BEFORE THE STATE OF CALIFORNIA
FISH AND GAME COMMISSION

PETITION TO LIST THE NORTHERN SPOTTED OWL AS "THREATENED" OR "ENDANGERED" UNDER THE CALIFORNIA ENDANGERED SPECIES ACT

ENVIRONMENTAL PROTECTION INFORMATION CENTER

August 15, 2012

Notice of Petition

California Fish and Game Commission
1416 Ninth Street, Suite 1320
Sacramento, CA 95814

The Environmental Protection Information Center (EPIC) hereby formally petitions the California Fish and Game Commission to list the northern spotted owl (*Strix occidentalis caurina*) as "threatened" or "endangered" pursuant to the California Endangered Species Act (CESA). California Fish and Game Code §§ 2050 *et seq*. This petition is filed under Sections 2072 and 2073 of the California Fish and Game Code and pursuant to Section 670.1, Title 14 of the California Code of Regulations which grants interested parties the right to petition for issue of a rule. This petition demonstrates that the northern spotted owl clearly warrants listing under CESA based on the factors specified in the statute.

This petition sets in motion a specific process placing definite response requirements on the California Fish and Game Commission and the California Department of Fish and Game and specific time constraints upon those responses. Petitioner certifies that all statements made in this petition are true and complete.

Petitioner:

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The Environmental Protection Information Center (EPIC) is a nonprofit organization that works to protect and restore ancient forests, watersheds, coastal estuaries, and native species in Northern California. EPIC's members have a direct interest in the conservation of the forests that support Northern Spotted Owls on both public and private lands which contribute to the continued existence of this species. Consequently, EPIC seeks to promote sustainable, restoration-based forestry through education, outreach, litigation, advocacy, and collaboration.

www.wildcalifornia.org

Executive Summary

The Northern Spotted Owl (*Strix occidentalis caurina*) has been listed under the federal Endangered Species Act (ESA) as "threatened" since 1990. By definition, a threatened species is ". . . likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." 16 U.S.C. §1531. Despite more than 20 years of protections, the northern spotted owl is now closer to extinction than ever. Recently, spotted owl biologists have published a comprehensive analysis that determined the species has been declining on seven of eleven active demographic study areas at about 3% annually range-wide from 1985-2008, and that the decline is accelerating in recent years (Forsman et al. 2011). The rate of decline is steepest in northern Oregon and Washington, where spotted owl populations would decline by more than half in the next 20 years. On the remaining federal lands, population decline is accelerating and vital rates are deteriorating (Forsman et al. 2011). On non-federal lands, including areas that once provided some of the highest quality habitat for spotted owls, declines are significantly greater than on federal lands, with vast areas no longer supporting any spotted owls at all. (Forsman et al. 2011, Anthony et al. 2006). The outlook for the northern spotted owl is dire based on the population trends, continued habitat loss, competition by the aggressive, invading barred owl, and the inadequacy of regulatory mechanisms, especially the lack of recovery efforts on state and private lands. This petition requests the U.S. Fish and Wildlife Service (USFWS) to acknowledge the best available science, and to act accordingly by changing the status of the northern spotted owl from "threatened" to "endangered" under the ESA.

The State of California has never acted to protect the northern spotted owl under the California Endangered Species Act (CESA). California Fish and Game Code §§ 2050 *et seq*. This is despite clear declines throughout the species range in California, as well as the remainder of the range. After listing the owl under the ESA, the USFWS and federal land managers developed a strategy, the "Northwest Forest Plan," to recover the spotted owl by heavily relying on a selection of federal lands to shoulder the burden of conservation. The plan's centerpiece was a network of habitat islands for spotted owls, termed "late-successional reserves" (LSRs). Unfortunately, the reliance on the Northwest Forest Plan meant that the conservation needs for spotted owls outside of the LSRs were largely ignored. This was especially true on state and private lands where spotted owls have been largely extirpated, with the remaining individuals in dire need of protections. The heavy reliance on fragmented reserves on federal lands without a comprehensive approach to spotted owl conservation on non-federal lands has proven to be a critical error, and one of the primary reasons why recovery has failed. Coupled with continued habitat loss is the very significant threat posed by the barred owl, which displaces spotted owls and thrives in the highly fragmented and simplified industrial forest landscapes.

It is now time for the State of California Fish and Game Commission to recognize its duties under CESA, and based on the overwhelming evidence, act swiftly to protect the northern spotted owl. Without a more holistic view of species recovery and landscape-scale conservation, the spotted owl is likely to go extinct in the foreseeable future.

Table of Contents

Notice of Petition 2
Executive Summary 3
I. Introduction 5
II. The Listing Process under the California Endangered Species Act 5
III. Biology and Ecology of the Northern Spotted Owl 7
A. Physical Description and Taxonomy 7
B. Range 7
C. Prey 8
D. Habitat Requirements 8
IV. Population Status 10
V. Nature, Degree and Immediacy of the Threat to Northern Spotted Owls in California 12
A. Present or threatened destruction, curtailment, or modification of habitat or range 12
1. Ongoing and Threatened Habitat Loss in California 13
2. Habitat Loss and the Decline of Preferred Prey Species 14
B. Disease or Predation 15
C. Predation 16
D. Inadequacy of Existing Regulatory Mechanisms 16
1. Non-federal Lands 16
2. Federal Lands 19
E. Other natural or manmade factors affecting the continued existence of the species 20
1. Barred Owl 20
VI. Recommended Management and Recovery Actions 23
VII. Conclusion 23
VIII. Literature Cited 24

I. Introduction

The northern spotted owl (*Strix occidentalis caurina*) is a subspecies of spotted owls that was listed as "threatened' under the federal Endangered Species Act (ESA) in 1990, due to widespread loss of suitable habitat and the inadequacy of existing regulatory mechanisms. (USFWS 1990). The State of California has never acted to protect the northern spotted owl under the California Endangered Species Act (CESA). California Fish and Game Code §§ 2050 *et seq*. This subspecies has a low reproductive rate, restrictive habitat requirements and specializes on a limited number of prey species. In this petition we summarize the evidence of population declines and ongoing threats that are well documented in recently published literature making the subspecies vulnerable to extinction (Forsman et al 2011, Courtney et al. 2004, 2008, Davis et al. 2011, Anthony et al. 2006, Noon and Blakesley 2006).

This petition, combined with recent extensive studies of spotted owls, and the extensive documentation provided to the Fish and Game Commission herein, leads to the conclusion that northern spotted owls should be listed as "threatened' or "endangered" under the CESA. The best available science clearly shows that threats faced by the northern spotted owl have increased since listing the subspecies as "threatened" in 1990, and that the owl has been extirpated or nearly extirpated in many portions of its range. In light of this overwhelming evidence, the northern spotted owl is presently in danger of extinction, as defined by the CESA.

II. The Listing Process under the California Endangered Species Act

The State of California enacted the California Endangered Species Act (CESA) in order to address and prevent the extinction of native biological diversity. The purpose of CESA is to "conserve, protect, restore, and enhance any endangered species or any threatened species and its habitat...." Fish & Game Code § 2052. The first step under CESA is to identify and list species as "threatened" and "endangered." A "threatened species" refers to a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts. Fish & G. Code § 2067. An "endangered species" refers to a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease. Fish & G. Code § 2062.

The California Fish and Game Commission (Commission) is the administrative body that makes all final decisions regarding the listing of species under CESA. The California Department of Fish and Game (DFG) is the expert agency that makes recommendations to the Commission regarding species listings. The listing process may be set in motion in two ways: "any person" may petition the Commission to list a species, or the Department may on its own initiative put

forward a species for consideration. “Petitions shall include information regarding the population trend, range, distribution, abundance, and life history of a species, the factors affecting the ability of the population to survive and reproduce, the degree and immediacy of the threat, the impact of existing management efforts, suggestions for future management, and the availability and sources of information. The petition shall also include information regarding the kind of habitat necessary for species survival, a detailed distribution map, and any other factors that the petitioner deems relevant.” Fish & G. Code § 2072.3. In the case of a citizen proposal, CESA sets forth a process for listing that contains several discrete steps.

Upon receipt of a petition to list a species, a 90-day review period ensues during which the Commission refers the petition to the Department, as the relevant expert agency, to prepare a detailed report. The Department’s report must determine whether the petition, along with other relevant information possessed or received by the Department, contains sufficient information indicating that listing may be warranted. Fish & G. Code § 2073.5.

During this period interested persons are notified of the petition and public comments are accepted by the Commission. Fish & G. Code § 2073.3. After receipt of the Department’s report, the Commission considers the petition at a public hearing. Fish & G. Code § 2074. At this time the Commission is charged with its first substantive decision: determining whether the Petition, together with the Department’s written report, and comments and testimony received, present sufficient information to indicate that listing of the species “may be warranted.” Fish & G. Code § 2074.2. This standard has been interpreted as the amount of information sufficient to "lead a reasonable person to conclude there is a substantial possibility the requested listing could occur." Natural Resources Defense Council v. California Fish and Game Comm. 28 Cal.App.4th at 1125, 1129.

If the petition, together with the Department’s report and comments received, indicates that listing “may be warranted,” then the Commission must accept the petition and designate the species as a “candidate species.” Fish & G. Code § 2074.2. “Candidate species” means a “native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that the commission has formally noticed as being under review by the department for addition to either the list of endangered species or the list of threatened species, or a species for which the commission has published a notice of proposed regulation to add the species to either list.” Fish & G. Code § 2068.

Once the petition is accepted by the Commission, then a more exacting level of review commences. The Department has twelve months from the date of the petition’s acceptance to complete a full status review of the species and recommend whether such listing “is warranted.” Following receipt of the Departments status review, the Commission holds an additional public hearing and determines whether listing of the species “is warranted.” If the Commission finds that the species is faced with extinction throughout all or a significant portion of its range, it must list the species as endangered. Fish & G. Code § 2062. If the Commission finds that the species is likely to become an endangered species in the foreseeable future, it must list the species as threatened. Fish & G. Code § 2067.

Notwithstanding these listing procedures, the Commission may adopt a regulation that adds a species to the list of threatened or endangered species at any time if the Commission finds that there is any emergency posing a significant threat to the continued existence of the species. Fish & G. Code § 2076.5.

Despite the fact that the northern spotted owl has been threatened with extinction since the 1980's, and listed under the federal Endangered Species Act since 1990, the Commission has not protected the northern spotted owl under the California Endangered Species Act (CESA).

III. Biology and Ecology of the Northern Spotted Owl

A. Physical Description and Taxonomy

The northern spotted owl is a medium-sized owl and the largest of the three subspecies of spotted owls currently recognized by the American Ornithologists' Union (Gutierrez et al.1995). It is dark brown with a barred tail and white spots on the head and breast, and has dark brown eyes that are surrounded by prominent facial disks. The taxonomic separation of these three subspecies is supported by numerous factors (Courtney et al. 2004), including genetic (Barrowclough and Gutierrez 1990, Barrowclough et al. 1999, Haig et al. 2004, Barrowclough et al. 2005) morphological (Gutierrez et al. 1995), behavioral (Van Gelder 2003), and biogeographical characteristics (Barrowclough et al. 1999).

B. Range

Historically, the northern spotted owl was found from British Columbia through western Washington, western Oregon, and northwestern California from Siskiyou County south to Marin County (American Ornithological Union 1957, Forsman 1976, Forsman et al. 1984, Gutiérrez et al. 1995). The ranges of the northern and California subspecies of spotted owls meet at the southern end of the Cascade Range in northern California (Thomas et al. 1990, USFWS 1992, Barrowclough et al. 1999, Haig et al. 2001).

Currently, the northern spotted owl is extirpated or nearly extirpated from a portion of its historic range. Populations in British Columbia are nearly extinct (COSEWIC 2008), and those in Washington have been extirpated or nearly extirpated in many areas, including most notably southwestern Washington and much of the Olympic Peninsula and Puget Sound where the owl has suffered particularly precipitous declines. Significant populations remain in southern Oregon, but in northwestern Oregon and much of the Oregon Coast Range the owl is nearly extirpated. And, in California, populations are declining in two of three long-term monitoring sites, while numerous historic territories have been lost from interior forests in California. The Revised Recovery Plan for the northern spotted owl states: "Many historical spotted owl site-centers are no longer occupied because spotted owls have been displaced by barred owls, timber harvest, or fires" (USFWS 2011).

C. Prey

Prey distribution and abundance plays a central role in the ecology of the northern spotted owl (Carey et al. 1992, Carey and Peeler 1995, Courtney et al. 2008). There is significant variation in the prey of the northern spotted owl across its range (Forsman et al. 2004, Courtney et al. 2008) and even within prey species, life history, and ecology vary geographically (Carey 2000, Lehmkuhl et al. 2006, Courtney et al. 2008). The northern portions of the owls' range lack several key prey species. For example, the red tree vole (*Aborimus longicaudus*) and dusky-footed wooded rat (*Neotoma fuscipes*) are not found north of the Columbia River (Carey et al. 1992, Carey 1999). However, southern Oregon provides some of the best remaining northern spotted owl habitat. In the margins of river valleys such as those along the Umpqua River, both the number of prey species and their abundance reaches a peak. In these areas, prey biomass may be the highest in the owl's entire range (Carey et al. 1992, Carey 1999). Ecotones between areas of older hemlock and mixed conifer forests may have three abundant prey species—red tree vole, bushy-tailed wood rat (*Neotoma cinerea*), and northern flying squirrel (*Glaucomys sabrinus*). Valley margins in southern Oregon often have these three prey species plus dusky-footed wood rat in abundance.

Carey et al. (1992) estimated the effect of the number of available prey species on the area needed to support a pair of northern spotted owls. In Douglas-fir (*Pseudotsuga menziesii*) / western hemlock (*Tsuga heterophylla*) forests in the southern Oregon Coast Range, when flying squirrels and bushy-tailed woodrats were available, 1,000 ha of old growth within a 2,000-ha area was sufficient to provide a high expectation of a pair surviving for one year. In more diverse nearby mixed conifer forests, with flying squirrels, bushy-tailed wood rats, dusky-footed wood rats, and red tree voles, owls needed less than half the area reported elsewhere. Cary et al. (1992) estimated that 500 ha of old forest within a 2,000-ha range could support a pair of northern spotted owls with a high probability of surviving for one year. In northern California, dusky-footed wood rat provides a major part of the northern spotted owl's diet (Courtney et al. 2008). The red tree vole is found in northwestern most California and is replaced by the Sonoma vole (*Arborimus pomo*) farther south.

While Courtney et al. (2004, 2008) provide a more extensive review of the diet of the northern spotted owl, little is known about the abundance and variability of prey populations. Owl demographic rates and population size may be influenced by prey abundance (Korpimäki 1992, Rohner 1996, Hakkarainen et al. 1997). Much of the high variation in northern spotted owl demographic rates may be explained, at least partially, by variations in prey abundance (Courtney et al. 2004).

D. Habitat Requirements

The best available science shows that relatively large areas of structurally complex, older forests provide the habitat necessary to support viable populations of northern spotted owls (Forsman et

al. 2011). Spotted owls generally rely on older forested habitats because such forests contain the structures and characteristics required for nesting, roosting, and foraging, and dispersal. Forest characteristics associated with spotted owls usually develop with increasing forest age, but their occurrence may vary by location, past forest practices, and stand type, history, and condition. Although spotted owl habitat is variable over its range, some general attributes are common to the owl's life-history requirements throughout its range. To support northern spotted owl reproduction, a home range requires appropriate amounts of nesting, roosting, and foraging habitat arrayed so that nesting pairs can survive, obtain resources, and breed successfully. In northern parts of the range where nesting, roosting, and foraging habitat have similar attributes, nesting is generally associated with increasing old forest in the core area (Swindle et al. 1999). In some southern portions of the range, northern spotted owl survival is positively associated with the area of old forest habitat in the core, but reproductive output is positively associated with amount of edge between older forest and other habitat types in the home range (Franklin et al. 2000). This pattern suggests that where dusky-footed woodrats (*Neotoma fuscipes*) are the primary prey species, core areas that have nesting habitat stands interspersed with varied types of foraging habitat may be optimal for northern spotted owl survival and reproduction. Both the amount and spatial distribution of nesting, roosting, foraging, and dispersal habitat influence reproductive success and long-term population viability of northern spotted owls. Population growth can occur only if there is adequate habitat in an appropriate configuration to allow for the dispersal of owls across the landscape. This includes support of dispersing juveniles, as well as nonresident subadults and adults that have not yet recruited into the breeding population. The survivorship of northern spotted owls is likely greatest when dispersal habitat most closely resembles nesting, roosting, and foraging habitat, but owls may use other types of habitat for dispersal on a short term basis. Dispersal habitat, at a minimum, consists of stands with adequate tree size and canopy closure to provide protection from avian predators and at least minimal foraging opportunities.

Large areas of older, structurally complex forests provide the habitat necessary to support viable populations of northern spotted owls. Extensive studies have supported the strong association of northern spotted owls and older forests. Northern spotted owls select older forests for nesting (Hershey et al. 1998, Swindle et al. 1999) and roosting and foraging (Forsman et al. 1984, Bart and Forsman 1992, Thomas et al. 1990, Herter et al. 2002, Glenn et al. 2004, Forsman et al. 2005). Nest site occupancy also is related to the presence of mature and old-growth forests throughout the owls' range although the nature of this relationship varies (Carroll and Johnson 2008). On private lands in northwestern California, northern spotted owls usually occur in the oldest forests available (Diller and Thome 1999). Understory structure characteristic of late-successional habitat is also important for northern spotted owls and their prey (Carey et al. 1992, Rosenberg and Anthony 1992, Buchanan et al. 1995, LaHaye and Gutiérrez 1999, Lehmkuhl et al. 2006).

Recruitment is positively related to the proportion of older forest habitat in owl territories, and higher levels of recruitment have been observed on federal lands with high proportions of old forest habitat (Forsman et al. 2011). Other studies have documented lower reproduction in areas with less old forest habitat. For example, pairs produced fewer fledglings in areas with less than

20 percent old forest habitat (average = 0.33 fledglings/pair) than in areas with greater than 60 percent old forest habitat (average = 0.93 fledglings/pair) (Bart and Forsman 1992). Survival and fecundity are positively associated with the proportion of old forest surrounding nesting territories (Franklin et al. 2000, Dugger et al. 2005, Olson et al. 2004). In southern Oregon reproduction increased as the proportion of old forest within 730 m of activity centers increased (Dugger et al. 2005). Habitat may partially mitigate the effects of the invasive barred owl. The effects of barred owls increase with a decrease in old forest habitat (Dugger et al. 2011).

IV. Population Status

Forsman et al. (2011) determined that northern spotted owl populations declined on 7 of 11 study areas range-wide from 1985-2008. Overall population declines were documented throughout the range of the northern spotted owl at 2.9% annually, with estimates of population declines ranging from 5 to 15% in the Tyee, Klamath, Southern Cascades, and Hoopa study areas, and 40 to 60% in the Olympic, Cle Elum, Rainier, and Oregon Coast Range study areas (Forsman et al. 2011). See Table 1.

TABLE 1: Summary of trends in demographic parameters for northern spotted owls, from 11 study areas 1985-2008, adapted from Forsman et al. (2011).

Study Area	Fecundity	Apparent survival	Population trend
Washington			
Cle Elum	Declining	Declining	Declining
Rainier	Increasing	Declining	Declining
Olympic	Stable	Declining	Declining
Oregon			
Coast Range	Increasing	Declining since 1998	Declining
H.J. Andrews	Increasing	Declining since 1997	Declining
Tyee	Stable	Declining since 2000	Stationary
Klamath	Declining	Stable	Stationary
Southern Cascades	Declining	Declining since 2000	Stationary
California			
Northwestern California	Declining	Declining	Declining
Hoopa	Stable	Declining since 2004	Stationary
Green Diamond	Declining	Declining	Declining

Areas of primarily non-federal land support few or no owls and Forsman et al. (2011) state that too few northern spotted owls exist in these regions (i.e., southwestern Washington, the Coast Range of northwest Oregon, the California Cascades, and much of Washington's Olympic Peninsula) even to conduct a demographic study with their methods. It is likely that these declines will continue on both federal and especially on non-federal lands.

The effectiveness monitoring program of the NWFP confirms the dire trajectories reported in the studies discussed above. Analysis of data from government monitoring of owl populations on eight sites on federal lands (including sites in Washington, Oregon, and California) show a 2.8% decline per year. A 3.1% decline per year was calculated for the other three study areas (Davis et al. 2011). While these declines are dramatic, rates of decline are even more precipitous on non-federal lands (Anthony et al. 2006, Davis et al. 2011).

Funk et al. (2010) provide additional independent evidence that northern spotted owls continue to decline and document that the subspecies is experiencing a reduced effective population size. The loss of genetic variation in the spotted owl is an emerging threat not considered during the original listing. The evidence for recent genetic bottlenecks in northern spotted owls is based on a large genetic dataset. This study observes that the genetic bottleneck, in addition to field evidence for demographic decline, highlights the increasing vulnerability of the northern spotted owl to extinction.

Demographic data from studies initiated as early as 1985 have been analyzed every 5 years to estimate northern spotted owl demographic rates and population trends (Franklin et al. 1999, Anthony et al. 2006, Davis et al. 2011, Forsman et al. 2011). The most current evaluation of population status and trends is based on data through 2008 (Forsman et al. 2011). Based on this analysis, populations on 7 of 11 study areas (Cle Elum, Rainier, Olympic Peninsula, Oregon Coast Ranges, H.J. Andrews, Northwest California, and Green Diamond) were declining (Forsman et al. 2011). Estimates of realized population change (cumulative population change across all study years) indicated that, in the more rapidly declining populations (Cle Elum, Rainier, and Olympic Peninsula), the 2006 populations were 40 to 60 percent of the population sizes observed in 1994 or 1995 (Forsman et al. 2011). Populations at the remaining areas (Tyee, Klamath, Southern Oregon Cascades, and Hoopa) showed declining population growth rates as well, although the estimated rates were not significantly different from stable populations (Forsman et al. 2011). A meta-analysis combining data from all 11 study areas indicates that rangewide the population declined at a rate of about 2.9 percent per year for the period from 1985 to 2006. Northern spotted owl populations on Federal lands had better demographic rates than elsewhere, but still declined at a mean annual rate of about 2.8 percent per year for 1985–2006 (Forsman et al. 2011). In addition to declines in population growth rates, declines in annual survival were reported for 10 of the 11 study areas (Forsman et al. 2011). Number of young produced each year showed declines at 5 areas (Cle Elum, Klamath, Southern Oregon Cascades, Northwest California, and Green Diamond), was relatively stable at 3 areas (Olympic Peninsula, Tyee, Hoopa), and was increasing at 2 areas (Oregon Coast Ranges, H. J. Andrews) (Forsman et al. 2011). The barred owl has emerged as a greater threat to the northern spotted owl than was previously recognized. The range of the barred owl has expanded in recent years and now completely overlaps that of the northern spotted owl (Crozier et al. 2006). The presence of barred owls has significant negative effects on northern spotted owl reproduction (Olson et al. 2004), survival (Anthony et al 2006), and number of territories occupied (Kelly et al. 2003; Olson et al. 2005). The determination of population trends for the northern spotted owl has become complicated by the finding that northern spotted owls are less likely to call when barred owls are also present; therefore, they are more likely to be undetected by standard survey methods (Olson et al. 2005, Crozier et al. 2006). As a result, it is difficult to determine whether northern spotted

owls no longer occupy a site, or whether they may still be present but are not detected. The 2011 Revised Recovery Plan for the Northern Spotted Owl concludes that ‘‘barred owls are contributing to the population decline of spotted owls, especially in Washington, portions of Oregon, and the northern coast of California.’’ (USFWS 2011). British Columbia has a small population of northern spotted owls. This population has declined at least 49 percent since 1992 (Courtney et al. 2004), and by as much as 90 percent since European settlement (Chutter et al. 2004) to a 2004 breeding population estimated at about 23 birds on 15 sites (Chutter et al. 2004). Chutter et al. (2004) suggested immediate action was required to improve the likelihood of recovering the spotted owl population in British Columbia. In 2007, the Spotted Owl Population Enhancement Team recommended to remove spotted owls from the wild in British Columbia. Personnel in British Columbia captured and brought into captivity the remaining 16 known wild spotted owls. Prior to initiating the captive-breeding program, the population of spotted owls in Canada was declining by as much as 35 percent per year (Chutter et al. 2004).

V. Nature, Degree and Immediacy of the Threat to Northern Spotted Owls in California

The following sections provide an overall summary of the threats to northern spotted owls throughout their range, including California. Taking all of the information together, it is clear that the species should be protected under CESA.

A. Present or threatened destruction, curtailment, or modification of habitat or range

The destruction of old-growth forests in the Pacific Northwest and northern California is the original reason why spotted owls are imperiled. The warning signs of extinction were first document in the 1970s, due to the heavy logging throughout the owl’s range, especially on many federal lands that had escaped logging up until that point. Lower elevation forests throughout Washington, Oregon and California were clearcut and substantial amounts of spotted owl habitat was high-graded by logging the biggest trees first (USFWS 1990). Many of these areas have never recovered to a point that they support spotted owls, particularly in southwestern Washington and the coast ranges of Oregon. The patchily distributed federal lands present in these regions are insufficient to provide sufficient habitat to recover spotted owls. Therefore, the spotted owl has been extirpated from large portion of its historic range and it is unlikely that the habitat on these predominantly private lands will be recovered in the foreseeable future. Management of federal lands, while improved from before ESA-listing, continues to allow the removal and degradation of spotted owl habitat, even areas deemed critical to their conservation. The Revised Recovery Plan even contemplates continued habitat losses with Recovery Action 32 (USFWS 2011). This action provides protections for “high quality” habitat but not for suitable owl habitat – as a result, ongoing losses are anticipated for nesting, roosting, foraging, and dispersal habitat that is not determined to be “high quality” by the action agencies or through consultation with USFWS.

According to the USFWS, spotted owl habitat losses have continued across ownerships despite the "threatened" listing (Moeur et al. 2005, Raphael 2006, Courtney et al. 2004). See Table 2.

TABLE 2. Spotted owl habitat losses across ownerships, 1994 to 2004.

Area (acres)	Time	Ownership	Cause	Description	Citation
16,900	1994 to 2003	Federal	Logging	older forest	Moeur et al. 2005
141,300	1994 to 2004	Federal and non-Federal	Stand-replacing fire	owl habitat	Raphael 2006
155,999	1994 to 2003	Federal	Logging	owl habitat	Courtney et al. 2004
583,500	1994 to 2004	Non-Federal	Logging	owl habitat	Courtney et al. 2004

According to Campbell et al. 2010, over 50% of the state's old-growth forests have been lost. From 1994 to 2003 in Oregon and Washington fragmentation of forests increased substantially, in some regions as high as five-fold (Davis and Lint 2005). Even if owl habitat has not been completely lost by clearcut logging, most other types of commercial logging remove important components of functional owl habitat. This simplification of forest ecosystems contributes the overall decline in habitat quality and the ability of owls to survive over the long-term. Within native forests with older-forest habitat, important components for owls and their prey such as standing dead trees, large down wood, multi-layered canopies, and other features have been lost throughout much of the owls' range and are in short supply particularly on nonfederal lands mainly because of lax forest practices. In many places, it will take centuries for forests to recover their former productivity even with the Northwest Forest Plan, and other measures in place due to the extensive ecological debt in late-seral habitat (Strittholt et al. 2006).

1. Ongoing and Threatened Habitat Loss in California

Within California alone, EPIC has identified numerous logging proposals on both private and public lands that will destroy or degrade spotted owl habitat. For example, on private lands owned by Sierra Pacific Industries, EPIC has identified over 27 timber harvest plans (THPs) that are currently ongoing or proposed that will destroy over 7,000 acres of spotted owl habitat. See Table 3. We provide the supporting information for the identified Sierra Pacific THPs, including the owl and habitat survey data with this petition to the USFWS.

TABLE 3: Sierra Pacific Industries' timber harvest plans (THPs) destroying northern spotted owl habitat in violation of the ESA Section 9 "Take" prohibition

THP number	THP Name	Spotted Owl Habitat Destroyed (acres)
1-09-054HUM	Roweisner	157

1-09-061HUM	Rerun	399
1-09-085HUM	Acer	371
1-10-025HUM	Green Mule	130
1-10-048HUM	Kragness	112
1-10-085HUM	Marvel	34
1-12-042HUM	Hiker's Parade	724
2-09-010TRI	Hogs	83
2-09-038TRI	Wilcox	727
2-09-041TRI	Halls	227
2-09-042SHA	Derby	68
2-09-078LAS	Big Widow	123
2-09-085TRI	Bowman	91
2-09-091TRI	Lowball	64
2-10-011TRI	Dyno	403
2-10-019TRI	Ebert	321
2-10-074TRI	Ranger	189
2-10-075TRI	Hinkey	22
2-11-004TRI	Llium	54
2-11-014TRI	3B's	138
2-11-035TRI	Bowtie	2
2-11-061TRI	Pappy	895
2-11-064TRI	Southern Star	271
2-11-070TRI	Thurman	426
2-11-076SHA	Tea Kettle	167
2-11-078SHA	Uncle	717
2-11-080TRI	Hay	173
		7088 acres destroyed in total

Notably, the ongoing destruction of northern spotted owl habitat by Sierra Pacific Industries is taking place without an incidental take permit as required under the ESA. Therefore, EPIC has formally notified Sierra Pacific Industries with letter of intent to sue over violations of the ESA (EPIC 2012). The Secretary and USFWS have been aware of this ongoing "take" since at least February 2012, but the federal authorities have failed to act. The overall habitat destruction on Sierra Pacific Industries and other private lands in northern California has resulted in the abandonment of dozens of historic spotted owl territories (USFWS 2009). Those that remain are mostly all severely deficient in suitable habitat, particularly nesting and roosting habitat made up of older forests.

2. Habitat Loss and the Decline of Preferred Prey Species

Northern Flying Squirrel

The northern flying squirrel northern flying squirrel (*Glaucomys sabrinus*) is an essential prey species for spotted owls, particularly in the Oregon and Washington. Carey (2003) determined

that logging in forests of the Pacific Northwest and northern California has produced imbalanced mammal communities, with some species that were once common in natural forests (Carey, 1995; Carey and Johnson, 1995) no being low in abundance. In particular, northern flying squirrels are very rare in the industrial timber stands due to dense homogeneous tree plantations with simplified understory while also promoting excessively high and uniform chipmunk abundance (Carey 2003). Manning et al. (2011) determined that large-scale commercial thinning of Douglas-fir forests is detrimental northern flying squirrels, and brings into question many of the proposed thinning treatments in spotted owl habitat. A recent meta-analysis of effects of silvicultural practices on northern flying squirrels found that previous studies asserting a benefit or no effect of harvesting on squirrel populations lacked statistical power and support for those assertions (Holloway and Smith 2011). The implication of Holloway and Smith's meta-analysis is that forest management practices that are currently widespread in the Pacific Northwest (thinning and clearcutting) have negative short-term and long-term impacts on northern flying squirrels (Manning et al 2011).

Tree Voles

Tree voles are small, mouse-sized rodents that live in conifer forests and spend almost all of their time in the tree canopy. Tree voles rarely come to the ground, and do so only to move briefly between trees. They are one of the few animals to persist on a diet of conifer needles, which is their principal food. Spotted owls in Oregon and California rely on heavily on tree voles as a main source of prey. Tree voles are endemic to the humid, coniferous forests of western Oregon and northwestern California. Recently, the USFWS has proposed listing the northwestern Oregon distinct population segment of red tree vole under the ESA. See 76 Fed. Reg. 198 (October 13, 2011). The status review found that despite federal protections afforded by the Northwest Forest Plan, that the red tree vole was threatened due to ongoing clearcutting and habitat destruction on private, state and federal lands. Id. The clear declines for red tree voles throughout the range of the spotted owl are another indication that the owl faces significant threats warranting an endangered listing.

B. Disease or Predation

West Nile Virus is a potential threat to the northern spotted owl (Blakesley et al. 2004). Large numbers of wild birds have been killed by West Nile Virus since its introduction in 1999 and subsequent spread across North America (McLean et al. 2001, Caffrey 2003, Marra et al. 2004, Blakesley et al. 2004). Owls are known to be susceptible to West Nile Virus (Fitzgerald et al. 2003) and a captive spotted owl has died of the virus (Gancz et al. 2004). In addition, recent examination of the rates of infection by blood parasites indicates that northern spotted owls have a high rate of infection by *Leucocytozoon* and other parasites (Ishak et al. 2008). In addition, a *Plasmodium* parasite was documented for the first time in a northern spotted owl. The observed discrepancy between prevalence of blood parasites in barred and spotted owls could be explained by a better host immune response to the parasites. This differential in blood parasite infection rates led Ishak et al. (2008) to speculate that barred owls on the West coast may have a competitive advantage over the potentially immune compromised spotted owls.

C. Predation

Northern spotted owls are subject to predation by great horned owls (*Bubo virginianus*), goshawks (*Accipiter gentilis*), and red tailed hawks (*Buteo jamaicensis*) (Forsman et al. 1984, Courtney et al. 2004). This natural predation has been severely exacerbated by the destruction and fragmentation of suitable habitat. Industrial forestry models across millions of acres of private lands that create dense tree plantations, coupled with ongoing habitat degradation on public lands has resulted in more open habitat suitable for predators of spotted owls (Courtney et al 2004). Additionally, barred owls (*Strix varia*) physically attack (Livezey and Fleming 2007) and may prey upon spotted owls (Leskiw and Gutiérrez 1998). With the expansion of the barred owl's range (Livezey 2009) this source of predation is increasing.

D. Inadequacy of Existing Regulatory Mechanisms

The inadequacy of existing regulatory mechanisms has been repeatedly cited as a primary threat to northern spotted owls for more than 20 years (USFWS 1990, Franklin and Courtney 2004, USFWS 2004, USFWS 2011). The primary inadequacies are the lack of protections for spotted owls on non federal lands, especially large swaths of industrial forestry lands controlled by a few large corporations. The regulatory inadequacies on non-federal lands were reviewed by DellaSala (2011) and categorized as follows: variable and often inadequate protection given to owls and owl habitat; lack of landscape-scale planning, especially on non-federal lands; use of survey protocols and other standards that fail to incorporate current relevant science; prevalence of discretionary guidelines and/or unclear or unsuitable direction; failure to consistently require involvement of personnel with biological expertise in evaluating/assessing ecological information. On federal lands and despite the protections afforded by the Northwest Forest Plan, insufficient protections and a lack of recovery planning outside of late-successional reserves continues to plague the agencies involved in forest management. This petition and supporting documentation clearly show that existing regulatory mechanisms have not prevented the continued decline of northern spotted owls since the 1990 ESA listing.

1. Non-federal Lands

Private and state lands managed for intensive timber production, employing clearcutting and short rotation, mono-culture and herbicide use have been largely overlooked by state regulators. Even though such practices were the primary reason for the original ESA-listing, this major cause of the spotted owl's decline and continued imperilment is simply not adequately addressed by existing laws and regulations. Most attention has focused on federal forest management, primarily because federal authorities have refused to prosecute ESA violations. Because the USFWS has abandoned its clear duties to prosecute "take" under the ESA, the lack of adequate regulations non-federal lands continues to pose a threat to northern spotted owls. Rather than issue protective regulations or prosecute violations of the ESA, the USFWS has allowed individual state agencies with conflicting missions to issue inadequate regulations in an attempt

to create a façade of conservation. The following sections describe the regulatory approach and inadequacies for California, Oregon and Washington.

a) California

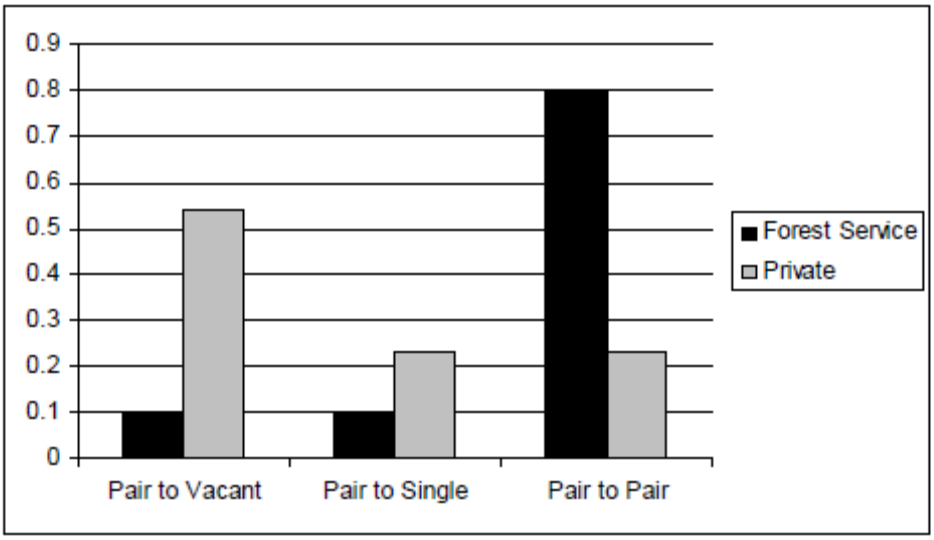
The California Forest Practices Rules ("CA FPRs") are the primary state regulations affecting the management of the spotted owl on private lands in California. These regulations implement the Z'berg Nejedley Forest Practices Act of 1973 (4 Pub. Res. Code Ch. 8). Unbelievably, the State of California has never listed the spotted owl under the state's own California Endangered Species Act (CESA). Lacking any listing under CESA, the California Department of Fish and Game (CA DFG), the state agency charged with defending the public wildlife trust, is completely absent from conservation efforts. Therefore, the CA FPRs, as administered by the California Department of Forestry and Fire Protection (CalFire), are the state's only attempt at conserving spotted owls, and they are woefully inadequate. The CA FPRs require timber operators to prepare and submit a Timber Harvest Plan (THP) that is intended to serve as a substitute for the planning and environmental protection requirements of the California Environmental Quality Act of 1970 (Pub. Res. Code sections 21000-21177). The CA FPRs allow for the removal of spotted owl habitat below threshold guidelines for the avoidance of "take" set by the U.S. Fish and Wildlife Service (CA FPRs 2012, USFWS 2009).

The Yreka Field Office of the U.S. Fish and Wildlife Service completed an extensive analysis of the status of historical spotted owl activity centers on federal and private lands in interior northern California (USFWS 2009). The Service found that extensive losses of owl pairs occurred on private lands, which sharply contrasted with the persistence of owl pairs on federal lands. Yreka USFWS concluded:

> To quantify the pattern of territory loss identified during the technical assistance process, we compared results of protocol surveys conducted at verified NSO territories supporting at least one year of occupancy by paired owls on Forest Service lands (N=196) with similar data from private timberlands (N=75) in Shasta and Trinity counties. The data set consisted of activity center status records in the California Department of Fish and Game's Spotted Owl Database (CDFG-NSO database), supplemented with territory locations and recent survey records received during technical assistance. We first evaluated the validity of activity center records in the CDFG-NSO database, and eliminated 18 sites on private lands due to lack of verification of status. The remaining 57 private-land activity centers had verified NSO status in at least one year between 1989 and 2007; 44 of these sites had supported pairs during at least one year. Of these verified pair sites, 54% declined from pair status to no response, and an additional 23% declined from pair status to a territorial single owl during subsequent protocol surveys (Figure I.B.1). On Forest Service-administered lands, 80% of pair sites did not change status during the same time periods. While we recognize that annual variation in survey effort and results at this relatively coarse scale of resolution may influence this type of analysis, the strong differences in trends observed on private versus federal lands supports the contention that management on private timberlands is creating habitat conditions that do not support sustained occupancy by NSO.

(USFWS 2009: 11-12). The Service also created the figure below to illustrate the results of their analysis. Clearly, the California Forest Practice Rules are completely inadequate to protect spotted owls on private lands.

Figure I.B.1. Status of valid historical northern spotted owl activity centers (pair sites only) when resurveyed after 5-10 years. Data are from U.S. Fish and Wildlife Service technical assistance records and USFS monitoring records



The application of the limited protections contained in the CA FPRs depends upon prior identification of areas as "activity centers." If an activity center has not been identified, then no habitat protections nor surveys are required. In addition, the current database of activity centers is generally acknowledged to be out of date, poorly maintained, not well updated, and not reliable. Further, the definition of an "active nest site" or "pair activity center" in §919.9(g)(1-2) & 939.9(g)(1-2) (known as "Option G") is not inclusive enough to apply to all the sites entitled to protection under the Endangered Species Act. For known activity centers, the CA FPRs "Option G" only requires that a minimum amount of general spotted owl habitat be maintained, and makes no distinction as to whether the habitat must be nesting, roosting or foraging habitat. This critical deficiency means that logging operations may result in the complete removal of nesting and roosting habitat from an activity center, and still comply with the rules so long as enough foraging habitat remains. This on-the-ground reality is why the USFWS has found most activity centers on private lands have been abandoned since the early 1990s.

b) Oregon

Only a nest site and 70 acres of adjacent habitat is protected in Oregon, and the Oregon Department of Forestry does not consider foraging habitat to be a specific resource site, and therefore it is not protected under the Oregon forest practice rules (Oregon Administrative Rules (OAR) 665, Oregon Forest Practice Act Rulebook 2010). Nothing contained within the state rules reflects the best available science regarding the habitat needs for spotted owls. Even

though the species is listed under the Oregon Endangered Species Act, the state has not developed a regulatory mechanism adequate to protect, much less recover, northern spotted owl habitat and populations.

c) Washington

Although the northern spotted owl has been listed as "endangered" under the Washington State Endangered Species Act since 1988, the subspecies has declined most precipitously in this state. There is no state recovery plan for spotted owls. Under the Washington State Forest Practice Rules, significantly different protections apply to northern spotted owls and their habitat depending on their location within or outside of designated Spotted Owl Special Emphasis Areas (SOSEAs). Conservation measures for northern spotted owls on private lands outside SOSEAs are "substantially less" than within SOSEAs (Ward 2006, Sweeden 2006). Even within SOSEAs, the designation does not prohibit detrimental forest practices so long as some environmental review takes place. The State of Washington and Weyerhaeuser Corporation were prosecuted for illegal "take" of northern spotted owls, resulting in a legal settlement that created a working group to recommend changes to Washington's Forest Practice Act. *See* Seattle Audubon Society v. Sutherland, 2:06−cv−01608−MJP, W.D. Washington. The federal court issued a preliminary injunction against further logging due to ongoing and threatened harm to spotted owls outside of SOSEAs. Id. The subsequent working group produced recommendations for changes to private lands logging in Washington to the state's forest practice board (Berg et al. 2009). The State of Washington's forest practice board has failed to act on those recommendations to the present day, and therefore spotted owls are still lacking adequate protections.

2. Federal Lands

While protections and conservation strategies are much better than on private and state lands, federal land management still poses many problems for spotted owls. All federal lands within the range of the northern spotted owl are currently managed under the provisions of the Northwest Forest Plan ("NWFP"). The NWFP was adopted in 1994, and it amended land management planning documents for nineteen National Forests and seven Bureau of Land Management districts throughout Washington, Oregon and California. The NWFP established a late-successional reserve (LSR) network and specified management standards and guidelines to further the recovery of northern spotted owls.

The 15-year report on the NWFP performance for spotted owls was recently released and it plainly shows that the plan is simply not enough to recover the species (Davis et al. 2011). The NWFP was based on overly optimistic assessments of spotted owl demographic performance (Franklin et al. 1999, Anthony et al. 2006). Demographic studies (Franklin et al. 1999, Anthony et al. 2006, Forsman et al. 2011, Davis et al. 2011) have demonstrated that the population declines are much greater rate than was anticipated across their range and particularly in Washington. In light of this decline, the Forsman et al. (2011) stressed the importance of retaining high quality owl habitat: "[i]n view of the continued decline of Spotted Owls in most

study areas, it would be wise to preserve as much high quality habitat (i.e., late-successional forests) for Spotted Owls as possible, distributed over as large an area as possible."

The NWFP protected some of the remaining high quality owl habitat, but not the entirety of remaining high quality owl habitat was protected. In addition, recent estimates have shown that only about 36% of late-successional reserves actually include late-successional forests, with the majority of the designated reserves expected to acquire such conditions over decades (Strittholt et al. 2006). Similarly, recent scientific literature suggests that the limited, bare minimum approach taken by the NWFP is inadequate to stabilize populations. Of particular note is the omission of all remaining nesting, roosting, and foraging habitat from reserves. While qualifying as late-seral the remaining nesting, roosting, and foraging habitat may not meet the standards of high quality habitat implicit in the Revised Recovery Plan (USFWS 2011). Thus, important owl habitat on federal lands will remain vulnerable to ongoing logging at a time when owl populations are declining more rapidly than anticipated, and risks are increasing from presumed competitive pressures from barred owls.

The NWFP noted that "certain thinning and salvage activities would be allowed in the reserves," however, thinning or other silvicultural treatments inside reserves theoretically are authorized "only if those treatments are beneficial to the creation of late-successional forest conditions" (USDA Forest Service and USDI BLM 1994). Some studies have indicated that spotted owls are somewhat resilient to low to mid-severity fire effects (Clark 2007, Bond et al. 2009). However, post-fire logging is often employed after fires, and a bigger threat to owls (Clark 2007, Bond et al. 2009, Hanson et al. 2010). Northern spotted owls remain vulnerable to post-fire logging even within late-successional reserves, as the NWFP is inadequate to protect owls from this threat. During the decades since original adoption of the NWFP, post-fire logging has become a more significant source of timber from federal lands, including late-successional reserves, and fire associated management (including thinning, suppression, and post-fire logging) has become a substantial emphasis of both the Forest Service and the Bureau of Land Management. As a result, supposedly protected owl habitat is at risk of fire-associated management (Hansen et al. 2009). This is particularly relevant on BLM lands in western Oregon, where the Secretary of Interior recently proposed a pilot process following active management guidelines in Johnson and Franklin (2009) that could extend thinning limits within reserves in dry forested regions from current 80-year limits to 120-years. Thus, active forest management designed to open forest canopies is increasing and could result in degrading additional owl habitat (Hanson et al. 2009, 2010).

E. Other natural or manmade factors affecting the continued existence of the species

1. Barred Owl

The barred owl (*Strix varia*), closely related species to spotted owls, has expanded its range from its original home in eastern North America into the Pacific Northwest, much to the detriment of spotted owls. (USFWS 2011, Campbell 1973, Hamer et al. 1994, 2001, Dark et al. 1998, Herter

and Hicks 2000, Pearson and Livezey 2003, Livezey 2009a and 2009b). Recent studies report that barred owls have "increased dramatically" on the demographic study areas over the last two decades (Forsman et al. 2011).During the second half of the 20thcentury, barred owls expanded their range from eastern to western North America, and the range of the barred owl now completely overlaps that of the northern spotted owl (Gutierrez et al. 1995, Crozier et al. 2006). Barred owls compete with northern spotted owls for habitat and resources for breeding, feeding, and sheltering, and the presence of barred owls has significant negative effects on northern spotted owl reproduction, survivorship, and successful occupation of territories. The loss of habitat has the potential to intensify competition with barred owls by reducing the total amount of resources available to the northern spotted owl and by increasing the likelihood and frequency of competitive interactions. Barred owls select very similar habitat to spotted owls for breeding, feeding, and sheltering, and loss of habitat has the potential to intensify competition between species. While conserving habitat will not alleviate the barred owl threat, Dugger et al. (2011) found that spotted owl occupancy and colonization rates decreased as both barred owl presence increased and available habitat decreased. These authors concluded that, similar to another case in which increased suitable habitat was required to support two potentially competing raptors, increased habitat protection for spotted owls may be necessary to provide for sustainable populations in the presence of barred owls (Dugger et al. 2011).

Maintaining high-quality habitat has been important since the northern spotted owl was initially listed as threatened in 1990, and this competitive pressure from barred owls has intensified the need to conserve and restore large areas of contiguous, high quality habitat across the range of the northern spotted owl (Dugger et al. 2011, Forsman et al. 2011, USFWS 2011). The Revised Recovery Plan states:

> Barred owls reportedly have reduced spotted owl site occupancy, reproduction, and survival. Limited experimental evidence, correlational studies, and copious anecdotal information all strongly suggest barred owls compete with spotted owls for nesting sites, roosting sites, and food, and possibly predate spotted owls. . . Because the abundance of barred owls continues to increase, the effectiveness in addressing this threat depends on action as soon as possible

(USFWS 2011, p. III-62). Barred owls initially proliferated in Washington and Oregon much more rapidly, but barred owls are becoming increasingly common in northern California (USFWS 2012, Dark et al. 1998, Kelly 2001, Kelly et al. 2003, Forsman et al. 2011).

The USFWS has recently embarked on a barred owl removal experiment, releasing a draft environmental impact statement in March 2012 that includes an exhaustive list of research and documentation outlining the threat posed by barred owls (USFWS 2012). While it encouraging that the USFWS will finally begin addressing the threat of barred owls, many researchers have questioned the utility of barred owl removal. Furthermore, given the landscape scale changes to Pacific Coast forests, and the rapid saturation of barred owls into these landscapes, a distinct question arises about USFWS' plans for addressing overall habitat changes in the range of the spotted owl. Regardless of whether the USFWS will address habitat loss and barred owls together, because it has taken 20 years for the USFWS to even begin addressing barred owls,

whatever outcome may be too little too late for spotted owls across much of their historic range. Barred owls will likely always be present in the spotted owl's range, despite control efforts described by USFWS (2012).

Studies have clearly shown a negative impact on spotted owls due to direct displacement and occupancy of nesting sites and territories (Kelly et al. 2003, Olson et al. 2005). A negative impact on spotted owl fecundity (Olson et al. 2004). Forsman et al. (2011) found that the presence of barred owls has a negative effect on spotted owl recruitment, in turn affecting their survival and population trends. Of all the factors contributing to declines in the demographic rates of northern spotted owls, the presence of barred owls is the strongest and most consistent across study areas (Forsman et al. 2011, p. 75). Kelly et al. (2003) concluded that the presence of barred owls at historical northern spotted owl sites reduced spotted owl occupancy. Gremel (2005) determined that the presence of barred owls appeared to be reducing northern spotted owl occupancy at their historical sites and increasing the detection distance between spotted owls and their original site centers.

Crozier et al. (2006) showed that northern spotted owls have a reduced response rate in the presence of barred owls. While not the focus of the study, this provides evidence that barred owls may disrupt certain behaviors important to spotted owls. Vocalizations are an important part of the spotted owl's territorial behavior.

Barred owls will choose old or mature forests for nesting and compete for nest cavities with spotted owls (USFWS 2012, McGarigal and Fraser 1984, Mazur and James 1998, Carroll and Johnson 2008, Mazur et al. 1997, Buchanan et al. 2004). Barred owls prey upon the same species of small mammals that are the primary prey species of Spotted Owls (Forsman et al. 2001, Hamer et al. 2001). In addition, barred owls also prey upon a wider variety of prey not taken by spotted owls (Elderkin 1987, Bosakowski and Smith 1992, Hamer et al. 2001, Livezey et al. 2008). Further, annual home ranges of sympatric northern spotted owls were 3–4 times larger than those of barred owls in the western Cascade Mountains of Washington (Hamer 1988, Singleton et al. 2005), probably due to the more-varied prey base of barred owls (Hamer et al. 2001, Livezey 2007, Livezey et al. 2008). Barred owls also breed more regularly and have consistently larger broods than do spotted owls (Livezey and Fleming 2007).

Finally, barred owls are capable of exploiting younger forest stands, and semi-forested urban and suburban landscapes in the range of the northern spotted owl that are seldom used by spotted owls (Livezey and Fleming 2007) and use forests in the Pacific Northwest outside of the range of the spotted owl (Buchanan 2005). As a result, barred owls have large source populations that, with their greater dispersal capability (Gutiérrez et al. 2004, Livezey and Fleming 2007), can supplement numbers of barred owls within the range of the spotted owl. As expected, the overlap between barred and spotted owls in habitat and prey coupled with the larger size and more aggressive nature of the barred owl has resulted in significant concern for the long-term sustainability of the northern spotted owl. Livezey and Fleming (2007) concluded that barred owls have a competitive advantage over spotted owls.

VI. Recommended Management and Recovery Actions

- List the northern spotted owl as an endangered species within California under the California Endangered Species Act.

- Initiate a long-term planning process to create a northern spotted owl recovery plan based on the best available science. Such a plan should include the development of clear conservation goals for the recovery of northern spotted owls.

VII. Conclusion

Northern spotted owls are now facing extinction throughout a significant portion of their range. Continued habitat loss range-wide, the failure on non-federal lands to protect and restore spotted owl habitat, the invasion of the barred owl and additional threats listed above require that the California Fish and Game Commission immediately begin the process of listing the species as "threatened" or "endangered" under the CESA. Many populations of spotted owls have already been extirpated, and the remaining populations are reduced and declining. The best available scientific evidence is clear that the northern spotted owl is in danger of extinction throughout all or a significant portion of its range.

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