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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; 12-month Finding for a Petition to List the California Spotted Owl (Strix occidentalis occidentalis) as Threatened or Endangered

THE NATIONAL ARCHIVES
AND RECORDS
ADMINISTRATION
FOR PUBLIC INSPECTION
2006 MAY 23 A 8 45
IN THE OFFICE OF
THE FEDERAL REGISTER

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of 12-month petition finding.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a 12-month finding on a petition to list the California spotted owl (Strix occidentalis occidentalis) under the Endangered Species Act of 1973, as amended. After reviewing the best available scientific and commercial information, we find that the petitioned action is not warranted. However, we will continue to seek new information on the biology of the species as well as potential threats. We ask the public to submit to us any new information that becomes available concerning the status of, or threats to, the species. This information will help us monitor the status of this species.

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May 15, 2006

DATES: The finding announced in this document was made on ~~insert date that this~~
~~document is signed~~. You may submit new information concerning this species for our
consideration at any time.

ADDRESSES: You may send data, information, comments, or questions concerning this
finding to the Field Supervisor (Attn: CALIFORNIA SPOTTED OWL), Sacramento Fish
and Wildlife Office, U.S. Fish and Wildlife Service, 2800 Cottage Way, Room W-2605,
Sacramento, CA 95825 or via fax at 916/414-6710. You may inspect the petition,
administrative finding, supporting information, and comments received during normal
business hours by appointment at the above address.

FOR FURTHER INFORMATION CONTACT: Arnold Roessler or Jan Knight at the
above address (telephone: 916/414-6600; fax: 916/414-6712).

SUPPLEMENTARY INFORMATION:

Background

Section 4(b)(3)(B) of the Endangered Species Act of 1973, as amended (Act) (16
U.S.C. 1531 et seq.), requires that, for any petition to revise the List of Threatened and
Endangered Species that contains substantial scientific and commercial information that the
petitioned action may be warranted, we make a finding within 12 months of the date of the
receipt of the petition on whether the petitioned action is: (a) not warranted, or (b) warranted,

or (c) warranted but that the immediate proposal of a regulation implementing the petitioned action is precluded by other pending proposals to determine whether any species is threatened or endangered, and expeditious progress is being made to add or remove qualified species from the List of Threatened and Endangered Species. Such 12-month findings are to be published promptly in the Federal Register. Section 4(b)(3)(C) of the Act requires that a petition for which the requested action is found to be warranted but precluded shall be treated as though resubmitted on the date of such finding, i.e., requiring a subsequent finding to be made within 12 months.

On April 3, 2000, we received a petition to list the California spotted owl (spotted owl) as a threatened or endangered species submitted by the Center for Biological Diversity and the Sierra Nevada Forest Protection Campaign (Center for Biological Diversity 2000), on behalf of themselves and 14 other organizations. Along with listing, the petition also requested the concurrent designation of critical habitat, emergency listing, and emergency designation of critical habitat. On October 12, 2000, we published a 90-day finding on that petition in the Federal Register (65 FR 60605). In that notice, we found that the petition presented substantial scientific or commercial information to indicate that listing the California spotted owl may be warranted, and we initiated a status review of the taxon. On February 14, 2003, we published a 12-month finding on the petition in the Federal Register (68 FR 7580). In that notice, we found that the petitioned action was not warranted because the overall magnitude of threats to the species did not rise to the level requiring protection under the Act.

On May 11, 2004, the Center for Biological Diversity and five other groups filed a lawsuit in Federal District Court for the Northern District of California (Center for Biological Diversity, et al. v. Norton et al., No. C-04-1861) alleging that our 12-month finding violated the Act and the Administrative Procedure Act (5 U.S.C. 706). On September 1, 2004, we received an updated petition, dated September 2004, to list the California spotted owl as a threatened or endangered species and to designate critical habitat concurrent with listing based, in part, on information that was not available to us at the time we made our original 12-month finding (Center for Biological Diversity 2004). The updated petition was submitted by the Center for Biological Diversity and the Sierra Nevada Forest Protection Campaign, acting on behalf of themselves and six other organizations. The submission clearly identified itself as a petition, and included the requisite identification information of the petitioners, as required in 50 CFR 424.14(a).

In view of the new petition, on March 8, 2005, the District Court in Center for Biological Diversity v. Norton issued an Order to Show Cause why it should not stay the litigation pending the Service's action on the new petition. In response to that Order, on March 14, 2005, we submitted a declaration to the Court stating that: (1) we could submit for publication in the Federal Register a 90-day finding on the new petition by June 13, 2005, and (2) if we found that the information presented in the petition was substantial, we could submit for publication in the Federal Register a 12-month finding by March 14, 2006. At a hearing on March 17, 2005, the Court stayed the case for 90 days, directed us to report to the Court and the parties concerning the status of our review of the petition by June 13, 2005, and continued the hearing on pending cross-motions for summary judgment to June 23, 2005.

On April 4, 2005, the Court concurred with the parties' requests to continue the hearing date until June 30, 2005, and to allow the Plaintiffs and Intervenor-Defendants (American Forest and Paper Association, California Forestry Association, and Sierra Pacific Industries) until June 23, 2005, to file any responses to our June 13, 2005, filing. On June 13, 2005, we submitted our 90-day finding to the Federal Register, which published the finding on June 21, 2005 (70 FR 35607). In that finding, we found that the petition presented substantial scientific or commercial information to indicate that listing the California spotted owl may be warranted, we initiated a status review of the taxon, and we solicited comments and information to be provided in connection with the status review by August 22, 2005. In light of the June 21, 2005, finding and pursuant to a joint stipulation of dismissal by the parties to the litigation, the Court dismissed the above case on July 25, 2005.

On October 14, 2005, we published in the Federal Register a notice reopening the public comment period through October 28, 2005 (70 FR 60051). On February 14, 2006, we filed with the Court our intention to deliver the 12-month finding to the Federal Register by May 15, 2006, to enable us to incorporate results from the most recent meta-analysis of California spotted owls that was delivered to us on February 21, 2006.

The Petition

The 2004 petition (Center for Biological Diversity 2004) states that historical and recent wildfires, historical logging, drought, diseases, insect pests, and other factors resulted in habitat loss and fragmentation, which negatively affected spotted owl numbers,

distribution, and dispersal. The petition describes how fuels build-up and changes in forest structure have put some stands at increased risk of stand-replacing fire, and that increased risk is considered a threat to existing owl pairs across the range of the California spotted owl.

The petition cites results from the meta-analysis of population dynamics of California spotted owls up through 2000 (Franklin *et al.* 2004) as evidence that spotted owl populations are declining and that management of forests may be a cause of these declines. The petition claims that we did not adequately address reported declines in our 2003 12-month finding (68 FR 7580) due to our heavy reliance on lambda (the finite rate of population change), 95-percent confidence intervals, and uncertainty.

The petition contends that the SNFPA (USFS 2004a) does not adequately protect large trees, high canopy closure, multiple-canopy layers, snags, and downed wood, that it does not provide limits on the proportion of areas that can be degraded through logging, and that it allows for treatment in more spotted owl Protected Activity Centers than does the 2001 Sierra Nevada Forest Plan (USFS 2001). The petition further states that logging under the SNFPA both within and outside of the Herger Feinstein Quincy Library Group Forest Recovery Act Pilot Project area threatens to further degrade and destroy California spotted owl habitat. The petition states that timber harvest on private lands threatens to further degrade and destroy spotted owl habitat, resulting in continued declines in numbers of spotted owls. The petition also states that the California State Forest Practices Code provides almost no specific protections for the spotted owl or its habitat.

The petition states that development on private lands in the Sierra Nevada and southern California presents a significant threat to the California spotted owl, particularly in low elevation riparian hardwood habitats. The petitioners further expressed concern that development in southern California could prevent dispersal between spotted owl populations in southern California, as mountain ranges occupied by spotted owls probably act as habitat islands with limited dispersal between them.

The petition states that recreation potentially affects spotted owls in several ways, including noise disturbance, construction of roads and trails, and expansion of ski resorts. The petition also states that grazing is likely to indirectly affect the owl by reducing or eliminating riparian vegetation, altering forest structure and fire regimes, and reducing prey density. The petition expresses concern that West Nile Virus presents a serious potential threat to California spotted owls, and recommends that its effects on spotted owls be monitored closely. The petition mentions concern that weather poses a threat to California spotted owls, and that threats from hybridization and site competition with the barred owl (Strix varia) have increased in recent years.

In this finding, we re-analyzed issues raised in the 2000 petition (Center for Biological Diversity 2000) and included a new analysis of concerns presented for the first time in the 2004 petition (Center for Biological Diversity 2004). In our 90-day finding of June 21, 2005 (70 FR 35607), we briefly analyzed the concerns as described in the petition. We stated that five changes that had taken place since our 2003 finding constituted substantial information that may affect the status and distribution of the California spotted

owl or change our understanding of possible declines in California spotted owl populations and thus justified further detailed analysis in a status review and 12-month finding. These changes were: (1) revisions to the 2001 SNFPA (USFS 2001) in the 2004 SNFPA (USFS 2004a); (2) revisions to the California State Forest Practices Code; (3) possible changes to the draft meta-analysis of the population dynamics of the California spotted owl in the final, published meta-analysis (Franklin *et al.* 2004); (4) impacts of recent fires and anticipated future fires in spotted owl habitat; and (5) further range expansion of the barred owl. In this finding, we analyze these five changes, other concerns expressed in the petition, and other pertinent information relative to whether the California spotted owl should be listed. Specific concerns included in the petition are noted and addressed under each of the factors presented below.

Taxonomy and Description

A summary of taxonomy and description of the California spotted owl can be found in the 2003 12-month finding (68 FR 7580) and is hereby incorporated by reference (68 FR 7580).

Genetics

A discussion of population genetics of the California spotted owl can be found in the 2003 12-month finding (68 FR 7580) and is hereby incorporated by reference (68 FR 7580). Subsequent studies analyzing mtDNA sequences (Haig *et al.* 2004; Chi *et al.* 2005;

Barrowclough et al. 2005) and microsatellites (Henke 2005) confirmed the validity of the current subspecies designations for northern (S. o. caurina) and California spotted owls.

Life History

Spotted owls in conifer forests of the Sierra Nevada, especially above mid-elevation mixed-conifer forests located at about 4,000 to 5,000 feet (ft)) (1,200 to 1,525 meters (m)), feed primarily on northern flying squirrels (Glaucomys sabrinus) (Verner et al. 1992b). Spotted owls in the mid- to lower elevations of the mixed-conifer zone and the upper elevations of the ponderosa pine (Pinus ponderosa)/hardwood belt of the Sierras prey primarily on both flying squirrels and dusky-footed woodrats (Neotoma fuscipes) (Verner et al. 1992b), while spotted owls in southern California feed mostly on woodrats (Thraillkill and Bias 1989). Flying squirrels typically use older mature forests because they provide suitable nest sites, including snags, and abundant sources of food including arboreal lichens and truffles, which are associated with an abundance of soil organic matter and decaying logs (Verner et al. 1992b). In second-growth forests in Oregon, northern flying squirrels were found in younger forests if large snags and downed logs remained from earlier stands (Carey and Peeler 1995). Woodrats and deer mice (Peromyscus maniculatus) accounted for 29 and 16 percent, respectively, of the total prey items in one study in an industrially managed forest in the Sierra Nevada (Clark 2002). According to Verner et al. (1992b:69), “spotted owls in the Sierran foothills and throughout southern California, even at high elevations, obtain 79 to 97 percent of their energy from woodrats.” Woodrats are most abundant in younger forest and in shrubby habitats and are uncommon in pure conifer forests or forests with little shrub

understory (Williams et al. 1992; Ward et al. 1998).

A more-complete discussion of California spotted owl life history characteristics including dispersal, reproduction, interactions with other species, and food habits can be found in the 2003 12-month finding (68 FR 7580) and is hereby incorporated by reference.

Distribution and Range

A discussion of range and distribution can be found in the 2003 12-month finding for the California spotted owl (68 FR 7580) and is hereby incorporated by reference. Since publication of the 2003 finding, Gutiérrez and Barrowclough (2005:185) noted that the range descriptions of the northern and California spotted owl subspecies in American Ornithologists' Union (1957) did not include the area between Mt. Shasta and Mt. Lassen because spotted owls were not known to occur in that area at that time, and that "the geographic scope of the listing was correct" to use the Pit River as the boundary between the two subspecies. Also since the publication of the 2003 finding, we gathered information concerning records of spotted owls in Baja California, Mexico. In 1887, A.W. Anthony reported seeing a spotted owl in the Sierra San Pedro Mártir of northern Baja California, Mexico (Bryant 1889), and, a few years later, may have had a second sighting in the same area (Anthony 1893). Wilbur (1987) stated that the only other records of spotted owls in Baja California were from the La Grulla area, also in northern Baja California, in 1925 and 1972.

Numbers and Connectivity

There are no reliable total population estimates for the California spotted owl. The number of California spotted owl territories has been used as an index to illustrate the range of the species and jurisdictions in which it occurs. This number is actually a cumulative total of all territories known to be historically or currently occupied by at least one spotted owl. This total increases over time as spotted owls move to new territories and as researchers survey new areas, even though many territories with sufficient suitable habitat may not be occupied in years following their initial discovery and some territories may no longer have sufficient suitable habitat to support spotted owls due to logging or fires. Thus, the number of territories should not be viewed as a population estimate for the taxon.

A total of 2,306 California spotted owl territories has been documented, 1,865 (81 percent) of which are in the Sierras (Service 2002). National forests in the Sierras contain a total of 1,399 territories: Modoc (3), Lassen (138), Plumas (254), Tahoe (173), Lake Tahoe Basin Management Unit (14), El Dorado (202), Stanislaus (234), Humboldt-Toiyabe (2), Inyo (5), Sierra (226), and Sequoia (148). National parks in the Sierras have 129 territories: Lassen Volcanic (6), Sequoia/ Kings Canyon (69), and Yosemite (54). Fourteen territories in the Sierras are on Bureau of Land Management (BLM) land in the Sierra Nevada, four are on California State Lands Commission Land, three are in State Parks, one is on California Department of Forestry (CDF) land, one is on Native American land, and 314 are on private lands (Service 2002).

Estimates for total number of spotted owl territories in southern California include 440 (Service 2002), 547 (Verner et al. 1994a), and 578 (Beck and Gould 1992). In southern California, spotted owls occupy “islands” of high-elevation forests separated by lowlands of chaparral, desert scrub, and, increasingly, human development (Noon and McKelvey 1992, LaHaye et al. 1994). The islands comprise 15–20 populations with 3–270 individuals per population. Islands are separated from each other by 10–72 kilometers (km) (6 to 45 miles (mi)) (Verner et al. 1992a, Gutiérrez 1994, LaHaye et al. 1994). These populations appear to be isolated from one another; no inter-mountain movements were documented for any of the 478 juvenile California spotted owls banded in the San Bernardino Mountains (LaHaye et al. 2001). Using our most-recent estimate of 440 total territories for southern California, the known territories on national forests are as follows: 109 on the Los Padres, 64 on the Angeles, 138 on the San Bernardino, and 18 on the Cleveland (Service 2002). There are two territories known on BLM land, eight on State park lands, six on Native American lands, and 95 on private lands. In addition, there is one known territory in Mexico (Service 2002). These 441 territories in southern California and Mexico comprise 19 percent of the total 2,306 California spotted owl territories.

Since publication of the 2003 12-month finding (68 FR 7580), we obtained additional information regarding spotted owl numbers on private lands in the Sierras. Six timber companies (W.M. Beaty and Associates, Inc.; Collins Pine Company; Fruit Growers Supply Co.; Roseburg Resources Co.; Sierra Pacific Industries (SPI); Soper-Wheeler Co.) own or manage the vast majority of California spotted owl habitat in private lands in the Sierra Nevada. SPI lands include more than 200 California spotted owl territories (Steve Self, SPI,

in litt. 2005). There are 36 records of nest sites within 4.8 km (3 mi) of W.M. Beaty-managed lands, and three nest sites either on or immediately adjacent to W.M. Beaty-managed lands (Bob Carey, W.M. Beaty, in litt. 2005). There are no known spotted owl territory-centers or nests on lands owned by Fruit Growers (John Eaker, Fruit Growers, in litt. 2006). (spotted owl territory-centers are typically the locations of nest trees, but if that information is unavailable, they can be the locations where fledgling owls were found, locations where a pair was detected, or locations where a single owl was detected) There are 40 spotted owl territory-centers situated either on or within 1.6 km (1 mi) of the land owned by Soper-Wheeler (Paul Violett, Soper-Wheeler, in litt. 2006). There are no known California spotted owl territory-centers or nests on lands owned by Collins Pine, and there are fewer than 10 territory-centers or nests immediately adjacent to their lands on national forest land (Jay Francis, Collins Pine, in litt. 2006). There are no known California spotted owl territory-centers or nests on Roseburg Resources lands, but there are four territory-centers or nests within 0.8 km (0.5 mi) of their boundaries (Rich Klug, Roseburg, in litt. 2006).

Habitat Use

Suitable habitat for spotted owls includes nesting, roosting, and foraging habitats. Nesting and roosting habitat of spotted owls typically includes many large trees (e.g., Call 1990; Zabel et al. 1992a, b; Moen and Gutiérrez 1997; North et al. 2000; USFS 2001a). For example, mean (\pm standard deviation) diameter at breast height (dbh) of the nest trees in Gutiérrez et al. (1992) were: 115.6 ± 37.3 cm (45.5 ± 14.7 in) (sample size = 81) in northern

Sierran conifer forests; 118.6 ± 49.8 cm (46.7 ± 19.6 in.) (sample size = 41) in southern Sierran conifer forests; 94.0 ± 35.3 cm (37.0 ± 13.9 in.) (sample size = 139) in southern California conifer forests; and 74.9 ± 42.2 cm (29.5 ± 16.6 in.) (sample size = 13) in riparian/hardwood forests. They found that the “dbh of nest trees in our current sample was significantly greater than that of conifers in the Sierra Nevada even in 1900” (Gutiérrez et al. 1992:92; emphasis in text). Mean diameters of nest trees in Blakesley (2003) were 117 ± 0.29 cm (46.1 ± 0.1 in.) (sample size = 132). Basal areas of nesting and roosting sites have been shown to be greater than those in random sites in the Sierras and in southern California (Bias 1989 in Gutiérrez et al. 1992; Laymon 1988 in Gutiérrez et al. 1992; LaHaye et al. 1997). Spotted owls nest in a variety of species of live trees and snags in pre-existing structures including cavities, broken top trees, and platforms such as mistletoe brooms, debris platforms and old raptor or squirrel nests; therefore nesting habitat includes more large live, decadent, and dead trees than do forests not used for nesting (Laymon 1988; Call 1990; Bias and Gutiérrez 1992; Gutiérrez et al. 1992, 1995; LaHaye et al. 1997).

High amounts of canopy closure and structural diversity (multi-layered canopy) are typical of nesting and roosting stands used by spotted owls in the Sierras and in southern California (e.g., Laymon 1988; Call et al. 1992; LaHaye et al. 1992, 1997; Zabel et al. 1992a; Moen and Gutiérrez 1997; North et al. 2000; Seamans 2005). Nesting and roosting stands often have mean canopy closures of greater than 75 percent (Bias and Gutiérrez 1992; Gutiérrez et al. 1992). Verner et al. (1992b:60; emphasis in text) summarized: “Habitats used for nesting typically have greater than 70 percent total canopy cover (all canopy above 7 feet [2.1 m]), except at very high elevations where canopy cover as low as 30–40 percent

may occur (as in some red fir stands of the Sierra Nevada). Nest stands typically exhibit a mixture of tree sizes and usually at least two canopy layers, with some very large, old trees usually present... Stands used for roosting are similar to those used for nesting, with relatively high canopy cover, dominated by older trees with large diameters, and with at least two canopy layers..."

Spotted owls forage in forests with ample open flying space within and beneath the canopy, so extremely dense stands typically are not used for foraging (Verner et al. 1992b; Gutiérrez et al. 1995). Verner et al. (1992b:60) summarized: "Foraging habitats include suitable nesting and roosting sites as well as more open stands, regularly down to 40–50 percent canopy cover, that are generally similar in structure and composition to nesting and roosting habitat." Foraging habitat in conifer forests is enhanced by the presence of hardwoods, and foraging habitat at lower elevations in the Sierras and in southern California tend to have less downed woody debris and be less multi-layered (Verner et al. 1992b).

In the study area with largest sample sizes in Zabel et al. (1992a), 24 spotted owls during the breeding season spent 69 percent of their time in forests with 40–69 percent canopy closure and 22 percent of their time in forests with greater than 70 percent canopy closure. During the non-breeding season, 18 spotted owls spent 64 percent of their time in suitable-habitat forests with 40–69 percent canopy closure and 22 percent of their time in forests with greater than 70 percent canopy closure (Zabel et al. 1992a). California spotted owls avoid open areas (0–30 percent canopy cover; Gutiérrez et al. 1992) and recently logged forests (Call 1990; Zabel et al. 1992b; Gutiérrez and Pritchard 1990). As previously

mentioned, suitable habitat includes nesting, roosting, and foraging habitat. In light of the typical canopy cover in these habitats (>70 percent for nesting/roosting and >40 percent for foraging), 40 percent canopy cover is a minimum threshold for suitable habitat. Other studies also support this 40-percent canopy-cover threshold for suitable habitat (e.g., Call et al. 1992; Verner et al. 1992b; Zabel et al. 1992; Moen and Gutiérrez 1997).

The Forest Service defines spotted owl habitat by using California Wildlife Habitat Relationship (CWHR) classes. In the CWHR system, tree-dominated habitats are classified relative to six tree size classes and four canopy-closure classes. Size class 1 (seedling tree) areas are comprised of trees less than 2.5 cm (1 in.) dbh, size class 2 (sapling tree) areas are of trees 2.5–15 cm (1–6 in.) dbh, size class 3 (pole tree) stands are of trees 15–28 cm (6–11 in.) dbh, size class 4 (small tree) stands are of trees 28–61 cm (11–24 in.) dbh, sizes class 5 (medium/large tree) stands are of trees greater than 61 cm (24 in.) dbh, and size class 6 (multi-layered tree) stands have class 5 trees over a distinct layer of Class 4 or 3 trees and have more than 60 percent canopy closure (Mayer and Laudenslayer 1988). Canopy-closure classes are: S (sparse; 10–24 percent closure), P (open; 25–39 percent closure), M (moderate; 40–59 percent closure), and D (dense; 60–100 percent closure) (Mayer and Laudenslayer 1988). The Forest Service considers suitable California spotted owl habitat as forest stands represented by CWHR classes 4M, 4D, 5M, 5D, and 6 (Mayer and Laudenslayer 1988) in mixed conifer, red fir, ponderosa pine/hardwood, foothill riparian/hardwood, and east-side pine forests, and considers nesting habitat as forest stands represented by CWHR classes 5M (with at least 50 percent canopy closure), 5D, and 6 (USFS 2004a). The Service agrees with this classification depending on the structural

condition of 4M and 4D stands. For a complete description of habitat use and home range of California spotted owls, see our 2003 12-month finding (70 FR 35607) and Service (2006), both of which are hereby incorporated by reference. We supplement information in that finding with the following discussion of habitat use by spotted owls.

Habitat modeling of northern spotted owls in California (Franklin et al. 2000) and Oregon (Olson et al. 2004) showed that survival was maximized when northern spotted owl territories included large blocks of mid- and late-seral forests with some edge, but that fecundity was maximized with small blocks of northern spotted owl habitat and large amounts of edge between spotted owl habitat and other habitats. This difference was due, presumably, to the presence of woodrat prey in brushy clearcuts and forest edges (Franklin et al. 2000; Olson et al. 2004). Conversely, population analysis of California spotted owls in the central Sierra Nevada with habitat covariates at the territory scale indicated there was no relationship between fecundity and habitat heterogeneity (Seamans 2005). However, survival rate and territory occupancy in that study were positively related to the amount of mid- and late-seral forests (Seamans 2005). Further, it was estimated that reproductive output was strongly influenced by weather, and it was hypothesized that reproductive output by California spotted owls at an individual territory was conditional on the territory being occupied during years when weather conditions were conducive to successful reproduction (Seamans 2005). Reproduction of spotted owls in the southern Sierra Nevada increased with canopy closure because more pairs successfully nested, not due to the production of more young per pair (Lee and Irwin 2005; Lee in litt. 2005). This increase in canopy closure appeared to be more of a minimum threshold requirement than a trend, with only marginal

increases in spotted owl reproduction as canopy closure increased past the minimum. The minimum appeared to require that at least 44 percent of the 430-ha (1,063-ac) immediately surrounding the territory-center was forest with greater than 40 percent canopy cover. Once this minimum was met, the relative amount of forests with intermediate (40–70 percent) and dense (greater than 70 percent) canopy cover had little measurable effect on reproduction of spotted owls. These findings were conditional on having a suitable nest tree in the stand and are, therefore, not applicable to fire-suppressed stands with heavy ladder fuels in which such trees would be lost in a fire (Lee and Irwin 2005; Lee in litt. 2005).

Additional information concerning habitat use and home range of California spotted owls can be found in our 2005 90-day finding (70 FR 35607) which is incorporated by reference.

Habitat Condition

Changes to Habitat

Our 2003 12-month finding (70 FR 35607) included a lengthy discussion of historic changes to California spotted owl habitat which is hereby incorporated by reference. Below, we supplement that discussion with additional information related to wildfires and timber harvest.

The petition states that historic and recent wildfires, as well as more than 100 years of

logging in the Sierras, resulted in habitat loss and fragmentation, which negatively affected spotted owl numbers, distribution, and dispersal (Center for Biological Diversity 2004). Suppression of wildland fires, established in California as State and Federal policy by the early 20th century, virtually eliminated forest fires. Up to the 1990s, it was estimated that only 269 ha (664 ac) burned annually in the 237,146-ha (586,000-ac) Eldorado National Forest, whereas approximately 11,736 ha (29,000 ac) burned annually before European arrival (Weatherspoon et al. 1992). Due to the lack of frequent fires, many forested areas have grown dense layers of understory trees and have accumulated large amounts of woody debris on the forest floor, thereby increasing the chances of high-intensity, stand-replacing crown fires in the Sierras and in the mountains of southern California (Kilgore and Taylor 1979; McKelvey and Weatherspoon 1992; Weatherspoon et al. 1992; Stephenson and Calcarone 1999). The species composition of these forests has shifted from fire-hardy species to more shade-tolerant, fire-sensitive species such as white fir and incense-cedar (Verner et al. 1992; Weatherspoon et al. 1992). Additionally, in areas throughout the range of the California spotted owl, trees that are dead or dying due to disease add to the already dense accumulations of woody debris. One of the challenges in assessing the effects of fire management in the habitat of California spotted owls is the need to weigh the long-term benefits of reducing the risk of catastrophic fires against any potential short-term effects on the quality or quantity of spotted owl habitat. In southern California, fire history records since 1910 indicate that the average patch-size of large fires has varied little over the years, but the occurrence of small fires has increased every year (Keeley et al. 1999 in USFS 2005a). The total acres burned in the four national forests of southern California have increased during each of the last three decades (USFS 2005a).

Selective harvest of merchantable trees in the Sierras—often old-growth trees—was the norm during the late 1800s through the 1970s, resulting in the loss of much suitable habitat and the production of forests with younger average tree ages. From the 1970s onward, clearcut harvests became increasingly more common, which resulted in patchworks of spatially heterogeneous forests (McKelvey and Johnston 1992). “The mixed-conifer zone of the Sierra Nevada, therefore, has few or no stands remaining that can be described as natural or pristine” (McKelvey and Johnston 1992:241). These activities “undoubtedly impacted spotted owl habitat, though we cannot determine the extent of that impact. In general, the proportion of the area supporting conifer forests appears to have been reasonably static over the last 90 years” (McKelvey and Johnston 1992:246). From the late 1980s onward, cutting was increasingly based on salvaging timber damaged or killed by fires or disease (salvage harvests) (McKelvey and Johnston 1992). Annual total volume of timber cut in the Sierras decreased from approximately 1.6 to 1.9 billion board feet during the late 1940s to early 1950s to approximately 1.3 to 1.5 billion board feet from the mid 1950s to the late 1970s (McKelvey and Johnston 1992:Fig. 11U). Levels of timber harvest on national forest lands declined sharply after implementation of the California Spotted Owl Sierran Province Interim Guidelines in 1993 (USFS 2001). From 1993 through 2004, annual harvest in national forests dropped over 80 percent from 450 to 86 million board feet (mmbf); similarly, annual timber harvest from 1993 to 2004 on private lands in the Sierras declined 37 percent from about 1 billion board feet to 632 mmbf (California Board of Equalization 2006). The average annual harvest from 1993 to 2004 was 188.5 mmbf (California Board of Equalization 2006). Currently, all cutting of timber in the national forests in the Sierra

Nevada is conducted as part of the implementation of the Herger Feinstein Quincy Library Group Forest Recovery Act Pilot Project (Pilot Project) and fire-fuel reductions via the SNFPA (USFS 2004a); the amounts and placements of these harvests, and how they are anticipated to affect spotted owls, are presented in other sections below.

The petition states that historical logging, drought, diseases, insects, and other factors have contributed to the loss of habitat for the isolated populations of spotted owls in southern California (Center for Biological Diversity 2004). Timber harvest in southern California was never as extensive as that in the Sierra Nevada. Harvest volume in Los Angeles and San Bernardino Counties was about 10 to 20 times higher in the 1960s than in the early 1980s, and the decline has continued since the 1980s (McKelvey and Johnston 1992). Timber harvest in the four national forests of southern California only occurred during 2 years from 1993 to 2004. In 2001, harvest volume was 1 mmbf, and in 2003, harvest volume was 390,000 board feet (California Board of Equalization 2006). Harvests in national forests of southern California in recent years have primarily been salvage and hazard trees along roads and near administrative sites (Mike Gertsch, USFS, *in litt.* 2002). In 2005, sales of saw timber in the national forests of southern California increased to approximately 10 mmbf due to salvage-harvesting of trees that had died from drought, insects, and fires (Loe *in litt.* 2006). Similarly, private-land harvests in southern California from 1993 to 2002 averaged only 130,000 bf annually, but increased to 7 mmbf in 2003 and 1.4 mmbf in 2004 (California Board of Equalization 2006) due to an increase in salvage-harvesting. Tree mortality and salvage harvesting likely had some adverse effects on spotted owls in southern California. The extent of this effect is unknown, but the quantity harvested is a small fraction of that

removed decades earlier (27.4 mmbf was cut in 1963 in southern California alone; McKelvey and Johnston 1992).

Forest types important to spotted owls in southern California include lower montane forests and bigcone-Douglas fir stands, which are patchy in nature and often located within expanses of chaparral. The Forest Service indicates that stand-replacing fires in southern California forests are still relatively uncommon; the few fires that have occurred have either been wind-driven fires in steep terrain or have spread into forests from lower elevations, most often from chaparral. However, in the San Bernardino Mountains, stand-replacing fires resulted in a net loss of 18 percent of the bigcone-Douglas fir stands between 1938 and 1978. Furthermore, recent history in other areas suggests that such fires will become more common (USFS 2005a).

Large-scale fires have occurred in spotted owl habitat in recent years in southern California. For example, in the Los Padres National Forest, wildfires burned to some extent 42,986 ha (106,220 ac) or 18 percent of California spotted owl habitat since 1989. In the Monterey Ranger District, where most of the California spotted owl habitat in Los Padres National Forest is located, 34 percent of 61,625 ha (152,280 ac) of California spotted owl habitat burned to some extent since 1989. The intensities and effects of these fires on spotted owl habitat are unknown, but many of these areas probably burned only lightly (Kevin Cooper, USFS, *in litt.* 2005). In San Bernardino National Forest, five spotted owl territories in the San Diego Ranges were completely burned in 2003, and nine territories in the San Gabriel Mountains were burned so heavily in 2002 and 2003 that it is doubtful that they can

support spotted owls at this time (USFS 2004b, Steve Loe, USFS, in litt. 2005). In Cuyamaca State Park, which is located in the Laguna Mountains adjacent to the Descanso Ranger District of Cleveland National Forest, the 2003 Cedar Fire completely burned approximately six spotted owl territories (Kirsten Winter, USFS, in litt. 2005). These 20 territories that were completely burned during recent years comprise 4.5 percent of the 440 total territories known for southern California. These fires had a negative impact on spotted owls, but we anticipate that fuels-reduction activities in southern California will decrease the frequency of fires in the future.

Present Habitat in the Sierra Nevada

Approximately 2,024,000 ha (5 million ac) of suitable habitat for California spotted owls (defined as CWHR classes 4M, 4D, 5M, 5D, 6) are located within national forests in the Sierra Nevada, which is about 43 percent of the area managed under the SNFPA (Tom Efird, USFS, in litt. 2006). Additionally, Sequoia and Kings Canyon national parks, Yosemite National Park, and Lassen Volcanic National Park collectively include approximately 186,676 ha (461,286 ac) of suitable habitat for spotted owls (Beck and Gould 1992).

National forests in the Sierra Nevada include approximately 560,000 ha (1.4 million ac) of private land within their administrative boundaries. Private land inholdings are much greater in extent in the northern national forests (especially the Lassen, Plumas, and Tahoe) than in the southern Sierra Nevada forests. Much of the private land within the boundary of the Lassen and Plumas national forests is in contiguous blocks, leaving national forest lands

also fairly contiguous. Most private land on the Tahoe National Forest is in checkerboard ownership, and the Eldorado National Forest has a combination of checkerboard ownership and large contiguous blocks of inholdings.

SPI is the largest private landowner in the range of the California spotted owl. SPI characterizes its timberland based upon an intensive set of measured inventory plots (1 plot every 1.6 ha (4 ac)) and does not categorize its inventory directly in terms of CWHR types. SPI owns 433,000 ha (1,070,000 ac) of land within the range of the California spotted owl, of which 370,000 ha (913,000 ac) are classified by SPI to be nesting, roosting, or foraging habitat (CWHR 3D, 4M, 4D, 5M, 5D, and 6), and the remainder is classified as prey-producing, non-forest, or plantation (Ed Murphy, SPI, *in litt.* 2006). (The SPI suitable-habitat class includes the smaller tree-size class CWHR class 3D, unlike the USFS and the Service.) Data provided by SPI indicate that many areas considered suitable habitat are of high quality. Of the nesting, roosting, or foraging habitat, 108,000 ha (267,000 ac) contain "nest-site characteristics" (with approximately 50 trees at least 56 cm dbh per ha (20 trees at least 22 in. dbh per ac) and a canopy closure at least 60 percent), and 260,000 ha (642,000 ac) are considered nesting/roosting habitat (CWHR 4D, 5M, 5D, and 6) (Murphy *in litt.* 2006). SPI's "nest-site characteristics" type is derived from measurements at 38 reproductive northern spotted owl (sample size = 22) and California spotted owl (sample size = 16) nest sites. During the next 100 years, SPI estimates that, as their forests mature, habitat with nest-site characteristics will more than double from 25 to 53 percent of all California spotted owl habitat on SPI land. Other habitat types will also change proportionally through time: from 29 to 15 percent for nesting/roosting habitat (excluding nest-site habitat); from 29

to 13 percent for foraging habitat; and from 12 to 16 percent for prey-producing habitat (SPI 1999a, b; Murphy in litt. 2006).

W.M. Beaty manages approximately 69,565 ha (171,900 ac) within the range of the California spotted owl. Of this total, 6,235 ha (15,408 ac) are considered suitable habitat for California spotted owls using the criteria used in CDF (2005) (quadratic mean diameter (QMD) at least 27.9 cm (11 in) and overstory canopy closure at least 40 percent) and 1,384 ha (3,420 ac) are considered suitable habitat using more-conservative criteria for northern spotted owls developed by W.M. Beaty and the Service (QMD at least 30.5 cm (12 in) and overstory canopy closure at least 50 percent) (Carey in litt. 2005). Fruit Growers owns approximately 44,515 ha (110,000 ac) acres of forest in the range of the California spotted owl (Eaker in litt. 2006). Soper-Wheeler owns approximately 25,900 ha (64,000 ac) of land within the range of the California spotted owl, of which approximately 15 percent is in what they define as nesting/roosting habitat (CWHR 4M, 4D, 5M, 5D, 6), 65 percent is what they define as foraging habitat (CWHR 3S, 3P, 3M, 3D, 4S, 4P, 5S, 5P) and 20 percent is non-habitat (CWHR 2S, 2P, 2M, 2D) (Ryan McKillop, Soper-Wheeler, in litt. 2006). Within the western Sierras, approximately 93 percent of the 16,997 ha (42,000 ac) owned by Soper-Wheeler is timbered (Violett in litt. 2006). Collins Pine owns approximately 38,040 ha (94,000 ac) in the range of the California spotted owl, approximately 95 percent of which is timbered (Francis in litt. 2006). Roseburg Resources has 50,000 to 70,000 timbered acres in the range of the California spotted owl, but they have not classified their lands relative to spotted owl habitat (Klug in litt. 2006).

Present Habitat in Southern California

There are approximately 473,473 ha (1,170,000 ac) of general habitat types where spotted owls were known to reproduce within the range of spotted owl in southern California and the central Coast Ranges (Stephenson and Calcarone 1999). However, the total amount of suitable habitat in southern California is likely lower than that amount because habitat types are a broad generalization of what California spotted owls actually require for habitat to be suitable (for example, a minimum canopy cover is a requisite for suitable habitat, but is not captured in characterization of habitat types). A discussion of spotted owl habitat in southern California can be found in the 2003 12-month finding for the California spotted owl (68 FR 7580) and is hereby incorporated by reference.

Population Trends

The petition cites results from the meta-analysis of population dynamics of California spotted owls up through 2000 (Franklin *et al.* 2004) as evidence that spotted owl populations are declining and that management of forests may be a cause of these declines (Center for Biological Diversity 2004). This meta-analysis analyzed demographic data of spotted owls on the Lassen (1990 to 2000), Eldorado (1986 to 2000), Sierra (1990 to 2000), and San Bernardino (1987 to 1998) national forests and in Sequoia and Kings Canyon national parks (1990 to 2000). The petition claims that we did not adequately address reported declines in our 2003 12-month finding (68 FR 7580) due to our heavy reliance on the finite rate of population change (λ), 95-percent confidence intervals, and scientific uncertainty

(Center for Biological Diversity 2004). Our analysis of more-recent data up through 2005 (Blakesley et al. 2006) indicates more-positive trends for spotted owls in the Sierras and is discussed at length below.

Spotted owls in the Sierra Nevada may have undergone at least three periods of decline due to: elimination of prey species by intensive livestock grazing and burning in the 1800s; logging beginning in the late 1800s, which removed basic structural elements of spotted owl habitat; and logging of stands in recent decades that regenerated following initial entry (Gutiérrez 1994). However, causal mechanisms of negative effects to spotted owls ascribed to the high levels of timber harvest circa 1990 have been substantially reduced as timber harvest levels dropped and increased protection measures were instituted in the mid- and late-1990s.

A discussion of studies concerning population trends of California spotted owls can be found in the 2003 12-month finding for the California spotted owl, and that information is incorporated by reference (68 FR 7580). Early population studies used an analysis called a “projection matrix” to estimate population trend, and many of these early studies showed declining California spotted owl populations. However, projection matrices were determined to bias results of spotted owl population trends because they do not account for movement of spotted owls in and out of the population (Franklin et al. 2004). With the exception of the San Bernardino study area, California spotted owl study areas were considered “open,” (owls moved in and out of the study areas) and, as stated by Franklin et al. (2004:53), “we do not expect [traditional projection matrices] to yield useful inferences for geographically open

systems.” Thus, we place greater weight on results of more recent meta-analyses (Franklin *et al.* 2004; Blakesley *et al.* 2006), which estimated growth rates for each study area using the “Pradel” method, than on methods that employed the projection matrix. The Pradel method avoids potential biases that cause uncertainty in estimating population trend using the projection matrix because it incorporates emigration and immigration rates (Franklin *et al.* 2004). In our 2003 finding, we included a discussion of the results of a meta-analysis using the Pradel method for five California spotted owls demographic study areas—Lassen (LAS), Eldorado (ELD), Sierra (SIE), Sequoia/Kings Canyon (SKC), and San Bernardino (SAB)—using a draft manuscript of data that was collected from 1990 to 2000 for the ELD, SIE, and SKC study areas, and from 1990-1998 for the SAB study area (later published in Franklin *et al.* 2004).

A more-recent draft meta-analysis report was submitted to the Service on February 21, 2006 (Blakesley *et al.* 2006) for data collected from 1990 to 2005 in four study areas in the Sierras. The San Bernardino study area was not included in this report because there were no survey data after 1998. This new meta-analysis used methods that were very similar to those used in Franklin *et al.* (2004), but incorporated many improvements; methods used in this new meta-analysis are described in Blakesley *et al.* (2006). At the request of the Service, this new analysis also included population viability analyses (PVAs). Overall, results of the new meta-analysis (Blakesley *et al.* 2006) reported more positive indications of population trends for the spotted owls of the Sierra than did the older analysis, as summarized below.

In the meta-analysis of all four study areas, survival rates of adult spotted owls (territorial owls at least 3 years old) were estimated to have increased through time (Blakesley *et al.* 2006). This result is important because “spotted owl population growth is most sensitive to changes in adult survival” (Blakesley *et al.* 2006:27). Analysis of reproductive output on individual study areas showed varying degrees of an even-odd year effect (with good reproduction in even years, poor reproduction in odd years) for the four study areas. As with the earlier meta-analysis, lambda, or the finite rate of population change, was calculated as an annual estimate to determine if the population increased, decreased, or remained stationary. In the earlier meta-analysis (Franklin *et al.* 2004), lambda for LAS showed no trend (was stationary), lambda for SKC decreased and then increased over time, and lambdas for ELD and SIE decreased through time, with that of the ELD being especially steep. With the additional years’ data included in the new meta-analysis, no strong evidence was found for decreasing linear trends in lambda on any of the study areas. Lambda for SKC decreased then increased over time, lambdas for LAS and SIE were relatively stationary, and lambda for the ELD showed decreases through the 1999 time period, and then subsequent increases (Blakesley *et al.* 2006).

Mean lambdas estimated for the ELD (1.007) and SKC (1.006) were greater than 1.0, indicating possible increasing populations, the mean lambda estimated for the SIE (0.992) was nearly 1.0, indicating a possible stationary population, and the mean lambda estimated for LAS (0.973) was less than 1.0, indicating a possible declining population. Because these values for lambdas were estimates (it is not possible to calculate the exact value), confidence intervals were calculated to provide an understanding of how close the estimated mean was

to the true mean. For example, if a 95-percent confidence interval for an estimated mean lambda of 0.98 was between 0.96 and 1.02, this would tell us that even though our estimated mean lambda was 0.98, we are 95 percent confident that the true lambda is between 0.96 and 1.02. In this example, the confidence interval included 1.0, which means we are 95 percent confident that the true lambda is not statistically different from a stationary population. In the meta-analysis results, the 95-percent confidence intervals for estimates of mean lambda for all four study areas in the Sierras included 1.0, indicating that statistically the populations were not different from stationary populations. The confidence interval for LAS barely included 1.0, however, suggesting that the spotted owls in that study area may have been declining (Blakesley *et al.* 2006).

Using annual lambda estimates calculated in the meta-analysis, Blakesley *et al.* (2006) evaluated the trajectory of each study population through time. This exercise used a hypothetical starting population of 100 owls on each study area, and calculated the number of owls that would remain over the study period (start and end years differed for some study areas depending on survey effort (Blakesley *et al.* 2006)). As presented in the report, if there were 100 spotted owls in SKC in 1993, hypothetical trajectory estimated that there would be 113 spotted owls in 2003. Similarly, for a 1992-2004 study period for the other study areas, if there were 100 spotted owls in each of these areas in 1992, there would be 69 in LAS, 127 in ELD, and 95 in SIE in 2004. To better understand this exercise as it related to the entire population of spotted owls in the Sierra Nevada, we noted that there were 400 spotted owls to start (100 owls per study area), and a projected end population of 404 spotted owls (by summing 113, 69, 127, and 95).

Finally, for each population, a PVA was produced on predictions of declines in the population greater than 10, 20, and 30 percent for 2–20 years into the future (Blakesley *et al.* 2006). In a PVA, the probability of a certain decline happening in a certain timeframe can range from 0.0 to 1.0 (i.e., 0 percent to 100 percent). Ninety-five-percent confidence intervals on probabilities of declines greater than 10 percent were 0.0 to 1.0 within 5–10 years for all four study areas. Because these probabilities were so imprecise (i.e., the confidence interval covered from 0–100 percent probabilities of decline), inferences were restricted to 7 years into the future. Even after this restriction, predictions had very imprecise confidence intervals. PVAs indicated that the probabilities of observing declines of greater than 10 percent in 7 years were 0.64 (95 percent confidence interval = 0.27 to 0.94) for LAS, 0.23 (95 percent confidence interval = 0.00 to 0.92) for ELD, 0.41 (95 percent confidence interval = 0.09 to 0.78) for SIE, and 0.25 (95 percent confidence interval = 0.00 to 0.89) for SKC. The large confidence intervals indicate that these probabilities still were inexact, making inference from these estimates difficult. In addition, the study modeled the probability of observing declines and increases of greater than 10, 20, and 30 percent at 7 years in the future for a hypothetical population with $\lambda = 1.0$ and temporal process standard deviation (estimated from these spotted owl studies) = 0.082. This hypothetical population exhibited 0.31, 0.15, and 0.05 probability of declining by greater than 10, 20, and 30 percent, respectively, and 0.33, 0.20, and 0.11 probability of increasing by greater than 10, 20, and 30 percent, respectively (Blakesley *et al.* 2006).

To summarize the recent meta-analysis results for spotted owl populations in the

Sierras: adult survival increased through time; most populations demonstrated an increasing or stationary trend; there was no strong evidence for decreasing linear trends in lambda on any of the study areas; modeling of four study areas demonstrated that total hypothetical spotted owl numbers did not decrease over time; and the PVA results appeared to be somewhat equivocal because of the imprecision of the estimates in the real populations and because the modeled probabilities of increase and decrease in the hypothetical populations were very similar . We find that with the exception of the LAS study area, California spotted owl populations in the Sierras show little evidence of a decline, and attempts to model future population trends are too imprecise to provide an accurate projection.

In southern California, approximately 71 percent of past or current territories of spotted owls are located on public lands, virtually all of which are within four national forests (Los Padres, Angeles, San Bernardino, and Cleveland). Other than a few project-specific surveys, there have been no surveys for spotted owls in the Los Padres National Forest since 1991 (Cooper *in litt.* 2005) or in the Cleveland National Forest since 1995 (Winter *in litt.* 2005), and results from surveys in the Angeles National Forest since 1994 have not been compiled (Ann Berkley and Leslie Welch, USFS, *in litt.* 2005). We have the most information for spotted owls in the San Bernardino National Forest, which contains the largest population of spotted owls in southern California. Early modeling conducted for spotted owls in the San Bernardino and San Jacinto mountains area indicated possible substantial declines (LaHaye *et al.* 1994). Using different methods and analyzing more years of data than those in LaHaye *et al.* (1994), the 2004 meta-analysis reported that the mean lambda for the San Bernardino study area up through 1998 was less than 1.0 (0.978), but was

not statistically different from that of a stationary population (Franklin *et al.* 2004). Surveys in the San Bernardino were not conducted from 1999 to 2002. Surveys of many of the territories in the San Bernardino Mountains and San Jacinto Mountains were resumed in 2003 and 2004 (LaHaye *et al.* 2003, 2004), but these surveys were not included in the recent meta-analysis (Blakesley *et al.* 2006) due to the lack of surveys from 1999 to 2002.

Identifying trends from southern California data is confounded by factors including: surveying of additional territories through time (from 42 territories in 1987 to 148 territories in 1998); surveying only approximately one-half of the San Bernardino territories in 2003 (63 territories) and 2004 (77 territories) that were surveyed in 1998; lack of separate analysis of occupancy of the same individual territories from 1987 to 1998; and high number of occupied territories near the end of the survey period (i.e., 100–109 occupied territories in 1989, 1990, 1991, and 1995) (LaHaye *et al.* 2001).

Summary of Factors Affecting the Species

Section 4 of the Act (16 U.S.C. 1533), and our implementing regulations at 50 CFR 424, set forth procedures for adding species to the Federal endangered and threatened species list. In making this finding, information regarding the status and threats to this species in relation to the five factors in section 4 of the Act is summarized below. In this evaluation, we confine the scope of our judgment of the future actions and programs to reasonably foreseeable outcomes of established management direction, rather than a more speculative assessment of possible future management scenarios.

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of the
Species' Habitat or Range

Stand-replacing Fires

Existing habitat used by California spotted owls appears to be vulnerable to stand-replacing catastrophic fire. As described in the 2003 12-month finding (70 FR 35607) (which we hereby incorporate by reference) and above in “Changes to Habitat,” removal of large overstory trees by logging in conjunction with decades of fire suppression has produced forests that are denser, composed of more small and medium-sized trees that are more fire-prone than those historically in the Sierras and in southern California. The petition discusses how changes in forest structure and fuels build-up have put some stands at increased risk of stand-replacing fire, and that increased risk is considered a threat to existing owl pairs across the range of the California spotted owl (Center for Biological Diversity 2004). Dense stand conditions in California forests have increased tree mortality due to drought, and insect and disease outbreaks (University of California 1996). Cumulatively, these conditions have increased the magnitude of the threat of catastrophic stand-replacing fires to nesting and roosting habitats used by spotted owls.

According to the Forest Service, the greatest continuing threat to spotted owls is loss of habitat and subsequent population losses of spotted owls due to stand-replacing fire in unnaturally dense forest stands (USFS 2004a; 2005a). During the past 30 years, an average of 17,400 ha (43,000 ac) of wildfire burned annually in the Sierras; in the past 10 years, this

average has increased to about 25,500 ha (63,000 ac) annually (USFS 2004a). The Forest Service believes that it will take at least 20 years of fuels treatments before significant changes in fire behavior are achieved (USFS 2004a). They estimate that about 24,281 ha (60,000 ac) of forests in the Sierras will be burned annually in wildfires over the next 20 years (USFS 2004a), which totals 485,622 ha (1,200,000 ac) or 10.9 percent of the 4.5 million ha (11 million ac) within these national forests. They estimate that about 25 percent of these fires will be high-intensity fires, which would affect 2.7 percent of all of their lands. They also estimate that approximately 90 spotted owl Protected Activity Centers (PACs) (6.8 percent of 1,321 total PACs) would be “lost to wildfire” during that time (USFS 2004a:278) (This 6.8 percent of total PACs lost is less than the 10.9 percent of total forest lost above because many acres anticipated to be burned would be outside of PACs in non-suitable habitat.) They further estimate that 50 years from now, after implementation of the SNFPA, the area burned in the Sierras would drop to about 19,830 ha (49,000 ac) annually (USFS 2004a). Recent fires in southern California, as presented above in “Changes to Habitat,” are indicative of anticipated fire-frequencies and fire-intensities anticipated for the near future.

Fuels-reduction Activities

The petition (Center for Biological Diversity 2004) contends that the SNFPA (USFS 2004a) does not adequately protect large trees, high canopy closure, multiple-canopy layers, snags, and downed wood, that it does not provide limits on the proportion of areas that can be degraded through logging, and that it allows for treatment in more PACs than does the 2001 Sierra Nevada Forest Plan (USFS 2001). The petition further states that logging under the

SNFPA both within and outside of the Pilot Project area threatens to further degrade and destroy California spotted owl habitat. Below, we discuss how guidelines in the SNFPA strive to maintain spotted owl habitat while reducing the threat of wildfire, and we provide details regarding the many restrictions and guidelines that limit the proportion of areas that can be logged in spotted owl habitat.

Concern over potential disastrous wildfire effects on human communities has strongly influenced management direction toward reducing fuels in proximity to human communities in the forested interface between wildlands and urban areas. Response to this concern is manifested in nationwide activities under the National Fire Plan of 2000 which established general guidance and funding for land-management agencies and communities involved in fire suppression and fuels reduction. To reduce the risk of wildfire to communities while modifying fire behavior over the broader landscape, the Forest Service is conducting a fuels-reduction treatment program (the SNFPA) throughout National Forest System lands in the Sierras (USFS 2004a; guidelines and regulations most pertinent to this finding are presented in Factor D).

The SNFPA addresses fuels treatments in two areas: the Pilot Project area within the Lassen and Plumas national forests and the Sierraville Ranger District of the Tahoe National Forest; and all other national forest lands in the Sierras. In Factor D, we discuss the regulations, standards, and guidelines that govern fuels reductions and timber harvests in the Pilot Project area. In brief, within the Pilot Project area, all fuels-reduction and timber-harvest activities are prohibited within the 411 PACs and spotted owl habitat areas (404.7 ha,

1,000ac) surrounding all known territory-centers; suitable nesting habitat (CWHR 5M, 5D, 6) is managed in Defensible Fuel Profile Zones to provide for at least 40 percent canopy cover, retain all trees greater than 76.2 cm (30 in) dbh, and to retain at least 40 percent of the basal area (generally in the largest trees); and there are specific retention requirements in Defensible Fuel Profile Zones and areas thinned using individual-tree selection.

In areas outside of the Pilot Project, priority treatments are focused on lands within designated land allocations named wildland urban interface (WUI) lands, but treatments will occur both in WUIs and in non-WUIs. WUIs are comprised of Defense Zones, which are generally a 0.4-km (0.25-mi) buffer around developed sites, and Threat Zones, which extend approximately 2 km (1.25 mi) out from the Defense Zone boundary. In the national forests in the Sierras, there are 129,177 ha (319,204 ac) in Defense Zones, and 850,433 ha (2,101,470 ac) in Threat Zones; approximately 13 percent of WUI acres are in Defense Zones and 87 percent are in Threat Zones (USFS 2004a). During the 20 years of the SNFPA, the Forest Service plans to treat 340,097 ha (840,400 ac) using prescribed fire as the initial treatment and 584,365 ha (1,444,000 ac) using mechanical treatments, for a total of 970,686 ha (2,398,620 ac) (USFS 2004a:FSEIS 98) or 22 percent of the 4.5 million total ha (11 million ac) in these national forests. Approximately 36 percent of these treatments are expected to be in WUIs and 64 percent are anticipated in non-WUI lands (USFS 2004a; Don Yasuda, USFS, *in litt.* 2006).

Fuels treatments implemented in PACs, each of which contains 121 ha (300 ac), may be important to the persistence of spotted owls if the treatments negatively affect the

suitability of these areas for nesting, roosting, and foraging spotted owls. PACs are delineated around all spotted owl territory-centers that have been detected on national forest lands since 1986. Pre-project surveys are conducted in areas of suitable habitat when occupancy of spotted owls is unknown and when projects are expected by the Forest Service to reduce habitat quality. New PACs are delineated when appropriate (USFS 2004a). The Forest Service employs a 0.4-km (0.25-mi) buffer centered on all PACs in which they do not conduct any treatments during the spotted owl nesting season (March 1-August 31) unless the spotted owls in question are found to not be breeding that year. However, they can prescribe-burn in PACs during the early nesting season if dry conditions and heavy fuel loadings after the nesting season would create conditions in which there would be an unacceptable risk of the fires escaping the burn unit or fires would reach the canopy and adversely damage nesting or roosting habitat (USFS 2004a).

Treatment of forest fuels has substantial implications for the California spotted owl, and raises complex questions about the potential benefits and risks to the species that may result from reduction of forest fuels. The Forest Service plans to treat approximately 265,194 ha (655,310 ac) of suitable habitat, which is 13 percent of the 2,024,000 ha (5 million ac) of suitable habitat in these national forests. The primary technique of fuels reduction, which is thinning understory trees with mechanical equipment and/or prescribed fire, may have detrimental effects on spotted owl habitat in the short term, but may favor development of habitat in the longer term, and may reduce the likelihood of catastrophic fire that could substantially degrade or eliminate habitat.

The potential reduction in amount of downed wood is another aspect of fuels treatments that can affect spotted owls. SNFPA direction states that specific retention-levels for downed woody materials within treatments are to be made on an individual-project basis, based on desired conditions for specific land allocations and the effects of future management actions that may create or remove downed logs. In general, the Forest Service will emphasize retention of downed woody material in the largest size classes. General guidelines for large-snag retention provide for retention of 3 to 6 of the largest snags per acre, depending on the forest habitat-type of the treatment (USFS 2004a).

Changes in forest structure due to treatments within PACs outside of the Pilot Project area may degrade the capability of PACs to supply suitable nesting and roosting habitat for spotted owls. Such changes include cutting of larger trees, decrease in canopy closure, increased fragmentation, removal of snags, and reduction in amount of downed wood. SNFPA projects throughout these national forests are to retain all trees 76 cm (30 in) dbh or greater, with exceptions for operability (e.g., road construction, road reconstruction, temporary landing construction). Due to the need to more-aggressively reduce fire threat in Defense Zones, the only limitation to the level of treatment in Defense Zones is this 76-cm (30-in) retention rule. In Threat Zones, the focus of treatments is to remove surface and ladder fuels; there, projects are to retain at least 5 percent of the total treatment area in trees of 15 to 61 cm (6 to 24 in) dbh. We anticipate that few if any nest trees of spotted owls will be lost during these treatments because few spotted owls use nest trees smaller than 76 cm (30 in) dbh (see 70 FR 35607 and Service 2006) and all known nest trees will be protected.

The Forest Service avoids conducting fuels treatments within PACs unless doing so would compromise the overall effectiveness of the landscape fire and fuels strategy. If the Forest Service determines that fuels treatments within PACs are necessary, activities are constrained to remove only surface and ladder fuels unless it is necessary to remove larger trees (except nest trees) to meet fuels-reduction requirements (such as in Defense Zones). Outside of PACs, the Forest Service allows more flexibility to remove larger trees that contribute to canopy closure in order to meet fuels-reduction needs.

Reduction in canopy cover may have adverse effects on site occupancy, survival, and reproduction of spotted owls due to exposure to weather and modification of preferred forest structure. The Forest Service anticipates that three types of fuels-reduction treatments would change suitable habitat (nesting, roosting, or foraging habitat) into non-suitable habitat, using the threshold of 40 percent canopy closure as the criterion for suitable/non-suitable habitat as described above. The three types of treatments are described as follows. (1) Outside of the Pilot Project area, the Forest Service plans to treat 3,490 ha (8,624 ac) within PACs in WUI Defense Zones (USFS 2004a), and they anticipate that canopy-cover reductions to less than 40 percent would occur in no more than 5 percent of these acres (Yasuda, *in litt.* 2006), or 175 ha (431 ac). This is only 0.1 percent of the total area of the 1,321 PACs, and these treatments are expected to decrease the chances that these PACs will be lost due to fires. This is the only case in which the Forest Service anticipates changing suitable habitat to non-suitable habitat in PACs in the Sierras. (2) Within the area managed under the Pilot Project, all of the 8,650 ha (21,375 ac) of suitable habitat to be group-selection harvested probably will be reduced to less than 40 percent canopy closure. Group-selection harvests are 0.2–0.8

ha (0.5–2 ac) in size, so these small patches may not be large-enough gaps in the canopy to adversely affect spotted owls. To the contrary, such small breaks in the forest could provide good habitat for woodrats (Williams et al. 1992), the preferred prey for spotted owls in much of the Sierras (Thraikill and Bias 1989). (3) Also within the area managed under the Pilot Project, approximately 8,827 ha (21,812 ac) to be treated as Defensible Fuel Profile Zones in CWHR-classed 4M and 4D stands are expected to go below 40 percent canopy closure (Yasuda in litt. 2006). We anticipate that the majority of the 8,827 ha (21,812 ac) of suitable habitat to be cut to below 40 percent canopy cover for Defensible Fuel Profile Zones would then be unsuitable for use by spotted owls, but that the edges of some of these areas would serve as foraging habitat. The most-important areas for spotted owls will not be affected by these two types of treatments in the Pilot Project area, because no PACs will be treated in the Pilot Project area. Overall, a total of 17,652 ha (43,618 ac) is anticipated to be downgraded from suitable to non-suitable habitat due to treatments via the SNFPA, which is 0.9 percent of the 2,024,000 ha (5 million ac) of present suitable habitat. Only 1 percent of these areas that would be reduced to less than 40 percent canopy cover would be in PACs; 99 percent would be outside of PACs within the Pilot Project area.

In the Sierras, there are 1,321 PACs totaling 170,688 ha (421,780 ac). In the 2001 Framework, no more than 10 percent of the individual PACs were to be treated per decade, whereas in the 2004 Framework no more than 10 percent of the PAC acres are to be treated per decade. This difference results in increasing the percentage of treated PACs during the 20-year life of the SNFPA from 20 percent (263 PACs) to 26 percent (343 PACs) of the 1,321 total PACs, and increasing the areal extent of treatments from 6,145 ha (15,184 ac) to

6,931 ha (17,126 ac), which is an increase of 786 ha (1,942 ac) (USFS 2004a). But only portions of selected PACs would be treated, and the total treated area (6,931 ha or 17,126 ac) comprises 16.6 percent of the area within the 343 PACs to be treated, or 4.3 percent of the area within all of the 1,321 PACs. The Forest Service anticipates that fuels treatments will lessen the total number of PACs that may be lost to wildfire (estimated to be 90; see above) due to lessening the severity and extent of wildfires and, conversely, that some of the 343 PACs scheduled for treatment may burn in wildfires before treatment. Consequently, the total number of PACs affected by wildfires or treatments is expected to be fewer than 433 (Yasuda in litt. 2006). During 2004 and 2005, the Forest Service used prescribed-fire or mechanical means to treat all or portions of 97 PACs (7 percent of 1,321 PACs), which was an area of 15,055 ha (37, 201 ac) (Efird in litt. 2006).

As presented above in “Habitat Use,” canopy cover in nesting and roosting habitat typically is at least 70 percent, so fuels reductions within PACs that lower canopy cover to less than 70 percent are anticipated to adversely affect the suitability of those stands as nesting and roosting habitat. Reductions of canopy cover to 40–50 percent would alter nesting or roosting habitat so that it would function chiefly as foraging habitat.

As mentioned above, these reductions in canopy cover within PACs will occur in no more than 4.3 percent of the area within all PACs. In many cases, the renewed growth of tree-crowns after thinning is expected to fill-in the canopy cover to some degree within one to two decades, so effects of reduction in canopy closure due to thinning of understory trees would be temporary; however, we do anticipate adverse, short-term effects from this reduction of canopy cover within PACs. We consider the risk of extinction for the spotted

owl from catastrophic fire to be a far greater concern than any other evaluated threat, and we anticipate that implementation of the SNFPA will reduce the threat of wildfire, thus benefitting the spotted owl in the long-term.

As presented in Factor D, mechanical treatments in “strategically placed landscape area treatments” (SPLATs) in late-seral forest stands outside of PACs include safeguards for spotted owl habitat including retention of at least 50 percent canopy cover averaged within the treatment unit (with exceptions that allow retention of as low as 40 percent canopy cover), and retention of live trees 76 cm (30 in) dbh or greater. It appears that areas modified in such a manner would remain as suitable foraging habitat, or be converted from nesting/roosting habitat to foraging habitat. Reproduction in California spotted owls in an area where woodrats were a main food source was maximized with small blocks of spotted owl habitat and large amounts of edge between spotted owl habitat and other habitats (Franklin *et al.* 2000). Other studies also support this 40-percent canopy-cover threshold for suitable habitat (e.g., Call *et al.* 1992; Verner *et al.* 1992b; Zabel *et al.* 1992; Moen and Gutiérrez 1997). With information currently available to us, it is difficult to estimate the effects of converting nesting/roosting habitat to foraging habitat. If nesting/roosting habitat is limited, then treatments that reduce nesting/roosting to foraging could have an adverse effect on spotted owls. If nesting/roosting habitat is not limited, then the effect could simply be an increase in foraging habitat. Locations scheduled for treatments will be identified on a project-specific basis in future years, at which time site-specific data on whether nesting/roosting habitat is limited in those areas may become available.

The petition (Center for Biological Diversity 2004) states that the above-mentioned threats have more substantial effects to spotted owls within the areas in the Sierra Nevada described in Beck and Gould (1992) as areas of concern, due to bottlenecks or gaps in spotted owl distribution, locally isolated populations, highly fragmented habitat, and areas of low spotted owl density. However, “[r]ather than reflecting current negative effects on spotted owls, areas of concern...simply indicate potential areas where future problems may be greatest if the owl’s status in the Sierra Nevada were to deteriorate” (Beck and Gould 1992:45). Even though these areas of concern do not necessarily indicate areas in which spotted owls are at risk at this time, we agree with Beck and Gould (1992), Verner *et al.* (1992a), USFS (2001), and USFS (2004a) that the risk associated with management within the areas of concern in the Sierra Nevada is higher than that in other areas due to bottlenecks or gaps in spotted owl distribution, locally isolated populations, highly fragmented habitat, and areas of low spotted owl density. Beck and Gould (1992:45) state that areas of concern may experience a greater impact if spotted owl populations were deteriorating in the Sierras. However, the California spotted owl’s status in the Sierra Nevada is not deteriorating as is evidenced by the increasing adult survival and stationary trends of the populations. Thus, we conclude that owls in the areas of concern in the Sierra Nevada are not experiencing heightened effects from threats discussed in this section.

To summarize the discussion of fuels-reduction treatments for the Sierra Nevada, we anticipate short-term adverse effects from certain logging activities, but expect long-term benefits from the reduced wildfire risk. Catastrophic wildfire appears to be the greatest potential threat to the California spotted owl, and fuels-reduction treatments are a necessary

measure to reduce that threat. We have looked at the cumulative effects of wildfire and fuels treatments and concluded that, although fuels treatments will have some short-term effects to owls, those treatments will offset much of the impact of wildfire in future years by reducing the extent of wildfire damage. Our analysis shows that fuels-reduction treatments will not threaten the continued existence of the spotted owl, as only 0.9 percent of the 2,024,000 ha (5 million ac) of present suitable habitat will be downgraded from suitable to unsuitable habitat via the SNFPA, and reductions in canopy cover in PACs to the 40 or 50 percent level will occur in only 4.3 percent of the area within all PACs.

In southern California, the four national forests began operating under new Land Management Plans (LMPs) in September, 2005. The new LMPs continue thinning and salvage-related timber sales, with a focus on removal of small-diameter, high-density understory trees and on dead and diseased overstory trees (USFS 2005a). (The new management direction is discussed further in Factor D.) There are 2,736 km (1,700 mi) of linear WUI land allocations on the four national forests. Fuels-related vegetation treatments and thinning projects will be located within these WUIs. The type and intensity of fuels treatments is expected to vary by vegetation type and proximity to human developments. The most-intensive treatments will occur within the WUI Defense Zones, which are buffer zones around developed sites that may be up to 457 m (1,500 ft) wide; there, trees will be mechanically thinned to 40 percent canopy cover or less with no ladder fuels (USFS 2005b; Loe in litt. 2006). Within Threat Zones, treatments will maintain at least 40 percent canopy cover (USFS 2005b; Loe in litt. 2006). The Forest Service projected the maximum area to be treated in forest types used by spotted owls in southern California (mixed conifer, bigcone

Douglas-fir (*Pseudotsuga macrocarpa*), and hardwood forests and woodlands) to be 8,168 ha (20,183 ac) in Defense Zones and 98,777 ha (244,083 ac) in Threat Zones (USFS 2005a), which sums to 22.6 percent of the 473,473 ha (1,170,000 ac) of forest types used by spotted owls in southern California. Consequently, using the 40-percent canopy cover criterion, up to 1.7 percent of suitable habitat in Defense Zones may be changed from suitable to unsuitable habitat, and up to 20.9 percent of the nesting, roosting, or foraging habitat would only be suitable for foraging habitat in Threat Zones. With information currently available to us, it is difficult to estimate the effects of converting nesting/roosting habitat to foraging habitat. If nesting/roosting habitat is limited, then treatments that reduce nesting/roosting to foraging could have an adverse effect on spotted owls. If nesting/roosting habitat is not limited, then the effect could simply be an increase in foraging habitat. Locations scheduled for treatments will be identified on a project-specific basis in future years, at which time site-specific data may become available on whether nesting/roosting habitat is limited in those areas.

In Factor D, we discuss the regulations, standards, and guidelines that govern fuels reductions and timber harvests in southern California. In brief, the LMPs: provide limited operating periods within 0.4 km (0.25 mi) of occupied territory-centers and nest sites during the breeding period; prohibit treatments within 12–24 ha (30–60 ac) of forest immediately surrounding nest stands in the Threat Zone; and include other protections for habitat in the Defense Zone, PACs, and larger core areas (USFS 2004b).

Timber Harvest on Federal Lands

The petition contends that logging activities on federal lands in the Sierras under the SNFPA and in southern California threaten to further degrade and destroy spotted owl habitat, resulting in continued declines in numbers of spotted owls (Center for Biological Diversity 2004). As presented below, the best-available data indicate that Forest Service management documents include adequate safeguards to protect spotted owls and their habitat, and fuels-reduction activities are anticipated to decrease the threat of stand-replacing wildfires. Therefore, we are not anticipating declines in spotted owl numbers due to these activities.

Recent history of timber harvest on Federal lands in the Sierra Nevada and in southern California was presented above in “Changes to Habitat.” During the next 20 years, all timber harvests on Federal lands in the Sierras will be carried out as fuels treatments via the SNFPA as presented above in this discussion and below (Factor D). These fuels treatments are anticipated to result in an average harvest of 330 mmbf of green saw timber per year for the first decade, and 132 mmbf per year for the second decade. An additional annual 90 mmbf of salvage timber sales is projected during the 20-year period (USFS 2004a). In southern California, the four national forests expect to sell in 2006 approximately the same amount of saw timber that they sold in 2005 (10 mmbf) from salvage sales and fuels-reduction projects, and they anticipate that this annual total will drop substantially in subsequent years as salvage-sale material is harvested (Loe in litt. 2006). All harvests on Federal lands are conducted under the regulations described in Factor D.

Timber Harvest on State and Private Lands

The petition states that timber harvest on private lands threatens to further degrade and destroy spotted owl habitat, resulting in continued declines in numbers of spotted owls (Center for Biological Diversity 2004). Below, we summarize information we collected regarding timber harvest on private lands, including various safeguards that are intended to protect the California spotted owl.

Recent history of timber harvests on private lands was presented above in “Changes to Habitat.” In Factor D, we present the regulatory mechanisms that direct forest management relative to spotted owl habitat in State and private lands. Here in Factor A, we describe, to the best of our knowledge, how private timber companies manage their forests relative to spotted owls and their habitat. As stated above in “Numbers and Connectivity,” SPI lands include more than 200 spotted owl territories, there are 40 territory-centers either on or within 1.6 km (1 mi) of the land owned by Soper-Wheeler, there are three nest sites either on or immediately adjacent to W.M. Beaty-managed lands, and there are no known territories on lands owned by Fruit Growers, Collins Pine, or Roseburg Resources. Most of the following information, therefore, concerns SPI.

SPI maintains a geographic information system-based database with all of the approximately 200 known California spotted owl territories within its boundaries (Self in litt. 2005). SPI checks its database and other databases (e.g., Natural Diversity Database, Forest Service, CDFG, CDF) for locations of known spotted owl territory-centers within 1.6 km (1

mi) of proposed activities (Self in litt. 2005). To estimate whether timber harvests were negatively affecting site occupancy of California spotted owls, SPI began conducting an occupancy study in 2004 in an area that had recently been subjected to many intensive, even-aged timber harvests. The area had been surveyed by spotted owl biologists of the Kern River Research Center from 1991 to 1994. All five of the territories surveyed in 1991–1994 were occupied by spotted owls during 2004–2005 (Murphy in litt. 2006). Through site-occupancy checks, one site was incidentally determined to be reproductive in 2005 (Murphy in litt. 2006). Reproductive monitoring will be conducted on all territories in 2006 (Murphy in litt. 2006).

When SPI lays-out a Timber Harvest Plan (THP), it typically delineates a 6.5–11 ha (16–28 ac) no-cut unit around each territory-center (Murphy in litt. 2006). Prior to all harvests, SPI surveys all known spotted owl territories within 0.4 km (0.25 mi) of proposed harvests to determine site-occupancy. Units with nesting spotted owls are not harvested for the foreseeable future, and harvests in units with nesting spotted owls within 0.4 km (0.25 mi) are postponed until after the breeding season (Murphy in litt. 2006). SPI does not remove any California spotted owl territories from the database even if occupancy checks indicate apparent non-occupancy, and therefore SPI will continue to provide protection for all known territories for the foreseeable future (Murphy in litt. 2006). When marking trees in selection harvests, indications of nesting by raptors are detected by inspection on an individual-tree basis by trained foresters or marking crews (Murphy in litt. 2006). In addition, prior to even-aged regeneration harvests, SPI wildlife biologists, foresters, botanists or contractors (who are trained to do so) conduct “walk-through” surveys to locate and

protect spotted owls and other raptors that might have re-located into a planned harvest unit (SPI 2002). Both occupancy surveys and walk-through surveys include attempts to detect spotted owls by vocal imitations of their calls (Self *in litt.* 2006). SPI produces annual reports concerning the implementation and results of its occupancy surveys and walk-through surveys (e.g., SPI 2004, 2005). For example, of the 801 harvest units throughout California that were candidates for walk-through surveys in 2004, 92 percent were surveyed (SPI 2005). Of the 61 units that did not receive surveys: 15 were not harvested in 2004, 14 were harvested no later than February 1 (before the breeding season), 28 were harvested no earlier than September 1 (after the breeding season), three were in brush fields being cleared for restocking, and one was harvested on August 15 (late in the breeding season) (SPI 2005). Thus, in approximately 5 percent (43 of 801) of the units, spotted owl habitat may have been negatively affected to some unknown degree due to SPI harvest operations in 2004. In 2004, no new California spotted owl territories were found during occupancy surveys adjacent to units or during walk-through surveys of 740 units (SPI 2005). In 2003, reproductive status of three known pairs of spotted owls adjacent to units was documented; for the two pairs that were nesting, 8-ha (20-ac) no-harvest zones were designated around these nests, and the harvests proceeded as planned, and for the pair that was not nesting, the adjacent unit was harvested as planned in October (after the nesting season) (SPI 2004). During walk-through surveys of 713 units in 2003, one new pair of spotted owls was discovered, and SPI set an 8-ha (20-ac) no-harvest zone and delayed adjacent harvest units until after fledging in August. In addition, two known pairs of spotted owls had moved into planned harvest units and were nesting, so those two units were dropped from harvest (SPI 2004). Under California Forest Practice Rules (FPRs) (CDF 2005) and the known nest-site protection conducted by SPI,

these units will not be harvested for the foreseeable future. Virtually all surveys in 2003 (92 percent) and 2004 (97 percent) were done during the nesting season (March to August), and approximately three-quarters (73 and 76 percent) were done within 4 weeks of harvest (SPI 2004, 2005).

SPI manages retention of snags to support at least 40 percent of the maximum habitat capability for cavity-nesting species based on published guidelines and models (SPI 2001); similarly, the Northwest Forest Plan (USDA and USDI 1994) requires minimum retention of snags sufficient to support species of cavity-nesting birds at 40 percent of potential population levels. SPI general guidelines recommend that they avoid downed logs that are at least 61 cm (24 in.) dbh and 3 m (10 ft.) long (Murphy *in litt.* 2006). Soper-Wheeler protects 2 to 4 ha (5 to 10 ac) surrounding known spotted owl nests (McKillop *in litt.* 2005).

To summarize, the best-available data indicate that timber harvest as conducted on private lands includes adequate safeguards to protect spotted owls and their habitat. Such safeguards include pre-harvest surveys to detect owls that may be present in the area, a no-cut unit around spotted owl territory-centers, retention of snags and downed wood, and a policy that protects forest units with nesting owls in the foreseeable future. Therefore, we do not anticipate that private lands practices will threaten the continued existence of the California spotted owl in the foreseeable future.

Tree Mortality

Tree mortality in the Sierras and southern California related to insects or pathogens can have many consequences including: a continuing need to enter stands to conduct salvage operations; increased fuel-loading levels; fewer large, older trees and fewer mid-diameter trees; reduction in crown closure; a short-term increase in nutrient cycling; a possible increase in snags and hazard trees; fewer trees/area; and changes in species composition (USFS 2004a). Insects and disease always have been a source of tree mortality in the forests occupied by the California spotted owl. Long-term stand densification and recent extreme drought have greatly increased tree mortality related to forest pests, particularly in the San Bernardino, San Jacinto, and San Diego ranges. This effect could cause a substantial reduction in the extent of suitable spotted owl habitat and negatively affect the numbers of spotted owls regionally (LaHaye 2004). In addition, droughts may negatively affect spotted owl prey populations, which would be expected to result in reduced productivity of spotted owls (USFS 2004b). The San Bernardino National Forest is experiencing the worst drought period in over 150 years; consequently, for example, huge areas of live oak are dying, and in many areas greater than 60 percent tree mortality has occurred in the conifer zone (USFS 2004b).

Sudden oak death, caused by the fungus Phytophthora ramorum, has the potential to sharply reduce tree canopy in oak woodlands that provide productive habitat for California spotted owls. At present, the disease occurs in the wild only in coastal counties in northern and central California, south through Monterey County almost to the San Luis Obispo County border (COMTF 2004 in USFS 2004b). Tanoak and several oak species are most susceptible to the pathogen and may be killed by it. However, a growing number of other

species have been found to harbor the disease without dying, including many native shrubs and trees as well as non-native horticultural plants (COMTF 2004 in USFS 2004b). Patches of dead oaks and tanoaks totaling 3,399 ha (8,400 ac) occur on the Los Padres National Forest in Monterey County. In April, 2004, nursery stock infected with this fungus was found in Monrovia, near Los Angeles, creating potential for the disease to spread to wildland plants far south of its current range. The seriousness and eventual extent of the threat posed by sudden oak death to spotted owl habitat in southern California cannot be predicted at this time. In general, tree mortality from drought, insects, and disease could contribute to declines in spotted owl habitat, especially in southern California.

Development and Other Factors

The petition states that development on private lands in the Sierra and southern California presents a significant threat to the California spotted owl, particularly in low elevation riparian hardwood habitats (Center for Biological Diversity 2004). Suitable habitat scattered among houses and housing developments was not found to be occupied by spotted owls in southern California, although areas adjacent to these developments contained dense and productive populations of the subspecies (Gutiérrez 1994). There is a potential for increased disturbance to a segment of the San Bernardino Mountains spotted owl population as a result of the burgeoning population in southern California (LaHaye *et al.* 1997). Urbanization has similar negative implications for Sierra Nevada spotted owls that migrate to lower elevations in the winter (Laymon 1988; Verner *et al.* 1992a).

Where development occurs, there is a decrease in crown cover and tree density and an increase in impervious surface (McBride et al. 1996). The amount of private vs. public lands in the Sierra Nevada and southern California portions of the spotted owl range varies widely by county. Estimates from the Sierra Business Council (1997) indicate that, for the nine Sierra Nevada counties in the range of the spotted owl they analyzed, an average of 46 percent is private land. These nine counties are experiencing varying degrees of urban expansion, and have projected population growth rates from 0.7 percent in Sierra County to 6.2 percent in Calaveras County (Sierra Business Council 1997). The human population in the Sierra Nevada is projected to triple between 1990 and 2040, primarily in the lower elevation grasslands and oak woodlands (SNCWG 2002). Because spotted owls have been observed in the Sierra Nevada to migrate downslope into the lower-elevation pine/oakwoods during the winter (Laymon 1988), we anticipate this could have a negative impact on their seasonal migration patterns. However, breeding spotted owls mostly occupy higher-elevation mixed conifer forests—not lower-elevation pine/oak woodland habitats. In fact, Verner et al. (1992a) stated that mixed-conifer forests were by far the most significant habitat for the spotted owl, as most known spotted owl territories (82 percent) on Federal lands in the Sierra Nevada are in higher-elevation, mixed-conifer forests. Additionally, although the petition presents concerns with anticipated development in low-elevation riparian hardwood habitat, only 1.2 percent of all habitat containing spotted owl territories were considered riparian hardwood habitat in the Sierra Nevada (Verner et al. 1992a). Thus, we anticipate that, although development may impact spotted owl habitat in localized areas, the impact will not be throughout the Sierra Nevada populations because development will occur primarily in the foothills.

Southern California's human population has grown substantially over the last two decades to over 20 million people and is anticipated to grow by another 35 percent over the next two decades (USFS 2005a). A substantial amount of private forest land has been, and yet may be, developed in the mountains of southern California (USFS 2005a). The petitioners and Verner *et al.* (1992a) expressed concern that development in southern California could prevent dispersal between spotted owl populations in southern California, as mountain ranges occupied by spotted owls probably act as habitat islands with limited dispersal between them. We agree that the best-available data indicate that the spotted owl populations in the mountains of southern California are isolated from one another (Verner *et al.* 1992a, Gutiérrez 1994, LaHaye *et al.* 1994); further, it is probable that this isolation could increase in the future.

The petition states that recreation potentially affects spotted owls in several ways, including noise disturbance, construction of roads and trails, and expansion of ski resorts (Center for Biological Diversity 2004). Recreation is the fastest-growing use of the national forests (USFS 2001a). Construction of facilities used for recreation, including campgrounds, trails, roads, ski resorts, and cabins likely has contributed to the destruction and fragmentation of spotted owl habitat. The effect of recreation on spotted owls is poorly understood and may be an increasing threat to California spotted owls, especially in southern California (Noon and McKelvey 1992).

Visitor use of southern California forests is estimated to increase by 15-20 percent

over the next 15 years. It is expected that short-term recreation activities such as pleasure driving, hiking, and picnicking will increase more than traditional backcountry extended duration activities (USFS 2005a). However, light recreation, such as hiking on established trails or birdwatching, probably has little impact on spotted owls (Swarthout and Steidl 2001, 2003). Most recreation-related development such as roads, developed recreation sites, and administrative structures that might be expected to occur on southern California national forests has already taken place. The Forest Service does not anticipate much expansion of its permanent road system beyond what is currently in place (USFS 2005a). We thus expect that most major impacts related to recreational development will not be a primary threat to spotted owls in southern California. Adverse effects on forest environments have occurred in the past, however. For example, development of ski areas eliminated spotted owl habitat in the past, and expansion of existing areas would further reduce it, because ski areas in the San Bernardino and San Gabriel Mountains are all located on north-facing slopes preferred by spotted owls (USFS 2004b).

In southern California, the Forest Service will be actively managing recreation to offset impacts to spotted owls. Effects to wildlife will be reduced through the use of seasonal closures, designation of OHV trails, location of developed recreation sites, back-country and wilderness restrictions, area restrictions on fuelwood collection, and other strategies (USFS 2005a). Limited operating periods prohibit vegetation management activities within approximately 0.4 km (0.25 mi) of the nest site (or territory-center where nest site is unknown) during the breeding season (February 1 through August 15) unless surveys confirm that spotted owls are not nesting. Although the limited operating period does not

apply to all existing road use, trail use, maintenance, or continuing recreation use, if the environmental analysis of proposed projects or activities suggests that either existing or proposed activities are likely to result in nest disturbance, limited operating periods could be adopted as deemed necessary at the project level (USFS 2004a, 2005a).

As in southern California, recreation is an important forest use in the Sierra Nevada. Specific recreation projects are not identified in the SNFPA. However, the Forest Service's preferred alternative favors a trend toward more dispersed, non-motorized recreation, such as hiking and backcountry camping, and would not result in increased levels of recreational visitor days (USFS 2004a). Moreover, the SNFPA specifies standards and guidelines for mitigation of impacts to the California spotted owl 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). The Forest Service operates under a further guideline to evaluate proposals for new roads, trails, off-highway vehicle routes, and developments for their potential to disturb nest sites. The guidelines thus direct that California spotted owls are to be given consideration during planning of recreational activities.

The petition states that grazing is likely to indirectly affect the owl by reducing or eliminating riparian vegetation, altering forest structure and fire regimes, and reducing prey density (Center for Biological Diversity 2004). During the late 1800s, heavy grazing of surface fuels by livestock may have reduced the influence or extent of wildfires (University of California 1996), and subsequent in-growth of vegetation on denuded soils may have contributed to the heavy fuel-loading and tendency towards catastrophic fire now found in

much of the California spotted owl's range. Over the past 15 to 20 years, livestock grazing has declined by over 50 percent in the national forests of the Sierras and by approximately 26 percent in the national forests of southern California; in addition, grazing is expected to decline further (USFS 2004a, 2005a). Grazing in the Sierras occurs on wet and moist montane and subalpine meadows, annual grasslands, and in oak woodlands. A small amount of literature exists on the effects of grazing to the Mexican spotted owl (S. o. lucida), and because the best-available information is limited to the Mexican subspecies, we apply that information to the California spotted owl. Effects of grazing have been placed in four categories: (1) altered prey availability; (2) altered susceptibility to fire; (3) degradation of riparian plant communities; and (4) impaired ability of plant communities to develop into owl habitat (USFWS 1995, 2004). Impacts can vary according to the numbers of grazers, grazing intensity, grazing frequency, and timing of grazing as well as habitat type and structure and plant composition (Ward and Block 1995). Permitting requirements on national forest grazing allotments limit these impacts (USFS 2004a).

Although the effects of grazing by domestic livestock and wild ungulates on the habitats of prey used by spotted owls is a complex issue, there exists some knowledge regarding the effects of grazing on small mammals frequently consumed by Mexican spotted owls (Ward and Block 1995; Ward 2001). Grazing may influence prey availability in different ways. Grazing that reduces the density of grasses can create favorable habitat conditions for deer mice while creating unfavorable conditions for voles (Microtus spp.), meadow jumping mice (Zapus hudsonius), and shrews (Sorex spp.) (Medlin and Clary 1990; Schultz and Leininger 1991). This change may decrease prey diversity (Medlin and Clary

1990; Hobbs and Huenneke 1992). Since populations of small mammals fluctuate seasonally and/or year to year, a diverse prey base can provide a more predictable food resource for spotted owls over time. Conversely, short-term removal of grass and shrub cover may improve conditions for spotted owls to detect and capture prey (USFWS 1995). Current predictions of grazing effects on plant communities as they relate to spotted owls are inexact. For the Mexican spotted owl, the Service concluded that grazing impacts to nesting, roosting, and other mixed conifer habitat will likely be insignificant and discountable because grazing usually does not occur within mixed conifer habitat; instead, livestock generally remain within meadows or riparian areas (USFWS 2004). The same conclusion logically applies to the California spotted owl.

In summary, increased urbanization, which leads to increased recreational use, and grazing activities, may result in some lost spotted owl habitat, but urbanization in the Sierra Nevada is occurring in the low to mid elevations rather than the higher elevation mixed conifer spotted owl habitat. However, grazing in the Sierra Nevada is declining, and generally occurs outside of the spotted owls primarily mixed-conifer habitat. The majority of spotted owl territories in the Sierra Nevada (82 percent) and in southern California (86 percent) are located on federal land, and are thus protected from development; and recreational use is being actively managed, particularly in the higher-impacted forests of southern California. Therefore, these factors do not pose a significant threat now or in the foreseeable future to the continued existence of the California spotted owl such that it warrants listing.

Summary of Factor A

Spotted owl habitat is being adversely affected by wildfire, fuels-reduction activities, timber harvest, tree mortality, and development. However, risks due to wildfire and fuels reductions are not additive; that is, fuels-reduction activities can have short-term adverse effects, but they can also reduce the greater risk of catastrophic wildfire in the long term which effectively ameliorates the short-term effects. In addition, the standards directing fuels treatments through the SNFPA in the Sierras and LMPs in southern California are protective of spotted owls themselves and their nest sites. In the Sierras, fuels treatments will be conducted over a small percentage (4.3 percent) of the area within all 1,321 PACs. In terms of timber harvest, during the next 20 years, all timber harvests on Federal lands in the Sierras will be carried out as fuels treatments via the SNFPA. Timber harvests on private lands are protective of spotted owls and of their nest sites.

Assessing spotted owl population demographics in the Sierras is meaningful to understanding the status of California spotted owls throughout the State of California because the Sierra Nevada contains approximately 81 percent of known California spotted owl territories. Even with losses of habitat from the above causes, spotted owls in the Sierra Nevada have shown increased survival during the past 16 years, and with the exception of one study area which showed a decline that was not statistically significant, spotted owl populations in the Sierras are not declining. This indicates that, in general, spotted owls in the Sierras have not been greatly impacted by the above threats, and there is sufficient quality and quantity of habitat to allow for essential life history functions. Spotted owls in southern

California are at a higher risk from threats because of their isolation, but the best-available data do not show statistically significant declines. Also, we do not anticipate that development, grazing, or recreation will greatly impact spotted owls in the Sierras or southern California. Finally, the standards directing future fuels treatments through the SNFPA in the Sierras and LMPs in southern California, as well as forest practices on private lands, protect spotted owls and their nest sites.

The Service concludes that no available data indicate that the removal of trees and the reduction in canopy cover as prescribed by the SNFPA and described herein would affect California spotted owl reproduction or occupancy such that the California spotted owl is in danger of extinction now or within the foreseeable future. This conclusion does not mean that other negative, short-term effects would not occur. We recognize adverse effects in the areas described above in which canopy cover will be reduced to less than 40 percent and in PACs where canopy cover is reduced significantly. Researchers have suggested that subtle effects could be important if they occur on a wide scale (Noon *et al.* 1992).

Substantial scientific uncertainty remains regarding the effects of fuel treatments in PACs and in all suitable habitat. In the absence of demonstrated effects, and considering the small amount of area to be treated in relation to the total area within all 1,321 PACs and that the potential negative impacts are also accompanied by the positive effects of reduction of fire risk and faster development of high-quality habitat, we find that the fuel treatments proposed under the SNFPA do not constitute a significant threat to the California spotted owl at this time. There is uncertainty whether the efforts will be sufficient to significantly lessen

the threat to spotted owl habitat due to the enormity of the task over such a large area, the unproven nature of some of the area treatments outside of PACs, and questionable funding for this 20-year project. While many aspects of the protection afforded to the spotted owls on private lands are voluntary, protection is nonetheless being afforded by private landowners, and the Service has no indication that this will change in the foreseeable future.

There are concerns about the future of the spotted owls in southern California, which exist in mountaintop-groups isolated from one another and isolated from spotted owls in the Sierras. However the best-available data show that trends in southern California owl populations are not statistically different than stationary populations. Further, despite fires, tree mortality, development and other factors, the best-available data indicate that survival of spotted owl populations in the balance of the State of California (the Sierras) has been improving at the population level, and those spotted owls constitute 81 percent of the known territories of California spotted owls. We expect this trend to continue as the Forest Service in the Sierras implements its fuels-reduction strategy that includes protections for the spotted owl and its habitat. Tree mortality and development continue to degrade and eliminate some spotted owl habitat in the Sierras and in southern California. In summary, threats affecting California spotted owls and their habitat, or in combination with other factors, are causes of concern but do not pose now or in the foreseeable future a significant threat to the continued existence of the California spotted owl such that it warrants listing.

Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

We found no evidence that overutilization for commercial, recreation, scientific, or educational purposes is a threat to the California spotted owl, and the petition does not present any threats relative to this factor.

Factor C. Disease or Predation

The petition expresses concern that West Nile Virus (WNV) presents a serious potential threat to California spotted owls, and recommends that its effects on spotted owls be monitored closely (Center for Biological Diversity 2004).

A discussion of known diseases and parasites can be found in the 2003 12-month finding for the California spotted owl (68 FR 7580) and that information is incorporated by reference. We supplement that information with the following best-available data regarding WNV research and describe the results of recent research regarding the presence of WNV in spotted owls.

West Nile Virus was first detected in the United States in 1999 in New York, and has quickly spread to the western United States. WNV has not yet been detected in spotted owls in California; 187 northern and California spotted owls were tested for the presence of WNV and WNV antibodies (Franklin in litt. 2004, 2005; Rocky Gutiérrez, Univ. of Minnesota, in litt. 2005, Keane 2005). In addition, none of the 251 small mammals (e.g., mice, northern flying squirrels, dusky-footed woodrats) sampled tested positive for WNV (Franklin in litt. 2005). A more-complete description of these results can be found in our 2005 90-day finding

(70 FR 35607) which is incorporated by reference. In summary, the best-available data show that WNV does not presently threaten California spotted owls and we have no indication that it will become a substantive threat in the foreseeable future.

The petition cites a personal communication (Zach Peery; Univ. of California, in litt. 1999) in support of its claims that, because great horned owls (Bubo virginianus) and red-tailed hawks (Buteo jamaicensis) tend to forage in open areas and because great horned owls are known predators of spotted owls (Forsman et al. 1984), the reduction of canopy cover and creation of breaks in the canopy due to logging may increase predation of spotted owls (Center for Biological Diversity 2004). The petition does not present any scientific information that supports the idea that logging increases predation of spotted owls by great horned owls or red-tailed hawks, and we are unaware of any such information. As noted in the 2003 12-month finding (68 FR 7580), spotted owls are preyed upon by other raptors and mammals. Natural predation probably has little effect on healthy populations. However, as populations become smaller and more fragmented, the impacts of natural predation may also become significant. Effects to California spotted owls from their new competitor and possible predator, the barred owl, are discussed in Factor E.

In summary, disease or predation factors by themselves, or in combination with other factors, do not pose now or in the foreseeable future a significant threat to the continued existence of the California spotted owl such that it warrants listing.

Factor D. The Inadequacy of Existing Regulatory Mechanisms

Federal Regulations

Existing Federal regulatory mechanisms that provide some protection for the California spotted owl and its habitat include the following: Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703–712), Wilderness Act of 1964 (16 U.S.C. 1131–1136), National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.), Multiple-Use Sustained-Yield Act of 1960 (16 U.S.C. 528–531), Forest and Rangeland Renewable Resources Planning Act of 1974 (16 U.S.C. 1601–1614, §§ 1641–1647), SNFPA (USFS 2004a), and various LMPs in national forests. The California spotted owl, as a member of the Order Strigiformes, is included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). CITES is an international treaty established to prevent international trade that may be detrimental to the survival of plants and animals. We have no indication that the international trade of spotted owls is a concern, so protections from CITES are not relevant to this finding.

NEPA. NEPA requires all Federal agencies to formally document, consider, and publicly disclose the environmental impacts of major federal actions and management decisions significantly affecting the human environment. NEPA documentation is provided in an environmental impact statement, an environmental assessment, or a categorical exemption, and may be subject to administrative or judicial appeal. These documents are primarily disclosure documents, and NEPA does not require or guide mitigation for impacts.

Under NEPA, Forest Service analysis of each proposed project may include a biological evaluation that discloses the potential impacts to plant and animal species, including the California spotted owl. Projects that are covered by certain “categorical exclusions” are exempt from NEPA biological evaluation. In 2003, the Forest Service and the Department of Interior revised their internal implementing procedures describing categorical exclusions under NEPA (68 FR 33814) to add two categories of actions to the agency lists of categorical exclusions: activities to reduce hazardous fuels, and rehabilitation activities for lands and infrastructure impacted by fires or fire suppression. These exclusions apply only to activities meeting certain criteria including mechanical hazardous-fuels-reduction projects up to 400 ha (1,000 ac) in size and hazardous-fuels-reduction projects using fire of less than 1,820 ha (4,500 ac) (See 68 FR 33814 for other applicable criteria.). Exempt post-fire rehabilitation activities may affect up to 1,700 ha (4,200 ac). As stated above in Factor A, fuels-reduction activities can reduce key habitat elements for spotted owls such as canopy cover, large downed logs, woody debris, and large snags, but they have the important counter-balancing benefit of reducing the probability of catastrophic, stand-replacing fires.

On July 29, 2003, the Forest Service published a notice of final interim directive (68 FR 44597) that adds three categories of small timber harvesting actions to the Forest Service’s list of NEPA categorical exclusions: (1) the harvest of up to 28 ha (70 ac) of live trees with no more than 0.8 km (0.5 mi) of temporary road construction; (2) the salvage of dead and/or dying trees not to exceed 101 ha (250 ac) with no more than 0.8 km (0.5 mi) of temporary road construction; and (3) felling and removal of any trees necessary to control the

spread of insects and disease on not more than 101 ha (250 ac) with no more than 0.8 km (0.5 mi) of temporary road construction.

A presentation of information regarding the MBTA, the Wilderness Act of 1964, and the Multiple-Use Sustained-Yield Act of 1960 can be found in the 2003 12-month finding (68 FR 7580) which is incorporated by reference. The Forest Service manages national forests under the Forest and Rangeland Renewable Resources Planning Act of 1974 as amended by the National Forest Management Act of 1976 (NFMA). Implementing regulations for NFMA (36 CFR 219.20(b)(i)) require all units of the National Forest System to have a land and resource management plan (LRMP). The purpose of LRMPs is to guide and set standards for all natural resource management activities over time. NFMA has required the Forest Service to incorporate standards and guidelines into LRMPs, including provisions to support and manage plant and animal communities for diversity, and the long-term range-wide viability of native and desired non-native species. On January 5, 2005, the Forest Service issued a new planning rule under NFMA (70 FR 1023) that changed the nature of Land Management Plans so that plans generally are strategic in nature and may be categorically excluded from NEPA analysis. Rather than providing management direction and mandated standards, plans will provide guidance through five components: desired conditions, objectives, guidelines, suitability of areas, and special areas.

Under the new rule, the primary means of sustaining ecological systems, including species, will be through guidance for ecosystem diversity, whereas the old rule specifically directed that viable populations of existing native (and non-native) species be maintained

within each planning unit. The new rule directs the Responsible Official to provide additional provisions, if needed, for threatened and endangered species, species-of-concern, and species-of-interest within overall multiple-use objectives. Because the California spotted owl is currently identified as a sensitive species by the Regional Forester, it will likely be categorized as a species-of-concern in the future, but we cannot predict specific protections that will be provided for the owl.

The new rule will take effect as forests, except the southern California forests, complete previously-scheduled revisions to LRMPs. The national forests in southern California (Los Padres, Angeles, San Bernardino, and Cleveland) were in the plan-revision process when the new rule was promulgated, so completed their plan revisions in September of 2005 under the 1982 planning rule. The national forests of the Sierra Nevada are scheduled to initiate plan revisions over the next 3 years (Efird in litt. 2005). The extent to which the new planning rule will change forest management is not known. However, the discretion of the Responsible Official in making land-management decisions continues to be constrained by a requirement that any decision must demonstrate it contributes to meeting the desired condition. Responsible Official discretion is also guided by a body of law, regulation, policy, and public oversight that transcends LMP direction (Efird in litt. 2005). See below for more information on forest management planning.

Regulations specific to national forests in the Sierras. The petition contends that the SNFPA (USFS 2004a): replaced explicit standards and guidelines in USFS (2001) with vague descriptions of desired future conditions; does not adequately protect large trees, high

canopy closure, multiple-canopy layers, snags, and downed wood; and does not provide limits on the proportion of the landscape that can be degraded through logging. We agree that the SNFPA replaced some standards and guidelines with more general desired future conditions. However, as presented below, the best-available data indicate the SNFPA does adequately protect spotted owl habitat while lessening the threat of wildfire, and that it includes many restrictions and guidelines that limit the proportion of areas that can be logged.

In 1991, the Forest Service initiated the first of several planning efforts focused on maintaining the viability of California spotted owls on 11 national forests and approximately 4.5 million ha (11 million ac) in the Sierra Nevada and Modoc Plateau of California. These efforts included a technical assessment of the status of the California spotted owl and issuance of interim guidelines (Verner *et al.* 1992a). The primary objectives of the interim guidelines were to protect known nest stands, protect large old trees in timber strata that provide suitable spotted owl habitat, and reduce the threat of stand-destroying fires. They allowed treatment of suitable nesting and roosting habitat that reduced canopy cover to 40 percent in timber types selected by spotted owls and below 40 percent in other types used by spotted owls according to their availability (except in PACs). Under the interim guidelines, no mechanism existed to evaluate cumulative impacts of timber harvest on California spotted owls in national forests. After 1993, when baseline surveys for the species were completed within lands managed by the Forest Service, forest management continued without further requirements to survey for the spotted owl (68 FR 7580).

In 1995, the Forest Service released a draft environmental impact statement for a long-term management plan for California spotted owl habitat (68 FR 7580). Final direction was not issued due to new scientific information provided by the Sierra Nevada Ecosystem Project (SNEP) report released in 1996. In 1998, the Forest Service initiated a collaborative effort to incorporate new information from the SNEP report into management of Sierra Nevada national forests. This effort became known as the Sierra Nevada Framework for Conservation and Collaboration (Framework). As part of the Framework, the Forest Service developed the SNFPA Environmental Impact Statement (EIS), for which a Record of Decision (ROD) was issued on January 12, 2001 (USFS 2001). The SNFPA addresses five problem areas: old forest ecosystems and associated species; aquatic, riparian, and meadow ecosystems and associated species; fire and fuels; noxious weeds; and lower westside hardwood ecosystems. Subsequent to the establishment of management direction by the SNFPA ROD, the Regional Forester assembled a review team to evaluate specific plan elements, including the fuels treatment strategy, consistency with the National Fire Plan, and agreement with the Herger Feinstein Quincy Library Group Recovery Act. The review was completed in March 2003 (USFS 2003a), and in June 2003, the Forest Service issued a Draft Supplemental EIS for proposed changes to the SNFPA (USFS 2003b). The Final Supplemental EIS was issued in January 2004, and the new ROD was issued on January 21, 2004 (USFS 2004a). Forest Plans were amended to be consistent with the new ROD, and all subsequent project decisions fall under the 2004 direction. Within the range of the California spotted owl, the Modoc, Lassen, Plumas, Tahoe, Eldorado, Stanislaus, Sierra, Inyo, and Sequoia national forests, a small part of the Humboldt-Toiyabe National Forest, and the Lake Tahoe Basin Management Unit are within the area covered by the SNFPA.

USFS (2004a) provides a system of land allocations to protect spotted owl habitat including PACs and Home Range Core Areas. Currently, there are a total of 1,321 PACs and Home Range Core Areas which result in the protection of 424,052 ha (1,047,858 ac). Each Home Range Core Area contains 243, 405, or 971 ha (600, 1000, or 2400 ac, respectively) depending on latitude, and Home Range Core Areas (like PACs) were delineated around all spotted owl territory-centers that have been detected on National Forest lands since 1986. The LMP sets Management Intentions, Management Objectives, and Desired Conditions for each land allocation. Desired conditions provide goals that PACs contain at least two tree-canopy layers, dominant and co-dominant trees with average diameters of at least 61 cm (24 in) dbh, at least 60 to 70 percent canopy cover, and provisions for snag and downed woody materials (USFS 2004a). Desired conditions for Home Range Core Areas include large habitat blocks that have at least two tree canopy layers, have dominant and co-dominant trees with at least 61 cm (24 in) dbh, a number of very large old trees greater than 114 cm (45 in) dbh, at least 50 to 70 percent canopy cover, and higher-than-average levels of snags and downed woody material (USFS 2004a). The Service agrees that this management direction provides necessary protections for the spotted owl during fuels-reduction activities.

The primary objective of the 2004 ROD is to reduce the likelihood of catastrophic fire throughout national forests, especially near developed areas. Forest-wide Standards and Guidelines for fuels reduction and thinning stipulate that fuels treatments of 20 ha (50 ac) to over 405 ha (1,000 ac) in size (averaging 40 to 121 ha (100 to 300 ac) be strategically placed (in SPLATs) to interrupt fire spread, reduce fire severity, and provide for drought-resistant

forests, while avoiding PACs to the greatest extent possible. The Forest Service anticipates implementing SPLATs on 25–30 percent of National Forest lands in the Sierras over 20 years (USFS 2004a). Direction provides that fuels treatments may include the use of mechanical thinning and prescribed fire. Standards that guide thinning activities stipulate that projects be designed to retain live trees 76 cm (30 in) dbh or greater, retain at least 40 percent of the existing basal area (outside of Defense Zones), and avoid reducing the pre-existing canopy cover by more than 30 percent. Projects are to retain at least 50 percent canopy cover averaged within the treatment unit, with exceptions that allow retention of as low as 40 percent canopy cover. Exceptions within Home Range Core Areas are allowed to reduce ladder fuels, provide for equipment operability, and minimize re-entry; several additional exceptions apply outside of PACs and Home Range Core Areas (USFS 2004a). In PACs located in Defense Zones, mechanical-thinning treatments may be used to reduce fuels build-ups. In PACs located in Threat Zones, mechanical treatments are allowed where prescribed fire is not feasible and where avoiding PACs would significantly compromise the fire-fuels strategy (See USDA 2004:60). Outside of the WUIs, only prescribed fire may be used in PACs. The 2004 ROD mandates that PACs be avoided to the maximum extent possible when designing fuels treatments, and stipulates that, on a region-wide basis, forests will treat no more than 5 percent of the total PAC area per year and 10 percent of the PAC acres per decade. Pre-project surveys are conducted in areas of suitable habitat when occupancy of spotted owls is unknown and projects are expected by the Forest Service to reduce habitat quality, and new PACs are delineated when appropriate (USFS 2004a). Standards concerning retention of large woody debris and snags are presented above in Factor A.

The 2004 SNFPA ROD provides for full implementation of the Pilot Project on the Lassen and Plumas national forests and the Sierraville District of the Tahoe National Forest. The Pilot Project was initiated under the Herger Feinstein Quincy Library Group Forest Recovery Act of 1998, which required the Forest Service to conduct a pilot project to test and demonstrate the effectiveness of resource management activities on the Lassen, Plumas, and Sierraville Ranger District of the Tahoe National Forest. It specifically required resource management activities that include fuelbreak construction consisting of a strategic system of defensible fuel profile zones, group-selection harvests, and individual tree selection harvest, and a program of riparian management and riparian restoration projects. One of the key requirements of the HFQLG Act is to convene an independent scientific panel to prepare a final report evaluating whether, and to what extent, implementation of the pilot project achieved its goals, in particular improving ecological health and community stability. The Forest Service completed a ROD on the FSEIS of the Pilot Project in August, 1999 (USFS 1999). In February, 2003, the Pilot Project was extended until the end of fiscal year 2009 (USFS 2004c), and upon conclusion of the Pilot Project, management activities will be guided by the SNFPA. Within the Pilot Project area, all fuels-reduction and timber-harvest activities are prohibited within the 411 spotted owl habitat areas (that are 405 ha (1,000 ac) in size) and PACs (that are 121 ha (300 ac) in size) contained within those habitat areas (USFS 2004a). Individual-tree selection and group-selection harvests are not permitted in late-successional old-growth forests (CWHR classes 5M, 5D, and 6), and fuels-reduction activities are designed to avoid such forests; however, construction of Defensible Fuel Profile Zones is allowed when needed. The national forest lands outside of PACs and spotted owl habitat areas are available to vegetation- and fuels-management activities, including group-

selection and individual-tree selection harvests. Standards and guidelines for all treatment areas direct that trees greater than 76.2 cm (30 in) dbh be retained, with exceptions for operability. Suitable nesting habitat (CWHR 5M, 5D, 6) is managed in Defensible Fuel Profile Zones to provide for at least 40 percent canopy cover, retain all trees greater than 76.2 cm (30 in) dbh and at least 40 percent of the basal area (generally in the largest trees). Within Defensible Fuel Profile Zones, direction also provides for retention of at least 40 percent canopy cover and at least 40 percent of the pre-existing basal area (in CWHR 5M, 5D, and 6 stands), or retention of at least 30 percent existing basal area (in CWHR 4M and 4D stands). Within areas thinned using individual-tree selection, direction provides for retention of at least 50 percent canopy cover with exceptions to a minimum of 40 percent canopy cover (averaged within the treatment), and avoidance of greater than a 30 percent reduction in canopy cover, along with retention of at least 40 percent of the existing basal area (in CWHR 4D, 4M, 5D, 5M, and 6 stands). In eastside-pine forest types, direction specifies that projects be designed to retain at least 30 percent of the existing basal area. In addition, there are retention requirements for downed woody material within the project area.

Regulations specific to national forests in southern California. The national forests in southern California (Los Padres, Angeles, San Bernardino, and Cleveland) have LMPs that are united by a common vision, common design criteria, and a common Final EIS (USFS 2005a; 2005b). The LMPs for the four forests are programmatic documents that leave all specific design decisions and analyses to project-level plans (USFS 2005a-f). Part Three (Design Criteria) of the LMP (USFS 2005b) also refers to auxiliary documents and agreements, such as conservation strategies, that provide additional guidance for

management actions. In this LMP (USFS 2005b), design criteria that could provide some protection for spotted owls include the following standards that apply to all four forests. Currently no land is identified as suitable for timber sale production; therefore, timber harvest may only occur to meet wildlife, fuels, fire, watershed, or other needs. In the mixed conifer-yellow pine, closed-cone conifer, big-cone Douglas-fir and canyon oak, and coast redwood habitat types that are used by spotted owls, the maximum size-openings allowed for silvicultural systems and fuels treatments are 0.1 to 1.2 ha (0.25 to 3 ac). Even-aged management is not allowed, except in closed-cone forests when justified. Uneven-aged group selection, uneven-aged single-tree selection, mechanical thinning, and prescribed-fire thinning are all acceptable in mixed-conifer-yellow-pine forests, while both mechanical and prescribed-fire thinning are acceptable in closed-cone forests. All the vegetation-management practices listed (except even-aged management) are permissible, when justified, in the above habitat types.

The new LMPs provide for designation of WUIs, as described above for the Sierra Nevada national forests, except that criteria specify that WUI Threat Zone boundaries may extend well beyond 2 km (1.25 mi) where fire history, local fuel conditions, etc., warrant extensions. The LMPs provide specific direction to consider “species guidance documents” when occupied or suitable habitat of threatened, endangered, candidate, or sensitive species is present on project sites (USFS 2005b). Direction specifies that short-term adverse impacts to species, including threatened, endangered, and proposed species will be accepted if such impacts will be compensated by accrual of long-term habitat benefits to such species (USFS 2005b). This LMP provides retention standards of a minimum of six downed logs and 10 to

15 hard snags per 2 ha (5 ac) where available (USFS 2005b). Specific protection for the spotted owl is provided to protect all spotted owl territories identified in the Statewide CDFG database (numbered owl territories) and new territories that meet state criteria by maintaining or enhancing habitat conditions over the long term to the greatest extent practicable, while protecting life and property (USFS 2005b). Other protective standards for the spotted owl include limited operating periods within 0.4 km (0.25 mi) of occupied territory-centers and nest sites during the breeding period (with exceptions for existing uses). The LMP allows the loss of spotted owl habitat to development (e.g., new campgrounds, buildings) that is needed for compelling reasons, but provides for mitigation measures of up to two-to-one for spotted owl habitat that is lost. Preferred areas for mitigation are within the forest where the impacts occurred (USFS 2005b). Where fuels and vegetation management are taking place, spotted owl occupancy and productivity are to be monitored during planning, implementation, and for at least 2 years after treatment in order to assess effects to owls (USFS 2004b).

In southern California, the Conservation Strategy for the California Spotted Owl (USFS 2004b) and the LMP (USFS 2005b) outline the management of spotted owl habitat in the Los Padres, Angeles, San Bernardino, and Cleveland national forests. Guidelines recommend identifying 121-ha (300-ac) PACs containing the best habitat within 2.4 km (1.5 mi) of nests or territory centers, and then identifying home range cores by adding to the PAC 121 ha (300 ac) of the best habitat within the same radius. Recommended restrictions include: treatments within 0.4 km (0.25 mi) of a nest site or territory-center may not be conducted during the nesting season; treatments in PACs and home range cores are to be designed with the primary goal of improving spotted owl habitat, and are to retain existing

overstory and midstory canopy cover when possible; fuels treatments are to leave all live trees greater than 61 cm (24 in) dbh; and fuels treatments in PACs are to be limited to no more than 5 percent of the PAC acreage in a given mountain range per year and 25 percent of the mountain range PAC acreage per decade (USFS 2004b). In addition, in the 12–24 ha (30–60 ac) of forest immediately surrounding nest stands, no treatments are permitted in the Threat Zone, and treatments are avoided when possible in the Defense Zone (USFS 2004b). The 2005 San Bernardino National Forest LMP directs the forest to harvest wood products including saw timber, house logs, and utility poles as a by-product of ecosystem management, healthy forest restoration, fuels management, and/or community protection projects (USFS 2005c). The other southern California plans provide no direction for saw timber products (USFS 2005d, e, f).

State Regulations

The petition states that the California State Forest Practices Code provides almost no specific protections for the spotted owl or its habitat. Below, we describe that, although there are no State Regulations providing specific protections to the spotted owl, there are some protections afforded to the spotted owl and its habitat through State laws and regulations.

State regulatory mechanisms that provide some protection for the California spotted owl and its habitat include the California Fish and Game Code (14 C.C.R. § 1 et seq.), the California Environmental Quality Act (CEQA) (Pub. Resources Code § 21000 et seq.), and the California Forest Practice Rules (14 C.C.R. § 895 et seq.). The State of California, in

Section 3503.5 of the California Fish and Game Code (CDFG 2002), provides that it is unlawful to take, possess, or destroy any birds in the order Strigiformes (owls) or to take, possess, or destroy their nests or eggs. This restriction applies only to individual owls, their nests and eggs, and does not place restrictions on inactive nests or habitats used by spotted owls. While the California spotted owl is not listed under the California Endangered Species Act and thus does not receive protections available under that statutory provision, the prohibitions against take of owls in the California Fish and Game Code (see above) are similar to the section 9 protections provided by a listing under the ESA.

CDFG identified the California spotted owl as a “species of special concern” (CDFG 1978). This status applies to animals that are not listed under the Federal Endangered Species Act or the California Endangered Species Act but are judged to be vulnerable to extinction. The intent of the designation is to obtain special consideration for the species in the project-planning process and to focus attention on the species to avert the need for listing under either State or Federal laws.

Local land-use processes and ordinances are subject to CEQA, which requires disclosure of potential environmental impacts of public or private projects carried out or authorized by all non-Federal agencies in California. CEQA regulations were described in the 2003 finding (68 FR 7580) and are incorporated by reference. According to a representative from CDFG, the California spotted owl likely meets the criteria for being a rare species under CEQA (Esther Burkett, CDFG *in litt.* 2006). And CEQA gives additional protections to rare species, CDFG could recommend to CDFG that certain mitigation actions

be incorporated into a THP that impacts the spotted owl. Because FPRs are a substitute for CEQA, this process technically takes place through the FPRs, which are discussed below.

As previously mentioned, logging activities on private and State forestlands in California are regulated through a process that is a substitute for CEQA. Under CEQA provisions, the State has established an independent regulatory program to oversee timber management activities on commercial forestlands under the Z'berg-Nejedly Forest Practice Act of 1973 and the California FPRs (CDF 2005). CDF has discretionary authority to interpret, implement, and enforce the FPRs.

Forest management is conducted through development of THPs and Non-industrial Timber Management Plans that are approved by the State. The FPRs require the registered professional forester preparing a THP to select silvicultural systems that achieve a maximum sustained production (MSP) of high-quality timber products while giving consideration to values relating to recreation, watershed, wildlife, range, forage, fisheries, regional economic vitality, employment, and aesthetic enjoyment (CDF 2005 § 933.11). Foresters may achieve MSP of high-quality timber products in a THP by several means, including the development of a Sustained Yield Plan (SYP) ("Option B") or by using an alternative plan ("Option A") (CDF 2005 §§ 933.11, 953.11). SYPs must include projections of timber growth and harvesting over a period of at least 100 years, assessment of watershed and wildlife resources, and analysis of other resource values. To the extent that sustained timber production, watershed impacts, and fish and wildlife issues are addressed in the approved SYP, these issues are considered to be addressed in the THP. Following approval, an SYP is

in force for a period of no more than 10 years (CDF 2005 §§ 913.11, 933.11, 953.11, 1091.1, 1091.4.5, 1091.5). SPI (1999a, b), Soper-Wheeler, Fruit Growers, and Collins Pine timber companies are achieving MSP through CDF-approved “Option A” Maximum Sustainable Production Plans, whereas W.M. Beaty and Roseburg Resources operate under CDF-approved “Option B” SYPs. The Option A Demonstration of MSP is a part of each THP submitted within a given assessment area. CDF reviews THPs and SYPs to ensure those plans, submitted by the Registered Professional Forester, demonstrate achievement of MSP. CDF invites written comments of these plans from reviewing agencies and the public, and considers those comments. CDF must approve each individual THP (William Snyder, CDF, in litt. 2006).

The FPRs provide no specific, enforceable protections for the California spotted owl, because it is not listed as threatened or endangered under CESA or the ESA, nor is it identified by the California Board of Forestry as a “sensitive species” (CDF 2005). However, FPRs do protect some habitat or habitat elements used by the owls (Chris Browder, CDF, in litt. 2005a). Implementation of the FPRs focuses primarily on sustainable timber harvest with an emphasis on conserving fish and wildlife and their habitats. The FPRs require production of a THP for certain logging operations in California, as described above. All THPs require an assessment of cumulative impacts to evaluate on-site and off-site effects of proposed activities from the past and the reasonably foreseeable future (CDF 2005 §§ 898, 1034). This cumulative impact assessment pertains to all wildlife resources, including the California spotted owl. If cumulative impacts to the spotted owl or its habitat occur, and if CDF considers those impacts to be significant, then the plan proponent will have to mitigate

such impacts to the level of insignificance or provide a feasible alternative, or the benefits of the unmitigated project need to outweigh the environmental risks of the project. THPs are to indicate where timber operations would have any significant adverse impact on the environment and, if they do have adverse impacts, they are to explain why alternatives or additional mitigation measures that would significantly reduce the impact are not feasible (CDF 2005 § 898). THPs are not approved if CDF considers the impact too great.

FPRs include general language about reducing significant impacts to non-listed species (CDF 2005 §§ 919.4, 939.4, 959.4), retention of snags (CDF 2005 §§ 919.1, 939.1, 959.1), and management of late-succession forest stands (CDF 2005 §§ 919.16, 939.16, 959.16). FPRs provide that all snags within the logging area be retained to provide wildlife habitat. Some exceptions are allowed, such as felling of snags where there is justification that there will not be a significant impact to wildlife, but snags removed under such exceptions must still be part of an approved THP.

California's FPRs provide for disclosure of impacts to late-succession forest stands in some cases. The rules require that information about late-succession stands be included in a THP when late-succession stands over 8 ha (20 ac) are proposed for harvesting and such harvest will "significantly reduce the amount and distribution of late succession forest stands" (CDF 2005 §§ 919.16, 939.16, 959.16). If the harvest is found to be "significant," FPR § 919.16 requires mitigation of impacts where it is feasible. The California FPRs require retention of trees within riparian buffers to maintain a minimum canopy cover, dependent on stream classification and slope. Several restrictions of even-aged regeneration

harvest practices limit the extent and rate of even-aged regeneration harvest and help provide protection against fragmentation (CDF 2005 §§ 913.1, 933.1, 953.1) and include acreage limitations and buffers between logging units.

Two changes to the California State Forest Practices Code took place since our February, 2003 12-month finding that may influence spotted owl habitat; these changes were not mentioned in the petition. The Fuel Hazard Reduction Emergency Rule allows emergency fuels-reduction treatments of dead or dying trees within 0.4 km (0.25 mi) of “communities at risk” as listed by the California Fire Alliance, as well as within 153 m (500 ft) from certain roads, permitted structures outside of the community areas, infrastructure facilities, and approved fire-suppression ridges. These treatments will target understory trees, and trees only less than 76 cm (30 in) dbh can be removed. We anticipate that few spotted owl territories will be negatively affected by these treatments because only dead or dying trees will be cut, most of the harvest will be of understory trees, and large-tree habitat values will be maintained in most cases. We also anticipate that frequencies of catastrophic wildfires in California spotted owl habitat will be decreased due to these treatments. As of September 26, 2005, the 35 notices submitted to implement the Fuel Hazard Reduction Emergency Rule affected a total of only 494 ha (1,220 ac) (range: 0.4 ha (1 ac) to 75 ha (185 ac), mean 14 ha (35 ac)) (Browder *in litt.* 2005). The second change, the Variable Retention Rule, provides a silvicultural prescription that promotes the retention of valuable biological structural elements and helps achieve ecological, social, and sustainable timber-production objectives. This Rule includes retention of individual trees or groups of trees to maintain structural diversity over the harvest unit, and of structural elements such as snags, down logs,

and other biological legacies. We anticipate that use of this Rule will increase the quality and quantity of suitable spotted owl habitat. As of September 26, 2005, the 35 notices submitted to implement the Variable Retention Rule affected a total of 1,062 ha (2,625 ac) (range: 8 ha (20 ac) to 115 ha (284 ac), mean 30 ha (75 ac)) (Browder in litt. 2005b).

Summary of Factor D

Some federal regulations afford some protection to California spotted owls and their habitat. Although there are many uncertainties concerning the effectiveness of fuels-reduction activities and their effects on spotted owl habitat, we anticipate that the long-term benefits of implementing the SNFPA and LMPs in southern California will benefit the spotted owl by returning areas to pre-suppression tree-density conditions, reducing loss of suitable habitat to catastrophic fire and, in some areas, improving prey habitat and the ability for spotted owls to capture their prey in more-open stands. We anticipate that pre-project surveys will identify unknown spotted owl territories, and that delineation of new PACs, when appropriate, will protect these territories. Subsequent designation of new PACs based on survey findings (USFS 2004a) will protect spotted owls. Although prescribed fires and mechanical thinning will degrade or temporarily reduce the amount of suitable habitat in some areas, it is expected that these negative effects will be offset in protection of other areas from stand-destroying wildfires, and that spotted owls will still have sufficient quality and quantity of nesting, roosting, and foraging habitat, as well as forested areas through which they can disperse throughout the Sierra Nevada, for the foreseeable future.

No State regulations specific to California spotted owls currently exist. However, the California Fish and Game Code regulations pertaining to owls provide protection similar to that provided by section 9 of the ESA in regard to killing of spotted owls or destruction of their nests or eggs. FPRs pertaining to cumulative impacts, watercourse protection, late-succession forest stands, and snag retention will provide protection to spotted owl habitats in the form of canopy cover, forest continuity, and some structural elements. As stated in Factor A, while many aspects of the protection afforded to the spotted owls on private lands are voluntary, companies including SPI are providing protections, and the Service has no indication that this will change in the foreseeable future. The Fuel Hazard Reduction Emergency Rule should benefit spotted owls by reducing fire frequency and intensity, and implementation of the Variable Retention Rule should increase the quality and quantity of suitable spotted owl habitat. Therefore, we believe that the best-available scientific information indicates that no significant or immediate threats to California spotted owl viability are due to the inadequacy of existing regulatory mechanisms.

Factor E. Other Natural or Manmade Factors Affecting the Continued Existence of the Species

The petition states concern that weather poses a threat to California spotted owls. The best-available data are summarized below. Variation in survival of California spotted owls has been shown to be based on habitat variation, whereas variation in reproductive output was based equally on variations in habitat and climate (Franklin *et al.* 2000). Weather conditions explain all or most of the temporal variations in fecundity observed in California

spotted owls (North et al. 2000; Franklin et al. 2004; LaHaye et al. 2004) and northern spotted owls in northwestern California (Franklin et al. 2000). Spotted owls compensate for this highly variable annual reproduction with high annual adult survival (Franklin et al. 2000). The long-term effects of variations in reproductive success of spotted owls in California due to climate are unknown, and will require decades of study (Franklin et al. 2000, 2004; North et al. 2000; LaHaye et al. 2004).

We are aware of three other possible threats to the California spotted owl. These include climate change, water diversions, and air pollution. Support for these possible threats was not provided in the petition. We are aware of no scientific information that indicates that these factors constitute a threat to the continued existence of this species at this time.

The petition presents concern that threats from hybridization and site competition with the barred owl have increased in recent years due to the barred owl's recent expansion farther into the range of the California spotted owl. The best-available data are summarized below.

During the past century, barred owls expanded their distribution from eastern to western North America (Mazur and James 2000), and are now found throughout the forests of the northern Rocky Mountains, southern Canada to British Columbia, and from Alaska to central California. Barred owls occasionally hybridize with spotted owls (Hamer et al. 1994; Kelly and Forsman 2004), but this behavior is considered to be an "inconsequential" phenomenon that takes place mostly when barred owls move into new areas, and declines as

barred owls become more numerous and have more access to other barred owls (Kelly and Forsman 2004:808). Kelly and Forsman (2004) documented only 47 hybrids out of more than 9,000 banded northern spotted owls and barred owls in Oregon and Washington from 1970 to 1999. However, barred owls have physically attacked (Pearson and Livezey 2003) and possibly killed (Leskiw and Gutiérrez 1998) northern spotted owls as well as negatively affected northern spotted owl detectability (Olson *et al.* 2005), site occupancy (Kelly *et al.* 2003; Pearson and Livezey 2003; Gremel 2005), reproduction (Olson *et al.* 2004), and survival (Anthony *et al.* 2004).

Since our 2003 finding, the known range of barred owls has expanded 200 miles southward in the Sierra Nevada. Two hybrid spotted/barred owls were documented in the Eldorado National Forest (Seamans *et al.* 2005; Seamans *in litt.* 2005) and a male barred owl was documented in Kings Canyon National Park (Steger *et al.* in review). Barred owls have not been detected in the mountains of southern California. Barred owls moved into and increased their densities in the Sierras at much slower rates than they did in other parts of western North America. For example, in 1988, 23 years after Barred Owls were detected in Washington in 1965 (Rogers 1966), they were at least twice as numerous as northern spotted owls in the western Washington Cascades (Hamer *et al.* 1989). Similarly, in 2005, 24 years after they were first detected in California in 1981 (Evens and LeValley 1982), they were approximately four times as numerous than northern spotted owls in the Redwood National and State Parks (Schmidt 2005, Schmidt *in litt.* 2006). However, in 2005, numbers of barred owls were only about 2 percent of California spotted owl numbers in the Sierra Nevada (Service 2005). We have no indication that barred owls are significantly affecting spotted

owls in the Sierras due to their low relative densities and to the uncertainty that they will reach high densities. Barred owls are having no effect on the spotted owls of southern California, and it is unknown whether they will expand their range to include some or all of the mountains of there.

In summary, we know of no substantial information that indicates that climate is a threat to the continued existence of the California spotted owl at this time. Although barred owls may pose a substantive threat to California spotted owls at some point in time, they do not appear to pose a significant threat now or in the foreseeable future, to the continued existence of the California spotted owl such that it warrants listing.

Finding

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by the California spotted owl. We reviewed the petition, available published and unpublished scientific and commercial information, and information submitted to us during the public comment periods following our 90-day petition finding. This finding reflects and incorporates information we received during the public comment period and responds to significant issues. We also consulted with recognized spotted owl experts and Federal and State resource agencies. On the basis of this review, we find that the listing of the California spotted owl is not warranted at this time because:

1) The best-available data indicate that California spotted owl populations are stationary throughout the Sierras, which contain 81% of known California spotted owl territories. In fact, there was no strong evidence for decreasing linear trends in the finite rate of population growth (λ) on any of the four Sierra Nevada study areas, adult survival showed an increasing trend throughout the Sierras, and modeling of realized population change for the four Sierra Nevada study areas combined indicated that total spotted owl numbers did not decrease over time. Additionally, the best available data for southern California owls (the San Bernardino study area) showed that the population was statistically stationary.

2) We anticipate that planned and currently implemented fuels-reduction activities in the Sierras and in southern California will have a long-term benefit to California spotted owls by reducing the risk of catastrophic wildfire. As stated above, a primary threat to spotted owls is loss of habitat and subsequent population losses of spotted owls due to stand-replacing fire in unnaturally dense forest stands (USFS 2004a; 2005a).

3) Although survey data for spotted owls in southern California are incomplete, the best-available data do not show statistically significant declines. Barred owls have not been detected in the mountains of southern California, and they have moved into the Sierras at much slower rates than they did in other parts of western North America. Moreover, numbers of barred owls are only about 2 percent of California spotted owl numbers in the Sierras.

4) The largest private landholder, SPI, offers protection of spotted owls on their lands (Murphy *in litt.* 2006). SPI conducts surveys for spotted owls prior to harvest, establishes 6.5–11 ha (16–28 ac) no-cut unit buffers around each territory-center, and protects forest

units with nesting spotted owls from harvest altogether. Moreover, during the next 100 years, SPI estimates that, as their forests mature, habitat with nest-site characteristics will more than double from 25 to 53 percent of all California spotted owl habitat on SPI land.

In making this finding, we recognize that while statistical analysis show that most California spotted owl populations are stationary in the Sierras, there is a possibility of decline for some populations (e.g., Lassen Study Area and San Bernardino Study Area), and that the species faces threats from catastrophic fire and habitat modification related to reduction of the risk of catastrophic fire. We recognize the difficult trade-offs involving short-term risk of fuel treatments versus long-term benefits of those treatments in reducing risks and improving habitat. We recognize other current threats to the species, including effects of isolation of spotted owls in southern California and the potential spread of barred owls. We conclude that impacts from fires, fuels treatments, timber harvest, and other activities are not at a scale, magnitude, or intensity that warrants listing, and that the overall magnitude of threats to the California spotted owl does not rise to the level that requires the protections of the Act. We will continue to monitor the status and management of the species and to accept additional information and comments from all concerned governmental agencies, the scientific community, industry, or any other interested party concerning the status of this species.

References Cited

A complete list of all references cited is available on request from the Sacramento

Fish and Wildlife Office (see ADDRESSES section, above).

Author

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Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).

Dated: MAY 15 2006

Signed: Kenneth Stansell

Kenneth Stansell

Acting Director, Fish and Wildlife Service

~~[Endangered and Threatened Wildlife and Plants; 12-month Finding for a Petition to List the California Spotted Owl (Strix occidentalis occidentalis) as Threatened or Endangered.]~~