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Sierra Nevada Forest Plan Amendment

Management Review and Recommendations

Interagency Field Trip – Eldorado National Forest, June 25, 2002

Photo Credit: Steve Clauson

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SNFPA Management Review and Recommendations

Executive Summary

On January 12, 2001 the Forest Service's Pacific Southwest Region released the record of decision (ROD) for the Sierra Nevada Forest Plan Amendment (SNFPA), which provided the management direction for 11 national forests--representing 11.5 million acres--in California's Sierra Nevada and Modoc Plateau.

The Forest Service received more than 200 appeals on the SNFPA--the most appeals on a decision in the agency's history. On November 16, 2001, Forest Service Chief Dale Bosworth affirmed the SNFPA ROD, but directed Pacific Southwest Regional Forester Jack Blackwell to review certain elements of the ROD relative to the following concerns: increased level of recent fire activity; the relationship between the SNFPA and national firefighting efforts; and the relationship between the SNFPA and the Herger-Feinstein Quincy Library Group (HFQLG) Forest Recovery Act. On December 26, 2001, Agriculture Under Secretary Mark Rey declined to conduct a discretionary review.

In December 2001, Regional Forester Blackwell chartered the Sierra Nevada Forest Plan Amendment Review Team (Team) to evaluate the SNFPA for any needed changes relative to six specific areas. Regional Forester Blackwell charged the team to use an open and public process to identify opportunities to:

1. Pursue more aggressive fuels treatments while still protecting Old Forest conditions and species at risk.
2. Achieve consistency with the National Fire Plan to insure goals of community protection and forest health are accomplished.
3. Harmonize the decision with HFQLG Forest Recovery Act to implement the pilot project to the fullest extent possible.
4. Reduce the unintended and adverse impacts on grazing permit holders.
5. Reduce the unintended and adverse impacts on recreation users and permit holders.
6. Reduce the unintended and adverse impacts on local communities.

The year-long review has been an open, transparent and highly collaborative process by local Forest Service employees working with a host of key stakeholders, including elected officials, tribes, interest groups and other government agencies. Insight was obtained from dozens of public meetings, workshops and field trips held with employees, interest groups, scientists, other government agencies, journalists and others. Biweekly updates were given to key stakeholders.

The Team reviewed the SNFPA's Environmental Impact Statement (EIS) and supporting documents, new information on owl populations, and conducted analysis using geographic information system technology, rich databases and advanced computer technology to study the effectiveness of fuels treatments under the ROD and the effect of fuels treatments on California spotted owl habitat. The Team also solicited input on lessons learned from national forest managers currently implementing the SNFPA and former members of the SNFPA interdisciplinary team.

The Team's major findings and recommendations of the six review areas are:

Protection of Communities and Wildlife: The SNFPA's rules on owl habitat protection and hazardous fuels reduction are ineffective in modifying the spread and intensity of wildfires across the landscape. A revised set of vegetation management rules, combined with existing land allocation desired condition statements, would increase the effective implementation of the fuels reduction strategy while protecting critical wildlife habitat. The rules would also allow managers to consider local conditions.

Improved Forest Health: The SNFPA reduces the region's ability to fully implement parts of the latest National Fire Plan Implementation Plan. An Integrated California Spotted Owl Conservation and Vegetation Management Strategy to more aggressively treat fuels is needed to increase the Sierra Nevada national forests ability to adhere to the National Fire Plan.

Implementation of the HFQLG legislation: The SNFPA severely limits the Plumas and Lassen National Forests and Sierraville Ranger District of the Tahoe National Forest from implementing HFQLG Pilot Project. Applying more effective vegetation management treatments while retaining the largest trees within treatment areas, conducting forest gap regeneration on a small part of the landscape, applying HFQLG ROD land allocations and standards and guidelines for northern goshawk, marten and fisher and proceeding with the Lassen Plumas Administrative Study would allow the forests to implement the Pilot Project.

Increased flexibility in grazing rules: The SNFPA fails to provide enough flexibility to maintain protection of sensitive wildlife species while reducing adverse impacts to grazing permit holders. Increasing forest managers' flexibility to adapt to site-specific conditions would reduce the adverse impacts to grazing permit holders.

Balanced recreation use: The SNFPA imposes specific restriction on broad categories of recreation activities and uses. Direction clarifying and adjusting rules on recreation activities and use would be appropriate and commensurate with the level of impact expected from those uses.

Help for local communities: Local communities would benefit through better wildfire protection, related improvements in air and water quality and increased economic opportunities by the use of wood products removed as part of hazardous fuels and forest health projects.

Regional Forester Blackwell will carefully review the Team's report, meet with interested stakeholders, government agencies, forest managers and others and decide on the necessary changes to the SNFPA. The Regional Forester will propose those changes later this month. Soon after his announcement, the agency will publish a Notice of Intent to prepare a draft supplement to the 2001 final EIS. Release of the draft supplement will be followed by a 90-day public comment period. The supplement will document new information and analyze proposed improvements to the SNFPA. The Forest Service expects to publish a new ROD in Fall 2003.

Introduction

More than 400 miles long, the Sierra Nevada is the longest continuous mountain range in the lower 48 states. The Sierra Nevada and the Modoc Plateau include 11.5 million acres of national forests encompassing dozens of complex ecosystems each with numerous, inter-connected social, economic and ecological components. In the 1980s the Forest Service began developing a plan for managing these complex systems at sustainable levels well into the foreseeable future. This process, still underway today, has led the Forest Service, other agencies, interest groups and the public through a lengthy series of studies, reviews, revisions and refinements.

In 1989, a policy of defining and establishing the Spotted Owl Habitat Areas (SOHAs) was initiated as a conservation strategy for California spotted owl habitat. By the early 1990s, California spotted owl populations were believed to be in continued decline. The Forest Service began to assess management for the northern spotted owl, and identified serious weaknesses in the SOHA strategy, which was being used for both northern and California spotted owls. A very different approach for conserving spotted owl populations began to come to light. In July 1992, the Forest Service published "The California Spotted Owl: A Technical Assessment of Its Current Status". In January 1993 the Forest Service completed an environmental assessment (EA) that proposed adopting a set of guidelines for owl conservation based on the findings of the Technical Assessment. Also in January 1993, the Regional Forester signed a "Finding of No Significant Impact (FONSI) for the California Spotted Owl Sierran Province EA." formally adopting these guidelines as an interim measure to protect owl habitat until a permanent strategy could be developed.

In May 1993, the Pacific Southwest Region began preparing an environmental impact statement (EIS) to develop a long-term strategy, and in February 1995 a Draft Environmental Impact Statement (DEIS) was released. During review of the DEIS, additional information was identified and was reflected in a 1996 Revised DEIS. In May 1997, the Secretary of Agriculture chartered a federal advisory committee (FAC) to review the Revised DEIS. The FAC committee, in its December 1997 report, was critical of the Revised DEIS, concluding that it was insufficient as either an owl habitat management plan or a broader ecosystem management plan. This report was part of an ongoing shift as the process moved from a single-species approach to one that encompassed that broader view of the Sierra Nevada ecosystem.

Shortly after the FAC was convened, the US Senate Subcommittee on Forest and Public Land Management and the House subcommittee on Forests formed the California Forest EIS Review Committee to evaluate the Revised DEIS. In May 1998 the California Forest EIS Review Committee released its findings that the Revised DEIS was scientifically sound and complete.

Early in 1998 the Chief of the Forest Service directed the Pacific Southwest Region to consider the recommendations of the FAC committee and especially the information in the Sierra Nevada Ecosystem Project report and to develop an ecosystem strategy to conserve the California spotted owl, old forests and other forest resources. The Sierra Nevada Ecosystem Project report, published between June 1996 and March 1997, was authorized by Congress in 1993 to scientifically review the entire Sierra Nevada ecosystem and assemble the comprehensive data necessary for policy decisions.

After informal discussions among state and federal agencies, the Forest Service began a new EIS process in the summer of 1998. In September 1998, after more than 30 community meetings in towns throughout the Sierra Nevada, the Forest Service convened a statewide gathering of citizens to encourage a dialogue and sharing of ideas about how best to sustain Sierra Nevada ecosystems and communities. In May 2000, the DEIS for the Sierra Nevada Forest Plan

Amendment (SNFPA) was released, and on January 12, 2001 a final decision and Record of Decision (ROD) for the SNFPA was released.

Partway through this process, in August 1999, forest supervisors of the Lassen, Plumas and Tahoe national forests signed a Record of Decision for the Herger-Feinstein Quincy Library Group Forest Recovery Act's (HFQLG) Final EIS project. The decision was designed to protect wildlife and associated old growth forests, reduce wildfire risk and provide economic opportunities for local communities.

Reason for Review

On November 16, 2001, the Chief of the Forest Service completed his review of over 200 appeals of the SNFPA. This was the largest number of appeals ever received on a forest plan amendment. The Chief affirmed the ROD for the SNFPA, but directed the Pacific Southwest Region to review certain elements of the ROD and basis for the SNFPA and associated EIS, including several other concerns raised in the appeals.

The Chief's appeal decision was subject to discretionary review by the Secretary of Agriculture, and on December 26, 2001 the Under Secretary returned the SNFPA to the Forest Service with his decision not to conduct a discretionary review. The Under Secretary expressed his confidence that the Regional Forester would develop an aggressive plan to respond to the Chief's appeal decision with an open, cooperative review of the SNFPA.

The Pacific Southwest Regional Forester chartered the Sierra Nevada Forest Plan Amendment Review Team (Team) to evaluate the SNFPA ROD for any needed changes relative to six specific areas. The Regional Forester provided further direction for the review in a December 31, 2001 memo and action plan directing the Team to use an open and public process to identify opportunities to:

1. Pursue more aggressive SNFPA fuels treatments while still protecting Old Forest conditions and species at risk.
2. Achieve consistency with the National Fire Plan to insure goals of community protection and forest health are accomplished.
3. Harmonize the decision with HFQLG Forest Recovery Act to implement the Pilot Project to the fullest extent possible.
4. Reduce the unintended and adverse impacts on grazing permit holders.
5. Reduce the unintended and adverse impacts on recreation users and permit holders.
6. Reduce the unintended and adverse impacts on local communities.

The Team reviewed the SNFPA EIS and supporting documents and gathered information about each focus area to identify specific issues that needed to be addressed. To help identify important issues, the Team solicited input from Forests currently implementing the SNFPA and former members of the SNFPA interdisciplinary team, held meetings with interest groups, sponsored field trips, and reviewed work products generated by the Regional Office SNFPA Implementation Team. The Team also reviewed the appeals and the Chief's appeals decision.

A comprehensive list of issues by focus area was then sent to interested parties for review before it was finalized (see Focus Area Summaries at http://www.fs.fed.us/r5/snfpa/library/archives/review/focus-areas/index.html). At the end of this exercise, the Team had a list of the concerns others had with the SNFPA. The next step was to further investigate those concerns and determine if changes could be made to improve the decision.

This report contains two major sections. **Part 1** provides a summary of the new insights, information and analysis the team has developed over the course of the review. The purpose of this section is to share what we have learned and to summarize the information we used to

develop our recommendations. **Part 2** of the report includes detailed and specific recommendations for changes to standards and guidelines in the ROD, along with more general recommendations for improvements to the SNFPA.

Part 1. Assessing the Need for Change

Review of the Fire Strategy and Effectiveness of Fuels Treatments

Key Findings

1. **Fuels reduction treatments at the landscape scale must:**
   - **Effectively modify fire behavior**
   - **Be strategically placed**
   - **Be cost efficient**

   Each of these conditions is compromised by the standards and guidelines in the ROD.

2. **The overlapping and layering of standards and guidelines restrict mechanical treatment to removal of material 6" in diameter or less over substantially more acres than was originally planned or intended. This results in ineffective fuels treatments.**

3. **Limitations on fuel treatments within Protected Activity Centers (PACs) constrain the placement of treatments and reduce the effectiveness of the fire and fuels strategy, especially where concentrations of PACs occur in the Urban Wildland Intermix.**

4. **In many cases, application of the standards and guidelines result in more expensive treatments which, coupled with fixed budgets, reduces program accomplishments and may compromise successful implementation of the fire and fuels strategy.**

5. **Significant technical problems are associated with many of the fuels treatment standards and guidelines. Many standards and guidelines are redundant, overlapping and ambiguous, creating administrative problems during planning and implementation.**

6. **Field professionals across the Sierra Nevada have expressed concerns over their inability to create effective and cost-efficient fuels treatments. Moreover, the standards and guidelines did not move the project area toward the desired condition.**

7. **The opportunity exists to improve the effectiveness of fuels treatments while limiting effects to habitat at the landscape scale in the short-run and developing and maintaining owl-nesting habitat in the long run.**

8. **The role of timber harvest in sustaining long-term forest health and its economic value as an output from suitable lands is eliminated by the SNFPA. This limits timber harvest to a by-product of fuels treatments.**

9. **Assumptions about the viability of the California Spotted Owl weighed heavily in the management direction set forth in the SNFPA. New information described in Findings 11 to 14 below, changes some of these assumptions.**

10. **New analysis of existing owl demographic data suggests that owl populations may not be declining as dramatically as assumed in the Final Environmental Impact Statement (FEIS). However, concern still exists for slow and undetectable declines due to the uncertainty in model predictions.**

11. **Alternative analytical techniques for assessing California spotted owl habitat at the landscape scale, suggest that the current habitat status across the Sierras is better than reported in the FEIS.**

12. **New information suggests that private timberlands could contribute to habitat needs of the owl. The FEIS assumed no contribution from private lands.**

13. **New information exists on the mosaic of canopy cover densities important to owl reproduction.**

Background

The SNFPA ROD emphasizes two key goals: (1) maintaining existing habitat for species associated with old forest ecosystems, particularly the California spotted owl and (2) strategically placing fuels treatments across broad landscapes to reduce the size and severity of wildland fires.

Modifying Wildland Fire Behavior Across Landscapes

Across much of the Sierra Nevada, the historic regime of short-interval, low- to moderate-severity fire has been changed to a long-interval, high severity, stand-replacing fire regime (Verner et al., 1992). Addressing this issue was defined as one of the five problem areas that drove various approaches analyzed under the SNFPA effort. Moving the forests of the bioregion towards their historic fire regime is also a goal of the National Fire Plan. Any approach designed to modify forest vegetation to moderate fire behavior across landscapes must balance two supremely important factors. These are the adverse effects from continued large scale high-intensity, stand-replacing fires, and the adverse effects of the fuel treatments themselves. There is little argument that unnaturally high severity fires are harmful to people and wildlife. Likewise that fuel reduction carried to an extreme would also be harmful to the environment. The root of the problem lies in finding a balance.

A reasonable array of approaches to resolving this conundrum was analyzed in the FEIS. Clear and concise analysis was and is difficult, because of major uncertainty that surrounds the two factors to be balanced. Because of this, no clearly definable “correct” course exists. Instead, the Regional Forester must use the best information available, judgment, and his own sense of the balance of risks in making the decision. In light of the overarching concern about catastrophic wildfires and perpetuating the conditions that led to them, the Team was charged with seeing if there was another approach to achieving that balance.

The objective of the fuels treatment strategy in the ROD is to modify wildland fire behavior across broad landscapes. The strategy is based on research conducted by Dr. Mark Finney (2001) that suggested the rate at which a fire spreads across the landscape could be reduced, even outside treatment areas, when the fire was forced to flank around individual treatment units. His research revealed that, for a given landscape, there is an optimum pattern for placing treatment units to have the greatest impact on fire spread. One benefit of using such a “strategic” approach to fuel treatments is that, given an effective treatment unit shape and pattern, only a relatively small proportion of the landscape needs to be treated to produce the desired modifications in wildland fire behavior. The current direction from the ROD is to maintain 30 to 40 percent of the landscape in a condition that meets fuels objectives.

Finney’s theory is carried forward in the ROD in the form of “strategically placed area treatments“ (SPLATs), which can vary from 50 to over 1,000 acres in size that are to be positioned across the landscape in a manner that will interrupt fire spread. Within the individual SPLATs, fuel loading must be reduced to the point that a fire entering the treated area will burn at lower intensity and slower rate of spread than comparable untreated areas. The SPLATs act as “speed bumps” and work to slow both the spread and intensity of an oncoming fire, reducing damage to both treated

and untreated areas, and effectively modifying wildland fire behavior to mitigate the consequences of large, damaging wildland fires.

Managing Fuels while Maintaining Wildlife Habitat

Current national direction, as mirrored through budget allocations, emphasizes implementing fuel treatments in defense zones (areas in closest proximity to structures and communities approximately one quarter mile wide) to prevent the loss of life and property by creating defensible space. Threat zones typically buffer defense zones extending approximately a mile and one quarter beyond them. In threat zones, a pattern of strategically placed area treatments are designed to modify the behavior of wildland fires approaching the defense zone. This allows firefighters to take advantage of reduced spotting, lower rates of spread, and lower intensity to rapidly contain wildfires. Together, the defense and threat zone comprise the urban wildland intermix zone which is to receive priority consideration for fuels treatments.

Away from structures and communities, fuels treatments are designed to support treatments in the urban wildland intermix, protect sensitive habitats from catastrophic fire, and reintroduce fire into fire-dependent ecosystems. The ROD takes a cautious approach to fuel treatments in PACs, the southern sierra fisher conservation area, old forest emphasis areas, California spotted owl home range core areas, and stands comprised of medium to large trees.

To implement this cautious approach, the ROD limited the tools and techniques available to managers to address fire hazard outside defense zones. For example, prescribed fire is the only treatment option in PACs outside defense zones, and it is the preferred method of treatment in old forest emphasis areas and California spotted owl home range core areas. Mechanical treatments are allowed in old forest emphasis areas and home range core areas only when prescribed burning is determined to have: (1) high likelihood for prescribed fire escape due to excessive fuel accumulations, (2) high potential for unacceptable smoke impacts, or (3) a high risk for prescribed fire to result in canopy structure loss due to excessive surface and ladder fuels.

The ROD imposes a number of restrictions on mechanical treatments because of uncertainty about their effects on old forest associated species and their habitats and to conserve special components of the landscape, such as stands of mid and late seral forests with large trees, structural diversity and complexity, and moderate to high canopy cover. Standards and guidelines for mechanical treatments also limit the area of each stand that can be treated.

The direction in the ROD applies on a stand-by-stand basis, and, for the most part, the stand condition (rather than land allocation) determines which standards and guidelines apply. A single treatment unit typically includes several stands, each of which must be delineated to ensure that the appropriate standards and guidelines are applied. Although the language in the ROD is complex, careful review shows that it overlaps and repeats in several areas. Moreover, as noted above, the layer of complexity introduced by the land allocations has a limited effect on the actual application of the standards and guidelines. As a result, the Team was able to reduce several pages of direction for fuels treatments outside the defense zone to one general rule and a set of exceptions (Table 4, pg 23). Additional rules, which apply at the forest-wide scale, also play a role in mechanical fuels treatment but are not illustrated in Table 4.

National forest managers encounter a complex situation as they begin to implement the ROD across a highly varied and dynamic landscape. Landscape conditions continue to change as large fires like the recent Star Fire (Tahoe and Eldorado National Forest) and McNally Fire (Sequoia National Forest) burn at high intensities over tens of thousands of acres. Managers must deal with other agents of change as well, including insects, diseases, invasive non-native plants, drought conditions, and so forth. These can pose serious threats to old forest ecosystems and species associated with these ecosystems, especially when multiple change agents operate together.

New Information and Understanding Gained from Review

The Team sponsored three field trips devoted specifically to fire and fuels to learn more about how the standards and guidelines from the ROD were being interpreted at the field level and to begin to assess where improvements could be made. In addition to Forest Service personnel, attendees included representatives from other state and federal agencies and key interest groups. The list of participants, agenda and meeting notes for each field trip are posted at http://www.fs.fed.us/r5/snfpa/review.

During the early stages of the review, the Team was focused on determining how well the standards and guidelines for fuels treatments really worked when they were applied to actual treatment areas. Throughout our discussions, most of the concerns stemmed from the prescriptive rule set in the ROD. There appeared to be less concern or disagreement with the desired future conditions described in the FEIS or the overall fuels reduction strategy embodied in the SNFPA. The field trips marked the beginning of an intense exploration of how the ROD actually played out on the ground and what the expected outcome would be under the existing standards and guidelines.

The richness of the Team's review and findings was enhanced by the insight of the field managers charged with implementing the ROD and reducing the build-up of hazardous fuels on their Ranger Districts. This new information grounded the review effort in a practical sense, in that the test of a successful plan lies in its ability to achieve the desired outcomes on the ground. Extensive input from Forest Service District Rangers illuminated a number of project-level concerns.

Following up on the concerns raised in the field, the Team used analytical techniques to test and evaluate the existing standards and guidelines for fuels treatments across a landscape. This analysis gave us an opportunity to examine the effects of the standards and guidelines in a spatial context. The exercise provided new information about the cumulative effect of the standards and guidelines as applied to the array of stand structures encountered in an actual landscape. The Team was able to see and understand the importance of resolving issues raised by local managers if we are to successfully reduce fire risk to communities and important wildlife habitat. This learning exercise was invaluable in that it allowed the Team to gain an appreciation of the nuances embedded in the existing decision and revealed a number of ways in which it could be refined to better accomplish the original intent.

Finally, the Team has compiled and reviewed new information and analysis about the California spotted owl and its habitat requirements. This will be important to consider in evaluating potential changes to the conservation strategy embodied in the ROD.

In brief, the Team found that the FEIS strategic approach to fuels treatments across landscapes is dependent on treating enough of the right places with treatments that are effective. We believe it is a reasonable approach to reducing the size and intensity of wildfires at the landscape scale **provided that certain conditions are met**.

Figure 1. Fire/Fuels Strategy Triangle

The Team developed a conceptual illustration of this we call the Fire/Fuels Strategy Triangle (Figure 1.) The idea is that to have a successful strategy, three mutually supporting concepts must be considered and balanced. These make up the three sides of the triangle: proper strategic placement of treatments, treatments that are effective in moderating fire behavior, and treatments that are cost efficient to the extent that we can afford to do enough to make a difference across the larger landscape. These three "sides of the triangle" must be balanced as a whole in the context of protecting wildlife habitats, and communities.

We found that the ROD's "cautious approach" to active fuels management includes prescriptive, stand level standards and guidelines that limit the effectiveness of many treatment areas. Under the existing direction, the densest stands--key components to sensitive wildlife species habitat and most vulnerable to wildfire loss--will be treated either lightly (ineffectively) or not at all. Our conclusion is that the standards and guidelines in the ROD will not allow for the placement and intensity of area treatments needed to effectively reduce the spread and intensity of wildland fires at the landscape scale. The following sections highlight the key findings that led us to this conclusion.

District Ranger Letters to Regional Forester

District Rangers are the line officers in the Forest Service that are charged with on-the-ground implementation of agency resource management direction. They must design actual projects to carry out agency planning direction, policy, and procedures while considering public interests, desires, and local site-specific resource conditions. Because of this, the experiences of District Rangers in carrying out the ROD direction are of particular importance to the review.

On August 9, 2002, the Regional Forester sent a letter to all Sierra Nevada District Rangers asking for their assistance in the review process. He asked specific questions relative to the review, and for their experiences implementing the ROD. Our attempt here is to distill the "take home message" from each question area. This was somewhat difficult, as there was a wide array in the detail of the responses. However, several issues came up repeatedly in the ranger's letters. This analysis is the Review Teams best effort to understand and take into consideration the thoughts, and experiences of the line officers ultimately responsible for implementing land management strategies in the Sierra Nevada. Of the 32 ranger districts in the Sierra Nevada, 31 rangers responded. One district ranger position was vacant at the time of the inquiry.

The following is a question-by-question analysis of the responses. Another summary of the responses can be found at http://www.fs.fed.us/r5/snfpa/library/archives/correspondence.1

Question 1: In FY2001 and FY2002, have you implemented any vegetative management projects (fuels or timber) under the standards and guidelines of the SNFPA?

The responses clearly showed that each of the District Rangers has been working hard to continue their program of work. The ROD represents a major change in direction with new and very prescriptive standards and guidelines that must be met. To ensure that current projects are consistent with their amended forest plans, ranger's have re-designed many projects for which planning had already begun. In some cases this caused delay of the projects. In others, where timely modifications could be made or where projects were already consistent with the new direction, the projects proceeded on schedule. 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. In general, it appears that the districts have proceeded to implement the new direction as rapidly as possible, given each project's status and the tremendous degree of complexity inherent in the new standards and guidelines. Based on their responses, the team believes that the ranger's have done a good job of absorbing the new direction and applying it in a way that creates the least disruption to ongoing programs while allowing for the most effective use of allocated funds.

[1] A 192-page paper copy of District Ranger letters is available upon request from the USFS Regional Office in Vallejo, CA.

Several rangers have been totally committed to planning and implementing wildfire restoration/salvage projects. As a result, fuel treatment activities on their districts have focused on burned areas.

There were three examples in the responses where rangers made the decision to defer projects that were being planned under previous direction. Under the amended direction, these projects were infeasible because of expense and/or ineffectiveness. One ranger indicated that current standards and guidelines would leave stands in an unnatural, overly dense condition. He stated: "As a result, we have dropped the proposed thinning activity, since under the current standards no project can achieve conscientious forest management objectives." While only three rangers indicated they had actually dropped or deferred projects because of difficulties with the new direction, nearly all of them expressed concern that the new guidelines would have the effect of making projects more expensive and less effective from a fuels or forest health standpoint.

Question 2: What has been your experience with types of treatments and costs, what do you think of the effectiveness of the treatments, how much are you able to get done, etc? If standards and guidelines in the SNFPA are a barrier to successful implementation, which ones are they? If changes are necessary, what do you recommend?

Types of treatments and costs: The ROD's impact on cost efficiency was a major point raised by the rangers. Over 70 percent of the rangers felt that cost was a significant problem with the current direction. This included increased planning costs and the higher cost of actually implementing the projects.

Additional analysis and survey requirements were identified as components of the new direction that substantially increased the cost to design and plan a project. For example, one ranger noted that survey requirements for spotted owl and goshawk must be conducted in all suitable habitats, versus focusing on nesting habitat. One project spent $250,000 and found one additional goshawk. The bird was found in nesting habitat. The ranger noted, "by focusing on nesting habitat, we could have reduced our costs significantly."

Because the diameter limits, and canopy cover limits restrict projects to only minimal removal of the smallest material, using a commercial timber sale as a tool to accomplish the treatment is usually not possible. Most projects that might have been timber sales under previous direction are now expensive service contracts or force account (local district crews) projects. Most rangers believe the resulting costs are not consistent with realistic budget constraints. Costs of over $1,000 per acre were reported which will allow very little fuels reduction work to actually be accomplished. One ranger reported the cost per acre shift (total change in cost as a result of the ROD) as an increase of over $1,500 per acre. "We can treat a larger amount of ground with a timber sale, than we ever will with service contracts, given the reality of limited funding," another ranger reported. She went on to relate that shifting treatments to timber sales, where environmentally appropriate, would result in dramatic savings of "over half of the funding the Region requests for service contracts (i.e. millions of dollars per year)." This response was echoed by many rangers.

Treatment effectiveness: More than 80 percent of the rangers reported that the current standards and guidelines prevent effective treatments and, in many cases, the overall desired condition of a healthy old forest ecosystem could not be reached.

Restrictive diameter limits, non-treatment requirements, canopy cover reduction limits, and canopy cover retention standards were consistently identified as major barriers to implementing fuel treatments that would effectively modify fire behavior. Essentially, most rangers reported that the numerous restrictive, overlapping, and confusing standards and guidelines in the ROD either prevented them from removing enough material to reach the stated objectives, or caused insurmountable logistical problems.

An example given was when residual fuel and vegetation were so thick that equipment could not be used to accomplish fuels treatments. In these cases, even hand treatments were reported to

be infeasible as they would have little to no effect on fire behavior. Moreover, once removed, there was no place to pile vegetation so it could be burned without excessive damage to the remaining vegetation. Sometimes the guidelines themselves, did not allow for effective modification of fire behavior. One ranger stated: "We have many uniform, even aged stands of white fir with canopy closure far in excess of 70 percent; however, reducing those canopies from 90 percent to 80 percent, as per direction in Old Forest Emphasis Areas, does absolutely nothing to change fire behavior."

While not expressed as frequently as the previous concern, over one quarter of the rangers felt the ROD standards and guidelines in many cases prevented the achievement of stated desired conditions. For example, the desired condition of a properly functioning old forest ecosystem is in conflict with the standards and guidelines that attempt to maintain the current unnaturally overstocked conditions that are the result of decades of efficient fire suppression. Many rangers identified this very problem as an important barrier.

> "The landscapes and ecosystems …have been profoundly altered after 140 years of livestock grazing, 100 years of fire suppression, and decades of timber harvest. Little or no functioning old growth exists. Therefore we need the freedom and the tools to manage for old growth. We need restoration and proactive management."

In the area of restoration of large stand replacing wild fires, one ranger summed it up by saying that the rules required leaving too much large fuel in a burned area. This would result in a long-term threat to the remaining old forest components.

> "We have seen many examples in the last few years where a fire area from the 1980's burned again. If we are going to restore old forest values in these areas we cannot afford to lose many more of the large old trees and most of the residual snags and down logs in the reburn."

How much can be accomplished: As mentioned above, over 70 percent of the rangers felt the current direction substantially increased the cost of planning and implementing projects. Most of these indicated that as a result, acres of treatment accomplished under the ROD would be very low, given budget limitations. Little information was given relating to estimating actual program accomplishment. However, the overwhelming message was that substantial increases in cost and complexity brought about by the current direction would cause a major reduction in accomplishment.

What are the barriers: The district rangers identified 82 specific barriers or problems with the current ROD. Many of these were identified more than once. Primary barriers that were brought up repeatedly in the ranger's responses were:

1. Reliance on prescribed burning as the primary method of fuel treatment
2. Canopy retention standards
3. Canopy reduction limits
4. Diameter limits
5. Non-treatment standards
6. Overall complexity of stand-based standards
7. Standards are too prescriptive, and leave no room to adjust to site-specific conditions.

Recommended changes: The most frequent recommendation for change was to structure new direction to rely more on the professional expertise and judgment of local managers and resource specialists. There was little disagreement among the rangers over the desired conditions adopted in the current direction (with the exception of some eastside types). However, there was a very prominent concern that the detailed, standards and guidelines in the SNFPA are an attempt at standard prescriptions to achieve multiple desired conditions across a broad and diverse landscape. One ranger summed this up:

> "Place more emphasis on the desired condition over a landscape and be very limited on prescribing how to achieve that desired condition…Give me a picture of what you want and leave it up to us in the field to achieve that condition…Nothing in nature is exact and uniform and when you try to apply standard prescriptions across a vast area, such as the Sierra Nevada, you're bound to run into problems."

Another area where rangers feel strongly about changes is the preference between use of mechanical treatment or prescribed fire. Overwhelmingly, the rangers felt that in the majority of cases, mechanical treatment is needed prior to reintroducing fire into the forest. This was a common thread through many of the responses. Many stated that without some sort of pre-treatment using mechanical means, no prescribed fire could be used since the risks were too high. The end result would be no treatment at all. One key area affected by this is sensitive habitat contained in PACs for California spotted owls and northern goshawks. These areas are by definition some of the densest forested stands with the highest fire hazard. Outside the defense zone, prescribed fire is the only method allowed to deal with this hazard. Unfortunately, introducing prescribed fire into these dense stands with typically heavy surface fuel loadings, and plentiful ladder fuels is generally infeasible. In order to reintroduce fire into these areas, some form of effective pre-treatment to reduce surface and ladder fuels must be accomplished. One ranger noted that the constraints on vegetation management within PACs create the situation where "excessive fuel loads are inevitable." As discussed earlier, rangers were also very consistent in the recommendation that the ROD's reliance on prescribed fire was unrealistic.

Rangers also made consistent recommendations regarding better guidance in developing restoration projects after large and catastrophic wildfires. Specifically, the requirement to leave tremendous amounts of snags within old forest emphasis areas was identified as a threat to achieving the desired condition of those important land allocations. Many rangers pointed out those short-term risks should be better balanced with long-term benefits in designing restoration projects. The use of salvage timber harvest as a tool to address long-term management of fuel profiles was another example. A short window of opportunity exists immediately after the fire to remove a portion of the fire-killed trees to reduce future fuel loadings. If accomplished promptly, this can generate revenue for other restoration activities while recovering a useful product.

Another recommendation relative to fire restoration was to use the latest and best information available to decide which trees should be removed based on the damage they received in the fire. Currently the direction restricts removal to "dead" trees only. The standard for determining when a tree is dead is not at all straightforward. The Regional Forester issued clarifying direction that defined dead trees eligible for removal as those with no green leaves or needles. This direction was necessary to ensure that the standards and guidelines in the ROD were interpreted consistently. However, the best available information indicates that this is not a good criterion for deciding which trees to cut in a salvage operation.

The rangers also recognized the important role that the wood products sector plays in the successful completion of ecosystem restoration. Many changes were recommended to allow timber sale contracts to be used for fuels treatments to offset costs and generate trust fund revenue to pay for the follow-up work.

Adaptive management was identified as a major area needing change. Rangers felt the requirement to do research prior to any deviation from the standards and guidelines was not necessary, too costly, and infeasible. Many stated that there should be simpler methods based on implementation monitoring, and a focus on maintaining accountability for designing projects to move landscapes toward their desired condition.

Question 3: Are the standards and guidelines in the SNFPA compatible with implementation of the National Fire Plan?

Almost every ranger identified strong concerns about meeting the goals and objectives of the National Fire Plan under the current standards and guidelines. Nearly one third of the rangers believe the standards and guidelines are incompatible with implementation of the National Fire

Plan. Primary concerns and recommended changes were the same as those mentioned above. Essentially, current direction leads to high-cost planning and projects, ineffective or minimally effective treatments, and inability to adequately reduce forest density in "protected areas".

An important point surfaced by several rangers is that the National Fire Plan is aimed in large part at restoring historic fire regimes that have been altered from short-interval, low to moderate severity; to long-interval, high-severity, stand-replacing regimes. One of the primary intents of the ROD is to maintain all moderate to dense canopied stands in their current condition (which also means allowing them to continue to increase in density) to avoid any possible adverse effects from fuel treatments to old forest species (especially spotted owls). This is at direct odds with the National Fire Plan since the changes in condition class that are sought under the plan would require reductions in stand densities in some areas with moderate to dense canopy cover.

Question 4. Do the SNFPA standards and guidelines give enough direction and flexibility to accomplish the fuels treatment program?

Nearly two-thirds of the rangers believe there is not enough flexibility in the current standards and guidelines to accomplish the fuels treatment program. Once again, many rangers suggested describing desired conditions rather than prescribing one-size-fits-all treatments in the various land allocations and vegetation types.

Question 5. Does Alternative Modified 8 provide an appropriate balance among ecological, social and economic values as it strives to protect wildlife habitat and reduce fuels?

The ranger's overwhelming response to the question of whether the current direction provides an appropriate balance among ecological, social, and economic values was "no". One of the primary reasons identified was the overly prescriptive nature of the direction. One ranger said:

> "The Downieville District is one of the Region's best growing sites. Many of our sites can grow trees 20 inches in diameter in 40 years. Contrast that with my neighboring district on the east side, where trees 100 years old are 20 inches. We need flexibility to manage the different site capabilities."

Additionally many rangers felt the current direction was out of balance ecologically because it over-emphasizes old forest dependent species at the expense of other wildlife. Some rangers indicated that the prescriptive standards designed to protect old forest habitat actually puts it at risk. One ranger put it this way:

> "The 'protection' strategies resulting from the many S&Gs (standards and guidelines) are clearly leaving all our lands in a vulnerable, unhealthy state. If social values are measured in terms of leaving a healthy legacy for future generations, these are clearly not being met. The strict, prescriptive S&Gs make economics VERY poor as most work can only be accomplished with appropriated funds."

From the standpoint of social and economic balance, most of the rangers felt the social and economic factors of land management had been poorly addressed in Alternative Modified 8. They indicated the ability to use timber sale contracts ("with the loggers paying the costs") to accomplish fuels objectives while providing economic opportunity to communities is severely hampered by the current direction. "Businesses cannot survive without some type of assurance of what types and quantities of products will be coming off of the national forests here in the Sierra Nevada, at least in the short term" said one ranger. He went on to say that without better ability, and direction to provide more economically sound projects, "I believe the industry that we are relying on to do our fuels work, will disappear."

Question 6: Do alternatives 4, 6, or 7 provide a better balance among ecological, social and economic values?

Many rangers felt that alternatives 4 and 7 provided a better balance among ecological, social, and economic values. From an ecological perspective, they indicated that Alternative Modified 8 lacked critical discussion and analysis of the "sustainability of forest ecosystems over time, and the need to maintain a balance of vegetation types and seral stages to support a variety of wildlife." Alternative 6 was avoided due to its reliance on prescribed fire.

Alternative 7 ranked high as a better-balanced alternative for managing the Sierra Nevada. Its emphasis on the concept of providing "a diversity of forest ages and structures over the landscape in a mosaic approximating patterns that would be expected under natural conditions" (ROD, Pg. 20) made it attractive in this regard. From a social and economic standpoint, Alternative 7 recognizes the importance of mechanical treatment in addressing hazardous fuels reduction, and restoration of historic fire regimes. Additionally, the rangers like the way this alternative emphasized desired condition and local flexibility to design projects to move the forest in that direction.

Alternative 4 was judged superior to Modified 8 in that it allowed more flexibility to "use timber sales as a tool…to thin out the forest", and depended more on describing the desired condition rather than setting "arbitrary diameter limits" or other prescriptive standards. Rangers see this alternative as more "implementable" than the current direction.

California Spotted Owl Protected Activity Centers in the Urban Wildland Intermix

The ROD directs each national forest to designate California spotted owl protected activity centers based on specific standards and guidelines.[2] Each national forest is also responsible for locally determining urban wildland intermix zones.[3] Updated information from the 11 Sierra Nevada national forests shows that out of approximately 11.5 million acres, 341,352 acres are in defense zones and 2,140,864 acres are in threat zones for a total of 2,482,216 acres in the urban wildland intermix zone. The total area in the 1,350 California spotted owl PACs across the 11 forests is 601,358 acres. Of particular interest, is the overlap between PACs and the urban wildland intermix in light of the ROD's emphasis on treating fuels in this area while limiting the number of PACs that can be treated in any year (Table 1).[4] The ROD limits the number of PACs treated to reduce fuels to five percent annually, and ten percent per decade of the total number of PACs in the bioregion.

California spotted owl PAC acreage in the urban wildland intermix zone accounts for 8 percent of the total area within this zone. Approximately 73 percent of the PACs have at least a portion of their area within in the urban wildland intermix zone. This accounts for approximately 33 percent of the overall PAC acreage in the Sierra Nevada national forests.

[2] SNFPA ROD, Pgs. A-33 and A-34.
[3] SNFPA ROD, Pgs. A-46 and A-47.
[4] The ROD limits the number of PACs that can be entered for treatment to 5 percent annually and 10 percent per decade across the bioregion.

Table 1. Overlap of California Spotted Owl PACs and Urban Wildland Intermix in the Eleven Sierra Nevada National Forests.

Urban Wildland Intermix Zone	PAC *acreage* in this zone	Proportion of the bioregional PAC *acreage* in this zone	Number of PACs (entire PAC or portion of the PAC overlaps this zone)	Proportion of bioregional PACs by *number* (entire PAC or portion of the PAC overlaps this zone)
Defense Zone	24,807 acres	4.1 %	287 PACs	21.3 %
Threat Zone	175,848 acres	29.2 %	692 PACs	51.3 %

The ROD directs managers to strategically locate fuels treatments in threat zones to interrupt wildland fire spread and reduce fire intensity. This approach would result in treating roughly 30 percent of the area in the threat zone. Table 2 shows the numbers and acres of PACs the Team estimates would need to be treated to achieve the existing fuels management objectives for the urban wildland intermix zones. These estimates were based on the assumption that all PACs that had 10 acres or greater within the defense zone would be treated. Additionally, a uniform template of SPLATs was overlaid across the bioregion, then the intersections with PACs were reduced by using an avoidance factor developed at the landscape scale for the Middle Fork Cosumnes.

Based on this, 224 PACs need some fuel reduction treatment in the defense zone. That is 4.1 percent of the bioregional PAC acreage. However, it represents over 16 percent of the bioregional PACs by number. Approximately 136 PACs would need some portion treated within the threat zone. This represents only 1.7 percent of the total bioregional acreage. However, it is 10.1 percent by number. Note that the values displayed in Table 2 for potential numbers and acres of PACs treated are not associated with a specific timeframe; however, the ROD envisions a 20- to 25-year timeframe for accomplishing the fuels treatments.

Table 2. Estimated Treatments in PACs Located in the Urban Wildland Intermix across the Eleven Sierra Nevada National Forests

Urban Wildland Intermix Zone	Proportion of bioregional PAC *acreage* in this zone	Estimated proportion of bioregional PAC *acreage needing treatment* in this zone	Proportion of bioregional PACs by *number* (entire PAC or portion of the PAC overlaps this zone)	Estimated proportion of bioregional PACs by *number needing treatment* (entire PAC or portion of the PAC overlaps this zone)
Defense Zone	4.1 %	4.1 %	16.6 %	16.6 %
Threat Zone	29.2 %	1.7 %	51.3 %	10.1 %

Tables 1 and 2 show substantial overlap between California spotted owl PACs and the urban wildland intermix. Because of this overlap, it is likely that the 10 percent limit on numbers of PACs treated per decade in the ROD will limit options for strategically placing treatments. Especially where PACs are clustered, there will be fewer opportunities to move treatments to avoid PACs while maintaining a pattern that is effective in interrupting fire spread and reducing fire intensities. Note that although the percentage of PACs likely to be entered to accomplish fuels treatments is above the current limit of 20 percent, only a small fraction of the total PAC acreage is likely to be treated throughout the life of the plan (4.1 percent in the defense zone and 1.7 percent in the threat zone).

Using a Landscape Analysis Approach

The watershed of the Middle Fork Cosumnes River in the Eldorado National Forest (referred to as the Middle Fork Cosumnes Landscape) was analyzed for several purposes:

- To understand how application of SNFPA ROD direction could play out on an actual landscape.
- To inform the Team about issues associated with implementing existing ROD direction.
- To gain insight into a complex decision.

The Team selected the Middle Fork Cosumnes Landscape for this case study to take advantage of an opportunity to collect data, collaborate, and share information with a team of resource specialists on the Eldorado National Forest. The Eldorado National Forest was conducting an assessment for the Middle Fork Cosumnes watershed at the same time the analysis for this case study was being conducted. The Team did not use priority-setting mechanisms from the ROD to select the Middle Fork Cosumnes Landscape for this exercise. We are conducting similar analyses on two additional landscapes to see if similar results occur.

The information presented here summarizes one approach for applying direction in the ROD, based on our interpretation of the management intent for different land allocations and application of the relevant standards and guidelines. This exercise resulted in a landscape-scale treatment scenario that reflected existing ROD direction. The Team used this model as a case study for understanding how fuels treatments conducted under the ROD would affect potential wildland fire behavior and California spotted owl habitat.

Understanding and solving landscape-scale problems requires a simultaneous view of both individual treatments and how they link together to create a cumulative effect across a larger area. Using Geographic Information System (GIS) technology, existing databases, and computer technology, specialists modeled one scenario under the ROD to estimate the potential effects of management actions.

Applying ROD Direction for Fuels Treatments

The fuels treatment strategy in the ROD is aimed at modifying wildland fire behavior across broad landscapes. To accomplish this, the ROD directs managers to strategically locate fuels treatments, linking treatments to support one another on the landscape to reduce wildland fire spread and severity. Two criteria must be met in order for the strategically located area treatment approach to effectively modify wildland fire behavior: (1) the pattern of treatment areas on the landscape must serve to interrupt fire spread; and (2) each individual treatment must effectively reduce spotting, rates of fire spread, and fire intensity.

Urban wildland intermix zones (defense and threat zones) have highest priority for fuels treatments. Objectives for treatments in defense zones are to prevent the loss of life and property by creating defensible space. Treatments in threat zones are strategically placed to

interrupt wildland fire behavior. Treatments in threat zones should be designed to effectively modify wildland fire behavior (reduce spotting, rates of spread, and fire intensity).

The ROD also directs managers to strategically locate fuels treatments across broad landscapes in areas outside urban wildland intermix zones. Consistent with the ROD's cautious approach to applying mechanical fuels treatments, management direction encourages managers to:

- Seek opportunities to adjust treatment patterns to avoid key habitat areas while reducing fire severity on the landscape.
- Use less intense mechanical treatments to minimize impacts to California spotted owls and their habitat.
- Emphasize prescribed fire, particularly in old forest emphasis areas and California spotted owl home range core areas, where low-risk maintenance opportunities exist.

Direction in the ROD was applied to the Middle Fork Cosumnes Landscape using the following steps: (1) identify land allocations; (2) design a pattern of treatment areas to interrupt potential fire spread; and (3) develop treatment prescriptions for each fuels treatment area following the standards and guidelines in the ROD. The following sections describe each step in more detail.

Identifying Land Allocations. The ROD describes two types of land allocations: mapped and unmapped. Mapped land allocations are delineated on the SNFPA FEIS Modified Alternative 8 map. Unmapped land allocations are designated by each national forest based on the ROD's standards and guidelines. Old forest emphasis areas are mapped land allocations. California spotted owl PACs and urban wildland intermix zones are locally determined based on direction in the ROD.

The total area of the Middle Fork Cosumnes Landscape is approximately 53,600 acres. The landscape contains all or portions of 26 California spotted owl PACs; PAC acreage in the Middle Fork Cosumnes Landscape totals approximately 9,800 acres. The urban wildland intermix zone is comprised of approximately 33,400 acres (1,300 acres in defense zones and 32,000 acres in threat zones). The landscape has approximately 10,500 acres of old forest emphasis area.

Locating Treatment Areas. Direction in the ROD allows managers to locally determine the size, distance between, and orientation of the treatment areas across landscapes. Information about local fire history, fire behavior potential (including the direction of prominent wildland fire spread), suppression resources, attack times, wind direction, and topography was used to establish the pattern of fuels treatment areas in the Middle Fork Cosumnes Landscape. The goal for the pattern of treatment areas was to limit a wildland fire to between 400 and 600 acres over one burning period (12 hours). The Team also considered local factors, including slope, roads, streams, natural barriers and previous vegetation treatments (plantations, thinning or prescribed burns) to design the locations of area treatments in this landscape. The pattern of fuels treatment areas attempted to minimize treatments in PACs, considering the ROD's direction for limiting the number of PACs treated.[5] However, treatment areas were placed in a higher number of PACs (6 PACs) than would have been treated if the bioregional standard had been prorated to this landscape (3 PACs).

[5] SNFPA ROD, Pg. A-35.

Table 3. Middle Fork Cosumnes Landscape Fuels Treatment Area Statistics

Total acres treated	12,248 acres
Percent of landscape treated	27%
Mean size of treatment areas	129 acres
Treatment area overlap with:	
PACs (6 PACs)	547 acres
Prior vegetation treatments	4,859 acres

Assigning Prescriptions to Treatment Areas. The ROD standards and guidelines for fuels treatment prescriptions are based on either land allocation or stand conditions within each treatment area. For treatments in PACs, prescribed burning is the only option. For old forest emphasis areas and home range core areas, prescribed burning is the preferred treatment, although mechanical treatment options are available. Mechanical treatments are allowed in all other areas. In order to apply standards and guidelines for mechanical treatments, each component stand in each treatment area must be identified.

While applying the ROD standards and guidelines to the treatment areas in the Middle Fork Cosumnes Landscape, the Team found that several layers of direction could be summarized with a few general rules and a short list of exceptions (Table 4). Standards and guidelines that most directly affect mechanical fuels treatment prescriptions include: (1) limits on the amount of area that can be disturbed by mechanical treatments in any given stand; (2) direction to identify and manage one-acre (or larger) inclusions of big trees with moderate to dense canopy conditions; (3) limits on the diameter of trees that can be removed in each treated stand; (4) limits on canopy reduction in each treated stand; and (5) canopy retention requirements for treated stands. These standards and guidelines do not apply when prescribed fire is used to accomplish fuels reduction objectives. Note that Table 4 does not include a number of the forest-wide standards and guidelines that apply to fuels treatments, such as standards for retaining hardwoods, snags, and large woody material.

In addition to the standards and guidelines referenced in Table 4, the following existing conditions also influenced stand level treatments in this assignment:

- recently treated stands (thins, underburns)
- natural barriers (lakes, rock outcrops)
- slope limitations

Local analyses would also consider the following factors in developing fuels treatment prescriptions: proximity of treatments to private lands and residences, roads as barriers (boundaries) for prescribed burning treatments and for access for mechanical treatments, smoke (burn days, production rates), and limited operating periods.

Table 4. Standards and Guidelines for Mechanical Fuels Treatments Outside the Defense Zone

General Standards:

Remove only trees less than 12 inches diameter breast height (dbh) and remove no more than 10 percent of the canopy cover in dominant and co-dominant trees.

Generally, do not mechanically treat 25 percent of the stand area for each stand in a treatment unit. In the Threat Zone, the area to remain untreated is reduced to 15 percent, except for stands larger than 1 acre classified as California Wildlife Habitat Relationships (CWHR) types 5M, 5D, and 6, where 25 percent of the stand area must remain untreated.

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Exceptions to the General Standards	
Stand Condition/Land Allocation	**Applicable Standards and Guidelines**
CWHR types 3M, 4M, and 5M (canopy cover 40%-59%) located outside defense zone	Mechanical treatments may: • Remove only trees < 6 inches dbh
CWHR type 4D in old forest emphasis areas and California spotted owl home range core areas where the following conditions are met: • Sufficient amount of habitat to meet home range core acreage requisite *and* • Treatments beyond prescribed burning and removing trees <12 inches dbh are needed to meet fuels objectives	Mechanical treatments may: • Remove only trees < 20 inches dbh *and* • Reduce canopy cover in dominant and co-dominant trees by no more than 20 percent
CWHR type 4D in threat zone where the following condition is met: • Sufficient amount of habitat to meet home range core acreage requisite	
CWHR 4D in general forest	
CWHR types 3S, 3P, 4S, 4P, 5S, 5P in threat zone and general forest	
Plantations and shrub fields	Unique standards and guidelines apply

Relationships between Fuels Treatments, Fire Modeling, and Habitat

A fire behavior model (FARSITE; Finney, M.A. 1998) was used to illustrate potential wildland fire behavior in the Middle Fork Cosumnes Landscape under two scenarios: no treatment and treatments under existing ROD direction. The fire model uses a set of assumptions about surface, ladder, and crown fuel conditions, topography (slope, aspect, and elevation), weather (relative humidity and temperature), and wind (direction and speed) to calculate flame length, rate of fire spread, and fire type (surface fire, passive crown fire, and active crown fire). In reality, these variables are constantly changing.

Transition from Fuels Treatment Prescriptions to Fuels Conditions. To model fire behavior, fuels treatment prescriptions are translated to residual fuels conditions, which then are used as input variables for the fire behavior models. The following sections describe how specific treatment prescriptions were translated into fuels conditions for modeling purposes.

Removal of Material Less than 6 inches. In stands where treatments remove material less than 6 inches dbh, the generally lower crown base heights associated with residual trees in the treated stand are likely to result in torching and launching of embers in the event of a wildland fire. Small material (less than 6-inches dbh) is not typically removed from treated areas. It is either crushed or shredded. Stands treated under this prescription are represented by a light- to moderate-slash fuel model.

Removal of Material Less than 12 inches. In stands where treatments remove material less than 12-inches dbh, lower crown base heights associated with residual trees in treated stands are likely to result in torching and launching of embers in the event of a wildland fire. However, this is expected to be far less than levels predicted for stands treated to a 6-inch standard because crown bases in the residual stand are expected to be higher. The 12-inch treatment prescription is represented by a light-slash fuel model; however the model associated with this prescription is expected to burn with lower flame lengths and rates of spread than the fuel model associated with the 6-inch prescription. Under this prescription, surface fuels are typically piled and burned.

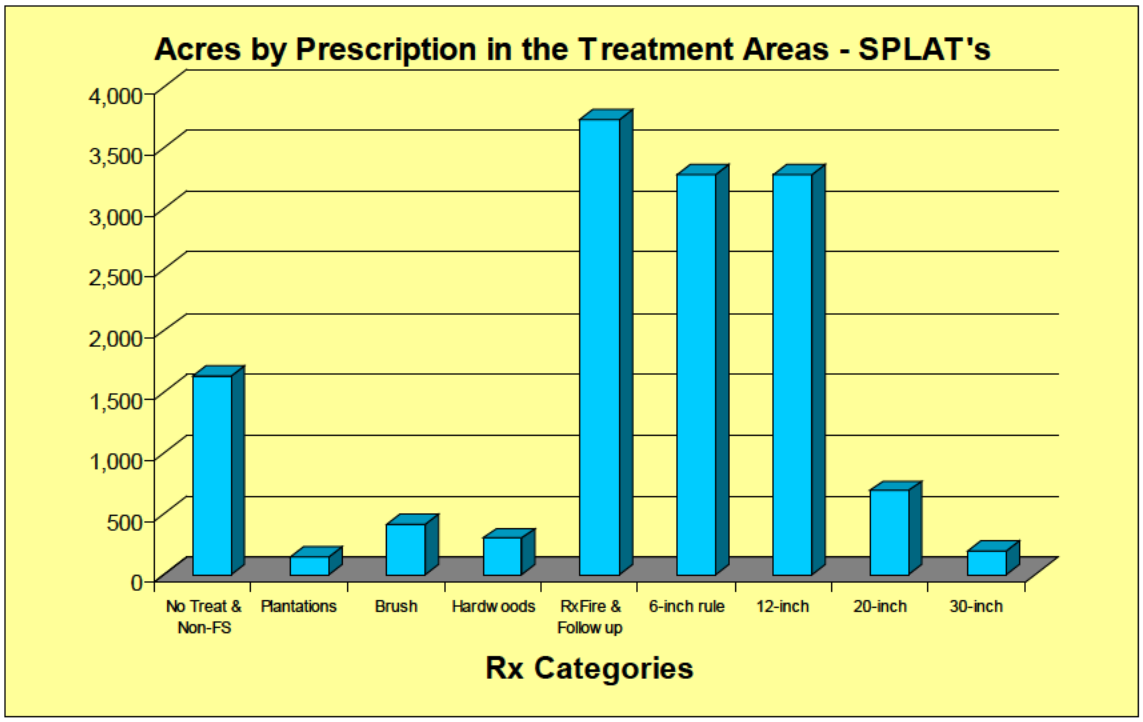
Removal of Material Less than 20 inches. In stands where standards and guidelines provide direction for removing trees less than 20 inches dbh, it is assumed that most trees less than 12 inches dbh are removed and a proportion of trees between 12 and 20 inches are removed, consistent with fuels treatment objectives. Some of the residual trees in the 12- to 20-inch diameter class may torch and launch embers in the event of a wildland fire. The 20-inch treatment prescription is represented by a light-slash fuel model; however the model associated with this prescription is expected to burn with lower flame lengths and rate of spread than the fuel models associated with the 6- and 12-inch prescriptions. Surface fuels are typically piled and burned.

Canopy Cover Retention and Reduction Standards. Mechanical fuels treatments under the ROD are subject to stand-level standards for: (1) reducing no more than 10 or 20 percent of the canopy cover in dominant and co-dominant trees; and (2) leaving 15 or 25 percent of the stand area untreated. This results in surface fuels in treated stands being characterized as different degrees of light slash and allows for only slight increases in crown base heights. The overall effect is to limit the extent to which these treatments meet the objectives of reducing spotting and lowering rates of fire spread.

Key Observations from the Middle Cosumnes Landscape Analysis

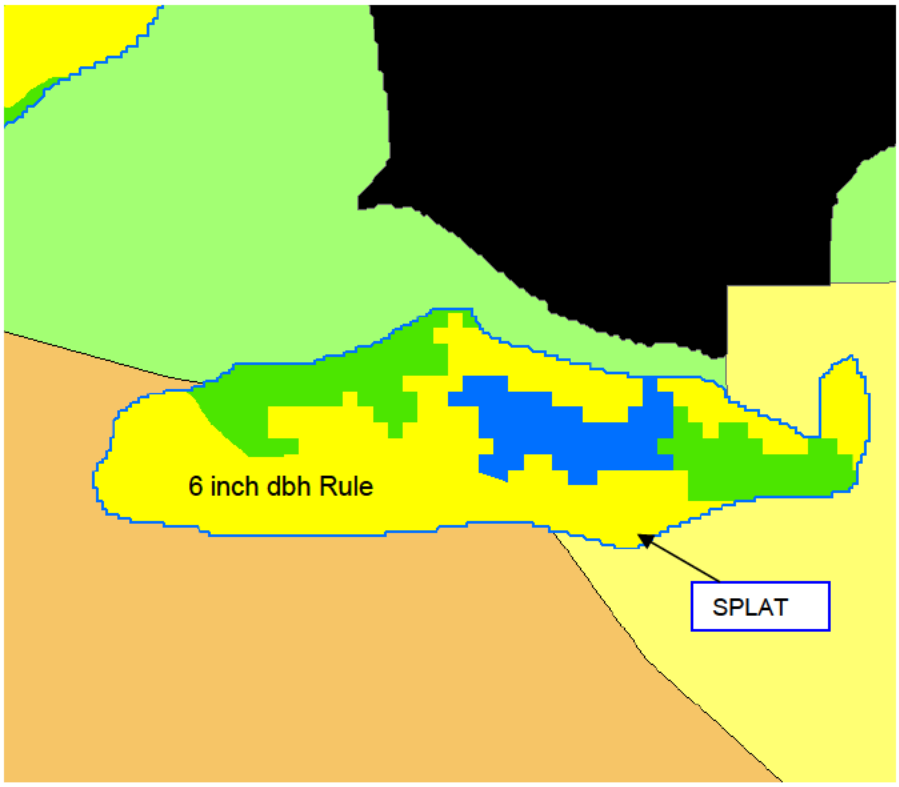
Ability to Reduce Fire Intensity within Treatment Areas. Figure 2 below shows the total number of acres assigned to each prescription for the strategically placed fuels treatment areas designed for the Middle Fork Cosumnes Landscape. A key observation is the degree to which fuels treatments would be limited to removing trees less than 6-inches dbh. Removing material of this size does not generally result in raising crown base heights to levels that effectively reduce fire intensity and spotting, unless the stand has been treated previously. In addition, treated material less than 6 inches dbh is typically left on site where it adds to surface fuels. Roughly 30 percent of the acres to be treated in this landscape were limited to the 6-inch treatment prescription (or prescribed burning).

Figure 2. Acres by Prescription for Treatment Areas in the Middle Fork Cosumnes



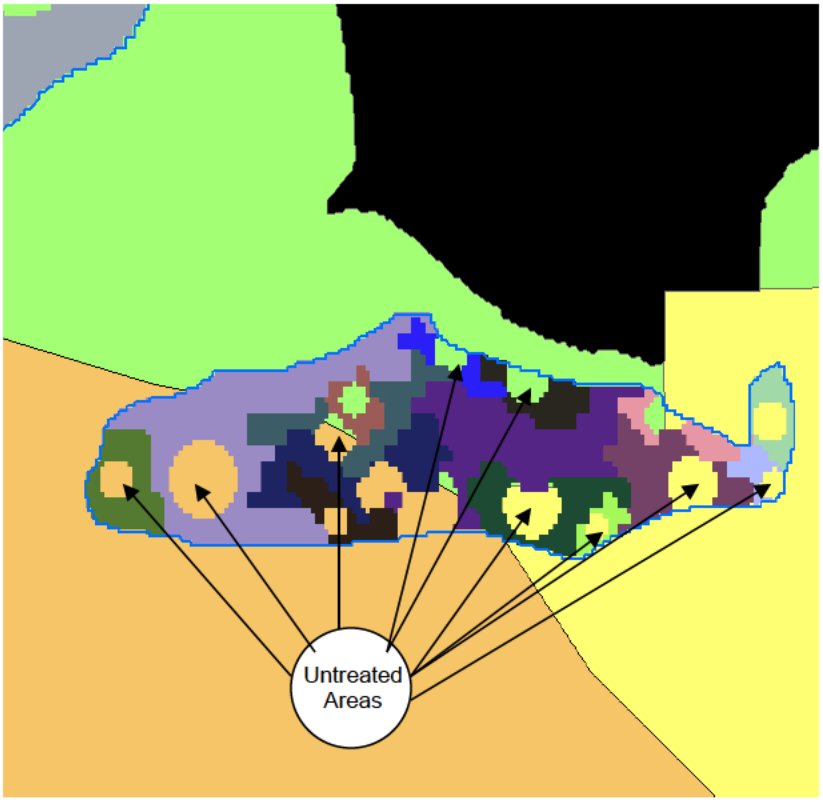
The extent to which the fuels treatments would be limited to 6-inch dbh material (the lightest shaded area in Figure 3 below) was not an intentional outcome of the ROD. In the exercise for the Middle Fork Cosumnes Landscape, it was primarily the result of using canopy cover classes (as would be done under photo interpretation techniques) to determine stand conditions for applying the standards and guidelines for mechanical fuels treatments. Photo-interpreted canopy cover is measured in 10 percent cover classes. For example, the 40-percent canopy cover class includes canopy cover conditions from the low end (40 percent) to just below the next higher class (49 percent). When stands are classified in the 50 percent class, they include canopy cover values anywhere from 50 percent to 59 percent. The ROD standards and guidelines do not allow mechanical treatments to reduce canopy cover below 50 percent. Where photo interpretation is used to identify the 50 percent canopy cover class (which includes a range of canopy cover values between 50 and 59 percent), our assumption was that only trees less than 6 inches dbh would be removed. As defined in the ROD, these smaller trees do not contribute to canopy cover.

Figure 3. Yellow Area = Tree Removal Limited to Less than 6 inches dbh



The Middle Fork Cosumnes Landscape exercise also demonstrated the consequences of leaving a portion of each stand untreated. Figure 4 below represents a single treatment area in the Middle Fork Cosumnes Landscape. The different shades represent individual stands within this treatment area. Note the "holes" in the treated stands within the treatment area that results from applying ROD direction to leave 10, 15, or 25 percent (depending on land allocation or vegetation condition) of each stand untreated. Leaving pockets of untreated fuels compromises the ability of the treatment to change fire behavior within the treated area because the modeled fire burns at higher intensity when it reaches these untreated patches. Because the intent of this standard was to maintain heterogeneity within each treated stand, the untreated areas within each stand in the treatment area were randomly chosen instead of being clumped along the edges. Had they been non-randomly selected, they would have resulted in less reduction in fuels treatment effectiveness but would not have maintained the intended within-stand heterogeneity.

Figure 4. Portions of Stands Left Untreated by Mechanical Methods



Influence of PACs on the Arrangement of Treatment Areas. The dense arrangement of California spotted owl PACs in the Middle Fork Cosumnes Landscape presented a challenge in arranging treatments that would effectively modify fire behavior in critical locations (assuming application of the ROD direction to avoid PACs). Like many areas on the western edge of the national forest boundaries in the Sierra Nevada, private lands and residences are located in close proximity to the same areas that have high densities of California spotted owls. The coincident location of PACs, private lands, and residences results in large (6,000 to 8,000 acre) gaps in the arrangement of fuels treatment areas if treatment areas generally avoid PACs. As previously noted, this exercise attempted to avoid treatments in PACs. However, treatment areas were placed in a higher number of PACs (6 PACs) than would have been treated if the bioregional standard limiting treatments in PACs had been prorated to this landscape (3 PACs).

The ROD allows prescribed burning to reduce surface and ladder fuels in PACs. However, limits on the number of PACs that can be treated in any given year or decade also apply to prescribed burning treatments in PACs. In addition, fuel levels in these dense, forested areas are frequently too high to make prescribed burning alone a feasible option.

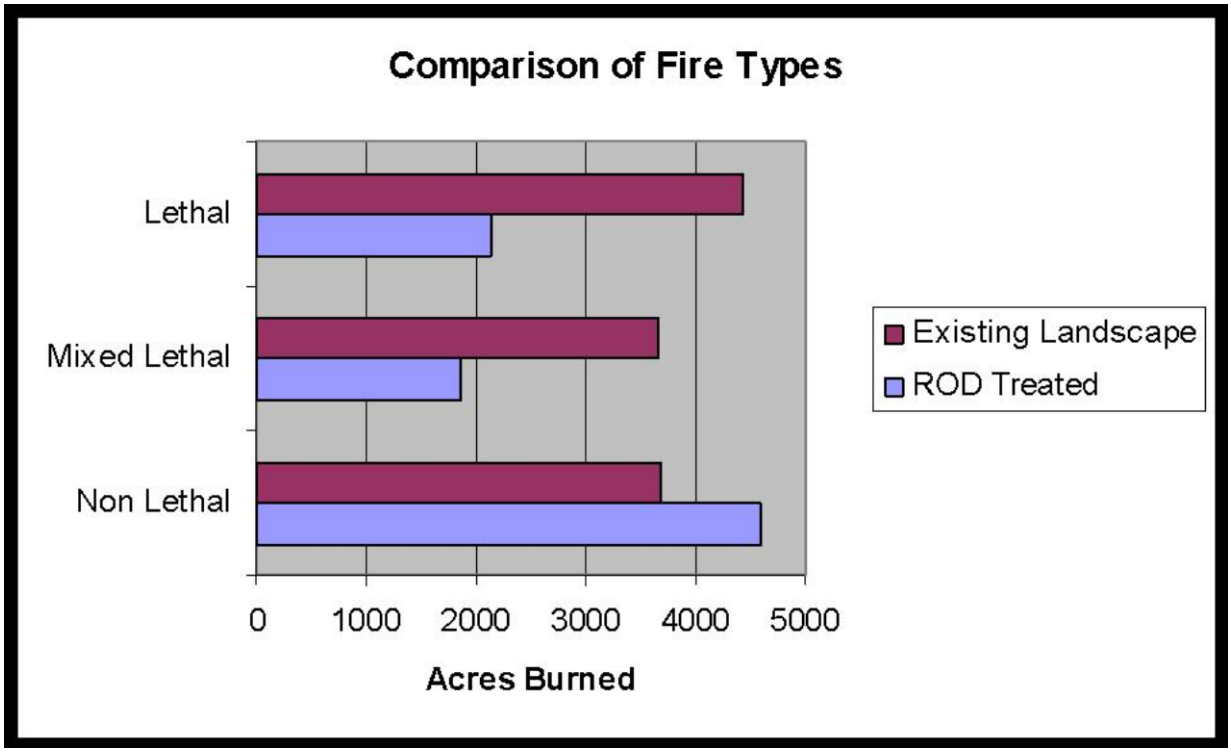
Assessing Potential Wildland Fire Behavior Using FARSITE

The FARSITE model was used to spatially depict potential fire spread. Assumptions about wind, weather, and fire duration influence the spread of the fire and its size. The model relies on user-defined variables for ignition points, prevailing winds (direction and speed), other weather variables, burning duration, and treatment prescription-fuel model crosswalks. Given these variables, FARSITE spatially models a fire in the landscape over a specified number of burning periods. FARSITE outputs include:

- Fire type (surface, passive crown, active crown)
- Rate of fire spread
- Flame length
- FARSITE outputs apply only to the modeled burned area

FARSITE was used to run wildland fire simulations for both the existing Middle Fork Cosumnes Landscape (with no ROD treatments) and the landscape treated under ROD direction. The wildland fire simulation for the existing landscapes over three burn periods resulted in an 11,781-acre modeled fire. The wildland fire simulation for the treated landscape over three burn periods resulted in an 8,593-acre modeled fire. Proportions of the modeled fires were characterized by one of three fire types: surface fire, passive crown fire, and active crown fire. These fire types were translated to expected mortality as follows: surface fire expected to result in non-lethal mortality, passive crown fire expected to result in mixed lethal mortality, and active crown fire expected to result in lethal mortality. Figures 5 displays expected vegetation mortality resulting from the FARSITE simulations for the existing landscape and the ROD-treated landscape.

Figure 5. Comparison of Vegetation Mortality based on FARSITE Simulations for the Middle Fork Cosumnes Landscape



Fuels Treatments, Fire Effects, and California Spotted Owl Habitat

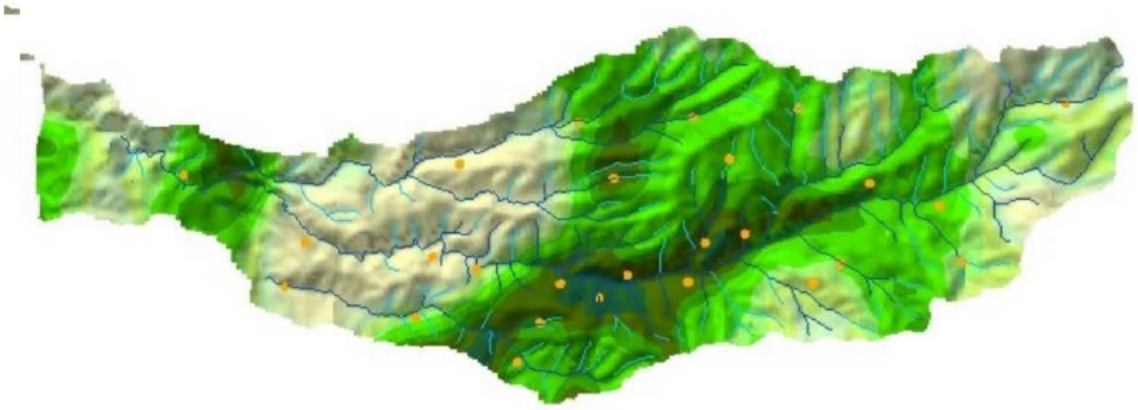
The Middle Fork Cosumnes Landscape was analyzed to demonstrate the spatial arrangement of existing California spotted owl habitat that might be modified by fuel treatments under the ROD.

The Middle Fork Cosumnes Landscape has the following baseline conditions: 26 PACs which have been locally validated by the Forest, 26 associated home range core areas (all 26 meet the habitat acreage requirement in the ROD), and approximately 13,000 acres of the existing forested landscape classified as CWHR types 5M, 5D and 6.

To depict habitat condition relative to the proportion of canopy cover, the Team utilized a focal mean analysis approach. The focal mean measures canopy cover as a 1,000-acre moving window that meets the following criteria: at least 50 percent of the area in moving window has at least 50 percent canopy cover in mature trees. Figures 6 and 7 illustrate habitat conditions across the landscape, as owls may perceive them. The different shades represent varying proportions of dense canopied habitat (50 percent or greater canopy cover) that would be found within a 1,000-acre circle around any given point. For example, the darkest shade represents the 90-100 percent class. In this class, the central point is surrounded by 900 to 1,000 acres where the canopy cover in mature trees is greater than 50 percent.

To evaluate the effectiveness of treatments, the change in habitat condition following the modeled fire was analyzed (Figures 8 and 9). Interestingly, although the overall fire size differs between the existing condition with no treatment and the ROD treatments, the amount of acres that retain greater than 50 percent canopy cover over 50 percent of a 1,000-acre moving window remains very similar. This may be explained by the size of the moving window itself, which may be masking the change in fire intensity between the ROD treatments and existing conditions. This may also be due to the spatial distribution of habitat and the timing sequence of the modeled fire moving across the landscape. The Team found that fire effects within the burn perimeter were affected by the placement of treatment units and believes that this supports the notion that strategically placed treatments can be effective at changing fire behavior and hence at changing the risk of habitat loss from wildfire.

Figure 6 – Existing Condition ed Fire



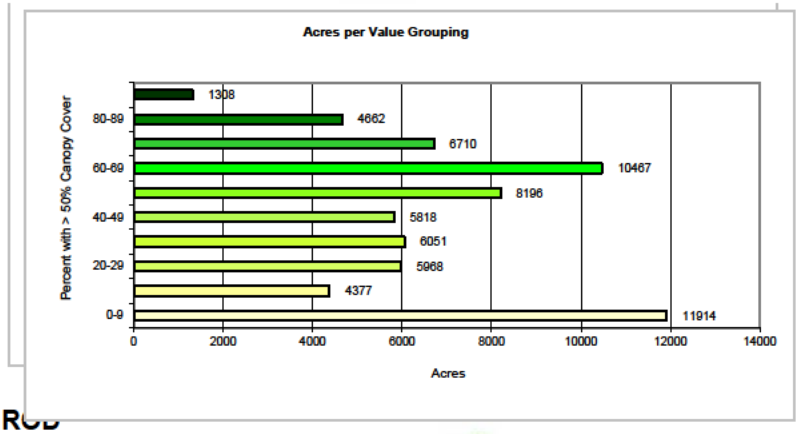
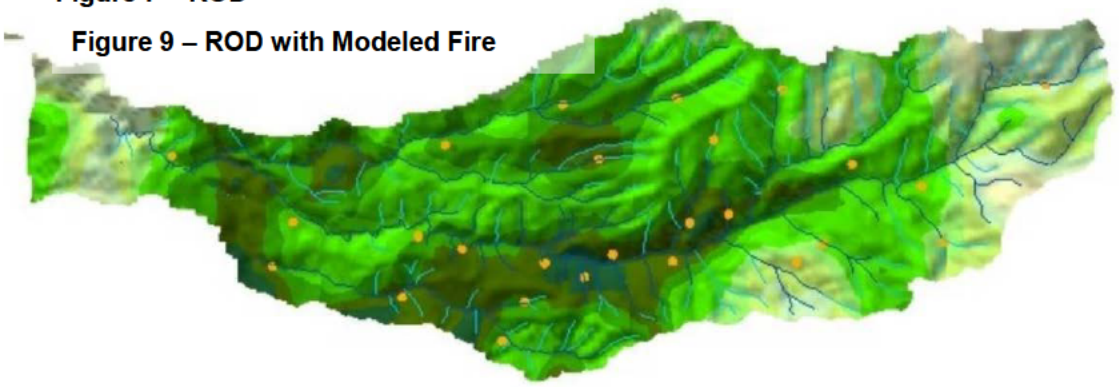
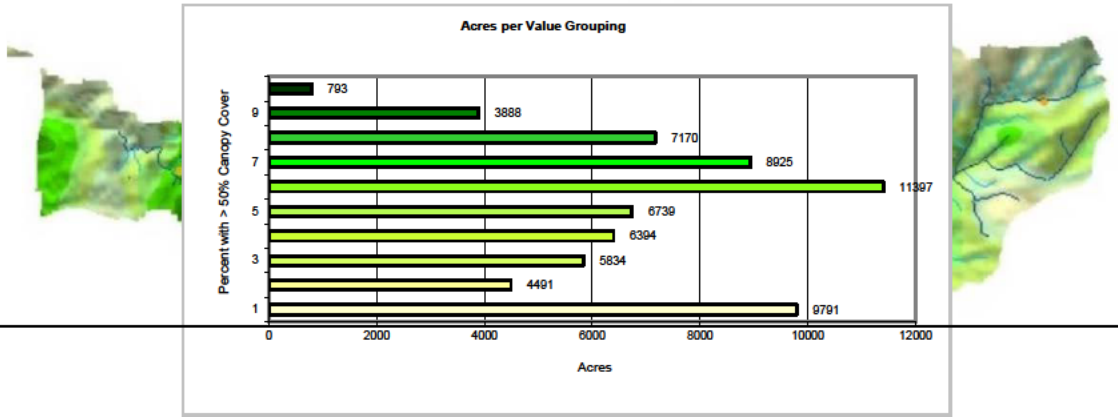


Figure 7 – ROD

Figure 9 – ROD with Modeled Fire





Summary
The Middle Fork Cosumnes Landscape analysis illustrates some of the difficulties identified by managers in the field in implementing the existing management direction. Over a relatively large part of the watershed it is not possible to achieve effective fuels treatments under the existing direction. The Team discovered that the cumulative outcome of certain elements of the existing ROD direction, particularly standards for leaving portions of stands untreated, treatment options limited to prescribed burning or removal of 6-inch material, and direction that effectively requires avoidance of PACs, can work at cross-purposes with management objectives. The extent to which this occurs was not well understood without the use of spatial modeling of the standards and guidelines in the ROD.

The analysis brings to light some clear opportunities for improving the standards and guidelines to better meet the objectives of protecting communities, wildlife habitat and watershed values. At this point, the Team feels confident that where PACs are clustered and where the density of existing vegetation limits mechanical treatments to the removal of small diameter material, similar findings will result. This belief is validated by the strong and extensive anecdotal evidence provided by district rangers attempting to implement the ROD under the existing set of standards and guidelines throughout the 11 Sierra Nevada national forests.

Technical Problems with Standards and Guidelines

This section provides more detail about a number of problems that have surfaced when the field tried to apply the standards and guidelines in the ROD. Some implementation problems stem from applying standards and guidelines to stands rather than treatment units. In addition, problems occur when different standards and guidelines overlap and/or interact with others to change the effectiveness of the resulting fuels treatments.

The information provided here is derived from a year's worth of experience in implementing the decision and the questions and requests for clarification that surfaced during that time. Further understanding of the nuances and unforeseen effects of the standards and guidelines was gained in the process of completing the watershed analysis described above.

Incorrect Fuels Treatment Objectives – To reduce the rate of spread and intensity of wildland fires, fuels treatments are intended to create a particular set of average stand conditions across the broader landscape. The ROD defines these desired conditions in terms of height-to-live-crown and average flame length under 90th percentile fire weather conditions. A series of fire modeling exercises demonstrated that average flame length ***across the landscape*** must be reduced to 6 feet or less to effectively change fire behavior. Recall that collectively, individual treatment areas cover only one-third of the landscape. It follows that average flame lengths within these treated areas must be reduced to a lower level to produce the desired average flame length across the broader area (i.e. average flame lengths in treated areas must be less than 6 feet.) However, the ROD set the 6-foot flame length standard for the ***treatment area***. The diameter limits and other constraints on activity were designed to meet this objective. This error in the ROD compromises the effectiveness of fuels treatments at the landscape scale.

Leaving parts of treatment areas untreated –The ROD specifies that for mechanical treatments, 10 percent of the stand area must be left untreated in the defense zone, 15 percent must remain untreated in the threat zone and 25 percent must remain untreated in areas outside of the urban wildland intermix. Additionally, in the threat zone, 25 percent of each stand within a one-acre+ inclusion of CWHR types 5M, 5D, and 6 must remain untreated.

This standard and guideline is simple in theory, but has limited value in practice. First, treatment unit and stand boundaries are not the same. A treatment unit typically intersects numerous stands. Since this standard and guideline applies only to the area of each stand within a treatment unit (i.e. 10, 15, or 25 percent of each stand area that is planned to be treated to meet fuels reduction goals), the effectiveness of the overall units treatment is questionable. In addition,

the total acres of planned treatments must increase to compensate for the area not treated to this standard and guideline.

Secondly, the ROD does not specify how one defines the "untreated" portion of a stand. We know that not every square foot within the treated stand will be disturbed. As with prescribed burns, some vegetation and ground remains untouched in a mechanically treated unit. In addition, the definition of mechanical "disturbance" is subjective. Should the percentage requirement take into account the cumulative acreage of small pieces of undisturbed ground within a treatment unit or is it a single area flagged off within the stand as an inclusion to avoid when conducting the treatment? Reasonable interpretation indicates the latter.

The Team has serious concerns about limiting the extent of fuels treatments and their effectiveness within areas expressly set aside for this purpose. As mentioned above, a proportion of every treatment unit will always remain untouched. Other standards limiting ground disturbance, avoiding compaction, and preserving soil cover would all come into play in achieving the objective of this standard.

One-Acre Inclusions – The ROD requires identification and management of one-acre and larger forested patches classified as CWHR types 5M, 5D, and 6. These small inclusions are managed differently than the stand in which they are found. By defining these forested fragments using CWHR as a proxy, and by setting a minimum size of one-acre, the direction in the ROD relies on parameters that are difficult, costly to measure and subject to inconsistent application across different field units.

Many ecologists consider small one-acre old growth fragments, or even clumps of trees, to be functionally important habitat features. However, while these components can be identified, they cannot be classified correctly or consistently on the ground using the CWHR system. This is especially true when stands are at or near the outer bounds of the CWHR classes in question. The CWHR vegetation classification system is designed for delineating stands as small as 5 acres, rather than small inclusions within stands. While clumps or cohorts that have the characteristics of large trees can easily be located on photos or on the ground, it is nearly impossible to determine where the boundary of a particular clump is. An infinite set of boundaries could be constructed around each "forested patch". Even small changes in the location of a boundary can cause the CWHR classification of the stand to change, along with the associated prescription.

Canopy Cover – The ROD relies extensively on canopy cover at the stand level to determine the type of treatment that may be conducted in a specific area. At the individual tree level, canopy cover is the ground area covered by a tree crown, as delineated by the vertical projection of its outermost perimeter. In the ROD, percent canopy cover refers to the cumulative coverage of all trees in a stand. Canopy cover (expressed as a percent of area) is a key measure in the ROD for purposes of classifying forest stands and defining or setting parameters for stand treatments. In fact, there are 76 references to "canopy cover" in the standards and guidelines.

Values for percent canopy cover can be derived in a number of ways, many of which are used interchangeably. However, different measurement techniques can result in widely divergent values. Three general methods for calculating canopy cover include: photo interpretation, a variety of direct measurements of canopy cover in the field, and a variety of methods used to derive canopy cover on the basis of field measurements of tree diameter.

The ROD recommends the use of aerial photography to measure canopy cover. Within a given class, it is not possible to use aerial photography to determine the exact canopy cover level; aerial photography can only indicate that canopy cover falls within a certain range. This is an adequate method for assigning stands to canopy cover classes in increments of 10 percent. Canopy cover class "4" represents stands with 40-49 percent canopy cover, canopy cover class "5" represents stands with 50-59 percent canopy cover, and so forth.

From an implementation standpoint, the difficulty of precisely and consistently determining canopy closure from aerial photos may limit the use of mechanical treatments and prevent large areas of the landscape from being treated. For example, the ROD frequently refers to stands where pre-treatment canopy cover is between 50 and 59 percent. However, given that canopy cover is generally only precise to increments of roughly 10 percent; the actual canopy cover in these stands could be at either end of the range. Direction for these stands is to retain a minimum of 50 percent canopy cover and judgments about the percent of canopy cover that can be removed under these circumstances will vary. Some will avoid the measurement issue altogether and decide that any tree that contributes to canopy closure in stands in the "5" density class must be retained. As discussed earlier, to the extent this happens with some regularity, the options for treating stands with pre-treatment canopy cover between 40 and 60 percent are limited to removing trees less than 6-inches dbh and prescribed burning.[6]

Choices about Uncertainty and Effects to the California Spotted Owl

Concern over the viability of the California Spotted Owl weighed heavily in the management direction set forth in the ROD. The ROD acknowledges that the SNFPA direction is aimed at reversing "current population declines."[7] The viability analysis lays out the detailed reasoning and analysis that is the foundation for this conclusion.

The conclusion that the owl population was declining, was based on a thorough discussion of demographic studies conducted at four study areas in the Sierra Nevada. The studies are located in Lassen National Forest (NF), Eldorado NF, Sierra NF, and Sequoia and Kings Canyon National Parks. All four studies reported statistically significant declining population trends. Both the DEIS and FEIS discussed the demographic studies. The DEIS discussion was more thorough and included substantial discussion of how the demographic studies were structured. It cautioned that this research does not provide a totally accurate picture of overall population dynamics unless it is continued "over a sufficiently long period of time."[8] Both the DEIS and FEIS discussed the scientific debate surrounding potential bias in the methods used in the four study areas to calculate the finite rate of population change (lambda).[9] The analysis includes several caveats concerning the context within which the study results should be viewed. Some examples from the FEIS (Volume 3, Chapter 3, Part 4.4) are:

1. A disclaimer stating that "there is no evidence, substantiated or anecdotal, to suggest that actual spotted owl abundances declined by the amount indicated" in the studies (Pg. 71).
2. Some census data that indicates population increase on one of the study areas, as opposed to the statistically generated declining trend (Pg. 71).
3. A fairly detailed discussion of the possible bias inherent in the statistical models used (Pg. 72). This bias would tend to over estimate population declines.

The discussions in both the DEIS and FEIS make a strong case for a high level of management concern for owl populations. They both state that the "studies strongly suggest population declines". However, both documents stopped short of formally concluding that a population decline was actually occurring. As the several caveats attest, this conclusion could not be made from the available scientific information. A full reading of both documents presents a complete picture of the state of scientific knowledge at the time the ROD was signed.

The DEIS concluded the suggested "declines are sufficient to warrant concern, even in light of uncertainties in the magnitude of the declines."[10] The FEIS reached a more alarming conclusion regarding the same information. Its conclusion was: "The declines are sufficiently **severe** to warrant concern, even in light of uncertainties in the magnitude of the declines (emphasis

[6] Because stems less than 6-inch DBH do not count against canopy closure (SNFPA ROD, Appendix B, Pg. B-1).
[7] SNFPA ROD, Pg. 3.
[8] SNFPA DEIS, Chapter 3, Pg. 339.
[9] SNFPA DEIS, Chapter 3, Pg. 340; SNFPA FEIS, Volume 3, Chapter 3, Pg. 72.
[10] SNFPA DEIS, Chapter 3, Pg. 341.

added)."[11] The Team believes this conclusion strongly influenced the assumptions in the viability analysis with respect the status of the owl population. The clear assumption in the viability analysis was that the owl population was actually in significant decline across the range. The following excerpts are specific examples from the FEIS (Volume 3, Chapter 3, Part 4.4):

- "Given declining population trends" (Pg. 84)
- "Given declining owl populations," (Pg. 92)
- "likely important to stabilize current population declines" (Pg. 92)
- "Given documented population declines" (Pg. 93)
- "opportunities to stabilize population declines would be substantially compromised" (Pg. 94)
- "In addition, retaining existing suitable habitat and improving habitat conditions over the next couple of decades may be particularly important for stabilizing owl populations." (Pg. 95)
- "With current population declines, vegetation treatment impacts over a short time period may involve risks…" (Pg. 95)
- "Given the owls declining population status," (Pg. 102)

At the time the ROD was signed, the assumption of a population decline was reasonable based on the available scientific information. The magnitude of a possible decline was debated. Uncertainty around this key element weighed heavily in the viability analysis and ratings provided to the Regional Forester.

New Analysis of Existing Owl Demographic Data

The viability analysis in the FEIS[12] formed two conclusions regarding the status of the California spotted owl and its habitat that appear to have been key factors in choosing to take a cautious, short-term approach when using mechanical methods to reduce wildfire hazard. These conclusions were:

- A severe decline in the owl population is occurring across the Sierra Nevada.
- The reason for the decline is insufficient existing habitat to support a self-sustaining owl population across the range.

New information recently made available (Franklin, et al. *in review*) has a direct bearing on the uncertainties about owl population trends. This study conducted a meta-analysis of data (including the most recent information) collected under the same demographic studies referred to above. Meta-analysis has been an analytical tool to evaluate status and trends of northern spotted owls since 1993. The analysis uses different analytical methodologies than the original studies. These new methods eliminate some of the potential bias associated with the earlier studies. Most importantly, the new analysis does not show a statistically significant decline in the study areas as previous research has indicated. It shows evidence of one apparently stable population (Sequoia and Kings Canyon National Parks), and the rest with an estimated finite rate of population change (lambda) that is less than 1.0, but includes 1.0 within a 95 percent confidence interval. However, the analysis also shows adult survivorship rates that indicate concern for population stability.

One of the reasons the owl conservation strategy in the ROD was adopted was the observation that "there is no available information suggesting a stable or increasing population."[13] By showing evidence of at least one stable population, the new information contained in the meta-

[11] SNFPA FEIS, Volume 3, Chapter 3, Part 4.4, Pg. 72.
[12] SNFPA FEIS, Volume 3, Chapter 3, Part 4.4.
[13] SNFPA ROD Pg. 38.

analysis should be considered in light of this statement. Because of the considerable uncertainty surrounding our knowledge of owl demographics in the Sierra Nevada, the Team does not believe or suggest that this new information will eliminate concern for the status and trend in owl population. The meta-analysis indicates that adult survivorship is still a concern. This analysis is important and should be thoroughly considered in the context of developing improvements in the current direction that lead to a sustainable approach for managing old forest habitat across the Sierra Nevada.

The Team believes all of the available science still indicates that spotted owl habitat must be carefully managed. Many important tradeoffs were acknowledged and accepted under the current direction because the weight of scientific evidence suggested a short-term strategy to deal with a declining owl population was necessary. This new information must be carefully considered as to how it might influence the balance between short- and long-term effects relative to managing wildfire hazard to owls and communities. The Team believes this is a compelling reason to consider a longer-term approach to managing for stable owl populations.

Reassessing the Status of Owl Habitat

In discussing habitat preferences for the California spotted owl, the analysis in the FEIS draws upon information from a study of owl home range habitat conducted in the southern Sierra Nevada (Hunsaker et al., 2002). This study reported sites that consistently produced young had a median proportion of 60 percent of their analysis area (1000-acre circles around the nest) in 50 percent canopy cover or greater (moderate to high density canopy cover). This result was interpreted in the FEIS as a habitat threshold for owl home ranges, below which pairs could not sustain themselves. A statement to that effect can be found on Page 77 of the viability analysis, referring to owl home ranges that have less than 60 percent of their area in moderate to high-density canopy cover:

> "Considering the findings reported in Hunsaker et al. (in press), habitat associated with these owl sites may be insufficient to support a self-sustaining population of owls."

Upon review, the Team has concluded that this statement does not accurately represent information presented in the Hunsaker paper. Also, it appears to be at the root of the assumption made in the FEIS that current habitat condition is leading to a decline in the owl population. A memo from Dr. Danny Lee, Forest Service Research Team Leader, indicated that the above statement was not supported by the information and data included in Hunsaker report. Lee also concluded in the above-referenced memo that:

> "[the] choice of the SNFP standard of 60 percent of the home range in 50 percent or greater canopy cover cannot be scientifically defended using the Hunsaker et al. data."

Additionally, at a June meeting with the majority of the owl scientists conducting research in California, the Team was able to ask Dr. Hunsaker directly for clarification as to how accurately her research was interpreted in the FEIS. The Team noted that the interpretation of Hunsaker's work in the FEIS "suggested that unless approximately 60 percent of an owl's home range is composed of moderate to dense canopy forest (i.e. at least 50 percent canopy cover), there's not likely sufficient habitat to support a self-sustaining pair in that area."

Dr. Hunsaker commented that this interpretation was possibly taking it a little too far. She indicated that her research focused only on canopy cover, and did not consider sustainability over time, or the overall quality of the sites being studied. Dr. Jared Verner, in written comments provided to the Team later, indicated that he thought the interpretation was appropriate. However he cautioned that one should not infer that these parameters applied to the owl's entire home range (as was done in the FEIS).

The FEIS analyzed the status of owl habitat using the above-referenced interpretation of Hunsaker's work. The assessment looked at existing data in the Forest Vegetation Inventory, and calculated the proportion of moderate and dense canopied habitat that occurred within

individual owl home ranges (a larger area than that studied by Hunsaker). Based on this estimate, the conclusion was that "approximately 50 percent of spotted owl home ranges have less than 60 percent of their (area) in moderate and dense-canopied habitat."[14]

A key point is that the 60-percent figure reported in Hunsaker's paper actually represented the median proportion of moderate to dense canopied habitat found in the more consistently productive analysis areas. The median is a statistic that represents the middle value in a set of data. In other words by definition, half of the observed data are greater than the median, and half fall below it. It follows then, that half of the consistently productive owl sites in the study must have had less than 60 percent moderate to dense-canopied habitat as well.

As a result, the Team concludes that the assessment of owl home range condition in the FEIS is not consistent with the research findings upon which it is based and may not be representative of the current status of owl habitat. The following excerpts are from the FEIS (Volume 3, Chapter 3, Part 4.4).

Based on the results of the habitat assessment discussed above, the viability analysis in the FEIS frequently refers to the "insufficient" habitat condition for owls in the bioregion. The habitat assessment included in the FEIS is a key piece of information that appears to have weighed heavily in the analysis. For example:

> "The current distribution and abundance of owls … does not suggest that habitat has markedly declined in abundance in any forest type." However, "current abundance and distribution of habitat appears to be of concern. Fifty percent of owl sites in the Sierra Nevada (58 percent in the central Sierra Nevada) have less than 60 percent of their home range in moderate and dense forest, indicating potentially lower productivity for these sites." (Pg. 79)

While discussing the advantages of protecting spotted owl habitat from vegetation treatments, the habitat assessment is again referenced:

> "The need to maintain and provide for higher than threshold amounts of habitat…is apparent in the Sierra Nevada where data indicates approximately half of the owl home ranges have less than desired amounts of habitat to begin with". (Pg. 83)

The viability analysis evaluates the alternatives in light of the currently "insufficient" habitat condition.

> "Existing information suggests that approximately half of spotted owl home ranges in the Sierra Nevada currently provide the amount of moderate and dense-canopied stands found to be associated with higher levels of owl occupancy and productivity" (Pg. 92)

Therefore:

> "Increasing the number of owl sites with desired amounts of habitat is likely important to stabilizing current population declines." (Pg. 92)

Finally, the viability analysis uses the above information to suggest that current habitat condition is so poor that it may constitute a threshold beyond which extinction for the owl is imminent.

> "…retaining existing suitable habitat and improving habitat conditions over the next couple of decades may be particularly important for stabilizing owl populations. Research into population dynamics at larger scales has suggested the possible existence of habitat thresholds, below which populations may go extinct in the presence of suitable habitat due to constraints on successful dispersal. With current population declines, vegetation treatment impacts over a short time period may involve risks to the spotted

[14] SNFPA FEIS, Volume 3, Chapter 3, Part 4.4, Pg. 77.

owl population that are not evident by considering longer-term habitat projections alone." (Pg. 95)

While levels of concern vary among experts, the Team found no information or analysis in the FEIS to identify a habitat threshold or to suggest that the Sierra Nevada bioregion has reached such a habitat threshold or is approaching one.

The FEIS analyzed current habitat status by assessing the proportion of moderate and dense-canopied habitat within a home range circle around each owl site as opposed to the smaller 1000-acre circles used in the Hunsaker et al. study. The analysis included only lands under Forest Service ownership.

The Team modified this analysis, reducing the size of the analysis circles to match the Hunsaker et al. data. In addition, land under all ownerships was included in the assessment. The outcome was a 10-percent increase in the number of owl home ranges that met the criteria used in the FEIS to determine suitable habitat. As noted above, because of the way in which the original research was interpreted, even this updated figure may be a conservative estimate of the amount and quality of suitable habitat that exists throughout the bioregion.

Finally, the Team believes that alternative analytical techniques used in the Cosumnes analysis can provide a more sophisticated assessment of habitat status in the Sierras. This GIS analysis provides a landscape depiction of the spatial juxtaposition of important habitat conditions. The method evaluates all points on the landscape and rates them according to how well they match with input conditions that are though to be important to owls. For example, the program can be set to plot areas within a landscape that encompass all points where dense canopied habitat makes up a specific proportion of the land within a given distance of each point. As an alternative to limiting the assessment to the area within a set of fixed circles, this technique shows habitat condition relative to the specific parameters for every point across the landscape. This method, combined with new information on the mosaic of canopy cover densities important to owl reproduction, promises to yield a more useful assessment of current habitat status than methods previously used in the FEIS.

Information on Canopy Cover Densities Important to Owl Reproduction

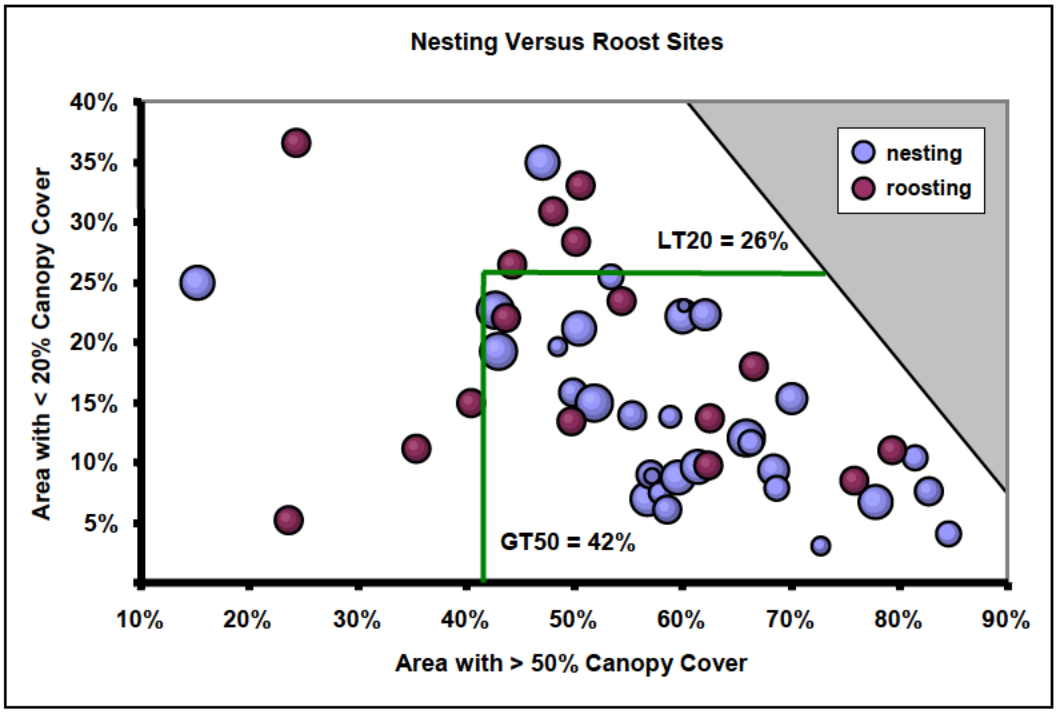
Since the development of the FEIS, the data gathered in the southern Sierra Nevada study and published in the Hunsaker et al. (2002) report has been reanalyzed for the specific purpose of helping to identify options for landscape standards.[15] Lee presented this analysis to the Team and other owl scientists on June 27, 2002.

The analysis explored three alternative models to the simple correlation used in the Hunsaker et al. (2002) report that was cited in the FEIS. The simplest model examined looked at the conditional relationship between the amounts of the "core" area (i.e. the 1000-acre analysis area used to approximate 90 percent of owl use within its home range) with greater than 50% canopy cover and an index of average productivity. When these moderate to high density stands cover more than 50 percent of the "core" area, the expectation of productivity is noticeably higher. However, more is not always better. The data suggest that having 70 to 100 percent of the area comprised of stands with greater than 50 percent canopy cover leads to lower expectations for owl reproduction than having 50 to 70 percent of the area in this condition.

A second model examined (Figure 10.) used the area with greater than 50 percent canopy closure in combination with the area less than 20 percent canopy cover to distinguish productive owl sites from non-productive sites. This model suggests productive sites had 26 percent or less of the area comprised of stands with less than 20 percent canopy cover, and 42 percent or more of the area comprised of higher density stands. Also, the mean number of young produced when pairs of owls are present appears to have no relationship to the amount of dense canopy in the surrounding area.

[15] Dr. Danny Lee, Redwood Sciences Laboratory, personal communication.

Figure 10. Owl nesting and non-nesting sites relative to canopy density.



Finally, the relationship of owl productivity and fire risk was examined. Two points were made:

- We could expect to be able to reduce canopy fire risk in many sites and have no measurable impact on expected reproduction. We may in fact see an increase.
- The risk to owl sites from canopy fire is not the same for all sites. Insight as to the relative risk of sites could be very useful in prioritizing areas for treatment.

The Team believes a more robust assessment of current habitat status can be developed that reflects this new information and advances in modeling techniques. The observation that a landscape level mosaic of canopy cover densities is important to successful owl reproduction may help to better define the desired condition for owl habitat. These parameters could then be used in conjunction with the alternative analytical technique described above to assess current habitat status.

Basis for Diameter Limits

During the meeting with owl scientists in June of 2002, diameter limits established in the FEIS and ROD were discussed. The Team wanted to determine whether there was a basis in owl biology for these metrics. Scientists at the meeting commented that they were not aware of any research indicating that 12-inch trees were specifically needed as an essential component of owl habitat.[16] During the discussion, Forest Service personnel familiar with the development of the SNFPA stated that the 12-inch diameter limit had not been based on owl biology. Rather they had been developed based on a lot of uncertainty of what was needed to maintain vertical structure for owl habitat. They indicated that removing up to 12-inch diameter trees would meet fuels reduction objectives in Old Forest Emphasis Areas and Home Range Core Areas. The Team agrees that standards should address maintaining some vertical structure in treated stands. This would be most important in Home Range Core Areas and Old Forest Emphasis areas within suitable owl habitat. A more flexible standard is recommended for blending the need

[16] Notes from June 27-28 Meeting with Owl Scientists.

to maintain some vertical structure with implementing an effective vegetation management strategy across the Sierra.

Contribution of Private Timberlands to Owl Habitat

Sierra Pacific Industries (SPI) made a presentation and provided a written report to the Review Team regarding the contribution of private timberlands to owl habitat. A key assumption in evaluating the alternatives in the FEIS was that there would be no contribution, short- or long-term.[17] This new information suggests that private timberlands will contribute to habitat needs of the California spotted owl. More than 15 percent of the currently known owl sites have more than 15 percent of their home range habitat on private lands. It is estimated that there are 135 known owl sites on private timberlands. At a minimum, private land habitat will continue to contribute to spotted owl needs for the short-term (at least one decade). At best, new information regarding habitat protections on private land under the state forest practices act may provide for a longer-term contribution.

California law, with the 1995 amendment to the California Forest Practices Act, now offers more protection to wildlife habitat than existed at the time the 1992 California Spotted Owl Technical Report was issued. Owners of substantial holdings of timberlands are required to develop ten-year sustained yield plans. Plans are to be approved by the State in accordance with California Public Resources Code Section 4551.3 (enacted in 1995). These plans are consistent with an ecosystem approach for land management, particularly in areas of checkerboard land ownership. Once audited and approved, they also carry the force of law.

Sierra Pacific Industries recently had their ten-year sustained yield plan approved. This plan provides a level of protection to owl habitat on about 938,929 acres of forestland within the range of the California spotted owl. SPI is by far the largest private landholder in the Sierra Nevada. Other owners may have similar plans approved. The expanse of private timberlands in the Sierra Nevada and their demonstrated value as owl habitat today warrants a reassessment of the choices made in the FEIS to exclude them from the habitat base. Including these lands in the mix of available habitat for the spotted owl more accurately portrays the amount of suitable habitat available today for owls and other old-forest dependent species.

Short-Term Effects of Alternative Modified 8

Part of the rationale for selecting Alternative Modified 8 in the ROD was the understanding that it offered the best protection for owl habitat in the short-term (over the next 20 years). Because the alternative does not call for significant amounts of heavy thinning, group selection, seed tree or regeneration harvest[18] there would be a relatively small change in stand structure under the treatment regimes proposed.

Although Alternatives 4, 7, and most others projected relatively higher levels of owl habitat over the long run[19] these future outcomes were judged to be less important than maintaining the owl habitat that currently exists. A concern that habitat across the Sierra Nevada may be at or near a threshold below which the owl may go extinct over the next few decades[20] clearly provides the basis for viewing habitat modification due to mechanical vegetation treatments as a primary threat. Upon review, however, the Team found that the short-term effects from mechanical treatments under Alternative Modified 8 were not significantly less than those of the other alternatives considered.

[17] SNFPA FEIS, Volume 3, Chapter 3, Part 4.4, Pg. 77.
[18] SNFPA ROD, Pg. 26.
[19] SNFPA FEIS, Volume 3, Chapter 3, Part 4.4, Pgs. 86-91.
[20] SNFPA FEIS Volume 3, Chapter 3, Part 4.4, Pg. 95.

To address the issue of short-term effects, the viability analysis includes an estimate and evaluation of the net gain or loss of habitat from the combined effects of wildfire and mechanical fuel treatments over the first two decades:

> "Given the owl's declining population status, net gains or losses of habitat must be evaluated over short (one to two decades) as well as longer time frames. Shorter-term projections, where the magnitude of change is less influenced by modeling assumptions, may also have lower levels of uncertainty associated with them. Table 4.4.2.1l displays the total acres affected from both fuels treatments and wildfire over the next two decades by adding the total acres of projected wildfire to the acres of vegetation treatments that are unlikely to maintain important spotted owl habitat elements."[21]

The results of the analysis[22] show that Alternative 4 potentially impacts 22,500 more acres than Alternative Modified 8 in the first twenty years (22,000 acres for Alternative 7). This equates to an average of 1,125 acres annually or roughly 113 acres per year on each of the eleven national forests in the Sierra Nevada. While this appears to be a negligible difference, the conclusion of the viability analysis was:

> "Based on this comparison [of acres impacted by wildfire and mechanical treatments], Modified Alternative 8 represents the lowest risk to declining habitat over the first two decades."

This is the only analysis of the "short-term" effects of vegetation treatments the Team could find in the FEIS. We do not believe the small differences in short-term effects across the alternatives in the FEIS warrants the weight assigned to these differences in choosing among them.

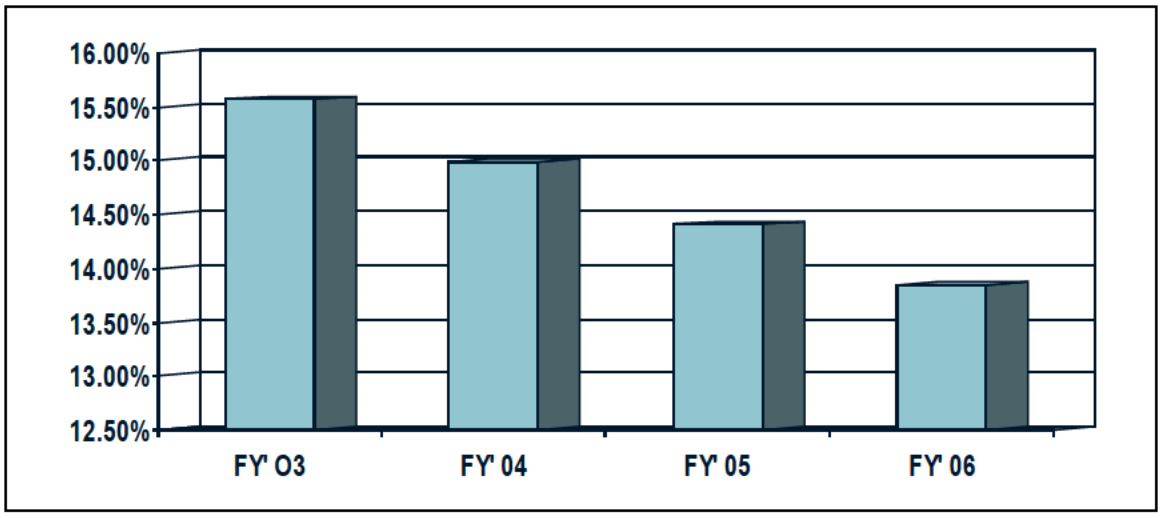
Cost of Fuels Treatments

The Team estimates that given the projected costs of implementing the ROD under current and future budget scenarios, only about half of the anticipated annual work can be done. The relationship between funding and the number of acres that are treated in any given year is a function of several different factors: the net funding available for direct project work, the mix of different treatment costs, and the ability to offset project costs with merchantable logs and/or biomass.

Net Funding Available for Project Work – As budgets throughout the Forest Service are restructured, the Pacific Southwest Region is expected to receive a smaller share of total Forest Service appropriations (Figure 11.). An integrated vegetation management program to reduce hazardous fuels is a Regional emphasis area. Therefore, we expect that funding for this work will remain relatively stable over the next several years. However, to maintain that stability, the program will make up a greater share of the Region's declining overall budget. The main point here is there is a very low likelihood that overall funding for reduction of hazardous fuels will increase for the foreseeable future.

[21] SNFPA FEIS, Volume 3, Chapter 3, Part 4.4, Pg. 102.
[22] SNFPA FEIS, Volume 3, Chapter 3, Table 4.4.2.1l, Pg. 102.

Figure 11. Region Five's Share of Appropriated Funding



In fiscal year 2002, of the $194.3 million for Fire and Aviation Management programs about 15 percent ($32.5 million) was allocated for hazardous fuels reduction on national forests in the Sierra (Figure 11).

The total hazardous fuels budget allocation does not reflect the actual amount of money available to implement projects through contracts or other means. The cost of planning fuels treatments and overhead expenses significantly reduces the funds available for implementing treatments in any given year. For example, in fiscal year 2002, approximately half the money received for fuels reduction work in the Sierra Nevada region was needed for organizational overhead, program management and project level planning and appeals. The remaining $17.5 million represents the net dollar amount available to pay for on-the-ground fuels reduction work. Planning costs were not analyzed by the Team. However, the majority of district rangers said that SNFPA requirements for survey, and analysis increased planning costs dramatically. Increases in planning costs result in less funds available to actually do the work. The benefits associated with increased costs must be carefully weighed.

Treatment Costs – Based on current Regional averages the contract treatment costs by activity are:

- $175/acre for prescribed fire
- $375/acre for mastication
- $344/acre for mechanical service contract with wood removal, or
- $445/acre for mechanical service contract without wood removal, or
- $600/acre for hand thin, pile and burn

As the mix of treatments changes, the average cost also changes. Adding proportionately more acres of hand thinning at $600 per acre, and service contract without wood removal at $445 per acre will increase the average cost of all treatments. Under fixed budget constraints, cost efficiency of individual treatments is very important to accomplish the mix of treatments necessary to implement a successful fuels strategy. As previously discussed, many district rangers reported that the SNFPA direction resulted in significant increases in fuel treatment costs (a "summary of the ranger letters" is at http://www.fs.fed.us/r5/snfpa/library/archives/correspondence/ranger/index.html).

The Team used the Middle Fork Cosumnes analysis to develop an estimate of average project costs under the ROD. The analysis took into account existing vegetation condition, slope,

accessibility, and allowable treatment prescription. Average costs across the region, and local Eldorado national forest costs were used to develop a range. Average costs were projected at $361 to $787 per acre. While this is only one analysis, we believe it supports the information provided by the rangers. That is, that the SNFPA standards result in higher average treatment costs.

With the above costs, appropriated money available for project implementation can be expended very quickly. For example, based on the 2002 budget, if the mix of treatments averaged $361 per acre, less than 50 thousand acres across the bioregion could be accomplished. At the higher end cost estimate of $787 per acre, only about 22,000 acres could be treated. This represents a program short fall of 50 to 78 percent. Based on this estimate, it seems highly unlikely that current funding levels would support full or substantial implementation of treatments envisioned by the current direction.

Value Cost Offset – The ability to offset the cost of fuel treatments with the value of material removed is a function of the net value of that material. Where contractors can salvage net value from the fuel removed (in the form of biomass, or timber), competitive bidding results in this recovered value being reflected in reduced contract costs. If the total value of material to be removed exceeds the cost of removal, revenue can be generated. Some of this revenue may be retained and used for follow-up vegetative treatment activities. The transportation costs for biomass and the size of logs removed are key components that affect revenue generation from vegetation treatments that can offset the cost of mechanical treatments.

Transportation costs for biomass are essentially dependant on the location of processing facilities with respect to the project area. Biomass value is very low, so the opportunity for substantial value cost offset is in close proximity to active facilities.

However, much more opportunity exists to offset costs with value from trees large enough to manufacture lumber. Ten to twelve inches in diameter is the minimum size tree that is considered merchantable. Under the current direction, outside the defense zone, standards that allow for the harvest of merchantable trees (20 inch diameter limit) are confined to exceptions for the purpose of meeting fuels objectives.

Over all, the small size of material available for removal within treatment units under the ROD severely limits the ability to offset the cost of mechanical treatments. For example, using the Cosumnes landscape more than half of the treatment acres were constrained to removing trees less than 12 inches in diameter. While the proportion of treatments limited to 12 inches or less would vary by individual landscape, the fact remains that only areas in close proximity to biomass processing facilities could expect any chance of taking advantage of value cost offsets to reduce treatment costs.

An important note here is that there are many areas in need of treatment that have no possibility of providing material to offset costs. Chaparral vegetation in southern California poses a hazardous fuel situation that can only be addressed using appropriated funds. Brush fields, and young stands of trees in the Sierra also offer little in the way of value cost offset, but none the less should be treated. The Team believes regional planning direction should set broad standards and allow local managers to fine tune projects to site-specific conditions. One advantage of this would be more opportunities for designing projects where the value of material removed helps offsets costs of treatment.

Based on the Cosumnes analysis, and information gained from district rangers across the bioregion, the Team believes that high average treatment costs, and few opportunities for value cost offsets make successful implementation of the fire and fuels strategy adopted under the ROD unlikely.

Conformance with the National Fire Plan

Key Findings

1. **Initial landscape level analysis indicates the current direction does not reduce the number of high severity acres burned over time. (Goal 2 – Reduce Hazardous Fuels)**
2. **The standards and guidelines in the ROD do not restore historic fire regimes across the landscape. (Goal 3 – Restore Fire-adapted Ecosystems)**
3. **The standards and guidelines limit the potential for communities to seek economic opportunities resulting from fuel treatment by-products. (Goal 4 - Promote Community Assistance)**
4. **A reliance on prescribed fire as the preferred fuels treatment method in the ROD is unrealistic because of air quality regulations and the limited availability of burn days.**

Background

To respond to the wildland fires in 2000, the President requested, and Secretaries of the Interior and Agriculture submitted, a September 8, 2000, report, Managing the Impact of Wildfires on Communities and the Environment, A Report to the president In Response to the Wildfires of 2000. This report and budget request, along with congressional direction for substantial new appropriations for wildland fire management for Fiscal Year 2001 and 2002, and the resulting action plans and agency strategies have collectively become known as the National Fire Plan. It has broad support with the present (and previous) administration, the Congress, the Western Governors, and many other local and regional groups.

The National Fire Plan includes a discussion of national priority setting, funding allocations and accomplishment and accountability mechanisms. The Plan serves as a clearinghouse with links to other bi-partisan Federal, State, Tribal and local fire management policies and funding initiatives. In August of 2001, a companion document entitled, A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment, 10-Year Comprehensive Strategy, (Comprehensive Strategy) was developed by the Secretaries of Agriculture and Interior, and State Governors. This document defined the core principles and goals of the Comprehensive Strategy. In May of 2002, the Secretaries and Governors developed the Implementation Plan for the Comprehensive Strategy. This is the latest and most specific National Fire Plan document available to compare to the SNFPA Record of Decision for consistency with national direction. This piece of the National Fire Plan had not been completed at the time the ROD was signed (January 2001).

The ROD noted that the priorities and objectives of the fire strategy in the SNFPA were consistent with the National Fire Plan. The Team's findings regarding the likelihood of successful implementation of the selected fire and fuels strategy were presented earlier in this report. These findings cast doubt on the forests ability to adequately meet the goals and objectives of the Implementation Plan and by extension achieve consistency with the National Fire Plan.

New Information and Understanding Gained from Review

Comparison of ROD Outcome with National Fire Plan

National Fire Plan direction has evolved over the last two years from the USDA Forest Service's original "Cohesive Strategy" to the finalization of the 10-Year Comprehensive Strategy Implementation Plan described above. The ability of the forests to implement an effective landscape level hazardous fuels reduction strategy is fundamental to meeting the obligation to effectively implement this plan. The Regional Forester is ultimately accountable for achieving this plan under the Government Performance and Results Act of 1993. Performance measures outlined within the plan will be used to evaluate successful outcomes. The detailed Cosumnes Landscape Analysis documented earlier in this report surfaced significant barriers to the successful implementation of the fire and fuels strategy in the SNFPA. Thus, the Team found that while the priorities and goals are consistent, the expected outcomes under the ROD are **not** consistent with the "Goals and Implementation Outcomes" stated in the Implementation Plan.

The expected outcomes that are inconsistent with the NFP are predicated on the limited use of mechanical treatments. Mechanical treatments are limited by how intensive and extensive the treatments themselves can be. When treatment intensity is compromised, multiple entries are often required to accomplish fire objectives. When landscape extent is compromised, more areas must be treated with "lighter" less intensive treatments to actually change wildfire intensity.

Federal, state, tribal and local governments have endorsed the four goals of the Comprehensive Strategy. Forest Service units at the state and local level are expected to work collaboratively with other agencies to accomplish the associated implementation outcomes by specific dates. The Team has reviewed each goal and assessed the likelihood of achieving it under the existing management direction.

Goal One - Improve Fire Prevention and Suppression – Implementation Outcome - *Losses of life are eliminated, and firefighter injuries and damage to communities and the environment from severe, unplanned and unwanted wildland fires are reduced.*

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.

While this performance measure strongly relates to developing and maintaining an efficient and well-trained suppression organization with improved prevention programs, it is also inextricably linked to implementing a successful strategy to reduce hazardous fuels across the landscape. Successful performance is influenced by the ability to reduce hazardous fuels to significantly lower wildfire intensity and rate of spread, thus directly contributing to more effective suppression efforts, and fewer acres burned.

The uncertainty of successful implementation of the fire and fuels management strategy adopted under the ROD was discussed in the FEIS. Alternative Modified 8 was identified as one of three alternatives that had the highest degree of uncertainty.[23] Further analysis to more clearly determine the potential for successful implementation was not available when the ROD was signed.[24]

While similar analysis of other representative watersheds will be useful, the Review Team's spatially explicit analysis of the Middle Fork Cosumnes landscape sheds more light on this uncertainty. It provides clear evidence that implementing the fire and fuels strategy under the

[23] SNFPA FEIS, Volume 2, Chapter 3, Part 3.5, Pg. 305.
[24] SNFPA FEIS, Volume 2, Chapter 3, Part 3.5, Pgs. 303-306.

existing suite of ROD standards and guidelines will not significantly reduce wildfire size and intensity across the bioregion. For example, on the Eldorado National Forest the number of acres per decade burned by wildfire is projected to **increase** to over 30,000 acres within 30 years under the current direction. Other FEIS alternatives analyzed project a **decrease** below 20,000 acres per decade burned by wildfire over the same time period.

Goal Two - Reduce Hazardous Fuels, Implementation Outcome – *Hazardous fuels are treated, using appropriate tools, to reduce the risk of unplanned and unwanted wildland fire to communities and to the environment.*

The number of acres treated, and the number of acres treated per million dollars gross investment in targeted areas are two performance measures for goal two.

The Team found that the standards and guidelines in the ROD will allow for hazardous fuels to be effectively and economically treated within the defense zone of the urban wildland intermix. However, outside this zone, the current standards and guidelines result in higher cost treatments. As discussed previously, treatment costs approximately doubled under current SNFPA direction. These elevated costs directly impact the current direction's performance under these measures.

A doubling of per acre costs reduces by one half the amounts of treatment acres possible under any fixed budget allocation. The current and reasonably foreseeable federal budget situation makes it unrealistic to expect that hazardous fuels treatment allocations will increase appreciably beyond current levels. Even if they did, expensive treatments indicated under the SNFPA would result in less acres treated per million dollars invested. As a result, it is very important that management direction enable the most cost efficient means to accomplish fuel treatments within environmental constraints. Because of this, the Team has found there is significant opportunity to better harmonize the SNFPA strategy and Goal Two of the Comprehensive Strategy.

Goal Three – Restore Fire-adapted Ecosystems, Implementation Outcome – *Fire adapted ecosystems are restored, rehabilitated and maintained, using appropriate tools, in a manner that will provide sustainable environmental, social and economic benefits.*

Performance measures for this goal include the number of acres moved to a better condition class, that were identified as high priority in total, and as a percent of total acres treated. Progress in the accomplishment of this goal is a key component of the Regional Forester's performance.

Condition classes 2 and 3 are the targets for treatment. Condition class 2 is composed of lands where fire regimes have been altered from their historic ranges creating a moderate risk of losing key ecosystem components as a result of wildfire. The vegetative composition, structure and diversity of lands in condition class 3 have been significantly altered due to missing multiple fire return intervals. These lands "verge on the greatest risk of ecological collapse."[25]

The current estimate of acres in condition class 2 and 3 across the eleven Sierra Nevada National Forests is over seven million acres. Of this amount, about three million acres are thought to be in condition class 3.

This is one area in which the ROD is in significant conflict with the National Fire Plan. While the Implementation Plan goal is to restore fire adapted ecosystems, the ROD acknowledges that the amended direction "would increase homogenous vegetation structure across the landscape over time" and "would increase the potential for catastrophic effects when wildfire" occurs.[26] Many District Rangers also pointed this out during the review. They told the Regional Forester that current direction attempts to maintain an unnaturally dense condition across the landscape. Fully one fourth of the Ranger responses indicated that the standards and guidelines prevented attaining ecologically desired conditions.

[25] 10-Year Comprehensive Strategy Implementation Plan, Pg. 18.
[26] SNFPA ROD, Pg. 24.

The current standards and guidelines limiting fuel treatment activities were not designed to restore or move forested landscapes toward their historic ecological condition. Instead, they were developed with the goal of minimally modifying fire behavior while avoiding short-term adverse effects to California spotted owl habitat. Because of this, they preclude embarking on meaningful restoration of the historic fire regimes and ecosystem function of the Sierra Nevada for at least the next few decades. This is not compatible with goal three of the Implementation Plan.

To fully restore the fire-adapted ecosystems of the Sierra Nevada to Condition Class 1, fire must enter the ecosystem. The current decision pushes managers to use more prescribed fire than was originally intended because of the limitations on mechanical treatments.

Goal Four – Promote Community Assistance, Implementation Outcome – *Communities at risk have an increased capacity to prevent losses from wildland fire and the potential to seek economic opportunities resulting from treatments and services.*

One performance measure is the percent of acres treated to reduce hazardous fuels by mechanical means with by-products utilized. The current direction performs poorly relative to this measure.

While socio-economic effects were considered in the FEIS, relative to other potential outcomes, the SNFPA significantly limits the forests ability to design fuel treatments that allow utilization of commercial by-products. A predictable, sustainable supply of forest products sufficient to sustain the local, community-based timber infrastructure was not an objective of Modified Alternative 8. Without this, there is likely to be a continued decline in the available equipment, labor, and processing facilities needed to address the objective of ecosystem restoration. Standards and guidelines that allow more flexibility to design hazardous fuel reduction projects which provide utilizable by-products would improve consistency with the National Fire Plan.

Smoke Management and Prescribed Fire

The SNFPA ROD emphasizes prescribed fire as the fuels management tool of choice in PACs, old forest emphasis areas and California spotted owl home range core areas (outside of the Southern Sierra Fisher Conservation Area). Mechanical treatments are allowed when prescribed burning is determined to have: 1) a high likelihood of escape due to excessive fuels accumulations; 2) a high potential for unacceptable smoke impacts; or 3) a high risk of causing a loss in canopy structure due to excessive surface and ladder fuels.[27]

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 firefighting resources for burning during the declared fire season. Moreover, public outcry over smoke pollution from wildfire suggests that increased levels of smoke will not be tolerated, regardless of the source. Nearly every District Ranger validated this point. The Team is concerned about these fundamental constraints on program delivery.

Available Burn Days – The numbers of days when prescribed fires may be safely ignited and meet burn objectives are generally grouped in the late spring and fall. A prescribed burn can only be executed when multiple physical parameters such as relative humidity, temperature, wind speed, and fuel moistures are simultaneously within desired ranges (known as the prescription). The factors influencing when a burn is within prescription must persist throughout the number of days required for fire to burn through the treatment unit. Therefore, the number of days that treatment areas are “in prescription” defines the gross number of available burn days.

Clean Air Regulations – Air quality concerns to communities within the air basin of the burn and those air basins down wind are a major concern within California and have localized impacts on the available burn days. At recent Interagency Team meetings, Doug Balmain, Mariposa County Supervisor, District Two, has commented that even under existing regulations, multi-burn-day

[27] SNFPA ROD, Pg. 6.

prescribed fires raise serious health and visual concerns for many individuals in affected communities.

Forest Service units are required to obtain burning permits under a Memorandum of Understanding with the California Air Resources Board prior to conducting a burn. Local air quality boards work with Forest Service personnel to identify days when burning will meet all air quality regulations and avoid smoke impacts to nearby communities. Citizen complaints can cause regulators to withdraw permits and require burns to be extinguished prior to objectives being met. The capacity of a given air shed to absorb additional particulate matter above ambient levels is also limited. Finally, local Forest Service managers must compete with agricultural burning and adjacent land management agencies for permits. This regulatory process and context further reduces days available to successfully implement burning projects.

Existing Vegetative Condition – Local managers must consider the existing vegetative condition to determine if prescribed fire will be effective in meeting the desired condition of the treatment unit. Generally, dense forested stands with high surface fuel loadings need some form of mechanical pre-treatment to reduce surface and ladder fuels to protect the residual trees prior to prescribed burning. The SNFPA prohibits mechanical treatment of some sensitive habitats such as owl and goshawk PACs. In addition, very dense stands on steep slopes where ground based machines cannot operate may be pre-treated only with very expensive methods. In areas where burning is the only treatment option available, and dense stands cannot be pre-treated mechanically, treatments will not occur. Under the SNFPA this could be a sizable amount of land.

Availability of Firefighting Resources – Avoiding escaped prescribed fires is high on the mind of the public and Forest Service managers. To minimize the risks of escapes, sufficient firefighting resources with proper qualifications and production capability must be available. These individuals and suppression equipment are used to conduct burns to meet objectives and keep fire within project perimeters. Key leadership positions are named within the burn plan prior to approval. Many of these resources' primary responsibilities are to suppress wildfires as part of initial attack or large fire management organizations. Wildfire occurrence usually overlaps the spring and fall burning season. If the necessary resources are not available due to wildfire activity, prescribed burning operations are cancelled or deferred.

The number of days where all of the above conditions are met is limited and decreasing as wildfire activity across the nation increases and air quality standards become more restrictive. In light of this discussion, the Team believes the SNFPA's reliance on prescribed burning as the tool of choice over large areas of the Sierra Nevada National Forests is not realistic.

Role of Commercial Timber Sales in Meeting Fuel Reduction Objectives

Timber sales can be an important tool to better meet landscape level fuel reduction objectives. Where vegetation targeted to be removed has enough commercial value, timber sales can be used to capture this value and invest it in needed fuel reduction work. When this is possible, it reduces the amount of fuel treatment that must be paid for through contracts. This applies to accomplishing short- and long-term fuel reduction objectives. Short-term objectives include immediate reduction of predicted fire behavior and effects, while long-term objectives apply to areas that are currently in a low hazard condition, but are on a long-term trajectory that will cause significant future hazard.

Long-term objectives are generally associated with salvage of timber killed by catastrophic events such as wildfire, windstorms, or significant insect infestations. Tremendous quantities of heavy fuel in the form of standing dead trees can create a significant fuel loading problem in the future. When the trees fall to the ground, the potential for extremely intense, and long duration burning can pose a serious threat to the soil, recovering vegetation, and other resources. In many cases, commercial timber sales can be used to address this problem by removing a portion of the dead

and dying trees while they still retain value. This has the double benefit of salvaging wood products for peoples use, and promoting the long-term sustainable recovery of the forest.

Catastrophic events are inconsistently and poorly addressed in the SNFPA. Management direction for snags and down woody material is ambiguous and scattered throughout different sections of the ROD. The guidance that is provided is subject to inconsistent interpretation, leaving projects vulnerable to appeals or lawsuits. Ultimately, the inability to expeditiously move ahead with salvage harvest results in lost economic opportunity, potentially extreme long-term area fuel loading, and snag and down wood levels in excess of known habitat requirements.

Under the current direction, salvage of dead and dying timber is significantly limited in Old Forest Emphasis Areas. This land allocation covers a significant (40%) proportion of National Forest lands within the Sierra Nevada. In Old Forest Emphasis Areas no removal of snags greater than 15 inches in diameter can be done unless a stand-replacing event kills at least 75% of the trees within the stand.

Across all land allocations (outside the defense zone), the SNFPA prohibits salvage harvest on at least 10% of the area after a stand-replacing event occurs. This harvest exclusion is focused on preserving blocks of dead forest vegetation that was classified as CWHR 6, 5M, and 5D prior to the event. Trees average 24 inches in diameter and up in these types.

According to the FEIS, this standard is to "Provide sufficient amounts of down woody material, large clumps of snags, and legacy elements important to future old forests and biodiversity."[28] Virtually all fire recovery projects over the last decade have included provisions to address this important issue.

Many District Rangers identified post fire (or other catastrophic event) management direction as an area of the SNFPA that could be improved upon. Their main concern was that the current direction made it difficult for local interdisciplinary teams to balance the amount standing and down woody material left with long-term watershed health. One Ranger stated it: "Though understandably snags and down logs are an important element of the Old Forest, the balance in terms of protecting watersheds from intense long duration fires is unclear."[29] Many Rangers are very concerned that leaving large areas of fire-killed trees comprising hundreds of dead trees per acre will create a long-term hazardous fuel condition that will result in severe impacts.

The ROD addresses salvage harvesting only narrowly as a fuels treatment in the context of benefiting old forest structure and function or as an imminent safety hazard. The objective of harvesting dead and dying timber to capture economic value is not directly addressed. This has caused confusion on the part of field units, and some have felt that no snag can be removed except to meet stand level fuel reduction objectives.

The lost value of standing dead and dying trees that results from extensive and time-consuming analysis requirements significantly reduces opportunities to remove trees and biomass from the project area without supplemental appropriated funding. The amount of salvage material annually harvested is only about 15 percent of the 238 million board feet that could be harvested and still meet the needs for key animal species estimated in the FEIS. The Fiscal Year (FY) 2002 Salvage Attainment for Region 5 Sierra Nevada Forests was 36 million board feet.[30]

Dealing With Insects and Disease

In August of 2002 the Healthy Forests Initiative directed federal agencies to develop administrative and legislative tools to restore ecosystems to healthy, natural conditions and to assist in executing core components of the National Fire Plan. As discussed above, an important

[28] SNFPA FEIS, Appendix D1, Pg. 16.
[29] District Ranger responses summary can be found at http://www.fs.fed.us/r5/snfpa/l brary/archives/correspondence.
[30] FY 2002, Periodic Timber Sale Report – Cumulative as of 9/30/2002 dated 10/21/02.

area of inconsistency between the SNFPA and the National Fire Plan lies in how the current direction affects forests ability to design and implement projects to restore fire adapted ecosystems by moving stands from condition class 2 and 3, to condition class 1. Ecosystem restoration must also consider the ecological roles of insects and diseases in the Sierra Nevada.

Insects, pathogens and fire play important ecological roles in forest ecosystems. These “change agents”, interacting dynamically, are among the most important regulators of forest density, composition and structure. However, over the past century certain logging and grazing practices, fire suppression, and the introduction of exotic species have altered fire regimes, and in many cases greatly changed forest conditions. These altered forests, primarily those that have experienced a dramatic increase in tree density and changes in composition and structure, are highly susceptible to wildfires, insects and diseases.

Historically, the most significant widespread, weather-related effect on vegetation in the Sierra Nevada has been conifer mortality associated with severe moisture stress and bark and engraver beetles. Conifer mortality increases whenever annual precipitation is less than 80% of normal. Recent moderate to extreme (Palmer Drought Index) drought periods in California occurred from 1959 to 1961; 1976 to 1977 and 1987 to 1994. The results of conifer mortality are widely evident in recent bark beetle outbreaks that coincided with these drought periods.

The SNFPA did not address the issue that bark beetles and their hosts are increasing hazardous fuels in the Sierra Nevada. Overstocking, drought, and resultant susceptibility to insects and disease are contributing to high levels of mortality and greater accumulations of standing and down dead fuel conditions. This situation crosses all ownerships, boundaries and land use designations. It extends beyond the urban wildland intermix, and effects sustainability of old-forest habitat. Failure to reduce forest susceptibility to insects and diseases can lead to large-scale mortality that may affect forest management objectives, alter fire behavior, or require additional costly fuel reduction measures.

Under the SNFPA, vegetation management is wholly focused on accomplishing fuel treatments, while having the minimum affect possible on stand density. The limitations posed by the standards and guidelines have been discussed. Generally, where the current direction does not allow enough reduction in stand density to achieve fuels objectives, forest health objectives are not achieved either. In addition, stands selected to implement the fire and fuel strategy may not be the same ones in need of treatment to improve resistance to insects and disease. Because of this, the current direction does not provide adequate guidance and flexibility to treat undesirable stand conditions reducing competition, stress, and bark beetle susceptibility; restoring resilient conifer species to the forests; or creating diverse landscapes where bark beetles and fire function in their essential ecological roles.

Compatibility with the Herger-Feinstein Quincy Library Group Forest Recovery Act

Key Findings

1. **The ROD significantly limits the implementation of the HFQLG Pilot Project.**
2. **Opportunities exist to "harmonize" regional management direction with the Pilot Project to achieve a full and fair test of the project.**
3. **In the Pilot Project area, forests are directed to use S&Gs designed for SPLATs in areas that are shaped and located specifically for Defensible Fuel Profile Zones (DFPZs). As a result, it is highly unlikely that these efforts will be successful in addressing the hazardous fuels situation.**
4. **Group selection is an important tool that needs to be fully tested within the Pilot Project for its contribution to a long-term habitat management strategy across the Sierras.**
5. **The S&Gs permit full testing of individual tree selection as an uneven-aged silvicultural technique.**
6. **Standards for protecting northern goshawk, pacific fisher and marten in place prior to the SNFPA ROD would likely provide adequate protection for these species. They would also allow greater implementation of the resource management activities to be tested in the Pilot Project.**
7. **The ROD removed the objective of providing socio-economic benefit through timber and biomass production from the HFQLG forests (and others). This was a key component to be tested by the Pilot Project.**
8. **The concept of the Lassen/Plumas Administrative Study is consistent with the goals of the Pilot Project.**

Background

The Herger-Feinstein Quincy Library Group Forest Recovery Act of 1998 directs the Secretary of Agriculture to test the effectiveness of certain resource management activities in a pilot project. The potential environmental effects of the Pilot Project were analyzed in the HFQLG FEIS. The SNFPA significantly limits full implementation of resource management activities[31] outlined in the Pilot Project. The HFQLG Act contains provisions for limiting resource management activities. These provisions are the basis for the limitations imposed under the SNFPA. They allow limitations based on:

1. Issuance of new California spotted owl guidelines.
2. New guidelines necessary to maintain viability for other Forest Service Sensitive species.

More specifically, the HFQLG Act requires that implementation of the Pilot Project be consistent with California spotted owl guidelines issued subsequent to the Act, and applicable federal law.[32]

[31] SNFPA ROD, Pg. 50.
[32] HFQLG Forest Recovery Act Sec. 401 c 3.

In response to the appeals filed against the SNFPA Record of Decision, the Chief of the Forest Service affirmed the ROD as meeting the "minimum requirements of Federal law and regulation",[33] but directed further review of three aspects of the decision. One of these was the relationship between the SNFPA and the Pilot Project. The Chief directed the Regional Forester to examine the approach to management across the Sierra Nevada taken by the ROD, and determine if it was adequately balanced with goals of the HFQLG Act. In addition, the review would determine if opportunities existed to harmonize the goals of these two efforts.

Many of the goals of the SNFPA and the HFQLG Pilot Project are similar. Both seek to:

1. Improve and restore ecological conditions across the landscape
2. Protect and maintain California spotted owl habitat
3. Protect human communities and sensitive wildlife habitat from wildfire by strategically locating fuel treatments across broad landscapes
4. Promote restoration and protection of aquatic, riparian and meadow ecosystems
5. Protect, increase, and restore old forest conditions
6. Apply the principles of adaptive management

The SNFPA and the Pilot Project are both integrated management plans with different approaches to achieving similar goals.

A primary difference between the two approaches is how each address the output of commodity forest products. The SNFPA changed eleven forest plans to remove the objective of producing commercial forest products. Outputs are generated solely as incidental by-products of fuel reduction activity. The Pilot Project includes commodity output as a legitimate and important objective of land management. In a white paper on regeneration silviculture discussing group selection, dated October 1998, this important objective is defined: "*Our goal is to provide management direction which will yield commodity resources while sustaining the health and diversity of the forest ecosystem."*

Prior to the SNFPA, Congress directed the Forest Service to implement the Pilot Project to test its effectiveness. The Pilot Project represents a "locally-developed, consensus-based resource management program".[34] This program seeks protection of ecological values and provision of environmentally acceptable commodity production. A review of the congressional record shows that there was an understanding of the untested nature of some of the forest management activities included in the Pilot Project. In addition, there was also considerable discussion of the scientific uncertainty regarding the environmental outcomes of those activities.[35] The intent was that the Pilot Project would provide information needed to reduce this uncertainty, and ascertain if the proposed resource management activities created beneficial outcomes. A Post-Pilot Project evaluation by an independent panel of scientists was to be completed to determine its effectiveness.

[33] Decision for the Appeals of the Record of Decision for the Sierra Nevada Forest Plan Amendment and its Final Environmental Impact Statement.
[34] S. Rep. No. 138, 105th Cong., 1st Session pg. 5.
[35] S. Rep. No. 138, 105th Cong., 1st Session pg. 20.

New Information and Understanding Gained from Review

The Team was tasked by the Regional Forester to review the SNFPA relative to its effect on implementation of the Herger-Feinstein Quincy Library Group Forest Recovery Act. The basic charge was to look for ways the current management direction could be "harmonized" with the Pilot Project specified in the Act.

The Team reviewed the administrative record of the SNFPA, the administrative record of the HFQLG FEIS and the SNFPA appeal record. In addition, the Team conducted and participated in several field visits on the Pilot Project forests, attended public meetings hosted by the HFQLG, and interviewed Forest Service employees and managers involved with the HFQLG Pilot Project effort. Members of the original SNFPA Interdisciplinary Team were also contacted and interviewed.

Implementation of the HFQLG Pilot Project

The ROD approves a management approach (Modified Alternative 8) that addresses five identified problem areas in national forest management direction (Page 1). The decision includes a new owl conservation strategy.[36] This strategy replaces the California Spotted Owl (CASPO) interim guidelines that were part of the HFQLG legislation. The ROD also authorizes a strategic approach to reducing the threats to habitats and communities associated with wildfire (Page 5).

The management direction in the ROD is not the same as the Pilot Project, and it precludes many of the resource management activities that Congress desired be tested. The stated rationale for this modification is the then Regional Forester's belief that limiting the Pilot Project was "necessary to provide the ecological conditions to maintain viable populations of spotted owls distributed across the Sierra Nevada." Additionally, he believed that the Pilot Project could not be fully implemented "without degrading owl habitat without increasing risk to owl viability" because of the "excessive canopy closure reductions, large tree removals, and substantial acreages in group selection treatments" planned.[37] The ROD took a very conservative approach to managing for spotted owls and other sensitive species. The Team believes there are other approaches that would be consistent with the viability requirements of the National Forest Management Act that could more fully implement the Pilot Project.

Selection of Modified Alternative 8 also removed the objective of timber production within the Pilot Project Area (and other Sierra Nevada National Forests). Under the SNFPA, all outputs of commercial forest products are incidental by-products of vegetation treatments designed to reduce fuel loadings.[38] The SNFPA declared all national forest land within the Pilot Project area as not suitable for timber production. The Big Valley Sustained Yield Unit on the Modoc National Forest is currently the only location in the Sierra Nevada where providing commercial forest products from the national forest is still a land management objective.

As discussed above, the Pilot Project was mandated by Congress to explore a specific approach (documented in the Quincy Library Group Community Stability Proposal) to several of the same problem areas identified under the SNFPA effort (see above). A primary objective was to reduce the uncertainty surrounding application of the prescribed resource management activities. However, under Modified Alternative 8, the opportunity to fully test the original design for this "locally-developed, consensus-based resource management program" is forgone. Currently, on the Plumas, Lassen, and Sierraville District of Tahoe National Forest, a program that mixes the standards and guides from the Record of Decision with the fire management approach of the Pilot Project is being implemented. However, no group selection is allowed (except for within an administrative study) on the Pilot project area.

[36] SNFPA ROD, Pgs. 37-41.
[37] SNFPA ROD, Pg. 51.
[38] SNFPA FEIS, Volume 2, Chapter 3, Part 5.1, Pgs. 377 and 378.

Another key component of the HFQLG Pilot Project is to provide socio-economic benefit through timber and biomass production, and therefore enhance community stability in the project area. Since, under current direction, project objectives cannot include the output of commercial forest products this part of the Pilot Project is no longer being implemented.

For these reasons, the Team believes that the management approach originally envisioned by the HFQLG and the Congress is not being fully tested.

Analysis of decision to limit the implementation of the HFQLG Pilot Project–The Team found that the SNFPA decision significantly limits the implementation of the Pilot Project. The SNFPA relies upon the biological evaluation completed for the HFQLG FEIS to determine the effects of full implementation of the Pilot Project.

The environmental effects of the Pilot Project were originally estimated and analyzed in the HFQLG FEIS. The FEIS showed the project was consistent with applicable federal law with one possible exception. The biological evaluation (BE) of potential effects on the California spotted owl concluded that the Pilot Project might trend the spotted owl toward federal listing. This is a potential violation of the National Forest Management Act (NFMA) and the Endangered Species Act (ESA). However, the analysis also determined that all other Forest Service Sensitive species (Including northern goshawk, fisher, and marten) within the planning area would either be unaffected, or would not be impacted to the extent to trend them towards listing under the ESA.

The Team found that the HFQLG BE took a "worst case" approach to estimating effects of the Pilot Project on owls. All group selection and DFPZ construction that was projected to occur within owl habitat was assumed to render 100 percent of that habitat unsuitable. The results of this assumption were that 93 percent of nesting habitat would not be impacted, 91.5 percent of foraging habitat would not be impacted, and 89 percent of owl home ranges currently containing 50-percent or more suitable habitat would retain that level. No spotted owl protected activity centers would be affected.

The cumulative effects discussion within the HFQLG BE discloses that past fuel reduction thinnings and DFPZ construction undertaken within habitat selected for nesting by spotted owls actually reduced that habitat by less than one percent of the acreage treated. Considering all timber strata used by owls for nesting, past projects reduced only six percent of the acres of habitat treated to lower quality habitat strata.[39] Even assuming the Pilot Project would double the highest percentage of reductions in habitat within treated areas previously experienced (six percent); the projected reductions in owl habitat would only be 12 percent instead of the 100 percent used in the analysis.

The HFQLG ROD was signed in August of 1999 just seventeen months before the SNFPA ROD was issued. Since the SNFPA effort was near completion, and it was addressing the issue of California spotted owl viability on a range-wide basis, the HFQLG ROD deferred all resource management activities in spotted owl habitat until new owl conservation guidelines were issued by the SNFPA. The SNFPA and HFQLG planning efforts had been closely coordinated, and it followed that the SNFPA Interdisciplinary Team could more thoroughly and rigorously analyze whether implementing the Pilot Project would jeopardize the viability of the owl in the context of the Sierra Nevada bioregion.

The Team found that the SNFPA FEIS relied primarily on the HFQLG BE in order to assess the effects of this action on owl viability. The Pilot Project was generally addressed in a qualitative fashion, or with reference to the HFQLG BE analysis of potential effects to owl habitat.[40] The Team believes that a new analysis of the effects to the owl under a different scenario that would allow a fuller test of the Pilot Project is warranted.

[39] HFQLG BE, Table 9, Pg. 71.
[40] SNFPA FEIS, Volume 3, Chapter 3, Part 4.4, Pgs. 83, 86, 94, 99, and 103.

Finally, by eliminating the suitable land base within the Pilot Project area, the SNFPA does not accommodate a key component of the HFQLG Pilot Project. That component is the intent of providing commercial output of forest products to enhance community socio-economic health and stability. A number of federal laws provide a foundation for managing for commercial forest products on the National Forests. No federal statutes the Team is aware of would be inconsistent with this. Moreover, the objective for removing vegetation is immaterial in the determination of environmental effects. It is the activity itself and how it occurs that causes the effects. This action under the SNFPA, significantly reduced the forest's ability to adequately test the concepts embodied in the Quincy Library Group Community Stability Proposal, which was the foundation for the HFQLG Pilot Project.

The HFQLG Fire and Fuels Strategy

The SNFPA ROD adopted a fire and fuels strategy for the Sierra Nevada National Forests.[41] This strategy focuses priority on reducing hazardous fuels in the urban wildland intermix. The urban wildland intermix is comprised of the defense zone, and threat zone. The defense zone is the area within a quarter mile of communities, and the threat zone extends from the outer edge of the defense zone for an additional 1.25 miles. The strategy is to treat defense zones to a standard that reduces fire line intensity to facilitate direct suppression action, and increase effectiveness and productivity of suppression efforts. In this zone, fuels concerns dominate project design decisions. In the threat zone, a complex of SPLATs is envisioned for approximately one-third of the landscape. These treatments are designed and placed to moderate fire intensity and spread within the treated areas, and also to reduce intensity and spread to some extent beyond the treated areas.[42] In the areas beyond the urban wildland intermix, SPLATs are also prescribed to moderate large wildfire behavior and effects across the landscape. In all areas outside of the defense zone, standards and guidelines are designed to protect late seral wildlife habitat and minimally achieve fuel treatment objectives. The strategy also calls for an emphasis on the use of prescribed fire, especially outside the urban wildland intermix.

The ROD states that, except for the new direction applicable to riparian protection, "the plan amendments adopted by this decision will be applied to the Herger-Feinstein Quincy Library Group Forest Recovery Act Pilot Project".[43] Therefore, all land allocations, management strategies, and standards and guidelines designed to achieve them apply (with the exception of the Aquatic Conservation Strategy and its associated land allocations and standards and guidelines).

The fire strategy adopted under the HFQLG Forest Recovery Act builds a network of defensible fuel profile zones as the first step in a longer-term plan. The DFPZs are designed to function in the same way as the defense zone in the current SNFPA direction. They are located around communities and in addition, along strategic locations for fire suppression activity such as roads and ridges. The concept is to create a strategic network of DFPZs to provide anchor points that facilitate safe and effective fire suppression action. This strategy is based on the approach outlined in the Sierra Nevada Ecosystem Project Final Report to Congress (Weatherspoon and Skinner, 1996). Proposed DFPZs were prioritized based on fire frequency and risk. The primary objective is to protect communities, and at the same time protect wildlife habitat by limiting the size of catastrophic stand replacing fires across the broader landscape.

Current direction only allows the Pilot Project Forests to construct DFPZs within the defense zone. Elsewhere, they must apply standards and guidelines intended for SPLATs in the shape and location they have determined for DFPZs. Since SPLATs do not serve the same function as DFPZs, the standards and guidelines for SPLAT construction generally do not allow construction of cost efficient and effective DFPZs. In many cases, the timber sales envisioned by the Pilot

[41] SNFPA ROD, Pgs. 5, A-10 thru A-13.
[42] SNFPA FEIS, Volume 4, Appendix G.
[43] SNFPA ROD, Pg. 50.

Project to construct the DFPZs are not possible since the standards and guidelines preclude the removal of enough merchantable trees. Because of this, the community stability, and socio-economic aspects of the Pilot Project are not being implemented. In addition, standards and guidelines intended to be applied across the landscape, shaped and arrayed to slow the spread and modify the intensity of wildfire within and outside the treatment areas cannot be applied in the shape and location of DFPZs successfully. In fact, the Team believes that neither the fuels strategy envisioned within the SNFPA, nor the HFQLG strategy can be successfully tested under the current management situation.

Testing Uneven-Aged Silviculture in the HFQLG Pilot Project

Group Selection – The SNFPA allowed group selection that was in the planning stages and was outside of California spotted owl habitat to go forward (approximately 3,400 acres). About 12,000 acres of group selection are now being planned as part of an administrative study initiated by the ROD on the Lassen and Plumas National Forests. Because of the scientific design, and the questions being evaluated, some of the group selection harvest is proposed at a higher intensity than envisioned in the Pilot Project. As a result, current ROD direction allows accomplishment of 15,400 acres of group selection.

The HFQLG Pilot Project envisioned approximately 43,500 acres of group selection to occur within the 5-year term of the Project. As stated above accomplishment of only 15,400 acres represents a little less than 36 percent of the original program envisioned over the 5 year life of the Pilot Project. Currently, no projects including group selection or individual tree selection are being planned within the Pilot Project area outside of the Lassen/Plumas Administrative Study.

The FEIS combined group selection harvest into a category of vegetation treatment activities that, if conducted in owl habitat, would have a moderate to low likelihood of retaining important structural elements.[44] The viability analysis acknowledged that group selection treatments could be implemented without having adverse habitat fragmentation effects.[45] However, the analysis concluded that there was insufficient information regarding "frequency, size, and distribution of openings" in the alternatives to assume no fragmentation. Group selection in the context of the Pilot Project was disclosed in the viability analysis[46] as being 43,500 acres over 5 years, of which 21,375 acres would occur in potential spotted owl habitat. The information was combined with other vegetation treatments in the Pilot Project, and was derived from the HFQLG Biological Evaluation. The Team believes that better guidance on frequency, size, and distribution of openings, would allow a more thorough testing of this important concept.

Group selection as a potential long-term owl habitat management strategy is discussed in some detail in the CASPO Technical Report (Verner et al. 1992). The inclusion of group selection harvest in the Quincy Library Group Community Stability Proposal (the basis of the Pilot Project) was in part based on the discussion contained in the Technical Report.[47] The Team asked a gathering of owl scientists on June 28, 2002, about the applicability of group selection in managing for owl habitat. The response was that that the CASPO report was a "valid source for using group-selection to manage for owls." The meeting with the owl scientists also brought up the problem of the current decision not addressing regeneration of important shade intolerant species of trees such as ponderosa pine and California black oak. This is also acknowledged in the ROD.[48] This is one of the purposes for including group selection in the Pilot Project.

While the ROD does not expressly prohibit group selection, Modified Alternative 8 does not include provision for it. Other alternatives do include group selection harvest as a management tool. The ROD does provide for limited testing of the response of spotted owls and their prey to group selection within an "administrative study". This study combined with previously planned

[44] SNFPA FEIS, Volume 3, Chapter 3, Part 4.4, Pg. 96.
[45] SNFPA FEIS, Volume 3, Chapter 3, Part 4.4, Pg. 97.
[46] SNFPA FEIS, Volume 3, Chapter 3, Part 4.4, Pg. 99.
[47] "Regeneration Silviculture as Proposed by the Quincy Library Group", a white paper: October 1998
[48] SNFPA ROD, Pg. 3.

projects outside of spotted owl habitat, only allows 36 percent of the program envisioned in the legislation. Therefore, the Team concludes that the ROD does not allow full implementation of group selection harvest as a restoration tool in the Pilot Project.

Individual Tree Selection – The ROD is silent on individual tree selection. The only standard and guideline that directly impacts this resource management activity, is the 30-inch and 24-inch diameter limits that apply to all vegetation management activities. No specific target for individual tree selection acreage was indicated in the Pilot Project.

None of the alternatives analyzed in the FEIS addresses individual tree selection. Because the SNFPA amended only part of the existing direction in forest plans, the direction dealing with individual tree selection contained in the management plans for the Pilot Project forests remains in effect. Accordingly, the Team believes that individual tree selection as a resource management activity may be fully tested under the Pilot Project.

Standards and Guidelines for Northern Goshawk, Pacific Fisher and Marten

In addition to provisions for the California spotted owl, the ROD includes a number of standards and guidelines for the northern goshawk, pacific fisher, and marten. The ROD states "Standards and guidelines intended to maintain the viability of other sensitive species may limit resource management activities in the HFQLG pilot project area.[49] The Review showed that this is indeed the case.

For goshawks, PACs of 200 acres for all known or discovered breeding territories are required. Fuels treatments within goshawk PACs outside defense zones are limited to prescribed burning only. Also mechanical treatment of goshawk PACs within the defense zone is limited to 5 percent annually, with a cumulative total of 10 percent for the decade. For Pacific fisher, 700-acre den site buffers are established. 100-acre buffers are established around marten den sites. Fuel treatment activity is limited to piling and mastication. Pile burning is allowed. Limited operating periods for these species are also mandatory.

Of the three species mentioned above, standards and guidelines for the northern goshawk have the greatest effect on the Pilot Project. Mechanical treatment within goshawk PACs is prohibited. These PACs are numerous and growing in number as more birds are located through surveys. Where these PACs intersect DFPZs, no mechanical treatment may occur unless they are located in the defense zone.

Standards and guidelines for fisher will have little if any effect as this species is not known to occur in the Pilot Project area. Restrictions for martin would limit resource management activities where den sites overlap with DFPZs. However, no den sites have been identified. This standard seems to have low potential to limit Pilot Project activities.

The question the Team looked at was the possibility that other standards and guidelines would provide adequate protection for these species while allowing fuller implementation of the Pilot Project.

The viability analysis in the FEIS concluded that the Pilot Project would incur "greater risk because of uncertainty regarding treatment effects and a high proportion of northern goshawk territories" would be treated. Greater risk was associated with the uncertainty even though Congress apparently recognized that a relatively large amount of scientific uncertainty existed when the authorizing legislation was passed. Based on the concern about the uncertainty of effects expressed in the FEIS, new more conservative, guidelines were selected under the ROD.

The standards and guidelines that existed prior to the ROD under the forest plans within the Pilot Project were analyzed in the HFQLG FEIS. The BE determined that the Pilot Project was "Not likely to result in a trend toward federal listing" of the northern goshawk, pacific fisher, and the

[49] SNFPA ROD, Pg. 50.

marten.[50] These guidelines represent an opportunity to harmonize the SNFPA with the Pilot Project.

Determination and Use of the Most Cost-Effective Means Available

The SNFPA amended the Lassen, Plumas, and Tahoe National Forest Plans. The requirement to determine and use the most cost effective means of implementing the resource management activities required under the HFQLG Forest Recovery Act [51] was not affected or amended by the SNFPA. Subsection (e) states "In conducting the pilot project, the Secretary shall use the most cost-effective means available, as determined by the Secretary, to implement resource management activities described in subsection (d)."

The HFQLG FEIS thoroughly analyzed the potential economic impact of implementing the Pilot Project, but did not analyze nor determine the "most cost effective means available" to implement individual projects. The Team could find no written direction for project level decision makers within the Pilot Project area to evaluate, determine, and select the "most cost effective means available" to proceed with resource management activities.

Cost effectiveness is an important consideration in any project design. In most cases costs rise as design elements to reduce or eliminate incidental adverse resource impacts are added. Interdisciplinary teams and District Rangers must make a conscious effort to balance cost, project effectiveness, and incidental resource impacts. This almost always will occur to some extent, but is rarely clearly documented in the project record. In some cases, where proper line oversight is lacking, costs of mitigation and selected methods of implementation can get out of hand and create expensive projects that may not meet the original objective. In other cases, line officers are heavily involved to ensure that project objectives and overall program objectives are blended to balance costs and impacts.

Conscious and documented determination of this balance by the deciding line officer should be done for each project. In some discussions with Forest personnel the Team found that cost effectiveness evaluation and determination is taking place through out the project planning process, at least in some cases. However, the extent of this is not possible to determine, and has not been documented in any individual cases the Team has found.

The Lassen/Plumas Administrative Study

The ROD expressed the intent to develop an administrative study in cooperation with the Pacific Southwest Research Station (PSW) to "examine the relationship between management-caused changes in vegetation and their effects on spotted owl habitat and spotted owl population dynamics." This study is being conducted on the Lassen and Plumas National Forests. The study is currently in the planning phase, and the FEIS and ROD are expected to be issued in the summer of 2003. The study has been rigorously developed by PSW and the forests. Because of the nature of scientific investigation, vegetation treatments are made up of a spread of intensities to ascertain and attribute changes in the parameters being studied. Three treatment regimes are included and replicated in the study. To test DFPZs, these include treatments designed to the SNFPA standards, and the original Pilot Project direction. To test group selection, treatments are all consistent with the Pilot Project direction, but some units are scheduled on a 20 year cutting cycle, versus a 10 year cycle. This examines the differences between more intensive treatments spread further apart over time, versus lighter treatments at shorter intervals. Strategically Placed Area Treatments are also being investigated under the study. However, none of these is planned to be implemented within the time frame of the Pilot Project.

[50] HFQLG BE, Pg. 191.
[51] HFQLG Forest Recovery Act Section 401, Subsection (e).

Because some of the DFPZs in the study are treated to SNFPA standards, these portions are not being managed using the specific resource management activities required under the HFQLG Act.

The ROD initiated the idea of an administrative study within the Pilot Project area. To implement this direction, the Forests have undertaken a very large and complex planning effort which includes the preparation of an EIS. This effort is well underway. The study is designed to answer important questions related to managing forest resources in an ecologically sustainable manner. In addition, nearly the entire resources of the Plumas National Forest, and a large portion of the Lassen's are heavily committed to successful planning and implementation of the study. Nearly of the FY 2003 and 2004 Pilot Project program for the Plumas is contained within the study area. A tremendous investment of funds and human resources has been made.

The Team believes the concept of the Lassen/Plumas Administrative Study is consistent with the goals of the Pilot Project. While one of the treatment regimes in the study does not coincide precisely with resource management activities described in the Act, the concept of the study is consistent with the Pilot Project goals. The Team feels the forests involved in the study should work closely with the HFQLG to determine if there are ways to make the treatments more compatible with the Pilot Project. We also believe that in the context of full implementation of the Pilot Project, the study adds an element of scientific rigor that will increase the usefulness of information obtained, and ultimately make the Project more valuable as an adaptive management tool.

Several members of the HFQLG are adamantly opposed to the administrative study. The Team understands their primary concern as ensuring consistency with the Act, and possible effects on owls. The HFQLG is a diverse group of individuals that came together in spite of wide initial differences. The concept of implementing more intensive treatments to determine the response of owls goes directly against one of the main tenants of their union. That is: to design and conduct a forest management program that avoids adverse affects to owls while providing socio-economic benefit for people and communities.

Impacts to Grazing

Key Findings

1. **There is a great deal of uncertainty about the relative risk to Yosemite toad, willow flycatcher and great gray owl from grazing managed under the ROD standards and guidelines for meadows and riparian systems.**

2. **Opportunities exist to provide flexibility to the field which will maintain protection for sensitive species while reducing impacts to permittees and providing incentives for habitat restoration.**

3. **The utilization standards in the ROD generally reflect management practices prior to the SNFPA. There are situations where trend and condition monitoring indicates another standard is reasonable and responsible. However, to change utilization standards based on site-specific conditions, a forest plan amendment is required.**

4. **Standards and guidelines cannot enforce administration. Setting tighter standards is not the answer to issues of accountability and trust.**

Background

The SNFPA imposes standards and guidelines to protect two Forest Service Sensitive species (Willow Flycatcher, and Yosemite Toad) from adverse impacts due to livestock grazing. Additional protections for fens, bogs, and stream banks, along with new standards of allowable use are also required. These new protections will impact active allotments and wilderness pack-stock use areas. The SNFPA FEIS estimated a twenty-percent reduction in Animal Unit Months (AUMs) across the bioregion under the standards and guidelines in Alternative Modified 8. Local impacts to individual permittees were expected to vary, but were likely to result in cancelled permits, or non-viable operations. At the request of the Regional Forester, the Team reviewed the standards and guidelines that affected grazing to determine if there were other ways to provide the desired level of resource protection while lessening impacts to permittees.

The Team held two field trips to discuss the SNFPA and issues related to grazing. On June 13, 2002 we traveled to the Stanislaus National Forest and discussed management for the Yosemite toad and great gray owl. Approximately 35 people attended the field review, including Forest Service biologists and range program managers, personnel from California State Fish and Game, the U.S. Fish and Wildlife Service, representatives from conservation organizations, the California Farm Bureau, the livestock industry and local Forest Service permittees. The second field trip was held June 26, 2002, beginning at the Sierra National Forest Supervisor's Office in Fresno. Again, some 45 persons, representing a spectrum of interests, attended this daylong session. Discussions focused on the ROD language pertaining to habitat management for Yosemite toad and willow flycatcher. During the site visits, participants were able to witness first-hand the challenges field personnel experience in attempting to balance multiple objectives within the confines of a single meadow.

During the field trips, it became clear that a high level of anxiety stemmed from the unknown consequences of direction yet to be fully implemented. Many were speculating about whether the surveys required by the ROD could be completed on time, what the outcome of those surveys would be, and what the consequences of the ROD would be to permittees given the survey results. Consequently, much of the focus was on the desire to know more and to know it as soon as possible. Other points that surfaced in the discussions included, the need to recognize the cumulative effect of standards and guidelines for multiple species on a given allotment, the limited

scientific information from which the standards and guidelines were derived, the need for flexibility to address site-specific conditions and anomalies, and concerns about the status of willow flycatcher and Yosemite toad populations in the Sierra Nevada.

The Team also observed that some permittees were ready and able to work within the management direction in the ROD while others were significantly impacted. The reported impacts varied significantly depending on the physical attributes of the allotment, the configuration of the targeted habitat within that allotment, and the stock management options unique to a given permittee. The discussion left us with the impression that most attendees understood the direction in the ROD and how it was to be applied at the Forest level. The rationale for the direction, however, was a subject of much disagreement and debate.

New Information and Understanding Gained from Review

Impacts from Standards and Guidelines for Sensitive Species

A summary of the ROD standards and guidelines for selected sensitive species is presented below. It is important to recognize that the focus of this report is on selected standards and guidelines that impact grazing activity. As a result, what is presented and discussed here represents a select component of a larger strategy to manage meadows and riparian ecosystems. For example, many components of the Aquatic Management Strategy in the SNFPA will not be highlighted in this report, although they play an important role in maintaining suitable habitat for the species of concern.

The Team began by developing a more detailed assessment of the likely effects of the standards and guidelines on grazing activities. This included a status check on the degree to which surveys mandated under the ROD had been completed. Based on the latest information about the range and distribution of the species of concern, we were able to better quantify the impact from the existing management direction. After validating the magnitude and extent of likely impacts, the Team began reviewing the rationale behind the standards and guidelines to identify which effects they were designed to mitigate, why the ROD adopted a particular approach, and if and how alternative direction could be developed to achieve the same outcome.

The sections below are organized by key species. A synthesis of the new information collected from two years of survey work is provided, along with a review of the key assumptions made in the FEIS about the effects of grazing on the species of concern. The standards and guidelines are reviewed for the way in which they addressed the relative significance of these effects, the uncertainty surrounding management actions, and the comprehensive protection for riparian and meadow ecosystems woven throughout Alternative Modified 8. The Team also considered the new information and management recommendations provided by the recently completed conservation assessment for the willow flycatcher (Green et al. 2003).

Willow Flycatcher

The willow flycatcher is listed as a Forest Service sensitive species and has formal listing in the State of California as an endangered species.[52] Within the last forty years, willow flycatcher populations have been extirpated from most low-elevation areas in California. Historical grazing practices are thought to be at the root of this decline. Populations in higher elevations also appear to be in a long-term decline, in part, due to urbanization and loss of habitat. Currently it is estimated that there are 300-400 breeding and non-breeding individuals within the Sierra Nevada bioregion. Of this, an estimated 120-150 individuals are found on national forest lands. The Team did not find any information to change the overarching concern about the fragility of the willow flycatcher population in the Sierra Nevada.

[52] Subspecies *E.t.adastus* and *E.t. brewsteri* are found within the planning area.

The willow flycatcher subspecies of interest, breed in shrubby vegetation in meadow and riparian communities. Meadows with high water tables, standing water, and abundant willow with medium to high foliar density appear to be preferred. The FEIS defines "known willow flycatcher sites" as meadows or riparian areas with willow flycatcher observations that meet specific criteria deemed to be representative of the breeding resident population. Known sites are located on each of the national forests in the Sierra, with higher numbers of sites located on the Lassen, Plumas, Tahoe, and Inyo National Forests. The extent of potentially suitable habitat throughout the Sierras has not yet been determined. That task, along with consistent and regular surveys to track population and site occupancy were key commitments in the ROD.

Impact of ROD Standards and Guidelines on Grazing – The ROD imposes a number of restrictions on grazing that are designed to maintain and foster suitable habitat for meadow and riparian species, exclude grazing from sites where breeding populations of willow flycatchers have been known to exist, and systematically survey suitable habitat in proximity to these known sites. Standards and guidelines developed specifically for the willow flycatcher and primarily to regulate grazing activity can be found in Appendix A of the ROD.[53] Although the direction appears lengthy, the key components can be summarized in the following few paragraphs:

Known Sites
At some point in time, willow flycatchers have been observed during the breeding season at 82 different sites in the forests of the Sierra Nevada bioregion.[54] These locations are referred to as "known sites" and the following management direction applies:

Survey 82 known sites in 2001 and 2002. If willow flycatchers are detected, eliminate grazing in the entire meadow. If not detected, allow late season grazing (after August 31) and monitor habitat conditions annually. Beginning in 2003, for known sites that have not been surveyed, prohibit grazing in entire meadow.

Emphasis Habitat
Emphasis habitat is defined as meadows greater than 15 acres in size with standing water on June 1 and a deciduous shrub component. The following management direction applies:

Survey emphasis habitat within 5 miles of the 82 known willow flycatcher sites. If willow flycatchers are detected, allow only late season grazing (after August 31) in these meadows and include site in survey cycle for known sites. In addition, survey emphasis habitat within a 5-mile radius of the new occupied site. If surveys are not completed within 5 years, allow only late-season grazing in areas remaining to be surveyed.

Standards for willow browse and streambank disturbance are found in the Forestwide standards and guidelines for grazing and in the Aquatic Management Strategy.[55]

Willow Browse
To protect hardwood regeneration in grazing allotments, allow livestock browse on no more than 20 percent of annual leader growth of hardwood seedlings and advanced regeneration. Alter grazing plans if hardwood regeneration and recruitment needs are not being met.[56]

Streambank Disturbance
Prevent disturbance to meadow-associated streambanks and natural lake and pond shorelines caused by resource activities from exceeding 20 percent of stream reach or 20 percent of natural lake and pond shorelines. In stream reaches occupied, or identified as

[53] SNFPA ROD, Pgs. A-61-A-62.
[54] There is some discussion about whether the Forest Service should actually be managing for 99 known sites. The point identifier for 17 additional sites is located on private land. However, the meadow associated with the site overlaps onto National Forest lands.
[55] SNFPA ROD, Pgs. A-31 and A-55.
[56] SNFPA ROD, Pg. A-31.

essential habitat for the Lahonton and Paiute cutthroat trout and the Little Kern golden trout, limit streambank disturbance from livestock to 10 percent of the stream reach[57].

The matrix below summarizes the possible outcomes to grazing and how the different outcomes are linked to the survey and discovery of willow flycatchers.

Location and Survey Result	Direct Effect on Grazing
Known site, surveyed and occupied	Exclude grazing from entire meadow
Known site, surveyed not occupied	Late season grazing (after Aug 31)
Known site *not surveyed by 2003*	Exclude grazing from entire meadow
Emphasis sites surveyed and occupied	Late season grazing (after Aug 31)
Emphasis sites surveyed not occupied	No effect
Emphasis sites not surveyed by 2006	Late season grazing (after Aug 31)

Because of the weight attached to survey deadlines in the ROD, grazing may be restricted as a result of inefficiencies, errors, or delay in completing survey work. The Team cannot find the rationale for this provision in the FEIS. We assume that it was included as an incentive for completing the surveys quickly to minimize the short-term risk of losing potential breeding opportunities given the fragility of the population. However, the penalty for not completing work falls on the permittee who has no ability to control Forest Service budgets or work priorities. The Team believes this to be a management and accountability issue that should be addressed outside the context of a resource management plan. From our review, we have determined that virtually all of the 82 known willow flycatcher sites have been surveyed to protocol and the forests are making a good-faith effort to follow through with surveys of emphasis habitat.

Another observation is the special attention given to the 82 known sites. Note that regardless of occupancy, restrictions on grazing apply to each of these sites. The FEIS reports that 56 of the 82 known willow flycatcher sites on Forest Service land occur in active allotments. The same document reports a total of 418 active allotments on the Sierra Nevada national forests. Thus, under the existing standards and guidelines, up to 13 percent of active National Forest grazing allotments will automatically receive at least some late-season grazing restrictions.[58]

At the time the ROD was signed, the actual impact of the standards and guidelines on permittees could only be estimated, because the actions to be taken hinged upon the results of surveys yet to be accomplished. To help fill this data gap, the Team collected survey information from each of the forests and reviewed it to determine: 1) the extent to which this work had been completed; 2) the number and location of known sites found to be occupied; and 3) the extent to which emphasis surveys were discovering additional occupied territories. A preliminary review of the survey data shows that 44 of the 82 known sites were occupied.[59] Occupied known sites were found in eleven allotments and unoccupied sites were found in 22 allotments.[60] One new occupied site was also found within an allotment.

The Team then contacted range program leaders on each forest to discuss the likely effects of implementing the standards and guidelines during the next field season. We found the most significant impacts to be on the Tahoe (8 of 29 active allotments), Sierra (6 of 30 active allotments), Stanislaus (5 of 35 active allotments), and Sequoia (4 of 54 active allotments) National Forests; each with at least one allotment expected to go to non-use status due to grazing restrictions for the willow flycatcher. Two of the non-use situations result from the late-

[57] SNFPA ROD, Pg. A-55.
[58] The percentage is likely to be somewhat less than 13 percent, because more than one known willow flycatcher site can be located in an allotment.
[59] Forests have found several apparent errors in the original list of 82 sites. Several sites are actually on private land, some have no suitable habitat, and others are in the middle of campgrounds or other development. Inaccuracies in the data set must be reconciled and remapped as part of the ongoing effort to develop the willow flycatcher conservation strategy.
[60] Six of the unoccupied sites are located on the Modoc National Forest and are managed under the Upper Pit Watershed Restoration Project. The ROD explicitly acknowledges this special situation and makes provision for it to continue (SNFPA ROD, Pg. 17).

season grazing restrictions imposed on unoccupied sites. Another seven allotments are likely to be moderately impacted. Reductions in use, fencing and/or other changes will be needed to allow some grazing activity to continue. Minimal effects were estimated for the remaining 22 allotments with known willow flycatcher sites.

Disincentives for Species Recovery – Generally speaking, if we are successful in increasing the population of willow flycatchers throughout the Sierra, under the ROD, the adverse impacts to grazing also increase. A case in point is the Perrazzo Meadow complex on the Tahoe National Forest. For a number of years the forest has been actively managing for willow flycatcher and grazing, working with the permittee to develop allotment plans to protect areas where willow flycatchers are nesting. It appears that these efforts may be reflected in the fact that Perazzo Meadows has one of the two highest concentrations of willow flycatcher territories in the Sierra Nevada (Green et al. 2003). However, under the existing management direction, this successful partnership will be reduced to a meadow closure and a non-use situation.

The Team finds the inherent disincentive for facilitating species recovery to be a significant problem with the ROD. Every new discovery in an active allotment brings with it the potential for impacts to ranching operations. Although the rate of discovery has been low, most emphasis habitat still remains to be surveyed. There have only been a few new detections of willow flycatchers during surveys of emphasis habitat, however, a good deal of this work remains to be completed. Finally, there are still 22 allotments that may be subject to non-use status in the future if willow flycatchers are detected in additional known sites.

Definition and Use of "Known" Sites – The Team found the standards and guidelines for willow flycatcher habitat to be heavily influenced by the definition and management of "known" sites. Although we understand the significance of site fidelity in the species, we question using a cut-off date as the sole determinant for the type of restriction to impose on livestock grazing. If willow flycatchers are present, the same management standards should apply regardless of when the first detection occurred.

The ROD treats willow flycatcher habitat differently depending on whether a particular site has a past history of occupancy. The assumption is that, given the observed site fidelity of the willow flycatcher, sites with evidence of historical occupancy should be managed more sensitively than other suitable habitat. This assumption plays out in the identification and management of the 82 known sites described above. These sites are at the heart of the activity-related standards and guidelines for willow flycatcher habitat and, if occupied, are the basis for total exclusion of grazing. Moreover, they serve as a nucleus for establishing emphasis habitat survey boundaries. Because of the important role they play in implementing current and future management, the Team carefully reviewed the rationale and assumptions used to identify the 82 known willow flycatcher sites.

The FEIS describes the criteria under which the 82 known sites were established. Criteria for determining "known willow flycatcher sites" are listed in the FEIS.[61] The FEIS states "all sites where willow flycatchers were identified are included in the dataset regardless of the year of observation or collection." Original detections for know sites date back to the early 1900's with the frequency and duration of occupancy in intervening years largely unknown. A quick review shows that in 15 recently surveyed (1998-2000) known sites, willow flycatchers have not been detected for ten or more years. For one known site, willow flycatchers have not been detected for 50 years. With the exception of habitat type conversion, the ROD makes no provision for removing or adjusting management direction for known sites that are regularly surveyed and found to be unoccupied. This direction implies that the same management restrictions will apply to these 82 locations in perpetuity, regardless of actual or likely occupancy.

The 82 known sites were screened to ensure that they represented habitat used by breeding residents as opposed to the migratory population. However, in establishing the database it was assumed that willow flycatcher records without a specific date were associated with breeding

[61] SNFPA FEIS, Volume 3, Chapter 3, part 4.4, Pg. 148.

season occupants.[62] The FEIS notes that five of the 82 known sites on forest service land fall into this category. These records were to be "pursued for additional information or eliminated from the willow flycatcher database if no further information is found." The Team found no evidence of follow-up efforts to reconcile this discrepancy.

Finally, the Team found it difficult to reconcile the inconsistent management for occupied sites. On the one hand, livestock grazing was prohibited in occupied known sites. Presumably, this was intended to keep cattle from tipping and trampling nests and as a precautionary measure to guard against attracting brown-headed cowbirds. However, the same precaution was not extended to occupied emphasis habitat, although the logic thread would seem to support this. We found no scientific rationale for drawing a distinction between historic occupancy--as defined by sporadic surveys and personal account--and verified current site occupancy. Again, we question the utility of using an arbitrary cut-off date as the basis for varying management approaches.

Effects of Grazing on Willow Flycatchers –The Team reviewed the extensive documentation about the willow flycatcher in the FEIS[63] to identify key concerns about grazing and any research findings that would provide further insight into those concerns. We note that the text was exhaustive in listing the many factors that could be influencing willow flycatcher populations. However, the FEIS treats every possible effect with equal importance. This makes it difficult and tedious to identify primary concerns and determine which of those can reasonably be associated with grazing. For example, there is a lengthy and comprehensive discussion of cowbird parasitism,[64] although the general conclusion is that it is a relatively rare event in the Sierra Nevada.[65]

With this in mind, the key questions to be answered were: 1) how was grazing specifically expected to affect willow flycatchers; 2) what is the basis for these concerns; and 3) how significant are the potential effects from grazing in relation to other factors that may be impacting the willow flycatcher population in the Sierra Nevada.

Relatively little research has been done to clarify the relationship between managed livestock grazing and willow flycatcher population dynamics. This information gap is identified in the FEIS with a statement that "specific research on livestock grazing practices in known willow flycatcher sites in the Sierra Nevada is lacking".[66] Inferences are drawn from three studies on willow flycatchers and grazing conducted in Colorado and eastern Oregon. These studies measure willow flycatcher abundance in the presence and absence of grazing over relatively short periods of time. However, they do not provide insight into the willow flycatcher reproduction and survival response in grazed sites vs. ungrazed sites. Extensive references are made to studies of how historic livestock grazing has altered hydrological systems and the structure of plant communities in riparian and meadow areas. However, no information is provided about the effects of managing grazing under the existing standards and guidelines for riparian areas and meadows.

In addition to grazing, the FEIS lists a number of factors that may be contributing to the apparent decline in the breeding population of willow flycatchers in the Sierra Nevada. These include:

- Wintering ground deforestation
- Increased human developments in the Sierra, road construction, recreation, and associated impacts on stream hydrology and meadow vegetation, draining, channelization and filling
- Increased use of chemicals for insect control
- Nest depredation
- Nest failures from inclement weather
- Infertile or non-viable eggs

[62] SNFPA FEIS, Volume 3, Chapter 3, part 4.4, Pg. 148.
[63] SNFPA FEIS, Volume 3, Chapter 3, part 4.4, Pgs. 143-195.
[64] SNFPA FEIS, Volume 3, Chapter 3, part 4.4, Pgs. 158-159.
[65] SNFPA FEIS, Volume 3, Chapter 3, part 4.4, Pg. 151.
[66] SNFPA FEIS, Volume 3, Chapter 3, part 4.4, Pg. 154.

- Changes in prey base due to changes in hydrological systems
- Fire
- Lodgepole pine encroachment
- Random environmental and demographic events
- Unforeseen fluctuations in population-regulating mechanisms

Clearly, there are many factors that are likely to influence the persistence and recovery of the willow flycatcher population in the Sierra Nevada. Ultimately, research is needed to better quantify the relationship between grazing practices and willow flycatcher populations. However, based on the impact from historic grazing practices, it seems reasonable to conclude that, under certain conditions, grazing can have a negative impact on willow flycatcher habitat. The more important question is, what is the relative risk to the species from the type and extent of grazing expected in the Sierra Nevada with the existing standards and guidelines for meadow health?

Essentially, the FEIS identifies four ways in which grazing may negatively affect willow flycatchers: 1) increased nest parasitism by brown-headed cowbirds; 2) reducing the extent and density of willow cover; 3) altering meadow hydrology through soil compaction and streambank chiseling; and 4) dislodging and trampling nests. However, cowbirds have not been shown to have a significant impact in the Sierra Nevada,[67] although continued monitoring of the situation is advisable (Green et al. 2003, Pg. 47). Also, the ROD includes explicit standards and guidelines to control willow browsing and streambank chiseling[68]. Utilization standards place additional sideboards on grazing intensity.[69] The probability of nest bumping is directly tied to stocking levels and meadow configurations and strategies to avoid this are most appropriately developed on-site. Finally, a factor outside the control of the Forest Service, nest predation, is reported to be a major cause of nest failures in the Sierra Nevada.[70] Given these observations, it is not clear what benefit would be derived from regional direction to completely exclude livestock from meadows that are occupied. The same concern applies to late-season grazing restrictions. In fact, permittees and range specialists have commented that the latter part of the season is when livestock are most likely to more actively browse willows and riparian shrubs—the very activity that is to be discouraged.

The Team believes there are a number of ways to identify and manage the specific risks associated with grazing in meadows occupied by willow flycatchers. Given the standards and guidelines already in place to protect key habitat features, concerns about nest bumping could be addressed by working with permittees to adjust the timing, location, and/or intensity of grazing as needed to keep livestock out of willows during the breeding period. Fencing may be an appropriate tool in some cases. In other situations, it may be preferable to remove stock to avoid willow flycatcher sites at critical times. With the proper incentives, it is possible that more habitat improvement projects could be initiated in a cooperative sprit and that permittees could work to support the goal of increasing the willow flycatcher population rather than being threatened by it. Given the demonstrated persistence of the willow flycatcher in areas currently managed as active allotments, we believe there are a number of successful strategies that could allow this to continue.

The ROD embodied a “cautious approach” and attempted to substantially reduce all risks to the willow flycatcher that were within the control of the Forest Service. Upon review, the Team believes significant restrictions were placed on grazing to mitigate questionable and, in our judgment, relatively minor risks. This is especially so when viewed in the context of other standards and guidelines.

The heightened concern about marginal increments of risk extends into the viability analysis in the FEIS. A key assumption underlying the analysis is:

[67] SNFPA FEIS, Volume 3, Chapter 3, part 4.4, Pg. 151.
[68] SNFPA ROD, Pgs. A-31 and A-55.
[69] SNFPA ROD, Pg. A-31.
[70] SNFPA FEIS, Volume 3, Chapter 3, part 4.4, Pg. 151.

> "Where bioregional standards are ambiguous or default to local management control, they may be widely interpreted and will have higher uncertainty with respect to implementation and therefore higher potential risks for focal species."[71]

This assumption appears to bias the viability analysis against alternatives that offer more flexibility for local managers to address site-specific concerns or opportunities. More flexibility does not necessarily equate to more risk, especially when the management objective (i.e. maintaining suitable willow flycatcher habitat) is clear. In this regard, more attention to the precise definition of suitable willow flycatcher habitat would be of great benefit.

The Team's support for local flexibility is mirrored in a recently released report entitled, Draft Conservation Assessment of the Willow Flycatcher in the Sierra Nevada. The assessment was commissioned by the Forest Service as the next step in developing a conservation strategy for the species. The following quotes are from the Draft Conservation Assessment. The report points to meadow desiccation as the "single most important proximate factor in willow flycatcher decline in the Sierra Nevada" (pg 43). Thus, restoration of meadow hydrology and reestablishment of healthy willow stands are believed to be the best options for restoring willow flycatcher populations (pg 43). Of note is the "management recommendation" that:

> "Because each meadow is impacted by each negative factor to varying degrees, management activities must also be tailored on a meadow-specific basis." (pg 45)

The need for location-specific solutions is again acknowledged with the statement:

> "Forest managers must make *meadow-specific* determinations of what, if any, impact livestock are having on willow flycatcher habitat and take appropriate corrective action. Whatever alternative is selected, additional research and monitoring are needed to address potential livestock impacts under current management regimes in the Sierra Nevada." (pg 45)

Yosemite Toad

The Yosemite toad is found only in the Sierra Nevada mountain range, along a narrow belt of high elevation habitat approximately 130 miles long (north-south), by 35 miles wide (east-west). Its breeding habitat is largely restricted to wet mountain meadows from the Blue Lakes region north of Ebbetts Pass in Alpine County south to Kaiser Pass area in the Evolution Lake/Darwin Canyon region of Fresno County. The known elevation range of the species extends from roughly 6,500 to 11,500 feet.[72]

The species is found in high montane and subalpine habitat associations in relatively open wet meadows surrounded by forests of lodgepole pine or whitebark pines. Toads are primarily active above ground during the late spring, summer, and early fall. They hibernate below ground for the remaining months. Suitable breeding sites are generally found in shallow, ephemeral pools of water, oftentimes but not always associated with flooded portions of wet and moist meadows; shallow wet meadow margins of ponds and lakes; shallow spring channels in wet meadows; slow moving side channels, and sloughs or oxbows associated with streams usually in wet or moist meadows.[73] Suitable habitat is primarily located on the Inyo, Sierra, and Stanislaus National Forests but also is found on the Eldorado and Humboldt-Toiyabe National Forests.

As of the mid-1990's, the Yosemite toad population appears to have declined substantially. One survey in Yosemite National Park indicated it has disappeared from over 50 percent of the sites where it was known historically (Kagarise, Sherman and Morton, 1993). The Yosemite toad is currently a California State Species of Special Concern and Forest Service Sensitive Species. A recent 12-month petition finding issued by the Fish and Wildlife Service stated that a federal

[71] SNFPA FEIS, Volume 3, Chapter 3, part 4.4, Pg. 163.
[72] SNFPA FEIS, Volume 3, Chapter 3, part 4.4, Pg. 218.
[73] Information taken from "Yosemite Toad Ecology and Management Issues" prepared by Gary Milano, biologist, Inyo National Forest, for Sierra National Forest grazing site visit, June 26, 2002.

listing under the Endangered Species Act was warranted but precluded by higher priority listing actions.[74] The Forest Service is in the process of completing a Conservation Assessment for the toad in collaboration with other agencies and scientists. Unfortunately, information from the Assessment has not been available for this review.

Evidence of the decline in amphibian populations throughout the Sierra and elsewhere is thoroughly documented in the Sierra Nevada Ecosystem Project. The Team has found no information that would cause us to question this fundamental concern.

Impact of ROD Standards and Guidelines on Grazing –The ROD imposes restrictions on grazing activity to avoid impacting breeding populations of Yosemite toads. Standards and guidelines developed specifically for Yosemite toad habitat and primarily to regulate grazing can be found in Appendix A of the ROD.[75] The direction is straightforward and the key points are paraphrased as follows:

> *Exclude livestock (including pack stock and saddle stock) from standing water and saturated soils in wet meadows and associated streams and springs occupied by Yosemite toads during the breeding and rearing season. If physical exclusion is impractical then exclude grazing from the entire meadow.*
>
> *Survey suitable habitat within the species' historical range. If surveys are not completed within three years, assume habitat is occupied until surveyed.*

Note that grazing will be restricted in suitable habitat that has not been surveyed for Yosemite toad by 2004. The Team did not find the rationale for this requirement in the FEIS, although we assume it was included to ensure the rapid completion of important survey work. We note that it effectively penalizes the permittee for inaction by the Forest Service. A great deal of survey work has already been completed and the forests have adjusted workloads and hired additional crews in an attempt to meet these time constraints. However, given the logistical difficulties and cost associated with wilderness and backcountry survey work, suitable habitat in remote areas may not be completely surveyed within the three-year timeframe specified by the ROD. We do not believe that the time allotted is reasonable to complete the task at hand. Moreover, we believe that setting work priorities and schedules is a management task that should occur outside of the environmental analysis process.

As was the case with the willow flycatcher, the impact of the Yosemite toad standards and guidelines on grazing could not be fully assessed when the ROD was signed. The consequences depended on survey work that, for the most part, had yet to be accomplished. The discussion of impacts to grazing was limited to one statement in the Grazing section of the FEIS:

> "it is estimated there is suitable and/or occupied Yosemite toad habitat within 70 allotments."[76]

All of these allotments are not active, and the amount of suitable habitat within an allotment varies greatly. Within a given allotment, the impact to grazing depends upon whether the suitable habitat is *occupied* and, if so, how the mandated exclusion will affect the availability of the allotment. To answer this question, the Team collected survey information from each of the affected forests to determine the number of allotments containing surveyed occupied habitat and the number of allotments with potentially suitable habitat remaining to be surveyed. The Team then contacted range program leaders on the forests to determine the likely effects of implementing the standards and guidelines as written.

The impact from existing management direction for Yosemite toad habitat is greatest on the Stanislaus and Sierra National Forests. The Stanislaus National Forest has 12,000 acres in potentially suitable Yosemite toad habitat within 16 active allotments. Surveys completed to-date

[74] Federal Register: December 10, 2002, Volume 67, Number 237, pp. 75834-75843.
[75] SNFPA ROD, Pg. A-60.
[76] SNFPA FEIS, Volume 2, Chapter 3, part 5.3, Pg. 406.

have found that eight of those allotments contain occupied wet meadows. Another 4,000 acres in 13 active allotments remain to be surveyed. Excluding grazing from the wet areas within these meadows is expected to make grazing infeasible for three allotments. One additional allotment will require a significant investment in time and money to manage the exclusion. For the other four allotments containing occupied habitat, grazing is likely to continue with relatively small adjustments.

The Sierra National Forest has over 7,800 acres of potentially suitable Yosemite toad habitat within 19 active livestock allotments. Survey work is progressing and expected to be completed in 2004. So far, meadows occupied by Yosemite toads have been found in 11 allotments used by commercial livestock. In three of these, grazing exclusions for Yosemite toad will limit use in key areas of the allotment to such a degree that it is infeasible to continue grazing. Grazing is expected to continue in the other eight allotments, although in most cases, considerably more time and money will be required to manage around restricted areas. An additional 4,200 acres in 24 active, vacant and closed commercial livestock allotments remain to be surveyed in 2003.

Surveys have been completed for all suitable habitat located in active allotments on the Eldorado and Humboldt-Toiyabe National Forests. One allotment contained occupied habitat on the Eldorado, as did two allotments on the Humboldt-Toiyabe. Restrictions are likely to eliminate grazing in one allotment. No active livestock allotments on the Inyo National Forest contain suitable Yosemite toad habitat.

The Team also reviewed the effects of Yosemite toad standards and guidelines on commercial packing. Sixteen commercial pack stations travel throughout the backcountry of the Sierra and Inyo National Forests. Surveys of suitable habitat have been completed for most of the areas used by commercial packers on the Inyo National Forest. Roughly 75 meadows, some used regularly for packstock grazing, contain occupied suitable habitat. However, on the Sierra National Forest, this survey work is not scheduled to begin until 2004. As a result, meadows within roughly 3,200 acres of potential habitat will likely be closed to grazing.

Currently, packstock grazing is not managed on an allotment basis. Instead, operators are allowed to use a number of meadows within a broad geographic area. Stock may graze different meadows, depending on itineraries and seasons of use. The numbers of meadows potentially used by commercial packers numbers in the hundreds. Exclusion methods involving fencing, holding and feeding areas, and picket lines tend to work against management objectives for wilderness areas by concentrating use and impacts and introducing artificial fixtures. Moreover, it is extremely difficult to effectively exclude loose stock from the many wet spots, pools, and ponds that tend to be associated with high-elevation wet meadows.

Closure of some high-elevation meadows in response to Yosemite toad standards has already occurred on the Sierra and Inyo National Forests and additional closures are planned for next year. In part, these restrictions are linked to requirements in the SNFPA, but they are also tied to standards for stock forage in the management plan recently adopted for the John Muir, Ansel Adams, and Dinkey Lakes Wilderness Areas (Sierra and Inyo National Forests). As the forests attempt to more intensively manage backcountry meadows, some of the same areas populated by Yosemite toad are also under review for closure to address other resource concerns. To some extent, packers have more flexibility to address meadow closures and restrictions. However, closing one meadow will put additional pressure on areas that remain open to this use. The cumulative effect of meadow closures may leave some operations with no recourse but to pack feed. Of concern, is the additional cost and reduced revenue associated with this outcome.

Effects of Grazing on Yosemite Toads – A key assumption used to complete the viability assessment for this species in the FEIS was:

> "Because…toads breed at the edges of wet meadow and slow-flowing streams, livestock grazing is a **primary** threat [emphasis added]".[77]

This assertion appears to be based on a brief reference to the possible effects of grazing on Yosemite toad is cited in the FEIS as "personal communication". Upon review, we found that anecdotal information suggests that grazing directly effects toads by trampling individuals, and indirectly, by altering hydrological systems. No data is provided in the FEIS to quantify these effects or to show the relative significance of the effects in contributing to the observed population decline. We are aware that the working group for the Yosemite Toad Conservation Assessment has identified trampling and/or crushing of adults and metamorphs and changes in the hydrological function of meadows as potential threats to the species.

Other information suggests that the decline in Yosemite toad populations may not be strongly linked to grazing activity. This includes the one research study specific to Yosemite toads that is cited in the FEIS. The study supports the observation that populations are declining, however, no grazing occurred in the study area (Kararise, Sherman and Morton, 1993). Moreover, baseline population estimates for Yosemite toad are derived from museum records and historical sightings reported over the same period of time that intensive grazing was taking place over vast areas of the Sierra Nevada. We note that the observed decline in the number and distribution of Yosemite toads in the Sierra is coincident with a significant reduction in grazing in the same location. These observations cause us to question the extent to which further restrictions on grazing will have any effect on the ability of the species to overcome more significant environmental stressors.

The fundamental problem, as reported in the Sierra Nevada Ecosystem Project and many other sources referenced therein, is that there is simply a great deal of scientific uncertainty about the reasons for the decline in amphibian populations over a broad geographic scale. Other potential impacts to the species and its habitats are reported as:

- Drought
- Disease
- Predation
- Chemical Toxins
- Recent increases in UV radiation
- Stocking of non-endemic sport fish

Under these circumstances, concerted efforts to collect more information and to develop a better understanding of the current population distribution of the Yosemite toad are clearly an important first step. The Forest Service is in the process of completing a conservation assessment for the Yosemite toad that will serve as a starting point for building a conservation strategy for the species. Work of this nature is needed to ensure that management actions will, in fact, make a difference in stabilizing and ultimately, restoring populations.

Although we found no research on the topic, livestock have reportedly trampled toads within Yosemite toad breeding areas. The degree to which this occurs and how it may affect toad population dynamics is unknown. Clearly, reasonable precautions should be taken to reduce the chance of trampling and to ensure that grazing does not compromise hydrological conditions in wet meadow habitats. However, by attempting to eliminate all risks from grazing, the ROD used an overly cautious approach to meet these objectives. This "zero-tolerance" approach comes at great expense to some permittees without any assurance that it will significantly reduce risk to the species of concern.

The Team believes that, where physical exclusion of livestock is impractical, there are situations where limited grazing can continue within allotments containing occupied Yosemite toad habitat. In these cases, active monitoring of hydrological conditions and Yosemite toad populations will be an important part of allotment and meadow management plans. We stress the importance of

[77] SNFPA FEIS, Volume 3, Chapter 3, Part 4.4, Pg. 221.

continuing current survey efforts and the need to complete the conservation assessment for this species. Management direction should allow for this information to be integrated as necessary and without delay. Ultimately, a conservation strategy for the Yosemite toad should be developed to inform future forest plan revisions.

Great Gray Owl

The great gray owl is the largest owl in North America. Isolated populations are known to occur in the contiguous United States, generally west of the Rocky Mountains. The center of population abundance in California is in the Sierra Nevada, specifically Yosemite Park. Scattered pairs occur on the Stanislaus, Sierra, Inyo, and Humboldt-Toiyabe National Forests. Great gray owls nest in large diameter snags with broken tops, or large stick nests constructed by raptors or ravens located along the edges of meadows used for foraging.

Key habitat requirements for great gray owls include mid- to late-successional conifer forests with large broken-top snags for nesting. Nest sites are found in close proximity (< 300 yards) to montane meadows or grassy areas at elevations from 2,000' to 8,000'. The associated meadow should be at least 25 acres in size and offer residual cover of 5-10 inches at the end of summer to provide adequate cover for primary prey species.

The great gray owl is a Forest Service Sensitive Species and was listed as Endangered by the State of California in 1980. A minimum population estimate for California is 100 individuals, based on 1996 data. It is estimated that up to 300 birds may have inhabited the State in earlier times.[78]

Management direction developed for the great gray owl in relation to grazing, is limited to one sentence (ROD, Pg. A-38):

> *In meadow areas of great gray owl PACs, maintain herbaceous meadow vegetation at least 12 inches in height and covering at least 90 percent of the meadow.*

Direction for establishing PACs is as follows:

> *Establish and maintain a protected activity center (PAC) that includes the forested area and adjacent meadow around all known great gray owl nest stands. Delineate at least 50 acres of the highest-quality nesting habitat (CWHR types 6, 5D, and 5M) available in the forested area surrounding the nest. Also include the meadow or meadow complex that supports the prey base for nesting owls.*

Impact of ROD Standards and Guidelines on Grazing – Great gray owl nest sites have been reported for the Stanislaus (18), Sierra (8), and Sequoia (3) National Forests. The Stanislaus also has 18 designated PACs. Three PACs on the Stanislaus overlap with active grazing allotments. Of these, one meadow within an allotment is integral to the overall allotment management plan. The vegetative height standard of 12 inches is unattainable for this meadow.

Effects of Grazing on Great Gray Owls –Grazing is assumed to effect great gray owls indirectly by reducing vegetative cover for prey species (voles and gophers) and reducing their abundance within grazed areas. The FEIS states "it is unclear how grazing in meadows may affect small mammal populations and foraging habitat quality for great gray owls".[79] The stated desired condition for great gray owl PACs is for meadow vegetation to "…. support a sufficiently large meadow vole population to provide a food source for great gray owls through the reproductive period.".[80] However, no rationale is provided for the 12-inch vegetation standard adopted in the ROD. After consulting with former SNFPA interdisciplinary team members, the Team traced the source of the 12-inch standard to a master's thesis completed in 1995 (Greene 1995).

[78] Information in this section was compiled from a handout prepared by John C. Robinson, USFS Avian Biologist, distributed during the Team's site visit to the Stanislaus National Forest, June 13, 2002.
[79] SNFPA FEIS, Volume 3, Chapter 3, Part 4.2, Pg. 41.
[80] SNFPA ROD, Pg. 9.

The Team has found the impact from the existing direction to be limited in scope. However, adherence to a standard that is biologically unattainable provides no additional benefit to the owl, while it seriously impacts a ranching operation. The Team believes that any region-wide standard must have widespread applicability. Given the limited distribution and numbers of great gray owl PACs throughout the bioregion, protections for the species could more easily and effectively be developed at the forest level. We understand the Stanislaus National Forest had developed management direction for the great gray owl. This may serve as a starting point for developing site-specific guidelines for individual PACs.

Standards and Guidelines for Meadows (Riparian Conservation Objectives (RCOs) #2 and #5)

The ROD provides the following direction to limit disturbance to meadow-associated streambanks and natural lake and pond shorelines:

> *Prevent disturbance to meadow-associated streambanks and natural lake and pond shorelines caused by resource activities (for example, livestock, off-highway vehicles, and dispersed recreation) from exceeding 20 percent of stream reach or 20 percent of natural lake and pond shorelines.*[81]

The FEIS identifies a number of effects to streams and riparian areas that can be caused by grazing. Some of these include: erosion and streambank collapse caused by trampling and chiseling of streambanks, erosion and sediment production caused by soil compaction, loss of habitat and cover associated with streambank vegetation, and changes in stream channel morphology and water temperature. The associated effects to fish species are describe in the FEIS.[82] Other alternatives in the FEIS proposed a streambank disturbance standard of 5 percent and 10 percent. The rationale for applying any of the percentages was not stated in the FEIS, although it may reside in one of the many forest plans which contained this standard prior to the SNFPA.

The ROD also sets regional utilization standards for season-long grazing as follows:

> *For meadows in early seral status: limit livestock utilization of grass and grass-like plants to 30 percent (or minimum 6-inch stubble height).*
>
> *For meadows in late seral status: limit livestock utilization of grass and grass-like plants to 40 percent (or minimum 4-inch stubble height).*[83]

The stated purpose for the utilization standards is to "reduce erosion of meadows and streambanks through the growth of stabilizing vegetation, and to improve aquatic habitats by increasing the number and size of woody shrubs along streams".[84] Stubble height guidelines were added to Modified Alternative 8 to "ensure habitat for meadow dwelling species is maintained."

Early in the Review, the Team heard concerns about the above standards and guidelines for meadows.[85] Issues with the new utilization standards were raised by permittees with allotments managed under direction in the R5 FSH 2209.21 Range Analysis Handbook, January 1969. This earlier direction set utilization standards on a sliding scale from 25-75 percent, based meadow condition.

Upon review, the Team found that only two of the eleven forests covered by the SNFPA were still using the standards and guidelines from the 1969 handbook (Table 5). Most of the other forests, through their forest plans, were following more stringent utilization levels. Many had adopted

[81] SNFPA ROD, Pg. A-55.
[82] SNFPA FEIS, Volume 3, Chapter 3, Part 4.3, Pgs. 64-65.
[83] SNFPA ROD, Pg. A-58.
[84] SNFPA FEIS, Volume 2, Chapter 3, Part 3.4, Pg. 233.
[85] SNFPA ROD, Pgs. A-58 and A-59.

either a 3-6 inch stubble height or 30-40 percent utilization level, depending on meadow condition.

In addition there are a number of studies including several conducted in the Sierra Nevada that support a more restricted utilization standard. Studies conducted by Clary and Webster at the Intermountain Research Station supported a 4 to 6-inch stubble height (Clary and Webster, 1989); a study by Myers (1989) in Montana found rapidly improving riparian areas with a 5-inch stubble height; and research by Ratliff[86] (1985) in the Southern Sierra Nevada that supported a 35-45 percent utilization standard for key forage species.

The Team has found that the utilization standards in the ROD generally reflect management practices prior to the SNFPA and are supported by several research findings. However, we believe there are situations where trend and condition monitoring indicates another standard is reasonable and responsible. Under the existing direction, a forest plan amendment is required to adjust standards, as necessary to better reflect site-specific conditions. We believe a simpler mechanism should be provided to change to alternative proven techniques for meeting the desired condition when they are founded on a solid information base.

Regarding streambank disturbance standards, the Team found all but three forests already had a 20-percent streambank disturbance standard in their forest plans. We believe the issues with this standard lie primarily with its implementation rather that the standard, itself. For example, there are still concerns about the techniques to use to effectively monitor and enforce this standard. There are currently five protocols for measuring streambank disturbance. All of them have limitations with regard to reliability, replication, and overall accuracy. Efforts directed toward refining and consistently applying these measurement techniques would help to resolve a number of concerns.

[86] For additional background on willow browse standards, see Kovalchik and Elmore, 1991.

Table 5. Utilization Standards in Place Prior to SNFPA

Forest	Applicable Standards and Guidelines
Modoc	Utilization standards based on range condition and trend: Good, trending upward = 50% use Fair, trending upward = 45% use Poor, static = 30% use Streambank disturbance max 20%
Lassen	Riparian areas = 4-6-inch stubble height at end of grazing season based on riparian condition Meadows in poor condition = do not exceed 20% use. Streambank vegetation = do not exceed 45% use Min 80% streambank stability rating
Plumas	Meadows of special concern = 35% use or 6-inch stubble height Other meadows = from 30-50% use (3-6-inch stubble height) based on range condition assessment
Tahoe	Poor condition = 35% use, 4-inch stubble height Fair to good conditions = 45% use, 6-inch stubble height Streambank disturbance max 20%
Eldorado	50% use, all species all conditions Streambank disturbance max 20%
LTBMU	Silent on utilization standards for grazing.
Humboldt-Toiyabe	Montane and subalpine meadows: Meadows in unsatisfactory condition = 45% use Meadows in satisfactory condition = 55% use Alpine meadows: Meadows in unsatisfactory condition = 30% use Meadows in satisfactory condition = 40% use
Inyo	Season-long grazing in moist and wet meadows: 5-45% use based on percent of desired plant species present Season-long grazing in alpine meadows: 5-30% use based on percent of desired plant species present Streambank disturbance standards from 5-20%, depending on condition of riparian system
Stanislaus	No forest-specific use standards. Reference was made to R5 Range Analysis Handbook (January 1969) which indicated a sliding scale based on soil and vegetative condition. The range was from 25% use in very poor conditions to 75% use in excellent conditions. However, the forest has been managing to more stringent standards through allotment management plans and annual operating instructions as they are renewed.
Sierra	Meadows in good/excellent condition = 45% use Meadows in fair/poor conditions = 35% use Streambank disturbance max 20%
Sequoia	The forest plan (and Settlement Agreement) dated 1990 both referenced R5 Range Analysis Handbook (January 1969) which indicated a sliding scale based on soil and vegetative condition. The range was from 25% use in very poor conditions to 75% use in excellent conditions.

Recreation Impacts

Key Findings

1. **The ROD was not written with recreation uses in mind. This makes it extremely frustrating for field personnel to tease out the direction relevant to a specific project.**
2. **The aquatic management strategy contains provisions found in other management direction (Best Management Practices (BMPs) for example). It is unnecessary to include this in the ROD as if it were another layer of requirements to be met.**
3. **Developed recreation sites have been mapped as old forest emphasis areas. In most cases, it is not appropriate to manage developed recreation sites for old forest structure and function.**
4. **The ROD suggests that landscape analyses alone, will trigger new requirements, relocation or closure of existing recreation activities. This was not the intent.**
5. **While letters of clarification do help in clearing up some confusion, it is extremely inefficient for field personnel to wade through layers of corrections and interpretations. Direction to the field must be clear and unambiguous.**

Background

The ROD embodies new standards and guidelines to conserve old forest ecosystems and their associated wildlife species and protect aquatic/riparian ecosystems. The standards and guidelines were primarily designed to control fuel reduction and vegetation management activities, however, selected parts of this direction apply to all activities, including the full scope of recreation uses. Depending on how these parts of the ROD are interpreted by the field, the associated impacts to recreation users, special use permittees, ski areas and resorts and recreation residence owners can be significant.

The Team sponsored two field meetings to learn more about how the standards and guidelines in the ROD were being interpreted at the field level and what effect this was having on recreation service providers and general recreation activity. On May 15, 2002, the Team visited Alpine Meadows ski area on the Tahoe National Forest and facilitated a discussion of the relationship between the ROD and the operation, maintenance, and development of ski resorts operating under permit to the Forest Service. On July 11, 2002 the Team traveled to Huntington Lake on the Sierra National Forest to discuss how the ROD pertains to the management of recreation residences, resorts under special use permit, and other developed recreation sites. As with other field trips, representatives from other government agencies and key interest groups participated and meeting summaries were posted on the Forest Service website.

At this point, concerns were fairly general and speculative in nature. The Team was hard-pressed to find examples of actual projects that had been prohibited or impeded by the decision. The underlying theme of these communications was fear of the unknown. It was simply not clear to the public or to the field personnel charged with implementing the decision how specific projects would or could be affected. Most were in agreement that the ROD required more analysis of individual projects before decisions could be made. However, we found a range of responses as to what level of analysis was appropriate for what type of decision, how long it would take to complete, and what criteria would be used to approve/disapprove or modify a

proposed project. This prolonged state of uncertainty had generated a fair amount of anxiety for people with substantial financial and emotional investment in their personal use of public lands.

As the Team learned more about the relationship between the ROD and recreation, we discovered that concerns boiled down to four fundamental issues. First, there was considerable confusion among field personnel, permittees, and the general public about how the ROD applied to any given recreation development or activity. Second, people were concerned about the stringent guidelines for tree removal for fuel treatments and feared the Forest Service would impose these requirements on recreation-related projects. Third, the Team heard concerns about "limited operating periods" for sensitive species and how they might limit options for operating, maintaining and developing recreation facilities. Finally, owners of recreation-related business and recreation residences noted the long list of requirements for managing riparian areas and were concerned that it would lead to significant changes to existing uses and infrastructure. The following sections provide more detail on these topics and other significant issues that surfaced during the review.

New Information and Understanding Gained from Review

How the ROD Applies to Recreation

The Team found that the standards and guidelines pertaining to recreation activities are scattered throughout the ROD and inconsistently worded. In several places, the direction for recreation is embedded in a larger paragraph or section pertaining to species protection. In other places, it appears as a single sentence at the end of a full discussion of vegetative treatment guidelines. Still other times, it appears woven throughout several pages of direction, as in the aquatic management strategy. It is our observation that the complexity of this broad direction has caused confusion on the part of permit administrators and other field-level readers who have limited time to sort through management direction primarily written for fuels projects to tease out the relevant standards and guidelines and interpret them for even the simplest of recreation projects.

References are made to evaluate recreation uses, projects and activities during landscape analysis, during project-level analysis, during site-specific Riparian Conservation Objectives analysis, during environmental analysis and when a permit is reissued or reviewed. The terms "existing use", "existing activity", "continuing recreation use", "new project", "new decision", "proposed project", "proposed activities", and "resource activities" are used throughout the ROD—sometimes interchangeably—to describe recreation. This is problematic because there are important nuances associated with each phrase.

Even after working on this subject for several months, the Team still had difficulty finding and explaining how a particular standard and guideline was supposed to apply to a project in the field. Given this level of confusion, our first step was to consolidate all relevant direction about recreation in the ROD so we could begin to evaluate the actual effects of implementation. Note that the standards and guidelines related to grazing, the willow flycatcher, and Yosemite toad are likely to effect recreational stock use (see "Impacts to Grazing", Pg. 60).

Mapping errors contribute to the confusion. For example, developed recreation sites have been mapped as old forest emphasis areas. In most cases, it is not appropriate to manage developed recreation sites for old forest structure and function. We recommend that the maps be redrawn to explicitly exclude developed recreation sites from old forest emphasis areas. A number of other steps can be taken to reduce confusion and increase program efficiency at the field level. These are described in more detail in the following sections.

Tree Removal in Old Forest Emphasis Areas

As discussed in earlier sections of this report, the ROD adopted a complicated suite of standards and guidelines for fuels treatments. Of concern here, is the diameter limits imposed on tree removal, which vary depending on land allocations. Forest-wide, the general diameter limits are 30-inches dbh for westside forest types and 24-inches dbh for eastside forest types. Old forest emphasis areas, which cover roughly 40 percent of the landbase, have a more restrictive diameter limit 12-inches dbh. In addition, old forest emphasis areas have a number of canopy closure requirements that must be met before a diameter-qualifying tree can be removed. Other more restrictive guidelines for fuels treatments apply to areas managed expressly for sensitive species.[87] There are nuances and exceptions to the basic direction across all land allocations.

The Team heard many concerns about the tree removal restrictions in old forest emphasis areas. Upon review, we found that the only direction included for this land allocation pertains to fuels treatments. In fact, the only standards and guidelines for tree removal that may apply to recreation activity are those included under forest-wide direction. At first read, we questioned whether even these guidelines applied, because they are prefaced with the statement "when implementing vegetation and fuels treatments…" The phrase "vegetation treatments" is not put in context or otherwise linked to recreation. On the following page, however, an exception to these "vegetation management standards and guidelines" is provided for the "incidental removal of vegetation" under certain circumstances. Several categories of recreation-related activities are listed. By way of the exception, then, we were able to determine that the guidelines for "vegetation treatments" did apply to trees cut for recreation and maintenance.

Although the list of exceptions is intended to be illustrative, the general theme is that deviation from the diameter limits for tree removal will only be made for maintaining existing recreational developments. Moreover, the definition of "incidental removal" is not defined. The ambiguity associated with the exception was a matter of some concern for ski areas and resort owners, who operate large facilities which may require significant retooling, upgrading and expansion of operations to remain competitive.

The Regional Forester issued a letter on June 24, 2002 to clarify this issue. The letter notes that the exception language was intended to provide for the:

> "operation, maintenance, and development of existing permitted recreation services and resorts and other existing recreation developments, trails, and roads."

The letter further explains that:

> "vegetation removal is considered "incidental" when it occurs to facilitate recreational activity and the maintenance, operation, and development of the supporting infrastructure and recreational uses. The scope of the removal in terms of acreage and volume of vegetation to be removed is likely to vary considerably from project to project. The key point is that vegetation is being removed "incidental" to the primary purpose of providing or enhancing a recreation opportunity."

Upon review, the Team found no analysis of the benefits (or costs) of applying the diameter limits for tree removal to recreation-related projects. We believe that the standards and guidelines for tree removal should be revised to clearly apply to specific categories of vegetation management only. The list should include fuels treatments, salvage, treating insect and disease, etc. It is far easier to state where direction applies than to comprehensively state where it does not. In this case, the list of stated exceptions for recreation covers all existing uses and carries over into resort expansion within previously approved master development plans. Our judgment is that the increment of uses that are not covered within this exemption will be addressed in other environmental analyses that consider the full range of environmental effects. Significant new developments are relatively rare, and in any case require full documentation and evaluation,

[87] SNFPA ROD, Pgs. A-35, A-37, and A-39.

usually in the form of an environmental impact statement. We question the benefit of retaining a strict standard for the diameter of trees removed for recreation projects, especially in light of the considerable confusion and concern it has created.

Limited Operating Periods for Sensitive Species

The SNFPA directs Forests to set up and maintain special management areas to provide for the habitat needs of sensitive species. The resulting PACs for owls and goshawks and den site buffers for forest carnivores are subject to special management direction that generally supercedes direction for other land allocations. The total land area included in these special habitat areas is likely to increase over time. Although 1,304 spotted owl PACs have already been delineated, as new nests and den sites are discovered, the number of special management areas will expand. The unknown rate and location of future discoveries is a concern of those who may be affected by more restrictive management in these areas.

With regard to recreation, most concerns center around the Limited Operating Periods (LOPs) that apply to these areas managed for sensitive species. Limited operating periods are designed to protect breeding adults and offspring from human-caused disturbances. Table 6 summarizes the direction for LOPs from several sections of the ROD.

Table 6. Management Direction Pertaining to Recreation in Special Habitat Areas

	Direction in SNFPA for:	
Habitat Area	**Existing Uses within Area**	**New Development or New Activity within Area**
California Spotted Owl PACs • PACs encompass best available 300 acres of habitat surrounding nest site. • LOPs prohibit activities within ¼ mile of the nest site from March 1-August 31. Northern Goshawk PACs • PACs encompass best available 200 acres of habitat surrounding nest site. • LOPs prohibit activities within ¼ mile of the nest site from February 15-September 15. • If nest site is unknown, survey to determine location of nest stand, or apply LOP to a 1/4 – mile area surrounding the PAC.	Analyses of existing uses will occur over time---for example, as part of a landscape analysis or as a prerequisite to permit renewal. When an analysis is done, does it show that the activity results in nest disturbance? • If no, proceed. • If yes, mitigate impacts.	Evaluate proposals for new recreational developments or activities for their potential to disturb nest sites. If there is potential for nest site disturbance: • LOP applies unless: 1) surveys confirm owls/goshawks are not nesting or 2) a biological evaluation documents that such projects are unlikely to result in breeding disturbance. • LOP may be waived for individual projects of limited scope and duration.
Great Gray Owl PACs • PACs include at least 50 acres of the highest quality nesting habitat available in the forested area surrounding the nest and the adjacent meadow. • LOPs prohibit activities within ¼ mile of active nest stands during the nesting period (typically March 1 to August	Analyses of existing uses will occur over time---for example, as part of a landscape analysis or as a prerequisite to permit renewal. When an analysis is done, does it show that the activity results in nest disturbance? • If no, proceed. • If yes, mitigate impacts.	Evaluate proposals for new recreational developments or activities for their potential to disturb nest site. If there is potential for nest site disturbance: • LOP applies. • LOP may be waived for individual projects of limited scope and duration.

	Direction in SNFPA for:	
Habitat Area	**Existing Uses within Area**	**New Development or New Activity within Area**
15).		
Forest Carnivore Den Sites • Fisher den site buffers consist of 700 acres of the highest quality habitat surrounding verified fisher birthing and kit rearing dens. • LOPs prohibit activities within den site buffers from March 1-June 30 (fisher) and from May 1 –July 31 (marten). • Marten den site buffers consist of 100 acres of the highest quality habitat around the den site.	The appropriateness of adopting LOPs for existing uses is to be evaluated during environmental analyses of those uses.	• LOP applies to all new projects. • LOP may be waived for individual projects of limited scope and duration when a biological evaluation documents that such projects are unlikely to result in breeding disturbance.

Some limited operating periods coincide with periods of peak recreation activity in the Sierra Nevada. Some permittees reported anecdotal information that suggests that marten will den in existing lodges and recreation cabins. If this does happen, they were concerned that an LOP would significantly impact their operations. Additionally, ski area operators and snowmobile enthusiasts in some areas have reported numerous marten sightings. The fear is that, with time, more den sites will be discovered and the associated 100-acre buffers and LOPs will impact early spring snow-based operations and summer construction projects.

The liberal reference to "uses" throughout the ROD causes considerable confusion. One example is found in the guidance for fisher and marten den sites, where the appropriateness of LOPs is to be evaluated for "existing uses" during environmental analysis.[88] Technically, the ROD does not specify which of many kinds of existing "uses" are to be evaluated. We assume it includes recreation Moreover, no criteria is provided to determine when an LOP will be considered "appropriate". The Team believes that standards and guidelines must provide clearer direction to minimize confusion and ensure consistency in application.

The Team found limited rationale in the FEIS for the need to apply LOPs to recreation activity. In fact, there was little discussion of the specific effects of recreation on any of the species of concern. A general statement is made that:

> "Recreational activities can alter wildlife behavior, cause wildlife displacement from preferred habitat, and decrease reproductive success and individual vigor."[89]

With regard to marten the FEIS states:

> "Effects of recreation on martens have not been studied, and it is unclear how results from studies on other species might apply to forest carnivores."[90]

This general statement is repeated for the fisher. For the California spotted owl, the FEIS states:

> "Management as well as recreational activities has the potential to disrupt spotted owl nesting efforts and reproductive success."[91]

[88] SNFPA ROD, Pg. A-39.
[89] SNFPA FEIS, Volume 3, Chapter 3, Part 4.4, Pg. 27.
[90] SNFPA FEIS, Volume 3, Chapter 3, Part 4.4, Pg. 27.
[91] SNFPA FEIS, Volume 3, Chapter 3, Part 4.4, Pg. 81

Finally, conflicts with Northern goshawks in the Lake Tahoe basin are described as an example of a negative human interaction:

> "Northern goshawks are aggressive nest defenders that will attack humans threat venture into active nest stands. In some case humans have responded by returning and shooting the birds or harassing the birds through repeated visits to the nest site."[92]

We believe that the LOPs in the ROD should apply only to vegetation management projects, as defined as fuels reduction, forest health, salvage, and gap regeneration. This is consistent with the approach used in the interim guidelines for the California spotted owl from which the existing direction evolved.[93] The interim guidelines did not address non-timber projects for two reasons. First, other projects such as trail and campground construction, special uses, and recreation site development are relatively small and effects to sensitive species can often be mitigated at the project level. Second, the Forest Service already has procedures in place, following the biological evaluation process, to analyze effects to species of concern, propose and analyze mitigation measures, and make viability determinations. The ROD provides additional assurance that this will occur with direction to evaluate proposals for new projects for their potential to disturb nest and den sites. This language should be retained.

Finally, we note that an important clause appeared to have been inadvertently omitted from the standards and guidelines for marten den site buffers.[94] This clause allowed LOPs to be waived for projects of limited scope and duration if supported by a biological evaluation. The provision was included for fisher but not for the more common marten species. The above-noted letter of clarification (dated June 24, 2002) corrected this omission. If the changes proposed above are adopted, this language should be included to allow for smaller vegetation management projects to be implemented, as appropriate.

Managing Recreation Use in Riparian Areas

The aquatic management strategy in the ROD includes six riparian conservation objectives that apply to land immediately adjacent to stream courses and other hydrological features. These linear land allocations are referred to as riparian conservation areas (RCAs). There are 43 separate standards and guidelines that pertain to the management of aquatic resources. Intermingled with this direction, is reference to its applicability to a number of land and recreation uses.

The aquatic management strategy contains provisions found in other management direction (BMPs for example). It is unnecessary to include this in the ROD as if it were another layer of requirements to be met. All RCOs and their associated standards and guidelines are to be analyzed for projects in RCAs. Some of these requirements, such as best management practices and State mandates for "water quality limited" water bodies, were in place long before the ROD was signed. Other standards, such as limiting soil compaction to five percent of the RCA, may have been required by a few forests, but were not widespread practice across the Sierra Nevada.

In its entirety, the management direction for riparian areas is detailed and extensive. This section alone accounts for eight pages of the ROD. It is challenging for the reader (both general public and field personnel) to synthesize the overall direction and envision the end result for a specific project. As a result, there are varying opinions and widespread speculation about what this part of the ROD actually requires.

Standards and guidelines are organized by RCO and not by activity. This is an impractical arrangement for field personnel and an impediment to the timely processing of decision documents for simple recreation projects. District staff are spending excessive time and energy

[92] SNFPA FEIS, Volume 3, Chapter 3, Part 4.4, Pg. 121
[93] USDA Forest Service, Pacific Southwest Region, California Spotted Owl Sierran Province Interim Guidelines Environmental Assessment, January 1993, Pgs. I-3 and II-5.
[94] SNFPA ROD, Pg. A-39.

figuring out which standards apply to recreation, how rigorously to apply them and how to document compliance. The default is to systematically go through each guideline and complete every analytical requirement for every project. For simple projects, this could well be creating paperwork solely for the sake of process.

For example, during the early weeks of the review, a great deal of concern was expressed about the soil compaction guidelines for RCAs[95] and how they should be applied to areas with heavy recreation use. A thorough review of the ROD revealed that these guidelines were never intended to apply to existing recreation sites. This clarification was also included in the above-referenced letter of June 24, 2002.

The Team believes that, in general, the aquatic management strategy embodies a great deal of flexibility. It sets forth clear objectives and gives management the latitude to determine how best to meet them. A focus on desired conditions keeps the direction from being too prescriptive and provides for unique solutions to be developed at the project level. If the direction is followed as intended and the analyses completed within a reasonable timeframe, there are likely to be only minor effects to recreation. However, for permittees, this flexibility translates to uncertainty about what the future holds.

Until project-specific analyses are completed, there is no way to know what changes will be required in order for an existing use to be deemed "consistent" with the RCOs. The standards and guidelines suggest activities may be relocated or removed and this spectre hangs over special use permit holders, recreation residence owners and other service providers dependent upon a specific location within the national forest.

The Team believes that the widespread confusion and concern about the riparian conservation objectives stems more from the way they are written than from the intent of this direction. Great benefit would be derived from reviewing this section of the ROD and carefully rewriting it to remove duplication and improve implementation. At a minimum, some direction must be provided to prevent rigorous analysis that is disproportional to the scope of the decision it supports. A quick screening process should preface the riparian conservation objectives to streamline consistency checks for projects with little or no impact.

The Role of Landscape Analysis

The ROD suggests that landscape analyses, alone, will trigger new requirements, relocation or closure of existing recreation activities. This was not the intent.

The ROD introduces the concept of using a "landscape analysis" to review existing uses and activities for their consistency with management direction for riparian areas. The development and practical application of landscape analyses is a new concept for the Region. The ROD provides a minimal description of what is needed to complete a landscape analysis and few forests are embarking on a rigorous schedule to complete them.

When there is no landscape analysis in place to refer to, the first project in the area bears the burden of the collection and analysis of data sufficient to complete the broader look required by the ROD. While this may be appropriate for a large-scale fuels reduction project, it is a roadblock for many small recreation-related decisions. Conceptually, the Team supports the idea of using some form of landscape analysis to frame decisions. However, the chosen method should be should be brief, efficient and easy to implement.

The Team believes there is a critical need for direction on the purpose and priority for landscape analysis. Effort needs to be directed toward providing a clear description of what a landscape analysis is, how it should be developed and how is should be used. At a minimum, two points need to come to the forefront: 1) decisions do not require a landscape analysis to be completed, and 2) landscape analyses are not decision documents. We understand that the Implementation

[95] SNFPA ROD, Pg. A-53.

Team is working on this issue and urge that this work be reviewed for possible incorporation into new decisions for the SNFPA.

Community Impacts

Key Findings

1. **The SNFPA eliminates the objective of providing commercial forest products from national forests. We could find no documentation of the rationale for this decision.**
2. **Including timber and biomass production as an objective does not necessarily create adverse environmental effects.**
3. **Including the provision of commercial forest products as a secondary, or possibly tertiary, objective would significantly enhance the forest's ability to achieve ecosystem restoration goals.**
4. **In the past, commercial forest products from national forests have contributed to an industrial forest products infrastructure.**
5. **This infrastructure provides an important tool to achieve ecosystem restoration objectives on NF land in the Sierra.**
6. **The extensive program of ecological restoration envisioned under Mod 8 and the National Fire Plan cannot be accomplished with only appropriated funds, it also requires local and regional public /private cooperative economic opportunities.**
7. **Many cases exist where removing some medium sized trees beyond those strictly required to meet minimum fuels objectives would offset costs.**

Background

The Review Team was tasked by the Regional Forester to review the impacts on communities of the Sierra Nevada Forest Plan Amendment decision. These impacts are primarily economic in that many rural communities are dependant in large part on the output of goods and services from the National Forests in the Sierra. The economic contribution includes forest product outputs such as timber, and biomass (burned to produce energy). In addition, the broad arena of outdoor recreation provides entrepreneurial opportunity, and supports the local service sector. Grazing permits play an important role in maintaining viable ranching operations that support local economies and rural lifestyles and land uses as well.

During the review, it became apparent to the Team that resolution of several other key focus area issues (fuels, recreation, grazing) would possibly reduce adverse economic impacts to communities. The Team reviewed the administrative record of the SNFPA and the SNFPA appeal record. The Team also listened to local community perceptions to gain a first hand feel for local impacts.

The Regional Council of Rural Counties (RCRC) worked with the Review Team to organize and schedule three public workshops/meetings to explore the relationship of the National Forests to the small rural communities scattered through out the mountain range. These events helped the Team develop an understanding of the SNFPA as seen from the perspective of people living and working in different areas of the Sierra Nevada. Federal, state, and local elected officials also participated. The events were located in Quincy, Sonora, and Nevada City.

The Team was impressed with the passion and commitment expressed by many people at these events. A common theme that seemed evident was a core value of conservation and use of this unique mountain range. While different people seemed to hold different opinions about

appropriate levels of use, all voiced a common desire to ensure that the resources of the national forests are conserved to provide continuing benefit to current and future generations.

Another aspect that became apparent to the Team is that these rural communities are an integral part of a larger system that provides benefits of renewable natural resources to people, while also maintaining and protecting the land that produces them. Maintaining all of the parts of this system is vital to ensuring balance and integrity of the larger system and its other components, including the national forests.

Meetings, Workshops and Presentations

The Review included several town-hall style meetings, workshops, presentations and field trips. The following are some highlights.

Quincy Field Trip and Town Hall (April 29, 2002). The RCRC sponsored a full day event that included a field trip and town hall meeting. Both were intended to provide a local perspective on the impacts to northern rural communities as a result of the SNFPA, and on the effects of implementing the HFQLG Pilot Project. The morning field trip included sites where fuels treatments under CASPO prescription (30" diameter limits) were compared with fuels treatments under the Framework and discussions ensued as to the ability to meet the fuels treatment objectives under the SNFPA. The afternoon and evening provided an opportunity for 200+ local residents, local officials, federal and state congressional staff, forest science professionals, and conservation leaders to present issues relating to implementation of the SNFPA to the Regional Forester and Review Team. Three panels, a roundtable, and an open forum provided valuable learning opportunities:

The panels provided knowledgeable local perspectives on the relationship between the SNFPA and the HFQLG, local social and economic impacts, interpretation of spotted owl data, and fire history and behavior.

Community roundtable discussions on the focus areas of the Review provided an excellent opportunity for clarification and validation of the specific issues around community impacts that the Team should further investigate.

An Open Public Forum allowed members of the public to comment directly to the Regional Forester and Team about impacts of the SNFPA. Personal perspectives from members of the audience were provided. The predominant theme voiced from local individuals and families dependent on the forest products industry, was one of moderate to severe impacts on family lifestyles and finances.

The Natural Resources Summit 2002 was held in Sonora (August 16, 2002). The public event was hosted by Dave Cogdill, California Assemblyman 25th District, who provided a welcome and opening remarks and was sponsored by the Tuolumne County Alliance for Resources and Environment and others. The theme for the summit was Fire in the Sierra Nevada Ecosystem and its interaction with local communities. Highlights of formal presentations included Dr. Thomas A. Bonnicksen's presentation on "Fire Ecology in the Sierra Nevada: Fire as a Landscape Process", the keynote address by Congressman George Radanovich, and presentations on community perspectives from a wide cross-section of values and interests. After a short update on the progress of the Sierra Nevada Framework Review, the afternoon session was devoted to personal testimonials from individuals and groups affected by the Sierra Nevada Forest Plan Amendment. The Review Team heard directly from people who live and work in the Sierra Nevada every day and care very much for its well-being and rural way of life. Dr. Bonnicksen's presentation is available at his website www.oldforest.com/.

The Regional Council of Rural Counties invited the Review Team to a socioeconomic presentation in Sacramento, CA (December 12, 2002). The RCRC's membership includes county supervisors from most of the counties in which the Sierra Nevada national forests are located. John Hofmann, Director of Natural Resources, gave a powerful presentation on the significance

of socioeconomic impacts of the Sierra Nevada Forest Plan Amendment (SNFPA) decision on local counties and communities within the Sierra Nevada. Hofmann's main conclusion was that there was "no significant impact ecologically between [SNFPA] alternatives" but there were "significant impacts economically between the [SNFPA] alternatives". RCRC Board members, all elected County Supervisors, gave additional personal testimonials of the adverse impact of the SNFPA on their local constituents. Minutes of the meeting are posted on RCRC's website, http://www.rcrcnet.org/rcrc/minutes/2002%20minutes/Mints1202.pdf

Socio-Economic Workshop in Nevada City (December 13, 2002). The Forest Service sponsored this public workshop on the socio-economic considerations for the Sierra Nevada national forests. Approximately 150 people attended. The workshop provided new information from professionals who have studied the social and economic conditions in California and the Sierra Nevada. Local perspectives were also offered on the relationship between national forest management and socioeconomic dynamics with local governments, tribes and communities. The meeting notes for the workshop are available on the Sierra Nevada Framework web site www.fs.fed.us/r5/snfpa. Several of the presentations are referenced in the following discussions.

Of particular interest to workshop participants in Nevada City was Dr. Jonathan Kusel's presentation on the Assessment of the "Northwest Economic Adjustment Initiative" by Forest Community Research, December 2002. The report is available on the world wide web at www.fcresearch.org/neai. Economic initiatives attempted in the Pacific Northwest as part of the Northwest Forest Plan have relevance for the Sierra Nevada region. A major success was getting agencies to work together. They came together at the state, federal and local level. An additional success was building the social, human, and cultural capacity. These are key in reaching communities and improving well being.

The SNFPA implements new land allocations and standards and guidelines across the eleven Sierra Nevada national forests. Its intent (as with all the alternatives considered) is to protect old forest ecosystems, aquatic, riparian, and meadow ecosystems, and lower Westside hardwood ecosystems, and reduce and prevent the spread of noxious weeds. In addition, the SNFPA attempts to address the reduction of forest fuels across the landscape to reduce the hazard of wildfire to human communities and wildlife habitat. Reducing the hazard of wildfire to human communities is the SNFPA objective expressly aimed at benefiting the rural communities scattered through out the Sierra.

The management theme for the existing direction (Modified Alternative 8) is focused on cautious management of sensitive wildlife species and their habitat, while reducing the threat of wildfire to human communities.[96] Active management of forest vegetation is greatly reduced from previous direction. The use of prescribed fire is favored over the use of mechanical fuels treatment. Appendix P of the FEIS shows the major tradeoffs and risks of the alternatives considered in the decision. Alternative Modified 8 is not included. However, Alternative 8 was examined as the closest to the selected alternative. A major tradeoff of the amendment is that "conserving ecosystems (is) favored over human use". Additionally, a major risk of implementing the SNFPA is how it affects the "economic viability of some Sierra Nevada communities"; already in decline. (For Alternative 8, Appendix P., DEIS)

Historically, an important objective for national forest management has been to provide economic benefit to the nearby rural communities. Many of these communities predate the national forests and were founded with an economic link to these lands and their resources. Those economic links to national forest resources continue to this day. Communities once solely engaged in logging, ranching and mining, now also provide services for outdoor recreationists, and other forest visitors. Besides direct services provided by outfitter guides, and recreational equipment sales, communities also provide indirect services such as food, lodging, medical care, law enforcement, and search and rescue.

[96] SNFPA FEIS, Volume 1, Chapter 2, Pg. 65.

Wood Products and Biomass

In the past, the stability and economic viability of many rural Sierra Nevada communities has been substantially dependent on outputs of commercial forest products from national forests near those communities.

During the period from 1988 to 1993, the average timber offered for sale was 879 million board feet.[97] From 1994 to 2000 timber offered from the Sierra Nevada National Forests dropped to an average of 353 million board feet [98] (244 million in fiscal year 2000).[99] This 60 percent decrease was a result of interim guidelines restricting timber harvest to protect California spotted owl habitat implemented in 1993. The SNFPA proposes an additional 70 percent reduction by 2010 to 108 million board feet.[100]

Current annual growth on the 11 national forests in the Sierra is estimated at almost two billion board feet, while mortality is around 450 million board feet each year.[101]

The availability of commercial forest products from national forest lands has contributed to, and in some cases enabled, the development and retention of an industrial infrastructure (saw mills, cogeneration facilities, harvesting operations, woods workers, etc.) that provides employment, a tax base, and important economic opportunity to these communities. For example, the potential economic benefit of the average volume of timber offered annually from 1988 to 1993 (879 million board feet) is approximately $440,000,000 per year based on the current end product value.

This industrial infrastructure also provides a means to achieve ecosystem restoration objectives on the national forests. In other words, an industry that was developed to provide timber outputs to society for profit is now available to accomplish vegetative treatments (such as fuel reduction thinning) that are restorative to the forest ecosystem. As mentioned, this infrastructure is based on profitable business practices, and its continued existence is predicated on a predictable flow of projects that represent good business opportunities. Therefore, a strong partnership with local business is needed to accomplish the extensive restoration envisioned in the National Fire Plan, the Western Governor's 10 Year Implementation Plan, and the Cohesive Strategy. As a result, maintenance of this infrastructure is imperative to, and inseparable from, these federal policies.

At the Nevada City workshop, one participant reported that the Sierra Economic Development District (SEDD) has analyzed biomass availability on private land in its area and that SEDD is working with the Nevada County Fire Safe Council to ensure that a portion of every fuels treatment has a commercial component. SEDD has also been working with the ski industry to use biomass for energy and working on a demonstration project at the California Youth Authority camp on Washington Ridge for electricity generation with a small plant on site. More information is on the SEDD web page http://www.sedd.org/sedd_publications.htm

While a small portion of fuel reduction work is done by Forest Service personnel (force account), the two primary business opportunities that sustain this industrial infrastructure are timber sales and service contracts. Timber sales are contracts to remove forest vegetation where the commercial value of the vegetation removed is greater than the cost of removal. Timber sales generate revenue in addition to achieving restoration objectives. Service contracts use congressionally appropriated fund to pay contractors to treat fuels

The FEIS estimates 68,928 acres of mechanical fuel reduction treatment will occur annually for the first decade of the plan[102] for Modified Alternative 8. In the ROD, the Regional Forester

[97] SNFPA FEIS, Volume 1, Chapter 2, Pg. 199.
[98] SNFPA FEIS Volume 1, Chapter 2, Pg. 199.
[99] FY 2000 PSTAR Manager's Report
[100] SNFPA ROD, Pg. 11.
[101] Forest Resources of the U.S.,GTR RM-234
[102] SNFPA FEIS, Volume 2, Chapter 3, Part 3.5, Pg. 297.

stated that "Active and successful timber and biomass industries will be important to the success of the fuel management objectives I have identified as part of my decision."[103]

In the selected alternative, vegetation treatments are "limited to those designed for fire hazard reduction, maintenance activities, or public health and safety."[104] The current decision then, relies on the incidental contribution of forest products from fuel treatment projects to provide raw material for an "active and successful" timber and biomass industry. The decision represents an 87 percent reduction in timber volume offered from 1993 levels by the end of the first decade.

The primary concern is that mechanical treatments meet only minimum fuel reduction objectives and will not provide sufficient business opportunities to sustain the forest industry infrastructure. This concern was expressed at all of the community meetings/workshops and on several of the Team's field trips on the issue of fuels management, and was a common thread in the responses from District Rangers across the Sierra Nevada. The Team shares this concern.

Livestock Grazing

Another important and historical economic linkage between rural communities and the national forests is livestock grazing. All of the grazing occurring under permit in the Sierra Nevada is summer pasture associated with privately owned ranches or base properties. Livestock are moved onto permitted allotments annually, usually in the spring or summer when lowland feed is consumed or dries out. The animals spend the summer grazing in the high mountain meadows and uplands of the national forests.

The families of the majority of ranches (75%) with permits began ranching in the area before 1900 (Sulak and Huntsinger, 2002). In some cases, the present owners have been going into the mountains with the livestock every summer for their entire lives. At the Nevada City workshop, Sulak and Huntsinger presented results of their study that found that a strong motivation for ranchers with Forest Service permits is to pass on the tradition and lifestyle of ranching. They believe ranching should be preserved as part of the family and the tradition of the American west, a legacy to be passed from one generation to the next. The Forest Service believes that by working with ranchers to promote responsible grazing, species habitat can be improved. The Sulak and Huntsinger report may be viewed at http://www.sierranevadaalliance.org/publications/Sierra%20Nevada%20Grazing.pdf

Sulak and Huntsinger also reported that ranchers with Forest Service permits are closely linked to the community and many are worried about the accelerating commercial development of private agricultural land. Seventy-three percent of all permittees participate in land use planning efforts in their area. Conversion of nearby ranches to other uses was stated to be an important factor when considering the possibility of selling the ranch. These ranching families are an important part of many rural communities in the Sierras.

One participant at the Nevada City workshop said that the US Department of Agriculture recently completed a study on the benefits of open space provided by the private land owners and the value to the public of stewardship of private lands[105] (http://www.ers.usda.gov/publications/aer815/). He also referred the Review Team to the September 10, 2002 New York Times report that researchers at University of New Mexico, Colorado State University, and Montana State University also have published recent research on the value of ranches in providing wildlife habitat. (http://www.nytimes.com/2002/09/10/science/earth/10RANC.html?8hpib=&pagewanted=print&position=top)

[103] SNFPA ROD, Pg. 28.
[104] SNFPA FEIS, Volume 1, Chapter 2, Pg. 165.
[105] Farmland Protection: The Role of Public Preferences for Rural Amenities, ERS Agricultural Economic Report No. AER815. 74 pp, November 2002.

Agricultural Economic Report No. 815 notes that public amenities provided by a rural agricultural landscape, arising from open space and farm activity, are important to many citizens and policy makers. The report investigates the relative importance of preserving different amenities conserved by farmland protection programs. It examines farmland protection program enabling legislation in the 48 contiguous States, and implementation of these programs in five Northeastern States. (Hellersteinn, et.al, 2002)

Historically, the number of livestock permitted by the Forest Service peaked during WWI, and has generally declined ever since. Most allotments today graze fewer than the commonly accepted threshold for a viable ranching operation of 300 brood pairs. Currently grazing on national forests is around 10 percent of historic high levels. The ROD estimates yet another 20-percent reduction in grazing with a corresponding 20 percent reduction in employment and income.[106] Allotments are expected to be vacated due to standards and guidelines that "affect livestock numbers to the point of eliminating the use on some allotments."[107] In addition the FEIS states: "conservative standards would make it uneconomical for permittees to graze their allotments while waiting for an analysis to be completed."[108] Additionally, budget constraints on allotment assessments and monitoring could preclude re-issuance of grazing permits.

The primary concern the Team heard is that loss of permitted grazing operations results in not only a loss of the economic benefit, but also in the loss of part of California's heritage. These operations in many cases represent a way of life that, while once common, is rapidly disappearing. A key concern over the disappearance of these small ranching operations is the conversion of base ranch private property into commercial development.

Economic Analyses

In addition to workshops and public meetings, the Review Team had available the entire SNFPA EIS and administrative record including the section on society, culture and economy. The EIS socio-economic analysis incorporated county and community or community-cluster data whenever it was available. The Review Team was also provided copies of two reports on the economic status of Sierra Nevada counties and communities: "The Sierra Nevada Wealth Index, 1999-2000 Edition", published by The Sierra Business Council; and, "Economic Profiles of the Sierra Nevada," published by The Wilderness Society in June 1998. (Alexander, et.al, 2002) Both of these publications were available to the EIS team and are reflected in the EIS socio-economic analysis. The Review Team did not find any more recent published economic analyses specific to the Sierra Nevada.

As a follow-up to the Nevada City workshop, The Wilderness Society provided unpublished updates of the economic profiles for El Dorado, Lassen, Mariposa, Nevada, Placer, Plumas, Sierra and Tuolumne counties and an unpublished analysis focused on Inyo and Mono counties titled, "The Economic Benefits of Wildlands in the Eastern Sierra Nevada Region of California." Several presenters at the Nevada City workshop brought recent, unpublished data.

The Sierra Nevada Wealth Index noted that the Sierra Nevada has had the third fastest growing population of any California region since 1990 and is expected to surpass one million by 2020. The index described social capital in the Sierra Nevada as generally strong, noting the following strengths: high school seniors outperformed the California average on Scholastic Aptitude Test (SAT) scores, income distribution is more equal than California as a whole; housing is more affordable and violent crime levels are half of those statewide. However, the Team heard the repeated concern directly from individual citizens and elected officials that the SNFPA would reduce business and employment opportunities. In specific communities, there was a high level of concern about the social consequences that may result from the loss of better-paying jobs due to management restrictions under the SNFPA.

[106] SNFPA ROD, Pg. 28.
[107] SNFPA FEIS, Volume 2, Chapter 3, Part 5.3, Pg. 404.
[108] SNFPA FEIS, Volume 1, Pg. 36.

The Sierra Nevada Wealth Index identified both strengths and weaknesses in natural capital. Some of the strengths are the following: only 16% of the land is privately owned making future settlement patterns more predictable than statewide, helping maintain healthy natural capital; agricultural land preservation has increased slightly in the past decade, mostly in the South Central counties; acreage of grapes has increased and cattle production is steady; and Mono Lake water levels continue to rise, contributing to ecological restoration. Troubling trends in natural capital include rapid loss of farmland in the North Central counties; lack of protection from conversion for oak ecosystems, riparian areas and agricultural lands; the number of species listed as threatened or endangered is increasing and very little old forest remains; fire hazard is significant on 45% of the Sierra Nevada; air quality is declining due to both particulate matter and ozone; more than 40% of the surface water is only of intermediate quality and the clarity of Lake Tahoe continues to decline.

With regard to financial capital, The Sierra Nevada Wealth Index noted that the North Central counties are prospering. In these counties, jobs are growing faster than population, unemployment is lower than in California as a whole, and per capita income is higher than California as a whole. In the North, South Central and East counties, financial trends are more mixed. In these counties, unemployment, while declining, remains higher than the California average, per capita income is falling behind California. Region wide, tourism accounts for 15% of the total payroll and in some counties is the single most important economic activity.

The Sierra Nevada Wealth Index notes the following region wide trends that must be addressed to ensure long term prosperity:

- "Improving scholastic achievement, increasing economic diversity, growing personal incomes and declining unemployment are trends we should support and encourage;
- Continued loss of farmlands, increasing air and water pollution, declining biodiversity and rapid urban sprawl are all trends we should work swiftly to reverse;
- Growing childhood poverty, poor literacy rates and low levels of investment in communications infrastructure demonstrate that some Sierra Nevadans are being left behind; these too are trends we must reverse."

The June 1998 Economic Profiles of the Sierra Nevada noted that 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. The unpublished updates for the eight counties notes that these trends continue for all except Sierra County where the government sector provides the most jobs and has added the most new jobs in the last three decades. 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.

The Review Team also had available the September 2002 Rocky Mountain Research Station publication, "Survey results of the American public's values, objectives, beliefs, and attitudes regarding forests and grasslands: A technical document supporting the 2000 USDA Forest Service RPA [Resource Planning Act] Assessment." (RMRS-GTR-95; http://www.fs.fed.us/rm/pubs/rmrs_gtr095.html) While this document was not focused on the rural communities in the Sierra Nevada, it contains important information about public attitudes and beliefs across the nation. The authors summarized their findings as follows:

> "The public sees the promotion of ecosystem health as an important objective and role for the agency. There is strong support for protecting watersheds. The public supports multiple uses, but not all uses equally. Motorized recreation is not a high priority objective, while preserving the ability to have a "wilderness experience" is important. There is moderate support for providing resources to dependent communities. The provision of less consumptive services is more important than those that are more consumptive. There is a lack of support for subsidies for

development and leasing of public lands. Preservation of traditional uses is a somewhat important objective. Development and use of the best scientific information enjoys wide support, as does information sharing and collaboration. A national direction for the management of National Forest lands is a slightly important objective. Increasing law enforcement on National Forests and Grasslands is an important objective and an appropriate role for the agency. The public has a strong environmental protection orientation, has a moderately strong conservation/preservation orientation, and supports some development." (Shields, 2000).

New Information and Understanding Gained from Review

Commercial Forest Products as a Management Objective

An assumption of the SNFPA planning effort was that timber harvest would be applied only in support of, and constrained by, the need to find solutions to the five problem areas.[109] Modified Alternative 8 limits vegetation treatments to those designed for fire hazard reduction, maintenance activities, or for public health and safety.[110] This means that on the Sierra Nevada national forests, providing forest products to meet the needs of people is no longer an objective. This is a large and important decision that is only documented in a few areas of the FEIS, and no discussion of the rationale for this decision was found in the administrative record by the Team. With the exception of the Big Valley Sustained Yield Unit, there is no long-term sustained yield or suitable acres for programmed timber yield on approximately 11.5 million acres on the 11 national forests.

In the Chief's appeal decision it was acknowledged that the discussion of timber management issues in the FEIS was confusing and difficult to follow. The Chief found no violation of regulation, and none is alleged here.

The decision to provide outputs of commercial forest products only coincidentally, while meeting minimal fuels objectives, may be the most important and far reaching decision made in the SNFPA. This is because one of the original purposes of establishing national forests was to "furnish a continuous supply of timber for the use and necessities of citizens of the United States."[111] Removing the objective to provide timber within the concept of sustainability is a significant deviation from past policy.

Currently project planning and development is difficult because of the restricted and narrow scope of objectives a manager can consider. This puts a "burden of proof" on project planners during project analysis and documentation and when they are faced with appeals and challenges. They must prove that any removal of trees meets, but does not exceed, the objective of reducing hazardous fuels. This greatly complicates planning to the point of forcing justification on nearly a tree-by-tree basis of any vegetative removal.

Many cases exist where harvesting some trees larger than those strictly required to meet the stated stand level fuels objectives would allow the project to go forward as a timber sale. This might mean the project would generate moderate revenue or break even, instead of using a service contract. The small difference in trees removed in many instances would not result in a measurable difference in environmental effects.

Eliminating any vegetation management objective other than those adopted by the ROD, precludes projects that include even a minor objective for timber production or even other

[109] SNFPA FEIS, Volume 2, Chapter 3, Part 5.1, Pg. 337.
[110] SNFPA FEIS, Volume 1, Chapter 2, Pg. 165.
[111] Organic Administration Act, 16 USC 475

restoration objectives such as improving forest health, or promoting regeneration of shade intolerant species.

Although the Team did no rigorous analysis, we believe that allowing the inclusion of timber production as a secondary or tertiary objective does not in itself necessarily create adverse environmental effects. It is the way that an objective is approached during project design that influences environmental effect. For example, a project with a purely fuels objective that eliminates 100 percent of surface fuel, and spaces trees widely to eliminate crown fire risk, would likely have a larger adverse impact on the environment than a light thinning from below of a young stand with the sole objective of increasing growth and yield of timber.

Some people feel that if there is an objective for providing commercial forest products from national forest lands, that local managers will be forced to provide commodity outputs at the expense of ecosystem health and integrity. The Team believes that current law, policy, and agency culture provide the necessary framework to responsibly manage national forests to produce an ecologically sustainable flow of wood products. Managers must be held accountable for doing a quality job of land management within existing law, policy, and direction.

Maintaining Forest Industry Infrastructure

The ROD envisions approximately 100,000 acres of initial fuel treatment annually across the range. This represents only about one percent of the national forest lands annually. Best estimates are that at that rate we might complete initial treatments on the landscape level within 20 to 30 years. Without a fairly well developed forest industries infrastructure, addressing the problem of fire hazard reduction across the Sierras at a pace that would make a difference would be impossible. Loss of significant components of that infrastructure could mean that significant areas of the Sierra Nevada would receive only minimal hazard reduction.

As discussed above, the existing direction focuses solely on fuels reduction, maintenance activities, and actions to protect human health and safety. This direction results in very large projected reductions in the level of forest product outputs (see above) from those experienced under the interim spotted owl guidelines in place prior to the SNFPA.

Current standards and guidelines result in most mechanical treatment projects devolving into service contracts, or force account work, at high costs per acre. This was a consistent theme in the responses from District Rangers across the Sierra (see Focus Area Summaries at http://www.fs.fed.us/r5/snfpa/library/archives/review/focus-areas/indes.html). The heavy dependence on service contracts and force account projects will exhaust annual appropriated funds very quickly. The Team believes that under existing direction, using timber sale contracts as a tool to leverage appropriated funds and achieve higher levels of accomplishment will not be possible. It will be confined to fairly isolated instances where standards and guidelines allow the removal of commercial size trees, **AND** removing them is necessary to meet fuel reduction objectives. Some hazard tree timber sales would also likely occur.

The existing standards and guidelines result in high costs for fuel reduction projects. This was borne out during many discussions on field trips, and about two thirds of the District Rangers supported this finding. The standards and guidelines also preclude the use of the timber sale contract as a tool to accomplish restoration objectives in the majority of cases. Increasing project costs, associated with, at best, stable budgets means reduced programs and fewer projects that represent business opportunities for local forest product businesses.

In the last two years, five Sierra mills have closed; Collins Pine Co. in Chester, Big Valley Lumber in Beiber, Wisconsin–California in Anderson, Shasta Paper Co in Anderson and Sierra Pacific Industries in Loyalton, laying off 830 employees. Seven additional mills closed during preparation of the SNFPA FEIS eliminating jobs for 400 employees. Since 1992, 27 mills that processed Sierra timber have closed down. In 1993 the CASPO EA listed 25 sawmill communities (Section IV Pg. 48). Today, 20 of those communities have closed sawmills. Only 10 of the 25 sawmill

communities still have at least one mill operating. Today, 15 mills conduct business[112] in the Sierra Nevada. Many have retooled to efficiently process the small wood that makes up the majority of material removed on a thinning project aimed at reducing hazardous fuels. At least one retooled sawmill was dismantled and moved out of the Sierra Nevada.

By eliminating the objective of providing timber outputs, projects will only result in sporadic, economically marginal timber sales. The Team believes this will not achieve the "active and successful timber and biomass industries" that are so important to the success of the any fuel management strategy.

The Team believes the SNFPA in its current form will eventually result in a further reduction, and possibly the long-term elimination, of industrial capacity in parts of the Sierra Nevada. It is most probable in areas that have little availability of private timberlands such as the area around the Sequoia National Forest. The loss of significant additional capacity to perform the huge task of fuel reduction would be very serious, and possibly irretrievable. Re-building this capacity would be very difficult, and highly unlikely in today's climate of economic uncertainty relative to the supply of forest products from public lands. Any further loss of capacity will virtually become permanent.

Considering FEIS Alternatives 4 and 7

The FEIS analyzed several alternatives. Alternative Modified 8 was selected based on assumed declines in the spotted owl population and the assumption that mechanical treatment of forest fuels to reduce wildfire hazard was a larger threat to owl populations than the wildfire itself.

Alternative Modified 8 contains a suite of very conservative and restrictive standards and guidelines. These guidelines are designed to eliminate or reduce risk from Forest Service management activities to near zero for some sensitive species. Most notably these include the California spotted owl, pacific fisher, marten, northern goshawk, willow flycatcher, great gray owl, and Yosemite toad.

Alternatives 4 and 7 performed better than the selected alternative in long-term habitat trends for old forest dependant species. These two alternatives also provided more economic outputs, and better air quality than the selected alternative. For these reasons, many think that these alternatives represent a better choice for resource management in the Sierra Nevada. Many District Rangers responded that Alternative 4 provided better flexibility to design projects to meet the desired conditions of the SNFPA.

Alternatives 4 and 7 were rendered "non-selectable" in the owl viability analysis. This was because key areas of uncertainty were considered as likely future adverse impacts, habitat contribution from private lands was considered zero, and restrictive stand level standards and guidelines were used as a criteria that would reduce risk to the owl, and increase probability of good habitat conditions in the long term.

Grazing and Recreation

To the extent that grazing operations are adversely affected by current standards and guidelines, the rural communities, of which they are an important part, are also affected. Specific direction that may adversely affect permitted ranching operations are discussed in detail in earlier sections of this report.

Livestock grazing is an important contributor to the economic and social health of many rural Sierra Nevada communities. Reducing this region-wide program will cause hardship, and displace livestock operators who make a substantial contribution to the economic and social well being of their communities. It is difficult, if not impossible to assess the true impact of the

[112] Reported to the Team by the Regional Council of Rural Counties

potential loss of a way of life that has been a part of the Sierra Nevada for over one hundred years. Perhaps one County Supervisor put it best when she said: "Our small rural communities are crucial to the enjoyment and use of these forests by the millions of Californians who live in urban areas. Small, family-run ranching operations are important to the health of these communities. Without these communities, the forests would not be nearly as available and enjoyable to others."

Existing direction, including standards and guidelines and analysis or process requirements designed to respond to the five problem areas also may reduce, restrict, or delay recreational activities, permits associated with providing recreational opportunities, and businesses that provide ancillary recreational supplies and services. Specific standards and guidelines that are perceived by some in this way are identified and discussed in detail in earlier sections in this report.

With respect to recreation: current standards and guidelines pertaining to resource protection are perceived by many to threaten the socio-economic benefits that recreational activities and uses provide to rural communities in the Sierra Nevada. The SNFPA direction has contributed to an unstable business environment that has been in decline for the last 10 years. This is because the large number of restrictions and procedures designed to address the five problem areas were not written specifically to address impacts of recreation activities. Businesses that hold special use permits to provide outdoor recreation services and experiences are concerned about the uncertainty involved with how various aspects of the SNFPA direction will apply to their operations. Many are saying they cannot invest in improvements or significant maintenance activities in this climate of uncertainty.

The Team found that several key standards and guidelines designed to protect sensitive riparian species from impacts of grazing will impact some ranching operations. Even though few allotments appear to be significantly affected, the Team understands the extremely tight economic margin these operations are based on. The standards and guidelines in question can be altered to provide more flexibility for ranchers to address risk reduction to sensitive species. This flexibility can provide equivalent levels of protection to wildlife, and allow grazing operations to continue.

The Team also agrees that several portions of the SNFPA direction are unclear and difficult to interpret with clarity and consistency as to how they apply to recreational uses. The Team also acknowledges that this has created an unstable business environment that can have adverse and unintended impacts on recreational businesses, their clients, and the communities they are a part of.

Part 2 – Recommendations

Introduction

Based on our collective assessment of the new information and analysis reported in Part 1 of this report, the Team concludes there is a compelling need for change to the existing management direction as embodied by the ROD for the SNFPA. In almost every case, we concurred with the desired condition envisioned under the ROD but found the standards and guidelines to be overly prescriptive for managing the complex and varied ecosystems encompassed by the 11.5 million acre planning area.

The Regional Forester directed the Team to develop recommendations for changes to the ROD to address some of the issues that surfaced during the review. Our challenge was to find ways to ensure that important habitat features would remain intact while allowing for critical fuels treatments to be accomplished and multiple uses to be sustained throughout the Sierra Nevada region. The first section below includes the Team's recommendations for strategy and planning: Adaptive Management, Cooperative Fuels Treatment Projects, a Strategic Approach to Implementation, Ecological Analysis, and Forest Sustainability. The second section describes an Integrated Vegetation Management Strategy that explicitly addresses the habitat needs of the California spotted owl. The next two sections include recommended changes to standards and guidelines that apply to grazing and recreation. Finally, we provide an assessment of how rural communities may benefit from the changes we are recommending.

For purposes of this report, the more detailed changes we propose are focused on the specific standards and guidelines in Appendix A of the SNFPA ROD. Other changes are more general in nature, describing a needed shift in strategy or focus without supplying all of the details needed to carry this out. We have attempted to keep our recommendations brief with the understanding that the rationale for the proposed changes has already been disclosed in Part 1.

For each section, we provide a brief summary of our thinking as we worked to craft the recommendations and the underlying principles that guided our work. This is followed by a discussion of relevant land allocations, desired conditions, and observations and recommendations that are more general in nature. Finally, we include specific wording changes and substitute language for new standards and guidelines. The format for the latter section includes the exact wording from the existing ROD (BLOCK A) followed by the substitute language recommended by the Team (BLOCK B). In some cases, only one or two words are changed. In others, the replacement language is more comprehensive and entire sections of the ROD have been rewritten. We note that any new decision is likely to entail a significant rewrite of the ROD that may go beyond the technical changes proposed here.

Adaptive Management

Throughout the Review, the Team was cognizant of the importance of an effective and efficient adaptive management strategy to complement any recommended changes to the current standards and guidelines. The owl scientists underscored the importance of this when we met to discuss our proposed recommendations on February 10, 2003. They very strongly indicated that a well thought out process for adaptive management should be coupled to our recommendations. We agree. The following discussion is our recommendation to the Regional Forester on this important matter.

Background

The Team reviewed the Adaptive Management Strategy in the ROD for the SNFPA. Formal research projects and site-specific non-significant forest plan amendments (to deviate from standards and guidelines) are identified as key components of the adaptive management strategy. Heavy reliance is placed on status and change monitoring and adaptive management projects such as Kings River and Black's Mountain. This approach was compatible with the prescriptive management direction in the ROD. However, we believe our recommended changes in management direction would benefit from a different approach that responds to inherent uncertainties.

The Team's Integrated Vegetative Management Strategy proposes a major program of vegetation treatments across the 11 Sierra Nevada national forests. Such a broad-scale approach for strategically placing area fuels treatments is based on sound scientific rationale, but has not been tested in the field. Hence, there is uncertainty related to achieving the landscape goals for modifying wildland fire behavior and perpetuating and enhancing old forest conditions. This uncertainty raises concerns that implementation of the strategy could result in unexpected cumulative adverse effects on old forest dependant species such as the spotted owl. The strategy embodies flexibility to allow decisions about treatment methods and locations to be made locally. Because of this, some perceive an increase in the possibility that implementation could be inconsistent across the bioregion. To address this uncertainty, the Team proposes a phased approach of rapid feedback monitoring, research, and adaptive management.

Collaboration with scientists and other stakeholders is a key element of the adaptive management approach. The success of recommended changes in direction from the existing SNFPA ROD will greatly depend on the proper application of adaptive management to test key assumptions and alternative management approaches at appropriate geographic locations and spatial scales. Coupling research and management in a disciplined and transparent adaptive management strategy is the most coherent and efficient means to reduce uncertainty. Management outcomes cannot be totally assured where uncertainty surrounds the functioning of large-scale ecosystems. The recommended adaptive management strategy provides both flexibility to test assumptions and alternative techniques, and reduces uncertainty over time through well-crafted collaborative efforts between science, management and the public. This approach enables the Forest Service to learn as it manages.

Overview

Adaptive management is the process of continually adjusting management in response to new information, knowledge or technologies. Adaptive management recognizes that unknowns and uncertainty exist in the course of achieving natural resource management goals. The complexity and interconnectedness of ecological systems, combined with technological and financial

limitations, makes a complete understanding of all the components and linkages impossible. Not only is our knowledge incomplete, but the systems themselves are constantly changing through both natural and human caused mechanisms. This makes the effort to comprehend ecosystem dynamics and foretell their trajectories even more challenging (Gunderson et al., 1995). Uncertainty will always be a part of the management of ecosystems, and adaptive management provides a mechanism by which uncertainty can become, "the currency of decision making instead of a barrier to it" (Walters, 1986).

The recommended strategy incorporates both passive and active adaptive management approaches. Passive adaptive management is applied primarily to status and change, and management effectiveness monitoring. Active adaptive management approaches are applied primarily in validation monitoring.

Adaptive management in this context has three key elements: (1) monitoring to gather information relative to effects of management approaches and activities and (2) using this monitoring information to determine and implement needed changes in management and (3) to focus research efforts on key information gaps. The integrated vegetation management strategy's more flexible approach necessitates an increased level of accountability with respect to local Forest Service managers monitoring changes resulting from management activities at a variety of scales. Adaptive management (through both monitoring and research) is the only way to determine whether the desired conditions and management goals are being achieved.

Under ideal circumstances, the Forest Service would conduct comprehensive status and trend monitoring and implementation/effectiveness monitoring as originally described in the SNFPA FEIS. However, given budget and resource constraints, monitoring must effectively focus on the needs for a particular management approach, and research efforts must follow a similar emphasis. The Team's recommended adjustments to the SNFPA, focus on tailoring project prescriptions according to management intent, to achieve well developed desired conditions within a broader set of standards and guidelines. Thus there is less reliance on standards and guidelines themselves to direct specific treatment methods and prescriptions. As a result, emphasis should be on a strategic balance of implementation, status and change, cause and effect monitoring and research throughout the Sierra Nevada. The different kinds of monitoring are defined as follows:

Implementation Monitoring

Implementation Monitoring records what, when, where, and how management direction has been followed, including legal requirements and agency policies. The objective of implementation monitoring is to determine the degree and extent to which projects are designed to meet the specific management intent and desired conditions for an area, while faithfully adhering to standards and guidelines, and other pertinent management direction.

Status and change monitoring

Status and change monitoring provides a description of the resources, landscape, sociocultural elements, and management activities of focus in this plan amendment. Status and change monitoring provides information on whether desired conditions are achieved as well as providing an early warning of unanticipated impacts from management or other activities.

Cause and effect monitoring and research

Cause and effect monitoring and research seek a better understanding of how components, structures and processes respond to management activities, and how ecosystem components interrelate. Cause and effect monitoring and research consists of (1) management effectiveness questions to describe the effect of specific management actions on a desired condition, and (2) validation questions to determine whether assumptions made at any stage of planning or

management are sound, particularly assumptions associated with management strategies, desired conditions, and the application of scientific knowledge.

Cause and effect monitoring and research entail testing hypotheses directly related to the effectiveness and underlying basis of management direction and actions. Thus, cause and effect monitoring and research requires careful consideration of the experimental design and analysis of the data to provide meaningful feedback to management. Cause and effect questions are formulated based on key areas of uncertainty and perceived risk associated with management approaches, assumptions, and legal requirements. In addition, cause and effect questions require companion implementation, and status and change questions, to provide a context for acting on information gained through cause and effect monitoring and research.

Management and research will need to work closely to identify the most efficient strategies to address key questions related to the uncertainty inherent in the recommended management approach.

The integrated vegetation management strategy provides for full implementation of the HFQLG Pilot Project and its administrative study. However, the strategy also provides for varied approaches in other parts of the Sierra Nevada. Further, applying research in the HFQLG Pilot Project Area to other parts of the Sierra Nevada may not be appropriate given the strong north-south gradients in forest ecosystem variation across the mountain range. Under the more flexible, broader approach that we recommend, it is critical to emphasize effectiveness (cause and effect) and implementation monitoring. The conceptual framework already developed for the existing ROD is still sound; however, the Team recommends monitoring focus on spatially tracking projects and assessing conditions before and after management. This is particularly true for California spotted owl habitat, old forest, and fuels conditions.

Recommended Adaptive Management Approach

Three underlying objectives and assumptions drive the Team's recommendations for adaptive management:

1. Adaptive management, with closely linked monitoring and research components, is a key process for developing and maintaining trust through accountability and transparency.
2. The feasibility and long-term sustainability of an adaptive management program is based on efficiency and cost/benefit considerations.
3. A rapid feedback system for collecting and sharing monitoring information is critical if this information is to be effectively used to inform management and focus future monitoring and research efforts.

Monitoring and research are often approached as separate elements within the overall concept of adaptive management. The Team's recommendation knits these elements together; presenting adaptive management as an on-going process that focuses both monitoring and research efforts. This approach presents a great opportunity to collect and process information that meets multiple needs (for example, project-level analysis, strategic planning, and cumulative effects analysis), thereby reducing overall costs for information and data gathering and improving information transfer. Further, this approach focuses monitoring on the most critical management needs.

Rapid feedback of monitoring results is a key characteristic of the Team's recommendation. Results and information should be made available annually to Forest Service managers at all levels, allowing them to respond to new information and improve or change management as needed. Rapid feedback facilitates timely adjustment of monitoring and management approaches thereby reducing the level of uncertainty associated with the overall management strategy.

Unfortunately, our recommendation is not complete. However, we recommend the Regional Forester develop an adaptive management strategy as we have described above with regular, rapid feedback that provides for broad participation, oversight, and public transparency. Development of this strategy and the establishment of organizational structures and procedures for implementing it should begin immediately. NEPA is not required to boldly move ahead on this task. This adaptive management approach could possibly build on the current structure of the Interagency Team given the desire for all members to work together cooperatively to make this a workable reality. It will require a strong and robust relationship between public representatives, agency managers, and scientists. While science is critical to the testing of assumptions and the development of new information, agency managers must also weigh public interest and administrative realities to determine how new information is used to adjust management direction.

The following five key elements provide the foundation for the Team's recommendations regarding adaptive management:

1. Focused implementation/effectiveness monitoring with rapid feedback of monitoring data
2. Focused research
3. Efficient compilation and application of project tracking for monitoring, analyzing cumulative effects, and streamlining NEPA analyses
4. Integrated design for sampling and evaluation of implementation, effectiveness, and validation monitoring and research
5. Agency and public involvement to foster trust and provide a basis for public participation in evaluating monitoring results

The Team recommends the approach focus on three key areas:

1. Monitoring the effects of vegetation treatments over a large portion of the Sierra Nevada bioregion. A certain proportion of projects would be assigned to serve as intensively monitored projects (for example, 10 percent of the projects across the bioregion). These projects would have more intensive pre-inventory and follow-up monitoring of treatments. These projects would be monitored to study the effects of treatments and evaluate whether management direction was being applied consistently and producing desired effects. Analysis of effects would be used to assess possible needs for change in existing management direction. Each national forest would be responsible for planning, implementing, and monitoring these projects. The goal would be to extract the maximum information from this effort, with emphasis on assessing effects of management activities and rapid annual feedback.

2. A limited set of rigorous research projects distributed across the bioregion. Some questions, particularly cause and effect oriented inquiries, are best answered directly with a formally designed adaptive management experiment. A research/monitoring/forest manager team would provide the criteria for selecting geographic areas and types of treatments for adaptive management projects. Research would be focused at the landscape scale and would be directed at key uncertainties related to management and species viability. Results need to be peer-reviewed and published to maximize credibility. The Team recommends a paired PAC research study within the existing owl demographic study areas.

3. A limited set of adaptive management projects to test alternative approaches for meeting management intent and objectives. A set of projects would be assigned as adaptive management projects to test alternative approaches to existing standards and guidelines. Information from these projects would be used to examine effects of changing standards and guidelines over larger areas.

The adaptive management approach would initially emphasize monitoring of a sample of projects across the bioregion (the first key area above). Monitoring information from these projects would be used to focus research efforts (the second key area above) and to design specific adaptive management projects to test alternative approaches to existing standards and guidelines (the

third key area above). Based on feed back from the above monitoring and research projects conduct a 5-year review of management direction.

Cooperative Fuels Treatments Projects

The Region is committed to working together to accomplish community protection and ecosystem maintenance and restoration. The Region intends to continue working with other Federal, State, Tribal and local partners within a collaborative process to ensure effective fuel treatment efforts. The results of these collaborative efforts will be shared widely. We will look for opportunities to emphasize and increase successful collaboration. A framework for organizing and completing cooperative fuels treatment and community protection projects is available.

The Team recommends one project per forest be planned and that the Region continue working with the California Resources Agency to build on the suggestions put forth by the State at several of the Framework Review meetings.

A Strategic Approach to Implementation

A strategic approach across a landscape is highly desired when identifying opportunities for fuels/vegetation treatments. It is important that individual treatments and their location are developed and linked with other treatments across a landscape and the cumulative effects across the area are understood. The Team recommends that the SNFPA Implementation Team supports such an approach and makes the Analysis of the Middle Fork Cosumnes Watershed available as one example of how this may be done. This analysis is not a standard or a requirement before implementing fuels/vegetation treatments. It was conducted as part of the review and was necessarily more rigorous to evaluate the need for change. However, the concepts and techniques developed for this analysis will be applicable in many other situations.

Ecological Analysis

The Team recommends that an analysis be undertaken to broaden the effects analysis of the Integrated Owl Conservation and Vegetation Management Strategy beyond owls and fuels, to incorporate an ecological/landscape perspective. Issues to be addressed could include sustainability, biodiversity, ecological surplus/deficit conditions, old forest conditions, etc.

The analysis should: (1) clarify the ecological conditions (future reference conditions) envisioned by the ROD/FEIS/DEIS, (2) assess the effects of the proposed changes on these desired conditions, and (3) recommend appropriate standards and guidelines to achieve these conditions (either included in the proposal or others).

In addition, while the Team recommends retaining the desired conditions and intent for the old forest emphasis area land allocation, we also recommend that the size and extent of this allocation be examined relative to the desired condition for old forest.

Forest Sustainability

The Review Team is concerned about the long-term sustainability of Sierra Nevada forest ecosystems with active management limited to thinning-from-below, salvage harvest and prescribed fire as the principle tools to meet vegetation management objectives. The existing Framework direction also expresses this concern by stating that “the management prescriptions to maintain habitat for sensitive species may not necessarily represent a long term forest

ecosystem management strategy." "Thinning from below is the principle silvicultural prescription to achieve immediate objectives, but if continued indefinitely, could result in forest regeneration challenges."[113]

The Team discussed small forest gaps (1/4 to 2 acres) as a vegetation management tool to address forest ecosystem sustainability. However, the use of forest regeneration gaps (gaps) as a tool to achieve this across the bioregion is a controversial issue. The Team believes that additional study and analysis needs to be conducted of gaps or other vegetation prescriptions and their effects that could address the forest sustainability concerns. Forest gap regeneration is part of the HFQLG Pilot Project Area.

The Team recommends that the Regional Forester initiate additional ecological analysis to determine whether the use of gaps is a desired tool to achieve a sustainable ecosystem structure and composition across the bioregion.

The following are specific points and concerns the Team raised as it made the above recommendation.

- Gaps can be used to address structural heterogeneity and species composition where landscape conditions indicate the need.
- Small openings in the forest canopy provide sunlight and moisture for shade intolerant tree species, particularly native pine species and some native hardwoods.
- Availability of this tool would allow local managers to design projects that mimic natural processes that shaped Sierra Nevada vegetation in the past.
- Forest gaps would be a useful tool for addressing some forest health issues, and addressing locally significant ecological deficits.
- There is uncertainty whether there is a short-term need for stand heterogeneity.
- The SNFPA FEIS and CASPO Technical Report (Verner et al., 1992) suggest that continual thinning from below could lead to stand homogeneity in the future.
- The use of gaps could be tied to adaptive management.
- Concern exists about the additional road system needs to access gaps.
- Strong regional guidance will be needed to sustain NEPA challenges.
- There is concern that objectives for creating gaps might really be for economic reasons rather than enhancing structural heterogeneity and species composition of forest stands.
- There is particular concern about the effects of gaps in old forest emphasis areas, and some believe that management direction for old forest emphasis areas provides opportunities for addressing needs related to enhancing structural heterogeneity and species composition.

[113] SNFPA ROD, Pg. 3.

An Integrated Vegetation Management Strategy

The Team recommends adopting an integrated vegetation management strategy to address the suite of issues we identified with regard to fuels treatments, consistency with the National Fire Plan and compatibility with the HFQLG Pilot Project. This strategy builds on the existing direction adopted under the SNFPA. In the broadest context, it forms a strategy for managing vegetation to reduce the threat of wildfire across the Sierra Nevada bioregion and minimize the impacts to wildlife. Changes are proposed to broaden objectives, improve consistency of application, and improve the overall effectiveness of the existing approach. For a summary of the recommendations and their projected effects see "Proposal for an Integrated California Spotted Owl Conservation and Vegetation Management Strategy" at www.fs.fed.us/r5/snfpa/review/review-report/proposed-presentation/options/presentation.pdf.

The Problem

There is great concern over the effects of habitat modification on California spotted owls and other old-forest dependant wildlife. Most people perceive two major threats to habitat. These are wildfires, and forest management activity (USFWS, 2003).

Previous management activity on national forests in the Sierra Nevada included plans for relatively large-scale even-aged management. In the early 1990's scientists identified this as a threat to owl habitat (Verner et al., 1992). The reason was these plans included timber harvest that would have removed many large old trees and changed habitat to a condition quite different from what owls are known to use and prefer. These plans were abandoned more than 10 years ago.

The way fires burn in the Sierra are recognized as different today than in the past. They have changed from short-interval, low- to moderate-severity fires; to long-interval, high-severity, forest destroying fires (Verner et al., 1992). In the past, fires burned frequently across the Sierra Nevada. These frequent fires prevented accumulation of forest fuel (dead branches and litter). Fires burned with less intensity and would rarely kill very many of the larger trees. Today, fires are less frequent, and thus the build up of fuels causes very hot fires that can kill large areas of mature forest (Weatherspoon et al., 1992). As a result, today's wildfires are modifying habitat over relatively large areas to a condition that is quite different than spotted owls are known to use and prefer.

Previously, we attempted to limit damage to the forest habitat caused by wildfires, by quickly putting them out. Unfortunately, our successful suppression of fires over the last 50 to 75 years is accepted as being a key factor contributing to the change in fire regime to long-interval, high-severity fires. This is because deadwood and debris have built up to dangerous levels on the forest floor, in combination with thick undergrowth of vegetation, and trees spaced very close together. This condition exists on around 7 million acres in the Sierra Nevada.

After several catastrophic fire seasons, existing federal policy (National Fire Plan) is to take action to reduce hazardous fuel conditions described in the previous paragraph across forests. The intent of this policy is to move the condition towards the historic less damaging wildfires. Existing federal law, regulation, and policy also mandate conservation of wildlife species, such as the California spotted owl.

How can we reduce hazardous fuels and move the forests back to a more fire resilient condition? The answer is that we must:

1. Reduce built up levels of surface fuels that cause hot and intense fires

2. Reduce thick undergrowth that acts as a “ladder” allowing fire to reach up into the tree tops
3. Remove some small to medium sized trees to provide space between the tree tops

The problem is that these changes also modify forest habitats that old forest associated species use. If we change the forest too much or too fast, it could result in adverse effects to these species. This is because many are known to thrive in fairly dense stands with heavy accumulation of dead branches, down trees, and thick undergrowth. This is especially true of the areas where old forest associated species nest, roost, or den. An integrated vegetation management strategy must strive to move the forest to a healthier, more fire resilient condition while at the same time avoiding adverse effects to wildlife populations, especially spotted owls.

The question then becomes: How much can we reduce the hazardous fuels, and avoid an adverse effect on the owls and other wildlife? Unfortunately there is a high degree of uncertainty surrounding the answer to this question. However, there is a substantial body of scientific information describing the kind of habitat owls prefer, and what habitat conditions seem to be important to them. Because of this, an integrated strategy must strive to manage forest fuels and vegetation to reduce the likelihood of catastrophic fire and to leave and maintain habitat conditions across the landscape that scientific information suggests are important to spotted owls.

If we do not reduce hazardous fuels in the Sierra, large damaging wildfires will continue to modify owl habitat creating large holes in the forest. An integrated approach must balance the shorter-term risks of temporarily changing some of the owl habitat to reduce fire hazard, with the longer-term risk of continued large destructive wildfires.

The Team developed an integrated vegetation management strategy based on the following concepts:

1. Avoid fuel reduction measures in critical owl areas such as around nesting sites where possible, and minimize habitat effects where fuel reduction occurs.
2. Strategically locate treatments to get the maximum benefit from the areas where we reduce hazardous fuels.
3. Where we do treatments, ensure that they effectively modify fire behavior.
4. Design treatments to be as cost efficient as possible.
5. Treat hazardous fuels at a rate that recognizes the wildfire problem, while going slow enough to reduce the risk of causing unexpected problems to the spotted owl and other wildlife.
6. Treat fuels in a way that keeps important parts of the habitat in place, so that the forest can grow back more quickly without becoming a fire hazard.
7. Focus treatments primarily around communities in the near term.
8. Keep track of our fuel treatment activities, and how the owls are doing so we can adjust our management practices as we go along.

One question the Team very much wanted to answer was: How would our recommended strategy affect California spotted owls? In attempting to answer this question we came up against the same problem identified in the FEIS. That is, there is no way to determine with any degree of certainty the effect of our recommendations on owl populations. We asked scientists who have done the major research on spotted owls, and they indicated that the answer to the question of how habitat modification affects owls cannot be quantified based upon the current state of knowledge. However, we can reasonably project how habitat would change after fuel treatments and if a wildfire burned through the area. Since we can describe the kind of habitat conditions owls seem to prefer and use, we can estimate what the effects might be, given the following assumptions:

- If the habitat after fuel treatments looks a lot like habitat owls use, we believe there is less chance of serious adverse effect than if it looks like habitat we know they avoid.
- Smaller scale changes in habitat are better than large-scale changes. If our fuel treatments do have an adverse effect, this effect will be reduced if we do less of them.
- Shortening the time period for treated areas to grow back into habitat (10 to 20 years) that looks like habitat that California spotted owls use would reduce the chance of adverse effect.
- Leaving the areas where owls are currently nesting untreated would reduce the chance of adverse effects to the owls from the treatments.

The SNFPA direction used a similar generalized approach to solving the problem. However, based on our review, we found that the standards and guidelines under the existing plan presented substantial barriers to accomplishing its objectives.

As discussed in Part 1 of this report, the existing standards and guidelines create expensive treatments that we cannot afford to implement across the bioregion. In many cases, treatments that will sufficiently modify fire behavior would be very difficult to conduct. Finally, in some cases existing direction prevents strategic placement of fuel treatments that is necessary to protect high value areas.

The core purpose of the Team's recommendations is to integrate the needs of California spotted owls and other old forest dependent wildlife with the need to effectively reduce hazardous fuels across the Sierra Nevada. The basic approach of the SNFPA direction is good. However, the team recommends replacing the existing standards and guidelines governing fuel treatment activities with different ones. We believe this will improve protection of old forest habitat by allowing us to:

1. improve our ability to do less expensive more cost efficient treatments;
2. enhance the effectiveness of treatments when and where they are done; and
3. improve our ability to provide strategic placement of treatment areas when values at stake are high.

The area proposed for treatment represents a small proportion of California spotted owl habitat across the Sierra Nevada. We estimate that only 1.6 percent of nesting and roosting habitat will be affected by thinning annually under the recommendations. These areas will retain the most important structural elements found to be important to owls with the exception of small short-term reductions in canopy cover. This means that many of the treated areas will stay in a condition that looks like habitat the owls are known to use. In addition, we estimate that within 10 to 20 years of treatment, the majority of these areas will grow into quality mature forest habitat. The Team's analysis projected that these recommendations would increase the amount of owl habitat by 5 to 10 percent across the Sierra Nevada within 20 years.

Based on our analysis, the Team believes that if a fire burns in a landscape that has been treated as we are recommending, there will be less damage to habitat that owls use. Our analysis projects that within approximately 20 years the area burned by moderate to high severity fires will be reduced by thousands of acres compared to the existing direction. We believe that the areas of the forest treated under our recommendations will retain or return to a habitat condition usable by owls and other wildlife much more quickly than habitat impacted by moderate to high severity wildfire.

The Team strongly believes these recommendations will increase protection and conservation of the communities and wildlife of the Sierra Nevada. This is because they encourage actions and conditions that facilitate the implementation of an effective vegetation management strategy that will maintain and develop old forest habitat, while beginning to reduce the size and severity of wildland fires across the bioregion.

Key Principles

In developing this recommendation, the Review Team was guided by four key principles:

1. Reduce fire hazard and risk to wildlife habitats and communities
2. Provide for healthy and vibrant rural communities
3. Provide flexibility at the local management level to enhance successful implementation
4. Develop a sustainable approach to short-term protection, and long-term development of quality old forest habitat across the bioregion

These recommendations are designed to improve the forests' ability to implement programs that reduce wildfire threat to habitats and communities. The Team believes these recommendations will ensure that fuels treatments, wherever they occur, will effectively moderate wildfire behavior. They will also result in more cost-efficient treatments as more medium-sized trees may be removed while still protecting important habitat elements that take a long time to replace. Finally, it allows more flexibility for local managers to strategically locate fuel treatments within the wildland urban intermix.

The Team believes these recommendations will also better support healthy and vibrant rural communities throughout the Sierra Nevada. We believe it is highly unlikely that agency budgets will allow for the majority of fuels reduction work to be accomplished using service contracts. The proposed new direction will allow fuels reduction projects to be developed that will provide business opportunities for local entrepreneurs. A combination of economically feasible fuels reduction projects and funded service contracts will allow us to balance the need for extensive treatments with the funding levels we are likely to see in the future. We believe that our recommendations will foster partnerships with local communities to restore forest ecosystems across the range.

Finally, the Team feels that these recommendations provide for strong and consistent standards coupled with management intents to minimize impacts to key habitat elements across the range. However, they also allow local managers some discretion and leeway to incorporate local environmental conditions into project planning and design.

The conceptual basis for this recommendation was to build on the existing direction. The Team did not find a great amount of disagreement with the goals of the SNFPA. Rather it was the standards and guidelines developed to attain those goals that presented the primary problems. As a result, our recommendations were developed to:

- Retain and amplify the existing set of desired conditions for land allocations with some minor exceptions regarding eastside forest types.
- Use one set of standards for vegetation management that is easily understood and efficient to implement.
- Avoid overly prescriptive standards, and instead focus on retaining important components of old forest habitat that would take a long time to replace.
- Allow managers to design projects to more effectively achieve desired conditions.
- Recognize that project level planning must ultimately tailor project design to respond local conditions while maintaining broad consistency across the bioregion.
- Include an adaptive management approach that recognizes the diversity across the bioregion and the uncertainty in key scientific areas and that is realistic to implement.

Management Objectives

The recommendation integrates objectives for hazardous fuels reduction, forest health issues, and ecosystem restoration while paying particular attention to minimizing impacts on habitat conditions for California spotted owls and other species with similar habitat needs. This integrated strategy strives to balance the risks to wildlife habitat from mechanical vegetation treatments with the risks posed by wildfire.

Treatments on a landscape scale will be undertaken to meet four primary objectives: hazardous fuels reduction, improved forest health, restoration of ecosystem structure and composition, and ecosystems restoration after catastrophic events. While not considered a primary objective under this strategy, providing commercial forest products to meet the needs of people is a secondary or tertiary objective supporting implementation of the strategy. The vegetative management objectives will be addressed using prescribed fire, and the silvicultural tools of thinning, salvage harvest, and forest gap regeneration, if appropriate.

Hazardous fuel reduction: Reduce losses from wildfire to habitats and communities, and restore historic fire regimes. This vegetation management objective is the only explicitly stated objective of the existing management direction. Our recommendation changes the existing set of standards and guidelines to improve the forests' ability to successfully implement projects aimed at achieving this objective.

Improved Forest Health: Improve forest health where stand conditions indicate insects or disease are likely to become a problem. This objective is compatible with the objective of reducing hazardous fuels and is consistent with the intent of the existing management direction. The proposed changes in the standards and guidelines are expected to allow forests to design projects to address forest health concerns. Note that accomplishing this objective is not intended to divert effort and resources from the primary task of reducing hazardous fuels.

Restore or maintain ecosystem structure and composition: Where landscape conditions indicate, restore desired structural heterogeneity and species composition. Design projects to reintroduce fire, and restore historic fire regimes. The existing direction recognizes the absence of this objective. Existing standards and guidelines in many cases impede forests' ability to accomplish projects toward this end.

Restoration following catastrophic wildfire: The Team recommends improved direction to respond to large catastrophic wildfires. Field managers struggling to deal with the aftermath of these increasingly common events have identified the existing direction as a concern. Recommendations focus on managing long-term fuel profiles and restoring habitat, while minimizing short-term impacts.

Provide commercial forest products to meet people's needs in support of restoration objectives: The Team believes that providing forest products to meet people's needs is a legitimate objective on national forest lands. However, we also recognize the urgent and important restoration needs embodied in the objectives above. Because of this, providing forest products in the form of timber harvest should be secondary, and in support of achieving the restoration objectives discussed above. Prudently applied within the standards and guidelines we are recommending, this objective can offset costs of fuel treatment, generate moderate revenue to assist with follow-up treatments, and provide some economic benefit to local communities.

Land Allocations

The integrated vegetative management strategy essentially retains existing Sierra Nevada Forest Plan Amendment land allocations. Minor changes to the desired conditions for eastside forest vegetation types are recommended in Appendix A. In the Herger-Feinstein Quincy Library Group

Pilot Project Area, the strategy adopts the land allocations from the HFQLG FEIS (August 1999) as well as the California spotted owl protected activity centers and home range core areas from the SNFPA direction. The management intent and desired conditions of each land allocation provide consistent guidance for the design and development of projects to achieve the objectives of the integrated vegetation management strategy. Standards and guidelines provide the sideboards for project design to insure important resource considerations are consistently applied across the bioregion. Project level planning ensures that resource management activities respond to and are consistent with forest plan direction which includes management intent, desired conditions, and standards and guidelines.

The information below was taken from the existing direction in the ROD and FEIS and clarified, where necessary. A cornerstone of the Team's recommendations is that management intent and desired conditions for the different land allocations be further clarified and more completely developed.

California Spotted Owl Protected Activity Centers

Management Intent

The available science indicates that habitat in the vicinity of owl nesting sites is extremely important to protect and maintain California spotted owl populations. The system of PACs has been created to protect all of the known owl sites from effects due to vegetation management. These areas are intended to provide conditions necessary for successful owl reproduction, and survival. The intent within PACs is to manage these areas very cautiously. Vegetation treatments in PACs are avoided to the greatest extent possible in order to avoid potential but uncertain effects in these crucial areas. This means that we are willing to accept an elevated level of fuels hazard in these areas when it does not represent an unacceptable threat to other high value areas (such as communities at risk). Landscape fuels strategies must be developed to minimize to the greatest extent feasible any treatment within PACs. They should consider protecting PACs by treating around them, or in such a way as to reduce the risk of fire entering the PAC. Reduction of hazardous fuels is the only vegetation management objective applicable within PACs.

Desired Conditions

Stands in each PAC have (1) at least two tree canopy layers, (2) trees in the dominant and co-dominant crown classes averaging at least 24 inches diameter at breast height (dbh), (3) 60-70 percent tree canopy cover (including hardwoods), (4) a number of very large (greater than 45 inches dbh) old trees, and (5) higher than average levels of snags and down woody material.

California Spotted Owl Home Range Core Areas

Management Intent

Home Range Core Areas are intended to provide high quality spotted owl habitat to support owl reproduction and survival in PACs. These areas represent the heavily used portion of an owl's home range where owls spend most of their time foraging and roosting. These areas therefore represent the full range of high quality suitable owl habitat. Vegetation management treatments should be designed to maintain currently suitable habitat where possible, and to accelerate development of currently unsuitable habitat into a suitable condition. All vegetation management objectives may apply to HRCAs. However, they must be weighed against the intent of managing the HRCA to support the function of the Protected Activity Center. Vegetation management should be limited but designed to meet fuels objective where necessary in portions of HCRAs.

Desired Conditions

Stands in each home range core area have (1) at least two tree canopy layers, (2) trees in the dominant and co-dominant crown classes averaging at least 24 inches diameter at breast height (dbh), (3) at least 70 percent tree canopy cover (including hardwoods), (4) a number of very large (greater than 45 inches dbh) old trees, and (5) higher than average levels of snags and down woody material. Spotted owl foraging habitat is also a desirable component of HRCAs.

Old Forest Emphasis Areas

Management Intent

The intent of the old forest emphasis area allocations are to protect, maintain and develop old forest habitat in areas containing the best remaining large blocks or landscape concentrations of old forest. This allocation recognizes the variety of old forest types. It is not the intent to manage solely for a higher proportion of high canopy cover old forest.[114] This allocation provides a substantial contribution of ecological conditions to maintain viable populations of old forest associated species. This includes providing for "functions," such as connectivity of habitat, and a range of elevation to provide for a variety of old forest types and allow for migration of wide ranging old forest dependent species. These areas should be managed to protect, maintain and enhance their old forest characteristics. Reintroduction of fire in this land allocation is very important, and restoration of historic fire regimes should be considered a high priority. It is also very important to reduce fire hazard in key old forest patches and stands to reduce the threat of high severity fire and resulting loss of old forest function. All vegetation management objectives apply with the intent of managing to emphasize and allow natural processes to influence vegetation structure and function.

Desired Conditions

Desired condition is based on forest type and described in detail in the FEIS Volume 1, Chapter 2, Pages 135 through 143. Old forest patch types, as determined by site capability, exist and are maintained on the greatest proportion of acres in old forest emphasis areas as possible. Within conifer-dominated forests, old forest patch types (late seral) typically comprise 50-90 percent of the landscape, depending on vegetation type and site capability. Each landscape has a mixture of open and closed-canopied patches based upon the range of site capacities and topography. For example, landscapes dominated by productive sites have few permanent openings, whereas landscapes with frequent rock outcrops have a higher percentage of openings.

Wildland urban intermix Zone

Management Intent

The primary management intent within the wildland urban intermix zone (defense and threat zones) is to manage hazardous fuels to protect communities as well as minimize the spread of fires that might originate in urban areas. Management activities in this zone are aimed at enhancing fire suppression capabilities by modifying fire behavior inside the zone and providing a safe and effective area for suppression activities. The intent is to concentrate roughly 75 percent of fuels treatment acres in the wildland urban intermix zone.

Defense Zone- The intent within the defense zone is to provide defensible space adjacent to communities and a safe and effective area for firefighters. In this zone the concern for reducing hazardous fuels is the highest imperative. Other resource objectives are applicable in this zone to the extent they do not significantly impair the objective to protect communities and prevent loss of life and property.

[114] Personal communication, JoAnn Fites, 2003.

Threat Zone - The intent of the threat zone of the wildland urban intermix is to provide a buffer to, and support the defense zone. Management intent here is to modify the behavior of wildland fires by interrupting spread, and reducing fire intensity. Firefighters should be able to take advantage of reduced spotting; lower rates of spread and intensity to more effectively contain fires approaching the defense zone. Other resource objectives can be accommodated within the threat zone primarily through the size and arrangement of strategically placed area treatments. Within treatment units, the primary emphasis should be to adequately modify wildland fire behavior.

Desired Conditions for Defense Zones

Within this zone, fuels objectives are fully met. Under high fire weather conditions, wildland fire behavior is characterized as follows: (1) flame lengths at the head of the fire are less than four feet, (2) the rate of spread at the head of the fire is reduced to at least 50 percent of pre-treatment levels for a minimum of five years, (3) hazards to firefighters are reduced by maintaining minimum snag levels, (4) production rates for fire line construction are doubled from pre-treatment levels.

Desired Conditions for Threat Zones

Maintain the landscape within this zone in a condition that fully meets fuels objectives described in the forest-wide standards and guidelines. Under high fire weather conditions, wildland fire behavior in treatment areas is characterized as follows: (1) flame lengths at the head of the fire are less than four feet, (2) the rate of spread at the head of the fire is reduced to at least 50 percent of pre-treatment levels for a minimum of five years, (3) hazards to firefighters are reduced by maintaining minimum snag levels, and (4) production rates for fire line construction are doubled from pre-treatment levels. The average flame length at the head of the fire across the entire threat zone (new treatments, maintenance treatments, natural barriers and untreated areas) is six feet or less.

General Forest

Management Intent

The general forest allocation is composed of lands outside of the other allocations. The management intent is to undertake a broad array of resource management activities to protect and maintain the forest, with a stronger emphasis on active management to meet human needs and desires. These areas provide a substantial contribution of habitat to support a broad array of species including those associated with old forests (including the California spotted owl). These areas should be managed to protect, maintain and enhance a variety of vegetative conditions including old forest characteristics. Restoration of historic fire regimes is important. It is also very important to reduce fire hazard in key areas to reduce the threat of high severity fire. All of the vegetation management objectives are applicable to this allocation. Management activities should mimic natural process, but there is no intent to limit management intervention in response to insect outbreaks, disease, or fire.

Desired Conditions

Desired condition is based on forest type and described in detail in the FEIS Volume 1, Chapter 2, Pages 135 through 143. In general, old forest patches make up a smaller proportion of the landscape than within old forest emphasis areas. The amount, quality, and connectivity of old forest habitat, support replacement rate reproduction for the California spotted owl and other old forest associated species. The density of large, old trees and the continuity and distribution of old forests patches across the landscape is consistent with distributions described in the FEIS. The amount of forest with late-successional characteristics (for example diverse species composition, higher canopy cover, multi-layered canopy, higher density of large diameter trees, snags and coarse woody material) is consistent with distributions described in the FEIS.

Table 7. Management Intent by Allocation and Purpose of Treatment

The purpose of this table is to explain why we are doing treatments in each of the allocations. Allocations are in trumping order from left to right. Within an allocation, the trumping order is from top to bottom. In all cases fire and fuels is the primary purpose for doing treatments. Example: 1) If we have an area that is both in a HRCA and a Defense Zone, the Defense Zone purposes override the HRCA, 2) If I am in a HRCA and a Threat Zone, the HRCA purpose trumps the Zone. 3) Fuel treatments trump doing Forest Health if there are limited resources for doing these activities. Areas not designated by other allocations are General Forest.

Purpose of the Treatment / Activity		**Habitat and Communities Protection Areas**		**Zones of Influence Around Habitat and Community Protection Areas**		**Wildlands**	
		PAC's	**DEFENSE ZONE**	**HRCA's**	**THREAT ZONES**	**OLD FOREST EMPHASIS**	**GENERAL FOREST**
		We do treatments in these allocation to:					
Fire and Fuels	Community Protection Landscape Fire Behavior Modification Fire Regimes Condition Classes	Protect the nest site from surrounding treatments; intent is to avoid treatment wherever possible but when treatments are essential to protect the area or surrounding values, minimize effect to large trees and canopy cover.	Protect the community from wildfire; prevent loss of life and property; and receive the highest priority for fuel treatments.	Protect the habitat from surrounding treatments; Intent is to avoid treatment wherever possible but when treatments are essential to protect the area or surrounding values, minimize effect to large trees and canopy cover.	Support treatments within the Defense zone; modify wildland fire behavior to reduce intensity and rate of spread; receive the highest priority for fuel treatments.	Protect the best remaining large blocks and concentrations of old forest; reduce hazardous fuels that threaten old forest. Emphasize reintroduction of fire.	Modify landscape scale wildland fire behavior by laying out treatment units in a strategic manner and treating units with sufficient intensity.
Forest Health	Reduced Susceptibility to Insects, Disease, Drought, etc.	N/A	N/A	Protect the habitat from a significant threat due to pest or drought conditions that would create a hazard	Protect habitat from significant threat due to pest or drought conditions that would create a hazard	Protect habitat from significant threat due to pest or drought conditions that would create a hazard	Protect habitat from significant threat due to pest or drought conditions that would create a hazard
Enhance Habitat	Enhance Stand Heterogeneity Old Forest Structure and Function	N/A	N/A	Accelerate development of suitable spotted owl habitat where insufficient quantities exist to satisfy HRCA requirements.	N/A	Accelerate old forest characteristics, especially in plantations and other areas where old forest patches are below desired condition at the landscape scale	Increase the density of large, old trees as well as accelerating number of acres of late successional forest characteristics according to desired condition
Produce Wood Products	Supports activities above	N/A	Allows revenue to be collected when poss ble to off-set treatment cost with minimum effect on other resources	Allows revenue to be collected when possible with minimum effect on other resources and only when other zones which have less impact have been utilized [treatment of last resort]	Allows revenue to be collected when possible with minimum effect on other resources	Allows revenue to be collected when possible with minimum effect on other resources	Allows revenue to be collected when possible with minimum effect on other resources
Salvage	Supports some activities above and provides valuable products	Stand replacing - lethal [see PAC rules]	Yes	Yes, salvage only in units of disturbance greater than 10-acres	Yes	Yes, salvage only in units of disturbance greater than 10-acres	Yes

HFQLG Pilot Project Area

The HFQLG Pilot Project encompasses the Lassen and Plumas National Forests, and the Sierraville Ranger District of the Tahoe National Forest. Our recommendation is to revert to land allocations adopted by the HFQLG ROD in August of 1999. The overall management objective within the Pilot Project area is different from the remainder of the Sierra Nevada. Here the objective is to provide a sustainable output of forest products, while restoring ecological structure and composition. Elsewhere, providing forest products is confined to a secondary or tertiary objective to support other vegetation management objectives.

Off-Base and Deferred

The HFQLG Forest Recovery Act passed into law in 1998 established this Pilot Project and adopted specific allocations called "off-base", and "deferred". The land area that makes up these mapped allocations is very close to the old forest emphasis area allocation considered under Alternative 6 in the FEIS. The HFQLG Act prohibits any resource management activities including timber harvest and road building within these areas. The intent is to focus active management in other less sensitive, and less controversial areas until a forest plan revision or amendment is completed. Information and knowledge gained through implementation of the Pilot Project will be utilized in the planning process.

Available for Group Selection

The area that falls outside the off-base and deferred allocation is the "available for group selection" allocation. The intent of this allocation is to yield commodity resources to support community stability while sustaining the health and diversity of the forest ecosystem. The aim is to actively manage the forest to promote forest health, ecological integrity, adequate timber supply and local economic stability. Active restoration to protect fisheries, improve watershed health, and a network of riparian habitats is emphasized. The desired condition is a forest that more closely mimics the historic natural landscapes of the Sierra Nevada. That is, an all-age, multi-story, fire-resistant forest approximating pre-settlement conditions.

Recommended Standards and Guidelines

The Team's recommendation is to replace a complex and overlapping set of direction for multiple stand types and land allocations with one set of standards based on CWHR types that is applied to all mechanical treatments. We retain the basic approach of the existing ROD's fire and fuels management strategy (which includes wildland urban intermix zones, an approach for strategically placing area treatments, and reintroducing fire). We also recommend that the Region commit to an adaptive management approach that is designed to provide timely, cost effective information to managers. Finally, we recommend that the HFQLG Pilot Project be implemented to the greatest extent possible and consistent with Federal law to allow this important demonstration of collaborative stewardship to continue.

Specific changes are recommended to standards and guidelines for PACs, HRCAs, thinning, forest gap regeneration, post fire restoration, general salvage, and retention of snags and coarse woody debris. **BLOCK A** in the following pages contains text from the ROD in its original form. **BLOCK B** includes the language proposed by the Team. Where possible, the changes have been italicized. A brief statement of rationale follows this.

Protected Activity Centers

As under existing direction, PACs are established around known spotted owl activity centers. These 300-acre allocations are determined locally, based on survey protocols and encompass the highest quality owl habitat available. Vegetation management activities are very restrictive within PACs under the existing direction, and they remain so under our recommendations. The intent of establishing the system of PACs is to set aside and manage very cautiously the highest quality habitat that is supporting known owl nesting.

One overall difference is the limit on the rate of treatment within PACs. Existing direction allows treatment of 5 percent of PACs annually and no more than 10 percent per decade. The Team believes this is a major obstacle to achieving adequate and timely treatment in wildland urban intermix zones. Under the existing direction, even very small intersections with PACs count toward the limit. We propose to change the standard to recognize the fact that minor portions of PACs can be treated without having the same effect as treating an entire PAC. Therefore, we recommend changing the limit on treatment in PACs to 5 percent of the PAC acres in the bioregion annually, and no more than 10 percent of the PAC acres per decade. This provides managers with an added incentive to treat the absolutely smallest portions of individual PACs.

Only a few changes are proposed in the management of these important areas. The Team believes these changes will not significantly reduce the amount of habitat available to California spotted owls using the PACs from the existing direction. This belief is based on the fact that our recommendations are more restrictive in protecting habitat elements within the defense zone, while they are slightly more liberal in allowing mechanical treatment in portions of selected PACs in the threat zone. No change is proposed to management activity in PACs in areas outside wildland urban intermix zones.

We recommend that northern goshawk PACs be managed similarly.

BLOCK A

California Spotted Owl PACs: Activity-Related Standards and Guidelines

Fuel Treatments (ROD, Pg. A-35)

In PACs located outside the defense zone of the urban wildland intermix zone: Limit stand-altering activities to reducing surface and ladder fuels through prescribed fire treatments. In forested stands with overstory trees 11 inches dbh and greater, design prescribed fire treatments that have an average flame length of 4 feet or less. Prior to burning, conduct hand treatments, including handline construction, tree pruning, and cutting of small trees (less than 6 inches dbh), within a 1- to 2-acre area surrounding known nest trees as needed to protect nest trees and trees in their immediate vicinity.

In PACs located inside the defense zone of the urban wildland intermix zone: Prohibit mechanical treatments within a 500-foot radius buffer around the California spotted owl activity center. Allow prescribed burning within the 500-foot radius buffer. Prior to burning, conduct hand treatments, including handline construction, tree pruning, and cutting of small trees (less than 6 inches dbh), within a 1- to 2-acre area surrounding known nest trees as needed to protect nest trees and trees in their immediate vicinity. The remaining area of the PAC may be mechanically treated to achieve the fuels reduction outcomes described for the general forest land allocation.

Conduct vegetation treatments in no more than 5 percent per year and 10 percent per decade of the California spotted owl PACs in the 11 Sierra Nevada national forests until a formal monitoring and adaptive management approach is developed in coordination with the Pacific Southwest Research Station. Monitor the number of PACs treated at a bioregional scale. Update the total number of PACs to account for losses of PACs due to catastrophic events.

BLOCK B

California Spotted Owl PACs: Activity-Related Standards and Guidelines

Fuel Treatments

In PACs located outside *of the wildland urban intermix zone*: Limit stand-altering activities to reducing surface and ladder fuels through prescribed fire treatments. In forested stands with overstory trees 11 inches dbh and greater, design prescribed fire treatments that have an average flame length of 4 feet or less. Prior to burning, conduct hand treatments, including handline construction, tree pruning, and cutting of small trees (less than 6 inches dbh), within a 1- to 2-acre area surrounding known nest trees as needed to protect nest trees and trees in their immediate vicinity.

In PACs located inside the threat zone of the wildland urban intermix zone, limit stand altering treatments as above with the following exception: Mechanical treatments are allowed where avoiding all PACs would significantly compromise the overall effectiveness of the landscape fire and fuels strategy.

Within the assessment area or watershed, locate fuels treatments to minimize impacts to PACs. When treatment areas must intersect PACs and choices can be made about which PACs to enter, use the following criteria to preferentially avoid PACs that have the highest likely contribution to owl productivity.

> *1) Lowest contribution to productivity: PACs presently unoccupied and historically occupied by territorial singles only.*

2) PACs presently unoccupied and historically occupied by pairs,

3) PACs presently occupied by territorial singles,

4) PACs presently occupied by pairs,

5) Highest contribution to productivity: PACs currently or historically reproductive,

Historical occupancy is considered occupancy since 1990. Current occupancy is based upon surveys consistent with survey protocol (March 1992) in the last 2-3 years prior to project planning. These dates were chosen to encompass the majority of survey efforts and to included the breeding pulses in the early 1990s when many sites were found to be productive. When designing treatment unit intersections with PACs, limit treatment acres to those necessary to achieve strategic placement objectives and avoid treatments adjacent to nest stands whenever possible.

In PACs located inside the defense zone of the wildland urban intermix zone: Prohibit mechanical treatments within a 500-foot radius buffer around the California spotted owl activity center. Allow prescribed burning within the 500-foot radius buffer. Prior to burning, conduct hand treatments, including handline construction, tree pruning, and cutting of small trees (less than 6 inches dbh), within a 1- to 2-acre area surrounding known nest trees as needed to protect nest trees and trees in their immediate vicinity. The remaining area of the PAC may be mechanically treated *using the forest-wide standards and guidelines*.

Conduct vegetative treatments in no more than 5 percent per year and 10 percent per decade of the *acres* in California spotted owl PACs in the 11 Sierra Nevada national forests until a formal monitoring and adaptive management approach is developed in coordination with the Pacific Southwest Research Station. Monitor the number of PACs treated at a bioregional scale. Update the total number of PACs to account for losses of PACs due to catastrophic events.

Rationale: These changes were needed because the Team felt that the existing standards significantly impaired the ability of local managers to successfully implement the fire and fuels strategy. These changes enhance protection for communities and limit impacts to habitat by controlling the extent of treatment within PACs, and allowing local decision makers to weigh and evaluate the risks based on consistent criteria.

BLOCK A

Northern Goshawk PACs: Activity-Related Standards and Guidelines

Fuel Treatments (ROD, Pg. A-37)

In PACs located outside the defense zone of the urban wildland intermix zone: Limit stand-altering activities to reducing surface and ladder fuels through prescribed fire treatments. In forested stands with overstory trees 11 inches dbh and greater, design prescribed fire treatments that have an average flame length of 4 feet or less. Prior to burning, conduct hand treatments, including handline construction, tree pruning, and cutting of small trees (less than 6 inches dbh), within a 1- to 2-acre area surrounding known nest trees as needed to protect nest trees and trees in their immediate vicinity.

In PACs located inside the defense zone of the urban wildland intermix zone: Prohibit mechanical treatments within a 500-foot radius buffer around nest trees. Allow prescribed burning within the 500-foot radius buffer. Prior to burning, conduct hand treatments, including handline construction, tree pruning, and cutting of small trees (less than 6 inches dbh), within a 1- to 2-acre area surrounding known nest trees as needed to protect nest trees and trees in their immediate vicinity. The remaining area of the PAC may be mechanically treated to achieve the fuels reduction outcomes described for the general forest land allocation.

Conduct mechanical treatments in no more than 5 percent per year and 10 percent per decade of the northern goshawk PACs in the 11 Sierra Nevada national forests until a formal monitoring and adaptive management study is developed in coordination with the Pacific Southwest Research Station.

BLOCK B

Northern Goshawk PACs: Activity-Related Standards and Guidelines

Fuel Treatments

In PACs located outside the defense zone of the wildland urban intermix zone use prescribed fire treatments to address fuels and forest health issues with the following exception: Mechanical treatments are allowed where prescribed fire is not feasible, and where avoiding PACs would significantly compromise the overall effectiveness of the landscape fire and fuels strategy. Design mechanical treatments to maintain habitat structure and function of the PAC.

In PACs where mechanical treatment is necessary: Prohibit mechanical treatments within a 500-foot radius buffer around nest trees. Allow prescribed burning within the 500-foot radius buffer. Prior to burning, conduct hand treatments, including handline construction, tree pruning, and cutting of small trees, within a 1- to 2-acre area surrounding known nest trees as needed to protect nest trees and trees in their immediate vicinity.

Conduct mechanical treatments in no more than 5 percent per year and 10 percent per decade of the *acres in* northern goshawk PACs in the 11 Sierra Nevada national forests until a formal monitoring and adaptive management study is developed in coordination with the Pacific Southwest Research Station.

Rationale: Same as for California spotted owl above.

Home Range Core Areas

Home Range Core Areas are established around and adjacent to PACs. HRCA sizes vary across the bioregion. HRCA boundaries are determined locally and encompass the highest quality owl habitat available. The desired condition for these areas is to provide high quality nesting, roosting, and foraging habitat to complement habitat within the PAC. Vegetation treatments may occur within these areas. Existing direction prescribes three different intensities of mechanical treatment that can occur in HRCAs based on location and habitat condition. The Team recommends using a set of forest-wide standards and guidelines for thinning in HRCAs. These standards and guidelines should result in generally lower diameter limits for HRCAs in defense zones due to basal area retention requirements. For HRCAs in threat zones, diameter limits are expected to be similar to existing direction where HCRA habitat requirements are met and probably higher where habitat requirements are not met. Again this is due to the proposed basal area retention guidelines. All thinning treatments within the HRCA provide for an important habitat element by retaining 5 percent or more of the existing understory canopy structure, which is important for prey habitat.

BLOCK A

California Spotted Owl Home Range Core Areas

Fuel Treatments (ROD, Pg. A-43)

California spotted owl home range core areas are unmapped forest-wide land allocations. The standards and guidelines in this section provide direction for designating and managing California spotted owl home range core areas.

Home range core areas include California spotted owl PACs and overlap other mapped and unmapped land allocations. Where home range core areas overlap with northern goshawk PACs or den site buffers, standards and guidelines for northern goshawk PACs and den site buffers supercede standards and guidelines for California spotted owl home range core areas. Standards and guidelines for California spotted owl home range core areas are identical to those for old forest emphasis areas. Where home range core areas overlap with the southern Sierra fisher conservation area, standards and guidelines for California spotted owl home range core areas apply. Management direction for overlapping riparian conservation areas, meadows, and critical aquatic refuges complements California spotted owl home range core area management direction; in these overlaps, the standards and guidelines of both allocations apply.

Fuel treatment standards and guidelines for the defense zone (outside of wilderness areas and wild and scenic river areas) of the urban wildland intermix zone supersede fuel treatment standards and guidelines for California spotted owl home range core areas where these allocations overlap. Fuel treatment standards and guidelines for the threat zone (outside of wilderness areas and wild and scenic river areas) of the urban wildland intermix zone usually supersede fuel treatment standards and guidelines for California spotted owl home range core areas where these allocations overlap. However, fuel treatments within the threat zone must satisfy specific habitat requirements for home range core areas (refer to standards and guidelines for the threat zone).

BLOCK B

California Spotted Owl Home Range Core Areas

Fuel Treatments

California spotted owl home range core areas are unmapped forest-wide land allocations. The standards and guidelines in this section provide direction for designating and managing California spotted owl home range core areas.

Home range core areas include California spotted owl PACs and overlap other mapped and unmapped land allocations. Where home range core areas overlap with northern goshawk PACs or den site buffers, standards and guidelines for northern goshawk PACs and den site buffers supersede standards and guidelines for California spotted owl home range core areas. *Standards and guidelines applicable to vegetation management activities within California spotted owl home range core areas are the same as the forest-wide standards and guidelines.* Management direction for overlapping riparian conservation areas, meadows, and critical aquatic refuges complements California spotted owl home range core area management direction; in these overlaps, the standards and guidelines of both allocations apply.

Rationale: Edited for clarity.

Vegetation Management and Thinning

Under existing direction, prescribed fire and mechanical treatment are the two primary methods of managing vegetation.

Thinning can be used to address many objectives. Some of these include: reducing hazardous fuel loadings, reducing stand densities to make forest vegetation more resistant to large scale insect and disease outbreaks, and safely reintroducing fire. The Team recommends the same overall amount of thinning, approximately 96,000 acres, that is contemplated under the existing plan. These acres of thinning represent projects with objectives of fuel reduction, forest health, or ecosystem restoration.

Proposed guidelines for thinning include a maximum diameter limit of 30 inches dbh, and the requirement to retain a certain proportion of the existing basal area of a stand in the largest trees. This requirement results in a "sliding" diameter limit adjusted for stand type and condition that, for many stands, is less than the 30-inch maximum. The recommendations also include a requirement to retain some understory vegetation after treatment. This allows local field practitioners to balance fuels and/or forest health objectives with habitat considerations according to each project's site-specific conditions.

The significant advantage of these recommendations is that they eliminate much of the overlap that served as a barrier to accomplishing effective fuels treatments.

BLOCK A

Forest-wide Standards and Guidelines

Fuel Treatments in Forested Stands of Large Trees with Moderate to Dense Canopy Cover (ROD, Pg. A-26)

Identify stands larger than 1 acre classified as California Wildlife Habitat Relationships (CWHR) 5M, 5D, and 6.

The following standards and guidelines apply to forested patches or stands larger than 1 acre identified as CWHR 5M, 5D, and 6 that are located outside the defense zone of the urban wildland intermix zone:

Design mechanical fuel treatments to remove the material necessary to achieve the following outcomes:

- Stands with less than 40 percent canopy cover: Over 75 percent of the stand area, achieve an average live crown base height of 15 feet and an average flame length of 6 feet or less if the stand was to burn under 90th percentile fire weather conditions.
- Stands with 40 to 70 percent canopy cover: Over 75 percent of the stand area, achieve an average live crown base height of 20 feet and an average flame length of 6 feet or less if the stand was to burn under 90th percentile fire weather conditions.
- Stands with greater than 70 percent canopy cover: Over 75 percent of the stand area, achieve an average live crown base height of 25 feet and an average flame length of 6 feet or less if the stand was to burn under 90th percentile fire weather conditions.

To enhance stand heterogeneity and to maintain intact biological processes, particularly soil biota that may be affected by mechanical treatments, do not mechanically treat the remaining 25 percent of the stand area.

Design mechanical treatments to achieve or approach the fuels outcomes described above by removing surface and ladder fuels less than 12 inches dbh. Allow incidental felling of trees between 12 and 20 inches dbh where required for operability. Retain felled trees on the ground where needed to achieve down woody material standards of 10 to 20 tons per acre in logs greater than 12 inches diameter at midpoint.

Do not reduce canopy cover in dominant and co-dominant trees by more than 10 percent across a stand following mechanical treatments. (For example, if canopy cover in a stand's dominant and co-dominant trees is 80 percent, retain at least 70 percent canopy cover in dominant and co-dominant trees following mechanical treatment.)

In westside forest types, where pre-treatment canopy cover is between 50 and 59 percent, design mechanical treatments to retain a minimum of 50 percent canopy cover in dominant and co-dominant trees. Do not reduce canopy cover in stands that currently have between 40 and 50 percent canopy cover, except where canopy cover reductions result from removing shade-tolerant trees less than 6 inches dbh. In the eastside pine forest type, retain a minimum of 30 percent canopy cover.

For prescribed fire treatments, use multiple entries as needed to achieve fuels management objectives, up to two burns per decade and four burns over 20 years.

Large Tree Retention (ROD, Pg. A-28)

When implementing vegetation and fuels treatments, retain all live conifer trees with a dbh of 30 inches or greater in westside forest types and 24 inches or greater in the eastside pine forest type. Retain montane hardwoods with a dbh of 12 inches or larger in westside forest types. Occasional

mortality of larger trees is expected to occur; however, design prescribed burn prescriptions and techniques to minimize the loss of large trees and large down material.

Old Forest Emphasis Areas: Activity-Related Standards and Guidelines

Fuel Treatments (ROD, Pgs. A-40 through A-42)

Give priority to restoring historic fire return intervals where possible. Emphasize fire restoration in pine and mixed conifer forests. In mixed conifer forests, fire return intervals vary by aspect and topographic position, with most frequent burning on south- and west-facing aspects.

Emphasize fuel treatments in stands at lower elevations with high fire hazard in the pine, mixed conifer, eastside pine, and eastside mixed conifer forest types. Emphasize fuel treatments on the upper two-thirds of south- and west-facing aspects near roads. Use mechanical treatments where fire managers determine a high potential for: (1) prescribed fire escape due to excessive fuel accumulations; (2) unacceptable smoke impacts; or (3) canopy cover and old forest structure loss due to excessive surface and ladder fuels.

Design mechanical fuel treatments to remove the material necessary to achieve the following outcomes:

- Stands with less than 40 percent canopy cover: Over 75 percent of the stand area, achieve an average live crown base height of 15 feet and an average flame length of 6 feet or less if the stand was to burn under 90th percentile fire weather conditions.
- Stands with 40 to 70 percent canopy cover: Over 75 percent of the stand area, achieve an average live crown base height of 20 feet and an average flame length of 6 feet or less if the stand was to burn under 90th percentile fire weather conditions.
- Stands with greater than 70 percent canopy cover: Over 75 percent of the stand area, achieve an average live crown base height of 25 feet and an average flame length of 6 feet or less if the stand was to burn under 90th percentile fire weather conditions.

To enhance stand heterogeneity and to maintain intact biological processes, particularly soil biota that may be affected by mechanical treatments, do not mechanically treat the remaining 25 percent of the stand area.

Where mechanical treatments are necessary, design treatments to achieve or approach the fuels outcomes described above by reducing surface and ladder fuels less than 12 inches dbh. Apply treatments to enhance stand heterogeneity. Allow incidental felling of trees between 12 and 20 inches dbh where required for operability. Retain felled trees on the ground where needed to achieve down woody material standards of 10 to 20 tons per acre in logs greater than 12 inches diameter at midpoint.

Do not reduce canopy cover in dominant and co-dominant trees by more than 10 percent across a stand following mechanical treatments. (For example, if canopy cover in a stand's dominant and co-dominant trees is 80 percent, retain at least 70 percent canopy cover in dominant and co-dominant trees following mechanical treatment.)

In westside forest types, where pre-treatment canopy cover in dominant and co-dominant trees is between 50 and 59 percent, design mechanical treatments to retain a minimum of 50 percent canopy cover. Do not reduce canopy cover in stands that currently have between 40 and 50 percent canopy cover in dominant and co-dominant trees, except where canopy cover reductions result from removing primarily shade-tolerant trees less than 6 inches dbh. In the eastside pine forest type, retain a minimum of 30 percent canopy cover.

Strategically placed area fuel treatments may be needed in old forest emphasis areas to minimize risks to human life and property, sensitive resources, or the old forest emphasis area from loss to wildfire. When treatments are necessary, prescribed fire is the first priority for achieving the fuels objectives. When prescribed fire will not achieve fuels objectives, use mechanical thinning as

described in the preceding paragraphs to achieve the fuels objectives. When this treatment will not achieve the fuels objectives due to existing stand conditions, mechanical thinning of trees up to 20 inches dbh and canopy reductions of up to 20 percent (refer to mechanical treatment standards and guidelines for the threat zone) may be conducted in CWHR 4M and 4D stands to meet fuels reduction objectives.

Conduct an analysis of suitable owl habitat before applying mechanical treatments that remove trees up to 20 inches dbh and reduce canopy cover up to 20 percent in old forest emphasis areas. This type of treatment may only be used when sufficient suitable owl habitat exists within 1½ miles of a California spotted owl nest site or activity center to satisfy the requirements of a home range core area, as described in the standards and guidelines for delineating California spotted owl home range core areas. This type of treatment may not be applied within 1½ miles of the nest site or activity center if the requirements for delineating a home range core area cannot be met. Document this site-specific analysis in the environmental analysis.

California Spotted Owl Home Range Core Areas: Activity-Related Standards and Guidelines

Fuel Treatments (ROD, Pg. A-44)

Fuel treatment standards and guidelines for California spotted owl home range core areas are identical to those presented for old forest emphasis areas above, except for the urban wildland intermix.

Defense Zone of the Urban Wildland Intermix Zone: Activity-Related Standards and Guidelines

Fuel Treatments (ROD, Pg. A-46)

Design mechanical fuel treatments to remove the material necessary to achieve the following outcomes:

- Stands with less than 40 percent canopy cover: Over 90 percent of the stand area, achieve an average live crown base height of 15 feet and an average flame length of 4 feet or less if the stand was to burn under 90th percentile fire weather conditions.
- Stands with 40 to 70 percent canopy cover: Over 90 percent of the stand area, achieve an average live crown base height of 20 feet and an average flame length of 4 feet or less if the stand was to burn under 90th percentile fire weather conditions.
- Stands with greater than 70 percent canopy cover: Over 90 percent of the stand area, achieve an average live crown base height of 25 feet and an average flame length of 4 feet or less if the stand was to burn under 90th percentile fire weather conditions.

To enhance stand heterogeneity, do not mechanically treat the remaining 10 percent of the stand area.

Achieve the fuels outcomes described above through thinning from below to remove surface and ladder fuels.

Threat Zone of the Urban Wildland Intermix Zone: Activity-Related Standards and Guidelines

Fuel Treatments (ROD, Pgs. A-47 and A-48)

Design mechanical fuel treatments to remove the material necessary to achieve the following outcomes:

- Stands with less than 40 percent canopy cover: Over 85 percent of the stand area, achieve an average live crown base height of 15 feet and an average flame length of 6 feet or less if the stand was to burn under 90th percentile fire weather conditions.

- Stands with 40 to 70 percent canopy cover: Over 85 percent of the stand area, achieve an average live crown base height of 20 feet and an average flame length of 6 feet or less if the stand was to burn under 90th percentile fire weather conditions.
- Stands with greater than 70 percent canopy cover: Over 85 percent of the stand area, achieve an average live crown base height of 25 feet and an average flame length of 6 feet or less if the stand was to burn under 90th percentile fire weather conditions.

To enhance stand heterogeneity, do not mechanically treat the remaining 15 percent of the stand area.

Design mechanical treatments to achieve the fuels outcomes described above through understory thinning to remove surface and ladder fuels up to 20 inches dbh. Focus treatments on removing suppressed and intermediate trees. Apply treatments to enhance stand heterogeneity. When conducting treatments in dense stands with uniform tree size and spacing, introduce heterogeneity into such stands by creating small (typically less than 1 acre), irregularly-spaced openings. Canopy cover reductions may be needed to meet fuels objectives, but do not exceed a 20 percent reduction in the dominant and co-dominate trees. (For example, a stand's canopy cover may be reduced from a pre-treatment level of 70 percent down to 50 percent to meet fuels objectives.)

In westside forest types, where pre-treatment canopy cover is between 50 and 59 percent, design mechanical treatments to retain a minimum of 50 percent canopy cover in dominant and co-dominant trees. In stands that currently have between 40 and 50 percent canopy cover, do not reduce canopy cover except where canopy cover reductions result from removing primarily shade-tolerant trees less than 6 inches dbh. In the eastside pine forest type, retain a minimum of 30 percent canopy cover.

For prescribed fire treatments, use multiple entries as needed to achieve fuels management objectives, up to two burns per decade and four burns over 20 years.

Conduct an analysis of suitable owl habitat around activity centers before applying the mechanical treatments described above. If sufficient suitable owl habitat exists within 1½ miles of the activity center to satisfy the home range core area delineation standards and guidelines, the area outside the PAC may be treated as described above. The mechanical treatments described above may not be applied within 1½ miles of the nest site or activity center where the requirements of a home range core area cannot be met; however, these areas may be treated according to the mechanical fuel treatment standards and guidelines for old forest emphasis areas. Document this site-specific analysis in the environmental analysis.

General Forest Activity-Related Standards and Guidelines

Fuel Treatments (ROD, Pgs. A-49 and A-50)

Design mechanical fuel treatments to removing the material necessary to achieve the following outcomes:

- Stands with less than 40 percent canopy cover: Over 75 percent of the stand area, achieve an average live crown base height of 15 feet and an average flame length of 6 feet or less if the stand was to burn under 90th percentile fire weather conditions.
- Stands with 40 to 70 percent canopy cover: Over 75 percent of the stand area, achieve an average live crown base height of 20 feet and an average flame length of 6 feet or less if the stand was to burn under 90th percentile fire weather conditions.
- Stands with greater than 70 percent canopy cover: Over 75 percent of the stand area, achieve an average live crown base height of 25 feet and an average flame length of 6 feet or less if the stand was to burn under 90th percentile fire weather conditions.

To enhance stand heterogeneity, do not mechanically treat the remaining 25 percent of the stand area.

Design mechanical treatments to achieve the fuels outcomes described above through understory thinning to remove surface and ladder fuels up to 20 inches dbh. Focus treatments on removing suppressed and intermediate conifer trees. Apply treatments to enhance stand heterogeneity. When conducting treatments in dense stands with uniform tree size and spacing, introduce heterogeneity into such stands by creating small (typically less than one acre), irregularly-spaced openings. Canopy cover reductions may be needed to meet fuels objectives, but do not exceed a 20 percent reduction in dominant and co-dominant trees. (For example, a stand's canopy cover may be reduced from a pre-treatment level of 70 percent down to 50 percent to meet fuels objectives.)

In westside forest types, where pre-treatment canopy cover is between 50 and 59 percent, design mechanical treatments to retain a minimum of 50 percent canopy cover in dominant and co-dominant trees. In stands that currently have between 40 and 50 percent canopy cover, do not reduce canopy cover of the dominant and co-dominant trees during fuels treatments, except where canopy cover reductions result from removing primarily shade-tolerant trees less than 6 inches dbh. In the eastside pine forest type, retain a minimum of 30 percent canopy cover.

For prescribed fire treatments, use multiple entries as needed to achieve fuels management objectives, up to two burns per decade and four burns over 20 years.

BLOCK B

Forest-wide Standards and Guidelines

Vegetation Management Treatments in Mature Forest Habitat

Mechanical Thinning:

The following standards and guidelines apply when mechanical thinning treatments are conducted in CWHR Classes 4M, 4D, 5M, 5D, and 6.

Design projects to retain 40 percent of the existing basal area, consisting of the largest trees in each treatment unit. The intent is to maintain and develop old forest habitat conditions by leaving the largest trees on site.

Design projects to retain all live trees 30 inches in DBH or larger. The intent here is to ensure recruitment for very large trees across the landscape.

Where available, design projects to retain 5 percent or more of the total post-treatment canopy cover in lower layers composed of trees 6 to 24 inches DBH within the treatment unit. The intent is to allow project designers to address and balance the need to provide and develop under-story structure as an important old forest habitat component, with the need to reduce ladder and crown fuels to restore historic fire regimes.

Where vegetative conditions permit, design projects to retain 50 percent canopy cover after treatment within the treatment unit, except where site-specific project objectives cannot be met (for example, to achieve adequate height-to-live-crown, to provide sufficient spacing for equipment operation, or to minimize re-entry). The intent is to maintain high levels of canopy cover whenever it is possible to do so and still meet project objectives.

Where 50 percent retention cannot be met as described above, design projects to retain a minimum of 40 percent canopy cover within the treatment unit.

When pre-treatment canopy cover is at or near 40 percent, remove only ladder fuels to achieve project fuels objectives. The intent here is to maintain canopy closure conditions suitable for dispersal and foraging for California spotted owls, while also allowing effective fuel treatments.

Design projects to avoid reducing pre-existing canopy cover by more than 30 percent within the treatment unit. Percent is measured in absolute terms (for example, do not reduce 60 percent canopy closure to less than 30 percent). The intent here is to avoid overly large changes in canopy density.

Differences for eastside pine vegetation types:

Design projects to retain 30 percent of the existing basal area, consisting of the largest trees in each treatment unit. The intent is to maintain and develop eastside old forest habitat conditions by leaving the largest trees on site.

There is no canopy cover retention standard for eastside pine vegetation types. Develop project specific canopy cover retention objectives based on landscape conditions and local desired condition.

Mechanical Thinning in other CWHR Classes:

For mechanical thinning treatments in CWHR Classes other than those mentioned above, design projects to retain all live trees 30 inches in DBH or larger. The intent here is to ensure recruitment for very large trees across the landscape and to develop and maintain

spotted owl nesting habitat.

Projects will be designed using standard regional techniques as developed and updated by the Pacific Southwest Regional Office.

Local interdisciplinary teams will design fuel reduction projects to achieve the standards in the table below. These are reference standards for the desired flame length and torching index objectives. These surface fuel standards apply to fuels treatment units.

Forest-wide Surface and Ladder Fuel Standards			
Treatment Units in Conifer Forest Types	*Minimum*	*Average*	*Maximum*
Height to live crown base height (feet)	*10*	*20*	*NA*
0 to 3 inch surface fuel load (tons/acre)	*5*	*10*	*12*
Treatment Units in Hardwood and Plantation Vegetation Types	*Minimum*	*Average*	*Maximum*
Height to live crown base height (feet)	*4*	*6*	*NA*
0 to 3 inch surface fuel load (tons/acre)	*5*	*10*	*12*

Crown base height may vary by slope and modeled fire behavior. The numbers shown for live crown base height in the above tables were based on the following assumptions: 0 percent slope; mid-flame wind speed of 5 miles per hour; 3 percent fuel moisture for 1-hour fuels; 4 percent fuel moisture for 10-hour fuels; 5 percent fuel moisture for 100-hour fuels; and 70 percent live foliar moisture.

Rationale: Existing direction is overly prescriptive and limits cost efficient treatments that adequately and effectively moderate fire behavior. The recommended changes retain the existing ROD's approach of providing standards and guidelines designed to limit potential effects of thinning treatments on old forest habitat important to California spotted owls and other wildlife. However, the recommended standards and guidelines, along with more appropriate fuels treatment objectives, provide more flexibility to tailor treatments to site-specific conditions than the existing direction. The expectation is that these changes will enhance the ability of local managers to effectively meet the goals of the ROD's fire and fuels strategy to reduce the size and severity of large wildland fires.

The proposed limits on the intensity of thinning are not intended to maintain fully functioning owl habitat within treated areas in the short-term. Rather, they are intended to maintain habitat elements that are rare and likely important components of the landscape that take a long time to replace. The standards are designed to ensure that treated areas return to their pre-treatment habitat condition or better within 10 to 20 years. The Team's expectation is that these limits, combined with the effects of reducing size and severity of wildland fires, will minimize short-term adverse effects while providing for increases in habitat for old forest dependent species, especially California spotted owls, over time.

Other Management Direction for Fuels Reduction

The Team identified needs for additional clarification for the following elements of the Fire and Fuels Strategy: delineation of the wildland urban intermix and fuels treatments in hardwood stands, plantations, and shrubfields.

In the spirit of collaborative work, we recommend using common terminology from the National Fire Plan. A change of terminology from “urban wildland intermix” to “ wildland urban intermix” provides for clear understanding between interagency partners as well as local project planning and reporting for all agencies.

BLOCK A

Designating the Defense Zone (ROD, Pg. A-46)

The urban wildland intermix zone is shown on the Modified Alternative 8 map included in the FEIS. While this map displays an approximate location for the defense zone, each national forest is responsible for locally delineating the actual boundaries of the defense zone. Defense zones extend approximately ¼ mile from areas that have a high density (approximately one structure per 5 acres) of structures, residences, commercial buildings, and administrative sites with facilities.

Designating the Threat Zone (ROD, Pg. A-47)

A threat zone of the urban wildland intermix zone is shown on the Modified Alternative 8 map included in the FEIS. While this map displays an approximate location for the threat zone, each national forest is responsible for locally delineating the actual boundaries of the threat zone. The threat zone normally buffers the defense zone: it extends approximately 1¼ mile out from the defense zone. In some cases, where structure density is less than one structure per 5 acres and greater than one structure per 40 acres, a threat zone may be delineated in the absence of a defense zone. The actual width of the threat zone is based on local fuel conditions, weather, topography, and existing barriers to fire spread.

BLOCK B

Designating Wildland Urban Intermix Zones

Areas around communities, homes, and assets at risk from wildland fire are prioritized for treatment by delineating a Wildland Urban Intermix (WUI) zone, which includes a defense zone and a threat zone. These areas are analyzed using local fire behavior conditions, rates of spread, and historical fires to establish the planning fire-shed or fire-scape.

The Wildland Urban Intermix is an area where human habitation is mixed with areas of flammable wildland vegetation. It extends out from the edge of developed private land into Federal, private, and State jurisdictions. The actual boundaries of the WUI are determined locally, based on the actual distribution of structures, assets, and communities adjacent to or intermixed with national forest lands. Strategic landscape features that support wildland fire suppression, such as roads, changes in fuel, and topography, are used to delineate the physical boundary of the wildland urban intermix zone. Whenever possible local government, fire safe councils, local fire protection, homeowners groups, and adjacent federal partners should be involved in a collaborative process that determines the WUI. Target areas for defense and threat zone treatments should be identified in this process.

Rationale: The recommended changes improve and clarify existing direction.

BLOCK A

Vegetation and Fuels Treatments in Plantations (ROD, Pg. A-25)

In plantations (timber strata classifications 0x, 1x, 2x, and 3x), apply the necessary silvicultural and fuels reduction treatments to: (1) accelerate the development of old forest characteristics, (2) increase stand heterogeneity, (3) promote hardwoods, and (4) reduce risk of loss to wildland fire. Use mechanical fuels treatments to remove the material necessary to achieve the following outcomes if the treated plantation was to burn under 90th percentile fire weather conditions: (1) wildland fire would burn with average flame lengths of 6 feet or less, (2) the rate of fire spread would be less than 50 percent of the pre-treatment rate of spread, and (3) fire line production rates would be doubled. Achieve these outcomes by reducing surface and ladder fuels and adjacent crown fuels. Treatments should be effective for more than 5 years.

Vegetation and Fuels Treatments in Shrubfields

Design mechanical treatments in brush and shrub patches to remove the material necessary to achieve the following outcomes from wildland fire under the 90th percentile fire weather conditions: (1) wildland fires would burn with an average flame length of 8 feet or less; (2) the fire's rate of spread would be less than 50 percent of the pre-treatment rate of spread; and (3) fire line production rates would be doubled. Treatments should be effective for more than 5 years.

BLOCK B

Vegetation and Fuels Treatments in Plantations

In plantations apply the necessary silvicultural and fuels reduction treatments to: (1) accelerate the development of key habitats and old forest characteristics, (2) increase stand heterogeneity, (3) promote hardwoods, and (4) reduce risk of loss to wildland fire. Use mechanical fuels treatments to remove the material necessary to achieve the following outcomes if the treated plantation was to burn under 90th percentile fire weather conditions: (1) *wildland fire would burn with average flame lengths of 2 feet or less*, (2) the rate of fire spread would be less than 50 percent of the pre-treatment rate of spread, and (3) fire line production rates would be doubled. Achieve these outcomes by reducing surface and ladder fuels and adjacent crown fuels. *Treatments should be effective for more than 10 years. Maintenance of fuels treatments in these areas should ensure that flame lengths remain non-lethal to the species identified above in developing future habitats and old forest.*

Vegetation and Fuels Treatments in Shrubfields

Design mechanical treatments in brush and shrub patches to remove the material necessary to achieve the following outcomes from wildland fire under 90th percentile fire weather conditions: (1) *wildland fires would burn with an average flame length of 4 feet or less;* (2) the fire's rate of spread would be less than 50 percent of the pre-treatment rate of spread; and (3) fire line production rates would be doubled. *Treatments should be effective for more than 10 years.*

Rationale: The recommended changes are designed to make vegetation and fuels treatments in plantations and shrubfields more effective and last longer compared to treatments designed under existing direction for these areas.

Post Fire Restoration and Salvage

The team recommends amplifying and changing the regional planning direction dealing with post fire restoration and salvage timber harvest. We believe the following recommended standards and guidelines will greatly improve and facilitate project planning efforts when and where they are undertaken.

BLOCK A

Forest-wide Standards and Guidelines

Snags and Down Woody Material (ROD, Pg. A-28)

Within westside vegetation types, beginning with the largest down logs, sequentially retain pieces of down wood until at least 10 to 20 tons pre acre are retained over a treatment unit. Within eastside vegetation types, retain at least three large logs per acre. Do not retain pieces smaller than 12 inches diameter at midpoint to meet this standard. Treatment units in the defense zone of the urban wildland intermix zone are exempt for this standard.

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.

Retain the following numbers of large snags after fuels treatments except where: (1) snag removal is needed to address imminent safety hazards and (2) snag levels are reduced as a result of incidental loss to prescribed fire. In westside mixed conifer and ponderosa pine forest types, retain four of the largest snags per acre. In the red fir forest type, retain six of the largest snags per acre. In eastside pine and eastside mixed conifer forest types, retain three of the largest snags per acre. In westside hardwood ecosystems, retain four of the largest snags (hardwood or conifer) per acre. Where standing live hardwood trees lack dead branches, retain six of the largest snags per acre, where they exist, to supplement wildlife needs for dead material. Use snags larger than 15 inches dbh to meet this standard. Evaluate snag density on a 10-acre basis. The defense zone of the urban wildland intermix zone and developed recreation sites are exempt form this standard and guideline.

Old Forest Emphasis Areas: Activity-Related Standards and Guidelines Fuels Treatments (ROD, Pg. A-42)

Retain all snags 15 inches or greater except following stand-replacing events and 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.

BLOCK B

Forest-wide Standards and Guidelines

Post Fire Restoration Activities

After wildfires, when forests determine the need, design and undertake projects to manage long-term fuel profiles, restore habitat, and recover commercial value of some of the fire killed timber. When planning restoration, local managers must carefully consider the balance between long-term benefits and short-term impacts. This balance is impossible to prescribe at the bioregional level. It can only be addressed on a site-specific basis, with the assistance of project interdisciplinary teams. The following guidelines are intended to provide consistent principles and objectives that local managers can use in making these difficult decisions.

In post fire restoration projects for large catastrophic fires (contiguous blocks of moderate to high fire severity of 1000 acres or more) do not conduct salvage harvest in at least 10 percent of the total area affected by *fire. Where consistent with overall restoration objectives*, this un-salvaged acreage should be comprised of vegetation classified as CWHR size class 5 or 6 prior to the burn. *If needed,* consider using vegetation *classified as CWHR size class 4 to reach the 10-percent level. Retention areas should be a minimum of 40 acres in size and strategically located to balance ecological values over the short- and long-term with fire and fuels management objectives and opportunities. The intent is to leave some areas of high-density large snags to meet the needs of post-fire opportunistic species. This standard and guideline does not apply to the defense zone of the wildland urban intermix zone.*

Design projects to reduce potential soil erosion and the loss of soil productivity caused by the loss of vegetation and ground cover. Examples are activities that would:

Provide for adequate soil cover in the short term.

Accelerate the dispersal of coarse woody debris.

Reduce the potential impacts of the fire on water quality.

Carefully plan restoration/salvage activities to minimize additional short term effects.

Design projects to protect and maintain critical wildlife habitat. Examples are activities that would:

Avoid areas where forest vegetation is still largely intact.

Provide for sufficient quantities of large snags.

Maintain existing large woody material as needed.

Providing for additional large woody material and ground cover as needed.

Accelerate development of mature forest habitat through reforestation and other cultural means.

Provide for a mix of seral stages over time.

Design projects to manage the development of fuel profiles over time. Examples are activities that would:

Remove sufficient standing and activity generated material to balance short-term and long-term surface fuel loading.

Protect remnant old forest structure (surviving large trees, snags, and large logs) from high

severity re-burns in the future.

Design projects to recover the value of timber killed or severely injured by the fire. Examples are activities that would:

Conduct timber salvage harvest in a timely manner to minimize value loss.

Minimize harvest costs within site-specific resource constraints.

Remove material that local managers and interdisciplinary teams determine is not needed for long-term resource recovery needs.

General Salvage

Removal and utilization of dead and dying trees to recover value, and support vegetation management objectives is permitted. Projects must carefully weigh habitat needs of wildlife when planning this activity.

The following are standards and guidelines that will be applied across the 11 Sierra Nevada national forests.

Use the best available information on determining tree mortality for the purpose of salvage as developed by the Pacific Southwest Region Forest Health Protection Staff.

Outside of the defense zone of the wildland urban intermix zone, salvage harvests are prohibited in protected activity centers and known den sites unless a biological evaluation determines these designated areas are rendered unsuitable for the purpose they were intended by a catastrophic stand-replacing event, and surveys conducted to protocol confirm non-occupancy. Surveys need not be conducted if the stand-replacing event has essentially destroyed all vegetation within the PAC or den site.

In Old Forest Emphasis Areas the potential for benefit to species associated with old forest conditions from salvage is greatest when large, stand-replacing events are involved. Salvage in disturbed sites of 10 acres or less is usually not appropriate because small forest openings are an important component of old-growth forests.

Snags and Down Woody Material

Down woody material retention levels shall be determined on an individual project basis for vegetation treatments. Within westside vegetation types, generally design projects to retain an average of 10 to 15 tons of large down wood per acre over the treatment unit. Within eastside vegetation types, generally design projects to retain an average of three large down logs per acre. Emphasize retention of wood in the earliest decay stages. Consider the effects of follow-up prescribed fire in achieving desired down wood retention levels.

Snag retention levels shall be determined on an individual project basis for vegetation treatments. Design projects to implement and sustain a generally continuous supply of snags and live decadent trees suitable for cavity nesting wildlife across a landscape. Retain some mid and large diameter live trees that are currently in decline, have substantial wood defect, or that have desirable characteristics (teakettle branches, large diameter broken top, large cavities in the bole) to serve as future replacement snags and to provide nesting structure. When determining snag retention levels, consider land allocation, desired condition, landscape position, and site conditions (such as riparian areas and ridge tops), avoiding uniformity across large areas.

General guidelines for large-snag retention are as follows:

- *In westside mixed conifer and ponderosa pine types, four of the largest snags per acre should be retained.*

- *In the red fir forest type, six of the largest snags per acre should be retained.*
- *In eastside pine and eastside mixed conifer forest types, three of the largest snags per acre should be retained.*
- *In westside hardwood ecosystems, four of the largest snags (hardwood or conifer) per acre should be retained.*

Where standing live hardwood trees lack dead branches, six of the largest snags per acre should be retained, where they exist, to supplement wildlife needs for dead material.

Use snags larger than 15 inches dbh to meet this guideline. Snags should be clumped and distributed irregularly across the treatment units. Consider leaving fewer snags strategically located in treatment areas within the wildland urban intermix zone. While some snags will be lost due to hazard removal, or the effects of prescribed fire, consider these potential loses during project planning to achieve desired snag retention levels.

Rationale: The salvage standard and guidelines provide for the timely harvest of dead and dying trees outside of functioning PACs and den sites, and in excess of habitat needs as determined by project level environmental analysis. This tool is made available to a wider set of vegetation management projects beyond fuels treatments to capture the economic value of trees to offset the cost of removal and other project objectives. Snag and down woody material guidelines provide for greater flexibility to increase or decrease retention of these important habitat components to adjust projects commensurate with land allocation, desired condition, and local existing conditions. This change should produce no difference in expected snag and down woody debris levels from those in the existing direction.

HFQLG Pilot Project

The HFQLG Pilot Project takes a different approach than is being proposed across the remainder of the Sierra Nevada national forests. The primary differences are the land allocations, standards and guidelines for some Sensitive species, the fire and fuels strategy, and a program of forest gap regeneration. There are also some subtle differences in management of protected activity centers for the California spotted owl. The Team recommends continuing the Lassen/Plumas Administrative Study.

The HFQLG Forest Recovery Act directs the Forest Service to implement the Pilot Project to test its effectiveness. The Pilot Project represents a "locally-developed, consensus-based resource management program". This program seeks protection of ecological values and provision of environmentally acceptable commodity production. A review of the congressional record shows that there was an understanding of the untested nature of some of the forest management activities included in the Pilot Project. In addition, there was also considerable discussion of the scientific uncertainty regarding the environmental outcomes of those activities. The intent was that the Pilot Project would provide information needed to reduce this uncertainty, and ascertain if the proposed resource management activities created beneficial outcomes. A post-Pilot Project evaluation by an independent panel of scientists is to be completed to determine its effectiveness. The intent of our recommendation is to take full advantage of the Pilot Project as an adaptive management opportunity to test different solutions to some of the key problem areas addressed under the SNFPA. This adaptive management fits well within the intent and authority of the HFQLG Forest Recovery Act of 1998. To accomplish this, the following changes to existing direction are recommended:

- Return land allocations within the Lassen and Plumas National Forests, and the Sierraville Ranger District of the Tahoe National Forest, to those that were determined in the HFQLG ROD signed (August, 1999).
- Return standards and guidelines for the northern goshawk, pacific fisher, and marten to those established in the HFQLG ROD.
- Implement the recommended integrated vegetation/owl management strategy with the following exceptions:
    1. The fire and fuels strategy from the HFQLG Act will be implemented consisting of a network of Defensible Fuel Profile Zones followed by treatment across the landscape.
    2. Implement a program of forest gap regeneration across 0.57 percent of the land-base, as required under the Act.

Land Allocations: The Act made specific land allocations for the Pilot Project as part of a comprehensive approach to addressing conservation of old forest resources. 466,433 acres of land is declared "off base" with respect to any type of timber harvest. An additional 60,424 acres of late successional old growth rank 4 and 5 patches as identified in the Sierra Nevada Ecosystem Project are also deferred from timber harvest or mechanical fuel treatment. This represents about 26 percent of the available land-base that is set aside in reserves during the period of the Pilot Project. This closely resembles the Old Forest Emphasis Area land allocation in Alternative 6 of the FEIS. Modified Alternative 8 greatly expanded this allocation. The Team recommends restoring land allocations within the affected national forests to those that were adopted by the HFQLG Record of Decision signed (August, 1999). The PACs and HRCAs specified under the SNFPA would apply in the Pilot Project area.

Other Sensitive Species: The impacts of Pilot Project activities were evaluated in the HFQLG FEIS. The biological evaluation indicated that standards and guidelines in place at the time (17 months prior to the SNFPA ROD) provided sufficient protection to northern goshawk, pacific fisher, and martin to avoid significant adverse effects. The SNFPA changed these guidelines, and as a result they limit the implementation of some of the resource management activities that are to be tested under the act. The Team recommends restoring the original standards and

guidelines for northern goshawk, pacific fisher, and martin that were in place at the time the HFQLG ROD was signed.

Vegetation Management: Vegetation management within the Pilot Project is constrained to activities specified in the HFQLG Act. Primarily these consist of thinning to construct a network of shaded fuel breaks termed defensible fuel profile zones, and forest gap regeneration (known as group selection under the HFQLG Act), and individual tree selection.

Fire and Fuels Strategy: The fire and fuels strategy for the Pilot Project takes a different approach than that envisioned elsewhere in the Sierra Nevada. It places first priority on building a network of Defensible Fuel Profile Zones as the first step in a longer-term plan. As described in the SNFPA ROD[115], DFPZs are located around communities and in addition, along strategic locations for fire suppression activity such as roads and ridges. The concept is to create a strategic network of DFPZs to provide anchor points that facilitate safe and effective fire suppression action, and prescribed fire activities. Once the DFPZ network is in place, the strategy moves to strategically placing treatments across the remainder of the landscape. This approach is based on the one outlined in the SNEP Final Report to Congress (Weatherspoon and Skinner, 1996). Proposed DFPZs have been prioritized based on fire frequency and hazards to communities and habitat. The primary objective is to protect communities, and at the same time protect wildlife habitat by limiting the size of catastrophic stand replacing fires across the broader landscape.

Treatments in DFPZs in the HFQLG pilot project are intended to function in the same way as treatments in the Defense Zone in the existing direction. Thinning activity associated with implementing the Pilot Project would continue at the same level as existing direction, an approximate average of 23,000 acres annually for the first decade (1.1 percent of the landbase). As part of the integrated vegetative management strategy, the standards for thinning recommended elsewhere in the Sierras would be applied to all thinning activity in the Pilot Project area.

Forest Gaps: Under the HFQLG Act, forest gap regeneration (group selection) is set at .57 percent of the available land-base. This activity was analyzed in the HFQLG FEIS, and a goal of 8,700 acres annually was established. This rate represents an average rotation of 175 years. The intent is to vary the rate according to site capability, managing the poorer sites for 200-year old trees, and the more productive sites for 150-year old trees. Our recommendation is to adopt the program adopted under Alternative 2 in the HFQLG FEIS. A key objective of the Pilot Project is to schedule and accomplish approximately 8,700 acres of forest gaps annually.

Protected Activity Centers: During the term of the Pilot Project, no mechanical treatment to reduce hazardous fuels may occur within spotted owl PACs. Only light under-burning to enhance old forest conditions and suitability of spotted owl habitat are allowed over the life of the project. Hand treatments (chainsaw) in support of under-burning would be permitted.

Home Range Core Areas: Home range core areas designated under the existing direction would remain, and they would be managed the same as elsewhere in the Sierras under the Team's recommendations.

[115] SNFPA ROD, Pg. A-13.

Impacts to Grazing

Recommended Standards and Guidelines

From a manager's perspective, the primary issue for grazing was the lack of flexibility in the existing direction. The Team believes many workable solutions can be developed for managing grazing and habitat for sensitive species if managers are given the ability to take advantage of site-specific conditions. We recommend specific changes to the ROD standards and guidelines for four basic areas of concern:

1. Willow Flycatcher
2. Yosemite Toad
3. Great Gray Owl
4. Utilization Standards

Willow Flycatcher

BLOCK A

Willow Flycatcher Habitat

Description
Standards and guidelines for conserving the willow flycatcher are based on: (1) the 82 known willow flycatcher sites in the Sierra Nevada national forests, (2) occupied willow flycatcher habitat, and (3) emphasis habitat. Occupied habitats are meadows or riparian sites with documented willow flycatcher occupancy, unless: (1) multiple surveys, completed to protocol, document a lack of occupancy; (2) all documented occurrences are outside the regional survey protocol for determining willow flycatcher occupancy during the breeding season; or (3) habitat type conversion has occurred. Emphasis habitat is defined as meadows larger than 15 acres that have standing water on June 1 and a deciduous shrub component.

Willow Flycatcher Habitat: Activity-Related Standards and Guidelines
Evaluate proposals for new concentrated stock areas (for example, livestock handling and management facilities, pack stations, equestrian stations, and corrals) located within 5 miles of occupied willow flycatcher habitat. Apply a broad landscape-level analysis in the biological evaluation for the project to determine if such action will increase brood parasitism pressure by the brown-headed cowbird.

As part of landscape analysis, give priority to meadow restoration opportunities near or adjacent to known willow flycatcher sites.

To the extent possible, construct no new roads in potential willow flycatcher habitat. Potential willow flycatcher habitat includes: (1) occupied willow flycatcher habitat, (2) known willow flycatcher sites, (3) emphasis habitat, and (4) small, wet woody meadows (meadows less than 15 acres that have standing water on June 1 and a deciduous shrub component.

Beginning in 2001, initiate a 4-year cycle for conducting willow flycatcher surveys in all 82 known willow flycatcher sites. In the first year, conduct willow flycatcher surveys to established protocols in all 82 known willow flycatcher sites. In the second year, conduct surveys in the known sites where willow flycatchers were not found in the first-year survey. Surveys are not conducted in the third and fourth years of the cycle of all known sites. After the fourth year, repeat the 4-year survey cycle of all known sites.

If willow flycatchers are detected during the surveys of known willow flycatcher sites, eliminate livestock grazing in the entire meadow (to the forested or other upland vegetation edge), beginning 1 calendar year after the detection in this occupied known site. Use permanent or electrical fencing or otherwise ensure that livestock avoid these sites. If willow flycatchers are not detected during the surveys of known willow flycatcher sites, allow late season grazing at utilization levels based on habitat condition of these unoccupied known sites. Beginning in 2003, prohibit livestock grazing in meadows of the 82 known willow flycatcher sites where surveys have not been completed.

In unoccupied known willow flycatcher sites where late-season grazing is allowed, annually monitor utilization of riparian vegetation using regional range analysis and planning guides. Every 3 years, monitor willow flycatcher habitat using the following criteria: (1) rooting depth cores for meadow condition, (2) point intercepts for shrub foliar density, and (3) strip transects for shrub recruitment and cover. Include meadow condition assessments in geographical information systems (GIS) coverages. If habitat conditions in unoccupied known willow flycatcher sites are not supporting the willow flycatcher or are trending downward, modify or suspend grazing in these areas.

Within 3 years of signing of the record of decision for the Sierra Nevada Forest Plan Amendment Project, survey emphasis habitat within 5 miles of the 82 known willow flycatcher sites to determine willow flycatcher occupancy. Use established protocols to conduct these surveys. If these surveys detect willow flycatchers, only allow late season grazing at utilization levels assessed according to habitat condition in these occupied emphasis sites. Subsequently include these occupied emphasis sites in the 4-year survey cycle for known willow flycatcher sites described above. In addition, survey emphasis habitat within 5 miles of these new occupied sites. In emphasis habitats where these surveys do not detect willow flycatchers, apply the grazing standard and guideline for meadows (the fourth standard and guideline described under RCO #5 in section 14. *Riparian Conservation Areas*), and repeat the surveys in these areas every 3 years. If willow flycatcher surveys of emphasis habitat within 5 miles of the 82 known willow flycatcher sites are not completed within 5 years, only allow late season grazing in these emphasis habitats.

Apply late-season grazing in known willow flycatcher sites where flycatchers are not detected and in occupied willow flycatcher emphasis sites during the willow flycatcher breeding season, which extends from June 1 to August 31. These dates may be modified when multi-year monitoring data support different dates for a particular breeding location.

Evaluate site condition of known sites and emphasis habitat. Those sites that no longer contain water on June 1 and lack a deciduous shrub component may be removed from the conservation network.

The grazing standards and guidelines described in this section may be modified under a formal management study, developed in cooperation with the Pacific Southwest Region Research Station, to assess the effects of grazing intensity and frequency on willow flycatcher site occupancy or demography.

BLOCK B

Willow Flycatcher Habitat

Description

Management direction for conserving the willow flycatcher is based on a field-verified database of willow flycatcher sites and associated meadows located on national forests in the Sierra Nevada. The database includes both occupied sites and unoccupied sites, and grazing activity in the meadow is managed according to occupancy status of the site. In addition, all willow flycatcher sites are to be surveyed on a regular basis. A third category of meadows, referred to as "emphasis habitat" is to be included in the survey effort. Emphasis habitat is defined as meadows larger than 15 acres that have standing water on June 1 and a deciduous shrub component.

<u>WIFL Standards and Guidelines for Grazing in Meadows with Occupied Sites</u>

A) Allow only late-season grazing in the entire meadow (after August 15).

<u>UNLESS</u>

B) Develop and implement a site specific meadow management strategy in partnership with the affected grazing permittee. The strategy objectives must focus on the protection of habitat during the breeding season and the long-term sustainability of suitable habitat at breeding sites. It may use a mix of management tools including grazing systems, structural improvements, and other exclusion by management techniques to protect willow flycatcher habitat. The management strategy must be feasible and agreeable to both the permittee and Forest Supervisor or this option cannot be exercised.

Annually monitor utilization of riparian vegetation in all willow flycatcher sites in grazed meadows using regional range analysis and planning guides. Every 3 years, monitor willow flycatcher

habitat using the following criteria: (1) rooting depth cores for meadow condition, (2) point intercepts for shrub foliar density, and (3) strip transects for shrub recruitment and cover. Include meadow condition assessments in geographical information systems (GIS) coverages. If habitat conditions in willow flycatcher sites are trending downward, modify or suspend grazing in these areas.

WIFL Standards and Guidelines for Grazing in Meadows with "Unoccupied" Sites

When willow flycatcher sites are categorized as unoccupied, assess willow flycatcher habitat suitability within the meadow. If habitat is degraded, develop restoration objectives and take appropriate actions (such as physical restoration of hydrological components, limiting or redirecting grazing activity, etc.) to move meadow toward desired condition.

The grazing standards and guidelines described in this section may be modified under a formal management study, developed in cooperation with the Pacific Southwest Region Research Station, to assess the effects of grazing intensity and frequency on willow flycatcher site occupancy or demography.

Surveys
Beginning in *2005*, initiate a 4-year cycle for conducting willow flycatcher surveys in all willow flycatcher sites. In the first year, conduct willow flycatcher surveys to established protocols in all willow flycatcher sites. In the second year, conduct surveys in sites where willow flycatchers were not found in the first-year survey. Surveys are not conducted in the third and fourth years of the cycle. After the fourth year, repeat the 4-year survey cycle of all occupied willow flycatcher sites.

As part of the project planning process, survey emphasis habitat within 5 miles of willow flycatcher sites to determine willow flycatcher occupancy. Use established protocols to conduct these surveys. If these surveys *determine willow flycatcher occupancy*, add these locations to the database of willow flycatcher sites and include them in the 4-year survey cycle of willow flycatcher sites described above.

Willow Flycatcher Habitat: Other Activity-Related Standards and Guidelines
Evaluate proposals for new concentrated stock areas (for example, livestock handling and management facilities, pack stations, equestrian stations, and corrals) located within 5 miles of occupied willow flycatcher sites. Apply a broad landscape-level analysis in the biological evaluation for the project to determine if such action will increase brood parasitism pressure by the brown-headed cowbird.

As part of landscape analysis, give priority to meadow restoration opportunities near or adjacent to willow flycatcher sites.

To the extent possible, construct no new roads in potential willow flycatcher habitat. Potential willow flycatcher habitat includes: (1) occupied willow flycatcher habitat, (2) known willow flycatcher sites, (3) emphasis habitat, and (4) small, wet woody meadows (meadows less than 15 acres that have standing water on June 1 and a deciduous shrub component.

Evaluate site condition of willow flycatcher sites and emphasis habitat. Meadows that no longer contain water on June 1 and lack a deciduous shrub component may be removed from the conservation network.

Rationale: See Part 1 of report. The intent here is to provide a standard and guideline that addresses concerns about the direct impact of livestock to nesting willow flycatchers and the maintenance of suitable habitat at those sites. In addition, we are recommending actions to restore habitat in sites previously occupied by willow flycatchers. We recommend retaining standards and guidelines for willow browse, streambank disturbance, and meadow utilization to address concerns about the potential for grazing to contribute to habitat degradation.

Steps needed to implement recommendation for willow flycatcher standards and guidelines:

1. Field-verify historical database of "known" sites for the presence of suitable habitat and to determine ownership of associated meadow. The verified "willow flycatcher site" database will be maintained and augmented with new discoveries over time.
2. Develop a definition for "occupied" sites using a specific set of criteria, such as number of years that a site must have been surveyed to protocol and/or the number of years since the last detection of willow flycatchers at the site, etc. Will need assistance from scientists with this task.
3. Screen database of willow flycatcher sites to identify "occupied" sites according to criteria developed in Step 2.
4. New "occupied" sites have already been identified and should be added to the database. Additional sites will likely be added as survey work is completed.
5. Manage "occupied" sites according to standards and guidelines above. The remaining sites in the database are termed "unoccupied" and will be managed under the standards and guidelines for meadows and riparian areas.
6. Develop criteria for defining when an "occupied" site will revert to "unoccupied" status such as number of years where surveys do not detect willow flycatchers, etc. Will need assistance from scientists with this task.
7. Develop regional guidelines for strategies to manage grazing activity while protecting key components of willow flycatcher habitat. The range specialist on the Tahoe National Forest has provided an excellent first cut at this.

Yosemite Toad

BLOCK A

Yosemite Toad Habitat

Activity-Related Standards and Guidelines

Exclude livestock (including pack stock and saddle stock) 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 the Yosemite toad during the breeding and rearing season (as determined locally). If physical exclusion of livestock, such as fencing, is impractical, then exclude grazing from the entire meadow until the meadow has been dry for 2 weeks. Wet meadows are defined as relatively open meadows with low to moderate amounts of woody vegetation that have standing water on June 1 or for more than 2 weeks following snow melt. Determine if the meadow has standing water and saturated soils after June 1st; if these conditions do not persist in the meadow for more than 2 weeks, allow grazing only in those portions of the meadow where dry conditions exist.

Monitor a sample of occupied Yosemite toad sites to: (1) assess habitat conditions and (2) assess Yosemite toad occupancy and population dynamics. Based on the monitoring data, modify or suspend grazing if Yosemite toad conservation is not being accomplished. These grazing restrictions may be modified through formal adaptive management studies, developed in cooperation with the Pacific Southwest Research Station, designed to assess the effects of grazing intensity and frequency on Yosemite toad habitat conditions and site occupancy.

Conduct surveys of unoccupied suitable habitat for the Yosemite toad within this species' historic range to determine presence of Yosemite toads. Complete surveys of these areas within 3 years of this record of decision. If surveys are not completed within the 3- year period, consider unsurveyed meadows as occupied habitat and apply the restrictions for excluding livestock described in the preceding paragraph. (ROD, Pg. A-60)

BLOCK B

Yosemite Toad Habitat

Activity-Related Standards and Guidelines

Exclude livestock (including pack stock and saddle stock) 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 the Yosemite toad during the breeding and rearing season (as determined locally). If physical exclusion of livestock is impractical, then exclude grazing from the entire meadow.

Exclusions may be waived if an interdisciplinary team has developed a site-specific management plan to minimize impacts to the Yosemite toad and its habitat by managing the movement of stock around wet areas. Such plans are to include a requirement for systematically monitoring on an annual basis a sample of occupied Yosemite toad sites within the meadow to: (1) assess habitat conditions and (2) assess Yosemite toad occupancy and population dynamics. Every 3 years from the date of the plan, evaluate monitoring data, and modify or suspend grazing if Yosemite toad conservation is not being accomplished. Plans must be approved by the authorized officer and incorporated into all allotment plans and/or special use permits governing use within the occupied habitat. Wet meadows are defined as relatively open meadows with low to moderate amounts of woody vegetation that have standing water on June 1 or for more than 2 weeks following snow

melt.

Conduct surveys of unoccupied suitable habitat for the Yosemite toad within this species' historic range to determine presence of Yosemite toads. *Complete surveys of these areas within 2 years of this record of decision. {Depending on when ROD is signed, set a timeframe for surveys that is realistic and attainable. Delete reference to applying standards and guidelines to unsurveyed habitat.}*

Rationale: Evidence suggests that the toad population is in decline, but there are many variables at play. We still need basic information on toad population and distribution. Surveys are a first step followed by Conservation Assessment. The forests have demonstrated a good faith effort to get these surveys completed. And it is likely that all Yosemite toad habitat within allotments will be surveyed by the end of next year. However, an additional 2 years will likely be needed to complete the job in the remote high country.

Additional Comments. The Team has reviewed the available information about the Yosemite toad and possible impacts from grazing. There is a basic lack of information about the existing population distribution and the relative importance of the different sub-populations and associated habitat. Lacking this information, much of which was to be provided by on-going survey work and the pending completion of the conservation assessment, we find it very difficult to make an informed judgment about whether and how the existing direction should be changed. The U.S. Fish and Wildlife Service found the Yosemite toad to be warranted but precluded for listing under the Endangered Species Act. This recent development underscores the fragile nature of the population. The Team recommends that completion of the conservation assessment be expedited. The Region should work in close coordination with the U.S. Fish and Wildlife Service to develop a more sophisticated approach to managing the risks from grazing in occupied habitat.

Great Gray Owl

BLOCK A

Great Gray Owl PACs: Activity-Related Standards and Guidelines

Grazing

In meadow areas of great gray owl PACs, maintain herbaceous meadow vegetation at least 12 inches in height and covering at least 90 percent of the meadow. (ROD, Pg. A-38)

BLOCK B

Great Gray Owl PACs: Activity-Related Standards and Guidelines

Grazing

In meadow areas of great gray owl PACs, maintain herbaceous vegetation at a height commensurate with site capability and habitat needs of prey species. Follow regional guidance to determine potential prey species and associated habitat requirements at the project level.

Rationale: The standard and guideline requires a vegetation height that is unattainable on certain sites, including the one meadow (so far) that has been designated as part of a great gray owl PAC. Flexibility is needed to meet the intent of the existing direction while acknowledging the great variability in site potential across the range of the species.

Utilization Standards

BLOCK A

RIPARIAN CONSERVATION OBJECTIVE #5

Under season-long grazing:

- For meadows in early seral status: limit livestock utilization of grass and grass-like plants to 30 percent (or minimum 6-inch stubble height).
- For meadows in late seral status: limit livestock utilization of grass and grass-like plants to a maximum of 40 percent (or minimum 4-inch stubble height).

Determine ecological status on all key areas monitored for grazing utilization prior to establishing utilization levels. Use Regional ecological scorecards and range plant list in regional range handbooks to determine ecological status. Analyze meadow ecological status every 3 to 5 years. If meadow ecological status is determined to be moving in a downward trend, modify or suspend grazing. Include ecological status data in a spatially explicit Geographical Information System database. (ROD, Pg. A-58)

BLOCK B

RIPARIAN CONSERVATION OBJECTIVE #5

Under season-long grazing:

- For meadows in early seral status: limit livestock utilization of grass and grass-like plants to 30 percent (or minimum 6-inch stubble height).
- For meadows in late seral status: limit livestock utilization of grass and grass-like plants to a maximum of 40 percent (or minimum 4-inch stubble height).

Determine ecological status on all key areas monitored for grazing utilization prior to establishing utilization levels. Utilization standards are to be met by the end of the grazing season. Use Regional ecological scorecards and range plant list in regional range handbooks to determine ecological status. Analyze meadow ecological status every 3 to 5 years. If meadow ecological status is determined to be moving in a downward trend, modify or suspend grazing. Include ecological status data in a spatially explicit Geographical Information System database.

Where professional judgment and quantifiable measurements find that current practices are maintaining range in good to excellent condition, these utilization standards may be modified to allow for the Forest Service, in partnership with selected permittees, to rigorously test and evaluate alternative standards.

Rationale: Adds flexibility to address site-specific variability.

Impacts to Recreation

As reported in Part 1, much of the concern about impacts to recreation uses under the SNFPA, stems from the lack of clarity in the ROD and the fact that specific restrictions are imposed on broad categories of activities and uses. If applied literally and everywhere, the management direction would impact ongoing activities, delay small projects while extensive analysis is being completed, and add to the costs and uncertainties of providing public recreation opportunities. In our judgment, it does not appear that a conscious decision was made to impose particular standards on recreation activity to address a regional problem. Instead, recreation uses appear to have been caught in the catchall phrase of "activity" and subjected to the same rigorous restrictions that apply to vegetative management. We propose a few underlying adjustments and clarifications and some specific wording changes to ensure that the direction applying to recreation uses is appropriate and commensurate with the level of impact expected from those uses.

The following are the Team's general observations and suggestions to address recreation-related impacts:

- We believe that maps should be adjusted to exclude developed recreation sites, ski areas, recreation residence tracts, administrative sites, etc. from the old forest emphasis area land allocation.
- There is a critical need for direction to the field on the scope and detail of analysis required under the Riparian Conservation Objectives. Initial screening criteria should be provided to eliminate extensive analyses of projects that have minimal or no impact.
- There is a critical need for direction on the purpose and priority for landscape analysis. One helpful modification would be to give fuel treatment projects priority status for landscape analysis instead of focusing on critical aquatic refuges. At a minimum, the field must be provided with a better understanding about when and how to use these analytical processes. It must be understood that a landscape analysis is not a decision document and that one is not required before a decision can be made. Finally, considerably more effort needs to be directed toward providing a clear description of what a landscape analysis is, how it should be developed, and how it should be used.
- New standards and guidelines for vegetative management should clearly apply only to fuels reduction, forest health, and gap regeneration. Existing direction is ambiguous in this regard.
- The ROD should be structured around activity vs. land allocation. Direction that applies to recreation should be placed in its own section.
- When drafting the ROD, take care in referring to "existing uses", "new projects" and "new decisions" and make absolutely clear what is meant in each case.

Recommended Standards and Guidelines

Second, we recommend the following specific changes to the ROD standards and guidelines to address five basic areas of concern:

1. Incidental Tree Removal – address confusion about incidental removal and when exemptions apply
2. Wolverine and Red Fox – strengthen the criteria for verifying a sighting
3. Off-Highway Vehicles – better convey management intent
4. Limited Operating Periods for Sensitive Species – remove blanket requirement and provide for project-level evaluation and site-specific mitigation
5. Riparian Conservation Objectives – better define the scale and detail of analysis required for small projects and reauthorizations

Incidental Tree Removal

BLOCK A

Forest-wide Standards and Guidelines

Incidental Removal of Vegetation and Down Woody Material

Incidental removal of vegetation and down woody material for activities such as administering special use permits; maintaining recreation developments; constructing, reconstructing, and maintaining roads, trails, and rights of way; expanding resorts based on approved development plans; and removing trees that present imminent safety hazards may deviate from vegetation management standards and guideline (ROD, Pg. A-29).

BLOCK B

Incidental Removal of Vegetation and Down Woody Material

{Delete}

Rationale: The glossary in the ROD defines vegetation treatments to: include mechanical treatments, prescribed burning, chemical treatments and livestock grazing. (ROD, Pg. B-2) However, the "incidental removal" clause above implies that tree removal for recreation is also "vegetation treatment." One could then assume that all vegetation treatment standards and guidelines must apply to recreation projects. The conflicting direction has caused concern and confusion in the field.

Wolverine and Red Fox

BLOCK A

Wolverine and Sierra Nevada Red Fox Detections

Upon a detection (photograph, track plate, or sighting verified by a wildlife biologist) of a wolverine or Sierra Nevada red fox, conduct an analysis to determine if activities within 5 miles of the detection have a potential to affect the species. For a 2-year period following the detection, restrict activities that are determined in the analysis to have an adverse impact from January 1 to June 30 (ROD, Pg. A-29).

BLOCK B

Wolverine and Sierra Nevada Red Fox Detections

Detection of a wolverine or Sierra Nevada red fox will be evaluated by a PSW forest carnivore specialist. Conduct an analysis to determine if activities within 5 miles of the detection have a potential to affect the species. Implement a limited operating period from January 1 to June 30 to avoid adverse impacts to potential breeding. Evaluate activities for a 2-year period for detections not associated with a den site.

Rationale: Provide assurance that sightings do reflect species presence.

Off-Highway Vehicles

BLOCK A

Wheeled Vehicles

Allow wheeled vehicle travel on designated routes, trails, and off highway vehicle (OHV) areas. Each national forest may designate where OHV use is allowed. Unless otherwise restricted by existing forest plans or other area-specific standards and guidelines, allow cross-country travel by over snow vehicles (ROD, Pg. A-32).

BLOCK B

Wheeled Vehicles

Prohibit wheeled vehicles off of designated roads, trails, and limited OHV use areas. Unless otherwise restricted by existing forest plans or other area-specific standards and guidelines, allow cross-country travel by over snow vehicles.

Rationale: The substitute sentence was in a Regional Forester letter to Forest Supervisors dated December 19, 2002. This language is part of the Region's OHV Strategy.

Limited Operating Periods for Sensitive Species

BLOCK A

Designating California Spotted Owl PACs

When activities are planned within or adjacent to a PAC and the location of the nest site or activity center is uncertain, conduct surveys to establish or confirm the location of the nest or activity center (ROD, Pg. A-34).

California Spotted Owl PACs: Activity-Related Standards and Guidelines

Limited Operating Period

Maintain a limited operating period (LOP), prohibiting activities within approximately ¼ mile of the nest site during the breeding season (March 1 through August 31) unless surveys confirm that California spotted owls are not nesting. The LOP does not apply to existing road and trail use and maintenance or continuing recreation use, except where analysis of proposed projects or activities determines that either existing or proposed activities are likely to result in nest disturbance.

The LOP may be waived for individual projects or activities of limited scope and duration or when a biological evaluation documents that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location. Where a biological evaluation determines that a nest site will be shielded from planned activities by topographic features that minimize disturbance, the LOP buffer distance may be reduced.

When activities are planned within or adjacent to a PAC and the location of the nest site or activity center is uncertain, conduct surveys to establish or confirm the location of the nest or activity center (ROD, Pg. A-34).

New Roads, Trails, Off Highway Vehicle Routes, Recreational Developments, and Other Developments

Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb nest sites. Mitigate impacts where there is documented evidence of disturbance to the nest site from existing recreation, off highway vehicle route, trail, and road uses (including road maintenance) (ROD, Pg. A-35).

BLOCK B

Designating California Spotted Owl PACs

When *vegetation treatments* are planned within or adjacent to a PAC and the location of the nest site or activity center is uncertain, conduct surveys to establish or confirm the location of the nest or activity center.

California Spotted Owl PACs: Activity-Related Standards and Guidelines

Limited Operating Period

Maintain a limited operating period (LOP), prohibiting *vegetation treatments* within approximately ¼ mile of the nest site during the breeding season (March 1 through August 31) unless surveys confirm that California spotted owls are not nesting.

The LOP may be waived for projects of limited scope and duration or when a biological evaluation documents that such projects are unlikely to result in breeding disturbance considering their

intensity, duration, timing, and specific location. Where a biological evaluation determines that a nest site will be shielded from proposed projects by topographic features that minimize disturbance, the LOP buffer distance may be reduced.

When *vegetation treatments* are planned within or adjacent to a PAC and the location of the nest site or activity center is uncertain, conduct surveys to establish or confirm the location of the nest or activity center.

{Delete "New"} Roads, Trails, Off Highway Vehicle Routes, Recreational Developments, and Other Developments *{Changed the order of the next two sentences}*

Mitigate impacts where there is documented evidence of disturbance to the nest site from existing recreation, off highway vehicle route, trail, and road uses (including road maintenance).

Evaluate proposals for *{Delete "new"}* roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb nest sites.

Rationale: The change is proposed to limit LOPs to activities associated with vegetation treatments. This is consistent with the CASPO report and the subsequent interim management guidelines. The interim guidelines did not address non-timber projects for two reasons.[116] First, the other projects such as trail and campground construction, special uses, recreation site development, etc. are relatively small and effects to sensitive species can often be mitigated at the project level. Second, the Forest Service already has procedures in place via the biological evaluation process to analyze effects to species of concern, propose and analyze mitigation measures, and make viability determinations. The ROD provides additional assurance with the standard and guideline for roads, trails, etc. that is also included for goshawk, great gray owl, fisher and marten.

[116] USDA Forest Service, Pacific Southwest Region, California Spotted Owl Sierran Province Interim Guidelines, Environmental Assessment, January 1993, Pg. II-5.

BLOCK A

Northern Goshawk PACs: Activity-Related Standards and Guidelines

Limited Operating Period

Maintain a limited operating period (LOP), prohibiting activities within approximately ¼ mile of the nest site during the breeding season (February 15 through September 15) unless surveys confirm that northern goshawks are not nesting. If the nest stand is unknown, either apply the LOP to a ¼-mile area surrounding the PAC or survey to determine the nest stand location. The LOP does not apply to existing road and trail use and maintenance or continuing recreation use, except where analysis of proposed projects or activities determines that either existing or proposed activities are likely to result in nest disturbance.

The LOP may be waived for individual projects or activities of limited scope and duration or when a biological evaluation documents that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location. Where a biological evaluation determines that a nest site will be shielded from planned activities by topographic features that minimize disturbance, the LOP buffer distance may be reduced.

New Roads, Trails, Off Highway Vehicle Routes, Recreational Developments, and Other Developments

Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb nest sites. Mitigate impacts where there is documented evidence of disturbance to the nest site from existing recreation, off highway vehicle route, trail, and road uses (including road maintenance)(ROD, Pg. A-37).

BLOCK B

Northern Goshawk PACs: Activity-Related Standards and Guidelines

Limited Operating Period

Maintain a limited operating period (LOP), prohibiting *vegetation treatments* within approximately ¼ mile of the nest site during the breeding season (February 15 through September 15) unless surveys confirm that northern goshawks are not nesting. If the nest stand is unknown, either apply the LOP to a ¼-mile area surrounding the PAC or survey to determine the nest stand location.

The LOP may be waived for vegetation treatments of limited scope and duration or when a biological evaluation documents that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location. Where a biological evaluation determines that a nest site will be shielded from these types of proposed activities by topographic features that minimize disturbance, the LOP buffer distance may be reduced.

{Delete "New"} Roads, Trails, Off Highway Vehicle Routes, Recreational Developments, and Other Developments *{Changed the order of the next two sentences}*

Mitigate impacts where there is documented evidence of disturbance to the nest site from existing recreation, off highway vehicle route, trail, and road uses (including road maintenance). *Use data obtained from focused studies or other scientific research to assess disturbance levels.*

Evaluate proposals for *{Delete "new"}* roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb nest sites.

Rationale: See above discussion on LOPs for California spotted owl.

BLOCK A

Great Gray Owl PACs: Activity-Related Standards and Guidelines

Limited Operating Period

Apply a limited operating period (LOP), prohibiting vegetation management activities and road construction within ¼ mile of active great gray owl nest stands during the nesting period (typically March 1 to August 15). The LOP does not apply to: (1) existing road traffic and road maintenance, (2) trail uses, and (3) other recreational uses and activities, unless a biological evaluation documents that these activities will result in nest disturbance. The LOP may also be waived for projects of limited scope and duration (ROD, Pg. A-38).

BLOCK B

Great Gray Owl PACs: Activity-Related Standards and Guidelines

Limited Operating Period

Apply a limited operating period (LOP), prohibiting *vegetation treatments* and road construction within ¼ mile of active great gray owl nest stands during the nesting period (typically March 1 to August 15). *{Delete list of activities where LOP does not apply}* The LOP may be waived for projects of limited scope and duration.

Rationale: See above discussion on LOPs for California spotted owl.

BLOCK A

Forest Carnivore Den Sites: Activity-Related Standards and Guidelines

Limited Operating Periods

Protect fisher den site buffers from disturbance with a limited operating period (LOP) from March 1 through June 30 for all new projects as long as habitat remains suitable or until another Regionally-approved management strategy is implemented. The LOP may be waived for individual projects of limited scope and duration, when a biological evaluation documents that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location.

Protect marten den site buffers from disturbance with a limited operating period (LOP) from May 1 through July 31 for all new projects as long as habitat remains suitable or until another Regionally-approved management strategy is implemented.

Evaluate the appropriateness of LOPs for existing uses in fisher and marten den site buffers during environmental analysis (ROD, Pg. A-39).

Roads, Trails, Off Highway Vehicle Routes, Recreational Developments, and Other Developments

Evaluate proposals for new roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb den sites. Mitigate impacts where there is documented evidence of disturbance to the den site from existing recreation, off highway vehicle route, trail, and road uses (including road maintenance) (ROD, Pg. A-40).

BLOCK B

Forest Carnivore Den Sites: Activity-Related Standards and Guidelines

Pacific Fisher

Limited Operating Periods

Protect fisher den site buffers from disturbance from *vegetation treatments* with a limited operating period (LOP) from March 1 through June 30 for as long as habitat remains suitable or until another Regionally-approved management strategy is implemented.

The LOP may be waived for individual projects of limited scope and duration, when a biological evaluation documents that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location.

Roads, Trails, Off Highway Vehicle Routes, Recreational Developments, and Other Developments

Evaluate on-going and proposed activities within fisher den site buffers and take action to minimize the potential for disturbance to den sites.

Marten

Protect marten den site buffers from disturbance from *vegetation treatments* with a limited operating period (LOP) from May 1 through July 31 for as long as habitat remains suitable or until another Regionally-approved management strategy is implemented.

The LOP may be waived for individual projects of limited scope and duration, when a biological

evaluation documents that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location.

Roads, Trails, Off Highway Vehicle Routes, Recreational Developments, and Other Developments

{Changed the order of the next two sentences}

Mitigate impacts where there is documented evidence of disturbance to the nest site from existing recreation, off highway vehicle route, trail, and road uses (including road maintenance).

Evaluate proposals for *{Delete "new"}* roads, trails, off highway vehicle routes, and recreational and other developments for their potential to disturb nest sites. *Use data obtained from focused studies or other scientific research to assess disturbance levels.*

Rationale: See above discussion on LOPs for California spotted owl. For marten, also fixes an omission in the original ROD about waiving the LOP in certain cases. This was noted in a clarification letter from the Regional Forester, dated June 24, 2002.

RIPARIAN CONSERVATION OBJECTIVE #1 Standards and Guidelines

BLOCK A

Conduct project-specific cumulative watershed effects analysis following Regional procedures or other appropriate scientific methodology to meet NEPA requirements (ROD, Pg. A-53).

BLOCK B

{Delete this statement and others that simply repeat direction from other source (i.e. NEPA, BMPs}

Rationale: Repeating direction found in other law or mandates causes confusion and takes that direction out of context. In this case, the field is literally interpreting this sentence to mean "do a cumulative watershed effects analysis for every project" without having the benefit of any guidance or context for the scope and detail of the analysis to be completed.

BLOCK A

Implement soil quality standards for soil loss, detrimental soil compaction, and organic matter retention to minimize the risk of sediment delivery to aquatic systems from management activities. Ensure that management-related activities, including roads, skid trails, landings, trails, or other activities, do not result in detrimental soil compaction on more than 5 percent of the RCA or 10 percent of the area in CARs. Measure compaction using the procedures outlined in Appendix F of the FEIS (ROD, Pg. A-53).

BLOCK B

Proposed changes are still being developed.

Rationale: This standard is unworkable as written. RCAs are linear features with varying areas depending on the scale of analysis. To be meaningful, the scale to which this threshold applies must be defined. Also, there has been considerable confusion about whether developed sites should be counted as contributing to the 5/10 percent figure. Appendix F implies that they don't but then separates RCAs out for special treatment. It is simply not clear what the objective of this standard and guideline, especially when applied to small recreation projects.

BLOCK A

Identify existing uses and activities in CARs and RCAs during landscape analysis. Evaluate existing management activities to determine consistency with RCOs during project-level analysis. Develop and implement actions needed for consistency with RCOs (ROD, Pg. A-54).

BLOCK B

During landscape analysis, review existing uses and activities in CARs and RCAs and implement actions necessary to attain AMS goals. Where actions such as increasing education, limiting or redirecting use, adding traffic control devices, increasing maintenance, relocating facilities, and/or closing specific sites are not effective in meeting AMS goals, eliminate the practice or occupancy.

Rationale: There is a circular argument in the original language in that the RCO is "to be consistent with the RCO". Really, the RCO should be giving more detail about how to be consistent with the AMS.

RIPARIAN CONSERVATION OBJECTIVE #4 Standards and Guidelines

BLOCK A

Assess roads, trails, OHV trails and staging areas, developed recreation sites, dispersed campgrounds, special use permits, grazing permits, and day use sites during landscape analysis. Identify conditions that degrade water quality or habitat for aquatic- and riparian-dependent species. At the project level, determine if use is consistent with other standards and guidelines or desired conditions. If inconsistent, modify the use through redesign, rehabilitation, relocation, closure, or re-directing the use to a more suitable location (ROD, Pg. A-57).

BLOCK B

{Delete; This direction repeats what is stated in the first two full paragraphs on Page A-54 of the ROD. The entire discussion of RCOs should be prefaced with a statement that says existing uses are to be reviewed for consistency with RCOs when a landscape analysis is done and at the project level prior to reauthorization. Appropriate mitigation measures will be implemented at the project level.}

Rationale: As written, implies that significant changes can and will be made to on-going uses at any time. Need to provide assurance of when and how these types of changes are going to be proposed and implemented. Also, need to clean up duplication throughout this section.

Impacts to Communities

Introduction

In the Chief's Appeal Decision he stated, "As I see it, the Forest Service's mission is to work with local individuals and communities to protect and restore the health of the land. Partly, that means finding intelligent, far sighted ways of using some of our natural resources. Partly, it means working together to diversify economies while putting people to work for the health of the land. We need to accomplish our land stewardship goals by looking for creative new ways to get needed work done on the land, get products from it, and build communities together."

We took these words to heart as we conducted the Review, and developed recommendations to respond to the various findings documented in Part 1. The Team strongly believes that new information and knowledge gained during the past year can be used to improve the current planning direction and move us closer to the Chief's vision.

During the Review we talked to Forest Service field practitioners, Forest Service managers, elected officials from the federal, state, local and tribal governments, environmental activists, representatives of industry associations, and many local citizens through out the mountain range. A common value held by every single person we talked to was a concern for the land, and the living things dependent upon it.

One overwhelming concern the Team heard was that many felt the SNFPA decision had not given appropriate emphasis and balance to the interrelationship, and interdependency between the national forests and the communities of the Sierra Nevada. We believe these linkages between ecosystem and community health and vitality are crucial to responsible management of the national forests.

Many people are perhaps most familiar with the idea of ecological interdependence within the "natural" system. For example, it is commonly understood that if management actions caused the loss of one part of the ecosystem, other parts would suffer. Removing predators to manage for larger populations of deer or elk, have resulted in the unintended consequence of overpopulation, starvation, and loss of food and habitat for other animals as well. In today's modern society, the Team believes that local communities, while they may not play a large part in the overall economic and demographic picture, play a crucial role in sustaining our forests, and helping ensure that those who live in the distant cities of our state can benefit from their bounty.

These communities provide a local labor force and entrepreneurial skills and capital to protect the forest from wildfire, reduce fuel hazard, and restore ecosystem health. They provide food, shelter, and assistance to forest visitors, and forest products and biomass produced under environmentally responsible rules to a growing California population. They also provide a place where in many cases we can see living examples of how the country used to live. A life tied to the land, and its stewardship, removed from the increasingly frenetic pace of our increasingly urbanized society.

We think these recommendations are a catalyst that will lead to a better partnership between the national forests and local communities in carrying out the important job of stewardship of the national forests to improve the lives of people, and move the Sierra Nevada ecosystem toward a more stable and resilient condition.

Integrated Vegetation Management Strategy

There are many benefits to local communities that flow from the integrated vegetation management strategy recommended by the Team.

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. This important acknowledgment adds a measure of balance while maintaining the appropriate focus on managing to restore ecosystems.

As part of this strategy, a more effective fire and fuels management program will better protect life and property from wildland fire.

It will improve our ability to protect high value community assets such as municipal watersheds by working collaboratively with local communities and fire-safe councils.

It will enhance protection of scenic and recreational forested landscapes that attract outdoor recreationists and tourists important to local economies.

By making planning direction more consistent with the National Fire Plan, our recommendations allow forests to design more projects that utilize commercial by-products. This will add to the number of good business opportunities for local entrepreneurs.

In addition to reducing smoke impacts from wildfires, our recommendation encourages a more effective blend of prescribed fire and mechanical treatments. Because of this, we believe the air-sheds of local communities will be less impacted by smoke from prescribed fire as well.

The strategy allows the removal of some medium sized trees. This will help leverage appropriated funds and enhance the forests' ability to successfully implement projects at the pace envisioned in the current direction.

We believe this will also increase the availability of material for small log mills in the region. We estimate the total timber (green and salvage) that could be offered for sale under this recommendation is in the neighborhood of 450 million board feet per year in the first ten years. This represents a little over double the amount projected under the ROD.

Finally, we believe that the recommendations will help support and maintain local forest industry infrastructure. This includes the businesses, workers, equipment and processing facilities that are so crucial to undertaking the program necessary to restore historic fire regimes.

HFQLG

Our recommendation is to fully implement the HFQLG Pilot Project as envisioned by the Quincy Library Group and passed into law by Congress in 1998. New information discussed in Part 1 leads the team to believe that this important project can and should be implemented in full compliance with applicable federal laws.

The Pilot Project has been plagued by delays and false starts since the completion of the FEIS in August of 1999. Because of this, Congress recently extended the term of the pilot project for an additional 5 years. Our recommendation provides the opportunity for the forests involved to recommit to working with the Quincy Library Group and other interested individuals to make this important piece of the overall adaptive management strategy a success.

This Pilot Project is a nationally recognized model of collaborative management, where people of diverse backgrounds and interests came together to develop a plan that in many ways was far ahead of its time. All of the primary components addressed by the SNFPA are addressed. Sustaining old forest ecosystems, reducing the threat from catastrophic wildfire to wildlife and communities, cautiously managing to conserve the California spotted owl, restoration and enhancement of riparian ecosystems are all the focus of resource management activities across the lands of the Pilot Project. In addition, an overarching goal is to provide a sustainable output of forest products to support community stability while sustaining the health and diversity of the forest ecosystem. This is a decidedly different approach than that recommended for the remainder of the Sierra.

The Pilot Project takes a different approach to managing hazardous fuels across the landscape. By testing a different strategy here we will learn more about how to effectively address the tremendous hazardous fuel problem facing much of the inland west.

By fully implementing the Pilot Project the concepts of forest gaps (group selection) and individual tree selection can be fully tested to determine how to use these silvicultural techniques to balance socio-economic sustainability with ecosystem sustainability.

Grazing

Our recommendations change some standards and guidelines for Forest Service Sensitive wildlife species. These changes are designed and intended to provide more flexibility and incentive for local managers and permittees to collaboratively develop approaches to minimize risk to these species. We believe that by tapping the creativity and experience of permittees, and giving them an opportunity to adaptively manage their grazing operations to further conservation of Sensitive species, we will all be winners.

The Team believes that these recommendations will result in more allotments that can support a viable grazing operation than provided under the ROD.

Because of this more permittees will be able to continue to operate. Maintaining these operations will maintain the contribution these ranchers and their families make to rural communities in the Sierras.

The Team did not quantify how many more operations will remain solvent under these recommendations. The number may be small. However, the families that run these operations represent much more than just the economic output of their ranches to the communities they live in. We believe the intangible benefits they provide to local communities are out of proportion to their numbers.

These recommendations will reduce the possibility that our planning direction might inadvertently encourage development of private base-ranch properties in the foothills. This would avoid having adverse indirect effects to wildlife that might be disproportionate to the effects the direction was designed to mitigate.

The conservation of the Yosemite toad remains problematic. So little is known about the factors affecting this species decline that we were unable to develop what we felt was a better approach that would provide equivalent protection. During our Review, this species was found to warrant listing under the Endangered Species Act. Our recommendation holds hope that a more sophisticated conservation approach to limiting the effects of grazing on this animal can be found after completion of the conservation assessment, with the active assistance of the US Fish and Wildlife Service, and the Pacific Southwest Region Ecosystem Management staff.

Finally, we believe that a historic connection to our heritage and to the land is benefited by these recommendations. Many of the operations that may be allowed to continue represent a tradition and lifestyle that is an important part of our California culture and heritage. They are a visible link to our dependence on the land and our stewardship responsibility to future generations.

Recreation

The myriad of restrictions and procedures in the ROD designed to address issues other than recreational use and activities, created a climate of uncertainty in the minds of many people involved in recreational endeavors on and near the national forest. The recommended changes remove the ambiguity, and clarify intent behind the standards and guidelines. In most cases we found the perceived effect on recreation was not intended. We believe these recommended changes will promote a more stable business environment for entrepreneurs involved in recreational enterprises.

By clearly indicating which standards apply to what activities, the numerous changes recommended should help encourage investment in recreation related endeavors for the purposes of maintenance and or improvement of services.

The recommendations will also reduce delay and unnecessary restrictions to permitted recreational activities.

We also expect that indirect effects to businesses that provide ancillary recreational supplies and services from unclear or ambiguous direction will be reduced or eliminated.

All of the above will maintain or enhance the economic contribution of these businesses to local communities.

Finally, the recommendations reaffirm the important role that outdoor recreation programs play in the management of the Sierra Nevada national forests.

Part 3 – Appendices

Appendix A

Review Team Recommendations for Desired Conditions for Eastside Pine and Eastside Mixed-Conifer

Introduction

During the review some district rangers and forest supervisors from eastside forests expressed the belief that the eastside desired conditions for conifer-dominated forests should be improved based on local knowledge of historic conditions. The Team asked the Lassen and Inyo National Forests to develop modifications to the desired conditions found in the FEIS. This appendix is the result of that work. The Team recommends adopting this work in place of information found in the FEIS Volume 1, Chapter 2, Pages 141 through 143, to improve management of old forest landscapes on the eastside of the Sierra Crest.

Desired conditions define resource characteristics that are expected to result if planning goals and objectives are fully achieved. The general desired condition for eastside vegetation types is to restore structure and species composition similar to that which existed within these fire-maintained landscapes prior to European settlement.

This objective is long-term, and recognizes that many components, such as the historical density of large trees, may no longer exist within a project planning area. Therefore, treatments are typically not expected to return landscapes or project areas to this desired condition in a single application. Single applications to achieve desired conditions may be appropriate in some areas, such as (1) areas in which the large tree component is largely intact, (2) restoration treatments of non-conifer types, such as meadows and aspen, or (3) areas of erosive soils or other site-specific concerns. However, single applications would likely be the exception in meeting the long-term desired condition. In the short-term, silvicultural or other treatments should be designed to incrementally move vegetative communities towards the desired condition. Sometimes it is appropriate to reduce the landscape condition in one parameter, for example canopy cover, to accelerate the development of another parameter, large diameter trees.

This statement of desired conditions also recognizes that current attributes of eastside communities are often outside their range of natural variability, and there is often a large disparity between existing and desired conditions. Management standards and guidelines recommended by the Team address this disparity, and provide flexibility to allow managers to effectively bridge the gap between the existing and desired conditions.

Desired Conditions for Eastside Pine and Eastside Mixed-Conifer

Forest structure and function is sufficient to provide for well-distributed, viable populations of native vertebrate species within all seral stages. The proportion of plant communities in early-, mid- and late-seral stages is similar to historic extent as influenced by fire regimes and climatic variation, in particular precipitation and temperature. The proportion of the landscape in non-forest communities (i.e., meadows, sagebrush flats, rock outcrops) will vary depending on topography, soils, geology and hydrology.

Open-canopied and medium-canopied forests dominate the potentially forested landscape. Canopy cover ranging from 20 to 50 percent characterizes pure pine forests, and canopy cover ranging from 20 to 80 percent characterizes forests of eastside mixed-conifer and true fir. Stands at the lower end of these ranges are typically found adjacent to and between meadows and sagebrush flats, and on south and west slopes. Stands at the higher end of the canopy cover range are typically located on north or east aspects, and in drainages. High canopy cover (50-

70%) may be found in dense groups of trees at a fine scale (typically less than an acre in size) within open-canopied forests.

Eastside pine forests typically contain greater than 13 trees per acre that are larger than 24 inches dbh. Total trees per acre in eastside pine forests range from 10 to 130, and basal areas range from 25 to 150 square feet per acre. Trees less than 12 inches dbh contribute less than 10 percent of a stand's basal area and total canopy closure, while greater than 75 percent of a stand's basal area and canopy closure is contributed by trees larger than 24 inches dbh.

In eastside mixed-conifer and true fir, trees per acre range from approximately 12 to 300 trees per acre, and basal areas range from 60 to 200 square feet per acre. High variability is due to the potential for distinctly different stand structures in eastside mixed-conifer and true fir forests, a result of a mixed-severity fire regime.

Eastside forests are characterized by openings that increase in size from small openings in low elevation, pure pine forests with grass and forb dominated under-stories, to larger openings in upper elevation mixed-conifer, pine-fir, and true fir forests with under-stories dominated by montane shrubs. The proportion of openings within forested landscapes may be similar between these two ends of the continuum, but due to mixed-severity fire regimes, openings are fewer but larger on upper slopes and the tops of eastside mountains due to patch- and stand-replacing fire events.

Openings in pure pine forests are relatively stable, reflecting the pre-settlement condition of grass under-stories and frequent fires which prevented successful regeneration except in "safe sites". "Safe sites" are those without significant grass competition, such as where a downed log burned intensely enough to temporarily destroy the grass cover. Successful patches of regeneration average less than 1 acre in size. Openings in eastside mixed-conifer and true fir are less stable, succeeding from shrubs to conifers during fire-free intervals. Fir is the dominant conifer in regenerating patches at high elevations. A shifting patch mosaic of open stands, shrub fields, and regenerating conifer patches of various ages characterizes mountaintops and upper slopes. Due to patch- and stand-replacing fire events, patch size is larger than in lower elevation forests. Because of frequent fires (which reduce ladder fuels) and the patchy nature of the forested landscape, structural diversity is characterized more by horizontal diversity than by vertical diversity.

In grass-dominated pure pine stands snags and downed logs are irregularly distributed and clumped in time and space. The average snag and downed logs per acre in these forests is less than two per acre. In shrub-dominated, pine-fir and true-fir forests on upper slopes, snags and downed logs are more abundant and are created in larger pulses due to the mixed-severity fire regime.

The extent and species composition of meadows, sagebrush flats and other non-coniferous, vegetated openings are similar to the historical condition, and encroaching conifers are removed by mechanical, prescribed fire or other means. The health and vigor of riparian hardwood communities (i.e., aspen, cottonwoods) are restored, regeneration is successfully recruited, and risk factors are reduced or eliminated. Oak composition is enhanced and restored.

The following **Table 1** displays desired conditions for Eastside vegetation types providing a definition by patch type, percent canopy cover, basal area in square feet, number of canopy layers, large tree densities (trees per acre by a specified dbh), opening size, and percent opening proportion of landscape.

Table 1. Desired Conditions for Eastside Vegetation Types

Patch Type	Definition	Canopy Cover (%)	Basal Area (sq. ft)	Canopy Layers	Large Tree Densities (trees per acre)	Opening Size	Openings Proportion of Landscape
Eastside Pine Productive	Pine stands on lower to mid slopes. Dunning 's site class 1A and 2	30-50	60-120	1	≥13 trees >24" dbh	<1 acre	Not applicable[3]
Eastside Pine Low Productivity	Pine stands on lower to mid slopes. Dunning 's site class 3, 4 and 5	20-40	25-150	1	>3-11 trees greater than 24" dbh	<1 acre	Not applicable[3]
Eastside Mixed Conifer Productive	Dunning 's site class 1A and 2	30-65[2]	80-170[2]	1-2	7-11 trees >30" dbh	Variable; large (>10 acres) openings possible	≤30%
Eastside Mixed Conifer Low Productivity	Dunning 's site class 3, 4 and 5	20-50[2]	60-140[2]	1-2	>25 trees >21" dbh	Variable; large (>10 acres) openings possible	≤50%
True Fir	Upper slopes, generally above 6,000'	20-80[2]	60-200[2]	1-2	>6 trees >30" dbh	Variable; large (>10 acres) openings possible	≤50%
Non-Coniferous Vegetative Openings [1]	Meadows, sage flats, and brushfields to their historic extents	<10% of conifers >6"dbh	-NA-	-NA-	-NA-	-NA-	-NA-
Riparian Hardwood [1]	Aspen, willows, cottonwood, other to their historic extent	<10% of conifers >6"dbh	-NA-	-NA-	-NA-	-NA-	-NA-

1. May currently be typed as conifer due to encroachment
2. Highly variable due to distinctly different stand types that may occur due to mixed-severity fire regime
3 Due to open structure and patchy distribution of trees, "openings" in this vegetation type are not distinguished

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Frequently Asked Questions

March 2003

1. What are the Sierra Nevada Forest Plan Amendment Review Team's (Team) major findings and recommendations to Forest Service Pacific Southwest Regional Forester Jack Blackwell?
The Team offers an ecological approach that strikes a balance between protecting owl habitat and communities from catastrophic wildfire on national forests in the Sierra Nevada mountains and Modoc Plateau. The recommendations would not change the Framework's original goals, but would offer forest managers more flexibility to carry them out. The recommendations are based on more than a decade of science, deliberations and innovative thinking from experts in a variety of disciplines.

Protection for Communities and Wildlife
Finding: The Framework's rules on owl habitat protection and hazardous fuels reduction are ineffective in modifying the spread and intensity of wildfires across the landscape.
Recommendation: A revised set of vegetation management rules, combined with the Framework's land allocations and desired condition statements, to increase the reduction of hazardous fuels while protecting critical wildlife habitat and allow managers to consider local conditions.

Improved Forest Health
Finding: The Framework reduces the region's ability to fully implement parts of the National Fire Plan.
Recommendation: An Integrated California Spotted Owl Conservation and Vegetation Management Strategy that allows more aggressive treatments to reduce hazardous fuels and improve the Sierra Nevada national forests' ability to comply with the National Fire Plan.

Implementation of the Herger-Feinstein Quincy Library Group (HFQLG) Pilot Project
Finding: The Framework severely limits the Plumas, Lassen and Sierraville ranger districts of the Tahoe National Forests from implementing the HFQLG pilot project.
Recommendation: Applying more effective vegetation management treatments while retaining the largest trees within treatment areas, conducting forest gap regeneration on a small part of the landscape, applying HFQLG Record of Decision (ROD) land allocations and standards and guidelines for northern goshawk, marten and fisher and proceeding with the Lassen Plumas Administrative Study to allow the forests to meet the objectives of the project.

Increased flexibility in grazing rules
Finding: The Framework fails to provide enough flexibility to reduce adverse impacts to grazing permittees while maintaining protection of sensitive wildlife species.
Recommendation: Increasing forest managers' flexibility to adapt to site-specific conditions to reduce the adverse impacts to grazing permit holders.

Balanced recreation use
Finding: The Framework imposes specific restrictions on broad categories of recreation activities and uses.
Recommendation: Direction clarifying and adjusting rules on recreation activities and use to be appropriate and commensurate with the level of impact expected from those activities.

Help for local communities
Finding: The Framework adversely impacts local communities, especially rural communities dependent on the output of goods and services from national forests in the Sierra Nevada.
Recommendations: Better wildfire protection, improvements in air and water quality and increased economic opportunities by the use of wood products removed as part of hazardous fuels reduction and forest health projects for local communities.

2. What are the major differences between the Team's recommendations and the January 2001 Sierra Nevada Framework Plan Amendment Record of Decision (ROD) or Framework?
The Team found that the Framework's rules on owl habitat protection and hazardous fuels reduction are ineffective in modifying the spread and intensity of wildfires across the landscape. They are also inconsistent with the National Fire Plan.

America's forests and rangelands are suffering a crisis of deteriorating ecological health caused by a century of well-intentioned but misguided management that interrupted the natural fire cycle and allowed forests to grow unnaturally dense. This has left forests vulnerable to disease, drought and extraordinarily destructive wildfires. There are many ways to reduce the number of trees and thereby reduce the risk of catastrophic wildfire. Two of the most common and practical tools are prescribed fire and mechanical treatments, such as thinning or harvest. However, in many forested areas it is unsafe to begin with prescribed fire because there is simply too much fuel. In this case, mechanical treatments must occur first for a prescribed fire operation to be safer. The National Fire Plan calls for federal land management agencies to use a variety of methods to restore forest health and reduce hazardous fuels.

The recommendations would preserve the land allocations and desired conditions established by the Framework, but also simplify, clarify and strengthen the rules for hazardous fuel treatments to better achieve the same desired conditions-protecting communities and wildlife from the risk of catastrophic wildfire.

The Framework includes a set of rules limiting mechanical treatments, which vary generally by existing stand density rather than by land allocation. The greater a stand's density, the greater are the restrictions placed on mechanical treatments. Vegetation treatments are limited to fuels reduction and imminent threats to human safety. The recommendations would set an upper limit (30-inch diameter) on vegetation treatments. The 30-inch diameter would be an upper limit, not a universal standard, and would retain the largest existing trees when conducting any treatment. In addition, vegetation

treatments would be expanded in the Framework from fuels treatments and imminent threats to humans to include forest health and post-fire restoration.

Like the Framework, the recommended goal would be to retain 50% or better canopy cover in treatment units after fuel treatments, but canopy cover retention may be temporarily reduced to 40% only if required to ensure an effective fuels treatment.

3. How would the Team's recommendations protect wildlife habitat in the Sierra Nevada, especially the California spotted owl habitat?
The recommendations would result in better protection of sensitive species by changing standards and guidelines to effectively treat hazardous fuels in the right places. The Forest Service will continue to protect critical wildlife habitat by:

- limiting operation periods that reduce human disturbance during critical nesting and denning times;
- avoiding the most critical habitat; known nesting and den sites;
- retaining vegetation conditions that are known to be important and take a long time to replace, such as large trees, while conducting all vegetation treatments; and
- retaining a hazardous fuels reduction strategy that modifies the least number of acres needed to better protect communities and natural resource values.

4. Would the Team's recommendations retain the Framework's Old Forest Emphasis Areas (OFEAs)?
Yes. The recommendations would retain all of the Framework's land allocations and desired conditions, including OFEAs. To protect OFEAs from severe wildfire, the Forest Service would treat hazardous fuels to reduce fuel loading from its current dangerous levels, strategically placed on about 22-30% of the landscape--consistent with the Framework. As in the Framework, only 32,500 acres of the 4.5 million acres of OFEAs would be thinned annually over the next five years. More than 75 percent of all thinning over that period would be done in the Wildland Urban Interface (WUI) near communities. The treatments would be carefully placed in such a way that they reduce wildfire severity on the surrounding landscape as well as the specific area actually treated. In line with the Framework, the Forest Service expects OFEAs to have a mosaic of various canopy covers ranging from natural openings to dense stands of older trees.

5. How would the Team's recommendations better protect communities and wildlife from catastrophic wildfire?
The Team found that the Framework's approach to hazardous fuels management is too cautious because it limits the placement of treatment units across the landscape and reduces the effectiveness of individual treatments by limiting the type and amount of fuels removed.

The recommendations would retain the basic elements of Framework's fuels management strategy with two major changes to enhance the protection of communities from the risk of catastrophic wildfire. First, emphasizing the strategic placement of area treatments to

modify fire behavior within the WUI and including dense old forest stands when necessary. The second change would ensure that fuels reduction within the treatment areas is aggressive enough to modify the intensity and rate of spread caused by wildfire spotting while still retaining the largest trees within the treatment unit.

The recommendations would permit local managers to remove enough of the hazardous fuels from the critical 30% to 40% of the landscape needed to effectively modify wildfire behavior over a large area, better protecting communities and wildlife habitat. The Team also recommends that local forest officials work with local fire agencies and fire safe councils to coordinate fuels reduction projects around communities.

6. Would the Team's recommendations establish any priorities for where fuel reduction work would be performed first?
Yes. The Team recommends that fuels reduction in the WUI be the first priority for treatment and suggests that more than 75% of the fuels reduction work be done in the WUI in the next 5 years. (The WUI covers about one-fifth of the total land area affected by the Framework.) This emphasis is consistent with the National Fire Plan. OFEAs with high fire hazard and risk would be the next priority, followed by general forest areas with high fire hazard and risk.

7. About how much board feet would be sold annually under the recommendations?
Although not a driving force, the recommendations would result in a level of about 450 million board feet annually in the first decade, primarily from thinning small and medium diameter trees to treat hazardous fuels. (A board foot is measured as a solid board, one foot long by one foot wide by 1-inch thick) The Framework allows for 191 million board feet annually in the first five years and 108 million board feet annually for the next five years. The difference is partly due to the Framework's heavy reliance on prescribed burning to reduce hazardous fuels rather than thinning.

8. What are the Team's recommendations for strategically placed area treatments (SPLATS) and group selection harvests (gaps)?
Treating enough of the right locations is critical to successfully modifying fire behavior across the landscape. Both the recommendations and the Framework would direct managers to avoid critical wildlife habitat in the size and location of SPLATs when possible and limit the amount of critical habitat that can be modified when avoidance is not possible to meet fuels reduction objectives.

The recommendations do not call for gaps (¼ to 2 acre openings retaining trees 30 inches and greater) except in the HFQLG pilot project. However, the Team is recommending that this tool be studied further to reach long-term ecological sustainability of the forests.

9. Has any decision been made to change the Framework?
No. The Team has submitted a report containing findings and recommendations to the regional forester. The regional forester will take time to review the findings and announce his proposed changes later this month. An environmental analysis to document new

information and analyze the proposed changes must be conducted, including a formal public comment period, before any changes can be made to the Framework.

10. What are the next steps in the process?

Over the next few weeks, Regional Forester Blackwell will carefully review the Team's report and meet with interested stakeholders and forest managers before deciding on the necessary changes to the Framework. The regional forester will make his proposal later this month. Soon after the announcement, the Forest Service will publish a Notice of Intent to develop a supplement to the Framework's 2001 final environmental impact statement. The supplement will document new information and analyze proposed improvements to the Framework, followed by a 90-day public comment period. The Forest Service expects to publish a revised ROD in Fall 2003.