislature." (DSEIS, p. 146). The implication seems to be that resource protection may increase shortly; however, the DSEIS provides no details of current proposals or an analysis of their likely success. In fact, there are no rules currently under consideration by the Board of Forestry that would significantly improve habitat condition for California spotted owl on private lands.[9]

The DSEIS also identifies private land considerations as a part of the purpose and need for action:

> "circumstances surrounding the use and availability of owl habitat on private lands have also changed. California Practices Act regulations require private industrial timberlands to be managed in a sustainable manner and there is a need to consider the potential supply of suitable owl habitat on private lands when evaluating the cumulative effect of Forest Service management activities." (DSEIS, p. 29).

Even though private lands considerations were identified in the purpose and need, there is essentially no analysis in the DSEIS to address this issue. An evaluation of current habitat availability, existing conservation measures or the trends in timber harvest in recent time for private lands is missing from the DSEIS.

Without a doubt, the current 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). (Britting 2002, p. 8).

The FPR defines management direction by defining standards for tree retention and tree regeneration among other things. In all harvest prescriptions where forest structure is retained, the minimum levels of retention required are far below those recommended for nesting, roosting and foraging habitat for California spotted owl. (Britting 2002, p. 9). In those practices that do not require the retention of trees (e.g., clear cutting), stand rotations are generally at about 80 year intervals. (See for example Sierra Pacific Industries 1999). "This means that over time the

[9] See the Board of Forestry website for recent proposed and final rule packages: http://www.fire.ca.gov/CDFBOFDB/board/board_proposed_rule_packages.aspx

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 habitat in the short and long term.

Demographic studies for the California spotted owl have been conducted on four sites on national forest lands in the Sierra Nevada over the past 15 years. There are no demographic studies for private land. Recent studies in the Chico area suggest that the adult survival rates for a small set of owls occupying private land were very low (Irwin et al. 2003). Such low rates raise questions about the suitability of the habitat on private lands to support healthy owl populations. (USDA Forest Service 2003b, p. 11).

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 cutting harvest increased in this sub-basin and the surrounding area, owl activity that had been noted previously in these territories was absent. The extent to which the abandonment of territories is correlated with increased clear cutting in the Sierra Nevada is not known. However, the stability of the population on private lands is key to understanding the nature of owl habitat use on private lands.

The assumption that private lands contribute to sustaining the owl population is of particular concern to owl scientists:

> "To what extent does the assessment of effects of the Proposal on California spotted owls rely on the contributions of private lands to the area of suitable habitat in the Sierra Nevada? As I've stated in the past, I believe this is an unjustifiable approach, as the FS has no jurisdiction over how private lands might be managed. Only through rigorous MOUs or other such agreements might this be defensible, and then only if the agreements are *binding* ***and*** *transferable* to new owners of the land." (Verner 2003a, p. 11).

The owl scientists have expressed "skepticism" about the ability of private lands to support suitable owl habitat and have stated that "the thought that private lands is actually contributing habitat is not backed up by what is happening around the [Eldorado National Forest]. SPI is clear cutting most of their lands around the forest." (USDA Forest Service 2003b, p. 8). Furthermore, "private lands, and other sites are marginal habitat where owls move but don't contribute to the overall populations." (USDA Forest Service 2003b, p. 8). See also Blakesley and Noon 2003, p. 2 (relying "on private land to provide spotted owl habitat … is not a defensible position"). In sum, "it is not reasonable to expect that private lands will contribute to California spotted owl habitat, and the DSEIS provides no new information to justify such a change in assumptions." (Bond 2003, p. 4).

e. <u>Relationship between fire and spotted owl habitat.</u>

The DSEIS cites to purportedly new information regarding the loss of spotted owl habitat, particularly owl PACs, to wildfire. (DSEIS, pp. 29, 112-114). However, according to 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 DSEIS "is seriously and disturbingly misleading." (Bond 2003, p. 4).

For example, the DSEIS presents Table 3.2.2.3d, which ostensibly "identifies those PACs having significant acres burned to be considered lost." (DSEIS, p. 113). However, a careful examination of that table reveals that "of PACS that have been affected by nine recent wildfires, 13 are occupied, nine are of unknown status, and only two are known to be unoccupied." (Bond 2003, p. 5). In other words, of the burned PACs that have been surveyed for owls, only 2 out of 15 (13 percent) of the supposedly "lost" PACs are unoccupied, whereas 13 out of 15 (87 percent) are confirmed to be occupied. According to Bond, "it is puzzling how the Forest Service can conclude that these PACs have been 'lost' to fire when most of them are actually still occupied or their status is unknown." (Bond 2003, p. 5).

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).

A recent study (Bond et al. 2002), not cited in the DSEIS, "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).

The DSEIS reports 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," and that over the past 4 years "it appears that the annual rate of loss has increased to 0.34 percent." (DSEIS, p. 185). However, not only is the assumption of PACs being "lost" likely overstated, but the rate of loss is not a serious concern:

> A loss of 0.2 percent per year relates to a rotation period of 500 years, hardly enough to generate much concern for the rate of loss to fires. And how many of these PACs are rendered useless to the owls? How many have even been surveyed to protocol for the last 2 years to find out? (Verner 2003b, p. 2).

Moreover, "the DSEIS does not project how many PACs are likely to become unsuitable to spotted owls under the proposed alternative. In the absence of this projection, it is impossible to estimate the magnitude of possible future impacts on spotted owl populations." (Blakesley and Noon 2003, p. 4).

The DSEIS also projects "habitat losses at 68,000 acres per year over the next decade," and goes on to state that "at that rate, old forest habitat is burning up faster than it can be replaced." (DSEIS, p. 29). However, this information is flatly inconsistent with the DSEIS's estimate that the amount of old growth is projected to increase significantly in the future, under Alternative S1, S2, or the "no treat" alternative. (DSEIS, p. 181). Moreover, as explained by Dr. Verner, given that not all burns are conflagrations, this amount of burning is not as worrisome as portrayed in the DSEIS, and the "concern for the extent of wildfire damage in the Sierra Nevada is exaggerated" in the DSEIS. (Verner 2003b, p. 2).

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.

4. <u>The Analysis of Impacts on the California Spotted Owl in the DSEIS is Inadequate.</u>

   a. <u>The DSEIS fails to analyze uncertainty in modeling projections of future owl habitat.</u>

The DSEIS relies heavily on modeling to assess the relative effects of the alternatives on California spotted owls and their habitat and to conclude that the long-term benefits of Alternative S2 outweigh its short-term risks. The models used in the DSEIS contain a large

number of parameters, some of which were not estimated from empirical data. (DSEIS, p. 303). 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 DSEIS does not explicitly take into account and discuss uncertainty in model predictions. For example, the DSEIS fails to provide a range of model outcomes, such as minimum and maximum values that take into account modeling uncertainty. The DSEIS (p. 186) states that "the best available information was used to make [habitat] projections and must be considered best effort projections." "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).

The DSEIS 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." (DSEIS, p. 35). 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.

As described by Verner (2003b, p. 6), 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."

The failure to address modeling uncertainty was identified as a problem by the California Spotted Owl Federal Advisory Committee. In language fully applicable to the DSEIS, 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 failure to analyze and reveal uncertainty with respect to modeling of spotted owl habitat stands in stark contrast to the Forest Service's focus on issues of uncertainty surrounding owl population modeling. For example, the owl meta-analysis (Franklin et al. 2002) showed declining owl populations in several study areas, but the Forest Service characterizes these results as not "statistically significant" because of the uncertainty surrounding the results. [10] (DSEIS, p. 112). Blakesley and Noon (2003, pp. 3-4) state:

> 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 similarly 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*.

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

b. <u>The DSEIS fails to consider effects on spotted owls at the territory or landscape scales.</u>

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 DSEIS fails to consider the effect of eliminating

[10] "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).

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 DSEIS 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 DSEIS 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 2003).

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 DSEIS 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 2003).

Beyond that, the DSEIS fails to reveal basic information regarding how much owl habitat will be affected by the proposal with respect to relevant parameters like nesting and foraging habitat, land allocation, CWHR classes, and national forest. As explained by Dr. Verner:

> The Draft suffers from a marked shortage of summary tables and figures to allow reviewers to *see the big picture* more easily. For example, we need to see summary tables that present total acres affected by the DSEIS, total acres of suitable owl habitat (both foraging and nesting) by National Forest and CWHR habitat class, numbers of PACs by land allocation, and the acres in PACs by land allocation, etc. It takes entirely too much time to find some of these numbers in the text when we need them, and many of the important numbers apparently are not even given in the text. For example, a key element of any management regime is the rate at which treatments are done, and the easiest way to assess whether the rate is excessive or not is to look at the percentage of the landbase treated each year—the extent and intensity of the treatments and where treatments are done in relation to elevation, CWHR classes, zone delineations, suitable foraging and nesting habitats of the owls, etc. The way the DSEIS is written, I don't believe it's possible to sort out these details, but some well-crafted tables could make this

a relatively simple exercise. But without this information, it's not possible to get a full understanding of the likely effects, overall, of implementing the plan. (Verner 2003b, p. 2, emphasis added).

c. The DSEIS fails to explain or justify the significant expansion of the wildland-urban interface.

The amount of land in the WUI in the DSEIS (2,420,674 acres; p. 100) is roughly twice what it was in the Framework DEIS (1,212,000 acres; DEIS, p. 49). Concomitantly, the percentage of owl sites in the WUI increased from 34% to 51%, and the percentage of owl sites in the defense zone of the WUI increased from 4% to 15% (DEIS, p. 99; DSEIS, p. 184). This is a major increase in the acreage of forest with reduced restrictions on logging and will have a significant impact on owl habitat. The basis for increasing the WUI has not been explained or justified in the DSEIS and the impacts have not been assessed as required by NEPA.

d. The DSEIS fails adequately to assess cumulative impacts.

NEPA requires the Forest Service to consider cumulative impacts, which include the impacts of "other past, present, and reasonably foreseeable future actions regardless of what agency … or person undertakes such other actions." 40 CFR 1508.7. The DSEIS fails to consider the cumulative effects of the proposed action together with planned logging on private lands, barred owl invasion (Peterson and Robins 2003), and West Nile virus (USDA Forest Service 2003b). As described above, both the amount and intensity of logging on private timberlands has accelerated in recent years. To the extent that private timberlands contribute to owl habitat, this contribution is likely to diminish rapidly in the near future. The effect could be to render owl sites unsuitable for nesting, reducing the density of owls and contributing to an increase in nearest-neighbor distance. The failure to assess these cumulative impacts in the DSEIS violates NEPA.

B. Pacific Fisher

The proposed 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 population may warrant protection under the Endangered Species Act. The plan would substantially weaken existing 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. Together with the proposed plan for the Giant Sequoia National Monument, the proposal would further threaten the precarious status of the fisher in the Sierra Nevada, contributing to the present trend towards extinction. (Barrett 2003; Kucera 2003). Furthermore, according to fisher experts, there is no new information that would warrant weakening the existing protection for this species. (Barrett 2003; Buskirk 2003).

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).

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 of 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 were extremely high, averaging 92.5 percent. (Ibid., p. 89, Table 7). Beyond den and rest sites, research cited by the U.S. Fish and Wildlife Service found that "on the Sequoia National Forest, 66 percent of the average fisher home range was in 60 percent or greater canopy closure." (USDI Fish and Wildlife Service 2001, p. 84).

A Forest Service literature review, considered by the agency to constitute "the best available information applicable to the Sierra" (USDA Forest Service 1999, 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. (Freel 1991). 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).

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 positive 90-day finding, reports that the fisher population in the southern Sierra Nevada is geographically isolated from the nearest population by a distance that "is far beyond the species' known maximum dispersal distance." (USDI Fish and Wildlife Service 2003b, p. 41170). 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). According to a report co-authored by leading Forest Service biologists, the population has a high likelihood of extirpation within the next 50 years under all but the most optimistic assumptions. (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).

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 proposed plan would move 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 2003; Kucera 2003).

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

The proposed plan would threaten the fisher's viability in the Sierra Nevada. First, the plan would weaken 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 would also weaken 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 over the long term. Moreover, these issues have not been adequately addressed or disclosed in the DSEIS, as required by NEPA.

a. The proposed plan would weaken protection for currently occupied habitat.

The first step in a 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 2003, p. 3). The proposed plan would weaken the Framework's existing protection for currently occupied fisher habitat in a number of important respects.

First, the southern Sierra fisher conservation area would 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 requires 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 generally 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." (USDI Fish and Wildlife Service 2001, p.84). The new proposal would entirely eliminate this requirement and would allow the SSFCA to be logged utilizing the same standards and guidelines as general forest (DSEIS, p. 299), even though there is no new information to warrant weakening the existing protection.

In addition, the proposal would eliminate 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 proposal substantially threatens the ability of these areas to support fisher denning, resting, and foraging." (Barrett 2003, p. 4).

Third, the proposal would weaken existing restrictions on logging that protect the key elements of fisher habitat, including large trees, dense and multi-storied canopy, and large snags and down wood:

- Large trees. The proposal would allow widespread logging of medium and large trees that are currently protected by the Framework. The proposed 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. Both the Forest Service and Fish and Wildlife Service have characterized key fisher habitat in terms of "large diameter (greater than 24 inch dbh) live conifer and oak trees with decadence." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 6; USDI Fish and Wildlife Service 1999, p. 11). 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 2003, p. 4).

- Canopy cover. The proposal would allow canopy cover to be reduced by as much as 30 percent, down to a minimum of 40 percent. 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). In sum, the proposed plan would allow significant degradation of habitat that is currently suitable for fisher denning and resting, despite the fact that there is no new information to justify weakening the existing plan.[11] (Barrett 2003; Buskirk 2003).

- Multi-storied canopies. 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 proposed 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.

- Large snags and down logs. The proposal would provide the Forest Service with broad discretion to weaken the existing 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. Thus, by providing broad leeway to weaken existing snag and down wood retention standards at the local level, the proposed plan would threaten an important component of fisher habitat.

- Eastside habitat is not adequately protected. The fisher inhabits eastside pine habitat within the SSFCA (DEIS, p. 175), and historically inhabited eastside habitat in the central and northern Sierra (Grinnell et al. 1937). The proposed plan would weaken the Framework by abandoning any protection for canopy cover in eastside forests (DSEIS, p. 282) and by "raising the maximum diameter limit of trees that can be cut from 24 inches to 30 inches" (DSEIS, p. 177). The Fish and Wildlife Service has expressed concerns that "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). Yet the Forest Service concedes that within the new plan "there are no guidelines in place that would adequately protect remaining fisher habitat within this vegetation type." (DSEIS, p. 175).

The proposed plan would also eliminate the limited operating period (LOP) surrounding fisher den sites for all activities other than vegetation management. (DSEIS, p. 238). The

[11] The DSEIS states (p. 173) that "fisher will use habitats at 40% canopy closure and less if there are sufficient clumps of denser vegetation with large legacy elements for rest sites." However, the DSEIS fails to provide any support or references for this assertion, and it is contrary to the best available research in the Sierra Nevada, as summarized by Freel (1991).

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 proposed plan.

The cumulative effect of removing large trees, reducing canopy cover, and reducing large snags and down wood would be to reduce the amount of resting and denning habitat within the SSFCA. As the DSEIS acknowledges, the proposed action "has the potential to degrade denning habitat across the SSFCA." (DSEIS, p. 174). Such widespread degradation of currently occupied habitat is inconsistent with the Forest Service's legal duty to ensure viability of the fisher and to manage the fisher's habitat so as to avoid contributing to a trend towards federal listing. (Barrett 2003; Kucera 2003).

b. <u>The proposed plan would weaken protection for potential fisher habitat in the central and northern Sierra, thereby discouraging necessary range expansion.</u>

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 2003; 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 2003, p. 4). "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, <u>subjecting it to stochastic events and possible extirpation</u>." (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." (<u>Ibid.</u>, p. 3-46). 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 proposed plan would significantly weaken protection of potential fisher habitat in the central and northern Sierra. As a general matter, as described above, the new standards and guidelines would 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. (Barrett 2003, pp. 4-5).

More specifically, the proposal would allow full implementation of the QLG pilot project, which will significantly increase the amount and intensity of logging in the northern Sierra Nevada. 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). 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 Fish and Wildlife Service also expressed concerns about intensive logging of eastside forests under the QLG proposal, which will be exacerbated by the current proposal'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).

In sum, by allowing significantly increased logging in the central and northern Sierra Nevada, particularly within the QLG pilot project area, the proposed 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. (Barrett 2003; Kucera 2003).

3. The Analysis of Impacts on the Fisher in the DSEIS is Inadequate.

The Forest Service is required by the National Environmental Policy Act (NEPA) and its own planning regulations to utilize the best available information and to disclose and analyze all

significant environmental impacts in the DSEIS. In this case, the agency has failed to comply with these duties in its assessment of the plan's likely impacts on the fisher.

a. The DSEIS is not based upon the best available information regarding the fisher.

The DSEIS fails to reflect the best available information regarding the status of the Pacific fisher, including Aubry and Lewis (2003) and the recent finding by the U.S. Fish and Wildlife Service that the fisher may merit protection under the Endangered Species Act (USDI Fish and Wildlife Service 2003b). This new information elevates the concerns regarding the fisher's conservation status and calls into question the Forest Service's conclusion in the DSEIS that the risks of the proposed action are acceptable.

Aubry and Lewis (2003) studied the status of the fisher in the Pacific states and reported on ongoing threats to the fisher's viability. Their results confirm that the southern Sierra Nevada population of the fisher is geographically isolated, and "that the geographic continuity that once provided for genetic interchange among fisher populations in western North America no longer exists" (p. 88). As a result, the vulnerability of the southern Sierra population to extirpation is greater than previously considered. The authors conclude that "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).

The recent positive 90-day finding by the U.S. Fish and Wildlife Service is even more significant, potentially heralding the conclusion that the Pacific fisher is a threatened or endangered species. In response to the finding, numerous forest carnivore experts have expressed their view that the west coast population of the fisher requires protection as an endangered species. (Buskirk et al. 2003). Notably, the finding by the Service emphasizes that "the potential effects of the SNFPA will have to be reevaluated based on any changes that are adopted as a result of the final supplemental EIS." (USDI Fish and Wildlife Service 2003b, p. 41173). Thus, a decision by the Forest Service to weaken the Framework along the lines proposed in the DSEIS is likely to strengthen the case for federal listing under the Endangered Species Act.

b. The DSEIS fails to assess the impacts of the proposed action on habitat connectivity in the central and northern Sierra Nevada.

There is a widespread consensus, reflected in the positive 90-day finding by the Fish and Wildlife Service, that restoring and maintaining habitat connectivity in the central and northern Sierra Nevada is essential to the recovery of the fisher throughout the Sierra.

> "Lack of habitat connectivity may result in significant delay or failure to access and use patches of suitable habitat. Lack of connectivity may also contribute to population isolation. The analysis of the 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 Service similarly remarked in its consultation on the Framework FEIS:

> Retaining suitable fisher 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…. 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. (USDI Fish and Wildlife Service 2001, p. 134).

Despite these serious concerns, the analysis in the DSEIS addresses "only known occupied habitat" (DSEIS, p. 172) and entirely fails to examine the impacts of proposed logging on fisher connectivity and dispersal to the central and northern Sierra.[12] "The failure to assess habitat connectivity in the DSEIS effectively sweeps this important issue under the rug and precludes a meaningful analysis of the plan's effects on the fisher population in the Sierra Nevada." (Barrett 2003, p. 5). In particular, the DSEIS fails to analyze potential habitat bottlenecks, such as the area west and north of Yosemite National Park and the checkerboard lands in the central and northern Sierra, which could impede fisher movement in the absence of habitat restoration efforts. (Ibid.).

c. The DSEIS fails adequately to assess cumulative impacts.

NEPA requires the Forest Service to consider cumulative impacts, which include the impacts of "other past, present, and reasonably foreseeable future actions regardless of what agency … or person undertakes such other actions." 40 CFR 1508.7. The DSEIS fails adequately to consider cumulative impacts on the fisher from at least three sources: the Giant Sequoia National Monument plan, the Kings River adaptive management study, and logging on private timberlands.[13]

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[12] The DSEIS states (p. 172) that the Framework "FEIS included projections of improved habitat, connectivity and opportunity for expansion of existing populations," and that "these projections appear to remain valid." However, the FEIS did not analyze the proposal in the DSEIS, which is significantly weaker than the Framework. Therefore, the conclusions in the Framework FEIS do not apply to the proposed action in the DSEIS. The Fish and Wildlife Service also expressed concerns that the Framework decision "may not provide for the expansion of the Pacific fisher because the proposed action will be managed to only specifically provide suitable habitat in their current range." (USDI Fish and Wildlife Service 2001, p. 132). Moreover, the FEIS assumed "that the provision of California spotted owl habitat and Old Forest Emphasis areas will provide adequate connectivity for fishers across the action area" (ibid., p. 134), and the proposal in the DSEIS would significantly weaken protection for owl habitat and OFEAs.

[13] The effects of proposed salvage sales on Forest Service lands, such as the McNally project within the southern Sierra fisher conservation area, also need to be considered when analyzing the cumulative effects of implementing the proposed action.

The DSEIS acknowledges "concern over the cumulative effects of adaptive management studies in the Kings River demonstration area and potential changes in management under the Giant Sequoia National Monument Management Plan," which together cover approximately 29 percent of presently occupied fisher habitat. (DSEIS, p. 176). The Kings River project has proposed intensive logging which, if applied across the range, "would greatly increase risk and uncertainty over viability" of the fisher. (DSEIS, p. 175). Dr. Reginald Barrett, one of the leading fisher researchers in California, has concluded that the draft Giant Sequoia National Monument plan would threaten the fisher's viability by reducing, degrading, and fragmenting suitable habitat. (Barrett 2003, p. 5). "At a minimum it is essential that the Forest Service consider the combined impacts of the GSNM plan and the proposed amendments to the Sierra Nevada Framework in one document." (Barrett 2003, pp. 5-6).

The Forest Service also must consider the impacts of logging on private timberlands both on currently occupied habitat and on potential habitat in the central and southern Sierra. As stated by the Fish and Wildlife Service, "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 DSEIS to provide a complete picture of how the proposed plan will impact the fisher." (Barrett 2003, p. 6).

Unfortunately, the DSEIS entirely fails to analyze the cumulative impacts of these actions on the fisher and its habitat. 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 2003a). Yet, despite admitting to "concern" over cumulative effects, the draft SEIS fails to analyze any of these issues.

d. <u>The DSEIS obscures likely direct effects by averaging projected impacts over large areas and long time periods.</u>

The analysis of consequences to the key parameters of fisher habitat serves to obscure likely impacts to the fisher by averaging effects over long time periods and large areas. For example, with respect to large trees, the DSEIS (p. 173) only reports "current average conditions" across the entire range, projected "out to 20 years." Thus, shorter-term impacts within the SSFCA are not even considered. Similarly, the DSEIS only examines "average canopy closure across the SSFCA," without consideration of how canopy closure will be reduced in the thousands of acres that will be subject to logging.

In sum, the DSEIS concludes (p. 175) that "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." At a minimum, the DSEIS must provide a sufficient level of detail to demonstrate that the proposed action is consistent with the Forest Service's legal duty to ensure the fisher's viability. The level of generality in the DSEIS serves to gloss over likely impacts and therefore fails to comply with NEPA.

D. American Marten

Like the Pacific fisher, the American marten is a forest carnivore closely associated with relatively closed canopy and late-successional forests. The proposed action would significantly weaken existing 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 proposed action "is likely to threaten the viability and distribution of the marten in the northern Sierra Nevada, potentially leading to local extirpation." (Barrett 2003, p. 6; see Kucera 2003, p. 3). These impacts are not adequately disclosed or analyzed in the DSEIS, and the conclusion in the DSEIS that the proposed action 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; USDA Forest Service 1999, p. 118). "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 1999, 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 on the north, south, and west sides of the basin." (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 another 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)." (USDA Forest Service 2001, Volume 3, Chapter 3, part 4.4, p. 19). A study on the Inyo National Forest concluded that "mean canopy cover at marten locations was significantly greater than at random sites," and recommended that "future management planning should … provide 40% or greater canopy cover for marten habitat" in eastside Sierra forests. (Strehl 1996).

"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 1999, 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 to constitute "the best available information applicable to the Sierra" (USDA Forest Service 1999, 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."

The marten's close association with late-successional forests is problematic, 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). Of even greater concern, 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).

The DSEIS states that "martens currently appear to be well distributed throughout their historic range in the Sierra Nevada." (DSEIS, p. 180). This assertion 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). 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). Thus, as stated by Dr. Kucera in his review of the DSEIS, "it is disconcerting that this important information is neither referenced nor discussed in the DSEIS, despite the fact that the Forest Service is proposing significant increases in the amount and intensity of logging in this area." (Kucera 2003, p. 1).

The apparent fact that martens are 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.

> [M]arten have relatively small home ranges [for forest carnivores] and low dispersal capabilities. Thus, small, isolated populations of these species 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 great concern, increasing the likelihood that remaining populations will become isolated and extirpated. (Barrett 2003, p. 6).

2. <u>The Proposed Plan Would Threaten the Marten's Distribution and Viability in the Northern Sierra.</u>

The proposed plan would significantly weaken existing 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 proposal 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 proposal would allow 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 proposed action would allow 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 proposed plan would adversely affect all of the following key attributes of suitable marten habitat:

- <u>Large trees.</u> The proposal would allow widespread logging of medium and large trees that are currently protected by the Framework. The proposed 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 1999, 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 2003, p. 3). Thus, removal of these trees will contribute to the further degradation of marten habitat.

- Canopy cover. The proposal would allow greater reductions in canopy cover than permitted by the Framework and would also reduce 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. "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 1999, 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 proposed plan would allow 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 proposal would provide the Forest Service with broad discretion to weaken the existing 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 1999, p. 114).

The proposed plan would also eliminate the limited operating period (LOP) surrounding marten den sites for all activities other than vegetation management. (DSEIS, p. 238). 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 proposed plan.

These proposed 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, as currently proposed by the Forest Service, would dramatically increase both the amount of logging and the intensity of logging compared to the existing 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 2003, p. 6).

Although the impacts on the marten of fully implementing the QLG project are nowhere addressed in the DSEIS, a review of the QLG EIS and its administrative record reveals the following:

- 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 [QLG FEIS], 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 proposal will allow at least 39,200 acres of new group selection openings in the QLG area. (DSEIS, p. 231). 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 2003, p. 3). Despite these findings and research, the DSEIS 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 proposal would allow 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 2003, p. 4). 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 DSEIS does not mention 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).

In short, the proposal to significantly increase both the amount and intensity of logging in the northern Sierra, and to weaken existing protection for marten habitat in the QLG area and in eastside forests, 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 proposed action 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 2003, pp. 2-3, emphasis added).

3. The Analysis of Impacts on the Marten in the DSEIS is Inadequate.

The Forest Service is required by the National Environmental Policy Act (NEPA) and its own planning regulations to utilize the best available information and to disclose and analyze all significant environmental impacts in the DSEIS. 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.

a. The DSEIS fails to disclose or analyze the apparent gap in the marten's distribution in the northern Sierra Nevada.

An intensive, rangewide survey effort has revealed 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. (Kucera 2003; Zielinski 2002; USDA Forest Service 2001, Volume 3, Chapter 3, part 4.4, p. 22; USDA Forest Service 1999, p. 113; Kucera et al. 1995). The DSEIS entirely fails to disclose or analyze this information, and instead incorrectly states that "martens currently appear to be well distributed throughout their historic range in the Sierra Nevada." (DSEIS, p. 180). 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 2003, p. 7). Therefore, the DSEIS's failure to reveal and analyze this significant information violates NEPA's full disclosure requirements as well as the agency's duty to utilize the "best available data" during forest planning. 36 C.F.R. 219.12(d).

b. The DSEIS fails to analyze forest openings and their likely impact on the marten.

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 2003, p. 3; Barrett 1999). Yet this issue is not even mentioned, much less analyzed, in the DSEIS. This failure to consider a significant environmental impact violates NEPA and the agency's duty to use the best available data in planning. (Kucera 2003, p. 4; Barrett 2003, p. 7).

c. The DSEIS fails to examine the impacts on the marten of fully implementing the QLG pilot project.

One of the most significant differences between the proposed plan and the existing Framework is the decision to fully implement the QLG pilot project. As described earlier, the result of this decision will be to greatly increase both the amount and intensity of logging in the northern Sierra Nevada, where the marten's population is already depleted, leading to a significant risk of adverse impacts to the marten. Unfortunately, neither the public nor the decision maker is made

aware of these potential impacts, because the DSEIS entirely fails to mention them. (Barrett 2003, p. 7).

For example, the DSEIS concludes that, "in the context of the broad planning area, Alternative S2 would result in little overall change in marten habitat compared to Alternative S1." (DSEIS, p. 182). This conclusion ignores the fact that in the QLG area, which covers approximately 1.5 million acres, the difference in impacts is likely to be highly significant.[14] More generally, the analysis in the DSEIS averages predicted impacts over the entire planning area and over a lengthy time horizon, the effect of which is to obscure likely significant impacts in the QLG area over a shorter time period.

In short, the DSEIS's failure to assess impacts on marten in the QLG planning area effectively sweeps this important issue under the rug.

d. The potential for adverse impacts to the marten in eastside forests is not adequately addressed.

The DSEIS acknowledges the possibility that the proposal could increase the risk to elements of marten habitat in eastside pine forests. However, the DSEIS concludes that "although Alternative S2 allows greater canopy cover reduction and removal of larger trees than Alternative S1 in the eastside pine type, this should not pose a significant risk to marten persistence since martens on the eastside are generally found in the red fir and mixed conifer transition zones." (DSEIS, pp. 180-181). In fact, the DSEIS acknowledges elsewhere that Jeffrey pine and eastside pine constitute "important forest types for martens" (DSEIS, p. 179), and research demonstrates marten use of Jeffrey pine (Kucera 1996) and lodgepole pine forests (Spencer et al. 1983) on the eastern slope of the Sierra. Therefore, there is a significant risk of adverse impacts to martens in eastside pine forests, which the DSEIS fails to assess. This failure to consider an important environmental impact violates NEPA.

e. The DSEIS obscures likely direct effects by averaging projected impacts over large areas and long time periods.

As with the analysis for fisher, the analysis of consequences to the key parameters of marten habitat serves to obscure likely impacts to the marten by averaging effects over long time periods and large areas. For example, with respect to large trees, the DSEIS (p. 177) projects that both alternatives "would maintain similar amounts of very large and large trees" at the end of 20 years. Although the DSEIS recognizes that "in the eastside pine type, Alternative S2 results in a greater degree of risk to large tree retention by raising the maximum diameter limit of trees that can be cut from 24 inches to 30 inches," the DSEIS fails to analyze the extent or impact of this standard. (DSEIS, p. 177). Given that extensive logging is planned within eastside forests within the QLG pilot project area, there will likely be a significant reduction in large trees within

[14] Moreover, the DSEIS conclusion was based on the assumption "that red fir types would not generally be managed for fuels treatments" (DSEIS, p. 182), even though the QLG planning records acknowledge significant concerns regarding planned DFPZs within red fir forests and their adverse impact on forest fragmentation and marten habitat. (USDA Forest Service 1999a, p. 123).

this area, which will adversely affect the marten. However, the DSEIS glosses over these and other likely impacts and therefore fails to comply with NEPA.

III. FIRE AND FUELS

Fire and fuels management was one of the five problem areas addressed in the SNFPA FEIS. The purpose of the proposed action 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, p. 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 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." (USDA Forest Service 2001b, p. 29)

> "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 ROD sought to balance habitat and species protection with the need to manage for fuel reduction, the DSEIS emphasizes resource extraction at the expense of sensitive species and habitats.

As will be shown below, the fundamental premise of the analysis in the DSEIS – that the acres burned by wildfire will increase in the future based on trends from the last 30 years – is not supported by evidence in the project record or elsewhere. As a result, the argument forwarded in the DSEIS that the overly aggressive fuel treatment proposed in Alternative S2 is required at the expense of habitat is not supported. Further, the DSEIS fails to provide new information to support the alleged need to change the ROD, fails to accurately portray the No Action alternative (Alternative S1), and fails to support the conclusions stated in the DSEIS with analysis.

A. 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 DSEIS. One is the average number of acres burned annually for the period 1910 to 1980 (USDA Forest Service 2003, p. 161) and the other is a projection into the future of the rate that acres burned during the period 1970 to 1999.[15] (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.5, p. 279-280; DSEIS, p. 162). The DSEIS focuses its discussion of effects only on a comparison of trends projected in Alternatives S1 and S2 compared to the "No treatment" condition.

Previous analyses of the fire history in the Sierra Nevada do not support an increasing trend in wildfire acres burned over time. McKelvey and Busse (1996) evaluated fire patterns on Forest Service lands in the 20th century. They examined fire frequency, size, and association with vegetation type, elevation, aspect, and weather patterns. They concluded that for the period examined (1909 to 1992) "time trends showed no overall trend in acreage." (McKelvey and Busse 1996, p. 1119). This conclusion is also supported by Keeley and Pfaff (2003) who found that for the period between 1990 and 2001 in the Sierra Nevada region, the number of acres burned did not increase with time – essentially, there was no trend with time. These studies demonstrate that historically the amount of area burned has not increased with time on Sierra Nevada national forests. In terms of what to expect in the future, McKelvey and Busse (1996, p. 1137) concluded "if conditions present in the twentieth century (fuels, weather, and suppression capabilities) continue, we can expect the patterns developed in these analyses to be stable into the near future." The lack of time trend in this analysis and the conclusions made by the authors indicates that there is no basis to suggest that there would be a projected increase in acres burned in the future.

The DSEIS and FEIS provide no evidence to support the use of a projection that shows increased acres burned over time. The findings above and elsewhere indicate that wildfire events are stochastic in nature (McKelvey and Busse 1996, p. 1122) and not well represented by

[15] This trend line is represented in Figure 4.2.4a as the "BM – No Treat."

considering the occurrence of fire as an expected value as was done for the DSEIS. Remarkably, the FEIS recognizes the inability to predict the rates of wildfire that will burn in the future:

> "Rates of change in future wildfire acreages burned from historic levels are unknown and were not included in the modeling." (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.5, p. 281).

Nonetheless, the effects analysis in the DSEIS relies entirely on comparing the performance of two alternatives that are driven by an increased number of wildfire acres burned each year – a premise that is not supported in the project record or by recent studies. As a result of making these unsupported projections of wildfire acres burned for the coming 14 decades, the context for decision making has no basis in reality.

B. The method used to estimate the severity of acres burned in the future is not supported by the best science and is inconsistent with other characterizations of severity used in the modeling.

The DSEIS uses a static value, i.e. the historic proportions of wildfire severity by forest type, to set the proportion of acres burned by lethal, mixed-lethal, or non-lethal severity each decade. As indicated above, there is no basis to presume that the severity of wildfire will be static in the future. As will be demonstrated below, there also is no reason to presume that fire severity will be the same for a given forest type throughout the Sierra Nevada region.

Fire behavior is determined by weather conditions, the nature of the fuels, and topography. (Biswell 1999, p. 18). Inferring fire severity from historic occurrences assumes that weather conditions for the period used to derive the estimates are the same as for the period for which the projections will be made. As mentioned above, there is no support in the project record for this assumption. The contribution that fuels and topography make to fire behavior was inferred from the vegetation analysis. For this analysis, the variability in fire severity was simply classified by forest type. However, the qualities of a stand that affect fire behavior are quite varied and include moisture content, the ratio of dead to living material, the ratio of fine to coarse material, the amount of fuels, the arrangement of fuels and their continuity. (Biswell 1999, p. 22). The qualities of topography that affect fire behavior are slope, aspect and elevation. (Biswell 1999, p. 33). The analysis in the DSEIS assumes that within a given forest type the variation in surface and ladder fuels, tree diameter, stand density, topography does not influence fire behavior and the resulting patterns of severity. This assumption is contrary to what is known about fire behavior and is contrary to subsequent use of fire behavior relationships in the DSEIS.

The very model that the Forest Service uses to estimate the effects of fire (First Order Fire Effects Model, FOFEM; USDA Forest Service 2001a, Volume 4, Appendix B, p. B-37) requires information on the density of trees by size class and species. (USDA Forest Service 2001a, Volume 4, Appendix G, p. 12). The DSEIS uses FOFEM to determine "for each unique stand of trees" the differing effects that non-lethal, mixed-lethal, and lethal fires have on stand condition. (USDA Forest Service 2001a, Volume 4, Appendix G, p. 12). The alterations that fires of differing severity make in each unique stand of trees then represent changes in the stand resulting

from wildfire and are returned to the model to grow. (USDA Forest Service 2001a, Volume 3, Chapter 3, part 3.5, p. 271). On one hand, the DSEIS presumes that the effect of fire is static in time and can be explained by a simple correlation to forest type. Then in a reversal of logic, the DSEIS recognizes that the effect of fire varies with stand condition and uses this information to estimate the nature of a stand following fire. The use of a fire severity estimate based solely on forest type is not supported by the current knowledge of how fire affects stand conditions and is inconsistent with the interpretation of how fire affects a stand in other aspects of the modeling framework in the DSEIS.

Beyond the questionable prediction of future fire severity, the methods used to estimate the severity of past fires are not sound in and of themselves. Severity of past fires was inferred from maps of existing vegetation. 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 DSEIS 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).

Tree mortality in the DSEIS 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 modeling of fire severity relies on questionable methods that are inconsistent with the current understanding of fire effects. Aspects of these methods result in an overestimation of areas affected by lethal and mixed-lethal fire and other elements affect the predictions in ways that are not known. As a result of these failings, the predictions of the future severity of wildfire in the DSEIS are not reliable.

C. The DSEIS fails to accurately model treatment prescriptions in Alternative S1 thereby underestimating the benefit of this alternative to fuels reduction.

In terms of the modeling framework, the "success" of a given alternative depends on its ability to effectively reduce fire effects on a given acre and across the landscape. In the modeling for the DSEIS, only two prescriptions were determined to be "not effective" at the per acre scale: 1) "underburn for ecological purposes" (flame length < 2 ft.); and 2) "6-inch hand" (only allows the

removal of material <6").[16] (Barber 2003c). Effectiveness at the landscape scale was modeled by assigning an added benefit when 30 percent of the acres in a watershed had been "effectively" treated at the per acre scale. When 30 percent of the watershed had been treated, a benefit of 2:1 was achieved and "the flamelength is not only reduced on the acre treated but on the adjacent acre as well, so for every 2 acres treated 1 untreated acre receives the reduced flamelength when those acres burn." (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.5, p. 292). For the modeling construct, success in reducing future acres burned with wildfire depends on maximizing the number of acres "effectively" treated.

Assessing vegetative condition and applying prescriptions that fit the vegetative conditions is a key element in Alternative S1. A vegetation classification system – California Wildlife Habitat Relations (CWHR) – was used to define various habitat types. CWHR types 4m and 5m are common habitat types that occur throughout the project area. Collectively, they are characterized by conifer forest types with average tree diameters 12 inches or greater and canopy cover ranging from 40 percent to 60 percent.

The modeling of harvest prescriptions that can be applied to CWHR types 4m and 5m is knowingly misrepresented in the DSEIS.[17] 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. Because the Review Team claimed that canopy cover differences between 50 and 59 percent could not be distinguished, timber harvest in these areas was limited to the removal of trees with diameters of 6 inches or less. (USDA Forest Service 2003a, p. 26, 34-35).[18] In reality, 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), which would be considered effective fuels treatments.

Presently, there are approximately 1.8 million acres of CWHR type 4m and 5m in the analysis area (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.1, p. 98). As a result of inappropriately constraining the harvest prescriptions on these acres under Alternative S1, the treatment applied is not considered "effective" in meeting fuel objectives. The underestimation of the acres that can be "effectively" treated under Alternative S1 is not disclosed in the DSEIS.

Vegetation data prepared for the Middle Fork Cosumnes analysis provides insight on the amount of area that could be erroneously excluded from "effective" treatment under the modeling

[16] Generally speaking, fuel treatments in the DSEIS were determined to be "effective" on the per acre basis if they achieved a fuel model 8. (Barber 2003c). "While the DSEIS discounts the treatment that removes material 6 inches and under as ineffective, it is possible to create Fuel Model 8 with this treatment, assuming surface fuels are treated simultaneously, probably with prescribed fire of some type. Limbing up to increase the height to live crown would be an important component to the treatment to increase the length of time before treatment is required again." (Rice 2003, p. 1). The DSEIS fails to recognize and disclose the full potential of the prescriptions to achieve fuel objectives thereby underestimating the benefit of Alternative S1 to fuel reduction.

[17] 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.

[18] Refer to discussion below for additional analysis of delineating canopy cover in the ROD.

scenario used for Alternative S1 in the DSEIS. The vegetation layer used in the Middle Fork Cosumnes analysis delineates canopy closure into 10 percent classes. (Barber 2003a). The analysis area totaled about 53,000 acres. Of this area, the Sierran mixed-conifer (SMC) type occupies about 58 percent of the land base. Of the SMC type where stands have been classified with average tree diameters that are 12" or greater, the distribution of canopy cover is shown in the table below.

Sierran Mixed-Conifer type with average tree size 12" DBH or greater

Canopy closure	Proportion of MFC area in SMC (%)	Proportion of MFC area (%)
0-39%	9.6	5.5
40-49%	10.7	6.1
50-59%	26.2	15.1
>60%	53.5	30.8

This means that, given the limitations imposed by the DSEIS, about 15 percent of the SMC landscape in the Middle Fork Cosumnes analysis area is not treated "effectively" even when the Framework explicitly allows such treatments. There are other forest types, of lesser representation in the analysis area, that are also affected by this application of the standards and guidelines. As a result, the estimated area inappropriately removed from "effective" treatment is greater than 15 percent of the Middle Fork Cosumnes assessment area.

Because of this approach to modeling Alternative S1, the DSEIS fails to adequately analyze the effects of the alternatives on the environment and fails to provide a reasonable comparison among the alternatives. Thus, any conclusions about the alleged "poor" performance in achieving the fuel objectives for Alternative S1 relative to S2 can not be supported by the analysis.

D. The Review Team failed to properly interpret the process available to measure canopy cover

The Review Team assumed that because they believed that canopy cover could not be accurately measured for stands that were between 50-59 percent canopy cover, canopy cover could not be reduced in those stands. (USDA Forest Service 2003a, pp. 26, 34-35). Thus, the prescriptions applied in the modeling of Alternative S1 were limited to prevent the reduction of canopy cover on all CWHR types 4m and 5m.

In considering this issue, the Review Team failed to complete an accurate review of the ROD standards and guidelines. There is a standard and guideline that specifically addresses the issue of measuring canopy cover:

> **"FW-f05O, Consistent methodology for determining canopy cover**
> Aerial photography interpretation serves as the basis for determining canopy cover associated with stand retention guidelines for vegetation treatments and serves as the

> basis against which other methods must be calibrated. Since canopy cover is difficult to estimate with precision, monitoring the implementation of canopy cover standards using stand measurements must anticipate a degree of variation from the standard. Variation is acceptable provided that treatments have been planned and implemented using reasonable methods for estimating pre-treatment and projecting post-treatment canopy cover. Pre- and post- treatment canopy cover estimates from the ground should attempt to exclude trees less than 6 inches dbh since these trees contribute little to useable canopy cover for spotted owls but may substantially contribute to ladder fuels. Canopy cover estimates may be averaged over a treatment area up to 20-40 acres in size unless the stands identified in RX21G are smaller." (USDA Forest Service 2001a, Volume 4 Appendix D-1, p. 23).

This standard allows for a process to be developed to measure canopy cover and supports the monitoring of the process to ensure that the canopy cover objectives are being met. The process also allows canopy cover to be averaged over 20-40 acres, except when identifying CWHR types 5m, 5d, and 6, thereby increasing the flexibility available to measure and meet this stand condition. Furthermore, the standard allows the use of other methods to estimate canopy closure, but directs that they must be calibrated against air photo interpretation. The Review Team is correct in concluding that "the extent to which fuels treatments would be limited to 6-inch dbh material … was not an intentional outcome of the ROD." (USDA Forest Service 2003a, p. 26) However, the Review Team failed to recognize that there was flexibility in the standard to resolve any measurement issues.

In spite of the issue made about measuring canopy cover under Alternative S1, the DSEIS proposes an alternative that requires the measurement of canopy cover in precisely the same way. Alternative S2 requires that projects "retain a minimum of 40 percent canopy cover within the treatment unit." (DSEIS, p. 53). If the same logic is applied to modeling Alternative S2 as was done for S1, then CWHR types 4m and 5m whose canopy is from 40-49 percent canopy cover can only be harvested with a prescription that limits removal of material to trees with diameters of 6 inches and less. However, the DSEIS does not apply this limitation to the modeling to Alternative S2. (USDA Forest Service 200b3, pp. 310-313). This differential treatment of Alternatives S1 and S2 is essentially arbitrary and skews the analysis in favor of Alternative S2.

Not only did the Review Team fail to identify the flexibility inherent in the ROD regarding the measurement of canopy cover, the DSEIS also fails to apply the same logic used in Alternative S1 when modeling Alternative S2. As a result, the alternatives can not be fairly compared to one another and the results are biased toward showing a "poorer" performance for Alternative S1 relative to S2.

E. The DSEIS fails to identify any new information that would support the proposed changes to the existing ROD.

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

recommendations as containing "aspects of the existing management direction that must be refined to achieve this goal." (DSEIS, p. 4). The Review Team raised four 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 DSEIS. In all cases, the issues raised by the Review Team are not new or are not supported by their own analyses.

1. Comparison of the ROD outcome to 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. (DSEIS, p. 97). With respect to the ROD, 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).

As demonstrated above, the DSEIS grossly underestimates the number of acres that can be treated to effectively meet fuel objectives under the existing plan. The analysis accomplishes this by mischaracterizing the level of treatment that can be completed on CWHR types 4m and 5m. It is unknown how many acres have had the wrong treatment prescription applied to them, but if the distribution of habitat types from the Middle Fork Cosumnes landscape analysis is used as a proxy, more than 15 percent of that analysis area was not being treated as aggressively as it could have been. Given that the target for successfully treating a watershed is 30 percent, improperly removing 15 percent of the landbase from treatment will negatively bias the results and lead to poorer performance with respect to reduction in wildfire acres burned. Thus, the Forest Service developed an analysis that knowingly biases the results in favor of reporting a reduced performance for Alternative S1. The DSEIS fails to estimate the degree to which the land base is mischaracterized and fails overall to recognize this misinterpretation of Alternative S1. As a result, there is no support for the claim that the actual application of mechanical fuels treatments in the ROD is so limited as to preclude achievement of the goals in the National Fire Plan.

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).

Beyond this general statement about the effectiveness of the ROD, the Review Team recommendations make additional claims that are not supported by the project record.

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)

This summary statement leads one to believe that practices in the ROD do not affect the severity of the acres burned by wildfire. However, the results of the Middle Fork Cosumnes analysis present evidence to the contrary. Following treatment, modeling results indicated that mixed-lethal and lethal acres burned were reduced by about 50 percent compared to untreated conditions. (USDA Forest Service 2003a, p. 29) This positive outcome was reported in spite of the fact that the analysis underestimates the actual number of acres that can be more aggressively treated to reduce fuels. Given that at least another 15 percent of this basin could have been more aggressively treated, it is reasonable to expect the results, when modeled appropriately, to yield an even greater reduction in severely burned acres. Thus, the Review Team's conclusions that the ROD does not reduce the number of acres severely burned conflicts with results from their own analysis.

b. The cost of treatments is high.

Consideration of treatment costs is not new to the DSEIS. 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 Review Team recommendations and DSEIS fail to provide any additional information on the changed cost of implementing treatments. If anything, the DSEIS indicates the cost to implement Alternative S2 likely exceeds S1.[19]

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 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.

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. (DSEIS, pp. 307-309). The Review Team concluded that:

> "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).

Despite these exhortations, the Review Team recommended and the DSEIS proposes an alternative that relies upon more prescribed burning to complete the desired treatments. (DSEIS, pp. 164). As in other cases, this appears to have been raised to "make the case against the ROD" but in reality Alternative S2 does not propose a different approach.

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

[19] Although Table 4.2.4c in the DSEIS reports that treatment costs for Alternative S2 are $49 million per year for the first decade, this table fails to include costs associated with an additional 11 miles of road associated and 110 miles of reconstruction per year with the implementation of the HFQLG Act. (DSEIS, p. 237). Additional road costs are estimated to be at least $5.2 million based on road construction estimates of $93,000 per mile and $38,247 per mile for reconstruction. (USDA Forest Service 2001b, Volume 2, Chapter 3, part 3.5, p. 447). The cost of "an increased level of decommissioning" (DSEIS, p. 237) is not included in this estimate and would further increase the additional costs.

standing and down woody material left with long-term watershed health." (USDA Forest Service 2003a, p. 50).

Ironically, the direction in the ROD on salvage gives broad discretion to the ranger districts to complete projects. For non-Old Forest Emphasis Areas the 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, 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, A-42).

Much like the management style touted in Alternative S2, the direction on salvage in the ROD 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. <u>Insects and disease</u>

Lastly, the Review Team recommendations identify the absence of direction on treating insect and drought conditions to be a serious omission in the ROD. This point was addressed explicitly in the Appeals 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 inventing the need for direction when their own reviewing officer 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 DSEIS significantly changes the purpose and need for action, and thereby requires scoping and a more thorough analysis than was completed for the DSEIS.

F. 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.

Alternative S2 proposes to remove trees up to 30 inches in diameter and reduce canopy cover in the name of increasing the effectiveness of 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 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 a result, the thinning of "smaller diameter trees or biomass removals" in essence produces "stands structurally similar to what are thought to have been presettlement conditions. Resulting forest structures will be more open, less likely to support crown fire, and less likely to exhibit extensive areas of extensive fire effects." (McKelvey et al. 1996, p. 1037). In contrast, medium-large trees contribute little to surface fuels, are more fire resistant, and generally do not act as fuel ladders under most fire intensities. (McKelvey et al. 1996, pp. 1035-1037).

Additionally, negative effects on fire behavior 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.

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).

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." (Stephens 1998, p. 32). 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.

In sum, the findings of recent studies all identify the importance of removing small diameter ladder and ground fuels as actions that may reduce the risk of catastrophic fire. 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 DSEIS fails to discuss or to utilize this information to evaluate trade-offs between canopy retention and fuels treatment effectiveness.

G. The DSEIS 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 DSEIS 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. (Barber 2003c). As such, treatments that only remove material up to 20 inches in diameter and maintain canopy cover at 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. Thus, the primary purpose of reducing canopy cover to 50 percent and removing trees over 20 inches in diameter can not 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 wildfire acres burned resulted from applying the Framework standards. 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). This level of treatment led to a

50 percent reduction in lethal and mixed-lethal fire type in the analysis area.[20] (USDA Forest Service 2003a, p. 29). A second landscape analysis completed for the Middle Fork Cosumnes area found that treatments as directed in the ROD reduced fire size, reduced the number of acres intensively burned, and reduced flamelengths when post-treatment fire was modeled in the analysis. (Eldorado National Forest 2002). 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.

Analysis completed by the Forest Service for the DSEIS and elsewhere indicates that treating fuels as directed by the ROD can reduce the risks of catastrophic fire. Given that the analysis of the ROD completed by the Review Team significantly underestimates the benefit achievable under the ROD, estimates of fire effects will be reduced even more when the modeling is corrected. The DSEIS fails to consider this in the analysis of effects.

IV. AQUATIC, RIPARIAN AND MEADOW ECOSYSTEMS

Improving management of the aquatic ecosystem has been a fundamental issue from the initiation of the forest plan amendment process. As stated in the ROD, "a primary purpose of the Sierra Nevada Forest Plan Amendment is to develop regional direction that will protect and restore aquatic, riparian, and meadow ecosystems and provide for the viability of native plant and animal species associated with these ecosystems." (USDA Forest Service 2001b, p. A-5). As we demonstrate below, Alternative S2 significantly degrades the aquatic conservation strategy outlined in the ROD and has a low likelihood of providing sufficient protection for aquatic ecosystems and dependent species to meet legal and policy requirements. Further, the environmental analysis presented in the DSEIS is inconsistent with conclusions published in the FEIS, is internally inconsistent, and fails to disclose the impacts of Alternative S2 on the environment. Finally, the DSEIS fails to present convincing evidence to support a change in management direction and pursues a review that far exceeds that directed by the Chief of the Forest Service in 2002.

A. Alternative S2 Degrades the Aquatic Management Strategy

The Aquatic Management Strategy (AMS) consists of "a suite of interrelated actions that work together to manage and conserve aquatic habitats." (USDA Forest Service 2001b, p. A-5). The ROD identified the following five elements of the AMS: 1) desired condition statements; 2) riparian and aquatic refuge land allocations; 3) standards and guidelines for management activities; 4) ecological assessment methods; and 5) an adaptive management program. (USDA Forest Service 2001b, p. A-5). Alternative S2 contains numerous changes that weaken the effectiveness of the AMS described in the ROD. These changes also fundamentally alter the ability to meet desired conditions and conserve aquatic habitats and dependent species.

[20] Given accurate modeling of this alternative, the acres of lethal and mixed lethal wildfire would be even less.

1. Reductions in canopy cover, removal of large trees, and increased salvage logging will result in greater disturbance to the riparian conservation areas (RCA).

The analysis in the DSEIS presumes that since both alternatives must apply the same AMS goals that there is little difference in the effects to the aquatic and riparian environment. (DSEIS, p. 161). This presumption is inconsistent with the logic used elsewhere in the analysis and faulty for a number of reasons.

First, the DSEIS itself conflicts with this reasoning by stating "Alternatives S1 and S3 provide the highest assurance of meeting the AMS goals, primarily due to their treatment methods and intensities in various land allocations." (DSEIS , p. 11). The DSEIS goes on to state that "Alternative S3 has slightly more uncertainty than Alternative S1 because it allows more use of mechanical treatments in the defense zone and potentially in the threat zone." (DSEIS, p. 11). These statements reflect an evaluation of effects that conflict with the overall conclusions in the aquatic section of the DSEIS which suggest that there are no differences between the two alternatives.

Second, nothing in Alternative S2's standards and guidelines precludes treatments in the RCA that are more intensive than allowed under the existing plan. Rather the judgment about the appropriate level of treatment is left to project level analysis. In the case of Alternative S1, the judgment of those in the field is guided by the objective to limit treatment to achieve the fuel objective and practices are limited by the management prescriptions that govern the different land allocations. Because Alternative S2 applies a uniform management prescription to all land allocations and lacks direction on how to balance competing objectives (i.e. economics vs. fuel reduction vs. aquatic conservation), there is a significant risk that intensive treatments will be proposed in the RCAs, consistent with the standards and guidelines.[21]

In fact, current timber sale planning on several forests supports the view that intensive treatments will be used in the RCAs and that there are cases where under the current direction little additional regard is given to these areas. The Blue Canyon Fuels Reduction Project (Tahoe National Forest 2003) serves as an example of how the AMS is applied today. This project establishes RCAs as prescribed in the ROD and identifies a no-harvest zone adjacent to the stream. This zone varies in size with the stream type. Outside of the no harvest zone, but within the RCA, harvest is allowed using low-ground-pressure equipment, skyline logging, and helicopter logging. The harvest intensity in these areas is the same as allowed by the overlapping land allocation and reflects the maximum allowed under the existing direction. This timber sale indicates that the current practice does not result in reduced harvest intensity in the RCA. Thus, there is no basis to presume that under Alternative S2 future treatments would not be proposed in the RCA or that the more intensive treatments allowed in Alternative S2 would not be applied in the RCA.

[21] Oddly enough, this potential conflict is recognized in the DSEIS (p. 160) and the Forest Service's response is to deny any ability to "forecast the extent of the conflict."

Third, Alternative S2 includes a substantial increase in road construction, reconstruction, temporary roads, and decommissioning with the implementation of the HFQLG Act. (DSEIS, p. 237). "The greatest risk of sediment moving into streams occurs when roads cross streams…. Existing roads constitute current and potential sources of sediment. In general, higher road densities translate to a higher potential for adverse effects to aquatic and riparian habitats." (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.4, p. 208). Despite having previously recognized that increased road density can be directly related to adverse impacts to aquatic and riparian habitats, the DSEIS fails to even mention that Alternative S2 will result in the construction of about 100 miles of road in the first decade. (USDA Forest Service 1999, p. 3-20). This is almost 5 times the amount of road construction estimated for the first decade under the ROD. (USDA Forest Service 2001a, Volume 2, Chapter 3, part 5.5, p. 450).

Lastly, the intensity of treatments varies between Alternatives S1 and S2 with respect to retained canopy closure and structure in ways that are important to microclimate. This was recognized clearly in the FEIS. Based on findings in Erman and Erman (2000), the FEIS found that "alternatives that remove smaller material and require higher crown closures will have a greater benefit to the aquatic and riparian ecosystem." (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.4, p. 236). The DSEIS fails to address this issue directly. Given that there are no restrictions preventing the reduction of canopy in RCAs and specific desired condition statements about opening sizes with respect to RCAs are absent, the likely removal of significantly more large trees and reductions in canopy closure reduces the benefit that Alternative S2 will have on aquatic values.

Compared to Alternative S1, Alternative S2 allows the removal of three times as much timber over the same land base and allows the removal of larger trees and a greater reduction in canopy cover. By the Forest Service's own assessment, such factors decrease the likelihood of achieving the aquatic conservation goals (DSEIS, p. 24). Combined with the huge increase in road construction, Alternative S2 significantly reduces the likelihood that the aquatic conservation goals will be met.

2. Alternative S2 weakens protections for general meadow conservation and in turn weakens the AMS.

Alternative S1 establishes measurable forage standards for meadow areas. (DSEIS, p. 271). Alternative S2 adopts these same standards and then adds:

> "Where professional judgment and quantifiable measurements find that current practices are maintaining range in good to excellent condition, the grazing utilization standards above may be modified to allow for the Forest Service, in partnership with selected permittees, to rigorously test and evaluate alternative standards." (DSEIS, p. 271).

Presently, a clear and measurable definition of "good" or "excellent" condition for range does not exist. The FEIS was clear on this point:

> "Range condition classes, poor, fair, good, etc, are arbitrary categories used to classify range condition (SRM, 1974), and relate more to forage production factors than ecological condition." (USDA Forest Service 2001a, Volume 2, Chapter 3, part 5.3, p. 403).

Furthermore, the relationship between the classification of range in "good" or "excellent" condition and the classification of range "early seral" or "late seral" status has not been articulated. As a result, alternative management prescriptions may be proposed on early seral range in "good" condition that in the end may preclude the ability to achieve desired conditions. Given that the desired condition for meadows is "late seral" (USDA Forest Service 2001b, p. 11), proposing standards that extract more forage from meadows in early seral condition could well impede their development to late seral condition and prevent the attainment of the desired condition. This would compromise achievement of the AMS goals. Beyond this, the lack of clarity in the definitions of terms and the failure to commit to the structure necessary to implement the alternative management program[22] precludes the ability to "rigorously test and evaluate alternative standards."

If the desire is to implement adaptive management in grazing settings, the addition of this standard to Alternative S2 is unnecessary. Presently, adaptive management is allowed under the current direction:

> "Adaptive management is one of the key elements of this decision…To accomplish this, I will allow for variances from the standards and guidelines in Appendix A to test hypotheses in a scientifically structured manner. Projects that seek variances from the standards and guidelines will be permitted if they are a part of a formal adaptive management research project or administrative study done in conjunction with the Pacific Southwest Research Station or another recognized scientific institution." (USDA Forest Service 2001b, p. 15).

This direction provides guidance on the structure necessary to achieve the rigorous testing and evaluation referenced in Alternative S2 and is not confounded by undefined terms.

The standard in Alternative S2 weakens the current direction because it uses terms that are ill defined and fails to identify a structure to implement adaptive management that will ensure the habitat protection or scientific rigor that it proposes. As a result, the condition of many mountain meadows and other riparian areas will deteriorate as implementation of Alternative S2 generates a hodgepodge of inconsistent, untested and unpredictable livestock management programs throughout the Sierra Nevada. If, as is likely, the Forest Service continues to be unable to adequately monitor forage utilization or other livestock impacts (see footnote 21), deterioration of these critical aquatic ecosystems will proceed undetected and uncorrected, leading to increased viability risk to numerous species.

[22] Identification of the mechanism to accomplish the "rigorous testing and evaluation" is especially important in light of the Forest Service's failure to complete required monitoring. For example, the 2002 monitoring report for range conditions showed that only 50 percent of the benchmark or key areas were monitored for compliance with annual operating instructions, or national forest standards and guidelines that season.

3. Alternative S2 weakens protections for sensitive species that are dependent on aquatic ecosystems thereby weakening the AMS.

The success of the AMS relies in part on achieving the goal to maintain habitat to support viable populations of desired species (USDA Forest Service 2001b, p. A-6). A number of changes proposed for willow flycatcher, Yosemite toad, mountain yellow-legged frog and great gray owl jeopardize the viability of these species and preclude the ability to meet the AMS goals.

a. Willow flycatcher

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 nests in the study area, from 62 in 1998 to 2 in 2002. (Bombay and Morrison 2003). The DSEIS also identified that:

> "Consistent survey efforts on the Sierra and Stanislaus National Forests in the past several years show a lack of willow flycatcher occurrence at a number of well-documented 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 occupancy of willow flycatchers." (DSEIS , p. 116).

Further, the ongoing demographic study in the north central Sierra Nevada concluded that "the willow flycatcher population in the north central Sierra Nevada has declined significantly since 1997." (Bombay and Morrison 2003, p. 20). All monitoring and assessment efforts 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). In spite of this clearly stated concern, the DSEIS identifies a Preferred Alternative that fails to protect important habitat for willow flycatcher and places the species at even greater risk of extirpation, according to a review by willow flycatcher expert Dr. Susan Sanders. (Sanders 2003).

The management direction for Alternative S2 differs from Alternative S1 in several significant ways. The willow flycatcher sites in Alternative S1 where conservation measures are applied are limited to a subset (66 sites) of the known sites (82 sites) that were covered in Alternative S1. Sites that were eliminated from the network were those in which willow flycatcher had not been observed during a specified survey period. These sites that were known to support willow flycatcher in the past are simply dropped from consideration in Alternative S2. Also, direction to identify suitable habitat is significantly limited in Alternative S2 and there is no requirement to complete surveys within a specific time period. Instead of systematically evaluating suitable habitat, Alternative S2 simply allows suitable habitat to be considered in project level planning. "To make the surveys project-dependent prevents collection of systematic data regarding movement of willow flycatcher populations. To gather the kind of data needed for a comprehensive, systematic plan for managing and eventually restoring populations of willow flycatcher all emphasis habitats should be surveyed to protocol at least once every five years." (Sanders 2003, p. 8). Directing conservation and restoration activities toward more than the 66

sites is important since even adequate protection of these sites by themselves "is unlikely to sustain a viable willow flycatcher population." (Sanders 2003, p. 7).

The time of late season grazing has been shortened to August 15 for Alternative S2 (versus August 30 for Alternative S1) and late season grazing will be allowed in occupied habitats. (DSEIS, p. 56). In contrast, grazing is prohibited in occupied meadows under Alternative S1. (DSEIS, p. 43). "Allowing grazing in occupied meadows, including late season grazing, has significant potential to harm nesting willow flycatchers. The revised LOP date in Alternative S2 fails to protect approximately 10 percent of willow flycatcher nests that on average fledge after August 15th. Undetected willow flycatchers in any sites that receive annual season-long grazing will experience direct and indirect effects of livestock grazing and will be placed at greater risk. 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. The Standards and Guidelines in Alternative S2 are intended to prevent this from occurring, but these guidelines are so general and subject to individual interpretation that there are no guarantees that grazed meadows will not be degraded. … 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, emphasis added).

Further, Alternative S2 allows the limitation on late season grazing to be waived if a site-specific meadow management strategy is developed. (DSEIS, p. 263). "The only protection provided here is that a general goal exists to protect willow flycatchers and their habitat, which is no protection at all. If this Standard and Guideline is to be implemented, then region-wide standards for preparing such a management strategy should be developed, and a Biological Evaluation should be prepared before implementing the proposed management strategy. For each site, the Biological Evaluation needs to consistently address all potential impacts of grazing (e.g., cowbird parasitism, hydrological and vegetative changes, nest disruption, increased predation) to willow flycatchers and their habitat before adopting and implementing a specific management strategy for that site." (Sanders 2003, p. 7).

Finally, "the DSEIS does not adequately incorporate recommendations and information contained in the conservation assessment (Green et al. 2003). As clearly summarized in the conservation assessment, 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). In the absence of a comprehensive strategy to address willow flycatcher conservation, Alternative S2 will lead to isolated populations that are more vulnerable to extirpation. (Sanders 2003, p. 2).

New information available since 2001 identifies increased risks to populations of willow flycatcher. 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. In the face of these important findings, the DSEIS proposal

contains less management certainty and greater risk to willow flycatcher and increases the likelihood of extirpation of this species from the planning area (Sanders 2003).

b. Yosemite toad

The U.S. Fish and Wildlife Service determined in 2002 that the listing of Yosemite toad was warranted. 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 2000b). Livestock grazing was specifically identified as having adverse effects on habitat and having contributed to direct loss of individuals.

Alternatives S1 and S2 both direct the exclusion of livestock from "standing water and saturated soils in wet meadows and associated streams and springs occupied by Yosemite toads or identified as 'essential habitat' in the conservation assessment for Yosemite toad during the breeding and rearing season (as determined locally)." (DSEIS, pp. 260-261). However, Alternative S2 establishes a major loophole by allowing grazing to continue when there is a "site specific management plan to minimize impacts to the Yosemite toad and its habitat by managing the movement of stock around wet areas." (DSEIS, pp. 218). The DSEIS does not identify any process by which such management plans would be reviewed to ensure adequate protection of the species or consistency with the best available science. The DSEIS recognizes that "this option is more problematic and difficult to implement because livestock can easily drift into the wet meadow portions of the meadows they are grazing in."[23] (DSEIS, p. 219). In all cases where differences are noted between the alternatives, the DSEIS identifies that Alternative S2 has a higher likelihood of negative effects to Yosemite toad. Further, the DSEIS identifies "aspects of toad ecology and survey" that "are likely to confound the results of any short-term (3 year) monitoring effort." (DSEIS, p. 220). Despite the determination by USFWS that listing the Yosemite toad is warranted, the DSEIS proposes a conservation strategy that is significantly more uncertain and risky than the conservation strategy adopted in the ROD.

Alternative S2 also extends the timeline for completion of Yosemite toad surveys and more importantly removes any consequences of failing to complete the surveys. Instead, livestock use, which damages both Yosemite toads and their habitat (DSEIS, p. 126), can continue with no protection for Yosemite toad and in the absence of any monitoring of this species' condition or trend. Again, Alternative S2 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.

c. Mountain yellow-legged frog

[23] The field trip hosted by the Forest Service Review Team to the Sierra National Forest on June 26, 2002 serves as a case in point. As we approached the stop where we were to discuss Yosemite toad management (adjacent to a wet meadow that supports Yosemite toad), cows were seen drifting about in the meadow areas from which they were meant to be excluded. Fencing was not being used to control the cows; rather they were being managed (ineffectively) by herding.

Recently, the USFWS determined that listing under the Endangered Species Act was warranted for mountain yellow-legged frog. (USDI Fish and Wildlife Service 2000a). Activities impacting mountain yellow-legged frog include livestock grazing and pack stock use and access. (DSEIS, p. 216).

Changes in the general management of meadows and in the conservation strategies for several species (i.e. Yosemite toad, willow flycatcher) affect mountain yellow-legged frog conservation. The DSEIS states:

> "Some mountain yellow-legged frog populations overlap with habitat for the Yosemite toad, willow flycatcher, or great gray owl. Alternative S2 changes some of the grazing management standards and guidelines related to these species that could potentially indirectly affect the mountain yellow-legged frog." (DSEIS, pp. 17-18)

For example, Alternative S2 allows season-long grazing in at least 15 meadows with wet meadow habitat, willow assemblages, and sufficient prey base to sustain willow flycatchers in the recent past. Such wet meadow areas are highly likely to be suitable for mountain yellow-legged frog as well. Under Alternative S1, livestock would be excluded until late season grazing, with a far shorter overall grazing season. Thus, overhanging grasses of seeps and pools would be less grazed, providing critical winter and dry-season cover to mountain yellow-legged frog tadpoles and juveniles.

In wet meadow habitat areas within the known, occupied willow flycatcher territories, and in meadows known to contain breeding and rearing habitat for Yosemite toad, Alternative S1 requires exclusion. Alternative S2, on the other hand, allows ill-defined management plans to "minimize impacts" to the toad and to avoid suitable habitat for the willow flycatcher. The difference between exclusion from a meadow and the looser management in locally devised plans may have an adverse impact on the mountain yellow-legged frog, which needs grass cover long into the fall season and on into the winter months when grasses may form a snow-covered protective barrier from freezing. For important biological reasons, ranging from risk of trampling to sloughing of stream banks to pocking in wet areas, the sporadic presence of livestock outside of the actual willow habitat or toad breeding areas may be directly threatening mountain yellow-legged frog in those same meadows.

The DSEIS claims that with respect to mountain yellow-legged frog "there is no discernible difference between implementation of Alternatives S1 and S2 from the current condition." However, as demonstrated above, this is simply not true. Alternative S2 weakens general meadow and specific species conservation measures and is, in turn, likely to negatively affect mountain yellow-legged frog. (See Vrendenburg 2003). Thus, Alternative S2 weakens conservation measures for this at- risk species and jeopardizes the ability to meet the AMS goals to maintain viability of desired species.

d. Great gray owl

Great gray owl is listed as endangered under the California Endangered Species Act and is a sensitive species under Forest Service management. This species has "only 5 to 10 known nest territories on national forest lands and a small total population size in the Sierra Nevada." (USDA Forest Service 2001a, Volume 3, part 4.2, p. 42). No new survey information is presented on the distribution or population status of this species in the DSEIS.

Presently, conservation measures for great gray owl include: 1) establishing a PAC around the nest stand and associated meadows; 2) maintaining "herbaceous meadow vegetation at least 12 inches in height and covering 90 percent of the meadow" (USDA Forest Service 2001b, p. A-38); and 3) adaptive management (USDA Forest Service 2001a, Volume 1, Chapter 2, p. 166). In spite of existing research that finds increased prey abundance in meadows with a mean vegetation height of 12" (Greene 1995), Alternative S2 eliminates the measurable standards and simply directs the maintenance of "herbaceous vegetation at a height commensurate with site capability and habitat needs of prey species." (DSEIS, p. 295).

In the absence of clear standards, it is uncertain what will actually occur under Alternative S2. This was recognized, in part, in the DSEIS:

> "Given that there is little research on foraging requirements of great gray owls or on habitat relationships of their key prey species in the Sierra Nevada ecosystems, it is unknown how this change in requirements will affect great gray owls other than herbaceous retention levels will be lower for those meadows that are incapable of attaining 12 inches in height." (DSEIS, p. 212).

What the DSEIS failed to identify is the uncertainty of meadow height retention for all great gray owl meadows and not just those "incapable of attaining 12 inches in height." If the intention was to recognize site capability constraints, then the standard could have been changed to "maintain herbaceous meadow vegetation commensurate with site capability up to 12" in height." Without specific direction, the potential for meadow conditions to be managed at levels that are less than optimal for great gray owl is high in part because there is no guidance on how to balance the competing objectives to "reduce unintended and adverse impacts on grazing permit holders" (DSEIS, p. 1) and to "maintain and restore habitat to support viable populations of … vertebrate riparian-dependent species" (USDA Forest Service 2001b, p. A-6).

But fundamentally, there is no need to change the existing guidelines. As addressed in the Chief's appeal response, there is an adaptive management approach outlined in the FEIS (USDA Forest Service 2001a, Volume 1, Chapter 2, p. 166) and:

> "Finally, the SNFPA provides local decision-makers with considerable discretion in the final design of individual great gray owl PACs and defines a means by which the standards and guidelines may be modified." (USDA Forest Service 2001c, p. C-24).

Oddly, the importance of adaptive management is identified in the DSEIS:

> "Since additional study and active monitoring of great gray owl populations may be needed to determine habitat needs of prey species in meadows that meet that criteria, this may be an area suitable for adaptive management." (DSEIS, p. 212).

In spite of the fact that the Forest Service recognizes that the uncertainties and risk associated with the management of great gray owl make it appropriate for adaptive management, Alternative S2 seeks only to adopt management actions that are less well defined and that have a lower likelihood of success than Alternative S1.

As to the analysis of effects of the alternatives on great gray owl, the DSEIS repeatedly states that the effects of Alternative S2 are uncertain and are likely to remove more large trees than Alternative S1. Yet, the conclusion is that "Alternative S2 tends to lead to greater improvement [of habitat] over time." (DSEIS, p. 213). This conclusion is unfounded for three reasons. First, the DSEIS fails to portray the uncertainty of implementing effective conservation measures in the absence of measurable standards.

Second, the analysis incorrectly relies upon long term modeling to conclude that fewer acres will be burned and fire severity will be reduced, thereby improving habitat conditions relative to Alternative S1. As found by the Forest Service:

> "Fifty years is a reasonable bound on what one might consider the reasonable foreseeable future for an analysis of this type. Fifty years is sufficient to demonstrate meaningful directional changes in stand structure under the various management regimes, but it is not so long that unforeseen changes in species composition or regeneration degrade the ability to predict stand dynamics. That is, it provides a picture far enough into the future to indicate that conditions are progressing toward a given state, but not so far into the future that there are serious concerns about the accuracy of the projections." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4, p. 3).

Examination of the modeled effects of the alternatives on "old growth late seral stage forest" (DSEIS, p. 181, Table 4.3.2.2a) indicates that there is no difference between the alternatives through the fifth decade. The DSEIS also found that:

> "The amount of [late seral forest] patches ranked as 4 and 5 increased steadily in both alternatives, but neither of the alternatives reached 40 percent of the forested landscape until the seventh decade." (DSEIS, p. 50).

Similarly, there was essentially no difference[24] between Alternatives S1 and S2 in the numbers of large or very large trees on the landscape. (Barber 2003b). Thus, the modeling results when considered over time frames deemed appropriate by the Forest Service indicate that large trees and old forest conditions increase under Alternative S1 despite the effects of wildfire. Thus, the

[24] At the fifth decade, Alternative S2 had 1.8% more very large trees than Alternative S1, and Alternative S2 had 4.8% more large trees than Alternative S1.

claims that "Alternative S2 tends to lead to greater improvement over time" (DSEIS, p. 213) because the adverse effects of wildfire are reduced is not supported by the analysis of large tree numbers or patches of forest in late seral condition, two aspects important to habitat quality for great gray owl.

Third, the DSEIS fails to take into consideration the moist open environment of meadow systems associated with great gray owl nest trees. Because of these conditions, such areas are not likely to sustain high intensity burns. Combined with this, the low intensity wildfires that might affect these meadow complexes and intervening forested areas can increase early seral stage vegetation that supports prey species critical to the great gray owl. In reality, there is no evidence to support the conclusion that "Alternative S2 tends to lead to greater improvement over time." (DSEIS, p.213).

Throughout the discussion of the great gray owl, the DSEIS fails to underscore that the single most direct and protective measure of Alternative S1 (i.e. the 12" herbaceous cover requirement supporting increased prey abundance (Green 1995) is so weakened in Alternative S2 as to provide no enforceable or measurable protection. As a result, Alternative S2 weakens the AMS and jeopardizes the ability to maintain viability of great gray owl.

e. Fish

The DSEIS gives cursory treatment to the 10 federally listed and 10 Forest Service designated sensitive fish species occurring in the planning area. The DSEIS presents no data on condition or trend for these species and provides no analysis of the effects of the alternatives on them. Instead, the DSEIS dismisses impacts to federally listed species in following brief statement:

> "The FEIS compared the projected habitat and population outcomes for each of these species. No differences were described across the range of alternatives for any of the species. Implementing the proposed changes in the SEIS would not be expected to produce appreciably different trends from current conditions as described in the FEIS. Therefore, no additional analysis is needed for this group of fish species." (DSEIS, p. 326)

For the sensitive fish species the DSEIS states:

> "The FEIS provided two tables that projected the effects of management on these species over 50 years. One table estimated the effects implementing the alternatives on each species habitat within the Sierra Nevada national forests. The other forecast relative population trends for the animals over the same time period. The tables suggest that none of the alternatives would result in a significant change from the current condition for any species. There is no evidence to suggest that implementing the proposed changes in the SEIS would result in conditions that are recognizably different from the trends described for all alternatives in the FEIS. Therefore, further analysis for these species would not be helpful." (DSEIS p. 329)

Neither statement is supported by data, analysis, or even anecdote to help readers understand how these conclusions were reached or to judge their validity.

In fact, the vast majority of native trout species in the planning area are so imperiled as to be either federally listed or designated Forest Service sensitive. This situation is testimony to the deteriorating ecosystem health of aquatic ecosystems and their mismanagement in the Sierra Nevada that made the ROD necessary in the first place.

Despite the poor condition of fish species, the proposed action presents no plans for their conservation, or even for their monitoring. Unlike other species such as the willow flycatcher and mountain yellow legged frog, the geographic distributions of listed and sensitive fish are well known. It would thus be relatively easy to implement conservation strategies for the watersheds and water bodies in which they occur. The DSEIS makes no such proposal.

As demonstrated throughout these comments, there are significant differences in the impacts of Alternatives S1 and S2 to the aquatic and meadow ecosystems that support Sierran fish. Alternative S2 will significantly weaken the Aquatic Management Strategy on which the health of riparian ecosystems depends. The DSEIS openly and repeatedly acknowledges that Alternative S2 will result in increased road building, road reconstruction, logging, grazing, spread of invasive species, and other human disturbances that adversely impact aquatic habitats.

Mismanaged grazing in particular is well known to degrade fish habitat. Most of the 20 listed and sensitive fish species occur in grazing allotments that are currently active. Mismanaged livestock can damage stream banks, increase erosion and sedimentation, destroy riparian vegetation and defecate and urinate into water bodies leading to the spread of pollution and disease (see e.g. Menke et al., 1996; Kondolf et al, 1996; Kattleman, 1996). Grazing related impacts to listed and sensitive fish are well recognized by the Forest Service. The Inyo National Forest has rested two allotments that provided habitat for California's State Fish, the California Golden Trout, because of grazing related habitat degradation. This national forest rested another allotment to protect the State's most imperiled fish, the federally listed Piaute Cutthroat trout. The U.S. Fish and Wildlife Service has also placed grazing management restrictions on allotments in habitat for the Little Kern Golden Trout on the Sequoia National Forest.

Alternative S2 allows measurable increases in allowed livestock use throughout the planning area (15 percent reduction in impacts to permittees). (DSEIS, p. 236). Alternative S2 also encourages that adoption of untested experimental livestock management protocols in an unknown number of grazing allotments. Changes in grazing impacts are greatest in areas occupied by Yosemite toad and willow flycatcher. (DSEIS, p. 236). At the very least, the DSEIS should have provided some analysis of the probable effects of changes in grazing management under the Alternatives in areas where listed and sensitive fish share habitat with these species.

In summary, the severe imperilment of listed and sensitive fish species is known, and the conflicts between mismanaged livestock and native fish are well documented. Further, Alternative S2 will substantially increase allowed livestock use as well as encourage inconsistent

and unpredictable livestock management and will allow substantial increases in other activities such as logging and road building that will further degrade fish habitat. Despite the clear evidence of threat to fish resources, the DSEIS fails to identify and analyze differences in fish impacts among alternatives. There is in fact no evidence to support the DSEIS assertion that there are no differences in impacts among alternatives. On the contrary, information presented in the DSEIS leads inevitably to the conclusion that implementation of Alternative 2 is likely to increase risks and threaten viability for the 20 listed and sensitive fish species covered by the plan.

B. The stated reasons for changing riparian and meadow conservation standards conflict with the conclusions in the Chief's appeal decision on the ROD and the Chief's direction to complete a review.

Two hundred and thirty-four timely appeals were filed in response to the ROD for the Sierra Nevada Forest Plan Amendment. A significant number of those appeals focused on issues related to the protection of wetlands, meadows, riparian areas and associated plant and animal species.

In November 2001, the Chief of the Forest Service affirmed the decision to amend 11 national forests in the Sierra Nevada. (USDA Forest Service 2001c). In the appeal decision, the Chief denied all 234 appeals and supported fully the Regional Forester's decision. (USDA Forest Service 2001c, p. 2). Thus, as of November 2001, the Forest Service had fully considered claims that the original ROD would harm livestock permittees in violation of law, regulation, or policy. All claims were found to be without legal or scientific merit and were denied at that time. The denials included appeals criticizing the ROD for a supposed lack of scientific support as well as appeals claiming that the Framework would illegally limit or eliminate livestock grazing in the Sierra Nevada.

1. <u>The changes in the DSEIS go far beyond the review directed by the Chief</u>.

In the Chief's appeal decision, the following three areas were identified for further review and analysis: 1) Continued high level of fire activity; 2) Relationship between the SNFPA and national firefighting efforts; 3) Relationship between the SNFPA and the Herger-Feinstein Quincy Library Group Recovery Act. (USDA Forest Service 2001c, pp. 5-7)

The Chief did not identify for additional review issues related to grazing, livestock permittees, recreational use or effects to local communities.

In contrast, the DSEIS identifies three additional areas that focus on grazing permit holders, recreation permit users and holders, and local communities. As will be demonstrated in the following section, there was no need to review these additional issues in the DSEIS because there is no new information to consider and the issues were adequately reviewed in the appeal decision.

2. The issues related to grazing and permittee use were adequately reviewed in the appeal decision and the strategies in the ROD (now known as Alternative S1) were strongly endorsed.

The Chief's appeal decision repeatedly endorsed the Framework's approach to grazing standards and guidelines. For example, the Chief stated with respect to protection for riparian areas:

> "Specifically, the Regional Forester consulted with a variety of non-Forest Service experts to ensure that they had considered all relevant scientific information. In addition, he called for an independent review of this information (Science Consistency Check) which was completed by a panel of 15 scientists with expertise in the areas related to the forest plan amendment and familiar with the Sierra Nevada region (USDA Forest Service 2001b, p. 30). Clearly, the Regional Forester made a good faith effort to ensure the use of the best available science. The FEIS discloses the fact that overgrazing (USDA Forest Service 2001a , Volume 2, Chapter 3, part 3.4, p. 194) is partially responsible for the degradation for riparian and aquatic habitats but that grazing is not solely responsible for the damage." (USDA Forest Service 2001c, p. B-5).

> "Modified 8 also provides the greatest protection for riparian and meadow plant and animal communities because it limits activities adjacent to watercourses (USDA Forest Service 2001b, p. 24). The Regional Forester stated that under the aquatic, riparian, and meadow conservation strategy contained in the SNFPA, in an effort to contribute towards providing for the viability of native plant and animal species associated with these ecosystems, changes in utilization standards will be implemented to maintain and restore meadows and their dependent species (ROD, p. 5)." (USDA Forest Service 2001c, p. B-6).

With respect to range issues, the Chief concluded:

> "After reviewing the record, I find that the Regional Forester considered the best available science and relied on experts both within the Forest Service and outside the agency. He also had the science peer reviewed." (USDA Forest Service 2001c, p. F-7).

Thus, the Chief made it clear that the SNFPA was intended to change grazing standards to better protect the Sierra Nevada's damaged aquatic and meadow ecosystems. Now, in a sudden reversal, the Region is attempting to weaken the very science-based standards which were unequivocally supported by the Chief.

The DSEIS implies that the consequences of changed grazing management were not adequately considered in the ROD. The Appeals Decision concludes the contrary. In his review of the record, the Chief found:

> "In my review of the record, I find that the Regional Forester acknowledged the potential negative impacts on many ranchers who graze livestock on the national forests and on many of their communities. Further, the emphasis on ecosystem sustainability and

> species viability is consistent with the objectives of the Purpose and Need." (USDA Forest Service 2001c, p. F-9).

Further, the Chief states:

> "After reviewing the record, I find that the FEIS does not ignore public input on grazing. The potential effects of the selected alternative on the grazing program are a result of the standards and guidelines designed to deal with the five areas of concern identified in the purpose and need and proposed action. The potential effects of the grazing program from implementing those standards and guidelines are adequately discussed, in accordance with NEPA." (USDA Forest Service 2001c, p. F-10).

In addition, there are multiple references to the use of the best available science to guide the development of the ROD for aquatic systems in general[25] and sensitive species in particular[26]. Thus, the DSEIS arbitrarily discards the conclusions of the agency's own appeal decision and as shown elsewhere in these comments has instead proposed a Preferred Alternative (S2) which undermines a primary purpose of the SNFPA: protection for a key "problem area" in the Sierra Nevada.

C. The DSEIS fails to present new information to justify weakening existing conservation measures for aquatic and riparian ecosystems and dependent species.

The DSEIS makes the following statement:

> "The SNFPA Review described above, combined with insight gained from two years of field implementation, highlighted the need for refinements within three broad problem areas identified in the SNFPA: old forest ecosystems and associated species; aquatic, riparian and meadow ecosystems and associated species; and fire and fuels management." (DSEIS, p. 2)

The reality for "aquatic, riparian and meadow ecosystems and associated species" is that the standards for grazing relating to meadow management and species conservation have never been fully implemented. The Forest Service failed in 2002 to notify permittees about the change in management direction and only finally sent notifications in 2003. Thus, full implementation of the ROD only began this grazing season.

It is false to suggest that field implementation of grazing standards has occurred. There can be no new information gained from implementation that did not occur.

However, new survey information is available for two species. All suitable habitat for willow flycatcher and some for Yosemite toad has been surveyed since adoption of the ROD. The

[25] See for example USDA Forest Service 2001c, pp. B-5, B-6.
[26] See for example USDA Forest Service 2001c, pp. C-10, C-11, C-24, C-48, C-74.

survey information that was collected has been used in the DSEIS to create an analysis of the effects that meadow management for these species would have on permittees under Alternatives S1 and S2. This analysis is based on crude assumptions about the effect that increased management requirements might have on permittees. The analysis also attempts to assess the degree to which management constraints would reduce the forage base on an allotment. However, the assumptions used in the analysis were not substantiated through the actual implementation of conservation measures nor do they take into account the total amount of forage available on a given allotment relative to the amount of forage that may be constrained due to conservation measures. Thus, this crude analysis provides little in the way of useful information to assess the effect of the conservation measures on permittees.

As elsewhere, the analysis also fails to recognize that adaptive management could be exercised in Alternative S1 for Yosemite toad (USDA Forest Service 2001b, p. A-60) and willow flycatcher (USDA Forest Service 2001b, p. A-62). Lastly, the analysis fails to consider alternative management strategies which might include rotations among allotments or redirection of grazing to allotments not currently in use. These strategies are permissible under Alternative S1 and could lessen the impacts to permittees without foregoing conservation measures. The analysis presented in the DSEIS is not based on verifiable information and chooses to present a misleading representation which substantially understates the flexibility available under Alternative S1. Thus, the analysis is biased and not supported by information presented in the DSEIS.

Setting aside the inadequacy of the analysis in the DSEIS, the results of the crude allotment analysis indicate that Alternative S1 will have less overall effect on permittees than previously estimated. The new analysis estimates that for both alternatives, the standards have a "very high" impact on the same number of allotments, i.e. seven. (DSEIS, p. 236). "High" impacts are estimated to affect an additional 12 permittees in Alternative S1 and 9 permittees in Alternative S2. There are a total of 418 active allotments in the planning area (USDA Forest Service 2001a, Volume 2, Chapter 3, part 5.3, p. 399). Thus, analysis presented in the DSEIS indicates that only 3.8 percent (Alternative S2) or 4.5 percent (Alternative S1) of the active allotments would be so strongly affected by the standards that "there may not be sufficient forage to sustain permitted numbers and season of use." (DSEIS, p. 235). In contrast, the FEIS estimated that Modified 8 would result in about a 20 percent decrease in AUMs relative to current use. On its face, the additional analysis in the DSEIS indicates that there is far less effect on permittees than originally estimated.

Since the Chief's affirmation of the ROD, the only new information available to the Forest Service regarding riparian and meadow conservation suggests that species dependent on these areas are even more imperiled than previously determined. For the Yosemite toad and mountain yellow-legged frog, the U.S. Fish and Wildlife Service determined in December 2002 that listing of these species is warranted under the Federal Endangered Species Act. Increases in cowbird parasitism, which in turn adversely affect willow flycatcher nesting success, have also been reported (Bombay and Morrison 2003) since the Appeal Decision. In addition, current data show continued declines in the population of willow flycatcher in the north central Sierra Nevada (Bombay and Morrison 2003) and studies correlating increased predation with late-season

grazing (Cain et al. 2003) each indicate that concern for this species' viability has only increased since 2001.

Finally, there is no information reported in the DSEIS to suggest that there has been an improvement in the health of aquatic or riparian ecosystems in the planning area. Furthermore, the evidence presented on species declines and endangerment verifies that a high level of concern and immediate action to protect species and habitats is warranted.

D. The DSEIS fails to disclose the effects of Alternative S2 on the aquatic environment and dependent species.

1. The DSEIS incorrectly concludes that Alternative S2 will have the same impact on the aquatic and riparian environment as Alternative S1.

The DSEIS provides no evidence to support the conclusion that given "the application of the same Aquatic Management Strategy goals and related standards and guidelines, Alternative S2 would tend to result in projects with similar on the ground effects between the two alternatives." (DSEIS, p. 161). To the contrary, the Framework FEIS found that even though all alternatives incorporate the same AMS goals, "the action alternatives would meet the Aquatic Management Strategy (AMS) goals to varying degrees." (USDA Forest Service 2001a, Volume 1, Summary, p. 28). In fact, increases in the number of livestock grazed, increases in the intensity of acres treated, numerous changes that reduce management consistency and the certainty of species conservation, the increased uncertainty of effects resulting from Alternative S2 (see for example DSEIS, pp. 160-161) combined with the Forest Service's stated inability to predict the effects of Alternative S2 (DSEIS, p. 161), demonstrate that Alternative S2 will have significantly greater impacts on aquatic and meadow ecosystems and will significantly increase risks to the viability of associated species than the current plan.

The analysis presented in the FEIS supports the conclusion that the effects differ between Alternative S1 and S2. Alternatives 4 and 7 in the FEIS were designed to increase local flexibility. Guidelines were set for forage utilization based upon range condition, and grazing management plans would be developed locally. These alternatives have a high degree of similarity to Alternative S2. For these alternatives, the FEIS concluded:

> "Alternatives 4 and 7 provide the greatest flexibility in management of livestock grazing since decisions are left to the discretion of local managers. The success of this approach could vary by unit, depending on the effectiveness of local managers in monitoring habitat conditions consistently. The lack of clearly defined standards leads to the conclusion that Alternatives 4 and 7 would have the lowest certainty for maintaining and restoring riparian, wetland and meadow plant and animal diversity." (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.4, p. 234) (emphasis added)

In spite of the recognized inability to assess the effects of deferring management decisions about grazing to the local level (DSEIS, p. 161), the DSEIS still concludes that Alternative S2 is "judged to perform similar to Modified 8." (DSEIS, p. 161). This assertion conflicts with

previous conclusions in the FEIS regarding similar alternatives and is not supported by any new evidence presented in the DSEIS.

2. The impacts associated with increased canopy removal, removal of larger trees, increased salvage logging and "forest health" treatments in Alternative S2 are not disclosed.

The DSEIS identifies that "the extent and intensity of treatments may be higher in Alternative S2" (DSEIS, p. 159) and that "the effects of salvage would be similar to those described in the FEIS and SEIS for wildfire salvage with the exception that it has the potential to be more widespread and distributed over an entire landscape rather than concentrated as in a wildfire." (DSEIS, p. 159). Nonetheless, the DSEIS determines that there are no differences in the effects between the alternatives.

As recognized in the FEIS, canopy removal can result in changes in microclimate. (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.4, p. 236). Changes in canopy cover and microclimate can have negative effects on riparian zones (Erman and Erman 2000) and elsewhere, resulting in drying of the soil, increased air temperatures, and decreased humidity. These changes in microclimate affect the moisture available to microorganisms, insects and other organisms in living the soil and down woody materials which, in turn, control vital ecosystem functions such as decomposition and nutrient cycling. Ultimately, habitat conditions can be significantly altered in the face of changes in canopy closure. Given the ability to reduce canopy closure by 30 percent in Alternative S2, i.e. to reduce 80 percent canopy closure down to 50 percent (DSEIS, p. 53), the opportunity to negatively affect riparian areas, as well as other habitats, is great. Yet the effects of changing canopy closure on riparian and aquatic systems are not disclosed in the DSEIS.

Alternative S2 also requires the retention of fewer snags than Alternative S1. (DSEIS, p. 191). This combined with the increase in the diameter of trees that can be removed results in Alternative S1 having more snags than Alternative S2 "because of the removal of the OFEA snag standard, increased upper diameter limit for tree retention (from 12" and 20" dbh to 30" dbh), thus fewer trees available to recruit snags, plus improved health of residual trees." (DSEIS, p. 191). Large snags and down wood provide habitat for numerous species and are essential to the health of riparian and aquatic systems. (Gregory et al. 1991). But the effects of changed snag and down wood levels under Alternative S2 are not disclosed in the DSEIS, again in violation of NEPA.

3. The DSEIS fails to disclose the likely adverse effects related to an increase in road construction expected under Alternative S2.

The total new road construction for Modified 8 (now Alternative S1) estimated for the first decade is 23 miles. (USDA Forest Service 2001a, Volume 2, Chapter 3, part 5.5, p. 450). The FEIS based the analysis of Modified 8 on creating an average of 2.3 miles of new road per year. In contrast, the DSEIS reports that "Alternative S2 involves full implementation of HFQLG, which was estimated in the HFQLG Final EIS to result in an additional 11 miles of road

construction and 640 miles of road maintenance per year for the period of full HFQLG implementation." (DSEIS, p. 237). The total amount of road construction in the first decade would be about 5 times greater in Alternative S2 compared to S1. Despite the recognized increase in road construction under Alternative S2, the DSEIS fails to present any analysis of the effects of this action.

The risks related to roads and their effects on aquatic systems were described in the FEIS:

> "Existing roads constitute current and potential sources of sediment. In general, higher road densities translate to higher potential for adverse effects to aquatic and riparian habitats.
>
> "Roads are considered the principal cause of accelerated erosion in forests throughout the western United States (California Division of Soil Conservation 1971, California Division of Forestry 1972, Reid and Dunne 1984, McCashion and Rice 1983, Furniss and others 1991, Harr and Nichols 1993). The locations of roads determine the degree of potential impacts, making some roads more environmentally sensitive than others. The presence of roads can increase the frequency of slope failures compared with the rate for undisturbed forest by hundreds of times (Sidle and others 1985). Road stream crossings constructed with culverts have been identified as a significant source of road derived sediment (Hagans and Weaver 1987, Best and others 1995, Weaver and others 1995, Park and others 1998). In addition, vegetation removal activities conducted within 300 feet of streams have been found to significantly negatively influence stream channel conditions (McGurk and Fong 1995)." (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.4, p. 208).

Roads also facilitate the spread of noxious weeds, one of the "problem areas" that form the purpose and need of the SNFPA.

> "Vehicles can carry noxious weeds when they pass through infestations or along the periphery of invasions, where seeds for noxious weed establishment. Yellow starthistle expansion into the higher elevations of the Sierra Nevada appears to be related to movement up the roadsides (Schoenig 1999). Studies in Montana demonstrated that roads were primary arteries of spread for spotted knapweed; the evidence was so convincing that the legislature approved a tax on vehicle registration, which forms the basis of Montana's noxious weed trust fund (Mullin 1999)." (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.6, p. 313,14).

Many weeds species "can transform arid riparian areas into impenetrable thickets within 10 years or less (Schwartz and others 1996). These species eliminate wildlife habitat and watering areas and may change stream hydrologic conditions resulting in increased sedimentation." (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.6, p. 318).

The relative effects of these and other road-related impacts to aquatic ecosystems and associated species under the alternatives are not discussed in the DSEIS.

The FEIS also analyzed road density, road crossings and road placement as a part of the Watershed Condition Assessment (WCA) completed in response to the Clean Water Action Plan. (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.4, p. 210-212, and Appendix I). The results from this analysis indicated that many basins in the QLG project area had high natural sensitivity and moderate to high activity levels. The FEIS identified that when watersheds have a high natural sensitivity and activity levels are high, the disturbance tolerance has been exceeded; in cases where natural sensitivity is high and activity is moderate, the watershed is "at or above tolerance." (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.4. p. 214). Thus, increased levels of disturbance as a result of intensive road construction in the QLG project area are proposed in some of the most sensitive areas in the planning area, yet the likely effects of this increased disturbance are not disclosed in the DSEIS.

> 4. <u>The impacts associated with changing grazing management and conservation measures for sensitive species associated with meadows in Alternative S2 are not disclosed</u>.

By recognizing that fewer permittees will be required to change grazing practices to protect aquatic species and habitats under Alternative S2 compared to S1 (DSEIS, p. 236), the DSEIS recognizes that grazing intensity will be greater under Alternative S2 than S1. Nonetheless, the DSEIS fails to acknowledge additional impacts associated with Alternative S2.

The late season grazing and season long grazing allowed in Alternative S2 in meadows presently or historically occupied by willow flycatcher can result in increased stream bank trampling, damage to stream function that leads to reductions in the water table, undesirable changes in species composition, and reduction in the vigor of shrub and herbaceous plant species. (Sanders 2003). Such declines in environmental condition compromise the overall health of meadow and riparian systems and can significantly reduce the quality of habitat for species that depend on this habitat. The DSEIS fails to disclose the effects of increased grazing intensity in violation of NEPA. Furthermore, in the absence of such an analysis, there is no support to conclude that viability will be maintained for the willow flycatcher, great gray owl, Yosemite toad, mountain yellow-legged frog, and the numerous other plant and animal species that require high quality meadow environments for habitat.

E. Conclusion

In the face of well-documented concerns about species viability and habitat degradation, the DSEIS fails to present any new information that justifies weakening the Aquatic Management Strategy contained in the ROD. In reality, affirmation of the continued population decline in willow flycatcher populations (Bombay and Morrison 2003), the ongoing imperilment and decline of certain fish species, and the determination that listing under the Endangered Species Act for Yosemite toad and mountain yellow-legged frog is warranted indicate that increased protection beyond even that offered in Alternative S1 may be necessary to meet NFMA requirements to maintain the viability of these and other aquatic species.

In the absence of new information or improved measures to support these threatened resources, it is indefensible for the Region to eliminate standards that have been subjected to exhaustive examination and rigorous approval processes by agency specialists, agency attorneys, and independent scientists. All of these reviews found that the existing direction fully meets legal, policy, and scientific requirements for conservation and management of aquatic species and ecosystems. There is no evidence that the proposed action meets these standards. This proposal is also contrary to the Chief's determination that the existing conservation measures for aquatic and riparian ecosystems and dependent species are legally sound and based on the best available information. (USDA Forest Service 2001c, pp. B-5, F-7)

Lastly, the DSEIS repeatedly denies that the effects of Alternative S2 differ from those of S1 despite the increased uncertainty and increased intensity of management activity in Alternative S2. Remarkably, the DSEIS repeatedly identifies circumstances in which human disturbance under Alternative S2 is likely to affect larger areas and be more intense than under S1. The DSEIS also shows that Alternative S2 will be more problematic to implement. Yet the DSEIS repeatedly "judges" the effects of the alternatives to be similar. The analysis presented in the DSEIS and FEIS does not support this conclusion. The superficial analysis in the DSEIS fails to evaluate effects that are unique to Alternative S2 (e.g. canopy openings, reduced canopy cover, removal of large trees, increased grazing intensity, increased road construction), and as a result violates NEPA.

V. MODELING ISSUES

In large part, the analysis of environmental impacts in the DSEIS is based on quantitative models that project future vegetative conditions and vary with management alternatives. The stated objective of these models is to "aid planners in estimating likely future consequences of alternative management actions." (DSEIS, p. 303). As demonstrated below, the uncertainty about the modeling is compounded by two factors: 1) the information and assumptions in the modeling process; 2) the lack of ability to accurately predict future conditions. Because of these limitations, the ability for these models to estimate the likely "future consequences" of management actions is very low. The use of such unreliable modeling results, and the failure to disclose modeling uncertainty, violates NEPA's full disclosure requirements.

These limitations were clearly recognized in the FEIS:

> "Fifty years is a reasonable bound on what one might consider the foreseeable future for an analysis of this type. Fifty years is sufficient to demonstrate meaningful, directional changes in stand structure under the various management regimes, but is not so long that unforeseen changes in species composition or regeneration degrade the ability to predict stand dynamics. That is, it provides a picture far enough into the future to indicate that conditions are progressing toward a given state, but not so far into the future that there are serious concerns about the accuracy of the projections." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4, 3).

> "All of the above projected trends are similar across Alternatives, although the magnitude of the difference among Alternatives is difficult to interpret with confidence due to uncertainty associated with the vegetation information and the assumptions that underpin the modeling process. Greater differences among the Alternatives are observed over longer time periods. However, confidence in these longer-term future projections is further lowered due to additional uncertainty regarding future conditions." (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 87).

However, the discussion in the DSEIS fails to apply the same care as was used in the FEIS to interpret the modeling results. For instance, the DSEIS claims:

> "Using historic fire data and recent trends, the FEIS projected habitat losses at 68,000 acres per year over the next decade. At that rate, old forest habitat is burning up faster than it can be replaced. There is a need to reduce expected habitat losses to a rate that is at or below replacement by treating enough acres with enough intensity to significantly modify fire behavior." (DSEIS, p. 3).

This statement identifies a specific cause-effect relationship between a management action, i.e. the FEIS, and habitat acres lost that depends on the results of the modeling. Without an understanding of how well the model predicts habitat loss, it is not possible to judge the legitimacy of this statement. On this point in particular, the modeled results are not particularly robust. If the mean number of acres burned for a different historic period (i.e. 1970-1999) were used[27], the conclusion would be the opposite – that the forest is growing faster than the area "lost" to wildfire. This is just one of many examples from the DSEIS that fail to accurately describe the context and limitations of the modeling results. Ultimately, the inadequacy of the modeling discussion and presentation of results in the SDEIS compromises the ability to fairly and accurately compare the alternatives. Further, such uncertain modeling results can not be used to support a finding that natural resources will not be adversely affected. See Greenpeace Foundation v. Mineta, 122 F. Supp. 2d at 1133 ("The conclusion of 'not likely to adversely affect' does not square with the NMFS's admission that the existing model grows increasingly uncertain").

A. The DSEIS fails to effectively evaluate and disclose modeling uncertainties.

The apparent shift from the FEIS to the DSEIS to an increased reliance on the long-term modeling results to estimate effects requires that additional analysis be completed on the model itself. Because the modeling results are being relied upon directly to support the need to change current management direction (as opposed to the more measured and indirect support utilized in the FEIS), it is essential to assess and disclose the ability of the model to produce robust estimates of the amount of forest to be burned by wildfire and amount of habitat grown. This disclosure is necessary in order to evaluate the comparative effects of the alternatives and provide an appropriate context for decision making.

[27] In contrast, the FEIS discusses this perspective in framing the context for the comparisons presented in the analysis. (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.5, p. 281).

The DSEIS fails to include any error or uncertainty analysis. "Error analyses are used to translate statistical uncertainty in parameter estimates into statistical uncertainty in a model's predictions. In an error analysis, one estimates the *sampling distribution* of the parameters. A sampling distribution specifies the distribution (probability density) of parameter estimates about the "true" parameter values (Mood et al. 1974). Repeated runs of a model, each for a different random draw of the parameters from the sampling distribution, thus produces a distribution of model output that reflects uncertainty in the parameter estimates." (Pacala et al. 1996, p. 8). Although there is one reference to sensitivity analysis in the DSEIS and several others in the FEIS (USDA Forest Service 2003b, Appendix B, p. 303; USDA Forest Service 2001a, Appendix B, pp. B-29-30), there is no indication that an error analysis has been completed for the modeling in the DSEIS.

Error analysis in the case of the model used in the DSEIS would include evaluation of model parameters such as the number of acres scheduled to burn each year, the distribution of fire severity classified by forest type, and acres of vegetation type. Methods are available to complete this type of analysis (see for example Pacala et al. 1996).

Error analysis is important for reasons specific to each of these parameters.

1. Acres burned and their severity

The modeling uses three estimates to characterize the incidence of wildfire and its severity:

a. Setting the average number of acres burned in recent time

The average acres burned in the last 10 years is used to "begin" each projection of wildfire acres burned. (DSEIS, p. 162-163). As mentioned above and in the fire and fuels section, recent research does not support an increasing or decreasing trend in the rate of acres burned by wildfire over time and not surprisingly the historic fire data are highly variable. The value that is selected for this parameter drives the outcome of the analysis, i.e. if a sufficiently low value is selected to initiate the model, the conclusion is that the forest grows faster than it burns up. Conversely, if a high value is selected, one concludes that the forest burns up important habitat faster than it grows. (USDA Forest Service 2000, Volume 2, Chapter 3, p. 163). The model or its description does not consider the variability in the probability of fire occurrence from year to year.

b. Setting the rate of increase in wildfire acres burned into the future

The rate of increase in wildfire acres burned was projected in to the future based on historic trends (1970 to 2001). (USDA Forest Service 2001a, Volume 2, Chapter 3, part 3.5, pp. 279-280). Little justification was given for the selection of this time period. Fire analysis over longer periods of time finds no trend with time (McKelvey and Busse 1996, p. 1119). This conclusion suggests that there is insufficient information to predict the likelihood of future fire occurrence. The uncertainty about this estimate of fire is quite high. The model and discussion of effects does not adequately consider this.

c. Determining the fire severity of future wildfire

For each acre burned, the severity of the fire affecting that acre was estimated. The fire severity parameter was 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. The high degree of variability in this data set was noted in the FEIS (USDA Forest Service 2001a, Volume 4, Appendix B, p. 30). Hermit (1996) also noted that lethal and mixed-lethal fires could be overstated in the analysis. Thus, there is a fair degree of uncertainty associated with the fire severity estimates used in the model. The DSEIS fails to evaluate this variability with respect to the performance of the model.

2. Accuracy of the vegetation data

The vegetation data used for the modeling is derived from a combination of satellite imagery and forest inventory and analysis (FIA) data. (USDA Forest Service 2001a, Volume 4, Appendix B, p. 32). Information from the sample plots is used to characterize areas of "homogeneous" vegetation that have been delineated from satellite imagery. Accuracy assessments have been completed for the vegetation data[28] in order to evaluate the reliability of the data set to predict vegetation types across the landscape. Although the variability represented by the plot data themselves has been incorporated into the modeling (USDA Forest Service 2001a, Volume 4, Appendix B, pp. 32-33), the certainty that the vegetation mapped reflects the vegetation on the ground has not been incorporated into the modeling. This is particularly important since for the vegetation data it is known that "accuracy is typically greatest in distinguishing very different size classes (like seedling/sapling or pole from large trees). However, for wildlife habitat interpretations, the difference between medium and large trees can make a large difference in interpretations of habitat suitability." (Fites 2000, p. 5).

Concern about the application of the vegetation data was expressed during a science consistency review of the FEIS:

> "… Current mapping and inventory methods of the USFS based on plot sampling and satellite imagery have been designed to produce forest-level estimates of timber volume. This information is of relatively fine spatial detail and good locational accuracy but is thematically coarse and is not reliable when applied to individual stands. SNEP LSOG data notwithstanding, USFS forest inventory information has continued to serve as the basis for much of the spatial planning and modeling exercises and policy analyses underlying the EIS. These are applications for which the data were never intended. The uncertainty in any projections of stand structure and composition, fire behavior, or species habitats, based on this information is extremely high." (Quinn et al. 2000, p. 80)

[28] http://www.fs.fed.us/r5/rsl/clearinghouse/forest-eveg.shtml

3. Conclusion

In the absence of an analysis that evaluates the uncertainty in estimates of fire occurrence, fire severity and vegetation type, it can't be known if the results of the model – acres of habitat, numbers of large trees and snags, acres burned by wildfire – are robust. If in fact the model outputs are not robust and sampling error overwhelms the predictions, then a heavy reliance on the outputs for decision making is questionable.

As concluded in the science consistency review for the FEIS:

> "In many cases, as described in the draft FEIS, the available scientific information is too uncertain to predict distinguishably different outcomes among the policy alternatives. As noted in group discussions among the panel and the Interdisciplinary and Science Teams, future projections of resource levels (populations, burned areas, etc.) in a stochastic environment (unpredictable rainfall, ignition rates, etc.) rapidly develop very large confidence intervals when projected very far into the future. Consequently, future projections often have little power to measure the effects of management policies." (Quinn et al. 2000, p. 17)

B. The growth and yield of old forests is overestimated

In 2000, the DEIS acknowledged that the models "used to predict changes in vegetation over time, including changes in the amount of old forest, were not specifically designed to model old forest development." (USDA Forest Service 2000, Volume 2, Chapter 3, p. 82). The forest vegetation simulator "does not model the growth and development of stands dominated by old trees accurately" (USDA Forest Service 2000, Volume 2, Chapter 3, p. 32) and "may over predict the growth and yield of old forests." (USDA Forest Service 2000, Volume 2, Chapter 3, p. 82). Similar concerns about growth and mortality rates of old trees were raised during the workshop between the Sierra Nevada Framework Science Team, spotted owl scientists, and the biologists with the U.S. Fish and Wildlife Service. (USDA Forest Service 1999c, pp. 53-54). For example, Forest Service ecologist Kevin McKelvey described the growth and mortality rates for large trees as "weak," stated that the models "compound errors" by giving large trees more weight, and concluded that the modeling projections beyond 10-20 years "can not be trusted." (USDA Forest Service 1999c, p. 53)

Modeling limitations such as these are especially important to the discussion of the future abundance of habitat for species dependent on old forests, such as the California spotted owl, Pacific fisher, and American marten. The analysis of effects in the DSEIS for these species relies to varying degrees on the modeling of suitable habitat using CWHR types. However, the limitations of the modeling are not discussed.

C. The logic used to model the alternatives is not consistent among alternatives.

Each alternative depends on measuring canopy cover to meet the respective standards and guidelines for vegetation management. (DSEIS, pp. 43 and 53). Each alternative also adopts the

same approach to measuring canopy cover. (DSEIS, p. 78). Yet when faced with the need to measure canopy cover to ensure that the canopy cover standard will be met, the Forest Service appears to be able to accomplish this in Alternative S2, but is unable to do so in Alternative S1.

Alternative S1 allows the canopy cover in stands that have 50 to 59 percent canopy cover to be reduced to 50 percent. (DSEIS, pp. 43). However, the Review Team believed that direction provided in the ROD would not allow a sufficiently precise measurement of canopy cover and therefore canopy could not be reduced at all for stands with 40 to 60 percent cover. (USDA Forest Service 2003a, pp. 26, 34-35). In contrast to this, Alternative S2 manages to a canopy standard of 40 and 50 percent (DSEIS, pp. 53). Yet using the same direction to measure canopy cover as Alternative S1 (DSEIS, p. 278), the Forest Service now believes that they can measure cover sufficiently precisely to allow them to reduce stands from 49 percent to 40 percent cover. In the case of Alternative S2, there is no claim that they can not measure small changes in canopy cover.

The differential logic applied to translating standards and guidelines to modeling constraints for each alternative leads to a biased analysis and prevents a fair comparison of alternatives.

D. The level of activity modeled under Alternative S2 does not reflect the levels allowed by the standards and guidelines.

Nothing in the alternatives or in their standards and guidelines requires that the volume or acreage of logging be constrained to the extent projected by the model. Since this is an amendment to the existing forest plans, the "allowable sale quantity" from the prior plans is still relevant and in all cases significantly higher than the modeled estimates of volume. (USDA Forest Service 2001a, Volume 3, Chapter 3, part 5.1, p. 379). "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 the 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, it is implied that the modeling for salvage was constrained to 1,000 acres annually; however, over 3.2 million acres have been "characterized by a high risk pest-drought condition." (DSEIS, p. 187). There is nothing in the standards and guidelines that establish a ceiling on the number of acres that could be salvaged. This is recognized in the DSEIS as well:

> "An unknown amount of habitat may be treated to address forest health issues under Alternative S2." (DSEIS, p. 187).

But beyond this, the modeling of Alternative S2 restricts the application of the standards and guidelines. As stated in the DSEIS:

> "Neither alternative pushes the treatment units to the maximum amount of product that could be produced except for group selection, but rather that which meets it[s] desired condition at the landscape level." (DSEIS, p. 319).

The modeling of the standards and guidelines needs to reflect their full capability to alter the environment. For example, if the intent is for only 1,000 acres to be salvaged each year, then this should be stated in a standard and guideline which could then be clearly evaluated. In the absence of clear limits, it is uncertain how the standards will be applied and the full potential of the alternative to alter the environment has not been disclosed.

E. The modeling of alternatives is held to a lower analysis standard than other analytical methods utilized in the DSEIS

Some of the parameters used in the modeling were not empirically derived (DSEIS, p. 303) and others are represented as expected values when they stochastic in nature. Environmental stochasticity and relatively small levels of bias and sampling variability can dramatically affect predictions from models (Saether and Egren 2002), particularly when long-term forecasting is conducted (Brook et al. 2000). Absent any effort to characterize and quantify the range of variability in the predictions or the sensitivity of the model to small changes in parameter values, it is not possible to determine what the outputs mean. Nonetheless, the DSEIS presents modeling data and uses in the analysis of each resource area in a fashion that assumes that the predictions are reliable and sound.

In contrast, analysis of the demographic studies for California spotted owl are held to extremely high standards of review and disclosure regarding variability when estimating changes in the owl population. In fact, the Forest Service commissioned a study of all the demographic results using a different methodology to estimate population changes in order to address bias and uncertainty. Others have identified this dual standard as well:

> "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." (Blakesley and Noon 2003, p. 4).

> "And some of the model parameters are based totally on untested hypotheses, such as the SPLATs and DFPZs. The true effects of these treatments are unknown at this time. 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." (Verner 2003c, p. 6).

The DSEIS compares information from the owl demographic studies on an equal basis with predictions from the fire and forest vegetation modeling when in fact these analyses are not similarly robust nor has the uncertainty for each been characterized equally. The DSEIS fails to

identify this disparity and in doing so fails to fairly analyze and compare the effects of the alternatives.

VI. ECONOMIC ISSUES

A. Alternative and Discussion of Environmental Impacts

Regulations for implementing NEPA (40 CFR §1500-1508) require that environmental impact statements provide full and fair discussion of significant environmental impacts (§1502.1). We find, however, that the timber volumes associated with the alternatives in the DSEIS are not the same as those in the FEIS. In addition, the evaluation of environmental consequences for all the alternatives in the DSEIS is considerably less comprehensive than the evaluation of alternatives in the FEIS. To comply with NEPA the following inconsistencies must be corrected.

1. Non-equivalent Alternatives for Commercial Forest Products Analysis

The timber volumes associated with the alternatives in the DSEIS are not the same as those in the FEIS. Total timber harvests for both S1 and S2 in the DSEIS are somewhat less, and sawtimber harvests are slightly more. The DSEIS states:

> "…total timber harvest and the distribution of harvest volumes across forests under Alternative S1 is approximately the same as Alternative MOD 8 in the FEIS. Specifically, timber outputs under Alternative S1 are 84 percent of those projected in the FEIS for the comparable alternative. Similarly, Alternative S2 most closely approximates the timber output and distribution of Alternative 4 in the FEIS. Timber harvest under S2 is 88 percent of that projected under Alternative 4." (DSEIS, p. 234, Chapter 4)

and

> "Table 4.4.1a illustrates average sawlog volumes harvested from national forests … under Alternatives S1 and S2….Sawtimber harvest volumes are slightly higher than projected in the FEIS for Alternative Modified 8, the alternative carried forward in the SNFPA ROD. …the green timber volume projected to be harvested under the no action alternative (S1) is slightly higher than projected in the FEIS." (DSEIS, p. 231, Chapter 4)

2. Less Comprehensive Analysis of Environmental Consequences for Land and Resource Uses

The evaluation of environmental consequences for alternatives S1 and S2 in the DSEIS is considerably less comprehensive than the evaluation of alternatives in the FEIS. Furthermore, alternatives S3 and F2 through F8 receive even less consideration (see DSEIS, p. 240-247.) Environmental consequences for S1 and S2 are discussed for only four types of land and resource uses over nine pages in the DEIS; one paragraph is presumed to be adequate for all consequences of alternative S3, and one page for alternatives F2 through F8.

B. Region's Economy

NEPA regulations require that the information made available to public officials and citizens be of high quality, and states that accurate scientific analysis is essential to implementing NEPA (§1500.1). However, fundamental socio-economic information is missing from the DSEIS: the region's economic structure and trends, noncommercial forest values, and the national forest's share of the region's timber supply. A description of these issues and specific recommendations follow.

1. The DSEIS lacks information on region's economy and trends

The Review Team noted that the socioeconomic workshop "provided new information from professionals who have studied the social and economic conditions in California and the Sierra Nevada" (USDA FS 2003a, p.86). The Report specifically mentions results of economic profiles for the region's eight counties, provided by The Wilderness Society, that show, "in most Sierra Nevada counties over the last twenty-five years, earnings from resource industries have declined or remained flat while earnings in the economy as a whole have grown substantially. Most of the growth in labor earnings has been in service jobs. …In all eight counties, non-labor or transfer income, the largest of which is retirement, ranges from 30% to nearly 50% of income growth in the last three decades" (USDA Forest Service 2003, p. 90). The team also refers to the Sierra Business Council's "Sierra Nevada Wealth Index," which notes that in some counties tourism is the single most important activity and recommends increasing economic diversity to ensure long term prosperity (p. 90).

These findings are echoed in a report recently released by University of California researchers. This report states that employment in the forest products industry plays a vital role in several northern California counties, but in recent years their economies have become more diversified (Laaksonen-Craig et al. 2003).

The FEIS also does not appear to provide information on the number of jobs and wages by industry sector, or non-wage income.[29]

A "Social and Economic Environment" section should be added to Chapter 3, "Affected Environment" to illustrate the diversity of the region's economy and show changes over time. The section would provide summary demographic data and the distribution of employment and income (both wage and non-wage) by major sector. The most recent data should be included, as well as trends over the last few decades. (The Department of Commerce, Bureau of Economic Analysis "Regional Economic Information System," for example, covers 1969-2000.)

2. Lacking Discussion of Noncommercial Forest Values

[29] This information was not in the FEIS Chapter 6, "Society, Culture and Economy." Appendix O, "Employment" was not accessible on the SNFPA website.

The Review Team Report acknowledges the services, such as outdoor recreation, that national forests contribute to communities' economies (USDA Forest Service 2003, p. 86). However, these services and nonmarket environmental benefits – such as clean water and biodiversity -- are not reflected in the DSEIS. In addition, the DSEIS addresses the potential effects of different harvest volumes (in S1 and S2) on the forest products industry, but not on other sectors of the economy or on the environment.

A subsection of the new "Social and Economic Environment" section of Chapter 3, noted above, should be developed that describes the non-commodity values the Sierra Nevada resources provide the economy, both market and nonmarket. (See Richardson 2002 for a discussion and estimates of the many direct and indirect values these natural areas provide.) A discussion of the likely effects of S1 and S2 on these noncommodity values should be added to Chapter 4.

3. Lacking Data on the National Forests' Share of the Region's Timber

The DSEIS does not provide information regarding the portion of timber harvested from the Sierra Nevada region that comes from the national forests. Consequently, readers may assume that if logging is not increased, the region's forest products industries will collapse.

In 2002, public forests provided an average of 21 percent of the total volume of timber cut in SNFP counties. The volume from public lands ranged from 0 to 42 percent of the total for these counties. Timber from public forests represented an average of 15 percent of the total value of timber cut SNFP counties in 2002 (California State Board of Equalization 2003). In 2001, timber from public forests in SNFP counties represented an average 16 percent of the volume and 13 percent of the value (California State Board of Equalization 2002).

To provide the appropriate context for review, a few sentences and a table (based on California State Board of Equalization data) should be added in the Commercial Forest Products subsection of Chapter 3 noting the portion of timber from public and private sources, by county. This would provide a broader perspective on the sources of material for the forest products industry.

It would also be helpful to include some information about changes in industry structure. For example, Laaksonen-Craig et al. (2003) note: The decrease in the number of mills operating in California has resulted from consolidation and increasing efficiency in the forest products industry; and

The total volume of timber harvested in California has declined over the last decade, yet the number of workers has increased. The production of lumber and wood products employs more than half of the workforce in the forest industry, and the recent upward trend in total employment in this industry took place in this sector.

C. Timber Volume and Price Assumptions

We believe several assumptions in the DSEIS are overly optimistic, and thus do not meet NEPA requirements that environmental impact statements provide full and fair discussion of

environmental impacts (§1502.1), and meet standards of scientific accuracy (§1502.24). Specifically described below, with recommendations, are assumptions regarding sawtimber sales volumes and stumpage prices.

1. Optimistic Estimate of Sawtimber Sales

Alternative S2 assumes 448 mmbf will sell annually in the first decade, two to three times more than has actually has sold in recent years (Ch. 4, p. 231). Because employment and income generated by timber harvested from the Sierra national forests are directly linked to projections of sawtimber harvest by alternative, forest products employment and income effects may therefore be overestimated.

Between 1994 and 2002, the average volume of sawtimber sold annually from national forests in the Sierra Nevada region ranged from 119 to 205 mmbf (DSEIS Table 3.3.1b, Ch. 3, p. 137). Before this, average annual volumes were substantially more -- 998 and 553mmbf for 1998-1990 and 1991-1993, respectively -- but this was before national forests amended their plans (in 1993) to include the California Spotted Owl Sierran Province Interim Guidelines (CASPO). Retaining greater numbers of larger trees in forest stands has decreased timber sale offerings and timber harvest volumes (FEIS, Volume 2, Ch. 3., Part 5.2, p. 370).

Since 1994, between 36 percent and 65 percent of the volume offered was sold (based on the 3-year averages shown in Tables 3.3.1a and 3.3.1b). (These percentages are overestimates because the data for volume offered does not include the Humboldt-Toiyabe national forest.) Note that the volume projected to sell under S2 is even higher than the volume *offered* 1994-2002 (DSEIS Ch. 3, p. 136). However:

> "Purchasers are less inclined in recent years to purchase timber sales from the FS… One reason for the increase in timber sale offerings without purchasers is that the timber offered produces lower quality wood products than earlier volumes offered… The shift in harvest from old growth to young growth and salvage timber has also affected timber supply…. In addition the composition of harvested tree species has shifted. The two most valuable species in the Sierra Nevada … have nearly disappeared from harvests on national forest lands" (FEIS Volume 2, Ch3, part 5.1, p. 371-372).

We recognize that the removal of more and larger trees allowed under alternative S2 (DSEIS, Ch. 4., p. 231) is likely to result in an increase in sales, but the lower quality of timber and less valuable tree species will continue to limit sales.

The analysis should include a realistic range of estimates for timber sales volume.

2. Optimistic Stumpage Price Assumptions

In Alternative Mod 8 (S1), average stumpage prices (the value of trees before harvest, transportation, and processing) of green-tree timber from National Forests are $283/mbf and under Alternative 4 (S2), $297/mbf (FEIS, Volume 2, Ch 3, part 5.2, p. 388; this information

does not appear to be repeated in the DSEIS). Note that these are 1995 dollars. Accounting for inflation since then, these prices are equivalent to $320/mbf (S1) and $336/mbf (S2) in 2002 dollars. Recent market data suggest that lower values would be more realistic. For example:

- The average stumpage price of public timber sold from Sierra Nevada counties averaged $210/mbf in 2002 and $268/mbf in 2001 (California State Board of Equalization 2003).

- The average stumpage price of timber sold from Forest Service lands in California ranged from $82/mbf to $193/mbf between 1994-1999. (Laaksonen-Craig, et. al. 2003).

- Revenues from FS forest stewardship timber sales averaged $115/MBF in 1998, the most recent year for which such data are available (USDA Forest Service 2001d). These sales, primarily for forest ecosystem health and wildlife habitat management, are similar to the types of sales described in the FEIS.

- In the FS Pacific Southwest region (California and Hawaii), sawtimber prices ranged from $135 per mbf to $241 per mbf between 1994-1998 (Laaksonen-Craig, et. al. 2003).

The analysis should include a range of estimates for stumpage values based on actual prices since 1993 (CASPO).

D. Financial Issues

Some of the information conveyed in the DSEIS is unclear, incomplete, or inaccurate and, as such, does not meet NEPA regulations' requirement that the information made available to public officials and citizens be of high quality (§1500.1). Specifically addressed below are: the source of funding for the activities included under the alternatives, omission of road costs, omission of grazing allotment administration costs, and the source of funds for county payments.

1. Source of Funding Unclear

The DSEIS (and FEIS) do not completely explain the sources of funding within the FS budget for activities under S1 and S2, or the contract mechanisms that may be used. Section 6.4, Forest Service Budget Projections (FEIS Volume 2., Ch. 3. Part 6, p. 549) provides limited information.

Generally, planning, preparing and administering timber sales is funded by the Forest Products budget, which is from appropriated funds. All receipts are ultimately deposited to the Treasury or FS special accounts. The "Economics of Fuel Treatments" section implies this is not the funding source for timber operations under S1 and S2 because the discussion refers to estimating the value of timber volume generated from fuels treatment and net product value (SDEIS Ch. 4, p. 165). Are the timber sales to be funded from Wildland Fire Management budget or other appropriated funds?

The Forest Service budget and contract mechanisms to be used should be identified and more clearly described. Economic efficiency should not a determining factor in the selection of the final action.

Please check the following sentences:

- "Stumpage values represent the value of the raw material after subtracting the logging costs" (third sentence). Perhaps this should be, "Net product values represent …."

- "For purposes of this analysis, net product value ranges from $7.50-$150 per thousand board feet (fourth sentence). Average annual treatment costs in Table 4.2.4c. exceed average annual net product values, so it seems that the lower number in the net product value range should be negative.

2. Road Costs Omitted

The costs of road construction associated with Alternatives S1 and S2 are not included in the DSEIS. The analysis of S2 also not appear to include any road construction or reconstruction that may be needed for the additional 3.2 million acres "having pest-drought driven forest health problems" (DSEIS p. 193) or the estimated 286 mmbf to be logged annually under the HF-QLG project (FEIS Volume 2, Ch. 3, part 6, p. 567). As a result, the costs associated with implementing the alternatives in the "Economics of fuels treatment" section – particularly estimates of net product value-- are underestimated (Ch. 4, p. 165).

The data needed to estimate road construction costs are provided in the FEIS and DSEIS. The "Roads" subsection of Chapter 4 (DSEIS, p. 237) states:

- Alternative S1 would represent no change in road related effects from existing management in the HFQLG area. The FEIS shows Mod 8 (S1) involves 23 miles of new road construction in the first decade (Table 5.5f, Volume 2, Ch. 3. Part 5.5, p. 450).

and

- Alternative S2 involves full implementation of HFQLG, which was estimated in the HFQLG Final EIS to result in 11 miles of road construction, 110 miles of road reconstruction, 43 miles of temporary road construction and 640 miles of road maintenance per year… (DSEIS, Ch. 4, p. 237)

And, the FEIS provides average costs for road work in the region: $93,035 per mile for road construction and $38,247 per mile for reconstruction (Volume 2, Ch. 3. Part 5.5, p. 447). (Note that these are 1995 dollars.) Together this information indicates an additional unreported cost of at least $5.2 million is associated with Alternative S2 ($1,023,385 for new roads and $4,207,170 for reconstruction, plus temporary road construction costs and maintenance).

In order to fully evaluate the alternative, the road construction costs (as well as reconstruction and maintenance costs, where feasible) must be estimated for each alternative, and included in a presentation of total costs for each alternative.

3. Cost of Administering Grazing Allotments Omitted

The DSEIS is remarkably brief on the issue of grazing, stating in only one paragraph that livestock grazing in Sierra Nevada national forests has decreased to 74,000 head of cattle and sheep in 2002 without showing AUMs or the distribution of AUMs among national forests (DSEIS p. 235). No financial data is provided. The FEIS does include some information on the number of allotments and associated AUMs, value of livestock, jobs, wages, and ranch income (Volume 2., Ch. 3, pp. 399-416). It fails to mention the federal revenues and costs associated with these permits. Grazing fees, now $1.43/AUM, are substantially less that agency estimates of program costs -- $2.40 to $3.24 per AUM (Cody 1998; in 1998 the fee was $1.35/AUM). Nationwide, the FS spent six times more on range management than it received in grazing fees in 2002 (USDA Forest Service 2003c). Receipts totaled about $6 million and the agency's range management budget was $34.8 million.

An adequate analysis requires that both receipts and range management costs for the Sierra Nevada national forests be included in the analysis.

4. County Revenues No Longer Related to Receipts

The DSEIS implies that timber sales are directly linked to county revenue: "The level of active management in each alternative directly affects the socioeconomic climate of the Sierra Nevada through county revenue, employment, and income derived from resource extraction, production and use. Receipts from timber sale on national forest lands can provide revenues to affected counties for roads and schools." (Summary, p.22)

However, these payments are made from the Treasury and are not determined by current timber volumes or receipts. The Secure Rural Schools and Community Self-Determination Act of 2000 allows counties to choose one of two methods of calculating annual payments to states (1) continuing to receive an amount equal to 25 percent of receipts from National Forest lands, or (2) receiving an amount equal to the average of the state's three highest 25 percent fund payments from FY 1986 to 1999. All Sierra Nevada Counties chose the latter, so their annual payments from the FS will remain level and predictable regardless of how much timber is cut from the National Forests and how much the selling price varies.

VII. THE DSEIS AND PROPOSED ACTION FAIL TO COMPLY WITH ENVIRONMENTAL LAWS

A. National Forest Management Act.

1. Alternative S2 would fail to ensure the viability of numerous wildlife species and would contribute to a trend towards federal listing of sensitive species.

The Forest Service's regulations require that "[f]ish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species." 36 C.F.R. 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 throughout these comments, Alternative S2 would threaten the viability and distribution of numerous species, including the California spotted owl, Pacific fisher, American marten, and willow flycatcher, contrary to law. Moreover, the proposal would contribute to a trend towards federal listing of these same species, which are Forest Service identified sensitive species, contrary to the agency's internal directive.

The process that the Forest Service has utilized to address issues of viability and trend towards federal listing in the DSEIS has been fundamentally deficient. One significant problem is that, with the exception of the California spotted owl, the Forest Service did not convene any experts to review potential impacts on species of concern. Moreover, as described in these comments, the owl scientists have repeatedly stated that they do not support the proposed action and that it is likely to threaten the owl's status.

The importance of utilizing expert panels in evaluating wildlife viability was emphasized during the Framework review process. For example, one Forest Service expert reviewing the Framework DEIS highlighted "a weakness in the current process that should be remedied before the FEIS …, to have species experts provide an assessment of these alternatives. For example, it would be very instructive and enhance credibility of your species assessment for a panel of owl experts to examine the alternatives." (Iverson 2000). A different reviewer reiterated this concern in a memo to the DEIS science team leader:

> I believe that the most important gap, in both the panel assessment and your summary judgment, is the lack of involvement of species experts in making the judgments. I encourage you to review the results with species experts between the draft and final, and to conduct that review early enough that you could use it to make any needed adjustments to direction. (Holthausen 2000).

The DSEIS process suffers from the same deficiency, which further undermines the conclusion that the proposed action is consistent with the viability requirement.

2. Alternative S2 Represents A Significant Plan Amendment for Which Scoping is Required.

The Forest Service's notice of intent (NOI) to prepare a supplemental EIS for the Sierra Nevada Forest 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." For the reasons expressed below and in our previous letter to the Regional Forester (Sierra Nevada Forest Protection Campaign 2003), the decision to omit the formal scoping process was erroneous and misguided, both on legal and policy grounds. In particular, because the proposed action would constitute a significant plan amendment, the Forest Service must follow the full planning procedures (including scoping) required for development and approval of forest plans.

a. The Proposed Action Would Significantly Amend Existing Plans.

The proposed action would significantly amend the Sierra Nevada Framework by substantially changing the standards and guidelines that are at the heart of the plan and by dramatically altering the goals and objectives. Where, as here, 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 C.F.R. 219.10(f)). Scoping is an essential part of that process.

The Forest Service is required to determine whether a plan amendment is significant "based on an analysis of the objectives, guidelines, and other contents of the forest plan." (36 C.F.R. 219.10(f)). The Forest Service Handbook further identifies four factors to be considered in determining whether a proposed change is significant, including (1) timing, (2) location and size, (3) goals, objectives, and outputs, and (4) management prescriptions. (FSH 1909.12, Chapter 5.32(3)). Consideration of each of these factors supports a finding that the proposed action would constitute a significant plan amendment.

With respect to timing, the Forest Service anticipates a final plan amendment later this year, which is early on in the first 10-year plan period for the Sierra Nevada Forest Plan Amendment. The Handbook states that generally "the later the change, the less likely it is to be significant for the current forest plan." (FSH 1909.12, Chapter 5.32(3)). Conversely, making a change early in the planning cycle supports a finding of significance.

The proposed amendment would potentially affect the entire planning area affected by the Sierra Nevada Forest Plan Amendment. The Handbook states that "in most cases, the smaller the area affected, the less likely the change is to be a significant change in the forest plan." (Ibid.). Therefore, this factor also supports a finding of significance.

The third factor involves the plan's goals, objectives, and outputs. The NOI states that "the proposal builds on the strengths of the SNFPA ROD and retains its goals, land allocations, acres of treatment and the same priority to protect communities." (68 Fed. Reg. at 16759). However,

a closer assessment of Alternative S2 reveals that the Forest Service is proposing a major shift in priorities, from one focused on avoiding short-term adverse impacts to wildlife habitat and limiting logging to removal of small trees that contribute to wildfire risk to one emphasizing more aggressive logging of medium and large trees for a much wider variety of purposes.

According to the Forest Service's Management Review, the Framework includes only one vegetation management objective, which is to "reduce losses from wildfire to habitats and communities, and restore historic fire regimes." (USDA Forest Service 2003a, p. 106). The proposed action would add several additional objectives, including "improved forest health," "restore or maintain ecosystem structure," and "restoration following catastrophic wildfire" (ibid.), each of which could justify additional logging. Leaving no doubt about this intention, the proposed action would explicitly add a new plan objective, to "provide commercial forest products to meet people's needs in support of restoration objectives." (Ibid.). By contrast, under the existing plan timber production was not considered a plan objective. (Ibid., p. 91). The Review Team speaks to this point very clearly:

> The recommended strategy broadens vegetation management objectives for the national forests in the Sierras beyond the focus in the ROD. As a result, it allows a more comprehensive approach to vegetation management needs across the bioregion. The strategy explicitly acknowledges providing commercial forest products to meet the needs of people as an objective to support successful implementation across landscapes. (Ibid., p. 160).

The new plan is also designed to "maintain forest industry infrastructure" that the agency believes might not exist under current plans. (Ibid., pp. 92-93). Thus, the proposed action is explicitly designed to change the goals and objectives of the existing plan.

Fourth, the proposed action would change many standards and guidelines that are at the heart of the existing plan, and would not be limited to a specific situation but rather "would apply to future decisions throughout the planning area." (FSH 1909.12, Chapter 5.32(3)). For example, the proposal would modify virtually all of the critical elements of the existing conservation plan for the California spotted owl and other old forest associated species, including logging diameter limits and canopy cover standards and protection for old forest emphasis areas, spotted owl home range core areas, and owl protected activity centers. The proposal would also significantly amend the Framework by reverting to land allocations and standards and guidelines included in the Quincy Library Group FEIS, which will greatly increase both the amount and intensity of logging in that area.

In sum, a fair analysis "of the objectives, guidelines, and other contents of the forest plan" (36 C.F.R. 219.10(f)) demonstrates that the proposed plan amendment would unquestionably be significant. The Review Team's recommendations state that "any new decision is likely to entail a significant rewrite of the ROD" and that "entire Chapters of the ROD have been rewritten." (USDA Forest Service 2003, p. 95). We have no doubt that Forest Service leadership considers the change to be highly significant. To argue otherwise would be to elevate legalistic interpretation over the plain facts of the situation.

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 planning process required by law and risks exactly the kind of delays and litigation that the agency is ostensibly trying to avoid.

b. Scoping serves an important purpose in public participation.

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)).

Although the Forest Service has informally solicited limited public involvement with selected stakeholders in the development of the proposed action, such an informal process is not the equivalent of compliance with the National Environmental Policy Act (NEPA) and the National Forest Management Act (NFMA) regulations. The agency's process to date has focused on making the case for changes to the Sierra Nevada Framework, culminating in the Management Team's Recommendations (USDA Forest Service 2003a) and the DSEIS. To the best of our knowledge, there has been little, if any, public discussion of the formal process to follow in considering these recommendations. 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.

By omitting the scoping process, the Forest Service is denying the public and interested parties of an opportunity to shape the EIS process. The result could well be that issues are raised in comments on the draft EIS that require significant revisions to the draft or additional public comment, leading to unnecessary delay. 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.

In this case, the Forest Service did not allow the public, sister agencies, academics or scientists an opportunity to influence the draft EIS. As reflected in our comments and those being submitted by others, members of the public have useful ideas on alternatives that should be considered in the EIS. They know about new information that needs to be addressed in the EIS and can offer important views on the kinds of modeling and analysis that should be included in the draft EIS. By omitting the scoping process and explicitly "not inviting comments" (68 Fed. Reg. at 16758), the Forest Service unreasonably truncated the public participation process.

The NOI asserts that "scoping is not required for supplements to environmental impact statements," citing the CEQ regulations. (40 C.F.R. 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 C.F.R. 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. Therefore, the Forest Service needs to undertake a new scoping process before proceeding with the EIS and final decision.[30]

3. Management Indicator Species

The National Forest Management Act and its implementing regulations require that forest planning decisions identify and analyze impacts to management indicator species (MIS), including impacts to both the amount and quality of habitat and population trends. 36 C.F.R. § 219.19 (a) (2) & (6). The forest planning regulations also require that management indicator species be monitored and relationships to habitat change determined. The diversity requirements in the regulations clearly require the Forest Service provide for a diversity of plant and animal species and that maintenance of diversity be considered throughout the planning process, including how planning alternatives will affect diversity in various mixes of resources uses and management practices. 36 C.F.R. § 219.26. Forest planning regulations also direct the Forest Service, to the extent practicable, to preserve and enhance the diversity of plant and animal communities to an extent at least as great as that which would be expected in a natural forest. 36 C.F.R. § 219.27 (g).

The Sierra Nevada Framework made a significant effort to identify and analyze impacts to management indicator species (MIS) and species at risk (SARs) at a landscape level, across forest boundaries. The Framework identified species guilds associated with old forest ecosystems, aquatic, riparian and meadow ecosystems, and lower westside hardwood ecosystems. Included with the species list is a vulnerability rating and a population tracking assignment for specific species. (USDA Forest Service 2001, Volume 4, Appendix E).

The Framework makes a firm commitment to population monitoring in addition to habitat assessments for MIS and SAR. The reason for increased focus on population trends is that,

[30] 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 DSEIS represents a new or revised EIS, rather than a true supplement, which must be preceded by a scoping process.

"since the enactment of NFMA, application and case law have refined our understanding of the appropriateness of using the status and change of environmental conditions as a surrogate for status and change for populations." The FEIS continues: "In short, case law suggests that using habitat as a surrogate for populations may be ruled as inadequate." (USDA Forest Service 2001, Volume 4, Appendix E-17).

Recent opinions in the 9th Circuit Court of Appeals have added clarity regarding the reliance on habitat as a proxy for population health. The 9th Circuit has rejected limited MIS analysis in recent Forest Service decisions specifically noting that the "habitat as proxy" approach is unacceptable for conducting adequate analysis of impacts to MIS. Idaho Sporting Congress, Inc. v. Rittenhouse, 305 F.3d (9th Cir. 2002). The court chastised the Forest Service for employing a proxy-on-proxy approach to MIS monitoring and for failing to provide population monitoring to ensure that sufficient numbers of management indicator species are being preserved.

The MIS section of the DSEIS fails to appropriately apply existing direction in the analysis of effect to management indicator species.

a. Disclosure and Analysis of MIS among alternatives is not comparable.

The DSEIS (p.131) identified 71 MIS in the Affected Environment section. This list was compiled from each national forest's MIS list. In contrast, the MIS list for the FEIS includes 273 plant and animal species identified in key habitat types that include old forest, west slope hardwoods and aquatic, riparian and meadow ecosystems.

To address effects on these species, the FEIS included a seventy-page analysis of broad scale trends in vertebrate species (USDA Forest Service 2001, Volume 3, part 4.2, pp. 1-70). Further, the FEIS describes the monitoring requirements for 273 plant and wildlife species that includes population trend monitoring for 112 old forest species, 59 aquatic-riparian-meadow species, and 34 hardwood species. (USDA Forest Service 2001b, Volume 4, Appendix E). Lastly, the FEIS (Appendix E, pp. 63, 75, 96) identified a period of annual population monitoring of the distribution and abundance of MIS and SAR within each ecosystem guild.

The DSEIS fails to analyze over 200 plant and animal species in the environmental analysis that were considered in the FEIS. A reasonable comparison of alternatives cannot occur without species lists that are comparable and without some idea of how the DEIS proposes to monitor population trend of MIS that is required by the forest planning regulations.

The FEIS also identified a new category of Species At Risk that require additional consideration in the Framework Plan. The DSEIS is completely silent on this issue. There is no explanation for why the SAR category is dropped or how the Forest Service will ensure viability of the species in this category. The Forest Service attempts to sweep these at-risk species out of sight by not mentioning them in the analysis, which is contrary to existing law.

b. The analysis of impacts in the DSEIS seriously flawed

i. Forest Service failed to include impacts from S2

The DSEIS (p. 130) assumes that little difference will occur between impacts to MIS under the Alternatives S1 and S2. For example, the Forest Service contends that since the aquatic management strategy remains similar, there is no need to assess the differences to MIS fish species.

Yet, the DSEIS proposes weakening of protection measures for several aquatic species (see Aquatic section comments *supra*) that will potentially impact fishery resources throughout the Sierra Nevada. Through the weakening of grazing standards there will be indirect impacts to a variety of aquatic species including the 24 MIS fish species listed in the FEIS. (USDA Forest Service, Volume 4, Appendix E, p. 98). The failure of the DSEIS to discuss and disclose impacts from increased sedimentation, loss of cover, changes in prey assemblages, and increases to base water temperature from changed grazing standards, is a glaring omission.

ii. The DSEIS fails to analyze cumulative impacts to MIS/SAR

The Forest Service must assess and disclose the cumulative impacts of management decisions as required by the National Environmental Policy Act and its regulations. 40 C.F.R. § 1508.7. (See discussion in Section VII.B.2). The DSEIS proposes significant increases in logging levels compared to the existing plan, from 157 mmbf to 448 mmbf, and includes increased logging of large diameter trees up to 30" d.b.h., throughout the Sierra Nevada. The DSEIS also propose a new objective of "forest health" logging not included in the FEIS. (DSEIS p. 193). Forest Health logging can include salvage logging, logging to manage disease and insects, and ecological restoration logging, related to stand density, and could potentially cover 3.2 million acres. There is no standard in the DSEIS to prohibit logging of significant acreage throughout the Sierra Nevada under this new "forest health" prescription.

The DSEIS (p.145) asserts that "[b]ecause the changes proposed are consistent with the range of choices in the FEIS, this assessment adequately describes the conditions that would result from implementing the alternatives in this Draft SEIS." This is a legally flawed assumption on several accounts, related to MIS/SAR. First, there is no cumulative impact section in the DSEIS that address the affects to at-risk wildlife from the alternatives considered. Second, there is no cumulative impacts section for the various management indicator species identified in the DSEIS. Third, the DSEIS fails to discuss or disclose potential cumulative impacts from the additional "forest health" logging on management indicator species in the Sierra Nevada. This flaw is particularly egregious since the forest health logging is not constrained by any annual acreage standard and many of the MIS/SAR are closely associated with snags and snag creating events across the landscape. Lastly, the DSEIS increases logging in old forest emphasis areas in particular and of large diameter trees in general. MIS/SAR associated with old forest habitats are particularly vulnerable because the Forest Service is targeting the removal of large trees and there is a general lack of large trees and old forest across the Sierra landscape. (Beardsley et al. 1999).

The Forest Service also fails to address the cumulative impacts of logging on industrial timber land, increased development in forest communities, water diversions, grazing, fire, weather effects, diseases such as West Nile virus (a serious threat to avian species), and the general impacts from increased forest fragmentation on management indicator species. The DSEIS fails to take a "hard look" at the impacts to specific habitat elements and population trends for management indicators, which is inconsistent with applicable laws, the forest planning regulations, and current case law in the 9th Circuit.

B. National Environmental Policy Act

As described throughout these comments, the DSEIS fails to comply with NEPA in numerous respects. Some of the most important shortcomings include the failure to utilize the best available information, failure to analyze important environmental impacts, inconsistent and arbitrary treatment of alternatives, and failure to disclose and analyze uncertainty. In this section, we focus on three issues: the failure to evaluate a reasonable range of alternatives, the failure to consider cumulative effects, and the failure to prepare a revised EIS accompanied by a new scoping process.

1. Failure to evaluate 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). 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.).

In this case, the DSEIS fails to evaluate a full range of alternatives, and those alternatives that are described in the DSEIS do not receive comparable treatment. Only two alternatives, S1 and S2, receive detailed consideration in the DSEIS. A third option, Alternative S3, was apparently added at the last minute and is only mentioned occasionally in the EIS. Alternative S3 is not addressed in detail in the analysis of environmental consequences and was not given comparable treatment, as required by NEPA.

The DSEIS also purports to incorporate the full suite of alternatives considered in the Framework FEIS. However, these Framework alternatives are rarely discussed in the environmental consequences section, are omitted from important tables and figures, and are clearly not given equal consideration in the DSEIS. Beyond that, 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 DSEIS. For example, the DSEIS 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. (DSEIS, pp. 304-305). The FEIS 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.

A number of reasonable alternatives have been suggested by sister agencies and members of the public, but have not been considered in the DSEIS. For example, the Environmental Protection Agency suggested that the DSEIS 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." (US Environmental Protection Agency 2003). 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 DSEIS. The State of California's Attorney General's Office has suggested a number of alternatives in their comments on the proposal. Even assuming the need for additional flexibility in the Framework's standards and guidelines, the DSEIS 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.

In effect, the DSEIS 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.

2. Failure to consider cumulative effects.

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 C.F.R. 1508.7). The consideration of cumulative impacts in the DSEIS fails to comply with this standard, particularly with respect to the effects of private land management on old forest and aquatic ecosystems.

Approximately 36 percent of the land within the planning area is privately owned. (Framework DEIS, p. 3-5). In certain areas, such as the checkerboard lands on the Eldorado and Tahoe National Forests, private timberlands are intensively intermingled with national forest lands. 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.

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 an early draft 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).

Consideration of private timberland management is particularly necessary with respect to wide-ranging, old forest associated species like the spotted owl and Pacific fisher, because these lands are potentially an important component of owl home ranges and fisher movement corridors. Thus, the failure to examine cumulative impacts in the DSEIS exacerbates the failure of the proposed action to include an owl home range strategy or to analyze and protect potential fisher habitat bottlenecks.

3. Failure to prepare a revised EIS and to undertake scoping.

The Forest Service has incorrectly described the new EIS as a "supplement" to the Framework FEIS, when in fact the proposed action represents a fundamental shift in direction that requires a new EIS, not a supplement. NEPA authorizes a supplement to an EIS when there are changes "in the proposed action." 40 CFR 1502.9(c)(1). Here, the Framework cannot be considered a "proposed action," because it was adopted over two years ago. Rather, it is a final decision that can only be changed by a revised EIS, not a mere supplement.

In addition, the proposed action would significantly change the goals, purpose, and need of the Framework. As described in Section VII.A.2 of these comments, Alternative S2 would add completely new objectives to the existing plan, including logging for purposes of "forest health" and providing commercial forest products. Issues that were considered outside the scope of the Framework FEIS, such as insects and disease, are now included in the DSEIS. In other words, the DSEIS cannot be considered a supplement to the Framework FEIS because it includes new issues and changes the underlying purposes of the existing plan.

The difference between a new or revised EIS and a supplement is legally significant. In particular, a new or revised EIS must be preceded by a scoping process, whereas the Forest Service has chosen to bypass scoping in this case. As described earlier, scoping would serve a valuable purpose in this case by helping to clarify the issues to be addressed, to determine the alternatives to be considered, and to ascertain which analytic and modeling tools to apply. The failure to undertake scoping before issuing the DSEIS violates NEPA.

VIII. CONCLUSION

For the reasons set forth above, both the DSEIS and the proposed action are fundamentally flawed. Alternative S2 would significantly weaken virtually all the key elements of the Sierra Nevada Framework in the absence of any significant new information to warrant such a change. Given the precarious state of numerous species and habitats, we would expect any proposals for change to the Framework to strengthen conservation measures in the Sierra Nevada. Moreover, the DSEIS fails to take a careful look at the likely environmental consequences, and instead sweeps important issues under the rug. Under the circumstances, both the DSEIS and the proposed action must be entirely reconsidered. To continue in the present direction is likely to result in the kind of "analysis paralysis" that Chief Bosworth is seeking to avoid. Given that the existing plan contains broad flexibility in its adaptive management provisions to consider and adopt necessary changes based on new information, we recommend that the Forest Service change course and rededicate the agency's limited resources to implementing the Sierra Nevada Framework.

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