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Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the Northern Spotted Owl; Proposed Rule

DEPARTMENT OF THE INTERIOR

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[FWS–R1–ES–2011–0112; 4500030114]

RIN 1018–AX69

Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the Northern Spotted Owl

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: The U.S. Fish and Wildlife Service (Service) proposes to revise the designated critical habitat for the northern spotted owl (*Strix occidentalis caurina*) under the Endangered Species Act of 1973, as amended (Act). Consistent with the best scientific data available, the standards of the Act, our regulations, and agency practice, we have initially identified, for public comment, approximately 13,962,449 acres (ac) (5,649,660 hectares (ha)) in 11 units and 63 subunits in California, Oregon, and Washington that meet the definition of critical habitat. In addition, however, the Act provides the Secretary with the discretion to exclude certain areas from the final designation after taking into consideration economic impacts, impacts on national security, and any other relevant impacts of specifying any particular area as critical habitat. We have identified and are considering a number of specific alternatives in this proposed rulemaking based on potential exclusions from the final rule. First, of the total area identified, we propose to exclude from the final designation approximately 2,631,736 ac (1,065,026 ha) of National Park lands, Federal Wilderness Areas, and other Congressionally reserved natural areas, as well as 164,776 ac (66,682 ha) of State Park lands. Second, we propose to exclude from a final designation approximately 936,816 ac (379,116 ha) of State and private lands that have a Habitat Conservation Plan, Safe Harbor Agreement, conservation easement, or similar conservation protection. And third, we are considering exclusion of an additional 838,344 ac (339,266 ha) of other non-Federal lands from the final designation.

These specific alternatives will be considered on an individual basis or in any combination thereof. In addition, the final designation may not be limited to these alternatives, but may also consider other exclusions as a result of continuing analysis of relevant considerations (both scientific and economic, as required by the Act) and the public comment process. In particular, we solicit comments from the public on the physical and biological features currently identified in this proposal as being essential for the conservation of the species, whether all of the areas identified meet the definition of critical habitat, whether other areas would meet that definition, whether to make the specific exclusions we have proposed, and whether there are other areas that are appropriate for exclusion.

DATES: We will accept comments received or postmarked on or before June 6, 2012. Please note that if you are submitting comments electronically, the deadline is midnight Eastern Standard Time on this date. We must receive requests for public hearings, in writing, at the address shown in the **FOR FURTHER INFORMATION CONTACT** section by April 23, 2012. At this time we are anticipating holding a total of at least three public information meetings, one each in the States of California, Oregon, and Washington, on this proposed rule. The dates and times of these meetings will be announced concurrent with the notice of availability of the draft economic analysis on this proposed revised designation of critical habitat and reopening of the public comment period. Public information meetings allow the public the opportunity to learn and ask questions about the proposed critical habitat designation, as well as the draft economic analysis. An information meeting is not the same as a public hearing, which allows the public to submit comments for the official record, but generally does not provide for the exchange of information between the public and representatives of the agency. Comments may always be submitted, however, either electronically or by mail (see **ADDRESSES**) during any open public comment period.

ADDRESSES: You may submit comments by one of the following methods:

(1) *Electronically:* Go to the Federal eRulemaking Portal: *http://www.regulations.gov.* In the Keyword box, enter Docket No. FWS–R1–ES–2011–0112, which is the docket number for this rulemaking. Then, in the Search panel on the left side of the screen, under the Document Type heading, click on the Proposed Rules link to locate this document. You may submit a comment by clicking on ''Send a Comment or Submission.''

(2) *By hard copy:* Submit by U.S. mail or hand-delivery to: Public Comments Processing, Attn: FWS–R1–ES–2011–0112; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, MS 2042–PDM; Arlington, VA 22203.

We will post all comments on *http://www.regulations.gov.* This generally means that we will post any personal information you provide us (see the Public Comments section below for more information).

FOR FURTHER INFORMATION CONTACT: Paul Henson, Field Supervisor, U.S. Fish and Wildlife Service, Oregon Fish and Wildlife Office, 2600 SE 98th Ave, Suite 100, Portland, Oregon 97266; telephone 503–231–6179; facsimile 503–231–6195. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

The purpose of this proposed revised critical habitat designation is: (1) To identify those geographic areas occupied at the time of listing that contain the physical or biological features essential to the conservation of the spotted owl; (2) to determine whether these features may require special management considerations or protection and provide general information on the types of management that may be appropriate consistent with the conservation of the owl; and (3) to identify any areas that may have been unoccupied at the time of listing, but that are nonetheless essential to the conservation and recovery of the owl. This proposed revised designation of critical habitat identifies all of the areas that we have initially determined meet the definition of critical habitat for the northern spotted owl. Federal lands comprise the strong majority of the area, but some State and private lands are also identified.

Under section 7(a)(2) of the Act, Federal agencies must, in consultation with and with the assistance of the Service, ensure that any action authorized, funded or carried out by that Federal agency is not likely to jeopardize the continued existence of a listed species (this is referred to as the ''jeopardy standard''). Once finalized, the effect of designation of critical habitat for a listed species is to require that Federal agencies additionally ensure that their actions are not likely to result in the destruction or adverse modification of that critical habitat. In areas where northern spotted owls occur, including areas identified as meeting the definition of critical habitat in this proposed rule, Federal agencies such as the U.S. Forest Service and Bureau of Land Management are already

consulting with the Service on the potential effects of their proposed actions under the ''jeopardy standard,'' regardless of whether these lands are currently designated as critical habitat. Aside from this requirement specific to Federal agencies, critical habitat designations do not provide additional regulatory protection for a species on non-Federal lands, unless the proposed activities involve Federal funding or permitting. In other words, designation of private or other non-Federal lands as critical habitat has no direct regulatory impact unless there is such a Federal connection. Although we anticipate that the effects on private landowners would not be significant, we acknowledge that there may be significant benefits to excluding private lands; we particularly request comments on whether and to what extent excluding such lands would be consistent with the Act.

While we have initially identified 13,962,449 ac (5,649,660 ha) of lands in the States of Washington, Oregon, and California that meet the definition of critical habitat for the northern spotted owl, it is important to emphasize that for several reasons, the number of acres actually included in the final designation may vary significantly from what is in this proposed revised designation. First, our conclusions as to what areas meet the Act's definition of ''critical habitat'' may change based on public comment and further analysis. Second, we may determine that military lands proposed for designation may qualify for an exemption from designation pursuant to section 4(a)(3)(B)(i) of the Act. Third, the Secretary may exclude certain areas from the final designation based on a thorough balancing analysis, including consideration of economic impacts, pursuant to section 4(b)(2) of the Act. In all cases, and without prejudging the consideration of further analysis and public comments, we anticipate a final designation that may be significantly smaller than the area currently identified.

The Act provides that critical habitat shall be designated after taking into consideration the economic impact, the impact on national security, and any other relevant impact of specifying any particular area as critical habitat. Section 4(b)(2) of the Act provides that the Secretary may exclude any area from critical habitat if he determines that the benefits of excluding that area outweigh the benefits of including it in the designation, unless such an exclusion would result in the extinction of the species. This ''weighing'' of considerations under section 4(b)(2) of the Act is the next step in the designation process, in which the Secretary may consider particular areas for exclusion from the final designation. In this proposed rule, we have already identified 4,571,672 ac (1,850,090 ha) of lands that we will specifically consider for exclusion from the final designation of critical habitat.

The final designation may reflect a variety of possible combinations of exclusions. The public is invited to comment on the possible exclusion of any areas proposed, but in particular those areas we have identified as those we propose to exclude and those we may additionally consider for exclusion from the final designation of critical habitat. After evaluating public comment and carefully analyzing and weighing all appropriate factors, a variety of potential outcomes are possible in the final designation.

This proposed revised critical habitat designation includes a diverse forest landscape that contains several different forest ecosystems and thousands of plant and animal species. Consistent with the best available science and the adaptive management principles outlined in the Revised Recovery Plan for the Northern Spotted Owl, we strongly encourage the application of ecosystem management principles and active forest management to ensure the long-term conservation of the northern spotted owl and its habitat, as well as other species dependent on these shared ecosystems. While proposed Federal actions must comply with requirements of the Act, actions with some short-term adverse impacts to spotted owls and critical habitat, but whose effect is to conserve or restore natural ecological processes and enhance forest resilience in the long term, should generally be consistent with the goals of critical habitat management. These management approaches are intended to be consistent with the principles of Executive Order 13563, which, as noted, directs agencies to consider regulatory approaches that reduce burdens and maintain flexibility and freedom of choice for the public. E.O. 13563 also further emphasizes that the rulemaking process must allow for public participation and an open exchange of ideas. To the extent feasible and consistent with law, the Service will seek to ensure that the process of designating critical habitat for the Northern Spotted Owl will be based on the open exchange of information and perspectives among State, local, and tribal officials, experts in relevant disciplines, affected stakeholders in the private sector, and the public as a whole.

Overview of Northern Spotted Owl Critical Habitat

The northern spotted owl (also variously referred to as simply ''spotted owl'' or ''owl'' in this document) was originally listed as threatened under the Act because of loss of its older growth forest habitat and a declining population (55 FR 26114, June 26, 1990). More recently, competition with barred owls (*Strix varia*) has emerged as a significant additional threat to spotted owl conservation. Experimental management of the barred owl threat is being addressed through a separate decision making process, as discussed further below.

One requirement of the Act, under section 7(a)(2), is that Federal agencies must, in consultation with and with the assistance of the Service, ensure that any action authorized, funded or carried out by that Federal agency is not likely to jeopardize the continued existence of a listed species (this is referred to as the ''jeopardy standard''). Once finalized, the effect of designation of critical habitat for a listed species is to add an independent requirement that Federal agencies ensure that their actions are not likely to result in the destruction or adverse modification of that critical habitat. Thus, in areas where northern spotted owls occur, including most areas included in this proposed rule, Federal agencies such as the U.S. Forest Service (USFS) and Bureau of Land Management (BLM) are already consulting with the Service on the potential effects of their proposed actions under the ''jeopardy standard,'' regardless of whether these lands are currently designated as critical habitat. Aside from this requirement specific to Federal agencies, critical habitat designations do not provide additional regulatory protection for a species on non-Federal lands, unless the activities proposed involve Federal funding or permitting. In other words, designation of private or other non-Federal lands as critical habitat has no direct regulatory impact on the use of that land unless there is such a Federal connection. Identifying non-Federal lands that are essential to the conservation of a species may nonetheless be relevant, in that it alerts State and local government agencies and private landowners to the value of the habitat, and may help facilitate voluntary conservation partnerships such as Safe Harbor Agreements and Habitat Conservation Plans that may contribute to the recovery and delisting of the species.

To comply with the statutory requirements of the Act, we begin by identifying the areas that meet the

definition of ''critical habitat.'' Notably, however, section 4 of the Act also requires us to consider the economic impacts, impacts on national security, and other relevant impacts of specifying any particular areas as critical habitat before we make our final designation. This process is summarized below in the section *An Introductory Background of the Critical Habitat Process,* and is detailed in the Exclusions section of this document.

In general, we recommend that critical habitat for the northern spotted owl should follow these basic management recommendations (detailed further in the Revised Recovery Plan for the Northern Spotted Owl, USFWS 2011; hereafter ''Revised Recovery Plan''):

1. Conserve the older growth, high quality and occupied forest habitat as necessary to meet recovery goals.
2. Implement science-based, active vegetation management to restore forest health, especially in drier forests in the eastern and southern portions of the owl's range.
3. Encourage landscape-level planning and vegetation management that allow historical ecological processes, such as characteristic fire regimes and natural forest succession, to occur on these landscapes throughout the range of the owl. This approach has the best chance of resulting in forests that are resilient to future changes that may arise due to climate change.

These general recommendations are consistent with the underlying purpose of the Act. Section 2(b) of the Act states, in part: ''The purposes of this Act are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved.'' A fundamental goal of critical habitat management is not only to conserve the listed species, but also to conserve the ecosystem upon which that species depends. This is the case with the northern spotted owl.

An ''ecosystem'' is a biological community of interacting organisms and their physical environment, or as the complex of a community of organisms and its environment functioning as an ecological unit (Krebs 1972, pp. 10–11; Ricklefs 1979, pp. 31–32, 869). These ecosystem interactions and functions are often referred to as ecological ''relationships'' or ''processes.'' Thus, to conserve the northern spotted owl as directed by the Act, one must also conserve the ecological processes that occur within the ecological landscape inhabited by the species. These natural processes—such as vegetation succession, forest fire regimes, and nutrient cycling—create and shape the physical and biological features that form the foundation of critical habitat. A complex interaction of physical and biological factors contribute to the development and maintenance of these ecosystems, which in turn provide the northern spotted owl with the environmental conditions required for its conservation and survival. A fundamental goal of critical habitat management should thus be to understand, describe, and conserve these processes. This ''ecosystem approach'' of management will ultimately have the highest likelihood of conserving listed species such as the northern spotted owl in the long term (Knight 1998, p. 43).

Service policy also endorses this approach: ''Species will be conserved best not by a species-by-species approach but by an ecosystem conservation strategy that transcends individual species'' (59 FR 34724, July 1, 1994). The Service considers this ecosystem approach in critical habitat designations for other listed species (e.g., in Hawaii (75 FR 18960, April 13, 2010; 76 FR 46362, August 2, 2011)). Likewise, the U.S. Forest Service, which manages the great majority of the proposed revised areas initially meeting the definition of northern spotted owl critical habitat, has prioritized restoring and maintaining natural ecological function and resiliency to its forest lands (Blate *et al.* 2009, entire; USDA 2010, entire; Tidwell 2011, entire). Active management of critical habitat is intended to be fully compatible and consistent with these landscape-level ecosystem conservation efforts.

This proposed revised critical habitat designation includes a diverse forest landscape that contains several different forest ecosystems and thousands of plant and animal species. It ranges from dry, fire-prone forests to moist old-growth conifer forest to a mix of conifers and hardwood trees. Thousands of species occur in these forest ecosystems, including other listed species with very specific biological needs. Prescribed management for all of these needs at the species level on large landscapes will raise a number of challenges (Thompson *et al.* 2009, p. 29). Many scientists believe a single-species approach to forest management is limited and that land managers need to focus on broader landscape goals that address ecosystem process and future habitat conditions (see, e.g., Thomas *et al.* 2006, p. 286; Boyd *et al.* 2008, p. 42; Hobbs *et al.* 2010, p. 487; Mori 2011, pp. 289–290). We strongly encourage the application of ecosystem management principles and active forest management to ensure the long-term conservation of the northern spotted owl and its habitat, as well as other species dependent on these shared ecosystems.

Another important development that would inform spotted owl critical habitat management involves changes in forestry science. Emulating natural disturbance regimes is emerging as a dominant paradigm in North American forest management (Seymour and Hunter 1999, p. 56; Long 2009, p. 1868). This change is occurring in response to (1) the simplification of forests in terms of structure, age-class diversity, and species composition as a result of management for timber production and (2) a recognition of fundamental changes in ecosystem function and processes due to land management practices, especially fire and successional patterns (Franklin *et al.* 2002, pp. 402–408; Hessburg *et al.* 2005, pp. 134–135; Drever *et al.* 2006, p. 2291). Although active vegetation management is unlikely to precisely mimic natural forest disturbance in all ways, it can be used to better maintain the resilience of landscapes and wildlife populations to respond to natural disturbance and climate change (Lindenmayer *et al.* 2008, p. 87). In general, silviculture prescriptions that apply ecological forestry principles to address the conservation of broader ecological processes are compatible with maintaining the proposed critical habitat's essential features in the long term (USFWS 2011, p. III–14).

Explicitly prescribing such management at a fine scale (e.g., forest stand level) is beyond the scope of this document and should be developed at the appropriate land management unit (e.g., National Forest or BLM District; USDA 2010, entire) and through consultation with the Service, as appropriate. While proposed Federal actions must comply with requirements of section 7 of the Act, which requires consideration of short as well as long-term impacts to species and their critical habitat, as described below and in the Revised Recovery Plan, management actions with some short term adverse impacts to spotted owls and critical habitat, but whose effect is to conserve or restore natural ecological processes and enhance forest resilience in the long term, should generally be consistent with the goals of critical habitat management (USFWS 2011, p. III 11–39). The Service has recently approved these types of management actions in occupied spotted owl habitat on BLM and USFS lands.

Specific considerations for managing within spotted owl critical habitat are discussed in more detail in the Special Management Considerations and

Adverse Modification sections later in this document. In sum, vegetation and fuels management in dry and mixed-dry forests is strongly encouraged both within and outside designated critical habitat where the effect of such treatment is to conserve natural ecological processes or restore them (including fire) where they have been modified or suppressed (Allen *et al.* 2002, pp. 1429–1430; Spies *et al.* 2006, pp. 358–361; Fielder *et al.* 2007, entire; Prather *et al.* 2008, entire; Lindenmayer *et al.* 2009, p. 274; Tidwell 2011, entire). Likewise, in moist and some mixed forests, management of spotted owl critical habitat should be compatible with broader ecological goals, such as the retention of high-quality older forest, the continued treatment of young or homogenous forest plantations, and the conservation or restoration of complex early seral forest habitat (Spies *et al.* 2007b, pp. 57–63; Betts *et al.* 2010, pp. 2117, 2126–2127; Swanson *et al.* 2010, entire). In general, actions that promote ecological restoration and those that apply ecological forestry principles as described in the Revised Recovery Plan (USFWS 2011, pp. III–11 to III–41) and later in this document are likely to be consistent with the conservation of the northern spotted owl and the management of its critical habitat.

In conclusion, the designation and management of critical habitat for the spotted owl must be compatible with these broader landscape management goals if it is to conserve the spotted owl as required by the Act. It is therefore important to emphasize that spotted owl critical habitat should not be a ''hands off'' reserve in the traditional sense. Rather, it should be a ''hands on'' ecosystem management landscape that should include a mix of active and passive actions to meet a variety of forest conservation goals that support long-term spotted owl conservation. It would be inconsistent with the stated purposes of the Act, the Revised Recovery Plan (USFWS 2011), and the goals of the Northwest Forest Plan (NWFP) if spotted owl critical habitat was narrowly managed and, in so doing, discouraged land managers from implementing scientifically justified measures for conserving forest ecosystem functions and health.

An Introductory Background of the Critical Habitat Process

Section 4(a)(3) of the Act specifies that the Service shall designate critical habitat for endangered or threatened species and may, from time-time thereafter as appropriate, revise such designation. Critical habitat is defined as (1) specific areas within the geographical area occupied by the species at the time it is listed, on which are found those physical or biological features that are essential to the conservation of the listed species and which may require special management considerations or protection, and (2) specific areas outside the geographical area occupied by the species at the time it is listed that are essential for the conservation of a listed species. Our regulations direct us to focus on the ''primary constituent elements,'' or PCEs, in identifying these physical or biological features.

As part of our rulemaking process, we identify what types of activities on Federal lands, or what activities involving a Federal nexus, may be affected within the proposed critical habitat area and would require consultation under section 7(a)(2) of the Act. Although we are in the process of developing an economic analysis specific to this proposed revision of critical habitat, the economic analysis for the 2008 designation of critical habitat for the northern spotted owl may be informative in terms of providing the categories of activities identified as those that may be affected within critical habitat. For the 2008 critical habitat, those initially included: (1) Timber management, (2) barred owl management and control, (3) northern spotted owl surveys and monitoring, (4) fire management, (5) linear projects (i.e., transportation, pipelines, and powerlines), (6) restoration, and (7) recreation. However, the effects on fire management, linear projects, restoration, and recreation were found to range from minimal to none. As a consequence, the 2008 economic analysis concluded that there were four categories of potential impacts from critical habitat for the northern spotted owl: (1) Impacts to timber management; (2) impacts to survey and monitoring activities; (3) impacts to barred owl management; and (4) costs related to consultations under section 7 of the Act.

Some specific examples of timber management and commercial timber harvesting activities that may be affected by the designation of critical habitat include, but are not limited to: Traditional clearcutting; targeted variable retention harvest; pre-commercial or commercial thinning; variable thinning in single-story, uniform forest stands; reduction of fuels in order to reduce the effect of wildfires; hazard tree removal; removal of younger, shade-intolerant conifers to reduce competition with larger, legacy conifers; and silvicultural treatments. Some of these activities may have short-term negative impacts to the owl, but long-term benefits by creating higher quality habitat. These activities and possible effects are discussed below in more detail (see Effects of Critical Habitat Designation, *Section 7 Consultation*). As described in this proposed rule, we anticipate that, in general, actions that promote ecological restoration and those that apply ecological forestry principles as described in the Revised Recovery Plan (USFWS 2011, pp. III–11 to III–41) and later in this document are likely to be consistent with the conservation of the northern spotted owl and the management of its critical habitat.

Any proposed designation of critical habitat begins with the identification of all specific areas that contain the physical or biological features essential to the conservation of the species and which may require special management considerations or protection (this applies to areas occupied at the time of listing), and all areas that the Secretary has otherwise determined to be essential to the conservation of the species (this applies to areas unoccupied by the species at the time of listing). The initial identification of these lands is based on the best available scientific information. After we have identified the lands that meet the definition of ''critical habitat,'' we consider the potential economic, national security, or other relevant impacts of the designation. Under section 4(b)(2) of the Act, we may identify any lands for which we believe the benefits of exclusion may outweigh the benefits of inclusion, and solicit public comment on our consideration of those particular lands for exclusion or exemption from the final designation, as we have done in this proposed rule.

In addition, section 4(a)(3)(B)(i) of the Act species that the Secretary shall not designate any lands as critical habitat owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan (INRMP) if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation. Such lands may be exempted from the designation of critical habitat, which is a separate process from the exclusion of lands under section 4(b)(2) of the Act.

The Critical Habitat Process for the Proposed Revised Designation of Critical Habitat for the Northern Spotted Owl

For this proposed revised designation of critical habitat for the northern spotted owl, we used the integrated habitat conservation planning framework developed in the Revised Recovery Plan for the Northern Spotted

Owl (USFWS 2011, Appendix C) as one key source of information. This framework integrates a spotted owl habitat model, a habitat conservation planning model, and a population simulation model that collectively allowed us to compare estimated spotted owl population performance among alternative habitat conservation network scenarios under a variety of potential conditions. This process specifically incorporated consideration of the physical or biological features and allowed us to determine the quantity and distribution or spatial arrangement of these features that are essential to the conservation of the northern spotted owl. It also assisted us in identifying habitat that may have been unoccupied at the time of listing but is essential to the species' conservation. Additionally, it allowed us to consider the effect of variables such as habitat change over time and density of barred owls, as well as to evaluate the effect of including different configurations of landownership in the scenarios considered.

Consistent with our statutory obligation to consider the best available science in making decisions, our evaluation of spotted owl population performance, based on various habitat configurations tested, required that we make assumptions regarding some of the model inputs, for example the interaction rate between northern spotted owls and barred owls (all assumptions are explicitly identified in Dunk *et al.* 2012). Given that critical habitat cannot be expected to ameliorate non-habitat based stressors to spotted owl populations, it was necessary to establish reasonable assumptions regarding barred owl encounter rates (the probability that a given spotted owl territory also has barred owls present) that we believed could, along with critical habitat designation, lead to recovery of the northern spotted owl. Absent such an assumption, it would not be possible to identify those areas essential to the conservation of the owl, as the negative effect of barred owls would essentially mask the positive effect of habitat on spotted owl populations. Therefore, as part of the critical habitat modeling process, we established region-specific barred owl encounter rates based on preliminary analyses conducted as part of the modeling process (Dunk *et al.* 2012) and barred owl encounter probabilities estimated from long-term demographic study areas (Forsman *et al.* 2011) within each modeling region. In some areas, we maintained barred owl encounter rates at current levels or allowed them to increase slightly. In others, we used encounter rates that were less than current levels, but at levels we believed could potentially be maintained through management activities.

It is important to recognize that the barred owl encounter probabilities we established for modeling purposes do not represent predictions about conditions that will be achieved through management actions, or that they are an estimate of what is likely to occur in the future. Instead, the assumed barred owl encounter probabilities were used to identify the critical habitat that is essential to recovery of the northern spotted owl, assuming that other, non-habitat based threats to the species have been addressed. We invite public comment on the process we used to evaluate barred owl effects on critical habitat.

The Service is currently in the process of preparing an Environmental Impact Statement (EIS) that will serve as the basis for a decision on whether to move forward with a study on the experimental removal of barred owls. We will release the EIS for public review and comment in the near future. If we decide to proceed with this study, we will likely implement it over a period of approximately 4 to 10 years. Furthermore, if we decide to proceed with this experimental removal study, that decision will not include a determination on whether or how barred owls would be managed in the long term; we will make that decision only after further evaluation of the results from our initial study. Barred owls are already present across most, if not all, of the landscape being proposed as revised critical habitat, and in many cases both spotted owls and barred owls are occupying the same forest lands. By designating additional habitat distributed across the range of the subspecies, our goal is to increase the likelihood that spotted owls will be able to persist in areas where barred owls are also present. With regard to how possible future management of the barred owl could affect the need for critical habitat for the spotted owl, if, through experimental removal studies or otherwise, we learn how to manage barred owls for the benefit of spotted owls, and if such management efforts are undertaken and result in a reduction in the amount of habitat essential to the conservation of the northern spotted owl, the Service may at that point consider revising critical habitat.

Each of the three models used in our integrated conservation planning framework helped identify an important element of the statutory definition of critical habitat: The identification of physical or biological features needed by the northern spotted owl, and the distribution of those features across the geographical range of the species; and the identification of a landscape configuration where these features, as well as any necessary unoccupied areas, are essential to the conservation of the species. In all cases, we attempted to maximize reliance on public lands, looking first to Federal lands and secondarily to State lands, and incorporated private lands only when Federal and State lands were insufficient to meet the recovery needs of the species. We then evaluated the population performance of each habitat configuration considered against the recovery criteria as set forth in the Revised Recovery Plan for the Northern Spotted Owl (USFWS 2011, p. ix).

Following the application of the modeling framework, we further refined the model-based map units after considering land-ownership patterns, interagency coordination, and best professional judgment, with the objective of increasing the efficiency and effectiveness of the critical habitat proposal. We again used the population simulation model to evaluate whether the habitat network, as refined, continued to provide what is essential to the conservation of the northern spotted owl. The details of this process are presented in this proposed rule in the section ''Criteria Used to Identify Critical Habitat,'' and are provided in greater detail in our supporting document ''Modeling and Analysis Procedures Used to Identify and Evaluate Potential Critical Habitat Networks for the Northern Spotted Owl,'' (Dunk *et al.* 2012), available online at *http://www.regulations.gov* (see **ADDRESSES**), or by contacting our Oregon Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**). The latter document in particular describes the specific assumptions and uncertainties associated with the modeling process, and we invite public comment on these assumptions and uncertainties. We further invite public comment on those areas we have identified here as providing the physical or biological features essential the conservation of the owl, or that have been otherwise determined to be essential to the conservation of the species.

As a result of this process, this proposed revised designation of critical habitat includes all of the areas that we have determined meet the definition of critical habitat for the northern spotted owl. Federal lands comprise the majority of the proposed revised designation, but some State and private

lands are also identified. As required by section 4(b)(2) of the Act, we have used the best scientific data available to identify those areas within the geographical area occupied by the species at the time it was listed, on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection. In addition, the Secretary has determined that some areas in a small subset of the proposed revised designation may not have been occupied at the time of listing, but these areas are nevertheless essential to the conservation of the species. While we conclude that the vast majority of lands included in the proposed designation were occupied at the time of listing for the reasons discussed below, we also evaluated them as if they were not occupied and have tentatively determined that all of these lands are essential to the conservation of the species. Based on the standards of the Act and our implementing regulations, we have initially identified 13,962,449 acres (5,649,660 ha) of lands in the States of Washington, Oregon, and California that meet the definition of critical habitat for the northern spotted owl.

The specific areas actually included in the final designation may vary significantly from what is in this proposed revised designation for several reasons. First, our conclusions as to what areas meet the Act's definition of ''critical habitat'' may change based on public comment and further analysis. Second, we may determine that military lands proposed for designation may qualify for an exemption from designation pursuant to section 4(a)(3)(B) of the Act. As described below under ''Exemptions,'' Joint Base Lewis-McChord in the State of Washington is currently in the process of revising its INRMP, and is under consideration for exemption from the final designation of critical habitat. Third, the Secretary may exercise his discretion to exclude certain areas from the final designation based on a thorough balancing analysis pursuant to section 4(b)(2) of the Act. In all cases, we anticipate a final designation that may be smaller than the current proposed revised designation. The proposed revised designation may be taken as a maximum in the sense that, in no case, with the exception of minor boundary adjustments, would the final designation include lands not included in the proposed rule without first providing the opportunity for public notice and comments with respect to such additional lands.

As described above, the Act provides that critical habitat shall be designated after taking into consideration the economic impact, the impact on national security, and any other relevant impact of specifying any particular area as critical habitat. Section 4(b)(2) of the Act provides that the Secretary may exclude any area from critical habitat if he determines that the benefits of excluding that area outweigh the benefits of including it in the designation, unless such an exclusion would result in the extinction of the species. This ''weighing'' of considerations under section 4(b)(2) of the Act is the next step in the designation process, in which the Secretary may consider particular areas for exclusion from the final designation. In this proposed revised designation of critical habitat, we have already identified 4,571,672 ac (1,850,090 ha) of lands that we will consider for exclusion from the final designation of critical habitat. We note that Executive Order 13563 states that to the extent permitted by law, each agency must ''tailor its regulations to impose the least burden on society, consistent with obtaining regulatory objectives,'' and that each agency ''shall identify and consider regulatory burdens that reduce burdens and maintain flexibility and freedom of choice for the public.''

The final designation may reflect a variety of possible combinations of exclusions (We note that in 1991, the initial proposal was for 11.6 million acres of critical habitat (May 6, 1991, 56 FR 20816), but the final rule identified 6.9 million acres (January 15, 1992, 57 FR 1796), a decrease of 40 percent). The public is invited to comment on the possible exclusion of any areas proposed, but in particular those areas we have identified as those we propose to exclude and those we may additionally consider to exclude from the final designation of critical habitat. After evaluating public comment and carefully analyzing and weighing all appropriate factors, a variety of potential outcomes is possible in the final designation. The following represents a range of some possible outcomes that may result from the critical habitat designation process. In all cases, and without prejudging the consideration of further analysis and public comments, we anticipate a final designation that may be significantly smaller than the currently identified area. We emphasize that these are possible outcomes and that we seek comments on alternatives, including those that may involve additional exclusions beyond those specifically identified in this proposal.

Possible Outcome 1. Finalize critical habitat on all lands described as meeting the definition of critical habitat in this proposed revised designation. This outcome would result if the Secretary determines, following public comment and consideration of all possible exclusions and exemptions, that all of the areas proposed as revised critical habitat still meet the definition of critical habitat, and no areas are excluded or exempted from the final designation. In this outcome, the final designation would be 13,962,449 ac (5,649,660 ha).

Possible Outcome 2. Finalize critical habitat by excluding all private and State lands with active conservation agreements (HCPS, SHAs, and other formal agreements) in place, identified here as proposed for exclusion based on a through balancing analysis under section 4(b)(2) of the Act (see Table 1). This outcome would result if, following public comment and consideration of all possible exclusions, the Secretary determined that, of all of the areas identified here for consideration for possible exclusion, the benefits of excluding those areas with formal conservation agreements that support conservation of the northern spotted owl would be greater than the benefits of including those areas in critical habitat, and if exclusion of those areas did not result in the extinction of the species. In this outcome, the final designation would be 13,025,633 ac (5,271,287 ha).

Possible Outcome 3. Finalize critical habitat by excluding all private and State lands with active conservation agreements (HCPs, SHAs, and other formal agreements) in place, all State parks, and all Congressionally reserved natural areas (e.g., wilderness areas, national scenic areas, national parks) based on a through balancing analysis under section 4(b)(2) of the Act (see Table 1). This outcome would result if, following public comment and consideration of all possible exclusions, the Secretary determined that of all of the areas identified here as proposed for exclusion, the benefits of excluding those areas with formal conservation agreements that support conservation of the northern spotted owl, as well as the benefits of excluding those State parks and Federal natural areas managed as parks or wilderness, would be greater than the benefits of including those areas in critical habitat, and if exclusion of those areas did not result in the extinction of the species. In this outcome, the final designation would be 10,229,121 ac (4,139,578 ha). Figures 1

through 3 demonstrate what the final critical habitat designation would be if all exclusions proposed in this proposed revised rule were finalized.

Possible Outcome 4. Finalize critical habitat by excluding all private lands, all State lands, and all Congressionally reserved natural areas based on a through balancing analysis under section 4(b)(2) of the Act (see Table 1). This outcome would result if, following public comment and consideration of all possible exclusions, the Secretary determined that of all of the areas identified here for consideration for possible exclusion, the benefits of excluding all private lands, State lands, and Federal natural areas managed as parks or wilderness would be greater than the benefits of including those areas in critical habitat. In this outcome, the final designation would be 9,390,777 ac (3,800,313 ha).

We emphasize that there may be significant benefits to excluding private lands; we particularly request comments on whether and to what extent excluding such lands would be consistent with the Act.

There is, of course, a Possible Outcome 5, which would involve greater exclusions than those identified in Possible Outcome 4. As noted, we request public comments on any such potential exclusions, and the underlying law and science that would support such exclusions. In considering the various possible outcomes, we will focus on the requirements of the Act and to the extent consistent with law, the requirements of Executive Order 13563 and in particular its emphasis on public participation, on imposing the least burden on society, and on maintaining flexibility and freedom of choice for the public.

TABLE 1—LANDS PROPOSED OR CONSIDERED FOR EXCLUSION FROM THE FINAL CRITICAL HABITAT DESIGNATION UNDER VARIOUS POSSIBLE OUTCOMES OF THIS PROPOSED RULE

	Acres (hectares) proposed or considered for exclusion	Acres (hectares) in potential final designation
Possible Outcome 1:		
No exclusions		13,962,449 ac (5,649,660 ha)
Possible Outcome 2:		
Excludes private lands with conservation agreements (HCPs, SHAs, and other formal agreements) proposed for exclusion.	711,803 ac (288,059 ha).	
Excludes State lands with conservation agreements (HCPs, SHAs, or other formal agreements) proposed for exclusion.	225,013 (91,059 ha).	
Subtotal	*936,816 ac*	13,025,633 ac
	(379,116 ha)	(5,271,287 ha)
Possible Outcome 3:		
Excludes private lands with conservation agreements (HCPs, SHAs, and other formal agreements) proposed for exclusion.	711,803 ac (288,059 ha).	
Excludes State lands with conservation agreements (HCPs, SHAs, or other formal agreements) proposed for exclusion.	225,013 (91,059 ha).	
Excludes State park lands proposed for exclusion	164,776 ac (66,682 ha).	
Excludes Congressionally reserved natural areas proposed for exclusion	2,631,736 ac (1,065,026 ha).	
Subtotal	*3,733,328 ac*	10,229,121 ac
	(1,510,824 ha)	(4,139,578 ha)
Possible Outcome 4:		
Excludes private lands with conservation agreements (HCPs, SHAs, and other formal agreements) proposed for exclusion.	711,803 ac (288,059 ha).	
Excludes State lands with conservation agreements (HCPs, SHAs, or other formal agreements) proposed for exclusion.	225,013 (91,059 ha).	
Excludes State park lands proposed for exclusion	164,776 ac (66,682 ha).	
Excludes Congressionally reserved natural areas proposed for exclusion	2,631,736 ac (1,065,026 ha).	
Excludes all additional private lands without formal conservation agreements under consideration for exclusion.	555,901 ac (224,996 ha).	
Excludes all additional State lands without formal conservation agreements under consideration for exclusion.	281, 247 ac (113,817 ha).	
Subtotal	*4,570,476 ac*	9,391,973 ac
	(1,849,613 ha)	(3,800,812 ha)

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Figure 1.

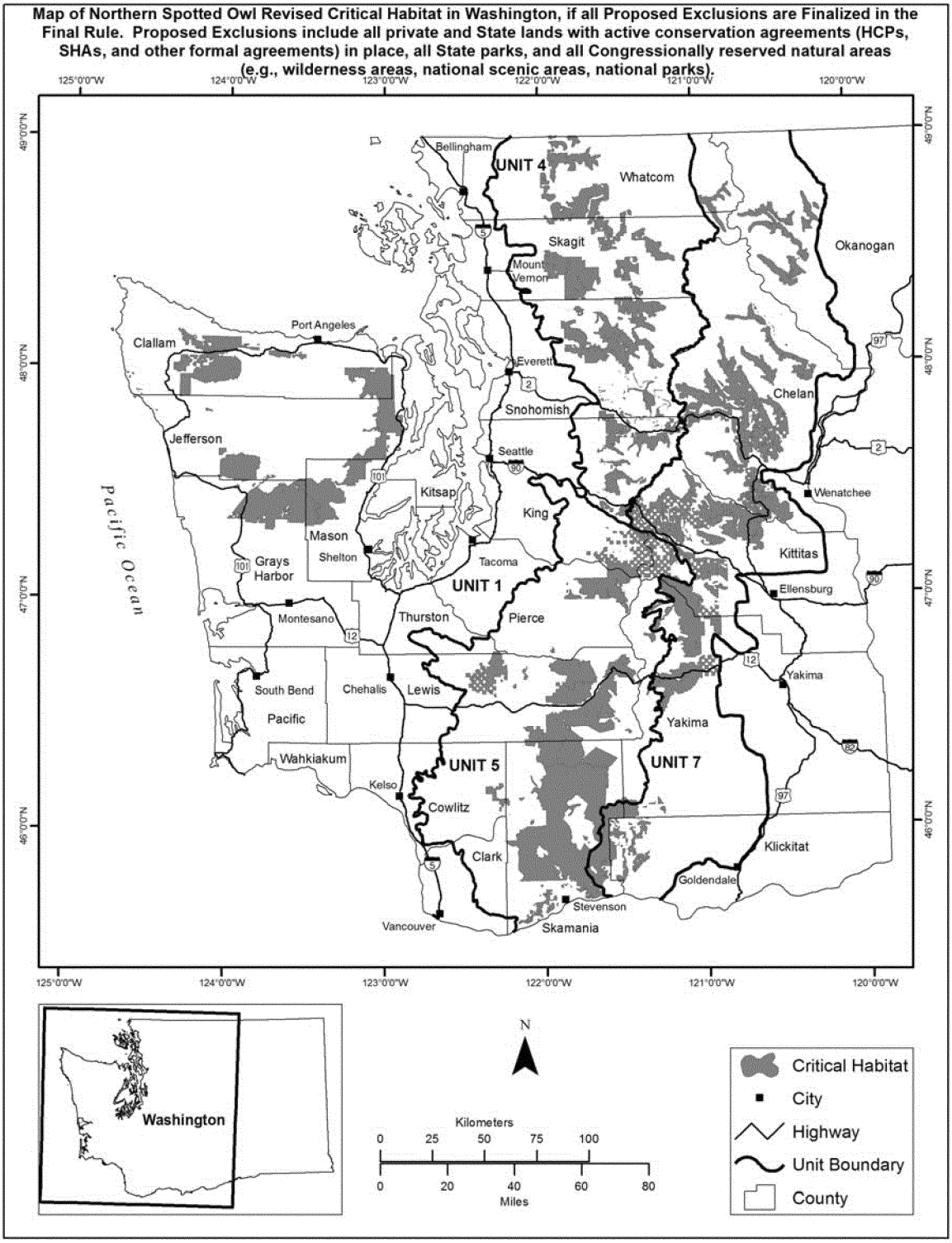

Map of Northern Spotted Owl Revised Critical Habitat in Washington, if all Proposed Exclusions are Finalized in the Final Rule. Proposed Exclusions include all private and State lands with active conservation agreements (HCPs, SHAs, and other formal agreements) in place, all State parks, and all Congressionally reserved natural areas (e.g., wilderness areas, national scenic areas, national parks).
125°0'0"W
124°0'0"W
123°0'0"W
122°0'0"W
121°0'0"W
120°0'0"W
49°0'0"N
48°0'0"N
47°0'0"N
46°0'0"N
Bellingham
UNIT 4
Whatcom
Skagit
Mount Vernon
Okanogan
Port Angeles
Clallam
Everett
Chelan
Snohomish
Jefferson
Seattle
Wenatchee
Kitsap
King
Pacific Ocean
Mason
Shelton
Grays Harbor
Tacoma
Kittitas
UNIT 1
Ellensburg
Montesano
Thurston
Pierce
Yakima
South Bend
Chehalis
Lewis
Pacific
Yakima
Wahkiakum
UNIT 5
UNIT 7
Kelso
Cowlitz
Klickitat
Clark
Goldendale
Stevenson
Vancouver
Skamania
Washington
N
Kilometers
0 25 50 75 100
0 20 40 60 80
Miles
Critical Habitat
City
Highway
Unit Boundary
County

Figure 2.

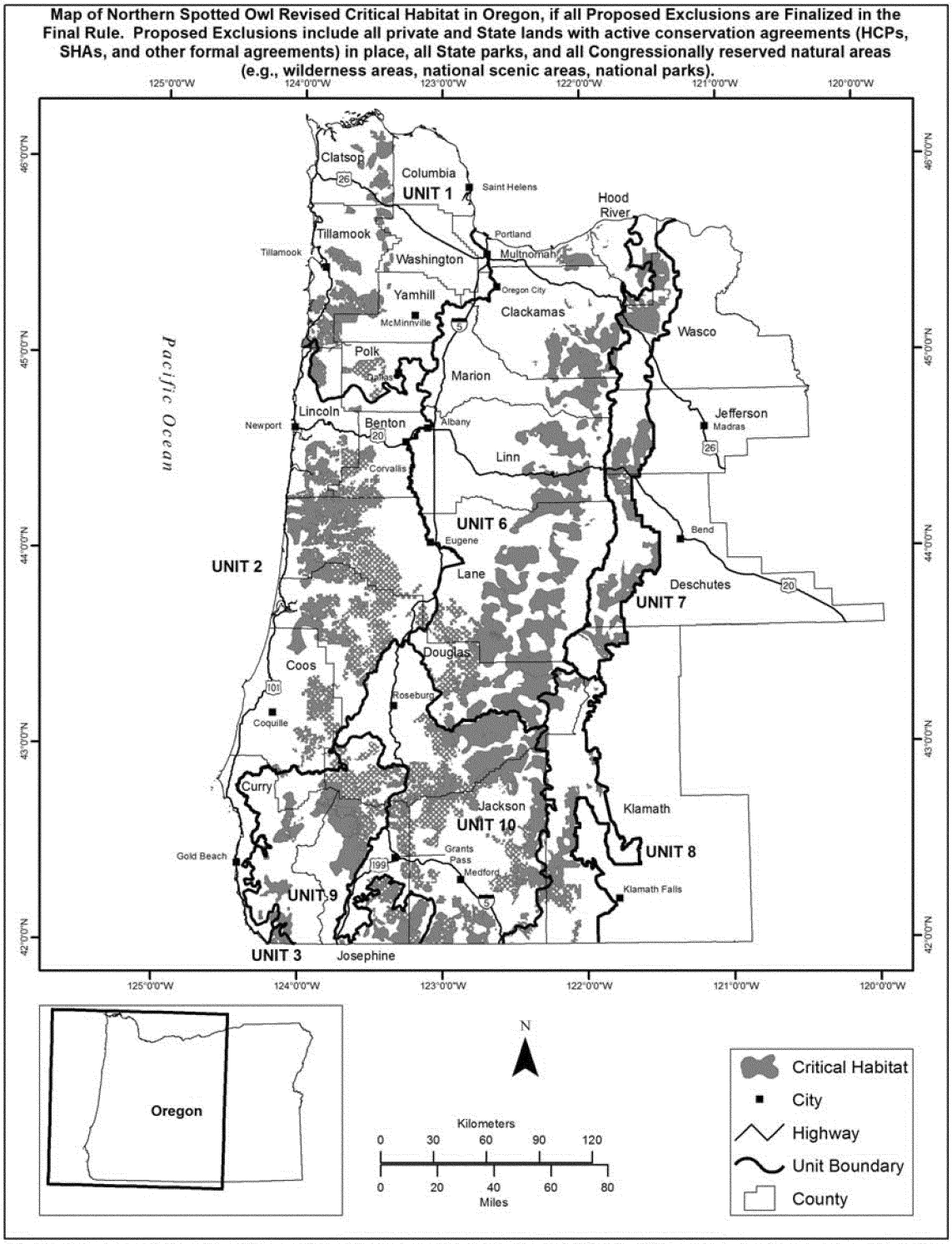
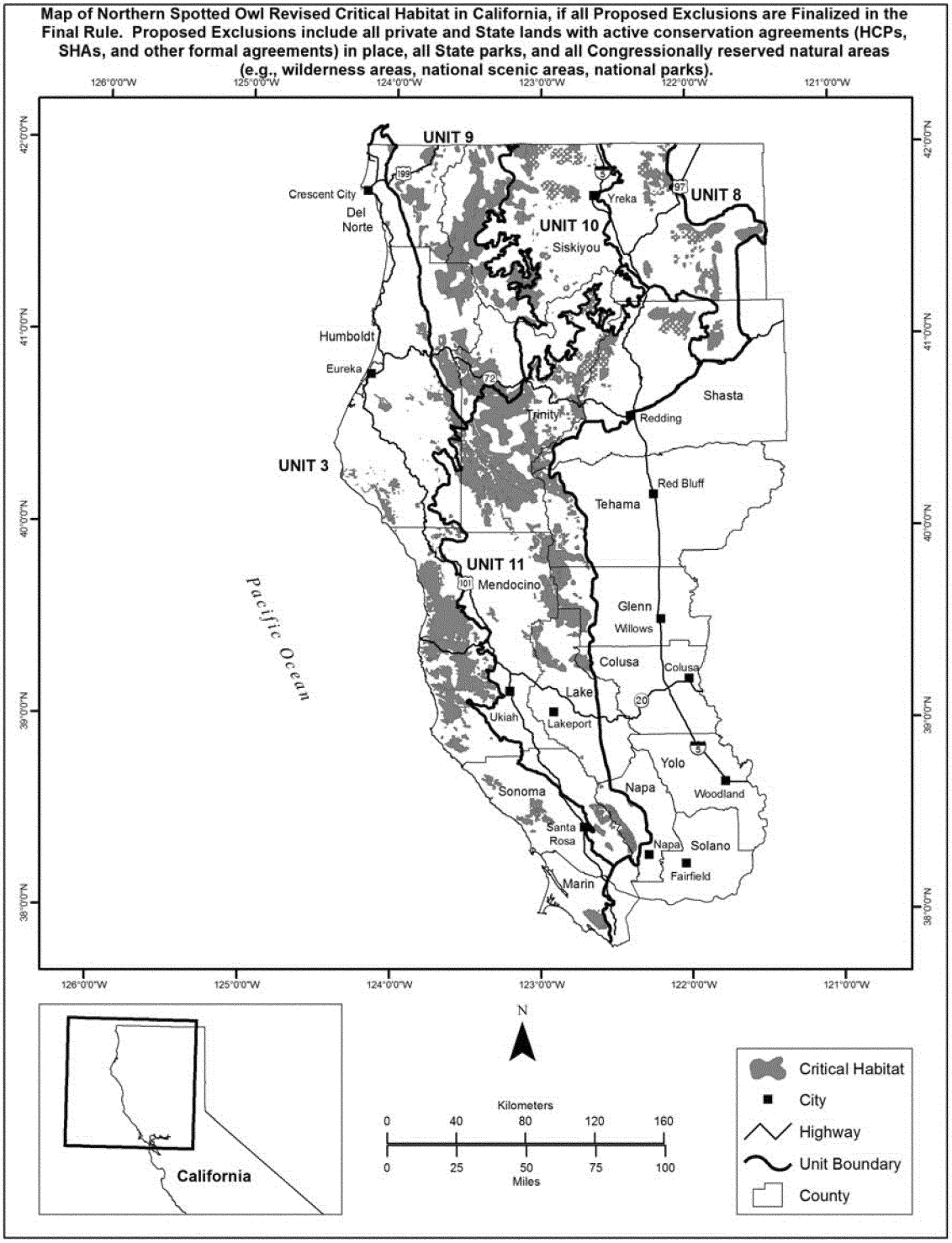

Map of Northern Spotted Owl Revised Critical Habitat in Oregon, if all Proposed Exclusions are Finalized in the Final Rule. Proposed Exclusions include all private and State lands with active conservation agreements (HCPs, SHAs, and other formal agreements) in place, all State parks, and all Congressionally reserved natural areas (e.g., wilderness areas, national scenic areas, national parks).
125°0'0"W
124°0'0"W
123°0'0"W
122°0'0"W
121°0'0"W
120°0'0"W
46°0'0"N
45°0'0"N
44°0'0"N
43°0'0"N
42°0'0"N
Pacific Ocean
Clatsop
Columbia
UNIT 1
Saint Helens
Hood River
Tillamook
Tillamook
Washington
Portland
Multnomah
Yamhill
Oregon City
Clackamas
McMinnville
Wasco
Polk
Dallas
Marion
Lincoln
Newport
Benton
Albany
Jefferson
Madras
Linn
Corvallis
UNIT 6
Eugene
Bend
UNIT 2
Lane
Deschutes
UNIT 7
Douglas
Coos
Roseburg
Coquille
Curry
Jackson
UNIT 10
Klamath
UNIT 8
Gold Beach
Grants Pass
Medford
Klamath Falls
UNIT 9
UNIT 3
Josephine
Oregon
N
Kilometers
0 30 60 90 120
0 20 40 60 80
Miles
Critical Habitat
City
Highway
Unit Boundary
County

Figure 3.



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Public Comment

We intend that any final action resulting from this proposed revised rule will be based on the best scientific and commercial data available and be as accurate and as effective as possible. Therefore, we request comments or information from other concerned government agencies, the scientific community, industry, or any other interested party concerning this proposed rule. We particularly seek comments concerning:

(1) Specific information regarding:

(a) The amount and distribution of northern spotted owl habitat;

(b) What areas were occupied at the time of listing and contain features essential to the conservation of the species such that they should be included in the designation and why;

(c) Whether these essential features may require special management considerations or protection and what special management considerations or protection may be needed in critical habitat areas we are proposing;

(d) What areas not occupied at the time of listing are essential for the conservation of the species and why;

(e) Whether we have identified here any areas occupied at the time of listing, but that do not contain features essential to the conservation of the species, and that therefore should not be included in the designation; and

(f) Whether we have identified here any areas that may not have been occupied at the time of listing and that are not essential to the conservation of the species, such that they should not be included in the designation.

(2) Land-use designations and current or planned activities in the subject areas and their possible impacts on proposed critical habitat.

(3) Our proposed approach to effects determinations for the purposes of conducting consultation under section 7(a)(2) of the Act, in particular the application of a 500-ac (200-ha) scale as a screen for a determination of not likely to adversely affect, as described in the section *Determinations of Adverse Effects and Application of the ''Adverse Modification'' Standard.*

(4) Assistance in the identification of any private lands that are not expressly identified as intended for inclusion within critical habitat and that may have inadvertently been included within the designation, due to mapping and modeling limitations, as described in the section ''Proposed Revised Critical Habitat Designation.''

(5) Information on the potential impacts of climate change on the northern spotted owl and proposed critical habitat, and whether special management needs or protections may be needed to address this issue in the critical habitat areas we are proposing.

(6) Any probable economic, national security, or other relevant impacts of designating any area as critical habitat, and in particular, any impacts on small entities, and the benefits of including or excluding areas that exhibit these impacts. We particularly request information and comments on what activities may occur and the effects to those activities in the proposed revised critical habitat areas. Such information could include:

(a) The extent of possible activities, including temporal and spatial scale, relative to the critical habitat area within which they occur.

(b) The impact of possible activities on the habitat's likelihood of serving its intended conservation function or purpose.

(c) The consistency of possible activities with the intent of the recovery plan or other landscape-level conservation plans.

(7) Whether the benefits of excluding the private and State lands with active conservation agreements (HCPs, SHAs, and other formal agreements) and Congressionally reserved natural areas (e.g., wilderness areas, national scenic areas, national parks) that are proposed for exclusion outweigh the benefits of including them in critical habitat.

(8) Whether the benefits of excluding any other particular area from critical habitat outweigh the benefits of including that area in critical habitat under section 4(b)(2) of the Act, after considering both the potential impacts and benefits of the proposed revised critical habitat designation. We are considering the possible exclusion of non-Federal lands, especially areas in private ownership, in particular, and whether the benefits of exclusion may outweigh the benefits of inclusion of those areas. We, therefore, request specific information on:

(a) The benefits of including any specific areas in the final designation and supporting rationale.

(b) The benefits of excluding any specific areas from the final designation and supporting rationale.

(c) Whether any specific exclusions may result in the extinction of the species and why (see Exclusions section, below).

(d) For private lands in particular, we are interested in information regarding the potential benefits of including private lands in critical habitat versus the benefits of excluding such lands from critical habitat. This information does not need to include a detailed technical analysis of the potential effects of designated critical habitat on private property. In weighing the potential benefits of exclusion versus inclusion of private lands, the Service may consider whether existing partnership agreements provide for the management of spotted owl habitat. We may consider, for example, the status of conservation efforts, the effectiveness of any conservation agreements to conserve the species, and the likelihood of the conservation agreement's future implementation. There may be broad public benefits of encouraging collaborative efforts and encouraging local and private conservation efforts, and these broad benefits are important considerations in our evaluation.

(9) Our process used for identifying those areas that meet the definition of critical habitat for the northern spotted owl, including the assumptions incorporated into the habitat modeling process, as described more fully in the section ''Criteria Used to Identify Critical Habitat'' and also in our supporting documentation (Dunk *et al.* 2012).

(10) Whether we could improve or modify our approach to designating critical habitat in any way to provide for greater public participation and understanding, or to better accommodate public concerns and comments.

(11) Specific information on ways to improve the clarity of this rule as it pertains to completion of consultations under section 7 of the Endangered Species Act.

Our final determination concerning the revision of northern spotted owl critical habitat will take into consideration all written comments and any additional information we receive during all comment periods. The comments will be included in the public record for this rulemaking, and we will fully consider them in the preparation of our final determination. On the basis of information received, we may, during the development of our final determination, find that areas within the proposed designation do not meet the definition of critical habitat, that some modifications to the described boundaries are appropriate, or that areas may or may not be appropriate for exclusion based on a through balancing analysis under section 4(b)(2) of the Act under section 4(b)(2) of the Act.

You may submit your comments and materials concerning this proposed rule by one of the methods listed in the **ADDRESSES** section. We will post your entire comment—including your personal identifying information—on *http://www.regulations.gov.* You may request at the top of your document that we withhold personal information such as your street address, phone number, or email address from public review; however, we cannot guarantee that we will be able to do so.

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on *http://www.regulations.gov,* or by appointment, during normal business hours, at the U.S. Fish and Wildlife Service, Oregon Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Background

It is our intent to discuss only those topics directly relevant to the revised designation of critical habitat in this proposed rule. For further details regarding northern spotted owl biology

and habitat, population abundance and trend, distribution, demographic features, habitat use and conditions, threats, and conservation measures, please see the Northern Spotted Owl 5 year Review Summary and Evaluation, completed October 26, 2011, and the Revised Recovery Plan for the Northern Spotted Owl (USFWS 2011), completed July 1, 2011. Both of these documents are available on the U.S. Fish and Wildlife Service's Endangered Species web site at *http://ecos.fws.gov/;* under ''Species Search,'' enter ''northern spotted owl''). As detailed below, Appendix C of the Revised Recovery Plan is particularly informative, as the habitat modeling process described therein was used to help identify those areas considered essential to the conservation of the northern spotted owl in this proposed revised designation of critical habitat. Furthermore, the recovery criteria for the northern spotted owl, as described in the Revised Recovery Plan (USFWS 2011, pp. I–1 to I–2), helped to discriminate between the various scenarios considered in the modeling process in terms of assessing which of the habitat networks evaluated would contribute most efficiently to the conservation of the northern spotted owl.

The Service recognizes that this proposed revision of critical habitat represents an increase in the total land area identified from previous designations in 1992 (January 15, 1992; 57 FR 1796) and 2008 (August 13, 2008; 73 FR 47325). For a detailed explanation of the changes proposed between this proposed revised designation and the present designation of critical habitat for the northern spotted owl, please see Summary of Changes from Previously Designated Critical Habitat, below.

Introduction

The northern spotted owl inhabits structurally complex forests from southwestern British Columbia through Washington and Oregon to northern California. The northern spotted owl was listed under the Act as a threatened species in 1990 because of widespread loss of habitat across its range and the inadequacy of existing regulatory mechanisms to conserve it (55 FR 26114; June 26, 1990). Although the rate of loss of habitat due to timber harvest has been greatly reduced on Federal lands over the past two decades, both past and current habitat loss remain a threat to the northern spotted owl. Despite implementation of habitat conservation measures in the early 1990s, Thomas *et al.* (1990, p. 5) and USDI (1992, Appendix C) foresaw that owl populations would continue to decline for several decades, even with habitat conservation, as the consequence of lag effects at both individual and population levels. However, many populations of northern spotted owls have declined at a faster rate than anticipated, especially in the northern parts of the subspecies' range (Anthony *et al.* 2006, pp. 31–32; Forsman *et al.* 2011, pp. 65, 76). We now know that the suite of threats facing the northern spotted owl differs from those at the time it was listed; in addition to the effects of historical and ongoing habitat loss, the northern spotted owl faces a new significant and complex threat in the form of competition from the congeneric (referring to a member of the same genus) barred owl (USFWS 2011, pp. I–7 to I–8).

During the second half of the 20th century, 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 (Gutiérrez *et al.* 1995, p. 3; Crozier *et al.* 2006, p. 761). 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 (see ''Population Status and Trends,'' below). 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, pp. 2464–2465) 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, p. 2467). 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, p. 2464; Forsman *et al.* 2011, p. 76; USFWS 2011, Recovery Action 32 [RA32], p. III–67).

It is becoming increasingly evident that solely securing habitat will not be effective in achieving the recovery of the northern spotted owl when barred owls are present (USFWS 2011, p. vi). While conservation of high-quality habitat is essential for the recovery and conservation of the owl, habitat conservation alone is not sufficient to achieve recovery objectives. As stated in the Revised Recovery Plan, ''addressing the threats associated with past and current habitat loss must be conducted simultaneously with addressing the threats from barred owls. Addressing the threat from habitat loss is relatively straightforward with predictable results. However, addressing a large-scale threat of one raptor on another, closely related raptor has many uncertainties'' (USFWS 2011, p. I–8). A designation of critical habitat is intended to ameliorate habitat-based threats to an endangered or threatened species; critical habitat cannot reasonably be expected to address other, non-habitat-related threats to the species. In the case of the northern spotted owl, the recovery goal of supporting population viability and demographically stable populations of northern spotted owls will likely require habitat conservation in concert with the implementation of recovery actions that address other, non-habitat-based threats to the species, including the barred owl. In addition, recovery actions include scientific evaluation of potential management options to reduce the impact of barred owls on northern spotted owls (USFWS 2011, Recovery Action 29 [RA29], p. III–65), and implementation of management actions determined to be effective (USFWS 2011, Recovery Action 30 [RA30], p. III–65).

When developing a critical habitat rule, the Service must use the best scientific information available to identify those specific areas within the geographical area occupied by the species at the time it was listed that provide the physical and biological features essential for the conservation of the species, and that may require special management considerations or protection, or to identify those areas outside the geographical area occupied by the species at the time it was listed that are otherwise determined to be essential to the conservation of the species. However, like most critical habitat proposals, this rule addresses

elements of risk management, because we must make recommendations and decisions in the face of incomplete information and uncertainty about factors influencing northern spotted owl populations. This uncertainty exists even though the northern spotted owl is among the most thoroughly studied of listed species. We understand a great deal about the habitats the subspecies prefers and the factors that influence its demographic trends. Nonetheless, considerable uncertainty remains, particularly about interactions among different factors that threaten the owl.

In the face of such uncertainty, the Revised Recovery Plan proposes strategies to address the primary threats to the northern spotted owl from habitat loss and barred owls (USFWS 2011, p. I–7). The effects of climate change and of past management practices are changing forest ecosystem processes and dynamics, including patterns of wildfires, insect outbreaks and disease, to a degree greater than anticipated in the Northwest Forest Plan (NWFP) (Hessburg *et al.* 2005, pp. 134–135; Carroll *et al.* 2010, p. 899; Spies *et al.* 2010, entire; USFWS 2011, p. I–8). At the same time, the expansion of barred owl populations is altering the capacity of intact habitat to support northern spotted owls. Projecting the effects of these factors and their interactions into the future leads to even higher levels of uncertainty, especially considering how the influences of different threats may vary across the owl's large geographical range. It is clear that ecosystem-level changes are occurring within the northern spotted owl's forest habitat.

The development of a critical habitat network for the northern spotted owl must take into account the current uncertainty associated with both barred owl impacts and climate change predictions (USFWS 2011, p. III–10) as well as the uncertainty associated with how land will be managed in the future, how climate change effects will impact northern spotted owls, and whether and how barred owls will be managed (and thus, what the future effect of barred owls will be on northern spotted owl populations). These uncertainties require that we make some assumptions about likely future conditions in developing, modeling, and evaluating potential critical habitat for the northern spotted owl; those assumptions are identified clearly in this proposed rule (see Criteria Used to Identify Critical Habitat, below) and in our supporting documentation (Dunk *et al.* 2012, entire).

Given the continued decline of northern spotted owl populations, the apparent increase in severity of the threat from barred owls, and information indicating a recent loss of genetic diversity for the subspecies, retaining both occupied northern spotted owl sites and unoccupied, high-value northern spotted owl habitat across the subspecies' range are key components for recovery (USFWS 2011, p. I–9). Accordingly, in this proposed rule, we have identified areas of occupied habitat that provide the physical or biological features essential to the conservation of the northern spotted owl, and which may require special management considerations or protection. When occupied areas were not adequate to achieve recovery goals, we also identified some unoccupied areas as critical habitat for the northern spotted owl when it was clear that such areas are essential to the conservation of the species. However, it is important to note that this proposed revised designation of critical habitat does not include all sites where northern spotted owls are known to occur. The habitat modeling that we used, in part, to assist us in developing this proposed revised designation was based primarily on present habitat suitability. While we did also consider the present known locations of northern spotted owls in refining the identified habitat network, not all such sites were included in the proposed revised designation if those areas did not make a significant contribution to population viability (for example, if known sites were too small or isolated to play a meaningful role in the conservation of the species; see Criteria Used to Identify Critical Habitat). This is in accordance with Section 3(5)(C) of the Act, which specifies that ''critical habitat shall not include the entire geographical area which can be occupied by the threatened or endangered species.''

Because of the uncertainties associated with the effects of barred owl interactions with the northern spotted owl and habitat changes that may occur as a result of climate change, active adaptive management strategies will be needed to achieve results in certain landscapes. Adaptive management is a systematic approach for improving resource management by learning from the results of explicit management policies and practices and applying that learning to future management decisions (USFWS 2011, p. G–1). This critical habitat rule identifies key sources of uncertainty, and the need to learn from our management of forests that provide habitat for northern spotted owls. We propose a critical habitat network that was developed based on what we believe to be essential for the conservation of the northern spotted owl, including information on essential habitats, the current distribution of those habitats, and the best available scientific knowledge about northern spotted owl population dynamics, while acknowledging uncertainty about future conditions in Pacific Northwest forests.

An Ecosystem-Based Approach to the Conservation of the Northern Spotted Owl and Managing Its Critical Habitat

Section 2 of the Act states, ''The purposes of this Act are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved.'' Although the conservation of the listed species is the specific objective of a critical habitat designation, the essential physical or biological features that serve as the basis of critical habitat are often essential components of the ecosystem upon which the species depends. In such cases, a fundamental goal of critical habitat management is not only to conserve the listed species, but also to conserve the ecosystem upon which that species depends. This is the case with the northern spotted owl.

An ''ecosystem'' is defined as a biological community of interacting organisms and their physical environment, or as the complex of a community of organisms and its environment functioning as an ecological unit (Krebs 1972, pp. 10–11; Ricklefs 1979, pp. 31–32, 869). These ecosystem interactions and functions are often referred to as ecological ''relationships'' or ''processes.'' Thus, to conserve the northern spotted owl as directed by the Act, one must also conserve the ecological processes that occur within the ecological landscape inhabited by the species. These processes—such as vegetation succession, forest fire regimes, and nutrient cycling—create and shape the physical and biological features that form the foundation of critical habitat. The northern spotted owl was initially listed as a threatened species largely due to the loss or degradation of the late-successional forest ecosystems upon which it depends. A complex interaction of physical and biological factors contribute to the development and maintenance of these ecosystems, which in turn provide the northern spotted owl with the environmental conditions required for its conservation and survival, such as large areas of suitable habitat, nest structures, and sufficient prey to sustain interconnected populations of owls across the landscape. A fundamental goal of critical habitat management should thus

be to understand, describe, and conserve these processes, which in turn will maintain the physical and biological features essential to the conservation of the species. This ''ecosystem approach'' will ultimately have the highest likelihood of conserving listed species such as the northern spotted owl in the long term (Knight 1998, p. 43).

Service policy also endorses this approach: ''Species will be conserved best not by a species-by-species approach but by an ecosystem conservation strategy that transcends individual species'' (59 FR 34724, July 1, 1994). The Service applies this ecosystem approach to critical habitat designations for other listed species (e.g., in Hawaii (75 FR 18960, April 13, 2010; 76 FR 46362, August 2, 2011)). Likewise, the U.S. Forest Service, which manages the great majority of the proposed northern spotted owl critical habitat, has prioritized restoring and maintaining natural ecological function and resiliency to its forest lands (Blate *et al.* 2009, entire; USDA 2010, entire; Tidwell 2011, entire). Active management of critical habitat is intended to be fully compatible and consistent with these landscape-level ecosystem conservation efforts.

Proposed revised critical habitat for the northern spotted owl includes a diverse forest landscape that covers millions of acres and contains several different forest ecosystems and thousands of plant and animal species. It ranges from dry, fire-prone forests to moist old-growth conifer forest to a mix of conifers and hardwood trees. Thousands of species occur in these forest ecosystems, including other listed species with very specific biological needs. Prescribed management for all of these needs at the species level on large landscapes is likely to be expensive, logistically difficult, and often in conflict (Thompson *et al.* 2009, p. 29). Many scientists believe a single-species approach to forest management is limited and that land managers need to focus on broader landscape goals that address ecosystem process and future habitat conditions (see, e.g., Thomas *et al.* 2006, p. 286; Boyd *et al.* 2008, p. 42; Hobbs *et al.* 2010, p. 487; Mori 2011, pp. 289–290). In this proposed revised designation of critical habitat, we encourage the application of ecosystem management principles to ensure the long-term conservation of the northern spotted owl and its habitat, as well as other species dependent on these shared ecosystems.

Forest Management Activities in Spotted Owl Critical Habitat

Another important development informing spotted owl critical habitat management involves changes in forestry science. Emulating natural disturbance regimes is emerging as a dominant paradigm in North American forest management (Seymour and Hunter 1999, p. 56; Long 2009, p. 1868). This change is occurring in response to: (1) The simplification of forests in terms of structure, age-class diversity, and species composition as a result of management for timber production, and (2) a recognition of fundamental changes in ecosystem function and processes due to land management practices, especially fire and successional patterns (Franklin *et al.* 2002, pp. 402–408; Hessburg *et al.* 2005, pp. 134–135; Drever *et al.* 2006, p. 2291). Although human disturbance is unlikely to precisely mimic natural forest disturbance, it can be used to better maintain the resilience of landscapes and wildlife populations to respond to natural disturbance and climate change (Lindenmayer *et al.* 2008, p. 87). In general, silviculture prescriptions that apply ecological forestry principles to address the conservation of broader ecological processes are compatible with maintaining the proposed critical habitat's essential features in the long term (USFWS 2011, p. III–14).

Explicitly prescribing such management at a fine scale (e.g., forest stand level) is beyond the scope of this document and should be developed at the appropriate land management unit (e.g., National Forest or BLM District; USDA 2010, entire) and through consultation with the Service, as appropriate. As described below and in the Revised Recovery Plan, management actions whose intent is to conserve or restore natural ecological processes and enhance forest resilience in the long term should generally be consistent with the goals of critical habitat management (USFWS 2011, p. III 11–39). The Service has recently approved these types of management actions in occupied spotted owl habitat on BLM and USFS lands.

Some general considerations for managing within spotted owl critical habitat are discussed in more detail in the Special Management Considerations and Adverse Modification sections of this document. In sum, vegetation and fuels management in dry and mixed-dry forests is encouraged both within and outside designated critical habitat where the goal of such treatment is to conserve natural ecological processes or restore them (including fire) where they have been modified or suppressed (Allen *et al.* 2002, pp. 1429–1430; Spies *et al.* 2006, pp. 358–361; Fielder *et al.* 2007, entire; Prather *et al.* 2008, entire; Lindenmayer *et al.* 2009, p. 274; Tidwell 2011, entire). Likewise, in moist and some mixed forests, management of spotted owl critical habitat should be compatible with broader ecological goals, such as the retention of high-quality older forest, the continued treatment of young or homogenous forest plantations, and the conservation or restoration of complex early seral forest habitat (Spies *et al.* 2007b, pp. 57–63; Betts *et al.* 2010, pp. 2117, 2126–2127; Swanson *at al.* 2010, entire). In general, actions that promote ecological restoration and those that apply ecological forestry principles as described in the Revised Recovery Plan (USFWS 2011, pp. III–11 to III–41) are likely to be consistent with the conservation of the northern spotted owl and the management of its critical habitat.

Critical Habitat and the Northwest Forest Plan

It is important for readers of this document to understand the relationship between spotted owl critical habitat and the Northwest Forest Plan (NWFP). Critical habitat for the spotted owl was first designated in 1992 (January 15, 1992; 57 FR 1796). Since 1994, the NWFP has also served as an important landscape-level plan that has contributed to the conservation of the northern spotted owl and its late-successional forest habitat (Thomas *et al.* 2006, pp. 278–284). The NWFP introduced a strategy of reserves where conservation would be the priority, and matrix areas where timber harvest would be the goal. Here we briefly provide a summary of how our proposed designation of critical habitat has been informed by the knowledge and experience gained from management under the NWFP.

The NWFP reserve strategy has been successful in the conservation and recruitment of late-successional forest and associated species on Federal lands (Thomas *et al.* 2006, p. 283). Implementation of the plan has been less successful in providing the anticipated level of commercial timber harvest from matrix lands (less than 50 percent of anticipated levels; Thomas *et al.* 2006, p. 284), at promoting active restoration in areas that may contain uncharacteristically high risk of severe fire (Spies *et al.* 2006, pg. 359; Thomas *et al.* 2006, p. 277), or in moist forests where early seral habitats are lacking

such as those described above (Betts *et al.* 2010, p. 2117).

Some scientists have suggested that it may be time to reconsider various recommendations or requirements of the NWFP in light of improved scientific insight, increasing concerns over future ecological conditions that appear increasingly dynamic, and changing social values (Spies *et al.* 2006, p. 360; Thomas *et al.* 2006, p. 286; Thompson *et al.* 2009, p. 29). Some specifically question the strategy of managing Federal lands in the range of the northern spotted owl separately as reserves in some areas and for commodity production in others, suggesting a more holistic management perspective (Spies *et al.* 2006, p. 360; Thomas *et al.* 2006, p. 286; Franklin and Lindenmayer 2009, entire). Other scientists conclude that a system of large reserves in the NWFP is still necessary for course-scale planning, but that fine-scale management should proceed that restores ecological processes while minimizing adverse impacts to wildlife (Carroll *et al.* 2009, p. 29).

The Service, in developing this proposed critical habitat designation, has taken these concerns into consideration. Thomas *et al.* (2006, pp. 284–287) recommend three primary improvements in the NWFP to address these concerns. These recommendations are highly relevant to spotted owl critical habitat management:

1. Conserve old growth trees and forests on Federal lands *wherever they are found* (emphasis added), and undertake appropriate restoration treatment in the threatened forest types.
2. Manage NWFP forests as dynamic ecosystems that conserve all stages of forest development (e.g., old growth and early seral), and where tradeoffs between short-term and long-term risks are better balanced.
3. Recognize the NWFP as an integrated conservation strategy that contributes to all components of sustainability across Federal lands.

The management of critical habitat for the spotted owl should be compatible with these broader landscape management goals articulated by Thomas *et al.* (2006, pp. 284–287). Critical habitat for the northern spotted owl is not intended to be a ''hands off'' reserve in the traditional sense. Rather, it should be a ''hands-on'' ecosystem management landscape that should include a mix of active and passive actions to meet a variety of conservation goals that support long-term spotted owl conservation. Some general considerations for managing for the conservation of the northern spotted owl are discussed in the Special Management Considerations and Adverse Modification sections of this document, as well as in the Revised Recovery Plan for the Northern Spotted Owl (USFWS 2011, pp. III–11 to III–39).

The Biology and Ecology of the Northern Spotted Owl

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 (Gutiérrez *et al.* 1995, p. 2). 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 (reviewed in Courtney *et al.* 2004, pp. 3–3 to 3–31), including genetic (Barrowclough and Gutiérrez 1990, p. 739; Barrowclough *et al.* 1999, p. 922; Haig *et al.* 2004, p. 1353; Barrowclough *et al.* 2005, p. 1113), morphological (Gutiérrez *et al.* 1995, pp. 2 to 3), behavioral (Van Gelder 2003, p. 30), and biogeographical characteristics (Barrowclough *et al.* 1999, p. 928).

Distribution and Habitat

The current range of the northern spotted owl extends from southwest British Columbia through the Cascade Mountains, coastal ranges, and intervening forested lands in Washington, Oregon, and California, as far south as Marin County, California. The subspecies is listed as threatened under the Act throughout its range (55 FR 26114; June 26, 1990). Within the United States, the northern spotted owl ranges across 12 physiographic provinces, based on recognized landscape subdivisions exhibiting different physical and environmental features, often referred to as ''physiographic provinces'' (Franklin and Dyrness 1988, pp. 5–26; Thomas *et al.* 1990, p. 61; USDA and USDI 1994, p. A–3). These include the Olympic Peninsula, Western Washington Lowlands, Western Washington Cascades, Eastern Washington Cascades, Oregon Coast Ranges, Western Oregon Cascades, Willamette Valley, Eastern Oregon Cascades, Oregon Klamath, California Klamath, California Coast Ranges, and California Cascades Provinces (based on USDA and USDI 1994, p. A–3). Very few northern spotted owls are found in British Columbia, the Western Washington Lowlands or Willamette Valley; therefore, the subspecies is restricted primarily to 10 of the 12 provinces within its range.

For the purposes of developing this proposed rule, and based on Appendix C of the Revised Recovery Plan (USFWS 2011, pp. C–7 to C–13), we have divided the range of the northern spotted owl into 11 different regions. We used these 11 regions in the habitat modeling that informed this proposed revised designation of critical habitat. The regions used here are more ''owl specific'' than the physiographic provinces used in the past. In addition to regional patterns of climate, topography, and forest communities, which the physiographic provinces also considered, the 11 regions are additionally based on specific patterns of spotted owl habitat relationships and prey base relationships across the range of the species. A map of the 11 regions used for the purposes of habitat modeling is provided in the Revised Recovery Plan (USFWS 2011, p. C–13), and are also shown in Figure 1 of this document. We additionally used these 11 regions identified in the Revised Recovery Plan as the organizing units for our designation of critical habitat.

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, p. 1216). 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, pp. 573, 579). 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 (57 FR 1805, January 15, 1992).

The three essential functions served by habitat within the home range of a northern spotted owl are:

(1) *Nesting.* Nesting habitat is essential to provide structural features for nesting, protection from adverse weather conditions, and cover to reduce predation risks. Habitat requirements for nesting and roosting are nearly identical. However, nesting habitat is specifically associated with a high incidence of large trees with various deformities (large cavities, broken tops, mistletoe (*Arceuthobium* spp.) infections, and other evidence of decadence) or large snags suitable for nest placement. Additional features that support nesting and roosting typically include a moderate to high canopy closure; a multilayered, multi-species canopy with large overstory trees; large accumulations of fallen trees and other woody debris on the ground; and sufficient open space below the canopy for spotted owls to fly (Thomas *et al.* 1990, p. 164). Forested stands with high canopy closure also provide thermal cover (Weathers *et al.* 2001, p. 686) and protection from predators. Patches of nesting habitat, in combination with roosting habitat, must be sufficiently large and contiguous to maintain northern spotted owl core areas and home ranges, and must be proximate to foraging habitat. Ideally, nesting habitat also functions as roosting, foraging, and dispersal habitat.

(2) *Roosting.* Roosting habitat is essential to provide for thermoregulation, shelter, and cover to reduce predation risk while resting or foraging. As noted above, the same habitat generally serves for both nesting and roosting functions; technically ''roosting habitat'' differs from nesting habitat only in that it need not contain those specific structural features used for nesting (cavities, broken tops, and mistletoe platforms), but does contain moderate to high canopy closure; a multi-layered, multi-species canopy; large accumulations of fallen trees and other woody debris on the ground; and open space below the canopy for northern spotted owls to fly. In practice, however, roosting habitat is not segregated from nesting habitat. Nesting and roosting habitat will also function as foraging and dispersal habitat.

(3) *Foraging.* Foraging habitat is essential to provide a food supply for survival and reproduction. Foraging habitat is the most variable of all habitats used by territorial spotted owls, and is closely tied to the prey base, as described below. Nesting and roosting habitat always provides for foraging, but in some cases owls also use more open and fragmented forests, especially in the southern portion of the range where some younger stands may have high prey abundance and structural attributes similar to those of older forests, such as moderate tree density, subcanopy perches at multiple levels, multi-layered vegetation, or residual older trees. Foraging habitat generally has attributes similar to those of nesting and roosting habitat, but foraging habitat may not always support successfully nesting pairs (USDI 1992, pp. 22–25). Foraging habitat can also function as dispersal habitat. The primary function of foraging habitat is to provide a food supply for survival and reproduction.

Because northern spotted owls show a clear geographical pattern in diet, and different prey species prefer different habitat types, prey distribution contributes to differences in northern spotted owl foraging habitat selection across the range. In the northern portion of their range, northern spotted owls forage heavily in older forests or forests with similar complex structure that support northern flying squirrels (*Glaucomys sabrinus*) Carey *et al.* 1992, p. 233; Rosenberg and Anthony 1992, p. 165). In the southern portion of their range, where woodrats are a major component of their diet, northern spotted owls are more likely to use a variety of stands, including younger stands, brushy openings in older stands, and edges between forest types in response to higher prey density in some of these areas (Solis 1983, pp. 89–90; Sakai and Noon 1993, pp. 376–378; Sakai and Noon 1997, p. 347; Carey *et al.* 1999, p. 73; Franklin *et al.* 2000, p. 579). Both the amount and distribution of foraging habitat within the home range influence the survival and reproduction of northern spotted owls.

Dispersal Habitat and Habitat for Nonresident Owls

Successful dispersal of northern spotted owls is essential to maintaining genetic and demographic connections among populations across the range of the species. Habitats that support movements between larger habitat patches that provide nesting, roosting, and foraging habitats for northern spotted owls act to limit the adverse genetic effects of inbreeding and genetic drift and provide demographic support to declining populations (Thomas *et al.* 1990, pp. 271–272). Dispersing juvenile northern spotted owls experience high mortality rates (more than 70 percent in some studies (Miller 1989, pp. 32–41; Franklin *et al.* 1999, pp. 25, 28; 55 FR 26115; June 26, 1990)) from starvation, predation, and accidents (Miller 1989, pp. 41–44; Forsman *et al.* 2002, pp. 18–19). Juvenile dispersal is thus a highly vulnerable life stage for northern spotted owls, and enhancing the survivorship of juveniles during this period could play an important role in maintaining stable populations of northern spotted owls.

Successful juvenile dispersal may depend on locating unoccupied suitable habitat in close proximity to other occupied sites (LaHaye *et al.* 2001, pp. 697–698). Dispersing juveniles are likely attracted to conspecific calls, and may look for suitable sites preferentially in the vicinity of occupied territories. When all suitable territories are occupied, dispersers may temporarily pursue a nonresident (nonbreeding) strategy; such individuals are sometimes referred to as ''floaters'' (Forsman *et al.* 2002, pp. 15, 26). Floaters prospect for territorial vacancies created when residents die or leave their territories. Floaters contribute to stable or increasing populations of northern spotted owls by quickly filling territorial vacancies. Where large blocks of habitat with multiple breeding pairs occur, the opportunities for successful recruitment of dispersers and floaters are enhanced due to the within-block production of potential replacement birds (Thomas *et al.* 1990, pp. 295, 307).

Juvenile dispersal occurs in steps (Forsman *et al.* 2002, pp. 13–14), between which dispersing juveniles settle into temporary home ranges for up to several months (Forsman *et al.* 2002, p. 13). Natal dispersal distances, measured from natal areas to eventual home range, tend to be larger for females (about 15 mi (24 km)) than males (about

8.5 mi (13.7 km)) (Courtney *et al.* 2004, p. 8–5). Forsman *et al.* (2002, pp. 15–16) reported dispersal distances of 1,475 spotted owls in Oregon and Washington for the period from 1985 to 1996. Median maximum dispersal distance (the straight-line distance between the natal site and the farthest location) for radio-marked juvenile male spotted owls was 12.7 mi (20.3 km), and that of female spotted owls was 17.2 mi (27.5 km) (Forsman *et al.* 2002, Table 2).

Spotted owls can utilize forests with the characteristics of nesting, roosting, or foraging for dispersal, and likely experience greater survivorship under such conditions. However, dispersing or nonresident individuals may also make use of other forested areas that do not meet the requirements of nesting or roosting habitat on a short-term basis. Such short-term dispersal habitats must, at minimum, consist of stands with adequate tree size and canopy closure to provide protection from avian predators and at least minimal foraging opportunities.

Population Status and Trends

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 (Anderson and Burnham 1992, entire; Burnham *et al.* 1994, entire; Franklin *et al.* 1999, entire; Anthony *et al.* 2006, entire; Forsman *et al.* 2011, entire). The most current evaluation of population status and trends is based on data through 2008 (Forsman *et al.* 2011, p. 1). 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, p. 64, Table 22).

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, pp. 47–49). 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, p 64). 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, p. 67).

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, p. 64, Table 22). 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, p. 64 Table 22).

As noted above, 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, p. 761). The presence of barred owls has significant negative effects on northern spotted owl reproduction (Olson *et al.* 2004, p. 1048), survival (Anthony et al 2006, p. 32), and number of territories occupied (Kelly *et al.* 2003, p. 51; Olson *et al.* 2005, p. 928). 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, pp. 919–929; Crozier *et al.* 2006, pp. 766–767). 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, p. B–12).

British Columbia has a small population of northern spotted owls. This population has declined at least 49 percent since 1992 (Courtney *et al.* 2004, p. 8–14), and by as much as 90 percent since European settlement (Chutter *et al.* 2004, p. 6) to a 2004 breeding population estimated at about 23 birds (Sierra Legal Defence [sic] Fund and Western Canada Wilderness Committee 2005, p. 16) on 15 sites (Chutter *et al.* 2004, p. 26). Chutter *et al.* (2004, p. 30) 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, p. 6). The amount of previous interaction between northern spotted owls in Canada and the United States is unknown (Chutter *et al.* 2004, p. 24). Although the status of the spotted owl in Canada is informative in terms of the overall declining trend of the northern spotted owl throughout its range, and consequently the increased need for conservation in those areas where it persists, the Service does not designate critical habitat in foreign countries (50 CFR 424.12(h)).

Life History

Northern spotted owls are a long-lived species with relatively stable and high rates of adult survival, lower rates of juvenile survival, and highly variable reproduction. Franklin *et al.* (2000, p. 576) suggested that northern spotted owls follow a ''bet-hedging'' life-history strategy, where natural selection favors individuals that reproduce only during favorable conditions. For such species, population growth rate is more susceptible to changes in adult survival than to recruitment of new individuals into the population. For northern spotted owls, recent demographic analyses have indicated declining trends in both adult survival and recruitment across much of the species range (Forsman *et al.* 2011, p. 64, Table 22).

Northern spotted owls are highly territorial (Courtney *et al.* 2004, p. 2–7), though overlap between the outer portions of the home ranges of adjacent pairs is common (Forsman *et al.* 1984, pp. 5, 17, 22–24; Solis and Gutiérrez 1990, p. 742; Forsman *et al.* 2005, p. 374). Pairs are nonmigratory and remain on their home range throughout the year, although they often increase the area used for foraging during fall and winter (Forsman *et al.* 1984, p. 21; Sisco 1990, p. 9), likely in response to potential depletion of prey in the core of their home range (Carey *et al.* 1992, p. 245; Carey 1995, p. 649; but see Rosenberg *et al.* 1994, entire). The northern spotted owl shows strong year-round fidelity to its territory, even when not nesting (Solis 1983, pp. 23–28; Forsman *et al.* 1984, pp. 52–53) or after natural disturbance alters habitat characteristics within the home range (Bond *et al.* 2002, pp. 1024–1026). A discussion of northern spotted owl

home range size and use is included in the Primary Constituent Elements section of this proposed rule.

Reproductive success of northern spotted owls has been characterized as a multi-stage process in which natal dispersal and survival to reproductive age are the most vulnerable stages (Carey and Peeler 1995, p. 236). Nomadic adults and juveniles dispersing from their natal area serve as sources of replacements for resident northern spotted owls that die or leave their home range (Thomas *et al.* 1990, p. 295). Habitat supporting movements of northern spotted owls between large habitat blocks is essential for successful dispersal of both juvenile and adult owls (Thomas *et al.* 1990, p. 271). The ability of individuals to move among more isolated populations reduces potentially adverse genetic effects of inbreeding and provides demographic support to declining populations (Thomas *et al.* 1990, pp. 271–272). A discussion of northern spotted owl dispersal is included in the Physical and Biological Features and Primary Constituent Elements sections of this proposed rule.

Prey

Northern spotted owl diets vary across owl territories, years, seasons, and geographical regions (Forsman *et al.* 2001, pp.146–148; 2004, pp. 217–220). However, four to six species of nocturnal mammals typically dominate their diets (Forsman *et al.* 2004, p. 218), with northern flying squirrels being a primary prey species in all areas. In Washington, diets are dominated by northern flying squirrels, snowshoe hare (*Lepus americanus*), bushy-tailed woodrats (*Neotoma cinerea*), and boreal red-backed voles (*Clethrionomys gapperi*) (Forsman *et al.* 2001, p. 144). In Oregon and northern California, northern flying squirrels in combination with dusky-footed woodrats, bushy-tailed woodrats, red tree voles (*Arborimus longicaudus*), and deer mice (*Peromyscus maniculatus*) comprise the majority of diets (Courtney *et al.* 2004, pp. 41–31 to 4–32; Forsman *et al.* 2004, p. 221). Northern spotted owls are also known to prey on insects, other terrestrial mammals, birds, and juveniles of larger mammals (e.g., mountain beaver (*Aplodontia rufa*) (Forsman *et al.* 2001, p. 146; 2004, p. 223).

Northern flying squirrels are positively associated with late-successional forests with high densities of large trees and snags (Holloway and Smith 2011, p. 671). Northern flying squirrels typically use cavities in large snags as den and natal sites, but may also use cavities in live trees, hollow branches of fallen trees, crevices in large stumps, stick nests of other species, and lichen and twig nests they construct (Carey 1995, p. 658). Fungi (mychorrhizal and epigeous types) are prominent in their diet; however, seeds, fruits, nuts, vegetation matter, insects, and lichens may also represent a significant proportion of their diet (summarized in Courtney *et al.* 2004, App. 4 p. 3–12). Northern flying squirrel densities tend to be higher in older forest stands with ericaceous shrubs (e.g., Pacific rhododendron (*Rhododendron macrophyllum*)) and an abundance of large snags (Carey 1995, p. 654), likely because these older forests produce a higher forage biomass. Flying squirrel density tends to increase with stand age (Carey 1995, pp. 653–654; Carey 2000, p. 252), although managed and second-growth stands sometimes also show high densities of squirrels, especially when canopy cover is high (e.g., Rosenberg and Anthony 1992, p. 163; Lehmkuhl *et al.* 2006, pp. 589–591). The main factors that may limit northern flying squirrel densities are the availability of den structures and food, especially hypogeous (below ground) fungi or truffles (Gomez *et al.* 2005, pp. 1677–1678).

For northern spotted owls in Oregon, both dusky-footed and bushy-tailed woodrats are important prey items (Forsman *et al.* 2004, pp. 226–227), whereas in Washington owls rely primarily on the bushy-tailed woodrat (Forsman *et al.* 2001, p. 144). Habitats that support bushy-tailed woodrats usually include early seral mixed-conifer/mixed-evergreen forests close to water (Carey *et al.* 1999, p. 77). Bushy-tailed woodrats reach high densities in both old forests with openings and closed-canopy young forests (Sakai and Noon 1993, pp. 376–378; Carey *et al.* 1999, p. 73), and use hardwood stands in mixed-evergreen forests (Carey *et al.* 1999, p. 73). Bushy-tailed woodrats are important prey species south of the Columbia River and may be more limited by abiotic features, such as the availability of suitable rocky areas for den sites (Smith 1997, p. 4) or the presence of streams (Carey *et al.* 1992, p. 234; 1999, p. 72). Dense woodrat populations in shrubby areas are likely a source of colonists to surrounding forested areas (Sakai and Noon 1997, p. 347), therefore forested areas with nearby open, shrubby vegetation generally support high numbers of woodrats. The main factors that may limit woodrats are access to stable, brushy environments that provide food, cover from predation, materials for nest construction, dispersal ability, and appropriate climatic conditions (Carey *et al.* 1999, p. 78).

Home Range and Habitat Use

Territorial northern spotted owls remain resident on their home range throughout the year; therefore, these homes ranges must provide all the habitat components needed for the survival and successful reproduction of a pair of owls. Northern spotted owls exhibit central-place foraging behavior (Rosenberg and McKelvey 1999, p. 1036), with much activity centered within a core area surrounding the nest tree during the breeding season. During fall and winter as well as in nonbreeding years, owls often roost and forage in areas of their home range more distant from the core. In nearly all studies of northern spotted owl habitat use, the amount of mature and old-growth forest was greater in core areas and home ranges than at random sites on the landscape (Courtney *et al.* 2004, pp. 5–6, 5–13; also see USFWS 2011, Appendix G for definitions of mature and old-growth forest), and forests were less fragmented within spotted owl home ranges (Hunter *et al.* 1995, p. 688). The amount of habitat at the core area scale shows the strongest relationships with home range occupancy (Meyer *et al.* 1998, p. 34; Zabel *et al.* 2003, p. 1036), survival (Franklin *et al.* 2000, p. 567; Dugger *et al.* 2005, p. 873), and reproductive success (Ripple *et al.* 1997, pp. 155–156; Dugger *et al.* 2005, p. 871). A more complete description of the home range is presented in the Physical or Biological Features section of this document, under ''Population Spatial Requirements.''

The size, configuration, and characteristics of vegetation patches within home ranges affect northern spotted owl survival and reproduction, a concept referred to as habitat fitness potential (Franklin *et al.* 2000, p. 542). Among studies that have estimated habitat fitness potential, the effects of forest fragmentation and heterogeneity vary geographically. In the California Klamath Province, locations for nesting and roosting tend to be centered in larger patches of old forest, but edges between forest types may provide increased prey abundance and availability (Franklin *et al.* 2000, p. 579). In the central Oregon Coast Range, northern spotted owls appear to benefit from a mixture of older forests with younger forest and nonforested areas in their home range (Olson *et al.* 2004, pp. 1049–1050), a pattern similar to that found in the California Klamath Province. Courtney *et al.* (2004, p. 5–23) suggest that although in general large

patches of older forest appear to be necessary to maintain stable populations of northern spotted owls, home ranges composed predominantly of old forest may not be optimal for northern spotted owls in the California Klamath Province and Oregon Coast Ranges Province.

The northern spotted owl inhabits most of the major types of coniferous forests across its geographical range, including Sitka spruce (*Picea sitchensis*), western hemlock (*Tsuga heterophylla*), mixed conifer and mixed evergreen, grand fir (*Abies grandis*), Pacific silver fir (*A. amabilis*), Douglas-fir (*Pseudotsuga menziesii*), redwood (*Sequoia sempervirens*)/Douglas-fir (in coastal California and southwestern Oregon), white fir (*A. concolor*), Shasta red fir (*A.magnifica* var. *shastensis*), and the moist end of the ponderosa pine (*Pinus ponderosa*) zone (Forsman *et al.* 1984, pp. 15–16; Thomas *et al.* 1990, p. 145). Habitat for northern spotted owls has traditionally been described as consisting of four functional types: Nesting, roosting, foraging, and dispersal habitats. Recent studies continue to support the practical value of discussing northern spotted owl habitat usage by classifying it into these functional habitat types (Irwin *et al.* 2000, p. 183; Zabel *et al.* 2003, p. 1028; Buchanan 2004, p. 1334; Davis and Lint 2005, p. 21; Forsman *et al.* 2005, p. 372), and data from studies are available to describe areas used for these types of activities, so we retain it here to structure our discussion of the physical or biological features of habitat essential to the conservation of the northern spotted owl.

Recent habitat modeling efforts have also accounted for differences in habitat associations across regions, which have often been attributed to regional differences in forest environments and factors including available prey species (USFWS 2011, p. C–7). These recent advances allowed for modeling of northern spotted owl habitat by regions to account for: (1) The degree of similarity between nesting/roosting and foraging habitats based on prey availability; (2) latitudinal patterns of topology and climate; (3) regional patterns of topography, climate, and forest communities; and (4) geographical distribution of habitat elements that influence the range of conditions occupied by northern spotted owls (USFWS 2011, p. C–8). Detailed characterizations of each of these functional habitat types and their relative distribution are described in the Physical or Biological Features and Primary Constituent Elements section of this document.

Climate Change

There is growing evidence that recent climate change has impacted a wide range of ecological systems (Stenseth *et al.* 2002, entire; Walther *et al.* 2002, entire; Adahl *et al.* 2006, entire; Karl *et al.* 2009, entire). Climate change, combined with effects from past management practices, is exacerbating changes in forest ecosystem processes and dynamics to a greater degree than originally anticipated under the NWFP. Environmental variation affects all wildlife populations; however, climate change presents new challenges as systems may change beyond historical ranges of variability. In some areas, changes in weather and climate may result in major shifts in vegetation communities that can persist in particular regions.

Climate change will present unique challenges to the future of northern spotted owl populations and their habitats. Northern spotted owl distributions (Carroll 2010, entire) and population dynamics (Franklin *et al.* 2000, entire; Glenn *et al.* 2010, entire; 2011a, entire; 2011b, entire) may be directly influenced by changes in temperature and precipitation. In addition, changes in forest composition and structure as well as prey species distributions and abundance resulting from climate change may impact availability of habitat across the historical range of the subspecies. The Revised Recovery Plan provides a detailed discussion of the possible environmental impacts to the habitat of the northern spotted owl from the projected effects of climate change (USFWS 2011, pp. III–5 to III–11).

Because both spotted owl population dynamics and forest conditions are likely to be influenced by large-scale changes in climate in the future, we have attempted to account for these influences in our designation of critical habitat by recognizing that forest composition may change beyond the range of historical variation and that climate changes may have unpredictable consequences for both Pacific Northwest forests and northern spotted owls. This proposed critical habitat designation recognizes that forest management practices that promote ecosystem health under changing climate conditions will be essential for spotted owl conservation.

Previous Federal Actions

The northern spotted owl was listed as a threatened species on June 26, 1990 (55 FR 26114); a description of the relevant previous Federal actions up to the time of listing can be found in that final rule. On January 15, 1992, we published a final rule designating 6,887,000 acres (ac) (2,787,000 hectares (ha)) of Federal lands in Washington, Oregon, and California as critical habitat for the northern spotted owl (57 FR 1796). On January 13, 2003, we entered into a settlement agreement with the American Forest Resources Council, Western Council of Industrial Workers, Swanson Group Inc., and Rough & Ready Lumber Company, to conduct a 5-year status review of the northern spotted owl and consider potential revisions to its critical habitat (*Western Council of Industrial Workers (WCIW)* v. *Secretary of the Interior, Civ. No. 02–6100–AA (D. Or.)*). On April 21, 2003, we published a notice initiating the 5-year review of the northern spotted owl (68 FR 19569), and published a second information request for the 5-year review on July 25, 2003 (68 FR 44093). We completed the 5-year review on November 15, 2004, concluding that the northern spotted owl should remain listed as a threatened species under the Act (USFWS 2004, entire). On November 24, 2010, we published a notice initiating a new 5-year review for the northern spotted owl (75 FR 71726); the information solicitation period for this review was reopened from April 20, 2011 through May 20, 2011 (76 FR 22139), and the completed review was signed on September 29, 2011, concluding that the northern spotted owl was appropriately listed as a threatened species.

In compliance with the settlement agreement, as amended in the WCIW case, we published a proposed revised critical habitat rule in the **Federal Register** on June 12, 2007 (72 FR 32450). On May 21, 2008, we published a notice announcing the availability of a draft economic analysis and the reopening of the public comment period on the proposed revised critical habitat designation (73 FR 29471). This notice also alerted the public of the opportunity to comment on the proposed revision of critical habitat in the context of the recently released Recovery Plan for the Northern Spotted Owl, which was released on May 16, 2008, and announced in the **Federal Register** on May 21, 2008 (73 FR 29471). The 2008 recovery plan formed the basis for the current designation of northern spotted owl critical habitat, which we published in the **Federal Register** on August 13, 2008 (73 FR 47325).

Both the 2008 critical habitat designation and the 2008 recovery plan were challenged in court (*Carpenters' Industrial Council* v. *Salazar,* Case No. 1:08–cv–01409–EGS (D.DC)). In addition, on December 15, 2008, the

Inspector General of the Department of the Interior issued a report entitled ''Investigative Report of The Endangered Species Act and the Conflict between Science and Policy,'' which concluded that the integrity of the agency decision-making process for the spotted owl recovery plan was potentially jeopardized by improper political influence. As a result, the Federal Government filed a motion in the lawsuit for remand of the 2008 recovery plan and the critical habitat designation that was based on it. On September 1, 2010, the Court issued an opinion remanding the 2008 recovery plan to us for issuance of a revised plan within 9 months. On September 15, 2010, we published a **Federal Register** notice (75 FR 56131) announcing the availability of the Draft Revised Recovery Plan for the Northern Spotted Owl, and opened a 60-day comment period through November 15, 2010. On November 12, 2010, we announced by way of press release an extension of the comment period until December 15, 2010.

On November 30, 2010, we announced in the **Federal Register** the reopening of the public comment period until December 15, 2010 (75 FR 74073). At that time we also announced the availability of a synopsis of the population response modeling results for public review and comment. The supporting information regarding the modeling process was posted on our Web site. Of the approximately 11,700 comments received on the Draft Revised Recovery Plan, many requested the opportunity to review and comment on more detailed information on the habitat modeling process in Appendix C. On April 22, 2011, we reopened the comment period on Appendix C of the draft revised recovery plan (76 FR 22720); this comment period closed on May 23, 2011. On May 6, 2011, the Court granted our request for an extension of the due date for issuance of the final revised recovery plan until July 1, 2011. We published the notice of availability of the final Revised Recovery Plan for the Northern Spotted Owl in the **Federal Register** on July 1, 2011 (76 FR 38575).

On October 12, 2010, the Court remanded the 2008 critical habitat designation, which had been based on the 2008 Recovery Plan for the Northern Spotted Owl, and adopted the Service's proposed schedule to issue a new proposed revised critical habitat rule for public comment by November 15, 2011, and a final rule by November 15, 2012. The Court has subsequently extended the date for delivery of the proposed rule to the **Federal Register** to February 28, 2012; the due date of November 15, 2012, for issuance of the final revised rule remains unchanged. This proposed revision of critical habitat for the northern spotted owl is in response to the Court's order.

Critical Habitat

Background

Critical habitat is defined in section 3 of the Act as:

(1) The specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the Act, on which are found those physical or biological features;

(a) Essential to the conservation of the species; and

(b) Which may require special management considerations or protection; and

(2) Specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Conservation, as defined under section 3 of the Act, means to use and the use of all methods and procedures that are necessary to bring an endangered or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking.

Critical habitat receives protection under section 7 of the Act through the requirement that Federal agencies ensure, in consultation with the Service, that any action they authorize, fund, or carry out is not likely to result in the destruction or adverse modification of critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Such designation does not allow the government or public to access private lands. Such designation does not require implementation of restoration, recovery, or enhancement measures by non-Federal landowners. Where a landowner requests Federal agency funding or authorization for an action that may affect a listed species or critical habitat, the consultation requirements of section 7(a)(2) of the Act would apply, but even in the event of a destruction or adverse modification finding, the obligation of the Federal action agency and the landowner is not to restore or recover the species, but to implement reasonable and prudent alternatives to avoid destruction or adverse modification of critical habitat.

Under the first prong of the Act's definition of critical habitat, areas within the geographical area occupied by the species at the time it was listed are included in a critical habitat designation if they contain physical or biological features: (1) Which are essential to the conservation of the species, and (2) which may require special management considerations or protection. For these areas, critical habitat designations identify, to the extent known using the best scientific and commercial data available, those physical or biological features that are essential to the conservation of the species (such as space, food, cover, and protected habitat). In identifying those physical and biological features within an area, we focus on the principal biological or physical constituent elements (primary constituent elements such as roost sites, nesting grounds, rainfall, canopy cover, soil type) that are essential to the conservation of the species.

Under the second prong of the Act's definition of critical habitat, we can designate critical habitat in areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. For example, an area that was not occupied at the time of listing but is essential to the conservation of the species may be included in the critical habitat designation. We designate critical habitat in areas outside the geographical area occupied by a species only when a designation limited to its range would be inadequate to ensure the conservation of the species (50 CFR 424.12(e)).

Section 4 of the Act requires that we designate critical habitat on the basis of the best scientific and commercial data available. Further, our Policy on Information Standards Under the Endangered Species Act (published in the **Federal Register** on July 1, 1994 (59 FR 34271)), the Information Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106–554; H.R. 5658)), and our associated Information Quality Guidelines, provide criteria, establish procedures, and provide guidance to ensure that our decisions are based on the best scientific data

available. They require our biologists, to the extent consistent with the Act and with the use of the best scientific data available, to use primary and original sources of information as the basis for recommendations to designate critical habitat.

When we are determining which areas should be designated as critical habitat, our primary source of information is generally the information developed during the listing process for the species. Additional information sources may include the recovery plan for the species, articles in peer-reviewed journals, conservation plans developed by States and counties, scientific status surveys and studies, biological assessments, other unpublished materials, or experts' opinions or personal knowledge.

Habitat is dynamic, and northern spotted owls may move from one area to another over time. We recognize that critical habitat designated at a particular point in time may not include all of the habitat areas that we may later determine are necessary for the recovery of the species. For these reasons, a critical habitat designation does not signal that habitat outside the designated area is unimportant or may not be needed for recovery of the species. Areas that are important to the conservation of the species, both inside and outside the critical habitat designation, will continue to be subject to: (1) Conservation actions implemented under section 7(a)(1) of the Act, (2) regulatory protections afforded by the requirement in section 7(a)(2) of the Act for Federal agencies to insure their actions are not likely to jeopardize the continued existence of any endangered or threatened species, and (3) the prohibitions of section 9 of the Act. Federally funded or permitted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. These protections and conservation tools will continue to contribute to recovery of this species. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans (HCPs), or other species conservation planning efforts if new information available at the time of these planning efforts calls for a different outcome.

Physical or Biological Features

In accordance with section 3(5)(A)(i) and 4(b)(1)(A) of the Act and regulations at 50 CFR 424.12, in determining which areas within the geographical area occupied by the species at the time of listing to designate as critical habitat, we consider the physical or biological features essential to the conservation of the species and which may require special management considerations or protection. These include, but are not limited to:

(1) Space for individual and population growth and for normal behavior;

(2) Food, water, air, light, minerals, or other nutritional or physiological requirements;

(3) Cover or shelter;

(4) Sites for breeding, reproduction, or rearing (or development) of offspring; and

(5) Habitats that are protected from disturbance or are representative of the historical, geographical, and ecological distributions of a species.

For the northern spotted owl, the physical or biological features essential to the owl are forested areas that are used or likely to be used by northern spotted owl for nesting, roosting, foraging, or dispersing. The specific characteristics or components that comprise these features include, for example, specific ranges of forest stand density and tree size distribution; coarse woody debris; and specific resources, such as food (prey and suitable prey habitat), nest sites, cover, and other physiological requirements required by northern spotted owls and considered essential for the conservation of the species. We consider these specific primary constituent elements (PCEs) later; here we describe the life-history needs of the owl and the physical and biological features essential to the conservation of the northern spotted owl, which informed our identification of the PCEs. The following information is based on studies of the habitat, ecology, and life history of the species as described in the final listing rule published in the **Federal Register** on June 26, 1990 (55 FR 26114), the Revised Recovery Plan for the Northern Spotted Owl released on June 30, 2011, the Background section of this proposal, and the following information.

Although the northern spotted owl is typically considered a habitat and prey specialist, it uses a relatively broad array of forest types for nesting, roosting, foraging, and dispersal. The diversity of forest types used is a reflection of the large geographical range of this subspecies and strong gradation in annual precipitation and temperature associated with both coastal mountain ranges and the Cascade Range. While the northern spotted owl is unquestionably associated with old-growth forests, habitat selection and population performance involves many additional features (Loehle *et al.* 2011, p. 20). This description of physical and biological features summarizes both variation in habitat use and particular features or portions of the overall gradient of variation that spotted owls preferentially select, and that we, therefore, consider essential to their conservation. We begin by considering the broad-scale patterns of climate, elevation, topography, and forest community type that act to influence spotted owl distributions and space for population growth and dispersal, and then discuss the abundance and pattern of habitats used for nesting, roosting, and foraging at the landscape scale that influence the availability and occupancy of breeding sites and the survival and fecundity of spotted owls. Thus, we begin by considering factors that operate at broader spatial scales and proceed to factors that influence habitat quality at the stand scale. When we discuss the physical or biological features, we focus on features that are common rangewide, but also summarize specific features or patterns of habitat selection that characterize particular regions.

Physical Influences Related to Features Essential to the Northern Spotted Owl

Climate, elevation, and topography are features of the physical environment that influence the capacity of a landscape to support habitat with high value for spotted owls and the type of habitat needed by the species. The distribution and amount of habitat on the landscape reflects interactions among these physical elements. Several studies have found that physical aspects of the environment such as topographic position, aspect, and elevation influence spotted owl habitat selection (e.g., Clark 2007, pp. 97–111; Stalberg *et al.* 2009, p. 80). They also are a factor in determining the type of habitats essential to spotted owl conservation.

Climate

Population processes for spotted owls are affected by both large-scale fluctuations in climate conditions and by local weather variation (Glenn 2009, pp. 246–248). The influence of weather and climate on spotted owl populations has been documented in northern California (Franklin *et al.* 2000, pp. 559–583), Oregon (Olson *et al.* 2004, pp. 1047–1052; Dugger *et al.* 2005, pp. 871–877; Glenn *et al.* 2010, pp. 2546–2551), and Washington (Glenn *et al.* 2010, pp. 2546–2551). Climate and weather effects on spotted owls are mediated by vegetation conditions, and the combination of climate and vegetation

variables improves models designed to predict the distribution of spotted owls (e.g., Carroll 2010, pp. 1434–1437).

Climate niche models for the spotted owl identified winter precipitation as the most important climate variable influencing ability to predict the distribution of spotted owl habitat (Carroll 2010, p. 1434), a finding consistent with previous demographic studies that suggest negative effects of winter and spring precipitation on survival, recruitment, and dispersal (Franklin *et al.* 2000; pp. 559–583). Niche modeling suggested that precipitation variables, both in winter and in summer, were more influential than winter and summer temperatures (Carroll 2010, p. 1434–1436).

Wet, cold weather during the winter or nesting season, particularly the early nesting season, has been shown to negatively affect spotted owl reproduction (Olson *et al.* 2004, p.1039; Dugger *et al.* 2005, p.863; Glenn *et al.* 2011b, p. 1279), survival (Franklin *et al.* 2000, p. 539;, Olson *et al.* 2004, p. 1039; Glenn *et al.* 2011a, p. 159), and recruitment (Franklin *et al.* 2000 p. 559; Glenn *et al.* 2010, p. 2546). Cold, wet weather may reduce reproduction and/or survival during the breeding season due to declines or decreased activity in small mammal populations so that less food is available during reproduction when metabolic demands are high (Glenn *et al.* 2011b, pp. 1290–1294). Wet, cold springs or intense storms during this time may increase the risk of starvation in adult birds (Franklin *et al.* 2000, pp. 559–590). Cold, wet weather may also reduce the male spotted owl's ability to bring food to incubating females or nestlings (Franklin *et al.* 2000, pp. 559–590). Cold, wet nesting seasons have been shown to increase the mortality of nestlings due to chilling (Franklin *et al.* 2000, pp. 559–590) and reduce the number of young fledged per pair per year (Franklin *et al.* 2000, p. 559, Olson *et al.* 2004, p. 1047; Glenn *et al.* 2011b, 1279). Wet, cold weather may decrease survival of dispersing juveniles during their first winter, thereby reducing recruitment (Franklin *et al.* 2000, pp.559–590).

Franklin *et al.* (2000, pp. 582–583) argued that spotted owl populations are regulated or limited by both habitat quality and environmental factors such as weather. Abundance and availability of prey may ultimately limit spotted owl populations, and prey are strongly associated with habitat conditions. As habitat quality decreases, other factors such as weather have a stronger influence on demographic performance. In essence, the presence of high-quality habitat appears to buffer the negative effects of cold, wet springs and winters on survival of spotted owls as well as ameliorate the effects of heat. High-quality spotted owl habitat was defined in a northern California study area as a mature or old growth core within a mosaic of old and younger forest (Franklin *et al.* 2000, p.559). The high-quality habitat can help maintain a stable prey base, thereby reducing the cost of foraging during the early breeding season when energetic needs are high (Carey *et al.* 1992, pp. 223–250; Franklin *et al.* 2000, p. 559). In addition, mature and old forest with high canopy closure typically remains cooler during summer months than younger stands.

Drought or hot temperatures during the previous summer have also been associated with reduced spotted owl recruitment and survival (Glenn *et al.* 2010, p. 2546). Drier, warmer summers and drought conditions during the growing season strongly influence primary production in forests, food availability, and the population sizes of small mammals (Glenn *et al.* 2010, p. 2546). Northern flying squirrels, for example, forage primarily on ectomycorrhizal fungi (truffles), many of which grow better under moist conditions (Lehmkuhl *et al.* 2004, pp. 58–60). Drier, warmer summers, or the high-intensity fires, which such conditions support, may change the range or availability of these fungi, affecting northern flying squirrels and the spotted owls that prey on them. Periods of drought are associated with declines in annual survival rates for other raptors due to a presumed decrease in prey availability (Glenn *et al.* 2010, pp. 2546–2551).

Mexican spotted owls (*S. o. lucida*) and California spotted owls (*S. o. occidentalis*) have a narrow temperature range where body temperature can be maintained without additional metabolic energy expenditure (Ganey *et al.* 1993, pp. 653–654; Weathers *et al.* 2001, pp. 682–686). Others (e.g., Franklin *et al.* 2000, entire) have assumed the northern spotted owl to be similar in this regard. While winter temperatures are relatively mild across much of the northern spotted owl's range, heat stress has been identified as a potential stressor at temperatures exceeding 30 °C (86 °F; Weathers *et al.* 2001, p. 678). The spotted owl's selection for areas with older-forest characteristics has been hypothesized to be related, in part, to its needing cooler areas in summer to avoid heat stress (Barrows and Barrows 1978, entire).

Elevation and Topography

Elevation and corresponding changes in temperature/moisture regimes constrain the development of vegetation communities selected by spotted owls, and may exceed the bounds of physiological tolerance of spotted owls or their prey. Several studies have noted the avoidance or absence of spotted owls above location-specific elevational limits (Blakesley *et al.* 1992, pp. 390–391; Hershey *et al.* 1998, p. 1406; LaHaye and Gutiérrez 1999, pp. 326, 328). In some locations, elevational limits occur despite the presence of forests that appear to have the structural characteristics typically associated with spotted owl habitat. Where forest structure is not the apparent cause of elevational limits, the mechanistic bases of these limits are unknown, but they could be related to prey availability, competitors, or extremes of temperature or precipitation. Habitat for spotted owls can occur from sea level to the lower elevation limit of subalpine vegetation types. This elevation varies with latitude from about 3,000 feet (ft) (900 meters (m)) above sea level in coastal Washington and Oregon (Davis and Lint 2005, p. 32) to about 6,000 ft (1,800 m) above sea level near the southern edge of the range (derived from Davis and Lint 2005, p. 32).

Topography also influences the distribution of spotted owl habitat and patterns of habitat selection. The effects of topography are strongest in drier forests where aspect and insolation (amount of solar radiation received in an area) contribute to moisture stress that can limit forest density and tree growth. In drier forests east of the Cascades and in the Klamath region, suitable habitat can be concentrated at intermediate topographic positions, on north-facing aspects, and in concave landforms that retain moisture. This leads to a distribution of suitable habitat characterized by ribbon-like bands and discrete patches. Ribbons occur along drainages and valley bottoms, along the north faces of ridges that trend from east to west, and at intermediate topographic positions between drier pine-dominated forests at lower elevations and subalpine forest types at higher elevations. Discrete patches occur on top of higher plateaus and in concave landforms. Spotted owl populations inhabiting drier forests have higher fecundity and lower survival rates than owls in other regions (Hicks *et al.* 2003, pp. 61–62; Anthony *et al.* 2006, pp. 28, 30;). The naturally fragmented distribution of suitable habitat in drier forests and increased predation risk associated with traversing this

landscape may be one of many features that contributed to the evolution of these life-history characteristics.

Slope may also influence the distribution of suitable habitat. Intermediate slopes have been associated with spotted owl sites in some studies (e.g., Gremel 2005, p. 37; Gaines *et al.* 2010, pp. 2048–2050; USFWS 2011, Appendix C), but the mechanisms underlying this association are unclear, potentially including a variety of features from soil depth to competition with barred owls.

Biological Influences Related to Features Essential to the Northern Spotted Owl

Forest Community Type (Composition)

Across their geographical range, spotted owl use of habitat spans several scales, with increasing levels of habitat selection specificity at each scale. We refer to these scales as the ''landscape,'' ''home range,'' and ''core area'' scales. Nest stands within core areas are even more narrowly selected (see Functional Categories of Spotted Owl Habitat, in the Background section, above).

Landscapes supporting populations of spotted owls are the broadest scale we will consider, encompassing areas sufficient to support numerous reproductive pairs (roughly 20,000 to 200,000 ac (8,100 to 81,000 ha). Within landscapes, the northern spotted owl inhabits most of the major types of coniferous forests across its geographical range, including Sitka spruce, western hemlock, mixed conifer and mixed evergreen, grand fir, Pacific silver fir, Douglas-fir, redwood/Douglas-fir (in coastal California and southwestern Oregon), white fir, Shasta red fir, and the moist end of the ponderosa pine zone (Forsman *et al.* 1984, pp. 8–9; Franklin and Dyrness 1988, numerous pages; Thomas *et al.* 1990, p. 145). These forest types may be in early-, mid-, or late-seral stages, and must occur in concert with at least one of the physical or biological features characteristic of breeding and nonbreeding (dispersal) habitat, described below.

Landscape-level patterns in tree species composition and topography can influence the distribution and density of spotted owls. These differences in spotted owl distribution occur even when different forest types have similar structural attributes, suggesting that spotted owls may prefer specific plant associations or tree species. Some forest types, such as pine-dominated and subalpine forests, are infrequently used, regardless of their structural attributes. In areas east of the Cascade Crest, spotted owls select forests with high proportions of Douglas-fir trees. The effects of tree species composition on habitat selection also extend to hardwoods within conifer-dominated forests (e.g., Meyer *et al.* 1998, p. 35). For example, our habitat association modeling indicated that habitat value in the central Western Cascades was negatively related to proportion of hardwoods present. At the home range and core area scales, locations occupied by spotted owls consistently have greater amounts of mature and old-growth forest compared to random locations or unused areas. The proportion of older forest within the home range varies greatly by geographical region, but typically falls between 30 and 78 percent (Courtney *et al.* 2004, p. 5–6). The only exception to this pattern occurred in drier forests of Washington, where development of a dense understory of shade-tolerant trees may have reduced suitability of older forests subjected to prolonged fire exclusion (Irwin *et al.* 2004, p. 20). In studies where circles of different sizes were compared, differences between spotted owl sites and random locations diminished as circles of increasing size were evaluated (Courtney *et al.* 2004, p. 5–7), suggesting habitat selection is stricter at the core area scale than at the home range and landscape scales.

Disturbance Regimes

Natural disturbances and anthropogenic (human-caused) activities continuously shape the amount and distribution of spotted owl habitat on the landscape. In moist forests west of the Cascades in Washington and Oregon, and in the Redwood region, anthropogenic activities have a dominant influence on distribution patterns of remaining habitat, with natural disturbances typically playing a secondary role. In contrast, drier forests east of the Cascades and in the Klamath region have dynamic disturbance regimes that continue to exert a strong influence on spotted owl habitat. Climate change may modify disturbance regimes across the range of the spotted owl, resulting in substantial changes to the frequency and extent of habitat disruption by natural events.

In drier forests, low- and mixed-severity fires historically contributed to a high level of spatial and temporal variability in landscape patterns of disturbed and recovering vegetation. However, anthropogenic activities have so altered these historic patterns of vegetation and fuels and associated disturbance regimes that contemporary landscapes no longer function as they did historically (Hessburg *et al.* 2000a, pp. 77–78; Hessburg and Agee 2003, pp. 44–51; Hessburg *et al.* 2005, pp. 122–127, 134–136; Skinner *et al.* 2006, pp. 176–179; Skinner and Taylor 2006, pp. 201–203).

Fire exclusion, combined with the removal of fire-tolerant structures (e.g., large, fire-tolerant tree species such as ponderosa pine, western larch (*Larix occidentalis*), and Douglas-fir), have reduced the resiliency of the landscape to fire and other disturbances, especially in those forest types outside of the wetter, higher severity fire regime types (Agee 1993, pp. 280–319; Hessburg *et al.* 2000a, pp. 71–80; Hessburg and Agee 2003, pp. 44–46). Understory vegetation in these forests has shifted in response to fire exclusion from grasses and shrubs to shade-tolerant conifers, reducing fire tolerance of these forests and increasing drought stress on dominant tree species.

Anthropogenic activities have also fundamentally changed the spatial distribution of fire intolerant-stands among the fire-tolerant stands, changing the pattern of fire activity across the landscape. Past management has homogenized the formerly patchy vegetative network and reduced the complexity that was more prevalent during the pre-settlement era (Skinner 1995, pp. 224–226; Hessburg and Agee 2003, pp. 44–45; Hessburg *et al.* 2007, p. 21; Kennedy and Wimberly 2009, pp. 564–565). Patches of fire-intolerant vegetation that had been spatially separated have become more contiguous and are more prone to conducting fire, insects, and diseases across larger swaths of the landscape (Hessburg *et al.* 2005, pp. 71–74, 77–78). This homogenized landscape may be altering the size and intensity of current disturbances and further altering landscape functionality (e.g., Everett *et al.* 2000, pp. 221–222). This alteration in the disturbance regime further affects forest structure and composition.

The intensity and spatial extent of natural disturbances that affect the amount, distribution, and quality of spotted owl habitat in dry forests are also influenced by local topographic features, elevation, and climate (Swanson *et al.* 1988, entire). At local scales these factors can be used to identify refugia that are insulated from existing disturbance and consequently tend to persist for longer periods (Camp *et al.* 1997, entire). These disturbance refugia are locations where spotted owl habitat has a higher likelihood of developing and persisting in drier forests. As a result of these disturbance regimes, especially in the drier forests within its range, habitat for the northern

spotted owl naturally occurs in a patchy mosaic in various stages of suitability in these regions. Sufficient area to provide for these habitat dynamics and to allow for the maintenance of adequate quantities of suitable habitat on the landscape at any one point in time is, therefore, essential to the conservation of the northern spotted owl in the dry forest regions.

Pattern and Distribution of Habitat

Historically, forest types occupied by the northern spotted owl were fairly continuous, particularly in the wetter parts of its range in coastal northern California and most of western Oregon and Washington. Suitable forest types in the drier parts of the range (interior northern California, interior southern Oregon, and east of the Cascade crest in Oregon and Washington) occur in a mosaic pattern interspersed with infrequently used vegetation types such as open forests, shrubby areas, and grasslands. As described above, natural disturbance processes in these drier regions likely contributed to a pattern in which patches of habitat in various stages of suitability shift positions on the landscape through time. In the Klamath Mountains Provinces of Oregon and California, and to a lesser extent in the Coast and Cascade Provinces of California, large areas of serpentine soils exist that are typically not capable of supporting northern spotted owl habitat (Davis and Lint 2005, pp. 31–33).

Population Spatial Requirements

We have described a range of climatic, elevational, topographic, and compositional factors, and associated disturbance dynamics typical of different regions, that constrain the amount and distribution of spotted owl habitat across landscapes. Within this context, areas that contain the physical and biological features described below must provide habitat in an amount and distribution sufficient to support persistent populations, including metapopulations of reproductive pairs, and opportunities for nonbreeding and dispersing owls to move among populations to be considered essential to the conservation of the northern spotted owl.

Spotted owls are territorial, defending areas that vary across nearly an order of magnitude, from about 1,400 to 14,000 ac (570 to 5,700 ha), depending on latitude and prey resources (see Home Range Requirements, below). Overlap occurs among adjoining territories, but the large size of territories nonetheless means that populations of spotted owls require landscapes with large areas of habitat suitable for nesting, roosting, and foraging. For example, in the northern parts of the subspecies' range where territories are largest, a population of 20 resident pairs would require at least 100,000 ac (about 40,500 ha) when habitat is relatively densely distributed and of high-quality.

As described in the Background section above, several studies have examined patterns of spotted owl habitat selection at the territory scale and the consequences of habitat configuration within a territory on fitness. We do not know if the features that contribute to enhancing spotted owl occupancy and reproductive success at the territory scale can be scaled up to predict what landscape-scale patterns of habitat are most conducive to stable or increasing spotted owl populations. Studies that use populations as units of analysis in order to investigate the effects of the landscape-scale configuration of habitat on the performance of spotted owl populations have only begun. Past models of spotted owl population dynamics have included predictions about the effects of habitat configuration on population performance, but these predictions have not been tested or validated by empirical studies (Franklin and Gutiérrez 2002; p. 215). Recent demographic analyses suggested that recruitment was positively related to the proportion of study areas covered by suitable habitat (see Forsman *et al.* 2011, pp. 59–62), but this covariate was not associated with other aspects of demographic performance, and few other covariates were investigated.

When the spotted owl was listed as threatened in 1990 (55 FR 26114), habitat loss and fragmentation of old-growth forest were identified as major factors contributing to declines in spotted owl populations. As older forests were reduced to smaller and more isolated patches, the ability of spotted owls to successfully disperse and establish territories was likely reduced (Lamberson *et al.* 1992, pp. 506, 508, 510–511). Lamberson *et al.* (1992, pp. 509–511) identified that there appeared to be a sharp threshold in the amount of habitat below which spotted owl population viability plummeted. Lamberson *et al.* (1994, pp. 185–186, 192–194) concluded that size, spacing and shape of reserved areas all had strong influence on population persistence, and reserves that could support a minimum of 20 spotted owl territories were more likely to maintain spotted owl populations than smaller reserves. They also found that juvenile dispersal was facilitated in areas large enough to support at least 20 spotted owl territories. In addition to size, spacing between reserves had a strong influence on successful dispersal (Lamberson *et al.* 1992, pp. 508, 510–511). Forsman *et al.* (2002, pp. 15–16) reported dispersal distances of 1,475 spotted owls in Oregon and Washington for 1985 to 1996. Median maximum dispersal distance (the straight-line distance between the natal site and the farthest location) for radio-marked juvenile male spotted owls was 12.7 miles (mi) (20.3 kilometers (km)), and that of female spotted owls was 17.2 mi. (27.5 km) (Forsman *et al.* 2002: Table 2). Dispersal data and other studies on the amount and configuration of habitat necessary to sustain spotted owls provided the foundation for developing previous spotted owl habitat reserve systems. Given the range-wide declining trends in northern spotted owl populations as well as declining trends in the recruitment of new individuals into territorial populations (Forsman *et al.* 2011, pp. 59–66, Table 22), we have determined that, to be essential, physical and biological features must be positioned on the landscape to enable populations to persist and individual owls to disperse among populations.

In contrast to earlier designations of critical habitat, we did not develop an *a priori* rule set to identify those areas that provide the physical or biological features essential to the conservation of the owl, using factors such as minimum size of habitat blocks, targeted numbers of owl pairs, or maximum distance between blocks of habitat. Instead, we determined the spatial extent and placement of the areas providing the physical or biological features that are essential to the conservation of the owl based on the relative demographic performance of various habitat models tested. This process is summarized in Criteria Used to Identify Critical Habitat, below, and is presented in detail in our supporting documentation (Dunk *et al.* 2012, entire).

Home Range Requirements

Northern spotted owls remain on their home range throughout the year; therefore, their home range must provide all the habitat components and prey needed for the survival and successful reproduction of a territorial pair. The home range of a northern spotted owl is relatively large, but varies in size across the range of the subspecies (Courtney *et al.* 2004, p. 5–24; 55 FR 26117, June 26, 1991). Home range sizes are largest in Washington (Olympic Peninsula: 14,271 ac (5775 ha) (USDI 1992, p. 23; USFWS 1994 in litt., p. 1) and generally decrease along a north-south gradient to approximately 1,430 ac (580 ha) in the Klamath region

of northwestern California and southern Oregon (Zabel *et al.* 1995, p. 436). Northern spotted owl home ranges are generally larger where northern flying squirrels are the predominant prey and smaller where woodrats are the predominant prey (Zabel *et al.* 1995, p. 436). Home range size also increases with increasing forest fragmentation (Carey *et al.* 1992, p. 235; Franklin and Gutiérrez 2002, p. 212; Glenn *et al.* 2004, p. 45) and decreasing proportions of nesting habitat on the landscape (Carey *et al.* 1992, p. 235; Forsman *et al.* 2005, p. 374), suggesting that northern spotted owls increase the size of their home ranges to encompass adequate amounts of suitable forest types (Forsman *et al.* 2005, p. 374).

Meta-analysis of features associated with occupancy at the territory-scale indicated that spotted owls consistently occupy areas having larger patches of older forests (which contained more interior forest) that were more numerous and closer together than random sites (Franklin and Gutiérrez 2002; p. 212). In the Klamath and Redwood regions owls also consistently occupy sites with higher forest heterogeneity than random sites. Occupied sites in the Klamath region, in particular, show a high degree of vegetative heterogeneity, with more variable patch sizes and more perimeter edge than in other regions (Franklin and Gutiérrez 2002; p. 212). In the Klamath region, ecotones, or edges between older forests and other seral stages, may contribute to improved access to prey (Franklin and Gutiérrez 2002, p. 215). Several studies in the Klamath region and the Redwood region have found that variables describing the relationship between habitat core area and edge length improve the ability of models to predict spotted owl occupancy (e.g., Folliard *et al.* 2000, pp. 79–81; Zabel *et al* 2003, pp. 1936–1038). In contrast, spotted owl sites in the Oregon Coast Range had a more even distribution of cover types than random locations, and nest stands had a higher ratio of core to edge and more complex stand shapes than non-nest stands (Courtney *et al.* 2004, p. 5–9).

A home range provides the habitat components essential for the survival and successful reproduction of a resident breeding pair of northern spotted owls. The exact amount, quality, and configuration of these habitat types required for survival and successful reproduction varies according to local conditions and factors such as the degree of habitat fragmentation, proportion of available nesting habitat, and primary prey species (Courtney *et al.* 2004, p. 5–2).

Core Area Requirements

Northern spotted owls often use habitat within their home ranges disproportionally, and exhibit central-place foraging behavior (Rosenberg and McKelvey 1999, p. 1028), with much activity centered within a core area surrounding the nest tree during the breeding season. During fall and winter, as well as in nonbreeding years, owls often roost and forage in areas of their home range more distant from the core. The size of core areas varies considerably across the subspecies' geographical range following a pattern similar to that of home range size (Bingham and Noon 1997, p. 133), varying from over 4,057 ac (1,642 ha) in the northernmost (flying squirrel prey) provinces (Forsman *et al.* 2005, pp. 370, 375) to less than 500 ac (202 ha) in the southernmost (dusky-footed woodrat prey) provinces (Pious 1995, pp. 9–10, Table 2; Zabel *et al.* 2003, pp. 1036–1038). Owls often switch nest trees and use multiple core areas over time, possibly in response to local prey depletion or loss of a particular nest tree.

Core areas contain greater proportions of mature/old forest than random or nonuse areas (Courtney *et al.* 2004, p. 5–13), and the amount of high-quality habitat at the core area scale shows the strongest relationships with occupancy (Meyer *et al.* 1998, p. 34; Zabel *et al.* 2003, pp. 1027, 1036), survival (Franklin *et al.* 2000, p. 567; Dugger *et al.* 2005, p. 873), and reproductive success (Ripple *et al.* 1997, pp. 155 to 156; Dugger *et al.* 2005, p. 871). In some areas, edges between forest types within northern spotted owl home ranges may provide increased prey abundance and availability (Franklin *et al.* 2000, p. 579). For successful reproduction, core areas need to contain one or more forest stands that have both the structural attributes and the location relative to other features in the home range that allow them to fulfill essential nesting, roosting, and foraging functions (Carey and Peeler 1995, pp. 233–236; Rosenberg and McKelvey 1999, pp. 1035–1037).

Areas To Support Dispersal and Nonbreeding Owls

Northern spotted owls regularly disperse through highly fragmented forested landscapes that are typical of the mountain ranges in western Washington and Oregon, and have dispersed from the Coastal Mountains to the Cascades Mountains in the broad forested regions between the Willamette, Umpqua, and Rogue Valleys of Oregon (Forsman *et al.* 2002, p. 22). Corridors of forest through fragmented landscapes serve primarily to support relatively rapid movement through such areas, rather than colonization or residency of nonbreeding owls.

During the transience (movement) phase, dispersers used mature and old-growth forest slightly more than its availability; during the colonization phase, mature and old-growth forest was used at nearly twice its availability (Miller *et al.* 1997, p. 144). Closed pole-sapling-sawtimber habitat was used roughly in proportion to availability in both phases and may represent the minimum condition for movement. Open sapling and clearcuts were used less than expected based on availability during colonization (Miller *et al.* 1997, p. 145). This indicates that transient dispersers can use a greater variety of forested habitats relative to those subadults or nonbreeding adults that are residents; the latter individuals will require habitats that are more similar to the nesting, roosting, and foraging habitats utilized by breeding pairs.

We currently do not have sufficient information to permit formal modeling of dispersal habitat and the influence of dispersal habitat condition on dispersal success (USFWS 2011, p. C–15). We expect that dispersal success is highest when dispersers move through forests that have the characteristics of nesting-roosting and foraging habitats. Spotted owls can also disperse successfully through forests with less complex structure, but risk of starvation and predation likely increase with increasing divergence from the characteristics of suitable (nesting, roosting, foraging) habitat.

Relatively little information is currently available about the features of habitats used by dispersing spotted owls, or the effectiveness of different approaches to managing dispersal habitat. The suitability of habitat to contribute to successful dispersal of spotted owls is likely related to the degree to which it ameliorates heat stress, provides abundant and accessible prey, limits predation risk, and resembles habitat in natal territories (Carey 1985, pp. 105–107; Buchanan 2004, pp. 1335–1341).

Dispersal habitat is habitat that owls use when dispersing. Although no formal studies have been completed to characterize dispersal habitat, a widely-accepted rule of thumb is that while dispersal habitat would optimally be the same as suitable nesting, roosting, or foraging habitat (mature and old-growth stands), if necessary owls can also make use of young stands of trees approximately 11 inches (in) (28 centimeters (cm)) diameter at breast

height (dbh) or greater with roughly a minimum 40 percent canopy closure. Dispersal habitat consists of forest types described above that provide one or both of the habitat components described below that are essential to the dispersal of juvenile and nonterritorial northern spotted owls. Dispersal habitat can occur between larger blocks of nesting, foraging, and roosting habitat or within blocks of nesting, roosting, and foraging habitat. Dispersal habitat is essential to maintaining stable populations by promoting rapid filling of territorial vacancies when resident northern spotted owls die or leave their territories, and to providing adequate gene flow across the range of the species.

Regional Variation in Habitat Use

Differences in patterns of habitat associations across the range of the spotted owl suggest four different broad zones of habitat use, which we characterize as the West Cascades/Coast Ranges of Oregon and Washington, East Cascades, Klamath and Northern California Interior Coast Ranges, and Redwood Coast (Figure 4). We configured these zones based on a qualitative assessment of similarity among ecological conditions and habitat associations within the 11 different regions analyzed, as these four zones efficiently capture the range in variation of some of the physical or biological features essential to the conservation of the northern spotted owl. We summarize the physical or biological features for each of these four zones, emphasizing zone-specific features that are distinctive within the context of general patterns that apply across the entire range of the northern spotted owl.

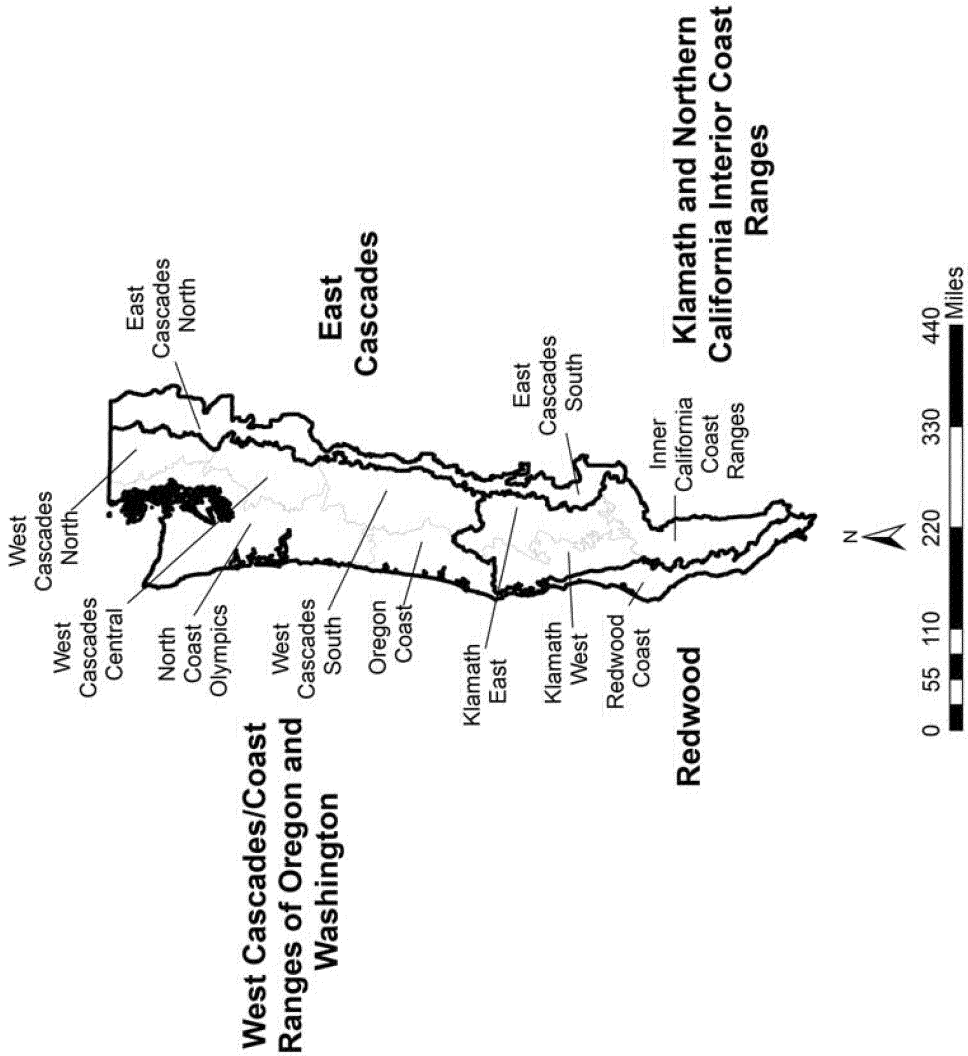

Figure 4. Eleven regions and four zones of habitat associations of northern spotted owls in Washington, Oregon, and California.

West Cascades/Coast Ranges of Oregon and Washington

This zone includes five regions west of the Cascade crest in Washington and Oregon (Western Cascades North, Central and South; North Coast Ranges and Olympic Peninsula; and Oregon Coast Ranges; USFWS 2011, p. C–13). Climate in this zone is characterized by high rainfall and cool to moderate temperatures. Variation in elevation between valley bottoms and ridges is

relatively low in the Coast Ranges, creating conditions favorable for development of contiguous forests. In contrast, the Olympic and Cascade ranges have greater topographic variation, with many high-elevation areas supporting permanent snowfields and glaciers. Douglas-fir and western hemlock dominate forests used by spotted owls. Root diseases and wind-throw are important natural disturbance mechanisms that form gaps in forested areas. Flying squirrels are the dominant prey, with voles and mice also representing important items in the spotted owl's diet.

Our habitat association modeling indicated that vegetation structure had a dominant influence on owl population performance, with habitat pattern and topography also contributing. High canopy cover, high density of large trees, high numbers of sub-canopy vegetation layers, and low to moderate slope positions were all important features.

Nesting habitat in this zone is mostly limited to areas with large trees with defects such as mistletoe brooms, cavities, or broken tops. The subset of foraging habitat that is not nesting/roosting habitat generally had slightly lower values than nesting habitat for canopy cover, tree size and density, and canopy layering. Prey species in this zone are associated with mature to late-successional forests, resulting in small differences between nesting, roosting, and foraging habitat.

East Cascades

This zone includes the Eastern Cascades North and Eastern Cascades South regions (USFWS 2011, p. C–13). This zone is characterized by a continental climate (cold, snowy winters and dry summers) and a high frequency of natural disturbances due to fires and outbreaks of forest insects and pathogens. Flying squirrels are the dominant prey species, but the diet of spotted owls also includes relatively large proportions of bushy-tailed woodrats, snowshoe hare, pika, and mice (Forsman *et al.* 2001, pp. 144–145).

Our modeling indicates that habitat associations in this zone do not show a pattern of dominant influence by one or a few variables (USFWS 2011, Appendix C). Instead, habitat association models for this zone included a large number of variables, each making a relatively modest contribution (20 percent or less) to the predictive ability of the model. The features that were most useful in predicting habitat quality were vegetation structure and composition, and topography, especially slope position in the north. Other efforts to model habitat associations in this zone have yielded similar results (e.g., Gaines *et al.* 2010, pp. 2048–2050; Loehle *et al.* 2011, pp. 25–28).

Relative to other portions of the subspecies' range, nesting and roosting habitat in this zone includes relatively younger and smaller trees, likely reflecting the common usage of dwarf mistletoe brooms (dense growths) as nesting platforms (especially in the north). Forest composition that includes high proportions of Douglas-fir is also associated with this nesting structure. Additional foraging habitat in this zone generally resembles nesting and roosting habitat, with reduced canopy cover and tree size, and reduced canopy layering. High prey diversity suggests relatively diverse foraging habitats are used. Topographic position was an important variable, particularly in the north, possibly reflecting competition from barred owls (Singleton *et al.* 2010, pp. 289, 292). Barred owls, which have been present for over 30 years in northern portions of this zone, preferentially occupy valley-bottom habitats, possibly compelling spotted owls to establish territories on less productive, mid-slope locations (Singleton *et al.* 2010, pp. 289, 292).

Klamath and Northern California Interior Coast Ranges

This zone includes the Klamath-Siskiyou West, Klamath-Siskiyou East, and Interior California Coast regions (USFWS 2011, p. C–13). This region in southwestern Oregon and northwestern California is characterized by very high climatic and vegetative diversity resulting from steep gradients of elevation, dissected topography, and large differences in moisture from west to east. Summer temperatures are high, and spotted owls occur at elevations up to 1,768 m (5,800 ft). Western portions of this zone support a diverse mix of mesic forest communities interspersed with drier forest types. Forests of mixed conifers and evergreen hardwoods are typical of the zone. Eastern portions of this zone have a Mediterranean climate with increased occurrence of ponderosa pine. Douglas-fir dwarf mistletoe (*Arceuthobium douglasii*) is rarely used for nesting platforms in the west, but commonly used in the east. The prey base for spotted owls in this zone is correspondingly diverse, but dominated by dusky-footed woodrats, bushy-tailed woodrats, and flying squirrels. Spotted owls have been well studied in the Klamath portion of this zone, but relatively little is known about spotted owl habitat use in the California Interior Coast Range portion of the zone. Our habitat association models for this zone suggest that vegetation structure and topographic features are nearly equally important in influencing owl population performance, particularly in the Klamath. High canopy cover, high levels of canopy layering, and the presence of very large dominant trees were all important features of nesting and roosting habitat. Compared to other zones, additional foraging habitat for this zone showed greater divergence from nesting habitat, with much lower canopy cover and tree size. Low to intermediate slope positions were strongly favored. In the eastern Klamath, presence of Douglas-fir was an important compositional variable in our habitat model (USFWS 2011, Appendix C).

Redwood Coast

This zone is confined to the northern California coast, and is represented by the Redwood Coast region (USFWS 2011, p. C–13). It is characterized by a maritime climate with moderate temperatures and generally mesic conditions. Near the coast, frequent fog delivers consistent moisture during the summer. Terrain is typically low-lying (0 to 900 m (0 to 3,000 ft)). Forest communities are dominated by redwood, Douglas-fir—tanoak (*Lithocarpus densiflorus*) forest, coast live oak (*Quercus agrifolia*), and tanoak series. Dusky footed woodrats are dominant prey items in this zone.

Habitat association models for this zone diverged strongly from models for other zones. Topographic variables (slope position and curvature) had a dominant influence with vegetation structure having a secondary role. Low position on slopes was strongly favored, along with concave landforms.

Several studies of spotted owl habitat relationships suggest that stump-sprouting and rapid growth of redwood trees, combined with high availability of woodrats in patchy, intensively managed forests, enables spotted owls to occupy a wide range of vegetation conditions within the redwood zone. Rapid growth rates enable young stands to develop structural characteristics typical of older stands in other regions. Relatively small patches of large remnant trees can also provide nesting habitat structure in this zone.

Physical or Biological Features and Primary Constituent Elements

Under the Act and its implementing regulations, we are required to identify the physical or biological features essential to the conservation of the spotted owl in areas occupied at the

time of listing, focusing on the features' primary constituent elements (PCEs). The physical or biological features essential to the conservation of the northern spotted owl are forested lands that are used or likely to be used for nesting, roosting, foraging, or dispersing. We have further determined that these physical or biological features may require special management considerations or protection, as described in the section Special Management Considerations or Protection, below. We consider the PCEs to be the specific elements that comprise the physical or biological features that are essential to the conservation of the species. For the northern spotted owl, the primary constituent elements are the specific characteristics that make areas suitable for nesting, roosting, foraging and dispersal habitat. To be essential to the conservation of the northern spotted owl, these features need to be distributed in a spatial configuration that is conducive to persistence of spotted owl populations, survival and reproductive success of resident pairs, and survival of dispersing individuals until they can recruit into a breeding population.

Physical or Biological Features by Life-History Function

Each of the essential features—in this case, forested lands that provide the functional categories of northern spotted owl habitat—comprises a complex interplay of structural elements, such as tree size and species, stand density, canopy diversity, and decadence. Spotted owls have been shown to exhibit strong associations with specific PCEs; however, the range of combinations of PCEs that may constitute habitat (particularly foraging habitat) is broad. In addition, the relative importance of specific habitat elements (and subsequently their relevance as PCEs) is strongly influenced by physical factors such as elevation and slope position, and the degree to which physical factors influence the role of individual PCEs varies geographically. In addition to forest type, the key elements of habitats with the physical or biological features essential for the conservation of the northern spotted owl may be organized as follows:

Nesting and Roosting Habitat

Nesting and roosting habitat provides structural features for nesting, protection from adverse weather conditions, and cover to reduce predation risks for adults and young. Because nesting habitat provides resources critical for nest site selection and breeding, its characteristics tend to be conservative; stand structures at nest sites tend to vary little across the spotted owl's range. Nesting stands typically include a moderate to high canopy closure (60 to over 80 percent); a multilayered, multispecies canopy with large (greater than 30 in (76 cm) dbh) overstory trees; a high incidence of large trees with various deformities (e.g., large cavities, broken tops, mistletoe infections, and other evidence of decadence); large snags; large accumulations of fallen trees and other woody debris on the ground; and sufficient open space below the canopy for northern spotted owls to fly (Thomas *et al.* 1990, p. 164; 57 FR 1798, January 15, 1992). These findings were recently reinforced in rangewide models developed by Davis and Dugger (2011, Table 3–1, p. 39), who found that stands used for nesting (moderate to high suitability) exhibited high canopy cover of conifers (65 to 89 percent), large trees (mean diameter from 20 to 36 in (51 to 91 cm)), with a forest density of 6 to 19 large trees (greater than 30 in dbh) per acre (15 to 47 large trees (greater than 76 cm dbh) per hectare), and high diameter diversity.

Recent studies have found that northern spotted owl nest stands tend to have greater tree basal area, number of canopy layers, density of broken-top trees, number or basal area of snags, and volume of logs (Courtney *et al.* 2004, pp. 5–16 to 5–19, 5–23) than non-nest stands. In some forest types, northern spotted owls nest in younger forest stands that contain structural characteristics of older forests (legacy features from previous stands before disturbance). In the portions of the spotted owl's range where Douglas-fir dwarf mistletoe occurs, infected trees provide an important source of nesting platforms (Buchanan *et al.* 1993, pp. 4–5). Nesting northern spotted owls consistently occupy stands having a high degree of canopy cover that may provide thermoregulatory benefits (Weathers *et al.* 2001, p. 686), allowing northern spotted owls a wider range of choices for locating thermally neutral roosts near the nest site. A high degree of canopy closure may also conceal northern spotted owls, reducing potential predation. Studies of roosting locations found that northern spotted owls tended to use stands with greater vertical canopy layering (Mills *et al.*1993, pp. 318–319), canopy closure (King 1993, p. 45), snag diameter (Mills *et al.* 1993, pp. 318–319), diameter of large trees (Herter *et al.* 2002, pp. 437, 441), and amounts of large woody debris (Chow 2001, p. 24; reviewed in Courtney *et al.* 2004, pp. 5–14 to 5–16, 5–23). Northern spotted owls use the same habitat for both nesting and roosting; the characteristics of roosting habitat differ from those of nesting habitat only in that roosting habitat need not contain the specific structural features used for nesting (Thomas *et al.*1990, p. 62). Aside from the presence of the nest structure, nesting and roosting habitat are generally inseparable.

Habitat modeling developed for the Revised Recovery Plan (USFWS 2011, Appendix C) and used as one means of helping us identify potential critical habitat for the northern spotted owl supports previous descriptions of nesting habitat (57 FR 1796, January 15, 1992; 73 FR 47326, August 13, 2008), and suggests a high degree of similarity among the 11 ecological regions across the range of the species. Across regions, moderate to high suitability nesting habitat was characterized as having high canopy cover (65 to over 80 percent) and high basal area (240 ft^2/ac; (55 m^2/ha), mean dbh of conifers at least 16.5 to 24 in (42 to 60 cm), and a significant component of larger trees (greater than 30 in (75 cm)).

Foraging Habitat

Habitats used for foraging by northern spotted owls vary widely across the spotted owl's range, in accordance with ecological conditions and disturbance regimes that influence vegetation structure and prey species distributions. In general, spotted owls select old forests for foraging in greater proportion than its availability at the landscape scale (Carey *et al.* 1992, pp. 236 to 237; Carey and Peeler 1995, p. 235; Forsman *et al.* 2005, pp. 372–373), but will forage in younger stands and brushy openings with high prey densities and access to prey (Carey *et al.* 1992, p. 247; Rosenberg and Anthony 1992, p. 165; Thome *et al.* 1999, pp. 56–57). Throughout much of the owl's range, the same habitat that provides for nesting and roosting also provides for foraging, although northern spotted owls have greater flexibility in utilizing a variety of habitats for foraging than they do for nesting and roosting. That is, habitats that meet the species' needs for nesting and roosting generally also provide for foraging (and dispersal) requirements of the owl. However, in some areas owls may use other types of habitats for foraging in addition to those used for nesting and roosting, thus habitat that supports foraging (or dispersal) does not always support the other PCEs and does not necessarily provide for nesting or roosting.

Variation in the potential use of various foraging habitats throughout the range of the northern spotted owl is described here.

West Cascades/Coast Ranges of Oregon and Washington

In the West Cascades/Coast Ranges of Oregon and Washington, high-quality foraging habitat is also nesting/roosting habitat. Foraging activity is positively associated with tree height diversity (North *et al.* 1999, p. 524), canopy closure (Irwin *et al.* 2000, p. 180; Courtney *et al.* 2004, p. 5–15), snag volume, density of snags greater than 20 in (50 cm) dbh (North *et al.* 1999, p. 524; Irwin *et al.* 2000, pp. 179–180; Courtney *et al.* 2004, p. 5–15), density of trees greater than or equal to 31 in (80 cm) dbh (North *et al.* 1999, p. 524) density of trees 20 to 31 in (51 to 80 cm) dbh (Irwin *et al.* 2000, pp. 179–180), and volume of woody debris (Irwin *et al.* 2000, pp. 179–180).

While the majority of studies reported strong associations with old-forest characteristics, younger forests with some structural characteristics (legacy features) of old forests (Carey *et al.* 1992, pp. 245 to 247; Irwin *et al.* 2000, pp. 178 to 179), hardwood forest patches and edges between old forest and hardwoods (Glenn *et al.* 2004, pp. 47–48) are also used by foraging spotted owls.

East Cascades

Foraging habitats used by spotted owls in the East Cascades of Oregon, Washington and California were similar to those used in the Western Cascades, but can also encompass forest stands that exhibit somewhat lower mean tree sizes (quadratic mean diameter 16–22 in (40–55 cm) (Irwin *et al.* 2012, p. 207). However, foraging activity was still positively associated with densities of large trees (greater than 26 in (66 cm)) and increasing basal area (Irwin *et al.* 2012, p. 206). Stands composed of Douglas-fir and white fir/Douglas-fir mix were preferred in some regions, whereas stands dominated by ponderosa pine were avoided (Irwin *et al.* 2012, p. 207).

Klamath and Northern California Interior Coast Ranges

Because diets of northern spotted owls in the Klamath and Northern California Interior Coast Ranges consist predominantly of both northern flying squirrels and dusky-footed woodrats, habitats used for foraging spotted owls are much more variable than in northern portions of the species' range. As in other regions, foraging spotted owls select stands with mature and old-forest characteristics such as increasing mean stand diameter and densities of trees greater than 26 in (66 cm) (Irwin *et al.* 2012, p. 206) and mean stand diameter greater than 21 in (52.5 cm) (Solis and Gutierrez 1990, p. 747), high canopy cover (87 percent at frequently used sites; Solis and Gutierrez 1990, p. 74, Table 3), and multiple canopy layers (Solis and Gutierrez 1990, p. 74; Anthony and Wagner 1999, pp. 14, 17). However, other habitat elements are disproportionately used, particularly forest patches within riparian zones of low-order streams (Solis and Gutierrez 1990, p. 747; Irwin *et al.* 2012, p. 208) and edges between conifer and hardwood forest stands (Zabel *et al* 1995, pp. 436–437; Ward *et al.* 1998, pp. 86, 88–89). Foraging use is positively influenced by conifer species, including incense-cedar (*Calocedrus decurrens*), sugar pine (*P. lambertiana*), Douglas-fir, and hardwoods such as bigleaf maple (*Acer macrophyllum*), California black oak (*Q. kelloggii*), live oaks, and Pacific madrone (*Arbutus menziesii*) as well as shrubs (Sisco 1990, p. 20; Irwin *et al.* 2012, pp. 206–207, 209–210), presumably because they produce mast important for prey species. Within a mosaic of mature and older forest habitat, brushy openings and dense young stands or low-density forest patches also receive some use (Sisco 1990, pp. 9, 12, 14, 16; Zabel *et al.* 1993, p. 19; Irwin *et al.* 2012, pp. 209–210).

Redwood Coast

The preponderance of information regarding habitats used for foraging by spotted owls in the Redwood Coast zone comes from intensively managed industrial forests. In these environments, which comprise the majority of the redwood region, interspersion of foraging habitat and prey-producing habitat appears to be an important element of habitat suitability. Foraging habitat is used by owls to access prey and is characterized by a wide range of tree sizes and ages. Foraging activity by owls is positively associated with density of small to medium sized trees (10 to 22 in (25 to 56 cm)) and trees greater than 26 in (66 cm) in diameter (Irwin *et al.* 2007b, p. 19) or greater than 41 years of age (MacDonald *et al.* 2006, p. 381). Foraging was also positively associated with hardwood species, particularly tanoak (MacDonald *et al.* 2006, pp. 380–382; Irwin *et al.* 2007a, pp. 1188–1189). Prey-producing habitats occur within early-seral habitats 6 to 20 years old (Hamm and Diller 2009, p. 100, Table 2), typically resulting from clearcuts or other intensive harvest methods. Habitat elements within these openings include dense shrub and hardwood cover, and woody debris.

Models developed for the Revised Recovery Plan (USFWS 2011, Appendix C) to assess habitat suitability for the northern spotted owl across the range of the species and applied here to help identify potential critical habitat were based on habitat conditions within 500-acre (200-ha) core areas. Because core areas support a mix of nesting, roosting, and foraging habitats, their characteristics provide a basis for identification and quantification of PCEs.

Nonbreeding and Dispersal Habitat

Although the term ''dispersal'' frequently refers to post fledgling movements of juveniles, for the purposes of this rule we are using the term to include all movement during both the transience and colonization phase, and to encompass important concepts of linkage and connectivity among owl subpopulations. Population growth can only occur if there is adequate habitat in an appropriate configuration to allow for the dispersal of owls across the landscape. Although habitat that allows for dispersal may currently be marginal or unsuitable for nesting, roosting, or foraging, it provides an important linkage function among blocks of nesting habitat both locally and over the owl's range that is essential to its conservation. However, as noted above, we expect dispersal success is highest when dispersers move through forests that have the characteristics of nesting-roosting and foraging habitats. Although spotted owls may be able to move through forests with less complex structure, survivorship is likely decreased. 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; there may be variations over the owl's range (e.g., drier site in the east Cascades or northern California). This may include younger and less diverse forest stands than foraging habitat, such as even-aged, pole-sized stands, but such stands should contain some roosting structures and foraging habitat to allow for temporary resting and feeding during the transience phase.

Habitat supporting nonbreeding spotted owls or the colonization phase of dispersal is generally equivalent to nesting, roosting, and foraging habitat and is described above, although it may be in smaller amounts than that needed to support nesting pairs.

Primary Constituent Elements for the Northern Spotted Owl

Based on our current knowledge of the life history, biology, and ecology of the northern spotted owl and the requirements of the habitat to sustain its essential life-history functions, as described above, we have determined that the PCEs for the northern spotted owl are:

(1) Forest types that may be in early-, mid-, or late-seral stages and that support the northern spotted owl across its geographical range; these forest types are primarily:

(a) Sitka spruce,

(b) Western hemlock,

(c) Mixed conifer and mixed evergreen,

(d) Grand fir,

(e) Pacific silver fir,

(f) Douglas-fir,

(g) White fir,

(h) Shasta red fir,

(i) Redwood/Douglas-fir (in coastal California and southwestern Oregon), and

(j) The moist end of the ponderosa pine coniferous forests zones at elevations up to approximately 3,000 ft (900 m) near the northern edge of the range and up to approximately 6,000 ft (1,800 m) at the southern edge.

(2) Habitat that provides for nesting and roosting. In many cases the same habitat also provides for foraging (PCE (3)). Nesting and roosting habitat provides structural features for nesting, protection from adverse weather conditions, and cover to reduce predation risks for adults and young. This PCE is found throughout the geographical range of the northern spotted owl, because stand structures at nest sites tend to vary little across the spotted owl's range. These habitats must provide:

(a) Sufficient foraging habitat to meet the home range needs of territorial pairs of northern spotted owls throughout the year.

(b) Stands for nesting and roosting that are generally characterized by:

(i) Moderate to high canopy closure (60 to over 80 percent),

(ii) Multilayered, multispecies canopies with large (20–30 in (51–76 cm) or greater dbh) overstory trees,

(iii) High basal area (greater than 240 ft^2/acre (55 m^2/ha)),

(iv) High diversity of different diameters of trees,

(v) High incidence of large live trees with various deformities (e.g., large cavities, broken tops, mistletoe infections, and other evidence of decadence),

(vi) Large snags and large accumulations of fallen trees and other woody debris on the ground, and

(vii) Sufficient open space below the canopy for northern spotted owls to fly.

(3) Habitat that provides for foraging, which varies widely across the northern spotted owl's range, in accordance with ecological conditions and disturbance regimes that influence vegetation structure and prey species distributions. Across most of the owl's range, nesting and roosting habitat is also foraging habitat, but in some regions northern spotted owls may additionally use other habitat types for foraging as well. The specific foraging habitat PCEs for the four ecological zones within the geographical range of the northern spotted owl are the following:

(a) West Cascades/Coast Ranges of Oregon and Washington

(i) Stands of nesting and roosting habitat; additionally, owls may use younger forests with some structural characteristics (legacy features) of old forests, hardwood forest patches, and edges between old forest and hardwoods;

(ii) Moderate to high canopy closure (60 to over 80 percent);

(iii) A diversity of tree diameters and heights;

(iv) Increasing density of trees greater than or equal to 31 in (80 cm) dbh increases foraging habitat quality (especially above 12 trees per ac (30 trees per ha));

(v) Increasing density of trees 20 to 31 in (51 to 80 cm) dbh increases foraging habitat quality (especially above 24 trees per ac (60 trees per ha));

(vi) Increasing snag basal area, snag volume (the product of snag diameter, height, estimated top diameter, and including a taper function (North *et al.* 1999, p. 523)), and density of snags greater than 20 in (50 cm) dbh all contribute to increasing foraging habitat quality, especially above 4 snags per ac (10 snags per ha);

(vii) Large accumulations of fallen trees and other woody debris on the ground; and

(viii) Sufficient open space below the canopy for northern spotted owls to fly.

(b) East Cascades

(i) Stands of nesting and roosting habitat;

(ii) Stands composed of Douglas-fir and white fir/Douglas-fir mix;

(iii) Mean tree size greater than 16.5 in (42 cm) quadratic mean diameter;

(iv) Increasing density of large trees (greater than 26 in (66 cm)) and increasing basal area (the total area covered by trees measured at breast height) increases foraging habitat quality;

(v) Large accumulations of fallen trees and other woody debris on the ground; and

(vi) Sufficient open space below the canopy for northern spotted owls to fly.

(c) Klamath and Northern California Interior Coast Ranges

(i) Stands of nesting and roosting habitat; in addition, other forest types with mature and old-forest characteristics;

(ii) Presence of the conifer species, incense-cedar, sugar pine, Douglas-fir, and hardwood species such as bigleaf maple, black oak, live oaks, and madrone, as well as shrubs;

(iii) Forest patches within riparian zones of low-order streams and edges between conifer and hardwood forest stands;

(iv) Brushy openings and dense young stands or low-density forest patches within a mosaic of mature and older forest habitat;

(v) High canopy cover (87 percent at frequently used sites);

(vi) Multiple canopy layers;

(vii) Mean stand diameter greater than 21 in (52.5 cm);

(viii) Increasing mean stand diameter and densities of trees greater than 26 in (66 cm) increases foraging habitat quality;

(ix) Large accumulations of fallen trees and other woody debris on the ground; and

(x) Sufficient open space below the canopy for northern spotted owls to fly.

(d) Redwood Coast

(i) Nesting and roosting habitat; in addition, stands composed of hardwood tree species, particularly tanoak;

(ii) Early-seral habitats 6 to 20 years old with dense shrub and hardwood cover and abundant woody debris; these habitats produce prey, and must occur in conjunction with nesting, roosting, or foraging habitat;

(iii) Increasing density of small-to-medium sized trees (10 to 22 in (25 to 56 cm)) increases foraging habitat quality;

(iv) Trees greater than 26 in (66 cm) in diameter or greater than 41 years of age; and

(v) Sufficient open space below the canopy for northern spotted owls to fly.

(4) Habitat to support the transience and colonization phases of dispersal, which in all cases would optimally be composed of nesting, roosting, or foraging habitat (PCEs (2) or (3)), but which may also be composed of other forest types that occur between larger blocks of nesting, roosting, and foraging

habitat. In cases where nesting, roosting, or foraging habitats are insufficient to provide for dispersing or nonbreeding owls, the specific dispersal habitat PCEs for the northern spotted owl may be provided by the following:

(a) Habitat supporting the transience phase of dispersal, which includes:

(i) Stands with adequate tree size and canopy closure to provide protection from avian predators and minimal foraging opportunities; in general this may include, but is not limited to, trees with at least 11 in (28 cm) dbh and a minimum 40 percent canopy closure; and

(ii) Younger and less diverse forest stands than foraging habitat, such as even-aged, pole-sized stands, if such stands contain some roosting structures and foraging habitat to allow for temporary resting and feeding during the transience phase.

(b) Habitat supporting the colonization phase of dispersal, which is generally equivalent to nesting, roosting, and foraging habitat as described in PCEs (2) and (3), but may be smaller in area than that needed to support nesting pairs.

This proposed revised designation describes the physical or biological features and their primary constituent elements essential to support the life-history functions of the northern spotted owl. We have determined that all of the units and subunits proposed for designation were most likely occupied by the northern spotted owl at the time of listing, with the exception of one subunit, and that, depending on the scale at which occupancy is considered, some smaller areas within the subunits may have been unoccupied at the time of listing. In such cases, we have evaluated those areas and determined that they are essential to the conservation of the species, as described in Criteria Used to Identify Critical Habitat. The Criteria section also describes our evaluation of the amount and configuration of the physical or biological features on the landscape to determine where those features are essential to the conservation of the spotted owl. We have further determined that the physical or biological features essential to the conservation of the northern spotted owl require special management considerations or protection, as described below.

In areas occupied at the time of listing, not all of the proposed revised critical habitat will contain all of the PCEs, because not all life-history functions require all of the PCEs. Some subunits contain all PCEs and support multiple life processes, while some subunits may contain only those PCEs necessary to support the species' particular use of that habitat. However, all of the areas proposed for designation support at least the first PCE described (forest-type), in conjunction with at least one other PCE. Thus PCE (1) must always occur in concert with at least one additional PCE (PCE 2, 3, or 4).

Special Management Considerations or Protection

The term critical habitat is defined in section 3(5)(A) of the Act, in part, as geographical areas on which are found those physical or biological features essential to the conservation of the species and ''which may require special management considerations or protection.'' Accordingly, in identifying critical habitat in areas occupied at the time of listing, we determine whether the features essential to the conservation of the species on those areas may require any special management actions or protection. Here we present a discussion of the special management considerations or protections that may be required throughout the proposed critical habitat for the northern spotted owl.

An effective critical habitat strategy needs to conserve extant, high-quality northern spotted owl habitat in order to reverse declining population trends and address the threat from barred owls. The northern spotted owl was initially listed as a threatened species due largely to both historical and ongoing habitat loss and degradation. The recovery of the northern spotted owl therefore requires both protection of habitat and management where necessary to provide sufficient high-quality habitat to allow for population growth and to provide a buffer against threats such as competition with the barred owl. Recovery Criterion 3 in the Revised Recovery Plan for the Northern Spotted Owl is the ''Continued Maintenance and Recruitment of Spotted Owl Habitat,'' which is further described as the achievement of a stable or increasing trend in spotted owl nesting, roosting, and foraging habitat throughout the range of the species. Meeting this recovery criterion will require special management considerations or protection of the physical or biological features essential to the conservation of the northern spotted owl in all of the proposed critical habitat units and subunits, as described here.

The 2011 Revised Recovery Plan for the Northern Spotted Owl describes the three main threats to the spotted owl as competition from barred owls, past habitat loss, and current habitat loss (USFWS 2011, p. III–42). As the barred owl is present throughout the range of the northern spotted owl, special management considerations or protections may be required in all of the proposed critical habitat units and subunits to ensure the northern spotted owl has sufficient habitat available to withstand competitive pressure from the barred owl (Dugger *et al.* 2011, pp. 2459, 2467). In addition, scientific peer reviewers and Forsman *et al.* (2011, p. 77) recommended that we address currently observed downward demographic trends in spotted owl populations by protecting currently occupied sites as well as historically occupied sites, and by maintaining and restoring older and more structurally complex multi-layered conifer forests on all lands (USFWS 2011, pp. III–42 to III–43). The types of management or protections that may be required to achieve these goals and maintain the physical or biological features essential to the conservation of the owl in occupied areas vary across the range of the species. Some areas of northern spotted owl habitat, particularly in wetter forest types, are unlikely to be enhanced by active management activities but instead need protection of the essential features, whereas other forest areas would likely benefit from more proactive forestry management. For example, in drier, more fire-prone regions of the owl's range, habitat conditions will likely be more dynamic, and more active management may be required to reduce the risk of the essential physical or biological features from fire, insects, disease, and climate change as well as to promote regeneration following disturbance.

As discussed in detail in the Revised Recovery Plan (USFWS 2011, pp. III–11 to III–39), long-term spotted owl recovery could benefit from forest management where the basic goals are to restore or maintain ecological processes and resilience. Special management considerations or protections may be required throughout the proposed critical habitat to achieve these goals and benefit the conservation of the owl. The natural ecological processes and landscape that once provided large areas of relatively contiguous spotted owl habitat have been altered by a history of anthropogenic activities such as timber harvest, road construction, development, agricultural conversion, and fire suppression. The resilience of these systems is now additionally challenged by the effects of climate change. As recommended in the Revised Recovery Plan for the Northern Spotted Owl, active forest management may be

required throughout the range of the owl with the goal of maintaining or restoring forest ecosystem structure, composition, and processes so they are sustainable and resilient under current and future climate conditions to provide for the long-term conservation of the species (USFWS 2011, p. III–13). For example, in some areas past management practices have decreased age-class diversity and altered the structure of forest patches; in these areas, management such as targeted vegetation treatments could simultaneously reduce fuel loads and increase canopy and age-class diversity (USFWS 2011, p. III–18). Special management considerations or protections may be required in areas with regeneration harvest in moist forests to enhance within-stand structural diversity, by emphasizing the retention of larger and older trees, or any trees with characteristics that create stand diversity, and may even require specific actions to maintain or develop suitable nest structures (USFWS 2011, p. III–20). In dry forest regions, where natural disturbance regimes and vegetation structure, composition, and distribution have been substantially altered since Euro-American settlement, vegetation management may be required to retain spotted owl habitat on the landscape by altering fire behavior and severity, and potentially to restore a more natural balance between forest vegetation and disturbance regimes. Special management considerations may be required to maintain adequate spotted owl habitat in the near term to allow spotted owls to persist in the face of threats from barred owl expansion and habitat alterations from fire and other disturbances, and to restore landscapes that are more resilient to alterations projected to occur with ongoing climate change (USFWS 2011, p. III–32).

Because the specific management approaches and types of forest where they should be applied in order to maintain sufficient suitable habitat across the range of the owl will vary geographically, here we provide more detailed recommendations of the types of management considerations or protections that may be required to preserve or enhance the essential physical or biological features for the northern spotted owl in the West Cascades/Coast Ranges of Oregon and Washington, East Cascades, Klamath and Northern California Interior Coast Ranges, and the Redwood Coast.

West Cascades/Coast Ranges of Oregon and Washington

Special management considerations or protection may be required in areas of moist forests to conserve or protect older stands that contain northern spotted owl sites (RA10: USFWS 2011, p. 43) or contain high-value northern spotted owl habitat (RA32: USFWS 2011, p. 67). Silvicultural treatments are generally not needed to maintain existing old-growth forests on moist sites (Wimberly *et al.* 2004, p. 155; Johnson and Franklin 2009, pp. 3, 39). In contrast to dry and mesic forests, short-term fire risk is generally lower in the moist forests that dominate on the west side of the Cascade Range, and occur east of the Cascades as a higher-elevation band or as peninsulas or inclusions in mesic forests. Disturbance-based management for forests and northern spotted owls in moist forest areas should be different from that applied in dry or mesic forests. Efforts to alter either fuel loading or potential fire behavior in these sites could have undesirable ecological consequences as well (Johnson and Franklin 2009, p. 39; Mitchell *et al.* 2009, pp. 653–654; USFWS 2011, p. III–17).

In general, to advance long-term northern spotted owl recovery and ecosystem restoration in moist forests in the face of climate change and past management practices, special management considerations or protections may be required that follow these principles as recommended in the 2011 Revised Recovery Plan (USFWS 2011, p. III–18):

(1) Conserve older stands that have occupied or high-value northern spotted owl habitat as described in Recovery Actions 10 and 32 (USFWS 2011, pp. III–43, III–67). On Federal lands this recommendation applies to all land-use allocations outside of Congressionally reserved Areas (see also Thomas *et al.* 2006, pp. 284–285).

(2) Management emphasis needs to be placed on meeting northern spotted owl recovery goals and long-term ecosystem restoration and conservation. When there is a conflict between these goals, actions that would disturb or remove the essential physical or biological features of northern spotted owl critical habitat need to be minimized and reconciled with long-term ecosystem restoration goals to avoid adverse modification (see Adverse Modification section for specific details).

(3) Continue to manage for large, continuous blocks of late-successional forest.

(4) Regeneration harvest, if carried out, should consider ecological forestry principles. One example that could be utilized is Franklin *et al.* (2002, pp. 417–421; 2007, entire), Drever *et al.* (2006, entire), Johnson and Franklin (2009, pp. 39–41), Swanson *et al.* (2010, entire), and others cited in the Revised Recovery Plan for the Northern Spotted Owl (USFWS 2011, pp. III–14, III–17 to III–19).

These special management considerations or protections apply to Units 1, 2, 4, 5 and 6 of the proposed revised critical habitat.

East Cascades

Special management considerations or protection may be required in the East Cascades to address the effects of past activities associated with Euro-American settlement, such as timber harvest, livestock grazing, fire suppression, and fire exclusion, that have substantially altered the inland northwest, modifying the patterns of vegetation and fuels, and subsequent disturbance regimes to the degree that contemporary landscapes no longer function as they did historically (Hessburg *et al.* 2000a, pp. 74–81; Hessburg and Agee 2003, pp. 44–46; Hessburg *et al.* 2005, pp. 134–135; Skinner *et al.* 2006, pp. 178–179; Skinner and Taylor 2006, pp. 201–203). This has affected not only the existing forest and disturbance regimes, but the quality, amount, and distribution of northern spotted owl habitat on the landscape. In order to preserve the essential physical or biological features, these dynamic, disturbance-prone forests must be managed in a way that promotes northern spotted owl conservation, responds to climate change, and restores dry forest ecological structure, composition and processes, including wildfire and other disturbances (USFWS 2011, p. III–20). The following restoration principles apply to the management that may be required in this dry forest region (USFWS 2011, pp. III–34 to III–35):

(1) Emphasize vegetation management treatments outside of northern spotted owl core areas or high-value habitat where consistent with overall landscape project goals;

(2) Design and implement restoration treatments at the landscape level;

(3) Retain and restore key structural components, including large and old trees, large snags, and downed logs;

(4) Retain and restore heterogeneity within stands;

(5) Retain and restore heterogeneity among stands;

(6) Manage roads to address fire risk; and

(7) Use wildfires to meet vegetation management objectives where appropriate.

The above principles will result in treatments that have a variety of effects on northern spotted owl habitat in the short and long term. For example, some

restoration treatments may have an immediate neutral or beneficial effect on existing northern spotted owl habitat (e.g., roads management, some prescribed fire prescriptions). Other treatments, however, may involve reductions in stand densities, canopy closure, or ladder fuels (understory vegetation that has the potential to carry up into a crown fire)—and thus affect the physical or biological features needed by the species. At the stand scale, this can result in a level of conflict between conserving existing northern spotted owl habitat and restoring dry-forest ecosystems. We typically cannot expect to meet both objectives on the same acre if that acre currently functions as suitable northern spotted owl habitat. We can reconcile this conflict, however, by managing at the landscape scale.

Land managers need to move away from implementing many small, uncoordinated and independent fuel-reduction and restoration treatments. Instead, coordinated and strategic efforts that link individual projects to the larger objectives of restoring landscapes while conserving and recovering northern spotted owl habitat are needed (sensu Sisk *et al.* 2005, entire; Prather *et al.* 2008, entire; Gaines *et al.* 2010, entire).

The special management considerations or protections identified here apply to Units 7 and 8 of the proposed revised critical habitat.

Klamath and Northern California Interior Coast Ranges

The special management considerations or protections that may be required in the Klamath and Northern California Interior Coast Ranges represent a mix of the requirements needed to maintain or enhance the essential physical or biological features in mesic and dry forest types. This region in southwestern Oregon and northwestern California is characterized by very high climatic and vegetative diversity resulting from steep gradients of elevation, dissected topography, and large differences in moisture from west to east. Summer temperatures are high, and northern spotted owls occur at elevations up to 1,768 m (5,800 ft). Western portions of this zone support a diverse mix of mesic forest communities interspersed with drier forest types. Forests of mixed conifers and evergreen hardwoods are typical of the zone. Eastern portions of this zone have a Mediterranean climate with increased occurrence of ponderosa pine. Douglas-fir dwarf mistletoe is rarely used for nesting platforms in the west, but commonly used in the east. The prey base for northern spotted owls in this zone is correspondingly diverse, but is dominated by dusky-footed woodrats, bushy-tailed woodrats, and flying squirrels. Northern spotted owls have been well studied in the Klamath portion of this zone, but relatively little is known about northern spotted owl habitat use in the California Interior Coast Range portion of the zone.

High canopy cover (65 to 75 percent), high levels of canopy layering, and the presence of very large dominant trees were all important features of nesting and roosting habitat. Compared to other zones, models of foraging habitat for this zone showed greater divergence from nesting habitat, with much lower canopy cover and tree size. Low to intermediate slope positions were strongly favored. In the eastern Klamath, presence of Douglas-fir was an important compositional variable. Habitat associations in the Klamath zone are diverse and unique, reflecting the climate, topography, and vegetation of this area. Nesting and roosting habitat somewhat resembles that of other zones, with a greater emphasis on topography that provides some relief from high temperatures. Foraging habitat in this zone includes more open forests. Consequently, management actions consistent with maintaining and developing northern spotted owl habitat need to consider local conditions. In some areas, appropriate management will be more consistent with dry forest management strategies, while in other areas wet forest management strategies will be more appropriate.

This region contains habitat characteristics of both moist and dry forests interspersed across a highly diverse landscape (Halofsky *et al.* 2011, p. 1). The special management recommendations from the moist and dry forest sections, above, apply to the management actions or protections that may be required in the Klamath and Northern California Interior Coast Ranges. Similar to the discussion in moist forests concerning conservation of small patches of early seral habitat, Perry *et al.* (2011, p. 715) noted that replacement of early successional shrub-hardwood communities by closed forests in the absence of fire significantly impacts landscape diversity. Restoration of appropriate fire regimes and use of targeted silvicultural intervention may be effective where the goal is to restore or maintain this diversity (Halofsky *et al.* 2011, p. 15).

The special management considerations or protections identified here apply to Units 9, 10, and 11 of the proposed revised critical habitat.

Redwood Coast

Special management considerations or protection may be needed in the Redwood Coast Zone to maintain or enhance the essential physical or biological features for the owl. Although the Redwood Coast zone of coastal northern California is considered part of the wet/moist forest region within the range of the northern spotted owl, there are distinct differences in northern spotted owl habitat use and diet within this zone. The long growing season in this region, combined with redwood's ability to resprout from stumps, allows redwood stands to attain suitable stand structure for nesting in a relatively short period of time (40–60 years) if legacy structures are present. Late-successional forest is an important component of nesting and roosting habitat in the Redwood Zone, and demographic productivity on northern spotted owl breeding sites has been positively correlated with the density of legacy trees in proximity to owl nest sites (Thome *et al.* 1999, p. 57). In contrast to the large, contiguous, older stands desired in other wet provinces, some degree of fine-scale fragmentation in redwood forests appears to benefit northern spotted owls. Forest openings aged 5–20 years (e.g., harvest units or burns), with dense shrub and hardwood cover, and abundant food sources, provide high-quality habitat for the northern spotted owl's primary prey, the dusky-footed woodrat. Relatively secure from owl predation, woodrats tend to overpopulate these openings and the demographic pressure drives surplus individuals into nearby older stands with sparse understories where they are highly vulnerable to owl predation. Woodrat populations within recent openings probably peak by about stand age 10. Food sources and understory cover decline steadily through about stand age 20, when the woodrat population-source diminishes. In northern spotted owl territories within the Redwood Zone, active management that creates small openings in proximity to nesting, roosting, or foraging habitat may be required to enhance northern spotted owl foraging opportunities.

The special management considerations or protections identified here apply to Unit 3 of the proposed revised critical habitat.

Summary of Special Management Considerations or Protection

We find that each of the areas occupied at the time of listing that we are proposing as critical habitat contains features essential to the conservation of the species that may require special

management considerations or protection to ensure the conservation of the northern spotted owl. These special management considerations or protection are required to preserve and enhance the essential features needed to achieve the conservation of the northern spotted owl. Additional information on management activities compatible with spotted owl conservation can be found within the Section 7 Consultation section in the proposed rule.

Criteria Used To Identify Critical Habitat

As required by section 4(b)(1)(A) of the Act, we use the best scientific and commercial data available to designate critical habitat. We have reviewed the available information pertaining to the habitat requirements of the species. In accordance with the Act and its implementing regulations at 50 CFR 424.12(e), based on this review, we have identified the specific areas within the geographical area occupied by the species at the time it was listed on which are found those physical or biological features essential to the conservation of the species, and which may require special management considerations or protection. In addition, we considered whether any additional areas outside those occupied at the time of listing are essential for the conservation of the species.

Occupied Areas

For the purpose of developing and evaluating this proposed revised critical habitat for the northern spotted owl, we used a definition of ''geographical area occupied by the species'' at the time it was listed consistent with the species' distribution, population ecology, and use of space. We based our identification of ''occupied'' geographical area on: (1) The distribution of verified spotted owl locations and (2) scientific information regarding spotted owl population structure and habitat associations.

Our proposed critical habitat is based in part on the distribution of approximately 4,000 spotted owl territories verified as occupied at the time of listing, across the geographical range of the species (USFWS 2011, p. C–62). We use the term ''verified'' here to represent locations for which we have records indicating the presence of spotted owls at the time of listing. These data are the result of surveys conducted by Federal and State agencies, private timber companies, and researchers between 1987 and 1996. We consider this time period to reasonably represent the time of listing because spotted owls are relatively long-lived and exhibit a high degree of fidelity to territory core areas; their territory locations are therefore relatively stable through time unless substantial changes occur to territory habitat. For this reason, we consider it highly likely that locations occupied between 1987–1990 and 1990–1996 were also occupied at the time of listing in 1990.

However, because large areas within the species' geographical range had not been surveyed, the distribution of northern spotted owl populations was incompletely known at the time the species was listed, and remains so today. For this reason, designating critical habitat based solely on the locations of territories identified through surveys would exclude a substantial proportion of the area that was likely occupied by the species at the time of listing and that provides the physical or biological features essential to the conservation of the species. To address this we developed and tested a habitat suitability model based on habitat selected by the approximately 4,000 known owl pairs. This enables us to reliably identify other areas that were likely supporting spotted owl territories at the time of listing, based on habitat value (USFWS 2011, Appendix C).

Furthermore, restricting a definition of occupancy to areas known to be used by resident territorial owls overlooks a large segment of the owl population that is not generally reflected in standard survey methodologies, as described below. Spotted owl populations consist of the territorial, resident owls for which we have documentation of occupancy throughout much of the owl's range, described above, but also includes nonterritorial adult 'floaters' and dispersing subadult owls. Both dispersing subadults and nonterritorial floaters are consistently present on the landscape and require suitable habitat to support dispersal and survival until they recruit into the breeding population; this habitat requirement is in addition to that already utilized by resident territorial owls. Non-territorial owls are difficult to detect in surveys because most surveys rely on territorial defense behavior of resident owls (responding to owl calls) to determine their presence. Because they are difficult to detect, the number and distribution of nonterritorial and dispersing owls is poorly known for any given spotted owl population. However, they constitute essential elements of spotted owl populations, and can reliably be assumed to occur in suitable habitat within the same landscapes occupied by territorial owls. Therefore, if suitable habitat to support northern spotted owls was present at the time the species was listed, and if the presence of northern spotted owls was documented in the same landscape, it is highly likely that non-territorial adults or dispersing subadults were also present at the time of listing.

Based on the best available scientific information regarding population structure of northern spotted owls, we define ''occupied'' as encompassing (1) home ranges of resident, territorial spotted owls known from surveys to be present at the time of listing, (2) home ranges of territorial owls determined likely to have been present at the time of listing based on a model developed specifically to predict owl presence based on relative habitat suitability, and (3) nonterritorial and dispersing owls that were likely to be present within the matrix of territories in a given landscape known to be occupied by resident owl pairs.

Having determined our working definition of the term ''occupied,'' we then defined ''specific areas'' as used in the definition of critical habitat, 16 U.S.C. 1532(5)(A)(i), to conform with known patterns of space-use and distribution exhibited by spotted owls. Spotted owls are wide-ranging organisms that maintain large home ranges and disperse relatively long distances. As described earlier, territorial northern spotted owls cover home ranges from roughly 1,400 ac (570 ha) at the southern end of their range (Zabel *et al.* 1995, p. 436) up to over 14,000 ac (5,700 ha) (USDI 1992, p. 23; USFWS 1994 in litt., p. 1) in the northern portion of the species' range. These large home ranges often overlap with those of neighboring spotted owls, such that large landscapes may be fully occupied by population clusters in areas where suitable habitat is well distributed. While this was more the case when the northern spotted owl was first listed, prior to extensive colonization of the species' range by the barred owl, many demographic study areas still exhibit a pattern of overlapping home ranges over large landscapes.

To evaluate the proportion of each subunit proposed for designation that was comprised of areas known to be occupied by northern spotted owls at the time of listing, we calculated the area within estimated home ranges (USFWS 2011, p. C–63 Table C–24) for all verified spotted owl locations known at the time of listing, as described above. Overall, 84.5 percent of the area proposed for designation is within home ranges of verified territorial spotted owl located through surveys at the time of listing; this area is entirely representative of verified owl locations,

and does not include habitat likely to be occupied based on habitat suitability or non-resident owls. Twenty-two (35 percent) of the 63 subunits proposed for designation have at least 90 percent of their area within verified known home ranges; 51 (66 percent) have at least 70 percent. As explained above, given that these areas represent occupancy by verified resident owls only, and considering the suitable habitat available at the time of listing in these same landscapes, the remainder of these areas were likely occupied by other resident owls, non-territorial adult owls (floaters) or dispersing subadults.

To help us identify and map potential critical habitat for the owl, we used a three-step modeling framework developed as part of the Revised Recovery Plan for the Northern Spotted Owl that integrates a spotted owl habitat model, a habitat conservation planning model, and a population simulation model. The details of this modeling framework are presented in Appendix C of the Revised Recovery Plan (USFWS 2011), and a detailed technical description of the modeling and habitat network selection process we used in this proposed revised designation of critical habitat is provided in Dunk *et al.* (2011, entire). Both of these supporting documents are available at *http://www.regulations.gov* (see **ADDRESSES**), or by contacting the Oregon Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**). Each of the three models helped identify an important element of the statutory definition of critical habitat: The identification of physical or biological features needed by the species; the distribution of those features across the geographical range of the species occupied at the time of listing; and the identification of a landscape configuration where these features, as well as any necessary unoccupied areas, are essential to the conservation of the species.

The overall approach for critical habitat modeling consisted of three main steps (USFWS 2011, Appendix C, p. C–3) to help refine, select, and evaluate a series of alternative critical habitat networks for the northern spotted owl. These steps are summarized here, and then each is described in further detail.

Step 1: At the outset, the attributes of forest composition and structure and characteristics of the physical environment associated with nesting, roosting, and foraging habitat—physical and biological features used by the species—were identified based on the habitat selection exhibited by nearly 4,000 known owl pairs (USFWS 2011, pp. C–20 to C–28). We then used these physical and biological features of nesting, roosting, and foraging habitats to create a range-wide map of (relative) habitat suitability (MaxEnt) (Phillips *et al.* 2006, entire; Phillips and Dudik 2008, entire). In addition to providing a map of relative habitat suitability, this process allowed us to evaluate an area's suitability and determine whether the presence of the species was likely based on an assessment of known species-habitat relationships.

Step 2: We developed northern spotted owl habitat networks based on the relative habitat suitability map using the Zonation conservation planning model (Moilanen and Kujala 2008, entire). The Zonation model used a hierarchical prioritization of the landscape based on relative habitat suitability and other user-specified criteria (e.g., land ownership) to develop the most efficient solutions for incorporating high value habitat. Zonation analyses were conducted separately for each region to ensure that reserves would be well-distributed across the range of the owl. Zonation also allowed for consideration of land ownership in development of reserve designs.

Step 3: In the last step, we determined where the physical and biological features, as well as unoccupied areas, are essential to the conservation of the species. To do this we used a spatially-explicit northern spotted owl population model (HexSim) (Schumaker 2008, entire) to predict relative responses of northern spotted owl populations to different habitat network designs, and evaluated these responses against the recovery objectives and criteria for the northern spotted owl using a rule set based on those criteria. Simulations from these models are not meant to be estimates of what will occur in the future, but rather provide information on trends predicted to occur under different network designs; this allowed us to compare the relative performance of various habitat scenarios.

In Step 1 of the modeling framework, we created a series of spotted owl habitat models that provide the basis for mapping spotted owl habitat. Based on published research, input from individual experts, and analysis of spotted owl location and habitat data, we developed relative habitat suitability models. These relative habitat suitability models identify areas with habitat that provides the combination of variables (forest composition and structure, and abiotic factors such as elevation, precipitation, and temperature) with a high predictive probability of supporting spotted owls, based on data gathered from known owl sites. Applying these models enables the Service to identify and describe the physical or biological features essential to the conservation of the owl by correlating these features with the nesting, roosting, and foraging habitats known to be utilized by resident owls, and to map their distribution across the range of the owl (USFWS 2011, pp. C–27 to C–42, C–62). Because the models are based on data from nearly 4,000 owl sites occupied at the time of listing (USFWS 2011, p. C–62), model outputs highlight surveyed and known to be occupied habitat. However, they also identify areas with habitat likely to have supported owls at the time of listing, based on habitat suitability, and areas that may have been unoccupied at the time of listing, but that may be essential to the conservation of the species based on their relative habitat suitability and potential to provide areas with the habitat characteristics needed for population growth or dispersal (see below). To ensure that the variety of physical or biological features used by spotted owls across their range is represented in the models, we applied separate habitat models for each of 11 ecological regions based on differences in forest environments, spotted owl habitat use and prey distribution, and variation in ecological conditions. (USFWS 2011, C–7 to C–13).

In Step 2 of the modeling framework, we used a habitat conservation planning model (Zonation) (Moilanen *et al.* 2005, entire; Moilanen and Kujala 2008, entire) to develop a spotted owl conservation planning model. We used this in the critical habitat process to aggregate areas of greatest relative habitat suitability (areas that provide the physical or biological features, or essential unoccupied habitat) from Step 1 into discrete units. This process provided a series of maps representing a range of alternative critical habitat networks, each containing a different amount and distribution of spotted owl habitat quality. The Zonation model seeks to provide the most efficient design (most habitat value on smallest land area) and allowed us to maximize reliance on public lands to achieve recovery goals.

In Step 3 of the modeling framework, we developed a spotted owl population simulation model that allowed us to simulate the relative population responses of spotted owls to various habitat conservation network scenarios (HexSim) (Schumaker 2011, entire). In developing this proposed rulemaking, we used this spotted owl population simulation model to compare alternative critical habitat networks and evaluate

each design's ability to meet the recovery goals and criteria for the northern spotted owl (described further below). This step of the process enabled us to determine the amount and configuration of physical or biological features on the landscape that are essential to the conservation of the owl. It also helped us to determine which unoccupied areas are essential to the conservation of the species. By evaluating spotted owl population metrics such as relative population size, population trend, and extinction risk that resulted from each scenario evaluated, we believe we are proposing the most efficient habitat network to conserve the northern spotted owl, with the potential to support an increasing or stable population trend of northern spotted owls; that exhibits relatively low extinction risk, both rangewide and at the recovery unit scale (recovery units, as identified in the Revised Recovery Plan, are defined by physiographic provinces (USFWS 2011, pp. III–1 to III–2)), and that achieves adequate connectivity among recovery units, while prioritizing reliance on public lands.

We determined what is essential to recovery of the spotted owl by evaluating the performance of each potential critical habitat scenario considered against the recovery needs of the owl. In contrast with earlier conservation modeling efforts for the spotted owl, the modeling framework we utilized does not rely on *a priori* rule sets for features such as size of habitat blocks, number of owl pairs per block, or distance between blocks (USFWS 2011, p. C–4) to determine what is essential for the conservation of the species. Instead, we evaluated spotted owl population metrics such as relative population size and trend to determine what is essential to owl conservation, both in terms of where and how much of the physical or biological features are essential and how much unoccupied habitat is essential to meet the recovery objectives for the owl, as defined in the Revised Recovery Plan (USFWS 2011, p. ix) and detailed in our supporting documentation (Dunk *et al.* 2012, entire).

To accomplish this, we developed a rule set for the identification of critical habitat based on the ability of that habitat to meet the recovery objectives and criteria set forth in the Revised Recovery Plan for the Northern Spotted Owl (USFWS 2011, p. ix). The recovery objectives for the northern spotted owl are:

(1) Spotted owl populations are sufficiently large and distributed such that the species no longer requires listing under the Act;

(2) Adequate habitat is available for spotted owls and will continue to exist to allow the species to persist without the protection of the Act; and

(3) The effects of threats have been reduced or eliminated such that spotted owl populations are stable or increasing and spotted owls are unlikely to become threatened again in the foreseeable future.

The recovery criteria for the northern spotted owl (aside from the requirement for post-delisting monitoring) are:

Recovery Criterion 1—Stable Population Trend: The overall population trend of spotted owls throughout the range is stable or increasing over 10 years, as measured by a statistically reliable monitoring effort.

Recovery Criterion 2—Adequate Population Distribution: Spotted owl subpopulations within each province (i.e., recovery unit), excluding the Willamette Valley Province) achieve viability, as informed by the HexSim population model or some other appropriate quantitative measure.

Recovery Criterion 3—Continued Maintenance and Recruitment of Spotted Owl Habitat: The future range-wide trend in spotted owl nesting/roosting and foraging habitat is stable or increasing throughout the range, from the date of Revised Recovery Plan approval, as measured by effectiveness monitoring efforts or other reliable habitat monitoring programs.

We used the following rule set to compare and evaluate the potential of various habitat scenarios to meet these recovery objectives and criteria for the northern spotted owl, and thus determine what is essential to the conservation of the northern spotted owl:

(1) Ensure sufficient habitat to support population viability across the range of the species.

(a) Habitat can support an increasing or stable population trend, as measured by a population growth rate of 1.0 or greater.

(b) Habitat will be sufficient to insure a low risk of extinction.

(2) Support demographically stable populations in each recovery unit.

(a) Habitat can support an increasing or stable population trend in each recovery unit.

(b) Habitat will be sufficient to insure a low risk of extinction in each recovery unit.

(c) Conserve or enhance connectivity within and among recovery units.

(d) Conserve genetic diversity.

(e) Ensure sufficient spatial redundancy in critical habitat within each recovery unit.

(i) Accommodate habitat disturbance due to fire, insects, disease, and catastrophic events.

(3) Ensure distribution of spotted owl populations across representative habitats.

(a) Maintain distribution across the full ecological gradient of the historical range.

(4) Acknowledge uncertainty associated with both future habitat conditions and spotted owl population performance—including influence of barred owls, climate change, fire/disturbance risk, and demographic stochasticity—in assessment of critical habitat design.

These critical habitat objectives of supporting population viability and demographically stable populations are intended to be met in concert with the implementation of recovery actions to address other non-habitat based threats to the owl.

We applied this rule set to the outcome of HexSim runs on the various habitat scenarios considered (see Appendix C of the Revised Recovery Plan (USFWS 2011) and Dunk *et al.* 2012, entire, for all details). Each HexSim run began with a population of 10,000 females (all population metrics are in numbers of females), consisted of 100 replicates and 350 time steps for each habitat scenario considered, and included the introduction of environmental stochasticity. We then evaluated the relative performance of each habitat scenario using numerous metrics to assess the ability of that scenario to meet the specified recovery goals for the northern spotted owl, as laid out in our rule set for identifying critical habitat; these metrics were evaluated at the scale of each region, as well as collectively rangewide. Our metrics of population performance resulting from each habitat scenario considered included:

- The percentage of simulations during which the rangewide population fell below 1,250 individuals.
- The percentage of simulations during which the rangewide population fell below 1,000 individuals.
- The percentage of simulations during which the rangewide population fell below 750 individuals.
- The percentage of simulations during which the population fell below 250 in each region (using 250 as a quasi-extinction threshold).
- The percentage of simulations during which the population fell below 100 in each region (using 100 as a quasi-extinction threshold).
- The percentage of simulations that went to extinction (population = 0) in each region.

• The mean population size from time step 150 to time step 350 in each region.

• The mean population size at the last time step in each region.

• The mean population size at the last time step rangewide.

These metrics were used to comparatively evaluate the ability of each scenario under consideration to meet the recovery goals for the species and as specified in our rule set for the identification of critical habitat (measures of extinction risk are used as an indirect measure of sufficient population abundance, as well as viability). We selected habitat scenarios for further evaluation if they outperformed the other scenarios under consideration in terms of being better able to meet the population abundance, viability, and trend criteria both across regions and rangewide. In all cases, we attempted to identify the most efficient (smallest total area) that would meet the population goals essential to recovery. Our proposed critical habitat is based on the habitat network that best met all of these criteria, and then was further refined, as described below.

We also focused on public lands to the maximum extent possible (see Dunk *et al.* 2012, entire, for specific details). In this step, we compared scenarios that did not discriminate between various land ownerships, and those that prioritized publicly-owned lands. As Federal agencies have a mandate under Section 7(a)(1) of the Act to utilize their authorities in furtherance of the purposes of the Act by carrying out programs for the conservation of listed species, we looked first to Federal lands for critical habitat. However, in some areas of limited Federal ownership, State and private lands may provide areas determined to be essential to the northern spotted owl by contributing to demographic support and connectivity to facilitate dispersal and colonization. In all cases, if the scenarios under consideration provided equal contribution to recovery, as measured by the population metrics described above, we chose the scenario that prioritized publicly-owned lands. State and private lands were included only if they were necessary to achieve conservation of the species, and were determined to provide either occupied areas that support the PCEs or unoccupied areas essential to the conservation of the owl. For example, in Washington some State and private lands were identified in Spotted Owl Special Emphasis Areas (SOSEAs), which the Washington Forest Practices Board adopted in 1996 to complement the Federal recovery and conservation strategy for the spotted owl. We also considered Indian or Tribal lands in our evaluations; if habitat scenarios performed equally well with or without Indian lands, we did not include them (see Indian Lands, below).

Following the application of this modeling framework, we further refined the model-based map units after considering land ownership patterns, interagency coordination, and best professional judgment with the objective of increasing the efficiency and effectiveness, of the critical habitat proposal. The process generally consisted of modifying boundaries to better conform to existing administrative and landscape features, removing small areas of relatively lower-suitability habitat, and incorporating additional areas that may have been unoccupied at the time of listing but that were determined to be essential for population connectivity, population growth, or to accommodate maintenance of suitable habitat on the landscape for owls in the face of natural disturbance regimes (e.g., fire) or competition with the barred owl, while retaining the overall configuration of the model-based maps. We used the population simulation model to evaluate whether this revised critical habitat network continued to provide what is essential to the conservation of the northern spotted owl.

Unoccupied Areas

Based on the northern spotted owl's wide-ranging use of the landscape, and the distribution of known owl sites at the time of listing across the units and subunits proposed as critical habitat here, we believe all units and all subunits except one meet the Act's definition of being within the geographical area occupied by the species at the time of listing.

Although we designed the units and subunits proposed for designation to consist predominantly of habitat occupied at the time of listing (or highly likely to be occupied), we know that one subunit was not occupied at that time. In addition, parts of most units contain a forested mosaic which includes younger forests that may not have been occupied at the time of listing. We also recognize that there may be some uncertainty regarding areas we believe were occupied based on the presence of suitable habitat or dispersing owls but for which we do not have survey information. Therefore, we have evaluated all of these areas as if they were unoccupied and deem them to be essential to the conservation of the species because they fulfill at least one of two functions essential to the conservation of the species: population connectivity, or space for population growth.

First, there is one subunit and portions of two others that function primarily for connectivity. Although portions of these subunits may not have been occupied at the time of listing, these areas contain the dispersal and foraging habitat to support movement between adjacent subunits and are therefore essential to provide population connectivity. Many of these areas are also anticipated to develop into habitat capable of supporting nesting pairs in the future. In 1990, the Interagency Scientific Committee (ISC) (Thomas *et al.* 1990, entire) identified ''Areas of Special Concern'' in the Draft Strategy for the Conservation of the Northern Spotted Owl. The ISC defined Areas of Special Concern as lands where past natural occurrences and human actions had adversely affected habitat more than in the remainder of the physiographic province under consideration (Thomas *et al.* 1990, p. 66). Within the Areas of Special Concern described by the ISC (Thomas *et al.* 1990, pp. 66–69), we identified areas that were strategically located between subunits that would otherwise be demographically isolated. Of 63 subunits proposed for designation, three (NCO–3, ORC–4, and ECS–3) are identified as functioning primarily for population connectivity with less than 70 percent of the subunit covered by survey-located owl sites. Only one subunit (NCO–3) is considered unoccupied and was identified primarily for connectivity and additional demographic support.

Second, because the primary threat to the northern spotted owl at the time of listing was habitat loss and degradation, conservation and recovery of the species in some portions of its range is dependent on development of additional habitat to allow for population expansion and recovery. Therefore, portions of the habitat mosaic in some subunits proposed for designation within the geographical area occupied by the species at the time of listing consist of younger and/or partially-harvested forest but are essential to conservation of the species because they are capable of developing the PCEs that support nesting, roosting, or foraging by spotted owls that will be necessary for population expansion. Typically the result of past timber harvest or wildfire, these areas of younger forest contain the elements conducive to fully developing the physical or biological features essential to the conservation of the owl (they are of suitable elevation, climate, and forest

community type) but may be lacking some element of the PCEs such as large trees or dense canopies that are associated with nesting habitat. In particular, of 63 subunits proposed for designation, four (NCO–4, NCO–5, ORC–1, and RDC–4) contain proportionally greater areas of younger forests that are essential to the conservation of the species because they can develop additional habitat necessary to support viable spotted owl populations in the future. These subunits are located within Southwestern Washington and Oregon Coast Ranges Areas of Special Concern (Thomas *et al.* 1990, pp. 66–69), areas described as exhibiting a scarcity of suitable habitat due to extensive timber harvest. The recovery goal of achieving viable populations distributed across the range of the owl cannot be achieved without these areas, therefore we have determined them to be essential to the conservation of the species.

Third, each unit and subunit in this proposed revised designation of critical habitat consists of a forested mosaic comprised predominantly of habitat known from surveys and other documented sources to be occupied at the time of listing, as well as habitat that was highly likely to have been occupied at that time based on the presence of physical or biological features associated with occupancy by spotted owls or based on the likely presence of non-territorial owls. However, we recognize there is some uncertainty associated with occupancy in regard to areas that our habitat model or the population dynamics of non-territorial owls indicate were highly likely to have been occupied at the time of listing, but for which we do not specifically have documented owl sites based on surveys. In addition, within this mosaic, each subunit also contains areas of potentially suitable habitat anticipated to develop into suitable habitat in the future. These specific areas may or may not have been occupied at the time of listing. We therefore also evaluated all areas proposed for designation as if they were unoccupied at the time of listing, to determine whether such areas are essential to the conservation of the species.

Thus, even if not occupied at the time of listing, all units and subunits proposed for designation are essential to the conservation of the species because, in addition to nesting, roosting, foraging, and dispersal habitat, they provide connectivity between occupied areas, room for population expansion or growth, and the ability to provide sufficient suitable habitat on the landscape for owls in the face of natural disturbance regimes (e.g., fire). In addition, recent work has confirmed that northern spotted owls require additional areas of habitat to persist in the face of competition with barred owls (Dugger *et al.* 2011, p. 2467). Finally, since the northern spotted owl was initially listed in large part due to the threat of habitat loss or degradation, there may be some areas of potentially suitable habitat that are currently in degraded condition and in need of restoration to provide the large, contiguous areas of nesting, roosting, and foraging habitat required to sustain viable spotted owl populations. Spotted owls require these large areas of habitat due to their expansive home range requirements and the need for connectivity between subpopulations to maintain genetic diversity and support stable, viable populations over the long term. Given the effects of past habitat loss and the increased habitat area needed to offset competition from the barred owl, our assessment indicates that large areas of habitat are required across the range of the northern spotted owl to meet recovery goals.

In summary, our evaluation of the various habitat scenarios considered in the modeling process described above enabled us to determine the amount and configuration of habitat essential to the conservation of the owl, based on the relative ability of that habitat network to meet the recovery criteria of stable or increasing populations and adequate distribution of viable populations. Although this evaluation was primarily based on areas we know to have been occupied at the time of listing, our evaluation of what is essential to the conservation of the owl additionally identified areas that may not have been occupied at the time of listing if those areas were essential to meeting the recovery goals for the species. We have determined these areas to be essential to the conservation of the species, to provide for dispersal and connectivity between currently occupied areas, allow space for population growth, and to provide habitat replacement in the event of disturbances such as wildfires and competition with barred owls. We have also determined that a critical habitat designation that does not include these areas, even if they may not have been occupied at the time of listing, would be inadequate to ensure the conservation of the species. The resulting proposed revised critical habitat network represents the amount and spatial distribution of habitats that we have determined to be essential for the conservation of the northern spotted owl.

This proposal is innovative in that it anticipates that in geographical regions with drier forests and more dynamic natural disturbance regimes, a landscape approach to managing critical habitat will occur. This landscape approach recognizes that large areas are essential in these regions to accommodate disturbance-driven shifts in the physical or biological features essential for the conservation of the northern spotted owl, and that restorative management actions may be needed across these landscapes to help manage for resilience in such a dynamic ecosystem. These large landscapes, although essential to provide for the conservation of the northern spotted owl, do include within their boundaries several particular types of areas which are not proposed as critical habitat because they cannot support northern spotted owl habitat. The following types of areas are not critical habitat for the northern spotted owl, and are not included in the proposed revised designation:

- Meadows and grasslands.
- Oak and aspen (*Populus* spp.) woodlands.
- Surface mine sites.
- Developed recreation sites, including a safety buffer for hazard tree management.
- Administrative sites, including a safety buffer for hazard tree management.
- Roadways, including a safety buffer for hazard tree management.
- Other manmade structures (such as buildings, aqueducts, runways, and other paved areas) and the land on which they are located.

When determining proposed critical habitat boundaries, we made every effort to avoid including these areas because they lack physical or biological features for the northern spotted owl. Due to the limitations of mapping at such fine scales, however, we were often not able to segregate these areas from areas being proposed as critical habitat on critical habitat maps suitable for publication within the Code of Federal Regulations. Thus, we have included regulatory text clarifying that these areas are not included in the proposed designation even if within the mapped boundaries of critical habitat; if the critical habitat is finalized as proposed, a Federal action involving these lands would not trigger section 7 consultation with respect to critical habitat unless the specific action would affect the physical or biological features in the adjacent critical habitat.

We are proposing for designation 11 units and 63 subunits based on sufficient elements of physical or

biological features being present to support the northern spotted owl's life-history processes. Some subunits contain all of the identified elements of physical or biological features and support multiple life-history processes. Some subunits may contain only some elements of the physical or biological features necessary to support the northern spotted owl's particular use of that habitat.

Summary of Changes From Previously Designated Critical Habitat

In 2008, we designated 5,312,300 ac (2,149,800 ha) of Federal lands in California, Oregon, and Washington as critical habitat for the northern spotted owl (73 FR 47326; August 13, 2008). In this revision, we are proposing that a total of 13,962,449 ac (5,649,660 ha) be designated as critical habitat for the northern spotted owl. We have proposed the revised designation of critical habitat for the northern spotted owl to be consistent with the most current assessment of the conservation needs of the species, as described in the 2011 Revised Recovery Plan for the Northern Spotted Owl (USFWS 2011, Appendix B). Of the proposed designation, 4,159,678 ac (1,683,362 ha) are the same as in the 2008 designation. Of the current proposed designation, 9,802,771 ac (3,966,298 ha) are lands not formerly designated in 2008, and 1,152,662 ac (466,438 ha) of lands that were included in the former designation are not proposed here, for reasons detailed below.

The Service recognizes that this proposed revision of critical habitat represents an increase in the total land area identified from previous designations in 1992 and 2008. This increase in area is due, in part, to (a) the unanticipated steep decline of the spotted owl and the impact of the barred owl, requiring larger areas of habitat to maintain sustainable spotted owl populations in the face of competition with the barred owl (Dugger *et al.* 2011, p. 2467); (b) the recommendation from the scientific community that the conservation of more occupied and high-quality habitat is essential to the conservation of the species (Forsman *et al.* 2011, p. 77); (c) the need to maintain sufficient suitable habitat for northern spotted owls on a landscape level in areas prone to frequent natural disturbances, such as the drier, fire-prone regions of its range (Noss *et al.* 2006, p. 484; Thomas *et al.* 2006, p. 285; Kennedy and Wimberly 2009, p. 565); and (d) in contrast to the previous critical habitat designation, the inclusion of significant areas of Federal reserve lands (e.g., national parks and wilderness areas) and some State and private lands in areas where Federal lands were not sufficient to meet the conservation needs of the spotted owl.

We expect to refine this proposed designation based on public comments, additional information from coordination with the land management agencies, scientific peer review, and consideration of exclusions and exemptions (per sections 4(b)(2) and 4(a)(3)(B) of the Act, respectively). Fine-scale adjustments to proposed critical habitat maps are also anticipated based on Service collaboration with Federal, State, and private land managers and receipt of site-specific information on habitat and landscape conditions.

The new delineation of areas determined to provide the physical or biological features essential for the conservation of the northern spotted owl, or otherwise determined to be essential for the conservation of the species, was based, in part, on an improved understanding of the forest characteristics and spatial patterns that influence habitat usage by northern spotted owls which were incorporated into the latest population evaluation and mapping technology. The modeling process we used to evaluate alternative critical habitat scenarios differed fundamentally from the conservation planning approach used to inform the 1992 and 2008 designations of critical habitat for the northern spotted owl. These past designations relied on *a priori* rule sets derived from best expert judgment regarding the size of reserves or habitat conservation blocks, target number of spotted owl pairs per reserve or block, and targeted spacing between reserves or blocks (USFWS 2011, p. C–4), which we then assessed and refined using expert opinion. The current proposed revised designation reflects our use of a series of spatially explicit modeling processes to determine where biological features are essential to the conservation of the northern spotted owl, and in the case of unoccupied habitat, to determine the areas that are essential to the conservation of the owl, as described in Criteria Used to Identify Critical Habitat, below. These models enabled us to compare potential critical habitat scenarios in a repeatable and scientifically accepted manner (USFWS 2011, p. C–4), using current tools that capitalize on new spatial information and algorithms for identifying efficient habitat networks essential for conservation.

The areas proposed for designation are lands that were occupied at the time of listing and that currently provide suitable nesting, roosting, foraging, or dispersal habitat for northern spotted owls, or that are otherwise essential to the conservation of the species. However, as noted above, not every site of known owl occupancy is included in the proposed revised designation. We did not include owl sites if they were isolated from other known occurrences or in areas of marginal habitat quality such that they were unlikely to make a significant contribution to the conservation of the species, and therefore were not considered to provide the essential features.

The habitat network development and evaluation strategy we used attempts to maximize the efficiency of the network by prioritizing lands for inclusion in the critical habitat network where management direction is more predictable and where resources are more available to conduct many of the ecosystem restoration projects the Service recommends within critical habitat. Utilization of new scientific information and advanced modeling techniques accounts for many of the changes in the proposed revised critical habitat, since the location of areas essential to northern spotted owls may have shifted based on the best information available regarding the spatial distribution of high-value habitat. Late-successional reserves (LSRs) and Congressionally withdrawn lands (e.g., national parks) were not prioritized in this approach based solely on their status as a reserved land allocation, but were included only where the habitat quality was high enough to meet the selection criteria. LSRs were not originally designated solely to meet the needs of the northern spotted owl, but may include areas designated for other late-successional forest species. Therefore, not all LSRs contain habitat of sufficient quality to be included in the critical habitat network for the northern spotted owl.

Table 2 shows a comparison of areas included in the 2008 designation and those proposed in this proposed revision to critical habitat. The process we used to determine occupied areas containing essential features and unoccupied areas essential to the conservation of the species is described in Criteria Used to Identify Critical Habitat.

TABLE 2—COMPARISON OF AREA INCLUDED IN 2008 CRITICAL HABITAT AND 2012 PROPOSED CRITICAL HABITAT BY REGION—THE 11 REGIONS ARE DESCRIBED IN DETAILS IN THE PROPOSED REVISED CRITICAL HABITAT DESIGNATION SECTION

Modeling region	2011 Proposed critical habitat		2008 Final critical habitat	
	Acres	Hectares	Acres	Hectares
North Coast Olympics	1,595,821	645,806	485,039	196,289
Oregon Coast	891,154	360,637	507,082	205,209
Redwood Coast	1,550,747	626,847	70,153	28,390
West Cascades North	820,832	332,179	390,232	157,921
West Cascades Central	1,353,045	547,558	546,333	221,093
West Cascades South	1,624,836	657,548	700,421	283,450
East Cascades North	1,919,469	776,781	687,702	278,303
East Cascades South	526,810	213,192	207,291	83,888
Klamath West	1,291,606	522,693	667,795	270,247
Klamath West	1,111,679	449,881	667,795	270,247
Inner California Coast Ranges	1,276,450	516,537	535,863	216,856
Grand total	13,962,449	5,649,660	5,312,327	2,149,823

The reduction in number of critical habitat units from 33 in 2008 to 11 in 2011 is a reflection, in part, of our decision to aggregate habitat by regions. The current designation includes 33 critical habitat units; the proposed revision includes 11 critical habitat units with 63 subunits.

Our proposed determination of PCEs in this proposed revised designation incorporates new information resulting from research conducted since the last revision in 2008. This new information, along with relevant older studies, allowed us to include a higher level of specificity in the PCEs in this revision. This proposal also includes two changes in overall organization. The 2008 revised designation considered nesting and roosting habitat as separate PCEs. In this version, we have combined these habitat types. Spotted owls generally use the same habitat for both nesting and roosting; they are not separate habitat types, and function differs only based on whether a nest structure is present. These structures can be difficult to detect during field surveys in some portions of the subspecies range, and are virtually impossible to detect via remote sensing. Our models of spotted owl habitat relied on remotely sensed data. At the scale of a rangewide proposal of critical habitat, nesting and roosting habitats cannot be systematically distinguished, and, therefore, we combined them in our analysis and resulting proposal. For project planning and management of spotted owls at the local scale, the distinction between nesting and roosting habitat remains useful, especially in portions of the subspecies range where nesting structures are conspicuous (e.g., mistletoe brooms). The second organizational change was to subdivide the range of the subspecies into four separate regions, and to describe PCEs for foraging habitat separately for each of these regions.

Finally, in this proposed rule we provide a more detailed and specific characterization of the PCEs for the northern spotted owl. Although described in more detail in the preamble, the actual rulemaking section of the 1992 designation described the PCEs only as ''forested areas that are used or potentially used by northern spotted owl for nesting, roosting, foraging, or dispersing'' (57 FR 1838; January 15, 1992). Research since the 1992 designation of critical habitat has largely confirmed our understanding of the PCEs as presented in the discussion section of that final rule (Blakesley 2004, entire), but this revision seeks to incorporate the specific description of those PCEs, as described earlier in the Primary Constituent Elements section of this document, into the Proposed Regulation Promulgation Section. For example, the proposed rule describing the PCEs now includes a list of the specific forest types used by northern spotted owls, as well as a description of the particular habitat components (tree size, canopy closure, nest platforms, etc.) used by northern spotted owls for nesting, roosting, foraging, and dispersal. Furthermore, recognizing that not all PCEs apply universally throughout the broad range occupied by the northern spotted owl, we have provided descriptions of PCEs specific to each of the four major ecoregional divisions within the range of the species.

Proposed Revised Critical Habitat Designation

Consistent with the standards of the Act, our regulations, and agency practice, we have identified 13,962,449 ac (5,649,660 ha) in 11 units and 63 subunits as meeting the definition of critical habitat for the northern spotted owl. The 11 units we have identified as critical habitat are: (1) North Coast Olympics, (2) Oregon Coast Ranges, (3) Redwood Coast, (4) West Cascades North, (5) West Cascades Central, (6) West Cascades South, (7) East Cascades North, (8) East Cascades South, (9) Klamath West, (10) Klamath East, and (11) Interior California Coast Ranges. All of the critical habitat units were largely occupied at the time of listing, may include some smaller areas that were not known to be occupied at the time of listing but have been determined to be essential to the conservation of the species, and are presently occupied by the northern spotted owl. Land ownership of the proposed critical habitat includes Federal, State, and private lands (private lands are intended for inclusion in a critical habitat subunit only in those cases where private land is identified as a component of critical habitat in the subunit description). In Washington, some private lands have been identified in the Spotted Owl Special Emphasis Areas (SOSEAs) that the Washington Forest Practices Board adopted in 1996. We acknowledge that some additional private lands (e.g. subdivisions, small (typically less than 10 ac (4 ha)) properties owned by individual landowners) may have been inadvertently included on the map as an artifact of both the modeling process and limitations on map resolution and accuracy, but any such private lands are not intended to be included in the proposed designation. We are seeking public comments to help us make any needed corrections in the final rule. No Indian lands are included in the critical habitat designation. The approximate area of each proposed critical habitat

unit is shown in Table 3. Table 4 gives a total of critical habitat being proposed by land ownership.

TABLE 3—PROPOSED REVISED CRITICAL HABITAT UNITS FOR THE NORTHERN SPOTTED OWL

[Area estimates reflect all land within critical habitat unit boundaries]

Critical habitat unit	Acres	Hectares
Unit 1—North Coast Olympics:		
Federal	1,457,564	589,855
State	137,318	55,571
Private	939	380
Total	1,595,821	645,806
Unit 2—Oregon Coast Ranges:		
Federal	813,215	329,096
State	77,939	31,541
Total	891,154	360,637
Unit 3—Redwood Coast:		
Federal	299,548	121,223
State	203,102	82,192
Private	1,048,097	423,431
Total	1,550,747	626,847
Unit 4—West Cascades North:		
Federal	709,022	286,931
State	111,222	45,010
Private:	588	238
Total	820,832	332,179
Unit 5—West Cascades Central:		
Federal	1,248,708	505,334
State	57,400	23,229
Private	46,937	18,995
Total	1,353,045	547,558
Unit 6—West Cascades South:		
Federal	1,624,836	657,548
Unit 7—East Cascades North:		
Federal	1,725,491	698,281
State	58,911	23,840
Private	135,067	54,660
Total	1,919,469	776,781
Unit 8—East Cascades South:		
Federal	526,810	213,192
Unit 9—Klamath West:		
Federal	1,281,145	518,460
State	10,461	4,233
Total	1,291,606	522,693
Unit 10—Klamath East:		
Federal	1,108,839	448,732
State	2,840	1,149
Total	1,111,679	449,881
Unit 11—Inner California Coast Ranges:		
Federal	1,229,174	497,429
State	12,123	4,906
Private	35,153	14,202
Total	1,276,450	516,537
Grand total	13,962,449	5,649,660

Note: Area sizes may not sum due to rounding.

TABLE 4—PROPOSED REVISED CRITICAL HABITAT UNITS FOR THE NORTHERN SPOTTED OWL, DESCRIBING AREA INCLUDED UNDER DIFFERENT LANDOWNERSHIPS

	Acres	Hectares
USFS	9,527,128	3,855,492
BLM	1,483,666	600,419
NPS	998,585	404,113
State	671,036	271,558
Private	1,267,704	512,279
Other Federal (DOD)	14,330	5,799
Indian	0	0
Total	13,962,449	5,649,660

We present brief descriptions of all units and their subunits below.

Unit 1: North Coast Ranges and Olympic Peninsula (NCO)

Unit 1 consists of 1,595,821 ac (645, 806 ha), and contains five subunits. This unit consists of the Oregon and Washington Coast Ranges Section M242A, based on section descriptions of forest types from Ecological Subregions of the United States (McNab and Avers 1994a, Section M242A). This region is characterized by high rainfall, cool to moderate temperatures, and generally low topography (1,470 to 2,460 ft (448 to 750 m)). High elevations and cold temperatures occur in the interior portions of the Olympic Peninsula, but spotted owls in this area are limited to the lower elevations (less than 2,950 ft (900 m)). Forests in the NCO are dominated by western hemlock, Sitka spruce, Douglas-fir, and western red cedar (*Thuja plicata*). Hardwoods are limited in species diversity (consist mostly of bigleaf maple and red alder (*Alnus rubra*)) and distribution within this region, and typically occur in riparian zones. Root pathogens like laminated root rot (*Phellinus weirii*) are important gap formers, and vine maple (*A. circinatum*), among others, fills these gaps. Because Douglas-fir dwarf mistletoe is unusual in this region, spotted owl nesting habitat consists of stands providing very large trees with cavities or deformities. A few nests are associated with western hemlock dwarf mistletoe (*Arceuthobium tsugense* subsp. *tsugense*). Spotted owl diets are dominated by species associated with mature to late-successional forests (flying squirrels, red tree voles), resulting in similar definitions of habitats used for nesting/roosting and foraging by spotted owls.

Subunit Descriptions—Unit 1

NCO–1. The NCO–1 subunit consists of approximately 747,000 ac (302,300 ha) in Clallam, Jefferson, Grays Harbor, and Mason Counties, Washington, and comprises lands managed by the National Park Service, Forest Service, State of Washington, and private landowners. Of this subunit, 421,078 ac (170,404 ha) are managed as part of the Olympic National Park as a Congressionally reserved or wilderness area under the NWFP and are proposed for exclusion in the final designation. The FS manages 233,116 ac (94,339 ha) as Late-successional Reserves to maintain functional, interactive, late-successional and old-growth forest ecosystems; 11,119 ac (4,500 ha) as Congressionally reserved or wilderness areas (proposed for exclusion); and 80,728 ac (32,669 ha) under the Matrix land use allocation where multiple uses occur, including most timber harvest and other silvicultural activities. Private landowners manage 939 ac (380 ha) for various uses within the Hoh-Clearwater Spotted Owl Special Emphasis Area (SOSEA), including maintenance of spotted owl habitat for demographic and dispersal support of habitat on Federal lands and will be considered for exclusion in the final designation. Threats in this subunit include current and past timber harvest, competition with barred owls, and isolation on a peninsula (along with subunit NCO–2). This subunit is expected to function primarily for demographic support of the overall population. NCO–1 is located primarily in the watersheds of Lyre, Hoko, Soleduck, Hoh, Quinault, Queets, and Clearwater rivers, and includes the northern part of the Lower Chehalis River watershed.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 94 percent of the area of NCO–1 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

NCO–2. The NCO–2 subunit consists of approximately 494,477 ac (200,108 ha) in Kitsap, Clallam, Jefferson, Grays Harbor, and Mason Counties, Washington, and comprises lands managed by the National Park Service, and Forest Service. Of this subunit, 226,223 ac (91,549 ha) are managed as part of the Olympic National Park as a Congressionally reserved or wilderness area under the NWFP and are proposed for exclusion in the final designation. The FS manages 171,649 ac (69,464 ha) as Late-successional Reserves to maintain functional, interactive, late-successional and old-growth forest ecosystems; 50,713 ac (20,523 ha) as Congressionally reserved or wilderness areas (also proposed for exclusion); and 45,909 ac (18,579 ha) under the Matrix land use allocation where multiple uses occur, including most timber harvest and other silvicultural activities. Threats in this subunit include current and past timber harvest, competition with barred owls, and isolation on a peninsula (along with subunit NCO–1). This subunit is expected to function primarily for demographic support of the overall population. NCO–2 is located primarily in the watersheds of the Elwha, Dungeness, Quilcene, Snow, Skokomish, and Dosewallips rivers.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 95 percent of the area of this subunit was covered by

verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

NCO–3. The NCO–3 subunit consists of approximately 14,313 ac (5,792 ha) in Thurston and Grays Harbor Counties, Washington, and comprises lands managed by the Department of Defense as part of Joint Base Lewis-McChord under their base management plan, which includes timber management. Threats in this subunit include current and past timber harvest, competition with barred owls, limited total habitat area, stand conversion, and isolation from surrounding subunits. This subunit, along with the Mineral Block SOSEA in the WCC–1 subunit and Federal lands adjacent to this SOSEA are meant to provide opportunities for demographic support between the West Cascades Central Unit and the North Coast Olympic Unit. In this subunit, we are considering exemption of lands on Joint Base Lewis-McChord under section 4(a)(3)(B) of the Act.

Available information indicates that subunit NCO–3 was unoccupied by spotted owls at the time of listing. However, this subunit is essential to the conservation of the species because it provides essential habitat connectivity for owls dispersing between occupied habitats in the Olympic Peninsula and the Western Cascades. Populations in the Olympic Peninsula are currently-isolated, and require stepping-stones containing both nesting and dispersal habitat to provide for genetic exchange with other owl populations. Proposed critical habitat in this subunit has the potential to develop sufficient nesting, roosting, and foraging habitat to support a limited number of nesting spotted owls. Opportunities to nest successfully in NCO–3 will increase the likelihood of successful movement of spotted owls between widely separated populations by providing an opportunity for dispersal to occur across generations. The designation of this subunit as critical habitat is necessary because limiting the designation to areas presently occupied by the species would be inadequate to achieve the conservation of the northern spotted owl. Without this subunit, connectivity and demographic support between the Olympic Peninsula and Western Cascades will be lacking, and the Olympic Peninsula population of spotted owls will remain isolated and potentially subject to inbreeding depression and other negative effects associated with isolated populations. The Western Cascades also has been identified as at risk due to low populations numbers and isolation from the Olympic Peninsula (Thomas *et al.* 1990, pp. 66–67). The achievement of a stable population and adequate population distribution, as required by Recovery Criteria 1 and 2 of the Revised Recovery Plan, cannot be met without this essential subunit.

NCO–4. The NCO–4 subunit consists of approximately 132,086 ac (553,453ha) in Clatsop, Columbia, Tillamook, and Washington Counties, Oregon, and comprises Federal lands and lands managed by the State of Oregon. Of this subunit, 122,675 ac (49,645 ha) are managed as part of the Tillamook and Clatsop State Forests for multiple uses including timber revenue production, recreation, and wildlife habitat according to the Northwest Oregon State Forest Management Plan (ODF 2010a, entire) and may be considered for exclusion in the final designation. Federal lands encompass 9,410 ac (3,808 ha) of this subunit and are managed as directed by the NWFP (USDA and USDI 1994, entire). Special management considerations or protection are required in this subunit to address threats from current and past timber harvest and competition with barred owls. This subunit is expected to function primarily for demographic support to the overall population. This subunit is isolated from the nearest subunit to the north but is adjacent to subunit NCO–5 to the south.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 63 percent of the area of NCO–4 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider a large part of this subunit to have been occupied at the time of listing. There are some areas of younger forest in this subunit that may have been unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat in this subunit is especially important for providing for population expansion and additional demographic support in this region. The development of additional suitable habitat in this subunit is needed to support viable spotted owl populations over the long term. The recruitment of additional suitable habitat will also contribute to the successful dispersal of spotted owls, and serve to buffer spotted owls from competition with the barred owl.

NCO–5. The NCO–5 subunit consists of approximately 213,024 ac (86,207 ha) in Yamhill, Lincoln, Tillamook, and Polk Counties, Oregon, and comprises lands managed by the State of Oregon, the BLM and the Forest Service. Of this subunit 14,643 ac (5,925 ha) are managed by the State of Oregon for multiple uses including timber revenue production, recreation, and wildlife habitat according to the Northwest Oregon State Forest Management Plan (ODF 2010a, entire), and may be considered for exclusion from the final critical habitat designation. Federal lands comprise 198,368 ac (80,277 ha) and are managed as directed by the NWFP (USDA and USDI 1994, entire). Special management considerations or protection are required in this subunit to address threats from current and past timber harvest and competition with barred owls. This subunit is expected to function primarily for demographic support to the overall population and north-south connectivity between subunits and CHUs.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 63 percent of the area of NCO–5 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider a large part of this subunit to have been occupied at the time of listing. There are some areas of younger forest in this subunit that may have been unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the

continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat in this subunit is especially important for providing for population expansion and additional demographic support in this region. The development of additional suitable habitat in this subunit is needed to support viable spotted owl populations over the long term. The recruitment of additional suitable habitat will also contribute to the successful dispersal of spotted owls, and serve to buffer spotted owls from competition with the barred owl.

Unit 2: Oregon Coast Ranges (OCR)

Unit 2 consists of 891,166 ac (360,642 ha) and contains six subunits. This unit consists of the southern third of the Oregon and Washington Coast Ranges Section M242A, based on section descriptions of forest types from Ecological Subregions of the United States (McNab and Avers 1994a, Section M242A). We split the section in the vicinity of Otter Rock, OR, based on gradients of increased temperature and decreased moisture that result in different patterns of vegetation to the south. Generally this region is characterized by high rainfall, cool to moderate temperatures, and generally low topography (980 to 2,460 ft (300 to 750 m)). Forests in this region are dominated by western hemlock, Sitka spruce, and Douglas-fir; hardwoods are limited in species diversity (largely bigleaf maple and red alder) and distribution, and are typically limited to riparian zones. Douglas-fir and hardwood species associated with the California Floristic Province (tanoak, Pacific madrone, black oak, giant chinquapin (*Castanopsis chrysophylla*)) increase toward the southern end of the OCR. On the eastern side of the Coast Ranges crest, habitats tend to be drier and dominated by Douglas-fir. Root pathogens like laminated root rot are important gap formers, and vine maple among others fills these gaps. Because Douglas-fir dwarf mistletoe is unusual in this region, spotted owl nesting habitat tends to be limited to stands providing very large trees with cavities or deformities. A few nests are associated with western hemlock dwarf mistletoe. Spotted owl diets are dominated by species associated with mature to late-successional forests (flying squirrels, red tree voles), resulting in similar definitions of habitats used for nesting/roosting and foraging by spotted owls. One significant difference between OCR and NCO is that woodrats comprise an increasing proportion of the diet in the southern portion of the modeling region.

Subunit Descriptions—Unit 2

OCR–1. The OCR–1 subunit consists of approximately 116,576 ac (47,177 ha) in Polk, Benton and Lincoln Counties, Oregon, and comprises lands managed by the State of Oregon, the BLM, and the Forest Service. Of this subunit 7,296 ac (2,953 ha) are managed by the State of Oregon for multiple uses including timber revenue production, recreation, and wildlife habitat according to the Northwest Oregon State Forest Management Plan (ODF 2010a, entire) and may be considered for exclusion in the final critical habitat designation. Federal lands comprise 109,279 ac (44,224 ha) and are managed as directed by the NWFP (USDA and USDI 1994, entire). Congressionally reserved Federal lands in this unit are proposed for exclusion. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest and competition with barred owls. This subunit is expected to function primarily for demographic support to the overall population and north-south connectivity between subunits and CHUs.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 55 percent of the area of OCR–1 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider a large part of this subunit to have been occupied at the time of listing. There are some areas of younger forest in this subunit that may have been unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat in this subunit is especially important for providing for population expansion and additional demographic support in this region. The development of additional suitable habitat in this subunit is needed to support viable spotted owl populations over the long term. The recruitment of additional suitable habitat will also contribute to the successful dispersal of spotted owls, and serve to buffer spotted owls from competition with the barred owl.

OCR–2. The OCR–2 subunit consists of approximately 278,526 ac (112,715 ha) in Lane, Benton, and Lincoln Counties, Oregon, and comprises lands managed by the State of Oregon, the BLM and the Forest Service. Of this subunit 18,648 ac (7,547 ha) are managed by the State of Oregon for multiple uses including timber revenue production, recreation, and wildlife habitat according to the Northwest Oregon State Forest Management Plan (ODF 2010a, entire) and may be considered for exclusion in the final critical habitat designation. Federal lands comprise 259,878 ac (105,169 ha) and are managed as directed by the NWFP (USDA and USDI 1994, entire). Congressionally reserved Federal lands in this unit are proposed for exclusion. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest and competition with barred owls. This subunit is expected to function primarily for demographic support to the overall population and north-south connectivity between subunits.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 77 percent of the area of OCR–2 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

OCR–3. The OCR–3 subunit consists of approximately 198,497 ac (80,329 ha) in Lane and Douglas Counties, Oregon, and comprises lands managed by the State of Oregon, the BLM, and the Forest Service. Of this subunit 4,970 ac (2,011 ha) are managed by the State of Oregon for multiple uses including timber revenue production, recreation, and wildlife habitat according to the Northwest Oregon State Forest

Management Plan (ODF 2010a, entire) and may be considered for exclusion in the final critical habitat designation. Federal lands comprise 193,526 ac (78,317 ha) and are managed as directed by the NWFP (USDA and USDI 1994, entire). Special management considerations or protection are required in this subunit to address threats from current and past timber harvest and competition with barred owls. This subunit is expected to function primarily for demographic support to the overall population and for both north-south and east-west connectivity between subunits.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 97 percent of the area of OCR–3 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

OCR–4. The OCR–4 subunit consists of approximately 9,305 ac (3,766 ha) in Lane and Douglas Counties, Oregon, and comprises lands managed by the BLM as directed by the NWFP (USDA and USDI 1994, entire). Special management considerations or protection are required in this subunit to address threats from current and past timber harvest and competition with barred owls. This subunit is expected to function primarily for east-west connectivity between subunits and CHUs, and between the Oregon coast and the western Cascades.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 43 percent of the area of OCR–4 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider a large part of this subunit to have been occupied at the time of listing. There are some areas of younger forest in this subunit that may have been unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat in this subunit is especially important for providing essential connectivity between currently occupied areas to support the successful dispersal of spotted owls, and may also help to buffer spotted owls from competition with the barred owl.

OCR–5. The OCR–5 subunit consists of approximately 184,248 ac (74,563 ha) in Coos and Douglas Counties, Oregon, and comprises lands managed by the State of Oregon, the BLM, and the Forest Service. Of this subunit 46,994 ac (19,018 ha) are managed by the State of Oregon for multiple uses including sustained economic benefit through timber harvest and management, recreation, and wildlife habitat according to the Elliot State Forest Management Plan (ODF 2011, entire) and may be considered for exclusion in the final critical habitat designation. Federal lands comprise 137,254 ac (55,545 ha) and are managed as directed by the NWFP (USDA and USDI 1994, entire). Special management considerations or protection are required in this subunit to address threats from current and past timber harvest and competition with barred owls. This subunit is expected to function primarily for demographic support to the overall population and for north-south, and potentially east-west, connectivity between subunits.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 94 percent of the area of OCR–5 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

OCR–6. The OCR–6 subunit consists of approximately 84,365 ac (34,141 ha) in Coos and Douglas Counties, Oregon, and comprises lands managed by the BLM as directed by the NWFP (USDA and USDI 1994, entire). Special management considerations or protection are required in this subunit to address threats from current and past timber harvest and competition with barred owls. This subunit is expected to function primarily for demographic support to the overall population and for north-south connectivity between subunits and CHUs.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 97 percent of the area of OCR–6 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

Unit 3: Redwood Coast (RWC)

Unit 3 contains 1,550,747 ac (626,847 ha) and five subunits. This unit consists of the Northern California Coast Ecological Section 263, based on section descriptions of forest types from Ecological Subregions of the United States (McNab and Avers 1994b, entire). This region is characterized by low-lying terrain (0 to 2,950 ft (0 to 900 m)) with a maritime climate, generally mesic conditions, and moderate temperatures. Climatic conditions are rarely limiting to spotted owls at all elevations. Forest communities are dominated by redwood, Douglas-fir-

tanoak forest, coast live oak, and tanoak series. The vast majority of the region is in private ownership, dominated by a few large industrial timberland holdings. The results of numerous studies of spotted owl habitat relationships suggest stump-sprouting and rapid growth rates of redwoods, combined with high availability of woodrats in patchy, intensively-managed forests, enables spotted owls to maintain high densities in a wide range of habitat conditions within the Redwood zone.

Subunit Descriptions—Unit 3

RDC–1. This subunit contains 877,193 ac (354,987 ha) in Curry County, Oregon and in Del Norte, Humboldt, and Trinity Counties, California. There are 188,056 ac (76,104 ha) of Federal lands in the subunit, managed by the Forest Service, National Park Service, and Bureau of Land Management. California State Park System lands make up 110,163 ac (44,581 ha) and are proposed for exclusion in the final critical habitat designation. This subunit contains 578,974 ac (234,302 ha) of private land. A large portion of these lands are included in two large private forests that have Habitat Conservation Plans with conservation strategies for northern spotted owls; these are Green Diamond Resource Company with 136,008 ac (55,041 ha) and Humboldt Redwood Company with 211,700 ac (85,672 ha) and both are proposed for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from the barred owl. Suitable habitat within the subunit is relatively contiguous north-to-south, and is capable of supporting a sustainable subpopulation of owls. We expect that this subunit will provide strong connectivity among the adjacent CHUs to the north (OCR) and east (KLW, ICC). The subunit is weakly connected to the adjacent subunit to the south (RDC–2).

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 78 percent of the area of RDC–1 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

RDC–2. This subunit contains 484,880 ac (196,224 ha) in Mendocino and southwestern Humboldt Counties, California. There are 32,021 ac (12,958 ha) of Federal lands in the subunit, managed by the Bureau of Land Management. California State Park System lands make up 19,115 ac (7,736 ha) and are proposed for exclusion in the final critical habitat designation. The California Department of Forestry and Fire Protection operates the Jackson Demonstration State Forest (48,652 ac (19,689 ha)) for multiple uses including timber production, water quality, wildlife habitat, and research and also may be considered for exclusion. Approximately 385,100 ac (155,845 ha) of private land is included in this subunit. Two large private forest land ownerships may be considered for exclusion. The first is Mendocino Redwood Company, which is in the process of developing a conservation strategy for northern spotted owls under a proposed Habitat Conservation Plan. The second holding is known as the Campbell-Hawthorne lands, owned by the Redwood Forest Foundation, Inc. (RWFI, non-profit) and managed by the Campbell Group, LLC (90,000 acres (36,423 ha)). The Campbell Group has approached us previously to explore the possibility of developing an HCP and more recently to explore a SHA. Three medium-sized private landholdings within this holding, Usal Forest, Big River Forest and Salmon Creek Forest, are under conservation easements and we propose to exclude these lands in the final critical habitat designation. Together, these easement holdings make up 66,513 ac (26,917 ha). Special management considerations or protection are required in this subunit to address threats from the barred owl. Suitable habitat within the subunit is relatively contiguous north-to-south, and is capable of supporting a sustainable subpopulation of owls. The subunit is weakly connected to the adjacent CHU to the east (ICC) and to the coastal subunit to the north (RDC–1); it is relatively well connected to the coastal subunit to the south (RDC–3).

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 85 percent of the area of RDC–2 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

RDC–3. This subunit contains 46,785 ac (18,933 ha) in southwestern Mendocino and northwestern Sonoma Counties, California. These lands are concentrated in the Garcia and Gualala River drainages. There are no Federal lands in the subunit. There are 243 ac (98 ha) of land in the California State Park System and are proposed for exclusion, and the remaining 46,541 ac (18,835 ha) is private land. Two management tracts of the Mendocino Redwood Company (discussed in RDC–2) are located in this subunit: Annapolis (7,044 ac (2,851 ha)) and Garcia River (15,634 ac (6,327 ha)) and may be considered for exclusion in the final critical habitat designation. One medium-sized private landholding, Garcia River Forest (23,864 ac (9,658 ha)), is operated by a nonprofit organization under a conservation easement and we propose to exclude this forest in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from the barred owl. Suitable habitat within the subunit is discontinuous from north-to-south, and may not be capable of supporting a self-sustaining subpopulation of owls without support from the subunit to the north (RDC–2). The subunit is poorly connected to the adjacent CHU to the east (ICC) and to the coastal subunit to the south (RDC–4).

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 80 percent of the area of RDC–3 was covered by verified spotted owl home ranges at the time of

listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

RDC–4. This subunit contains 31.497 ac (12,746 ha) in southwestern Sonoma County, California. These lands are concentrated north of the Russian River. There are no Federal lands in the subunit, and there are 13,421 ac (5,431 ha) of land in the California State Park system and are proposed for exclusion in the final critical habitat designation. Private lands total 18,074 ac (7,315 ha) of mixed forest and grazing land and may be considered for exclusion in the final designation of critical habitat. Developed and undeveloped residential subdivisions, commercially-zoned lands, and individual parcels less than 40 acres that may have been included in the mapped area are not being proposed as critical habitat. There are no industrial forest landholdings in this subunit. Special management considerations or protection are required in this subunit to address threats from the barred owl. Suitable habitat within the subunit is discontinuous throughout, interspersed with grassland, oak woodland, and chaparral, and may not be capable of supporting a self-sustaining subpopulation of owls without support from the subunit to the north (RDC–3). The subunit is poorly connected to the adjacent CHU to the east (ICC) and to the coastal subunit to the south (RDC–5).

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 65 percent of the area of RDC–4 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider a large part of this subunit to have been occupied at the time of listing. There are some areas of younger forest in this subunit that may have been unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat in this subunit is especially important for providing for population expansion and additional demographic support in this region. The development of additional suitable habitat in this subunit is needed to support viable spotted owl populations over the long term. The recruitment of additional suitable habitat will also contribute to the successful dispersal of spotted owls, and serve to buffer spotted owls from competition with the barred owl.

RDC–5. This subunit contains 77,798 acres (31,484 hectares) in southern Marin County, California and represents the southern range limit of the subspecies. No private lands are proposed for designation in this subunit. There are 44,866 ac (18,157 ha) of National Park land within the subunit, and an additional 11,524 ac (4,464 ha) of California State park lands both of which are proposed for exclusion. The Mount Tamalpais Watershed (18,900 ac (7,649 ha)) of the Marin Municipal Water District has been proposed for designation; as have six Open Space Preserves totaling 2,492 ac (1,008 ha) in the Marin County Parks system and may be considered for exclusion in the final designation. Special management considerations or protection are required in this subunit to address incipient threats from the barred owl. Suitable habitat within the subunit is continuous from east to west. It is unknown whether this subunit is capable of supporting a self-sustaining subpopulation of owls without support from the subunit to the north (RDC–4). The lands between this subunit and the nearest subunit to the east (ICC–6) are dominated by agricultural and urban land use, and are very weakly connected.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 82 percent of the area of RDC–5 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

Unit 4: West Cascades North (WCN)

This unit contains 802, 832 ac (332,179 ha) and two subunits. This unit coincides with the northern Western Cascades Section M242B, based on section descriptions of forest types from Ecological Subregions of the United States (McNab and Avers 1994a, Section M242B), combined with the western portion of M242D (Northern Cascades Section), extending from the U.S.-Canadian border south to Snoqualmie Pass in central Washington. It is similar to the Northern Cascades Province of Franklin and Dyrness (1988, pp. 17–20). This region is characterized by high mountainous terrain with extensive areas of glaciers and snowfields at higher elevation. The marine climate brings high precipitation (both annual and summer) but is modified by high elevations and low temperatures over much of this modeling region. The resulting distribution of forest vegetation is dominated by subalpine species, mountain hemlock and silver fir; the western hemlock and Douglas-fir forests typically used by spotted owls are more limited to lower elevations and river valleys (spotted owls are rarely found at elevations greater than 4,200 ft (1,280 m) in this region) grading into the mesic Puget lowland to the west.

Subunit Descriptions—Unit 4

WCN–1. The WCN–1 subunit consists of approximately 613,375 ac (248,224 ha) in Whatcom, Skagit, and Snohomish Counties, Washington, and comprises lands managed by the National Park Service, Forest Service, State of Washington, and private landowners. Of this subunit, 12,649 ac (5,119 ha) are managed as part of the North Cascades National Park and Recreation Area as a Congressionally reserved or wilderness area under the NWFP and we propose to exclude these lands in the final critical habitat designation. The Forest Service manages 433,592 ac (175,469

ha) as Late-successional Reserves to maintain functional, interactive, late-successional, and old-growth forest ecosystems; 66,653 ac (26,974 ha) as Congressionally reserved or wilderness areas (propose to exclude); and 4,873 ac (1,972 ha) under the Matrix land use allocation where multiple uses occur, including most timber harvest and other silvicultural activities. The State of Washington, primarily the Department of Natural Resources manages 95,837 ac (38,784 ha) for multiple uses, including timber revenue production, water quality, recreation and wildlife habitat. Threats in this subunit include current and past timber harvest, competition with barred owls, steep topography with high-elevation ridges that separate relatively small, linear strips of suitable habitat in valley bottoms, and location at the northern limit of the subspecies range. This subunit is expected to function primarily for demographic support of the overall population and to maintain the subspecies distribution in the northernmost portion of its range. WCN–1 is located in the watersheds of the Stillaguamish, Skagit, and Nooksack rivers, and is bounded on the north by the international boundary with British Columbia, Canada. In this subunit, we propose to exclude lands covered under the Washington Department of Natural Resources State Lands HCP.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 92 percent of the area of WCN–1 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

WCN–2. The WCN–2 subunit consists of approximately 206,885 ac (83,723 ha) in King and Snohomish Counties, Washington, and comprises lands managed by the Forest Service, State of Washington, and private landowners. The Forest Service manages 104,821 ac (42,420 ha) as Late-successional Reserves to maintain functional, interactive, late-successional, and old-growth forest ecosystems; 86,274 ac (35,914 ha) as Congressionally reserved or wilderness areas (propose to exclude); and 296 ac (120 ha) under the Matrix land use allocation where multiple uses occur, including most timber harvest and other silvicultural activities. The State of Washington, primarily the Department of Natural Resources manages 15,569 ac (6,300 ha) for multiple uses, including timber revenue production, water quality, recreation, and wildlife habitat. Threats in this subunit include current and past timber harvest, competition with barred owls, and steep topography with high-elevation ridges that separate relatively small, linear strips of suitable habitat in valley bottoms. This subunit has a key role in maintaining connectivity between spotted owl populations, both north to south in the West Cascades and west to east between the West and East Cascades units. This role is shared with the WCC–1 subunit to the south and the ECN–4 subunit to the east. This subunit is also expected to provide demographic support of the overall population. WCN–2 is located in the watersheds of the Snohomish and Cedar/Sammamish rivers. In this subunit, we propose to exclude lands covered under the Washington Department of Natural Resources State Lands HCP.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 79 percent of the area of WCN–2 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

Unit 5: West Cascades Central (WCC)

This unit contains 1,353,045 ac (547,558 ha) and three subunits. This region consists of the midsection of the Western Cascades Section M242B, based on section descriptions of forest types from Ecological Subregions of the United States (McNab and Avers 1994a, Section M242B), extending from Snoqualmie Pass in central Washington south to the Columbia River. It is similar to the Southern Washington Cascades Province of Franklin and Dyrness (1988, pp. 21–23). We separated this region from the northern section based on differences in spotted owl habitat due to relatively milder temperatures, lower elevations, and greater proportion of western hemlock/Douglas-fir forest and occurrence of noble fir (*A. procera*) to the south of Snoqualmie Pass. Because Douglas-fir dwarf mistletoe occurs rarely in this region, spotted owl nest sites are largely limited to defects in large trees, and occasionally nests of other raptors.

Subunit Descriptions—Unit 5

WCC–1. The WCC–1 subunit consists of approximately 384,797 ac (155,722 ha) in King, Pierce, Thurston, Lewis, Kittitas, and Yakima Counties, Washington, and comprises lands managed by the National Park Service, Forest Service, State of Washington, and private landowners. Of this subunit, 79,551 ac (32,193 ha) are managed as part of the Mount Rainier National Park as a Congressionally reserved or wilderness area under the NWFP and we propose to exclude these lands in the final critical habitat designation. The Forest Service manages 189,984 ac (76,884 ha) as Late-successional Reserves to maintain functional, interactive, late-successional, and old-growth forest ecosystems; 35,175 ac (14,235 ha) as Congressionally reserved or wilderness areas (propose to exclude); and 31,329 ac (12,678 ha) under the Matrix land use allocation where multiple uses occur, including most timber harvest and other silvicultural activities. The State of Washington, primarily the Department of Natural Resources manages 3,322 ac (1,345 ha) for multiple uses, including timber revenue production, water quality, recreation, and wildlife habitat. Private landowners manage 45,463 ac (18,398 ha) for various uses within the I–90 West, I–90 East, and Mineral Block SOSEAs, including maintenance of spotted owl habitat for demographic and dispersal support of habitat on Federal lands and will be considered for exclusion in the final designation. Threats in this subunit include current

and past timber harvest, competition with barred owls, and stand conversion. This subunit is expected to provide demographic support of the overall population and to maintain demographic connectivity between the Cascade Range and the Olympic Peninsula in conjunction with subunit NCO–3. WCC–1 is located primarily in the watersheds of the Nisqually, Puyallup, White, Duwamish, and Green rivers, and also includes portions of the Cowlitz River watershed in the Mineral Block SOSEA. In this subunit, we propose to exclude lands covered under the Washington Department of Natural Resources State Lands HCP, the Cedar River Watershed HCP, the Plum Creek Timber Central Cascades HCP, the West Fork Timber HCP, and the Tacoma Water Green River Water Supply Operations and Watershed Protection HCP.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 96 percent of the area of WCC–1 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

WCC–2. The WCC–2 subunit consists of approximately 403,978 ac (163,484 ha) in Pierce, Lewis, Cowlitz, Skamania, and Yakima Counties, Washington, and comprises lands managed by the National Park Service, Forest Service, State of Washington, and private landowners. Congressionally reserved natural areas in Federal ownership are proposed for exclusion. Of this subunit, 44,453 ac (17,989 ha) are managed as part of the Mount Rainier National Park as a Congressionally reserved or wilderness area under the NWFP. The Forest Service manages 116,982 ac (47,341 ha) as Late-successional Reserves to maintain functional, interactive, late-successional, and old-growth forest ecosystems; 78,191 ac (31,643 ha) as Congressionally reserved or wilderness areas; and 164,206 ac (66,452 ha) under the Matrix land use allocation where multiple uses occur, including most timber harvest and other silvicultural activities. Private landowners manage 195 ac (79 ha) for various uses within the Mineral Block SOSEA, including maintenance of spotted owl habitat for demographic and dispersal support of habitat on Federal lands and will be considered for exclusion in the final designation. Threats in this subunit include current and past timber harvest and competition with barred owls. This subunit is expected to provide demographic support of the overall population. WCC–2 is located primarily in the Cowlitz River watersheds west of the Cascade Crest and the headwaters of the Naches River watershed east of the Crest. In this subunit, we propose to exclude lands covered under the Washington Department of Natural Resources State Lands HCP, the West Fork Timber HCP, and the Port Blakely Tree Farms L.P. (Morton Block) SHA, Landowner Option Plan, and Cooperative Habitat Enhancement Agreement in the final critical habitat designation.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 96 percent of the area of WCC–2 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

WCC–3. The WCC–3 subunit consists of approximately 499,449 ac (202,120 ha) in Clark, Skamania, and Yakima Counties, Washington, and comprises lands managed by the Forest Service, the State of Washington, and private landowners. The Forest Service manages 286,220 ac (115,829 ha) as Late-successional Reserves to maintain functional, interactive, late-successional, and old-growth forest ecosystems; 32,862 ac (13,299 ha) as Congressionally reserved or wilderness areas (propose to exclude); and 125,488 ac (50,783 ha) under the Matrix land use allocation where multiple uses occur, including most timber harvest and other silvicultural activities. The State of Washington, primarily the Department of Natural Resources, manages 63,504 ac (21,652 ha) in the Siouxon and Columbia Gorge SOSEAs for multiple uses, including timber revenue production, water quality, recreation and wildlife habitat. Private landowners manage 1,746 ac (706 ha) for various uses within the Siouxon and Columbia Gorge SOSEAs, including maintenance of spotted owl habitat for demographic and dispersal support of habitat on Federal lands and will be considered for exclusion in the final designation. Threats in this subunit include current and past timber harvest, competition with barred owls, and the Columbia River as an impediment to spotted owl dispersal. This subunit is expected to provide demographic support of the overall population and an opportunity for demographic exchange between the WCC Unit and the WCS Unit. WCC–3 is located primarily in the watersheds of the Lewis, Wind, and White Salmon rivers, and is bounded on the south by the Columbia River. In this subunit, we propose to exclude lands covered under the Washington Department of Natural Resources State Lands HCP.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 96 percent of the area of WCC–3 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and

buffering from competition with the barred owl.

Unit 6: West Cascades South (WCS)

Unit 6 contains 1,624,900 ac (657,574 ha) and contains six subunits. This unit consists of the southern portion of the Western Cascades Section M242B, based on section descriptions of forest types from Ecological Subregions of the United States (McNab and Avers 1994a, Section M242B), and extends from the Columbia River south to the North Umpqua River. We separated this region from the northern section due to its relatively milder temperatures, reduced summer precipitation due to the influence of the Willamette Valley to the west, lower elevations, and greater proportion of western hemlock/Douglas-fir forest. The southern portion of this region exhibits a gradient between Douglas-fir/western hemlock and increasing Klamath-like vegetation (mixed conifer/evergreen hardwoods) which continues across the Umpqua divide area. The southern boundary of this region is novel and reflects a transition to mixed-conifer forest (Franklin and Dyrness 1988, pp. 23–24, 137–143). The importance of Douglas-fir dwarf mistletoe increases to the south in this region, but most spotted owl nest sites in defective large trees, and occasionally nests of other raptors.

Subunit Descriptions—Unit 6

WCS–1. The WCS–1 subunit consists of approximately 177,738 ac (71,928 ha) in Multnomah, Hood River, and Clackamas Counties, Oregon, and comprises only Federal lands managed by the BLM and the Forest Service under the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest and competition with barred owls. This subunit is expected to function primarily for demographic support to the overall population, as well as north-south and east-west connectivity between subunits and CHUs.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 88 percent of the area of WCS–1 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

WCS–2. The WCS–2 subunit consists of approximately 195,833 ac (79,251 ha) in Clackamas, Marion, and Wasco Counties, Oregon, and comprises only Federal lands managed by the BLM and the Forest Service under the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest and competition with barred owls. This subunit is expected to function primarily for demographic support to the overall population, as well as north-south connectivity between subunits.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 82 percent of the area of WCS–2 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011 p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

WCS–3. The WCS–3 subunit consists of approximately 374,061 ac (151,377 ha) in Clackamas, Marion, Linn, and Lane Counties, Oregon, and comprises lands managed by the State of Oregon, the BLM, and the Forest Service. Congressionally reserved natural areas in Federal ownership are proposed for exclusion. Of this subunit, 183 ac (74 ha) are managed by the State of Oregon primarily for recreation (Oregon Administrative Rules, ch. 736, entire). The remaining 373,878 ac (151,303 ha) are Federal lands managed as directed by the NWFP (USDA and USDI 1994, entire). Special management considerations or protection are required in this subunit to address threats from current and past timber harvest and competition with barred owls. This subunit is expected to function primarily for demographic support to the overall population, as well as north-south connectivity between subunits.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 85 percent of the area of WCS–3 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

WCS–4. The WCS–4 subunit consists of approximately 453,146 ac (183,382 ha) in Lane and Douglas Counties, Oregon, and comprises only Federal lands managed by the BLM and the Forest Service under the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest and competition with barred owls. This subunit is expected to function primarily for demographic support to the overall population, as well as north-south connectivity between subunits.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 86 percent of the area of WCS–4 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

WCS–5. The WCS–5 subunit consists of approximately 370,253 ac (149,836 ha) in Lane and Douglas Counties, Oregon, and comprises only Federal lands managed by the Forest Service under the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest and competition with barred owls. This subunit is expected to function primarily for demographic support to the overall population, as well as north-south and east-west connectivity between subunits and CHUs.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 83 percent of the area of WCS–5 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

WCS–6. The WCS–6 subunit consists of approximately 104,650 ac (42,351 ha) in Lane, Klamath and Douglas Counties, Oregon, and is managed by the BLM and the Forest Service as directed by the NWFP (USDA and USDI 1994, entire). Special management considerations or protection are required in this subunit to address threats from current and past timber harvest and competition with barred owls. This subunit is expected to function primarily for east-west connectivity between subunits and CHUs, and between the Oregon coast and the western Cascades.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 97 percent of the area of WCS–6 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

Unit 7: East Cascades North (ECN)

Unit 7 contains 1,919,469 ac (776,781 ha) and nine subunits. This unit consists of the eastern slopes of the Cascade range, extending from the Canadian border south to the Deschutes National Forest near Bend, OR. Terrain in portions of this region is glaciated and steeply dissected. This region is characterized by a continental climate (cold, snowy winters and dry summers) and a high-frequency/low-mixed severity fire regime. Increased precipitation from marine air passing east through Snoqualmie Pass and the Columbia River has resulted in an increase of moist forest conditions in this region (Hessburg *et al.* 2000b, p. 165). Forest composition, particularly the presence of grand fir and western larch, distinguishes this modeling region from the southern section of the eastern Cascades. While ponderosa pine forest dominates lower and middle elevations in both this and the southern section, the northern section supports grand fir and Douglas-fir habitat at middle elevations. Dwarf mistletoe provides an important component of nesting habitat, enabling spotted owls to nest within stands of relatively younger, small trees.

Subunit Descriptions—Unit 7

ECN–1. The ECN–1 subunit consists of approximately 135,108 ac (54,676 ha) in Whatcom, Skagit, and Okanogan Counties, Washington, and comprises lands managed by the National Park Service and Forest Service. Of this subunit, 2,634 ac (1,066 ha) are managed as part of the North Cascades National Park and Recreation Area as a Congressionally reserved or wilderness area under the NWFP and we propose to exclude these lands from the final critical habitat designation. The Forest Service manages 78,681 ac (31,841 ha) as Late-successional Reserves to maintain functional, interactive, late-successional and old-growth forest ecosystems; 31,323 ac (12,676 ha) as Congressionally reserved or wilderness areas (propose to exclude); and 22,480 ac (9,097 ha) under the Matrix land use allocation where multiple uses occur, including most timber harvest and other silvicultural activities. Threats in this subunit include current and past timber harvest; competition with barred owls; removal or modification of habitat by forest fires, insects, and diseases; steep topography with high-elevation ridges that separate relatively small, linear, strips of suitable habitat in valley bottoms; and location at the northeastern limit of the range of the subspecies. This subunit is expected to provide demographic support of the overall population and maintain the subspecies distribution in the northeastern portion of its range. ECN–1 is located primarily in the watershed of the Methow River and includes a small portion of the upper Skagit River watershed. It is bounded on the north by the international boundary with British Columbia, Canada.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 41 percent of the area of ECN–1 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and

occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

ECN–2. The ECN–2 subunit consists of approximately 164,310 ac (66,494 ha) in Chelan County, Washington, and comprises lands managed by the National Park Service, and Forest Service. Of this subunit, 48,922 ac (19,798 ha) are managed as part of the North Cascades National Park and Recreation Area as a Congressionally reserved or wilderness area under the NWFP and we propose to exclude these lands in the final critical habitat designation. The Forest Service manages 41,999 ac (16,997 ha) as Late-successional Reserves to maintain functional, interactive, late-successional and old-growth forest ecosystems; 55,618 ac (22,508 ha) as Congressionally reserved or wilderness areas (propose to exclude); and 17,771 ac (7,192 ha) under the Matrix land use allocation where multiple uses occur, including most timber harvest and other silvicultural activities. Threats in this subunit include current and past timber harvest; competition with barred owls; steep topography with high-elevation ridges that separate relatively small, linear, strips of suitable habitat in valley bottoms; the combination of Lake Chelan and the Sawtooth Mountains acting as a barrier to dispersal; and removal or modification of habitat by forest fires, insects, and diseases. This subunit is expected to provide demographic support of the overall population. ECN–2 is located primarily in the watersheds of the Chelan and Entiat rivers.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 34 percent of the area of ECN–2 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

ECN–3. The ECN–3 subunit consists of approximately 423,801 ac (171,506 ha) in Chelan County, Washington, and comprises lands managed by the Forest Service, the State of Washington, and private landowners. The Forest Service manages 186,478 ac (75,465 ha) as Late-successional Reserves to maintain functional, interactive, late-successional and old-growth forest ecosystems; 97,131 ac (39,307 ha) as Congressionally reserved or wilderness areas (propose to exclude); and 112,267 ac (45,433 ha) under the Matrix land use allocation where multiple uses occur, including most timber harvest and other silvicultural activities. The State of Washington, primarily the Department of Natural Resources, manages 5,819 ac (2,355 ha) in the Entiat and North Blewett SOSEAs for multiple uses, including timber revenue production, water quality, recreation, and wildlife habitat. Private landowners manage 22,575 ac (9,136 ha) for various uses within the Entiat and North Blewett SOSEAs, including maintenance of spotted owl habitat for demographic and dispersal support of habitat on Federal lands and will be considered for exclusion in the final designation. Threats in this subunit include current and past timber harvest, competition with barred owls, and removal or modification of habitat by forest fires, insects, and diseases. This subunit is expected to provide demographic support of the overall population. ECN–3 is located primarily in the watershed of the Wenatchee River. In this subunit, we propose to exclude lands covered under the Washington Department of Natural Resources State Lands HCP and the Scofield Corporation HCP.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 71 percent of the area of ECN–3 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

ECN–4. The ECN–4 subunit consists of approximately 303,494 ac (123,224 ha) in Kittitas County, Washington, and comprises lands managed by the Forest Service, the State of Washington, and private landowners. The Forest Service manages 99,040 ac (40,080 ha) as Late-successional Reserves to maintain functional, interactive, late-successional, and old-growth forest ecosystems; 35,507 ac (14,369 ha) as Congressionally reserved or wilderness areas (propose to exclude) and 93,283 ac (37,750 ha) under the Matrix land use allocation where multiple uses occur, including most timber harvest and other silvicultural activities. The State of Washington, primarily the Department of Natural Resources, manages 9,781 ac (3,958 ha) mostly in the I–90 East SOSEA for multiple uses, including timber revenue production, water quality, recreation, and wildlife habitat. Private landowners manage 66,814 ac (27,039 ha) for various uses within the I–90 East SOSEA, including maintenance of spotted owl habitat for demographic and dispersal support of habitat on Federal lands and will be considered for exclusion in the final designation. Threats in this subunit include current and past timber harvest, competition with barred owls, and removal or modification of habitat by forest fires, insects, and diseases. This subunit is expected to provide demographic support of the overall population. This subunit also has a key role in maintaining connectivity between spotted owl populations, both north to south in the East Cascades North Unit and west to east between the West and East Cascades units. This role

is shared with the WCN–2 subunit and the WCC–1 subunit to the west. ECN–4 is located primarily in the Upper Yakima River watershed. In this subunit, we propose to exclude lands covered under the Washington Department of Natural Resources State Lands HCP and the Plum Creek Timber Central Cascades HCP.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 78 percent of the area of ECN–4 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

ECN–5. The ECN–5 subunit consists of approximately 300,384 ac (121,561 ha) in Kittitas and Yakima Counties, Washington, and comprises lands managed by the Forest Service, the State of Washington, and private landowners. The Forest Service manages 115,583 ac (46,775 ha) as Late-successional Reserves to maintain functional, interactive, late-successional, and old-growth forest ecosystems; 95,351 ac (38,587 ha) as Congressionally reserved or wilderness areas (propose to exclude); and 83,692 ac (33,869 ha) under the Matrix land use allocation where multiple uses occur, including most timber harvest and other silvicultural activities. The State of Washington, primarily the Department of Natural Resources, manages 3,400 ac (1,376 ha) mostly in the I–90 East SOSEA for multiple uses, including timber revenue production, water quality, recreation, and wildlife habitat. Private landowners manage 2,322 ac (940 ha) for various uses within the I–90 East SOSEA, including maintenance of spotted owl habitat for demographic and dispersal support of habitat on Federal lands and will be considered for exclusion in the final designation. Threats in this subunit include current and past timber harvest, competition with barred owls, and removal or modification of habitat by forest fires, insects, and diseases. This subunit is expected to provide demographic support of the overall population. ECN–5 is located primarily in the watershed of the Naches River. In this subunit, we propose to exclude lands covered under the Washington Department of Natural Resources State Lands HCP and the Plum Creek Timber Central Cascades HCP.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 85 percent of the area of ECN–5 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

ECN–6. The ECN–6 subunit consists of approximately 169,139 ac (68,448 ha) in Skamania, Yakima, and Klickitat Counties, Washington, and comprises lands managed by the Forest Service, the State of Washington, and private landowners. Of this subunit, 4,466 ac (1,807 ha) are managed as part of the Columbia River Gorge National Scenic Area as a Congressionally reserved area under the NWFP which we propose to exclude in the final critical habitat designation. The Forest Service manages 32,430 ac (13,124 ha) as Late-successional Reserves to maintain functional, interactive, late-successional, and old-growth forest ecosystems; and 49,338 ac (19,967 ha) under the Matrix land use allocation where multiple uses occur, including most timber harvest and other silvicultural activities. The State of Washington, primarily the Department of Natural Resources, manages 39,555 ac (16,007 ha), mostly in the White Salmon SOSEA for multiple uses, including timber revenue production, water quality, recreation, and wildlife habitat. Private landowners manage 43,392 ac (17,560 ha) for various uses within the White Salmon SOSEA, including maintenance of spotted owl habitat for demographic and dispersal support of habitat on Federal lands and will be considered for exclusion in the final designation. Threats in this subunit include current and past timber harvest, competition with barred owls, and the Columbia River as an impediment to spotted owl dispersal. This subunit is expected to provide demographic support of the overall population. ECN–6 is located primarily in the watersheds of the Klickitat and White Salmon rivers, and is bounded on the south by the Columbia River. In this subunit, we propose to exclude lands covered under the Washington Department of Natural Resources State Lands HCP.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 88 percent of the area of ECN–6 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

ECN–7. The ECN–7 subunit consists of approximately 174,949 ac (70,799 ha) in Hood River and Wasco Counties, Oregon, and comprises only Federal lands managed by the Forest Service under the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function primarily for demographic

support to the overall population, as well as north-south and east-west connectivity between subunits and CHUs.

Our evaluation of sites known to be occupied at the time of listing indicate that nearly 100 percent of the area of ECN–7 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

ECN–8. The ECN–8 subunit consists of approximately 157,877 ac (63,891 ha) in Jefferson and Deschutes Counties, Oregon, of Federal lands managed by the Forest Service under the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function primarily for demographic support to the overall population, as well as north-south connectivity between subunits.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 61 percent of the area of ECN–8 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

ECN–9. The ECN–9 subunit consists of approximately 158,126 ac (63,991 ha) in Deschutes and Klamath Counties, Oregon, and comprises only Federal lands managed by the Forest Service under the NWFP (USDA and USDI 1994). Congressionally reserved natural areas in Federal ownership are proposed for exclusion. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function primarily for demographic support to the overall population, as well as north-south connectivity between subunits and CHUs.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 45 percent of the area of ECN–9 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

Unit 8: East Cascades South (ECS)

Unit 8 contains 526,815 ac (213,195 ha) and three subunits. This unit incorporates the Southern Cascades Ecological Section M261D, based on section descriptions of forest types from Ecological Subregions of the United States (McNab and Avers 1994c, Section M261D) and the eastern slopes of the Cascades from the Crescent Ranger District of the Deschutes National Forest south to the Shasta area. Topography is gentler and less dissected than the glaciated northern section of the eastern Cascades. A large expanse of recent volcanic soils (pumice region) (Franklin and Dyrness 1988, pp. 25–26), large areas of lodgepole pine, and increasing presence of red fir (*A. magnifica*) and white fir (and decreasing grand fir) along a south-trending gradient further supported separation of this region from the northern portion of the eastern Cascades. This region is characterized by a continental climate (cold, snowy winters and dry summers) and a high-frequency/low-mixed severity fire regime. Ponderosa pine is a dominant forest type at mid-to-lower elevations, with a narrow band of Douglas-fir and white fir at middle elevations providing the majority of spotted owl habitat. Dwarf mistletoe provides an important component of nesting habitat, enabling spotted owls to nest within stands of relatively younger, smaller trees.

Subunit Descriptions—Unit 8

ECS–1. The ECS–1 subunit consists of approximately 192,523 ac (77,911 ha) in Klamath, Jackson, and Douglas Counties, Oregon, and comprises lands managed by the BLM, the National Park Service, and the Forest Service. Of these acres 21,129 ac (8,550 ha) are under management of the National Park Service and are proposed for exclusion in the final critical habitat designation, while the remaining 170,394 ac (69,361 ha) are BLM and Forest Service lands managed as directed by the NWFP (USDA and USDI 1994, entire). Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function primarily for demographic support to the overall population, as well as north-south and east-west connectivity between subunits and CHUs. This subunit is adjacent to ECS–2 to the south.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 78 percent of the area of ECS–1 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger

forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

ECS–2. The ECS–2 subunit consists of approximately 90,012 ac (36,427 ha) in Klamath and Jackson Counties, Oregon, and Siskiyou County, California, all of which are Federal lands managed by the BLM and Forest Service per the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function primarily for north-south connectivity between subunits, but also for demographic support in this area of sparse Federal land and sparse high-quality nesting habitat.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 77 percent of the area of ECS–2 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

ECS–3. The ECS–3 subunit consists of approximately 112,960 ac (45,713 ha) in Siskiyou County, California, all of which are Federal lands managed by the Forest Service per the NWFP (USDA and USDI 1994, entire). Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. The function of this subunit is to provide demographic support in this area of sparsely distributed high-quality habitat and Federal land, and to provide for population connectivity between subunits to the north and south.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 69 percent of the area of ECS–3 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider a large part of this subunit to have been occupied at the time of listing. There are some areas of younger forest in this subunit that may have been unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat in this subunit is especially important for providing essential connectivity between currently occupied areas to support the successful dispersal of spotted owls, and may also help to buffer spotted owls from competition with the barred owl.

Unit 9: Klamath West (KLW)

Unit 9 contains 1,290,687 ac (522,322 ha) and nine subunits. This unit consists of the western portion of the Klamath Mountains Ecological Section M261A, based on section descriptions of forest types from Ecological Subregions of the United States (McNab and Avers 1994c, Section M261A). A long north-south trending system of mountains (particularly South Fork Mountain) creates a rainshadow effect that separates this region from more mesic conditions to the west. This region is characterized by very high climatic and vegetative diversity resulting from steep gradients of elevation, dissected topography, and the influence of marine air (relatively high potential precipitation). These conditions support a highly diverse mix of mesic forest communities such as Pacific Douglas-fir, Douglas-fir tanoak, and mixed evergreen forest interspersed with more xeric forest types. Overall, the distribution of tanoak is a dominant factor distinguishing the Western Klamath Region. Douglas-fir dwarf mistletoe is uncommon and seldom used for nesting platforms by spotted owls. The prey base of spotted owls within the Western Klamath is diverse, but dominated by woodrats and flying squirrels.

Subunit Descriptions—Unit 9

KLW–1. The KLW–1 subunit consists of approximately 156,075 ac (63,161 ha) in Douglas, Josephine, Curry, and Coos Counties, Oregon, and comprises lands managed by the State of Oregon and the BLM. Of this subunit 7,236 ac (2,928 ha) are managed by the State of Oregon for multiple uses including timber revenue production, recreation, and wildlife habitat according to the Southwest Oregon State Forests Management Plan (ODF 2010b, entire) and may be considered for exclusion in the final critical habitat designation. Federal lands comprise 148,837 ac (60,233 ha) and are managed as directed by the NWFP (USDA and USDI 1994, entire). Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function for demographic support to the overall population and for north-south and east-west connectivity between subunits and CHUs. This subunit sits at the western edge of an important connectivity corridor between coastal Oregon and the western Cascades.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 96 percent of the area of KLW–1 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable

populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

KLW–2. The KLW–2 subunit consists of approximately 150,777 ac (61,017 ha) in Josephine, Curry, and Coos Counties, Oregon, and comprises lands managed by the Forest Service and the BLM as directed by the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function for demographic support to the overall population and for north-south and east-west connectivity between subunits and CHUs.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 71 percent of the area of KLW–2 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

KLW–3. The KLW–3 subunit consists of approximately 111,595 ac (45,161 ha) in Josephine, Curry, and Coos Counties, Oregon, and comprises lands managed by the Forest Service, the BLM and the State of Oregon. There are 110,356 ac (44,660 ha) of Federal lands managed as directed by the NWFP (USDA and USDI 1994, entire). The 837 ac (339 ha) of State of Oregon lands are managed according to the Southwest Oregon State Forests Management Plan (ODF 2010b, entire) and may be considered for exclusion for the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function for demographic support to the overall population and for north-south connectivity between subunits and CHUs.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 88 percent of the area of KLW–3 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

KLW–4. The KLW–4 subunit consists of approximately 155,811 ac (63,055 ha) in Josephine and Jackson Counties, Oregon, and Del Norte and Siskiyou Counties, California, and comprises lands managed by the Forest Service, the BLM, and the NPS that are managed as directed by the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function for demographic support to the overall population and for north-south and east-west connectivity between subunits and CHUs.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 95 percent of the area of KLW–4 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

KLW–5. The KLW–5 subunit consists of approximately 28,622 ac (11,583 ha) in Josephine County, Oregon, and Del Norte and Siskiyou Counties, California, all of which are Federal lands managed by the BLM and Forest Service per the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function for demographic support.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 98 percent of the area of KLW–5 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population

expansion, successful dispersal, and buffering from competition with the barred owl.

KLW–6. The KLW–6 subunit consists of approximately 159,566 ac (64,574 ha) in Del Norte, Humboldt, and Siskiyou Counties, California, all of which are Federal lands managed by the Forest Service as directed by the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function for demographic support.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 91 percent of the area of KLW–6 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

KLW–7. The KLW–7 subunit consists of approximately 302,139 ac (122,271 ha) in Del Norte, Humboldt, and Siskiyou Counties, California, all of which are Federal lands managed by the BLM and Forest Service as directed by the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function for demographic support.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 91 percent of the area of KLW–7 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

KLW–8. The KLW–8 subunit consists of approximately 118,671 ac (48,024 ha) in Siskiyou and Trinity Counties, California, all of which are Federal lands managed by the BLM and Forest Service as directed by the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function for demographic support.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 85 percent of the area of KLW–8 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

KLW–9. The KLW–9 subunit consists of approximately 190,140 ac (76,949 ha) in Humboldt and Trinity Counties, California, all of which are Federal lands managed by the Forest Service as directed by the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function for demographic support.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 89 percent of the area of KLW–9 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

Unit 10: Klamath East (KLE)

Unit 10 contains 1,111,790 ac (449,926 ha) and seven subunits. This unit consists of the eastern portion of the Klamath Mountains Ecological Section M261A, based on section descriptions of forest types from Ecological Subregions of the United States (McNab and Avers 1994c, Section M261A), and portions of the Southern Cascades Ecological Section M261D in Oregon. This region is characterized by a Mediterranean climate, greatly reduced influence of marine air, and

steep, dissected terrain. Franklin and Dyrness (1988, pp. 137–149) differentiate the mixed-conifer forest occurring on the ''Cascade side of the Klamath from the more mesic mixed evergreen forests on the western portion (Siskiyou Mountains),'' and Kuchler (1977) separates out the eastern Klamath based on increased occurrence of ponderosa pine. The mixed-conifer/evergreen hardwood forest types typical of the Klamath region extend into the southern Cascades in the vicinity of Roseburg and the North Umpqua River, where they grade into the western hemlock forest typical of the Cascades. High summer temperatures and a mosaic of open forest conditions and Oregon white oak (*Q. garryana*) woodlands act to influence spotted owl distribution in this region. Spotted owls occur at elevations up to 1,768 m. Dwarf mistletoe provides an important component of nesting habitat, enabling spotted owls to nest within stands of relatively younger, small trees.

Subunit Descriptions—Unit 10

KLE–1. The KLE–1 subunit consists of approximately 262,810 ac (106,355 ha) in Jackson and Douglas Counties, Oregon, and comprises Federal lands managed by the Forest Service and the BLM under the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function primarily for demographic support to the overall population, as well as north-south and east-west connectivity between subunits and CHUs.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 84 percent of the area of KLE–1 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

KLE–2. The KLE–2 subunit consists of approximately 110,477 ac (44,709ha) in Josephine and Douglas Counties, Oregon, and comprises Federal lands managed by the Forest Service and the BLM under the NWFP (USDA and USDI 1994, entire). Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function primarily for east-west connectivity between subunits and CHUs, but also for demographic support. This subunit facilitates spotted owl movements between the western Cascades and coastal Oregon and the Klamath Mountains.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 92 percent of the area of KLE–2 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

KLE–3. The KLE–3 subunit consists of approximately 110,484 ac (44,711 ha) in Jackson, Josephine, and Douglas Counties, Oregon, and comprises Federal lands managed by the Forest Service and the BLM under the NWFP (USDA and USDI 1994, entire). Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function primarily for east-west connectivity between subunits and CHUs, but also for demographic support. This subunit facilitates spotted owl movements between the western Cascades and coastal Oregon and the Klamath Mountains.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 97 percent of the area of KLE–3 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

KLE–4. The KLE–4 subunit consists of approximately 307,339 ac (124,376 ha) in Jackson, Klamath, and Douglas Counties, Oregon, and comprises Federal lands managed by the NPS, Forest Service, and the BLM under the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function primarily for east-west connectivity between subunits and CHUs, but also for demographic support.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 81 percent of the area of KLE–4 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and

occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

KLE–5. The KLE–5 subunit consists of approximately 37,646 ac (15,325,ha) in Jackson County, Oregon, and comprises lands managed by the BLM and the State of Oregon. The 37,606 ac (15,219 ha) of BLM land are managed per the NWFP (USDA and USDI 1994, entire) while the State of Oregon lands are managed under the Southwest Oregon State Forests Management Plan (ODF 2010b, entire) and may be considered for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function primarily for north-south connectivity between subunits, but also for demographic support.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 86 percent of the area of KLE–5 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

KLE–6. The KLE–6 subunit consists of approximately 167,089 ac (67,619 ha) in Jackson County, Oregon, and Siskiyou County, California, all of which are Federal lands managed by the BLM and Forest Service per the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function primarily for north-south connectivity between subunits, but also for demographic support.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 97 percent of the area of KLE–6 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

KLE–7. The KLE–7 subunit consists of approximately 73,749 ac (29,845 ha) in Siskiyou County, California, all of which are Federal lands managed by the BLM and Forest Service per the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function for demographic support and also for connectivity across the landscape.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 96 percent of the area of KLE–7 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

Unit 11: Interior California Coast (ICC)

Unit 11 contains 1,276,450 ac (516,537 ha) and eight subunits. This unit consists of the Northern California Coast Ranges ecological Section M261B, based on section descriptions of forest types from Ecological Subregions of the United States (McNab and Avers 1994c, Section M261B), and differs markedly from the adjacent redwood coast region. Marine air moderates winter climate, but precipitation is limited by rainshadow effects from steep elevational gradients (100 to 2,400 m.) along a series of north-south trending mountain ridges. Due to the influence of the adjacent Central Valley, summer temperatures in the interior portions of this region are among the highest within the spotted owl's range. Forest communities tend to be relatively dry mixed-conifer, blue and Oregon white oak, and the Douglas-fir tanoak series. Spotted owl habitat within this region is poorly known; there are no DSAs, and few studies have been conducted here. Spotted owl habitat data obtained during this project suggests that some spotted owls occupy steep canyons dominated by live oak and Douglas-fir; the distribution of dense conifer habitats is limited to higher elevations on the Mendocino National Forest.

Subunit Descriptions—Unit 11

ICC–1. The ICC–1 subunit consists of approximately 352,275 ac (142,561 ha) in Humboldt, Trinity, Shasta, and Tehama Counties, California, all of which are Federal lands managed by the BLM and the Forest Service per the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function primarily for demographic support, but also for connectivity between subunits and CHUs.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 97 percent of the area of ICC–1 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

ICC–2. The ICC–2 subunit consists of approximately 224,779 ac (90,956 ha) in Humboldt and Trinity Counties, California, all of which are Federal lands managed by the BLM and the Forest Service per the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function primarily for demographic support, but also for connectivity between subunits and CHUs.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 98 percent of the area of ICC–2 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

ICC–3. The ICC–3 subunit consists of approximately 257,668 ac (104,274 ha) in Trinity, Tehama, and Mendocino Counties, California, all of which are Federal lands managed by the BLM and the Forest Service per the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function primarily for demographic support, but also for north-south connectivity between subunits.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 89 percent of the area of ICC–3 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

ICC–4. The ICC–4 subunit consists of approximately 173,199 ac (70,091 ha) in Mendocino, Glenn, and Colusa Counties, California, all of which are Federal lands managed by the BLM and Forest Service per the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function primarily for demographic support.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 93 percent of the area of ICC–4 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

ICC–5. The ICC–5 subunit consists of approximately 47,243 ac (19,119 ha) in Lake and Mendocino Counties, California, all of which are Federal lands managed by the Forest Service per the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion in the final critical habitat

designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function primarily for demographic support, but also for connectivity between subunits and CHUs.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 78 percent of the area of ICC–5 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

ICC–6. The ICC–6 subunit consists of approximately 51,519 ac (20,849 ha) in Napa and Sonoma Counties, California. It is comprised largely of privately owned lands, which may be considered for exclusion from the final designation, along with some State and Federal lands. Residential subdivisions, commercially-zoned lands, and individually-owned parcels less than 40 acres that may have been included in the mapped area are not being proposed as critical habitat. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. The expected function of this subunit is to provide demographic support to an isolated population.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 90 percent of the area of ICC–6 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

ICC–7. The ICC–7 subunit consists of approximately 132,386 ac (53,575 ha) in Trinity and Shasta Counties, California, all of which are Federal lands managed by the BLM, NPS, and the Forest Service per the NWFP (USDA and USDI 1994, entire). Congressionally reserved natural areas in Federal ownership are proposed for exclusion in the final critical habitat designation. Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function both for demographic support and for east-west connectivity between subunits in an area of sparse Federal ownership.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 73 percent of the area of ICC–7 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

ICC–8. The ICC–8 subunit consists of approximately 73,492 ac (29,741 ha) in Siskiyou and Shasta Counties, California, all of which are Federal lands managed by the BLM and the Forest Service per the NWFP (USDA and USDI 1994, entire). Special management considerations or protection are required in this subunit to address threats from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function both for demographic support and for connectivity between subunits in an area of sparse Federal ownership.

Our evaluation of sites known to be occupied at the time of listing indicate that approximately 84 percent of the area of ICC–8 was covered by verified spotted owl home ranges at the time of listing. When combined with likely occupancy of suitable habitat and occupancy by non-territorial owls and dispersing subadults, we consider this subunit to have been largely occupied at the time of listing. In addition, there may be some smaller areas of younger forest within the habitat mosaic of this subunit that were unoccupied at the time of listing. We have determined that all of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of spotted owl habitat (USFWS 2011, p. ix). The increase and enhancement of spotted owl habitat is necessary to provide for viable populations of spotted owls over the long term by providing for population expansion, successful dispersal, and buffering from competition with the barred owl.

Effects of Critical Habitat Designation

Section 7 Consultation

Section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that any action they fund, authorize, or carry out is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat of such species. In addition, section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any agency action which is likely to jeopardize the continued existence of any species proposed to be listed under the Act or result in the destruction or adverse modification of proposed critical habitat.

Decisions by the 5th and 9th Circuit Courts of Appeals have invalidated our regulatory definition of ''destruction or adverse modification'' (50 CFR 402.02) (see *Gifford Pinchot Task Force* v. *U.S. Fish and Wildlife Service,* 378 F. 3d 1059 (9th Cir. 2004) and *Sierra Club* v. *U.S. Fish and Wildlife Service et al.,* 245 F.3d 434, 442 (5th Cir. 2001)), and we do not rely on this regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat. Under the statutory provisions of the Act, we determine destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would continue to serve its intended conservation role for the species.

If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency (action agency) must enter into consultation with the Service. Examples of actions that are subject to the section 7 consultation process are actions on State, Indian, local, or private lands that require a Federal permit (such as a permit from the U.S. Army Corps of Engineers under section 404 of the Clean Water Act (33 U.S.C. 1251 *et seq.*) or a permit from the Service under section 10 of the Act) or that involve some other Federal action (such as funding from the Federal Highway Administration, Federal Aviation Administration, or the Federal Emergency Management Agency). Federal actions not affecting listed species or critical habitat, and actions on State, Indian, local, or private lands that are not federally funded or authorized, do not require section 7 consultation.

As a result of section 7 consultation, we document compliance with the requirements of section 7(a)(2) through our issuance of:

(1) A concurrence letter for Federal actions that may affect, but are not likely to adversely affect, listed species or critical habitat; or

(2) A biological opinion for Federal actions that may affect, or are likely to adversely affect, listed species or critical habitat.

When we issue a biological opinion concluding that a project is likely to jeopardize the continued existence of a listed species and/or destroy or adversely modify critical habitat, we provide reasonable and prudent alternatives to the project, if any are identifiable, that would avoid the likelihood of jeopardy and/or destruction or adverse modification of critical habitat. We define ''reasonable and prudent alternatives'' (at 50 CFR 402.02) as alternative actions identified during consultation that:

(1) Can be implemented in a manner consistent with the intended purpose of the action,

(2) Can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction,

(3) Are economically and technologically feasible, and

(4) Would, in the Director's opinion, avoid the likelihood of jeopardizing the continued existence of the listed species and/or avoid the likelihood of destroying or adversely modifying critical habitat.

Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of the project. Costs associated with implementing a reasonable and prudent alternative are similarly variable.

Regulations at 50 CFR 402.16 require Federal agencies to reinitiate consultation on previously reviewed actions in instances where we have listed a new species or subsequently designated critical habitat that may be affected and the Federal agency has retained discretionary involvement or control over the action (or the agency's discretionary involvement or control is authorized by law). Consequently, Federal agencies sometimes may need to request reinitiation of consultation with us on actions for which formal consultation has been completed, if those actions with discretionary involvement or control may affect subsequently listed species or designated critical habitat.

Determinations of Adverse Effects and Application of the ''Adverse Modification'' Standard

Section 4(b)(8) of the Act requires us to briefly evaluate and describe, in any proposed or final regulation that designates critical habitat, activities involving a Federal action that may destroy or adversely modify such habitat, or that may be affected by such designation.

Section 7(a)(2) of the Act requires Federal agencies to ensure their actions do not jeopardize the continued existence of listed species or destroy or adversely modify critical habitat. The key factor involved in the destruction/adverse modification determination for a proposed Federal agency action is whether the affected critical habitat would continue to serve its intended conservation role for the species with implementation of the proposed action after taking into account any anticipated cumulative effects (USFWS 2004, *in litt.* entire). Activities that may destroy or adversely modify critical habitat are those that alter the physical or biological features to an extent that appreciably reduces the conservation value of critical habitat for the northern spotted owl. As discussed above, the role of critical habitat is to support life-history needs of the species and provide for the conservation of the species.

In general, there are five possible outcomes in terms of how proposed Federal actions may affect the PCEs or physical and biological features of northern spotted owl critical habitat: (1) No effect; (2) wholly beneficial effects (e.g., improve habitat condition); (3) both short-term adverse effects and long-term beneficial effects; (4) insignificant or discountable adverse effects; or (5) wholly adverse effects. Actions with no effect on the PCEs and physical and biological features of northern spotted owl critical habitat do not require section 7 consultation, although such actions may still have adverse or beneficial effects on the species itself that require consultation. Actions with effects to the PCEs or physical and biological features of northern spotted owl critical habitat that are discountable, insignificant, or wholly beneficial are considered as not likely to adversely affect critical habitat and do not require formal consultation if the Service concurs in writing with that Federal action agency determination. Actions that are likely to adversely affect the physical or biological features of northern spotted owl critical habitat require formal consultation and the preparation of a Biological Opinion by the Service. The Biological Opinion sets forth the basis for our section 7(a)(2) determination as to whether the proposed Federal action is likely to destroy or adversely modify northern spotted owl critical habitat.

Activities that may destroy or adversely modify critical habitat are those that alter the essential physical or biological features of the critical habitat to an extent that appreciably reduces the conservation value of the critical habitat for the listed species. As discussed above, the conservation role or value of northern spotted owl critical habitat is to adequately support the life-history needs of the species to the extent that well-distributed and inter-connected northern spotted owl nesting populations at habitat carrying capacity levels are likely to persist within properly functioning ecosystems at the critical habitat unit and range-wide scales.

In areas occupied at the time of listing, proposed Federal actions that may affect the essential physical or biological features of northern spotted

owl critical habitat will trigger the consultation requirements under section 7 of the Act and compliance with the section 7(a)(2) standard described above. Similarly, in areas that may have been unoccupied at the time of listing, proposed Federal actions that may affect the habitat qualities that served as the basis for the determination that the area is essential to the conservation of the species will trigger these requirements as well. The consultation process evaluates how a proposed action is likely to affect the capability of the critical habitat to support northern spotted owl nesting, roosting, foraging, or dispersal by considering the scales at which the life-history requirements of the northern spotted owl are based regardless of the species' presence or absence. For an action that may affect critical habitat, the next step is to determine whether it is likely to adversely affect critical habitat. For example, where a project is designed to reduce fuels such that the effect of wildfires will be reduced but will also reduce foraging opportunities within treatment areas, established interagency consultation teams should determine whether the proposed project has more than an insignificant impact on the foraging PCEs for northern spotted owls. A localized reduction in foraging habitat within a stand may have such a small impact on foraging PCEs within the stand that a not likely to adversely affect determination is appropriate. Similarly, a hazard tree removal project in a stand with many suitable nest trees may have such a minimal reduction in nesting PCEs of that stand that the effect to nesting habitat is negligible.

Scale and context are especially important in evaluating the potential effects of forest management on northern spotted owl habitat. The degree to which various forest management activities are likely to affect the capability of the critical habitat to support northern spotted owl nesting, roosting, foraging, or dispersal will vary depending on factors such as the scope and location of the action and the quantity of the critical habitat affected. In addition, the evaluation of actions that may affect critical habitat for the northern spotted owl for purposes of completing the section 7(a)(2) analysis for the destruction or adverse modification determination should consider the effects of the action on the factors that were the basis for determining the area to meet the definition of critical habitat. Thus when conducting section 7 consultations, the factors to be considered may include, but are not limited to:

- The extent of the proposed action, including its temporal and spatial scale, relative to the critical habitat subunit within which it occurs.
- The specific purpose for which that subunit was identified and designated as critical habitat.
- The impact of the proposed action on the subunit's likelihood of serving its intended conservation function or purpose.
- The overall consistency of the proposed action with the intent of the recovery plan or other landscape-level conservation plans.

In general, we would anticipate that management actions that are consistent with the overall purpose for which a critical habitat unit was designated would be determined as not likely to adversely affect or destroy or adversely modify critical habitat. Such actions include activities whose intent is to restore ecological processes or long-term forest health to forested landscapes that contain spotted owl habitat, such as those actions described in the Revised Recovery Plan for the Northern Spotted Owl (USFWS 2011) and elsewhere in this document.

Section 7 consultations need to consider the temporal and spatial scale of impacts a proposed action may have on the PCEs or essential habitat qualities associated with the affected critical habitat subunit(s). Actions that have a relatively short-lived temporal impact will likely not adversely affect the critical habitat subunit's role and function in conserving spotted owls and on that basis generally warrant a not likely to adversely affect or a no-destruction or adverse modification conclusion under formal consultation. Likewise, proposed actions that are small in spatial scale relative to the subunit's size and overall habitat condition are also potentially not likely to adversely affect the critical habitat's role and function. As a general rule of thumb, when conducting section 7 consultation, we recommend consideration of a scale that is relevant to the needs and biology of the spotted owl. As outlined in Appendix C of the Revised Recovery Plan (USFWS 2011, p. C–15), spotted owls select nest sites (their most specific habitat requirement) based on conditions that exist at a variety of spatial scales beyond the nest site, most notably the ''core area'' surrounding the nest site. While these scales vary by study and location, we believe an area roughly 500 ac (200 ha) in size is a reasonable core area metric for land managers to consider when assessing effects on critical habitat. This 500-ac (200-ha) metric is consistent with the methodology used to construct the habitat model described in Appendix C of the Revised Recovery Plan and for which areas were evaluated for possible designation. We would anticipate that in most cases, restoration and thinning actions (see Special Management Actions and Considerations) at or below this size will likely not adversely affect a given critical habitat subunit; however, such a determination would have to be made on a case-by-case basis, after careful consideration of the specific conditions of the proposed action.

The Service believes that this 500-ac (200-ha) scale is a reasonable extent for evaluating potential effects; the Service would then evaluate whether there is a reasonable certainty that the proposed action would result in a measurable change in the subunit's ability to provide the functions for which it was designated. Caveats to this generalization include the need to consider the subunit's baseline condition and the potential for cumulative effects within the subunit, which can accrue both spatially and temporally. The Service invites public comment on this approach to effects determinations for the northern spotted owl.

Actions resulting in wholly beneficial effects include those that actively promote the development or improve the functionality of critical habitat for the northern spotted owl without causing adverse effects to the essential physical or biological features. Such actions might involve variable-density thinning in forest stands that do not currently support nesting, roosting, or foraging habitat for the northern spotted owl to speed the development of these types of habitats while maintaining dispersal habitat function. Thinning or other treatments in young plantations that do not provide even dispersal habitat (but are capable of providing habitat) would also fall into this effect category, where these actions are specifically designed to accelerate the development of northern spotted owl habitat. Some of these actions may affect critical habitat and would, therefore, require consultation under section 7 of the Act. But because they may be not likely to adversely affect critical habitat, the consultation may be completed informally through the Service's issuance of a concurrence letter as discussed above.

Likewise, if the adverse effects of a proposed Federal action on the physical or biological features of northern spotted owl critical habitat at the 500-ac (200-ha) scale are expected to be discountable (extremely unlikely to occur) or insignificant, that action is

considered not likely to adversely affect northern spotted owl critical habitat. In such cases, the Act's section 7 consultation requirements can be satisfied through the informal concurrence process described above. Examples of such actions may include: Pre-commercial or commercial thinning that does not delay the development of essential physical or biological features; fuel-reduction treatments that have a negligible effect on northern spotted owl foraging habitat within the stand; and the removal of hazard trees where the removal has an insignificant effect on the capability of the stand to provide northern spotted owl nesting opportunities.

Some proposed Federal forest management activities may have short-term adverse effects and long-term beneficial effects on the physical or biological features of northern spotted owl critical habitat. The Revised Recovery Plan for the Northern Spotted Owl anticipates that land managers will actively manage portions of both moist and dry forests to improve stand conditions and forest resiliency, which should benefit the long-term recovery of the northern spotted owl (USFWS 2011, p. III–11). For example, variable thinning in single-story, uniform forest stands to promote the development of multistory structure and nest trees may result in short-term adverse impacts to the habitat's current capability to support owl dispersal and some foraging, but have long-term benefits by creating higher quality habitat that will better support territorial pairs of northern spotted owls. Such activities would have less impact in areas where foraging and dispersal habitat is not limiting. Even though they may have long term beneficial effects, if they have short-term adverse effects, such actions may adversely affect critical habitat and would require formal consultation under section 7 of the Act. For efficiency, such actions could be evaluated under section 7 programmatically at the landscape scale (e.g., National Forest or BLM District).

Habitat conditions in moist/wet and dry/fire-prone forests within the range of the northern spotted owl vary widely as do the types of management activities designed to accelerate or enhance the development of northern spotted owl habitat. ''Wet'' and ''dry'' are ends of a spectrum, not distinct categories that adequately describe the full range of forest types within the range of the northern spotted owl. Because these categories are broad, and conditions on the ground are more variable, land managers and cooperators should have the expectation that multiple forest types may be involved and similar projects in different forest types may not always lead to the same effect determination for purposes of compliance with section 7 of the Act.

Within dry forests, the Revised Recovery Plan emphasizes active forest management that could meet overlapping goals of northern spotted owl conservation, climate change response, and restoration of dry forest ecological structure, composition and process, including wildfire and other disturbances (USFWS 2011, pp. III–20). For the rest of the northern spotted owl's range that is not fire-prone, the Revised Recovery Plan emphasizes habitat management that accelerates the development of future habitat, restores larger habitat blocks, and reduces habitat fragmentation. The following discussion describes the type of management approaches that would be consistent with the revised recovery plan in the West Cascades/Coast Ranges of Oregon and Washington, East Cascades, and the Redwood Coast zones, and a discussion of possible corresponding effect determinations for activities implementing these approaches for purposes of analyzing effects to critical habitat under section 7 of the Act. The Klamath and Northern California Interior Coast Ranges regions contain conditions similar to the three regions discussed below, and similar management approaches would be consistent with the recovery needs of the owl.

West Cascades/Coast Ranges of Oregon and Washington

The primary goal of the Revised Recovery Plan for this portion of the northern spotted owl's range is to conserve stands that support northern spotted owl occupancy or contain high-value northern spotted owl habitat (USFWS 2011, p. III–17). Silvicultural treatments are generally not needed to accomplish this goal. However, there is a significant amount of younger forest that occurs between and around the older stands where silvicultural treatments may accelerate the development of these stands into future northern spotted owl nesting habitat, even if doing so temporarily degrades existing dispersal habitat, as recommended in Recovery Action 6 (USFWS 2011, p. III–19). The Revised Recovery Plan encourages silviculture designed to develop late-successional structural complexity and to promote resilience (USFWS 2011, pp. III–17 to III–19). Restoration or ecological prescriptions can help uniform stands of poor quality develop more quickly into northern spotted owl habitat and provide resiliency in the face of potential climate change impacts in the future. Targeted vegetation treatments could simultaneously increase canopy and age-class diversity, putting those stands on a more efficient trajectory towards nesting and roosting habitat while reducing fuel loads. Introducing varying levels of spatial heterogeneity, both vertically and horizontally, into forest ecosystems can contribute to both of the goals stated above.

While these treatments would be intended to benefit the development of northern spotted owl habitat over time, they may have short-term adverse effects but are not expected to adversely modify the role and function of critical habitat. Additional information about ecological forestry activities in moist forests can be found in the Revised Recovery Plan under *Spotted Owls and Ecological Forestry* (USFWS 2011, p. III–11) and *Habitat Management in Moist Forests* (USFWS 2011, p. III–17).

Similarly, land managers should consider what areas of forest land might be appropriate to create or restore complex early seral forest habitat (USFWS 2011, p. III–14). Ideally, such actions should consist of relatively small patches targeted to younger, mid-seral forest stands that do not cause reductions in higher quality spotted owl habitat, and they should be planned in such a way that their net occurrence on the regional landscape is consistent with ecosystem-based planning targets (e.g., Spies *et al.* 2007a, entire) to provide the physical or biological features that are essential to the conservation of the northern spotted owl. As an example, targeted variable retention harvest in moist forests should be considered where the conservation of complex early seral forest habitat is a localized goal within spotted owl critical habitat. Some researchers have concluded that a focus on older forest conservation on Federal lands in the Pacific Northwest during the last 20 years is leading to a significant reduction in early seral habitat that is important to many species (Hagar 2007, p. 109; Spies *et al.* 2007b, p. 63; Betts *et al.* 2010, p. 2117). Traditional clearcutting on nearby private timber lands does not usually mimic natural disturbance or create viable early seral communities that grow into high-quality habitat (Franklin *et al.* 2002, p. 419; Swanson *et al.* 2010, p. 8). In recent years, variable retention harvest has been increasingly utilized as a way to reconcile the often competing goals of commercial timber production and biodiversity conservation (Carey 2003, p. 128; Rosenvald and Lohmus 2008, p. 2; Aubry *et al.* 2009, p. 399; Baker

2011, entire; Ellis and Betts 2011, p. 1372). It is appropriate to consider vegetation management actions within critical habitat to restore or encourage early seral restoration where such habitat is underrepresented at the landscape ecosystem level and the goal is to conserve landscape and biological diversity (Betts *et al.* 2010, pp. 2126–2127; Messier *et al.* 2012, p. 69). Such actions may adversely affect critical habitat, but they are not expected to adversely modify the role and function of critical habitat at the watershed or larger landscape scale (i.e., subunit or unit).

East Cascades

The Revised Recovery Plan recommends that the dynamic, fire-prone portion of the northern spotted owl's range be actively managed to conserve northern spotted owls, but also address climate change and restore dry forest ecological structure, composition, and processes (e.g., wildfire) to provide for the long-term conservation of the species and its habitat in a dynamic ecosystem (USFWS 2011, pp, III–13, III–20). To do this, management actions will need to be implemented that balance short-term adverse effects with long-term beneficial effects. In some cases, formal consultation on the effects of dry forest management activities on northern spotted owl critical habitat is likely to occur; in other cases, there may be no adverse effects and consultation can be concluded informally.

Management in dry forests should increase the likelihood that northern spotted owl habitat will remain on the landscape longer and develop as part of the dynamic fire- and disturbance-adapted community. Several management approaches can be described for these systems. The first is to maintain adequate northern spotted owl habitat in the near term to allow owls to persist on the landscape in the face of threats from barred owl expansion and habitat alterations from fire and other disturbances. The next is to restore landscapes that are resilient to fire and other disturbances, including those projected to occur with climate change. This will require more than reducing fuels and thinning trees to promote low-severity fires; management will need to develop ''more natural patterns and patch size distributions of forest structure, composition, fuels, and fire regime area'' (Hessburg *et al.* 2007, p. 21).

Our prime objective for vegetation management activities within northern spotted owl critical habitat is to maintain adequate amounts of nesting, roosting, foraging or dispersal habitat where it currently exists and to restore degraded habitat where it is essential to the owl and can be best sustained on the landscape as recommended in the Revised Recovery Plan (USFWS 2011, Section III). Successfully accomplishing these objectives can be facilitated by spatially and temporally explicit landscape assessments that identify areas valuable for northern spotted owl conservation and recovery, as well as areas important for process restoration (e.g., Prather *et al.* 2008, p. 149). Such assessments could answer questions which are frequently asked about proposed forest management activities, namely ''why here?'' and ''why now?'' Providing well-reasoned responses to these questions becomes especially important when restoration activities degrade or remove existing northern spotted owl habitat. By scaling up conservation and restoration planning from the stand to the landscape level, many apparent conflicts may disappear because management actions can be prioritized and spatially partitioned (Prather *et al.* 2008, p. 149; Rieman *et al.* 2010, p. 464). For example, portions of the landscape can be identified where there may be no conflict between objectives, and where relatively aggressive approaches to ecosystem restoration can occur without placing listed species at substantial risk (Prather *et al.* 2008, pp. 147–149; Gaines *et al.* 2010, pp. 2049–2050). Conflicts between objectives will remain in some locations, for example in places where removing younger, shade-intolerant conifers to reduce competition with larger, legacy conifers may result in a substantial decrease in canopy cover that translates into a reduction in northern spotted owl habitat quality. However, when this sort of treatment is well designed, strategically located, and justified within a landscape approach to treatments, it is easier to assess its effectiveness in meeting both owl conservation and forest restoration needs.

Landscape assessments developed at the scale of entire National Forests, Ranger Districts, or BLM Districts have the broad perspective that can improve our ability to estimate effects of our management activities on the function of critical habitat and better identify and prioritize treatment areas and the actions that will restore landscapes while conserving northern spotted owl habitat. The Okanogan-Wenatchee National Forest has developed a landscape evaluation process as part of their forest restoration strategy (USDA 2010, pp. 36–52) that can serve as an example other administrative units can refer to when developing their own assessment approaches. We suggest that the value of such assessments in guiding vegetation management within critical habitat can be enhanced by spatially identifying locations where restoration objectives and northern spotted owl habitat objectives converge, are in conflict, or simply are not an issue. We suggest the following approach for the East Cascades:

(1) Spatially identify and map:

a. Existing northern spotted owl habitat and northern spotted owl nesting sites.

b. Places on the landscape where northern spotted owl habitat is expected to be retained longer on the landscape in the face of disturbance activities such as fire and insect outbreaks.

c. Places on the landscape where key ecosystem structures and processes are at risk and would benefit from restoration (e.g., legacy trees, unique habitats).

(2) Overlay what is known about landscape patterns of vegetation and disturbance processes with items from step 1 above to determine:

a. Stands of high restoration value but low value as existing northern spotted owl habitat.

b. Stands of low restoration value but high value as existing northern spotted owl habitat.

c. Stands of low restoration value and low value as existing northern spotted owl habitat.

d. Stands of high restoration value and high value as existing northern spotted owl habitat.

In locations where there is high restoration value and high value as existing northern spotted owl habitat, a landscape assessment can help to build a strong rationale for impacting owl habitat functionality to achieve broader landscape goals. Conditions that may support management activities in these stands may include, but are not limited to:

(1) The patch of habitat is located in an area where it is likely unsustainable and has the potential for conveying natural disturbances across the landscape in ways that jeopardize large patches of suitable northern spotted owl habitat.

(2) There are nearby areas that are more likely to sustain suitable northern spotted owl habitat and are either currently habitat or will likely develop suitable conditions within the next 30 years.

(3) The patch of habitat does not appear to be associated with a northern spotted owl home range or to promote successful dispersal between existing home ranges.

(4) The area will still retain some habitat function after treatment, while still meeting the intended restoration objective. For example, stands that are suitable as foraging habitat may be degraded post treatment but remain foraging habitat after treatment. Or, stands may be downgraded to dispersal habitat as a result of treatment.

We do not expect the desired landscape conditions will be achieved within the next decade or two, but it will require a longer time to be restored as younger forests develop into northern spotted owl nesting, roosting, and foraging habitat. In the interim, management actions are needed that protect current habitat, especially where it occurs in larger blocks on areas of the landscape where it is more likely to be resistant or resilient to fires and other disturbance agents. Actions are also needed to accelerate the restoration of habitat, especially where it is consistent with overall forest restoration and occurs in those portions of the landscape that are less fire prone or are resilient in the face of these disturbances. The careful application of these types of activities will be necessary to achieve the desired future landscape that is resilient to future disturbances; a landscape in which the natural disturbance process no longer threaten the conservation of the northern spotted owl, but acts to maintain and restore necessary habitat components. As such, we anticipate that projects designed to achieve this goal will need to be of a larger spatial scale as to have a meaningful effect on wildfire behavior, severity, and extent. The effects of these projects will vary depending on existing condition, prescriptions, proximity of habitat, etc. It is likely that such projects may affect northern spotted owl critical habitat and require section 7 consultation.

Some situations also exist in the proposed critical habitat where northern spotted owl habitat has been created through fire suppression activities (e.g., meadow conversion, white fir intrusion), but retention of those forested habitat elements is contrary to the overall goals of ecosystem restoration and long-term security for the owl. Restoration projects that remove these elements, while recommended, may adversely affect northern spotted owls or their critical habitat and may need to be evaluated through the section 7 consultation process. Additional information about restoration activities in dry forests can be found in the Revised Recovery Plan under *Restoring Dry Forest Ecosystems* (USFWS 2011, p. III–32).

Redwood Coast

While the Redwood Coast region of coastal northern California is similar to the West Cascades/Coast region in many respects, there are some distinct differences in northern spotted owl habitat use and diet within this zone. The long growing season, combined with the redwood's ability to resprout from stumps, allows redwood stands to attain suitable stand structure for nesting in a relatively short period of time (40 to 60 years) if legacy structures are present. In contrast to the large, contiguous, older stands desired in other wet provinces, some degree of fine-scale fragmentation in redwood forests appears to benefit northern spotted owls. These openings provide habitat for the northern spotted owl's primary prey, the dusky-footed woodrat. High woodrat abundance is associated with dense shrub and hardwood cover that persists for up to 20 years in recent forest openings created by harvesting or burns. Under dense shrub and hardwood cover, woodrats can forage, build nests, and reproduce, relatively secure from owl predation. These sites quickly become overpopulated and surplus individuals are displaced into adjacent older stands where they become available as owl prey. When developing stands reach an age of around 20 years, understory vegetation is increasingly shaded-out, cover and food sources become scarce, and woodrat abundance declines rapidly. By this time, the stand that once supported a dense woodrat population makes a structural transition into a stand where woodrats are subject to intense owl predation. In northern spotted owl territories within the Redwood Forest zone, active management that creates small openings within foraging habitat can enhance northern spotted owl foraging opportunities and produce or retain habitat suitability in the short term. Actions consistent with this type of land management are not expected to adversely modify critical habitat.

Summary of Adverse Modification

This discussion has covered projects that may or may not require formal section 7 consultation. It is also important to distinguish between a finding that a project is likely to adversely affect critical habitat and a finding at the conclusion of formal consultation that a project is likely to destroy or adversely modify critical habitat; these are two very different outcomes. It is not uncommon for a proposed project to be considered as likely to adversely affect critical habitat and thus require formal consultation, but still warrant a conclusion that it will not destroy or adversely modify critical habitat. An action may destroy or adversely modify critical habitat if it adversely affects the essential physical or biological features to an extent that the intended conservation role of critical habitat for the northern spotted owl is appreciably reduced.

The adverse modification determination is made at the scale of the entire designated critical habitat unless the final critical habitat rule identifies another basis for that determination, such as at the scale of discrete units and/or groups of units necessary for different life cycle phases, units representing distinctive habitat characteristics or gene pools, or units fulfilling essential geographical distribution requirements of the species (USFWS and NMFS 1998, p. 4–39). In the case of spotted owl critical habitat, the adverse modification determination will be made at the scale of the entire designated critical habitat. However, by describing the relationship between the conservation role of affected subunits, units, and the entire designated critical habitat in the biological opinion, a sensitive analytical framework is established for informing the determination of whether a proposed action is likely to appreciably reduce the conservation role of the critical habitat overall. In this way, a proposed action that compromises the capability of a subunit or unit to fulfill its essential conservation role (e.g., demographic, genetic, or distributional support for spotted owl recovery) would represent an appreciable reduction in the conservation value of the entire designated critical habitat. This approach should avoid ''death-by-a-thousand-cuts'' outcomes of formal consultations (i.e., false, no-adverse-modification determinations). This approach will also take into account any redundancy in conservation function that may be associated with affected subunits or units for purposes of informing the significance of project effects relative to the conservation function of the entire designated critical habitat. Such redundancy is likely to decrease the significance of adverse project effects at the scale of the entire designated critical habitat.

As described above, we do not anticipate that activities consistent with the stated management goals or recommended recovery actions of the Revised Recovery Plan for the Northern Spotted Owl (USFWS 2011, Chapters II and III) would constitute adverse modification of critical habitat, even if those activities may have adverse effects in the short term, if the result over the

long term is an improvement in the function of the habitat to provide for the essential life-history needs of the northern spotted owl.

Exemptions

Application of Section 4(a)(3) of the Act

The Sikes Act Improvement Act of 1997 (Sikes Act) (16 U.S.C. 670a) required each military installation that includes land and water suitable for the conservation and management of natural resources to complete an integrated natural resource management plan (INRMP) by November 17, 2001. An INRMP integrates implementation of the military mission of the installation with stewardship of the natural resources found on the base. Each INRMP includes:

(1) An assessment of the ecological needs on the installation, including the need to provide for the conservation of listed species;

(2) A statement of goals and priorities;

(3) A detailed description of management actions to be implemented to provide for these ecological needs; and

(4) A monitoring and adaptive management plan.

Among other things, each INRMP must, to the extent appropriate and applicable, provide for fish and wildlife management; fish and wildlife habitat enhancement or modification; wetland protection, enhancement, and restoration where necessary to support fish and wildlife; and enforcement of applicable natural resource laws.

The National Defense Authorization Act for Fiscal Year 2004 (Pub. L. 108–136) amended the Act to limit areas eligible for designation as critical habitat. Specifically, section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) now provides: ''The Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation.''

We consult with the military on the development and implementation of INRMPs for installations with listed species. We analyzed INRMPs developed by military installations located within the range of the proposed critical habitat designation for the northern spotted owl to determine if they are exempt under section 4(a)(3) of the Act. The following areas are Department of Defense lands with completed, Service-approved INRMPs within the proposed revised critical habitat designation.

Approved INRMPs

Joint Base Lewis-McChord

Joint Base Lewis-McChord (JBLM), formerly known as Fort Lewis, is an 86,500-ac (35,000-ha) U.S. Army military reservation in western Washington, south of Tacoma and the Puget Sound. JBLM contains one of the largest remaining intact forest areas in the Puget Sound basin, with approximately 54,400 ac (22,000 ha) of forests and woodlands, predominantly of the dry Douglas-fir forest type and including some moist forest types (Douglas-fir, red cedar, hemlock). The forested area of JBLM is managed by the Base's Forestry Program, and the primary mission for the JBLM Forest is to provide a variety of forested environments for military training. JBLM has a history of applying an ecosystem management strategy to their forests to provide for multiple conservation goals, which have included promoting native biological diversity, maintaining and restoring unique plant communities, and developing late successional (older) forest structure. There are 14,997 ac (6,069 ha) of lands within the boundary of JBLM currently identified in the proposed critical habitat designation.

JBLM's INRMP, dated July 2006, covers the years 2006 through 2010. This INRMP is in the process of being updated; the Department of the Army informed us that a revised INRMP will be submitted to the Service in 2012 (Steucke 2008, in litt., p. 1). To date, JBLM has managed their forest lands according to their Forest Management Strategy, first prepared for then-Fort Lewis in 1995 by the Public Forestry Foundation based in Eugene, Oregon, in collaboration with The Nature Conservancy. The Forest Management Strategy was last revised in May 2005, and is also in the process of being updated (Forest Management Strategy 2005, entire).

The last INRMP identified management objectives for the conservation of the northern spotted owl. Specifically, the INRMP specified the objective of managing JBLM forests to develop spotted owl habitat characteristics, and indicated desired conditions of the forest to provide for nesting, roosting, foraging. and dispersal habitat (INRMP 2007, p. 3–18). Although northern spotted owls are not currently known to occupy JBLM, it is the only significant Federal ownership in this region of Washington, and it provides the largest contiguous block of forest in this area as well. The potential development of suitable owl habitat at JBLM provides one of the only feasible opportunities for establishing connectivity between owl populations in the Olympic Peninsula and the western Cascades Range. Connectivity allows gene flow between populations, and further maintains northern spotted owl distribution and metapopulation dynamics, which are important components of the recovery strategy for the northern spotted owl (USFWS 2011, p. III–1, III–44). The Forest Management Strategy (2005, p. 82) notes that the mosaic of dry forest, woodland, and prairie at JBLM is very different from typical forest landscapes that support northern spotted owls, and that while suitable habitat for dispersal of northern spotted owls can be achieved in the short term, at least 40 to 50 years may be needed to meet the desired condition for foraging, nesting, and roosting habitat.

JBLM's forest management program has the potential to provide a conservation benefit to the northern spotted owl. However, since their INRMP is currently undergoing revision and is subject to change, we are reserving judgment on whether management under the new INRMP may meet our criteria for exemption from critical habitat at this time. In accordance with section 4(a)(3)(B)(i) of the Act, if we determine prior to our final rulemaking that conservation efforts identified in the INRMP will provide a conservation benefit to the northern spotted owl, we may at that time exempt the identified lands from the final designation of critical habitat.

Exclusions

Application of Section 4(b)(2) of the Act

Section 4(b)(2) of the Act states that the Secretary must designate or make revisions to critical habitat on the basis of the best available scientific data after taking into consideration the economic impact, national security impact, and any other relevant impacts of specifying any particular area as critical habitat. The Secretary may exclude an area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific data available, that the failure to designate such area as critical habitat will result in the extinction of the species.

Under section 4(b)(2) of the Act, we may exclude an area from designated

critical habitat based on economic impacts, impacts to national security, or any other relevant impacts. In considering whether to exclude a particular area from the designation, we must identify the benefits of including the area in the designation, identify the benefits of excluding the area from the designation, and determine whether the benefits of exclusion outweigh the benefits of inclusion. If based on this analysis we make this determination, we can then exclude the area only if such exclusion would not result in the extinction of the species.

When considering the benefits of inclusion for an area, we consider the additional regulatory benefits that area would receive from the protection from adverse modification or destruction as a result of actions with a Federal nexus; the educational benefits of mapping essential habitat for recovery of the listed species; and any benefits that may result from a designation due to State or Federal laws that may apply to critical habitat.

When considering the benefits of exclusion, we consider, among other things, whether exclusion of a specific area is likely to result in the overall conservation of the northern spotted owl through the continuation, strengthening, or encouragement of partnerships and the implementation of management plans or programs that provide equal or more conservation for the northern spotted owl than could be achieved through a designation of critical habitat. The Secretary can consider the existence of conservation agreements and other land management plans with Federal, private, State, and Indian entities when making decisions under section 4(b)(2) of the Act. The Secretary may also consider relationships with landowners, voluntary partnerships, and conservation plans, and weigh the implementation and effectiveness of these against that of designation to determine which provides the greatest conservation value to the listed species. Consideration of relevant impacts of designation or exclusion under section 4(b)(2) may include, but is not limited to, any of the following factors: (1) Whether the plan provides specific information on how it protects the species and the physical and biological features, and whether the plan is at a geographical scope commensurate with the species; (2) whether the plan is complete and will be effective at conserving and protecting the physical and biological features; (3) whether a reasonable expectation exists that conservation management strategies and actions will be implemented, that those responsible for implementing the plan are capable of achieving the objectives, that an implementation schedule exists, and that adequate funding exists; (4) whether the plan provides assurances that the conservation strategies and measures will be effective (i.e., identifies biological goals, has provisions for reporting progress, and is of a duration sufficient to implement the plan); (5) whether the plan has a monitoring program or adaptive management to ensure that the conservation measures are effective; (6) the degree to which the record supports a conclusion that a critical habitat designation would impair the benefits of the plan; (7) the extent of public participation; (8) demonstrated track record of implementation success; (9) level of public benefits derived from encouraging collaborative efforts and encouraging private and local conservation efforts; and (10) the effect designation would have on partnerships.

After evaluating the benefits of inclusion and the benefits of exclusion, we carefully weigh the two sides to determine whether the benefits of excluding a particular area outweigh the benefits of its inclusion in critical habitat. If we determine that the benefits of excluding a particular area outweigh the benefits of its inclusion, then the Secretary can exercise his discretion to exclude the area, provided that the exclusion will not result in the extinction of the species.

Based on the information provided by entities seeking exclusion, as well as any additional public comments received, we will evaluate whether certain lands in proposed critical habitat may be appropriate for exclusion from the final designation. If our analysis results in a determination that the benefits of excluding particular areas from the final designation outweigh the benefits of designating those areas as critical habitat, then the Secretary may exercise his discretion to exclude the particular areas from the final designation.

Under section 4(b)(2) of the Act, we must consider all relevant impacts of the designation of critical habitat, including economic impacts. In addition to economic impacts (discussed in the Economics Analysis section, below), we consider a number of factors in a section 4(b)(2) analysis. For example, we consider whether there are lands owned by the Department of Defense (DOD) where a national security impact might exist. We also consider whether Federal or private landowners or other public agencies have developed management plans or habitat conservation plants (HCPs) for the area or whether there are conservation partnerships or other conservation benefits that would be encouraged or discouraged by designation of, or exclusion from, critical habitat in an area. In addition, we look at the presence of Indian lands or Indian trust resources that might be affected, and consider the government-to-government relationship of the United States with Indian entities. We also consider any other relevant impacts that might occur because of the designation. To ensure that our final determination is based on the best available information, we are inviting comments on any foreseeable economic, national security, or other potential impacts resulting from this proposed designation of critical habitat from governmental, business, or private interests and, in particular, any potential impacts on small businesses.

For the reasons discussed above, if the Secretary decides to exercise his discretion under section 4(b)(2) of the Act, we have identified certain areas that we are proposing or considering for exclusion from the final revised critical habitat designation for the northern spotted owl. However, we solicit comments on the inclusion or exclusion of such particular areas, as well as any other areas identified in the proposed revised rule (see Public Comments section). During the development of the final revised designation, we will consider economic impacts, public comments, and other new information. In this proposed rule we have tentatively identified some additional areas that may be considered for exclusion from the final rule; however, the Secretary's decision as to which, if any, areas may be excluded from the final designation is not limited to these lands. Additional particular areas, in addition to those identified below for potential exclusion in this proposed rule, may be excluded from the final critical habitat designation under section 4(b)(2) of the Act. In other words, potential exclusions are not limited to those areas specifically identified in this proposed rule.

Exclusions Based on Economic Impacts

Under section 4(b)(2) of the Act, we consider the economic impacts of specifying any particular area as critical habitat. In order to consider economic impacts, we are preparing an analysis of the economic impacts of the proposed critical habitat designation and related factors. We will announce the availability of the draft economic analysis as soon as it is completed, at which time we will seek public review and comment. At that time, copies of

the draft economic analysis will be available for downloading from the Internet at *http://www.regulations.gov,* or by contacting the Oregon Fish and Wildlife Office directly (see **FOR FURTHER INFORMATION CONTACT** section). During the development of a final designation, we will consider economic impacts, public comments, and other new information, and areas may be excluded from the final critical habitat designation under section 4(b)(2) of the Act and our implementing regulations at 50 CFR 424.19.

Exclusions Based on National Security Impacts

Under section 4(b)(2) of the Act, we consider whether there are lands owned or managed by the Department of Defense (DOD) where a national security impact might exist. The U.S. Army's Fort Lewis Military Reservation is the only DOD land included within the proposed revised designation of critical habitat. As described above, in preparing this proposal, we are considering Fort Lewis for exemption from the designation of critical habitat under section 4(a)(3) of the Act, pending our evaluation of their revised INRMP, scheduled for completion in 2012, to determine whether it provides a conservation benefit to the northern spotted owl. We have determined that the remaining lands within the proposed designation of critical habitat for the species are not owned or managed by the Department of Defense, and, therefore, we anticipate no impact on national security. Consequently, we do not anticipate excluding any areas from the final designation based on impacts on national security.

Exclusions Based on Other Relevant Factors

Under section 4(b)(2) of the Act, we consider any other relevant impacts, in addition to economic impacts and impacts to national security. We consider a number of factors, including whether the landowners have developed any HCPs or other management plans for the area, or whether there are conservation partnerships or relationships that would be encouraged by designation of, or exclusion from, critical habitat. In addition, we look at any Indian issues, and consider the government-to-government relationship of the United States with Indian entities. We also consider any other relevant impacts that might occur because of the designation. Our weighing of the benefits of inclusion versus exclusion considers all relevant factors in making a final determination as to what will result in the greatest conservation benefit to the listed species. Depending on the specifics of each situation, there may be cases where the designation of critical habitat will not necessarily provide enhanced protection, and may actually lead to a net loss of conservation benefit. Here we provide our analysis of areas proposed for the revised designation of critical habitat that may provide a greater conservation benefit to the northern spotted owl by exclusion from the designation. We invite public comment on these areas under consideration for exclusion.

Benefits of Designating Critical Habitat

The process of designating critical habitat as described in the Act requires that the Service identify those lands within the geographical area occupied by the species at the time of listing on which are found the physical or biological features essential to the conservation of the species that may require special management considerations or protection, and those areas outside the geographical area occupied by the species at the time of listing that are essential for the conservation of the species.

The identification of areas that contain the features essential to the conservation of the species, or are otherwise essential for the conservation of the species if outside the geographical area occupied by the species at the time of listing, is a benefit resulting from the designation. The critical habitat designation process includes peer review and public comment on the identified physical and biological features and areas, and provides a mechanism to educate landowners, State and local governments, and the public regarding the potential conservation value of an area. This helps focus and promote conservation efforts by other parties by clearly delineating areas of high conservation value for the species, and is valuable to land owners and managers in developing conservation management plans by describing the essential physical and biological features and special management actions or protections that are needed for identified areas. Including lands in critical habitat also informs State agencies and local governments about areas that could be conserved under State laws or local ordinances.

The prohibition on destruction or adverse modification under Section 7(a)(2) of the Act constitutes the primary regulatory benefit of critical habitat designation. As discussed above, Federal agencies must consult with the Service on actions that may affect critical habitat and must avoid destroying or adversely modifying critical habitat. Federal agencies must also consult with us on actions that may affect a listed species and refrain from undertaking actions that are likely to jeopardize the continued existence of such species. The analysis of effects to critical habitat is a separate and different analysis from that of the effects to the species. Therefore, the difference in outcomes of these two analyses also represents the regulatory benefit of critical habitat. For some species, and in some locations, the outcome of these analyses will be similar because effects on habitat will often result in effects on the species. However, these two regulatory standards are different. The jeopardy analysis evaluates how a proposed action is likely to influence the likelihood of a species' survival and recovery. The adverse modification analysis evaluates how an action affects the capability of the critical habitat to serve its intended conservation role (USFWS, in litt. 2004). Although these standards are different, it has been the Service's experience that in many instances proposed actions that affect both a listed species and its critical habitat and that constitute jeopardy also constitute adverse modification. In some cases, however, application of these different standards results in different section 7(a)(2) determinations, especially in situations where the affected area is mostly or exclusively unoccupied critical habitat. Thus, critical habitat designations may provide greater benefits to the recovery of a species than would listing alone.

There are two limitations to the regulatory effect of critical habitat. First, a section 7(a)(2) consultation is required only where there is a Federal nexus (an action authorized, funded, or carried out by any Federal agency)—if there is no Federal nexus, the critical habitat designation of non-Federal lands itself does not restrict any actions that destroy or adversely modify critical habitat. Aside from the requirement that Federal agencies ensure that their actions are not likely to result in destruction or adverse modification of critical habitat under section 7, the Act does not provide any additional regulatory protection to lands designated as critical habitat.

Second, designating critical habitat does not create a management plan for the areas; does not establish numerical population goals or prescribe specific management actions (inside or outside of critical habitat); and does not have a direct effect on areas not designated as critical habitat. Specific management recommendations for critical habitat are addressed in recovery plans,

management plans, and in section 7 consultation. The designation only limits destruction or adverse modification of critical habitat, not all adverse effects. By its nature, the prohibition on adverse modification ensures that the conservation role and function of those areas designated as critical habitat are not appreciably reduced as a result of a Federal action.

Once an agency determines that consultation under section 7(a)(2) of the Act is necessary, the process may conclude informally when the Service concurs in writing that the proposed Federal action is not likely to adversely affect the species or critical habitat. However, if we determine through informal consultation that adverse impacts are likely to occur, then formal consultation is initiated. Formal consultation concludes with a biological opinion issued by the Service on whether the proposed Federal action is likely to jeopardize the continued existence of listed species or result in destruction or adverse modification of critical habitat.

For critical habitat, a biological opinion that concludes in a determination of no destruction or adverse modification may recommend additional conservation measures to minimize adverse effects to primary constituent elements, but such measures would be discretionary on the part of the Federal agency.

The designation of critical habitat does not require that any management or recovery actions take place on the lands included in the designation. Even in cases where consultation has been initiated under section 7(a)(2) of the Act because of effects to critical habitat, the end result of consultation is to avoid adverse modification, but not necessarily to manage critical habitat or institute recovery actions on critical habitat. On the other hand, voluntary conservation efforts by landowners can remove or reduce known threats to a species or its habitat by implementing recovery actions. We believe that in many instances the regulatory benefit of critical habitat is minimal when compared to the conservation benefit that can be achieved through implementing HCPs under section 10 of the Act, or other voluntary conservation efforts or management plans. The conservation achieved through implementing HCPs or other habitat management plans can be greater than what we achieve through multiple site-by-site, project-by-project, section 7(a)(2) consultations involving project effects to critical habitat. Management plans can commit resources to implement long-term management and protection to particular habitat for at least one and possibly other listed or sensitive species. Section 7(a)(2) consultations commit Federal agencies to preventing adverse modification of critical habitat caused by the particular project; consultation does not require Federal agencies to provide for conservation or long-term benefits to areas not affected by the proposed project. Thus, implementation of any HCP or management plan that incorporates enhancement or recovery as the management standard may often provide as much or more benefit than a consultation for critical habitat designation. Therefore, we propose to exclude all private lands with current HCPs, SHAs, other active management plans or conservation agreements in the final critical habitat designation. We seek public comment on all of these potential exclusions.

Benefits of Excluding Private Lands

As noted above, the Secretary may exclude areas from critical habitat if he determines that the benefits of exclusion outweigh the benefits of including those areas as part of the critical habitat (unless exclusion of those areas will result in the extinction of the species). We believe that in some cases designation can negatively impact the working relationships and conservation partnerships we have formed with private landowners, and may serve as a disincentive for the formation of future partnerships or relationships that would have the potential to provide conservation benefits. We will consider whether the benefits of excluding private lands may outweigh the benefits of including those areas in the designation of critical habitat for the northern spotted owl.

The Service recognizes that most federally listed species in the United States will not recover without the cooperation of non-Federal landowners. More than 60 percent of the United States is privately owned (Lubowski *et al.* 2006, p. 35), and at least 80 percent of endangered or threatened species occur either partially or solely on private lands (Crouse *et al.* 2002, p. 720). Groves *et al.* (2000, pp. 280–281) reported that about one-third of populations of federally listed species are found on Federal lands; private lands were found to provide for at least one population of more than two-thirds of federally listed species (Groves *et al.* 2000, p. 283).

Given the distribution of listed species with respect to landownership, the successful conservation of listed species in many parts of the United States will clearly depend upon working partnerships with a wide variety of entities and the voluntary cooperation of many non-Federal landowners (Wilcove and Chen 1998, p. 1407; Crouse *et al.* 2002, p. 720; James 2002, p. 271). Building partnerships and promoting the willing cooperation of landowners is essential to understanding the status of species on non-Federal lands and necessary to implement recovery actions, such as the reintroduction of listed species, habitat restoration, and habitat protection.

Many non-Federal landowners derive satisfaction from voluntarily participating in the recovery of endangered or threatened species. Conservation agreements with non-Federal landowners, Safe Harbor Agreements, other conservation agreements, easements, and State and local regulations enhance species conservation by extending species protections beyond those available through section 7 consultations. We encourage non-Federal landowners to enter into conservation agreements based on a view that we can achieve greater species conservation on non-Federal land through such partnerships than we can through regulatory methods (61 FR 63854; December 2, 1996).

We acknowledge that private landowners are often wary of the possible consequences of encouraging endangered species conservation on their property, and of regulatory action by the Federal Government under the Act. Social science research has demonstrated that, for many private landowners, government regulation under the Act is perceived as a loss of individual freedoms, regardless of whether that regulation may in fact result in any actual impact to the landowner (Brook *et al.* 2003, pp. 1644–1648; Conley *et al.* 2007, p. 141). Furthermore, in a recent study of private landowners who have experience with regulation under the Act, only 2 percent of respondents believed the Federal Government rewards private landowners for good management of their lands and resources (Conley *et al.* 2007, pp. 141, 144). According to some researchers, the designation of critical habitat on private lands significantly reduces the likelihood that landowners will support and carry out conservation actions (Main *et al.* 1999, p. 1263; Bean 2002, p. 412; Brook *et al.* 2003, pp. 1644–1648). The magnitude of this negative outcome is greatly amplified in situations where active management measures (such as reintroduction, fire management, or control of invasive species) are necessary for species conservation (Bean 2002, pp. 412–413).

Since Federal actions such as the designation of critical habitat on private lands may reduce the likelihood that landowners will support and carry out conservation actions for the benefit of listed species, based on the research described above, we believe that in some cases the judicious exclusion of non-federally owned lands from critical habitat designations can contribute to species recovery and provide a greater level of species conservation than critical habitat designation alone. Although we believe that the potentially positive contribution of private landowners with a demonstrated record of conservation management should be an important consideration when designating critical habitat, we wish to emphasize that we will continue to be discriminating in our evaluation of potential exclusions, and private lands will be excluded only should we determine that the benefits of exclusion outweigh the benefits of inclusion following a rigorous examination of the record on a case-by-case basis.

We are considering excluding private lands held under one or more ownerships in two localities in Sonoma and Napa Counties, California. The first area is located in southwestern Sonoma County near the mouth of the Russian River, in Subunit 4 of the Redwood Coast CHU. The combined area of private lands in this area is 28,932 ac (11,708 ha). The second area spans the Sonoma-Napa County line and lies west of St. Helena and Yountville, in Subunit 6 of the Interior Coastal California CHU. The combined area of private lands in this second area is 59,786 ac (24,194 ha). Each area contains one or more landholdings that are under conservation easements for agriculture and open space preservation. We are considering excluding these privately-owned lands because we believe that the greatest conservation benefit to the northern spotted owl in this region of little Federal land ownership may be derived from preserving good relationships with private landowners who have demonstrated themselves to be good stewards of the habitat essential to the conservation of the northern spotted owl. Our consideration of these lands for exclusion will be based on case-by-case reviews of how they are managed by each landowner, and what conservation mechanisms may be in place, such as easement provisions, that would act to conserve or enhance the suitability of northern spotted owl habitats. We request public comments on the relative benefits of inclusion or exclusion from the designation of critical habitat.

We believe that acknowledging the positive contribution these private landowners are currently making to the conservation of the northern spotted owl, and maintaining good working relationships with these landowners by excluding these areas may provide a significant benefit to the conservation of the northern spotted owl in this area where private lands will play an essential role in the recovery of the species. The exclusion of these areas may encourage these landowners to continue their positive management practices without fear of further government regulation. In addition, the exclusion of such lands may lay the foundation for building additional conservation partnerships and relationships with other private landowners, with conservation benefit not only for the northern spotted owl, but other endangered or threatened species as well.

In contrast, we believe there may be relatively little benefit to be gained by the designation of these privately owned lands. A potential benefit of designation would be the regulatory protections afforded to critical habitat under section 7(a)(2) of the Act. However, as described earlier, on private lands the regulatory protections of critical habitat only apply when there is a Federal nexus (actions funded, permitted, or otherwise carried out by the Federal Government), and we have no evidence to suggest that these regulatory protections are likely to be triggered on the private lands in the Redwood Coast CHU or Interior Coastal California CHU. Furthermore, most of these lands are currently occupied by the northern spotted owl. Thus, even if these lands are excluded from the final revised critical habitat designation, if the northern spotted owl is present and may be affected, actions with Federal involvement require consultation to review the effects of management activities that might adversely affect listed species under a jeopardy standard; this assessment includes effects to the species from habitat modification. Overall, given the low likelihood of a Federal nexus occurring on these lands, we believe the regulatory benefit of a critical habitat designation on these lands, if any, may be limited.

The purpose of designating critical habitat is to contribute to the conservation of threatened and endangered species and the ecosystems upon which they depend. The outcome of the designation is to trigger regulatory requirements for actions funded, authorized, or carried out by Federal agencies under section 7(a) (2) of the Act. Where there is little likelihood of a Federal action, the benefits of this protection can be low. On the other hand, the benefits of excluding areas that are covered by voluntary conservation efforts can, in specific circumstances, be high. In this case, in weighing the potential benefits of inclusion versus benefits of exclusion, as detailed above, we believe the greatest conservation benefit to the northern spotted owl in the Redwood Coast CHU may result from the exclusion of privately owned lands from the final designation. Specific potential exclusions in the Redwood Coast CHU and Interior Coastal California CHU in northern California will be discussed in our Notice of Availability to be published in the **Federal Register** when the draft economic analysis is released for public comment. At that time the public will have an opportunity to review and comment on specific proposed exclusions. At present, we seek public comment on the general benefits of including or excluding private lands in this area [see Public Comments, above].

Table 5 identifies all private lands proposed or considered for exclusion, Table 6 identifies State lands proposed or considered for exclusion, and Table 7 identifies Congressionally reserved natural areas proposed for exclusion in the final rule. We ask for public comment on all of these possible exclusions, or information to identify any additional potential areas we should consider for exclusion and why.

TABLE 5—PRIVATE LANDS PROPOSED OR THAT MAY BE CONSIDERED FOR EXCLUSION FROM THE FINAL RULE

Type of agreement	Critical habitat unit	State	Land owner/agency	Acres	Hectares
Safe Harbor Agreements—proposed for exclusion.	WCC	WA	Port Blakely Tree Farms, L.P, Safe Harbor Agreement, Landowner Option Plan, Cooperative Habitat Enhancement.	421	170
	RWC	CA	Forster-Gill, Inc	236	95

TABLE 5—PRIVATE LANDS PROPOSED OR THAT MAY BE CONSIDERED FOR EXCLUSION FROM THE FINAL RULE—Continued

Type of agreement	Critical habitat unit	State	Land owner/agency	Acres	Hectares
Habitat Conservation Plans—proposed for exclusion.	RWC	CA	Van Eck Forest Foundation, Safe Harbor Agreement	2,163	875
	WCC	WA	Cedar River Watershed Habitat Conservation Plan	3,367	1,363
	WCC	WA	Green River Water Supply Operations and Watershed Protection Habitat Conservation Plan.	3,175	1,285
	WCC/ECN	WA	Plum Creek Timber Central Cascades I-90 Habitat Conservation Plan.	33,764	13,664
	WCC	WA	West Fork Timber Habitat Conservation Plan	5,233	2,118
	RWC	CA	Green Diamond Resource Company Habitat Conservation Plan.	360,870	146,042
	RWC	CA	Humboldt Redwood Company, Habitat Conservation Plan.	211,700	85,672
	RWC	CA	Regli Estates Habitat Conservation Plan	500	202
	ICC	CA	Terra Springs Habitat Conservation Plan	41	16
Conservation Easements, Other Agreements or Partnerships—proposed for exclusion.	ECN	WA	Scofield Corporation Habitat Conservation Plan	40	16
	RWC	CA	Usal Forest	50,000	20,235
	RWC	CA	Big River, Salmon Creek, and Garcia River Forests	40,293	16,306
Total private lands proposed for exclusion.				711,803	288,059
Proposed Agreements that may be considered for exclusion.	RWC	CA	Mendocino Redwood Company Proposed HCP	232,584	94,123
	WCC/ECN	WA	SDS Co. & Broughton Lumber Co. Proposed Conservation Plan.	16,031	6,487
Other Private lands that may be considered for exclusion.	various	WA[1]	various	133,895	54,186
	various	OR	various	0	0
	various	CA	various	174,587	70,450
Total additional private lands that may be considered for exclusion.				557,097	225,246
Total private lands proposed for exclusion or that may be considered for exclusion.				1,268,900	513,305

[1] These lands are within SOSEAs—Spotted Owl Special Emphasis Areas.

TABLE 6—STATE LANDS PROPOSED OR THAT MAY BE CONSIDERED FOR EXCLUSION FROM THE FINAL RULE

State	Land owner/agency	Acres	Hectares
WA	Washington Dept. of Natural Resources State Lands HCP—proposed for exclusion.	225,013	91,059
	Washington State Parks—proposed for exclusion	104	42
	Washington Department of Fish and Wildlife Lands—may be considered for exclusion.	1,752	709
OR	Oregon Department of Forestry—may be considered for exclusion	228,733	92,565
CA	California State Parks—proposed for exclusion	164,672	66,640
	California State Forests—may be considered for exclusion	50,762	20,543
Total State lands proposed for exclusion.		389,789	157,809
Total State lands that may be considered for exclusion.		281,247	113,749
Total State Lands		671,036	271,558

TABLE 7—CONGRESSIONALLY RESERVED NATURAL AREAS PROPOSED FOR EXCLUSION FROM THE FINAL RULE

State	*Acres*	*Hectares*
WA	1,530,205	619,252
OR	499,836	202,277
CA	616,692	249,567
Total	2,646,733	1,071,095

Benefits of Excluding Lands With Safe Harbor Agreements

A Safe Harbor Agreement (SHA) is a voluntary agreement involving private or other non-Federal property owners whose actions contribute to the recovery of listed species. The agreement is between cooperating non-Federal property owners and the Service. In exchange for actions that contribute to the recovery of listed species on non-Federal lands, participating property owners receive formal assurances from the Service that if they fulfill the conditions of the SHA, the Service will not require any additional or different management activities by the participants without their consent. In addition, at the end of the agreement period, participants may return the enrolled property to the baseline conditions that existed at the beginning of the SHA.

As detailed above in the section ''Benefits of Excluding Private Lands,'' because many endangered and threatened species occur exclusively, or to a large extent, on privately owned property, the involvement of the private sector in the conservation and recovery of species is crucial. Property owners are often willing partners in efforts to recover listed species. However, some property owners may be reluctant to undertake activities that support or attract listed species on their properties, due to fear of future property-use restrictions related to the Act. To address this concern, a SHA provides that future property-use limitations will not occur without the landowner's consent if the landowner is in compliance with the permit and Agreement and the activity is not likely to result in jeopardy to the listed species.

Central to this approach is that the actions taken under the SHA must provide a net conservation benefit that contributes to the recovery of the covered species. Examples of conservation benefits include:

- Reduced habitat fragmentation;
- Maintenance, restoration, or enhancement of existing habitats;
- Increases in habitat connectivity;
- Stabilized or increased numbers or distribution;
- The creation of buffers for protected areas; and
- Opportunities to test and develop new habitat management techniques.

By entering into an SHA, property owners receive assurances that land use restrictions will not be required even if the voluntary actions taken under the agreement attract particular listed species onto enrolled properties or increase the numbers of distribution of those listed species already present on those properties. The assurances are provided through an enhancement of survival permit issued to the property owner, under the authority of section 10(a)(1)(A) of the Act. To implement this provision of the Act, the Service and National Marine Fisheries Service issued a joint policy for developing SHAs for listed species on June 17, 1999 (64 FR 32726). The Service simultaneously issued regulations for implementing SHAs on June 17, 1999 (64 FR 32706). A correction to the final rule was announced on September 30, 1999 (64 FR 52676). The enhancement of survival permit issued in association with an SHA authorizes incidental take of species that may result from actions undertaken by the landowner under the SHA, which could include returning the property to the baseline conditions at the end of the agreement. The permit also specifies that the Service will not require any additional or different management activities by participants without their consent if the permittee is in compliance with the requirements of the permit and the SHA and the permittee's actions are not likely to result in jeopardy.

The benefits of excluding lands with approved SHAs from critical habitat designation may include relieving landowners, communities, and counties of any additional regulatory burden that might be imposed as a result of the critical habitat designation. Even if any additional regulatory burden would be unlikely due to a lack of a Federal nexus, as described above in the section ''Benefits of Excluding Private Lands,'' the designation of critical habitat could nonetheless have an unintended negative effect on our relationship with non-Federal landowners due to the perceived imposition of government regulation. We believe that an exclusion of lands under an approved SHA would be in keeping with the spirit of the agreement. An additional benefit of excluding lands covered by approved SHAs from critical habitat designation is that it may make it easier for us to seek new partnerships with future SHA participants, including States, counties, local jurisdictions, conservation organizations, and private landowners, in cases where potential partners may be reluctant to encourage the development of habitat that supports threatened or endangered species. In such cases, we may be able to implement conservation actions that we would be unable to accomplish otherwise. By excluding these lands, we may preserve our current partnerships and encourage additional future conservation actions.

In weighing the benefits of inclusion versus the benefits of exclusion for lands subject to approved SHAs, it is important to note that a fundamental requirement of an SHA is an advance determination by the Service that the provisions of the SHA will result in a net conservation benefit to the listed species. Approved SHAs have, therefore, already been determined to provide a net conservation benefit to the listed species; in addition, the management activities provided in a SHA often provide conservation benefits to unlisted sensitive species as well. As described earlier, the designation of critical habitat is unlikely to provide any realized conservation benefit to the species on non-Federal lands absent a Federal nexus for an activity. Especially where further Federal action is unlikely, the net conservation benefit provided by the terms of the SHA itself, considered in conjunction with the benefit of excluding lands subject to an SHA by preserving our working relationships with landowners who have entered into SHAs with the Service, and the benefit of laying the positive groundwork for possible future agreements with other landowners, may collectively outweigh the potentially limited benefit that would be realized on these lands from the designation of critical habitat. However, as with all potential exclusions under consideration, lands subject to an SHA will only be excluded should we determine that the benefits of exclusion outweigh the benefits of inclusion following a rigorous examination of the record on a case-by-case basis.

We note that permit issuance in association with SHA applications requires consultation under section 7(a)(2) of the Act, which would include the review of the effects of all-SHA-covered activities that might adversely impact the species under a jeopardy standard, including possibly significant habitat modification (see definition of ''harm'' at 50 CFR 17.3), even without the critical habitat designation. In addition, all other Federal actions that may affect the listed species would still require consultation under section

7(a)(2) of the Act, and we would review these actions for possible significant habitat modification in accordance with the definition of harm, described in the following section ''Benefits of Excluding Lands with Habitat Conservation Plans.''

We further note that SHAs may include a provision that the landowner may return the area to baseline conditions upon expiration of the permit. The term of the permit is thus an important consideration in weighing the relative benefits of inclusion versus exclusion from the designation of critical habitat. However, we note that the Service has the right to revise a critical habitat designation at any time. Furthermore, we note that the potential benefit of acknowledging the positive conservation contributions of landowners willing to enter into voluntary conservation agreements with the Service for the recovery of endangered or threatened species may nonetheless outweigh the loss of benefit that may be incurred through a possible return to baseline following permit expiration. As noted above, such circumstances require careful consideration on a case-by-case basis in order to make a final determination of the benefits of exclusion or inclusion in a critical habitat designation.

Below is a brief description of each SHA and the lands proposed as critical habitat covered by each agreement that we are considering for exclusion from critical habitat designation under section 4(b)(2) of the Act.

State of California

Forster-Gill, Inc., Safe Harbor Agreement

We propose to exclude lands covered by the SHA between Forster-Gill, Inc., and the Service in the Redwood Coast CHU in California from the final critical habitat designation. The enhancement of survival permit associated with this SHA was noticed in the **Federal Register** on March 22, 2002 (67 FR 13357), and issued June 18, 2002. The term of the agreement is 80 years, and the term of the permit is 90 years. The SHA provides for the creation and enhancement of habitat for the northern spotted owl on 236 ac (95 ha) of lands in Humboldt County, California, and provides for continued timber harvest on those lands.

There are two baseline conditions that will be maintained under the SHA: (1) Protection of an 11.2-ac (5-ha) no-harvest area that will buffer the most recent active northern spotted owl nest site, but will also be maintained in the absence of a nest site; and (2) maintenance of 216 ac (87 ha) on the property such that the trees will always average 12 to 24 in (30 to 60 cm) dbh with a canopy closure of 60 to 100 percent. At the time of the agreement, forest conditions were on the lower end of the diameter and canopy closure ranges. By the end of the agreement, the property will be at the upper end of the diameter and canopy closure ranges.

Under the SHA, Forster-Gill, Inc., agrees to: (1) Annually survey and monitor for the location and reproductive status of northern spotted owls on the property; (2) protect all active nest sites (locations where nesting behavior is observed during any of the previous 3 years) with a no-harvest area that buffers the nest site by no less than 300 ft (90 m) and limits timber harvest operations within 1,000 ft (300 m) of an active nest site during the breeding season, and only allows use of existing haul roads; and (3) manage the second-growth redwood timber on the property in a manner that maintains suitable northern spotted owl habitat while creating over time the multilayered canopy structure with an older, larger tree component associated with high-quality spotted owl habitat. The SHA is expected to provide, maintain, and enhance for the 80-year life of the agreement over 200 ac (80 ha) of northern spotted owl habitat within a matrix of private timberland. The cumulative impact of the agreement and the timber management activities it covers, which are facilitated by the allowable incidental take, is expected to provide a net benefit to the northern spotted owl. The complete text of the Forster-Gill Safe Harbor Agreement can be viewed at *http://www.fws.gov/arcata/es/birds/NSO/documents/Forster-Gill_SHA.pdf.*

Van Eck Forest Foundation Safe Harbor Agreement

We propose to exclude lands covered by a SHA between the Fred M. van Eck Forest Foundation and the Service in the Redwood Coast CHU in California from the final critical habitat designation. The enhancement of survival permit associated with this SHA was noticed in the **Federal Register** on July 8, 2008 (73 FR 39026), and issued August 18, 2008. The term of the permit and the agreement is 90 years. The SHA provides for the creation and enhancement of habitat for the northern spotted owl on 2,163 ac (875 ha) of lands in Humboldt County, California, and provides for continued timber harvest on those lands.

At the time of the agreement, the lands under consideration supported 1,730 ac (700 ha) of northern spotted owl nesting and roosting habitat and one northern spotted owl activity center. We anticipate that under the northern spotted owl habitat creation and enhancement timber management regime proposed in the SHA that approximately 1,947 ac (788 ha) of nesting and roosting habitat and potentially up to five northern spotted owl activity centers could exist on the property at the end of 90 years. The SHA does not provide for a return to baseline conditions at the end of the agreement term. Instead, the agreement provides that if more than five northern spotted owl activity centers should become established on the property during the 90-year term, the landowner would be allowed to remove such additional activity centers during the agreement period. Under the SHA, the Fred M. van Eck Forest Foundation agrees to: (1) Conduct surveys annually to determine the locations and reproductive status of any northern spotted owls; (2) protect up to five activity centers (locations where owls are observed nesting or roosting) with a no-harvest area that buffers the activity center by no less than 100 ft (30 m); (3) utilize selective timber harvest methods such that suitable nesting habitat is maintained within 300 ft (91 m) of each activity center; (4) limit noise disturbance from timber harvest operations within 1,000 ft (305 m) of an active nest during the breeding season; and (5) manage all second-growth redwood timber on the property in a manner that maintains or creates suitable nesting and roosting habitat over time. The cumulative impact of the agreement and the timber management activities it covers, which are facilitated by the allowable incidental take, is expected to provide a net benefit to the northern spotted owl. The complete text of the Van Eck Forest Foundation Safe Harbor Agreement can be viewed at *http://www.fws.gov/arcata/es/birds/NSO/documents/Van-Eck_SHA.pdf.*

State of Oregon

No lands covered under a Safe Harbor Agreement in Oregon are currently proposed as northern spotted owl critical habitat. However, we want to use this opportunity to inform the public of the programmatic SHA between the Oregon Department of Forestry (ODF), U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), and the Fish and Wildlife Service in Oregon. This program has excellent potential to contribute to spotted owl recovery by increasing the quality and quantity of spotted owl habitat in areas where such habitat is lacking. The enhancement of

survival permit associated with this SHA was noticed in the **Federal Register** on July 21, 2009 (74 FR 35883) and issued July 26, 2010. The term of the permit and SHA is 50 years. The permit authorizes ODF to extend incidental take coverage with assurances through issuance of certificates of inclusion to eligible landowners who are willing to carry out habitat management measures that would benefit the northern spotted owl. The covered area or geographical scope of SHA includes non-Federal forest lands within the range of the northern spotted owl in Oregon. The full text of the Programmatic Safe Harbor Agreement between the Oregon Department of Forestry, U.S. Department of Agriculture, Natural Resources Conservation Service, and the U.S. Fish and Wildlife Service is available for review at *http://ecos.fws.gov/docs/plan_documents/tsha/tsha_826.pdf.*

State of Washington

Port Blakely Tree Farms L.P. (Morton Block) Safe Harbor Agreement, Landowner Option Plan, and Cooperative Habitat Enhancement Agreement

We propose to exclude lands covered by the Port Blakely Tree Farms (also known as Morton Block) SHA in the West Cascades Central CHU in Washington from the final critical habitat designation. The enhancement of survival permit associated with this SHA was noticed in the **Federal Register** on December 17, 2008 (73 FR 76680) and issued May 22, 2009. The SHA and permit include both the marbled murrelet (*Brachyramphus marmoratus*) and the northern spotted owl, and covers an area of 45,306 ac (18,335 ha) of managed forest lands known as the ''Morton Block,'' in Lewis and Skamania Counties. The term of the permit and SHA is 60 years.

The covered lands have been intensively managed and at the time the permit was issued were not known to be occupied by either the spotted owl or the marbled murrelet. The environmental baseline was measured in terms of dispersal habitat for the northern spotted owl and potential nesting habitat for the marbled murrelet. There are no known northern spotted owls nesting on Port Blakely lands. However, spotted owls have historically nested on adjacent Federal lands and the 1.8-mi (2.9-km) radius circles around those sites that are used for evaluating potential habitat availability for spotted owls extend onto Port Blakely lands. Because of this, Port Blakely Tree Farms conducted habitat evaluations of their properties to determine the amount of suitable spotted owl habitat present. The baseline estimate for the SHA is 8,360 ac (3,383 ha) of spotted owl dispersal habitat.

Under the SHA, Port Blakely will implement voluntary conservation measures that are expected to provide net conservation benefits to the northern spotted owl and marbled murrelet. The SHA also provides that Port Blakely will manage their tree farm in a manner that contributes to the goals of the Mineral Block Spotted Owl Special Emphasis Area (SOSEA) according to Washington Forest Practices Rules and Regulations (Washington Forest Practices Board 2002, WAC 222–16–080, WAC 222–16–086). In the SHA, Port Blakely agrees to implement enhanced forest management measures that would create potential habitat for the northern spotted owl and marbled murrelet, such as longer harvest rotations, additional thinning to accelerate forest growth, a snag creation program, retaining more down wood than is required by Washington Forest Practices Rules, establishing special management areas and special set-aside areas, and monitoring. The terms of the agreement are intended to produce conditions that will facilitate the dispersal of the northern spotted owl across the Port Blakely ownership, and allow marbled murrelets to nest. The full text of the Port Blakely Tree Farms L.P. (Morton Block) Safe Harbor Agreement, Landowner Option Plan, and Cooperative Habitat Enhancement Agreement is available at *http://ecos.fws.gov/docs/plan_documents/tsha/tsha_696.pdf.*

Benefits of Excluding Lands With Habitat Conservation Plans

Habitat Conservation Plans (HCPs) are planning documents required as part of an application for an ''incidental take'' permit. They describe the anticipated effects of the proposed taking; how those impacts will be minimized, or mitigated; and how the HCP is to be funded. HCPs can apply to both listed and nonlisted species, including those that are candidates or have been proposed for listing. Anyone whose otherwise-lawful activities will result in the ''incidental take'' of a listed wildlife species needs a permit. The Act defines ''take'' as ''* * * to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.'' ''Harm'' includes significant habitat modification that actually kills or injures a listed species through impairing essential behavior such as breeding, feeding, or sheltering. Section 9 of the Act prohibits the take of endangered and threatened species. The purpose of the incidental take permit is to exempt non-Federal permit-holders—such as States and private landowners—from the prohibitions of section 9, not to authorize the activities that result in take.

In developing HCPs, people applying for incidental take permits describe measures designed to minimize and mitigate the effects of their actions— to ensure that species will be conserved and to contribute to their recovery. Habitat Conservation Plans are required to meet the permit issuance criteria of section 10(a)(2)(B) of the Act:

- Taking will be incidental;
- The applicant will, to the maximum extent practicable, minimize and mitigate the impacts of the taking;
- The applicant will ensure that adequate funding for the plan will be provided;
- Taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; and
- Other measures, as required by the Secretary, will be met.

The benefits of excluding lands with approved HCPs from critical habitat designation may include relieving landowners, communities, and counties of any additional regulatory burden that might be imposed as a result of the critical habitat designation. Many HCPs take years to develop and, upon completion, are consistent with the recovery objectives for listed species covered within the plan area. Many conservation plans also provide conservation benefits to unlisted sensitive species.

A related benefit of excluding lands covered by approved HCPs from critical habitat designation is that it can make it easier for us to seek new partnerships with future plan participants, including States, counties, local jurisdictions, conservation organizations, and private landowners, which together can implement conservation actions that we would be unable to accomplish otherwise. HCPs often cover a wide range of species, including species that are not State and federally-listed and would otherwise receive little protection from development. By excluding these lands, we preserve our current partnerships and encourage additional future conservation actions.

We also note that permit issuance in association with HCP applications requires consultation under section 7(a)(2) of the Act, which would include the review of the effects of all HCP-covered activities that might adversely impact the species under a jeopardy

standard, including possibly significant habitat modification (see definition of ''harm'' at 50 CFR 17.3), even without the critical habitat designation. In addition, all other Federal actions that may affect the listed species would still require consultation under section 7(a)(2) of the Act, and we would review these actions for possible significant habitat modification in accordance with the definition of harm referenced above.

We consider a current HCP to be appropriate for consideration for exclusion from a final critical habitat designation under section 4(b)(2) of the Act if:

(1) It provides for the conservation of the essential physical and biological features or areas otherwise determined to be essential;

(2) There is a reasonable expectation that the conservation management strategies and actions contained in a management plan will be implemented into the future;

(3) The conservation strategies in the HCP are likely to be effective; and

(4) The HCP contains a monitoring program or adaptive management to ensure that the conservation measures are effective and can be adapted in the future in response to new information.

Below is a brief description of each HCP and the lands proposed as critical habitat covered by each plan that we are considering for exclusion from critical habitat designation under section 4(b)(2) of the Act.

State of California

Green Diamond Resource Company Habitat Conservation Plan

We propose to exclude lands managed under the Green Diamond Resource Company (formerly Simpson Timber Company) HCP in the Redwood Coast CHU in California from the final critical habitat designation. The permit issued in association with this HCP was initially noticed in the **Federal Register** on May 27, 1992 (57 FR 22254) and issued September 17, 1992. Both the HCP and the permit had a term of 30 years, with a comprehensive review scheduled after 10 years to review the efficacy of the plan. The permit allowed incidental take of up to 50 pairs of northern spotted owls and their habitat during the course of timber harvest operations on 383,106 ac (155,041 ha) of forest lands in Del Norte and Humboldt Counties. At the time the permit was issued, more than 100 northern spotted owl nest sites or activity centers were known or suspected on the property. The Service determined that the projected growth and harvest rates indicated more habitat of the age class primarily used by northern spotted owls would exist on the property at the end of the 30-year permit period. In addition, the HCP provided that nest sites would be protected during the breeding season, and no direct killing or injuring of owls was anticipated. Simpson also agreed to continue their monitoring programs, in which more than 250 adult owls and more than 100 juveniles were already banded, as well as analyses of timber stands used by owls.

As required by the terms of the HCP, Green Diamond and the Service conducted a comprehensive review of the first 10 years of implementation, including a comparison of actual and estimated levels of owl displacement, a comparison of estimated and actual distribution of habitat, a reevaluation of the biological basis for the HCP's conservation strategy, an examination of the efficacy of and continued need for habitat set-asides, and an estimate of future owl displacements. During the comprehensive review, Green Diamond requested an amendment to the 1992 ITP to allow incidental take of up to eight additional spotted owl pairs. This request was noticed in the **Federal Register** on February 26, 2007 (72 FR 8393) and the modified permit was issued in October 2007. In addition, in April, 2011, Green Diamond sold 22,236 ac (8,999 ha) of its lands covered by the HCP to the Yurok Tribe; as those lands are no longer covered by the HCP, the current total of the covered lands is 360,870 ac (146,042 ha).

On April 16, 2010, we announced our intent to prepare an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) in response to an expected new HCP from Green Diamond, which would include provisions for the northern spotted owl and possibly the Pacific fisher (*Martes pennanti*), a species which may be considered for listing during the term of the HCP. This new HCP, if completed and approved, would replace the 1992 HCP, and would require the issuance of a new incidental take permit. The proposed new HCP is intended to address the retention of suitable spotted owl nesting habitat, the development of older forest habitat elements and habitat structures, and future establishment of spotted owl nest sites in streamside retention zones, cluster owl sites in favorable habitat areas, and initiate future research on other wildlife species such as fishers and barred owls. As this HCP has not yet been completed, however, we cannot consider it for exclusion at this point in time. The existing HCP originally completed in 1992 is still in effect as of this date, and is intended to be excluded The full text of the Green Diamond HCP is available at *http://www.fws.gov/arcata/es/birds/NSO/documents/Simpson_(Green_Diamond)_1992_NSO_HCP_Part_A.pdf* and *http://www.fws.gov/arcata/es/birds/NSO/documents/Simpson_(Green_Diamond)_1992_NSO_HCP_Part_B_Large maps.pdf.*

Humboldt Redwood Company Habitat Conservation Plan

We propose to exclude lands managed under the Humboldt Redwood Company (formerly Pacific Lumber) HCP in the Redwood Coast CHU in California from the final critical habitat designation. The permit under this HCP with a term of 50 years was noticed on July 14, 1998 (63 FR 37900) and issued on March 1, 1999. The HCP includes 211,700 ac (85,672 ha) of commercial timber lands in Humboldt County, essentially all of the formerly Pacific Lumber timberlands outside of the Headwaters Preserve. The Humboldt Redwood Company HCP includes nine nonlisted species (including one candidate species) and three listed species, including the northern spotted owl. Activities covered by the HCP include forest management activities and mining or other extractive activities. With regard to the northern spotted owl in particular, the HCP addresses the harvest, retention, and recruitment of requisite habitat types and elements within watershed assessment areas and individual northern spotted owl activity sites.

The management objectives of the HCP are to minimize disturbance to northern spotted owl activity sites, monitor to determine whether these efforts maintain a high-density and productive population of northern spotted owls, and apply adaptive management techniques as necessary. The other conservation elements of the HCP are expected to aid in the retention and recruitment of potential foraging, roosting, and nesting habitat in watersheds across the ownership. Specifically, the HCP states that the silvicultural requirements associated with riparian management zones, the mass wasting avoidance strategy, the cumulative effects/disturbance index restrictions, the marbled murrelet conservation areas, and the retention standard of 10 percent late seral habitat for each watershed assessment area are likely to provide suitable habitat for northern spotted owl. In addition, there are specific habitat retention requirements to conserve habitat for foraging, roosting, and nesting at

northern spotted owl activity sites. Details of the Humboldt Redwood Company HCP are available at *http://www.fws.gov/arcata/es/birds/NSO/documents/Pacific_Lumber_Co_(Humboldt_Redwood_Co.)_1999_Final_HCP.pdf.*

Regli Estates Habitat Conservation Plan

We propose to exclude lands managed under the Regli Estates HCP in the Redwood Coast CHU from the final critical habitat designation. The permit issued under this HCP in 1995 (noticed July 17, 1995 (60 FR 36432) and issued August 30, 1995) covers 500 ac (202 ha) in Humboldt County, California, to be used for forest management activities. Two listed species, the marbled murrelet and northern spotted owl, as well as two nonlisted species are covered under the incidental take permit for a period of 20 years. Provisions in the HCP for the northern spotted owl include the mitigation of any impacts from forest management activities by implementing selective harvest techniques that would maintain owl foraging habitat in all harvested areas, protecting an 80-ac (32-ha) core nesting area for one of the two owl pairs known to exist in the HCP area, and planting conifer tree species on approximately 80 ac (32 ha) of currently unforested habitat within the HCP area, which would result in a net increase in forested habitat over time. In addition, take of owls would be minimized using seasonal protection measures specified in the HCP. Details of the Regli Estates HCP are available at *http://www.fws.gov/arcata/es/birds/NSO/documents/Regli_Estates_1995_Final_HCP.pdf.*

Terra Springs Habitat Conservation Plan

We propose to exclude lands managed under the Terra Springs LLC Low Effect HCP in the Interior California Coast CHU from the final critical habitat designation. The permit issued in association with this HCP (noticed October 29, 2002 (67 FR 65998), and issued in 2004) has a term of 30 years and includes 76 ac (31 ha) of second-growth forest lands in Napa County, California. This HCP addresses the effects of timber harvest and conversion of 22 ac (9 ha) of forest lands to vineyard and any subsequent removal of commercial conifer trees from the remainder of the covered lands. The HCP provides a conservation program to minimize and mitigate for the covered activities, including a deed restriction that requires management in perpetuity of 41 ac (16 ha) of the property as nesting and roosting quality habitat for the northern spotted owl. In addition to mitigation, the Plan also includes measures to minimize take of the northern spotted owl. Details of the Terra Springs HCP are available at *http://www.fws.gov/arcata/es/birds/NSO/documents/Terra_Springs_2003_Final_HCP.pdf.*

State of Oregon

No lands covered under an HCP in the State of Oregon are currently proposed as critical habitat.

State of Washington

Cedar River Watershed Habitat Conservation Plan

We propose to exclude lands managed under the Cedar River Watershed HCP in in King County, Washington from the final critical habitat designation. The City of Seattle completed an HCP that covers the City's 90,535-ac (36,368-ha) watershed and the City's water supply and hydroelectric operations on the Cedar River, which discharges into Lake Washington. Based on this HCP, we issued a permit April 21, 2000 (noticed December 11, 1998 (63 FR 68469)), that covers forestry restoration activities including riparian thinning, road abandonment, and timber-stand improvement in the upper Cedar River Watershed. It also provides for activities associated with the development of utilities and infrastructure, recreational activities, and water activities. The plan was prepared to address the declining populations of salmon, steelhead, and other species of fish and wildlife in the Cedar River basin, and includes habitat-based conservation and mitigation strategies for all species addressed in the HCP, as well as species-specific conservation and mitigation strategies for all listed species. Details regarding the City of Seattle Cedar River Watershed HCP are available at *http://www.seattle.gov/util/About_SPU/Water_System/Habitat_Conservation_Plan/index.asp.*

Green River Water Supply Operations and Watershed Protection Habitat Conservation Plan

The Service proposes to exclude lands managed under the Green River Water Supply Operations and Watershed Protection HCP in the State of Washington from the final critical habitat designation. The permit associated with this HCP was noticed in the **Federal Register** on August 21, 1998 (63 FR 44918), and issued on July 6, 2001. The Green River Water Supply Operations and Watershed Protection HCP addresses upstream and downstream fish passage issues, flows in the Middle and lower Green River, and timber and watershed-management activities on Tacoma-owned land in the upper Green River Watershed of 15,843 ac (6,411 ha). The HCP covers 32 species of fish and wildlife, including the northern spotted owl and 10 other listed species under an agreement designed to allow the continuation of water-supply operations on the Green River, and covers forest management and water activities. The plan provides for fish passage into and out of the upper Green River Watershed, and serves as an umbrella for a number of agreements for river operations, water-supply operations, and forest and land management, including several major habitat-restoration projects. Details of the Green River Water Supply Operations and Watershed Protection HCP are available at *http://www.mytpu.org/tacomawater/water-conservation/environment/fish-wildlife/habitat-conservation-plan.htm.*

Plum Creek Timber Central Cascades Habitat Conservation Plan

We propose to exclude lands managed under the Plum Creek Timber Central Cascades HCP in the State of Washington in the final critical habitat designation. The permit associated with the Plum Creek Timber HCP was first noticed in the **Federal Register** on November 17, 1995 (60 FR 57722), issued on June 27, 1996, and later modified in December of 1999 as noticed on February 10, 2000 (65 FR 6590). The permit has a term of 50 years (with an option to extend to 100 years if certain conditions are met) and covers 84,600 ac (34,236 ha) of lands in the Interstate-90 corridor in King and Kittitas Counties, Washington. The HCP includes over 315 species of fish and wildlife, including the northern spotted owl and 7 other listed species. The plan addresses forest-management activities across an area of industrial timberlands in Washington's central Cascade Mountains, and provides for management of the northern spotted owl based on landscape conditions tailored to the guidelines provided by the NWFP by providing additional protection to northern spotted owl sites near Late Successional Reserves. Wildlife trees are retained in buffers of natural features (e.g., caves, wetlands, springs, cliffs, talus slopes) and streams, as well as scattered and clumped within harvest units. The HCP also requires Plum Creek to maintain and grow forests of various structural stages across all of their HCP ownerships. This commitment of forest stages, in combination with wildlife trees retained within harvest units and stream and landscape-feature buffers will provide a

matrix of habitat conditions that complements the owl habitat provided in the HCP. Stands containing scattered leave trees following harvest will be expected to become more valuable for spotted owls at earlier ages than those harvested using previous methods. Details of the Plum Creek Timber Central Cascades HCP are available at *http://www.fws.gov/wafwo/CHP_new.html.*

Washington State Department of Natural Resources State Lands Habitat Conservation Plan

We propose to exclude lands managed under the Washington State Department of Natural Resources (WDNR) State Lands HCP in multiple CHUs in Washington from the final critical habitat designation. The WDNR State Lands HCP covers approximately 1.7 million ac (730,000 ha) of State forest lands within the range of the northern spotted owl in the State of Washington. The majority of the area covered by the HCP is west of the Cascade Crest and includes the Olympic Peninsula and southwest Washington. The WDNR HCP lands on the west side of the Olympic Peninsula are managed as the Olympic Experimental State Forest. The remainder of the area is on the east side of the Cascade Range within the range of the northern spotted owl. The permit associated with this HCP, issued January 30, 1997, was noticed in the **Federal Register** on April 5, 1996 (61 FR 15297), has a term of 70 to 100 years, and covers activities primarily associated with commercial forest management, but also includes limited non-timber activities such as some recreational activities. The HCP covers all species, including the northern spotted owl and other listed species.

The HCP addressed multiple species through a combination of strategies. The marbled murrelet is addressed through a combination of research, modeling, surveys, and development of a long-term plan to retain and protect important old-forest habitat. The HCP also includes a series of Natural Area Preserves and Natural Resource Conservation Areas. Riparian conservation includes buffers on fishbearing streams as well as substantial buffers on streams and wetlands without fish. Wildlife trees are retained in buffers of natural features (e.g., caves, wetlands, springs, cliffs, talus slopes) and streams, as well as scattered and clumped within harvest units. The HCP also requires WDNR to maintain and grow forests of various structural stages across all of their HCP ownerships. Specifically for spotted owls, they have identified portions of the landscape upon which they will manage for nesting, roosting, and foraging (NRF) habitat for spotted owls. These areas are known as NRF Management Areas (NRFMAs) and were located to provide demographic support that would strategically complement the NWFP's Late-Successional Reserves as well as those Adaptive Management Areas that have late-successional objectives. The NRFMAs also were situated to help maintain species distribution. Generally, these NRFMAs will be managed so that approximately 50 percent of those lands will develop into NRF habitat for the northern spotted owl over time. Within this 50 percent, certain nest patches containing high-quality nesting habitat are to be retained and grown. Since the HCP was implemented, within the NRFMAs, WDNR has carried out 5,100 ac (2,064 ha) of pre-commercial thinning and 7,800 ac (3,156 ha) of timber harvest specifically configured to enhance spotted owl habitat. WDNR's habitat enhancement activities will continue under the HCP.

Some areas outside of the NRFMAs are managed to provide for dispersal and foraging conditions in 50 percent of the forests in those areas; these were strategically located in landscapes important for connectivity. The Olympic Experimental State Forest is managed to provide for spotted owl conservation across all of its lands. Even in areas not specifically managed for spotted owls, WDNR has committed to providing a range of forest stages across the landscape to address multiple species. This commitment of forest stages, in combination with wildlife trees retained within harvest units and stream and landscape-feature buffers, will provide a matrix of habitat conditions that will also provide some assistance in conserving spotted owls. Stands containing scattered leave trees following harvest will be expected to become more valuable for spotted owls at earlier ages than those harvested using previous methods. Owls across the WDNR HCP are expected to benefit from the combination of these strategies. Details of the WDNR HCP are available at *http://www.dnr.wa.gov/researchscience/topics/trustlandshcp/Pages/Home.aspx.*

West Fork Timber Habitat Conservation Plan

We propose to exclude lands managed under the West Fork Timber HCP (formerly known as Murray Pacific) in the West Cascades Central CHU from the final critical habitat designation. The West Fork Timber HCP was the first multi-species HCP on forested lands in the Nation. The permit associated with the West Fork Timber HCP has a term of 100 years and was first issued on September 24, 1993; amended on June 26, 1995; and amended again on October 16, 2001 (66 FR 52638). The HCP includes 53,558 ac (21,674 ha) of commercial timber lands managed as a tree farm in Lewis County, Washington. The HCP was first developed to allow for forest-management activities and provide for the conservation of the northern spotted owl; the amended HCP provides for all species, including 6 listed species. The HCP is designed to develop and maintain owl dispersal habitat across 43 percent of the tree farm. In addition, the HCP provides for leaving at least 10 percent of the tree farm in reserves for the next 100 years. These reserves will primarily take the form of riparian buffers averaging at least 100 ft (30 m) on each side of all fish-bearing streams, as well as other buffers and set-a-side areas. Other provisions of the HCP are designed to ensure that all forest habitat types and age classes currently on the tree farm, as well as special habitat types such as talus slopes, caves, nest trees, and den sites, are protected or enhanced. Details of the West Fork Timber HCP are available at *http://www.fws.gov/wafwo/CHP_new.html.*

SDS Company LLC and Broughton Lumber Company Proposed Conservation Plan

We may consider excluding forest lands owned and managed by the SDS Company LLC and Broughton Lumber Company in Washington and Oregon. The companies are in the process of negotiating a conservation plan (either an HCP or an SHA) with the Service. If the spotted owl provisions of the conservation plan are finalized, and the permit is issued in time for us to consider the provisions of the conservation plan prior to our final rulemaking, we propose to exclude these lands. If the northern spotted owl provisions of the conservation plan are finalized, and the permit is issued prior to our final rulemaking, we propose to exclude these lands. The SDS Company LLC and Broughton Lumber Company collectively manage approximately 83,000 acres (33,589 ha) of forestland in Skamania and Klickitat counties in Washington, and Hood River and Wasco counties in Oregon. These lands provide some habitat for some northern spotted owl activity sites. The Service anticipates conservation benefits for northern spotted owls could be provided by completing a conservation plan with the companies on these lands.

Lands With Conservation Easements, Other Management Agreements, or Other Partnerships

California

California State Park Lands

We propose to exclude 164,672 ac (66,640 ha) of California State Park lands, as these lands are managed consistent with the conservation and recovery needs of the northern spotted owl.

Big River, Salmon Creek and Garcia River Forests

We propose to exclude the three forest tracts known as the Big River Forest (11,837 ac (4,790 ha)), Salmon Creek Forest (4,676 ac (1,892 ha)), and Garcia River Forest (23,780 ac (9,624 ha)) in western Mendocino County from the final critical habitat designation. The Big River and Salmon Creek Forests are in Subunit 2 and the Garcia Forest is in Subunit 3 of the Redwood Coast CHU. The Garcia River Forest is in a key location for local and regional habitat connectivity. The three tracts were recently acquired by The Conservation Fund (TCF); conservation easements on these tracts are held by The Nature Conservancy (TNC). TCF maintains forest certifications under the Forest Stewardship Council and the Sustainable Forestry Initiative programs; and is initiating carbon sequestration certification through the California Climate Action Registry. TCF has completed Integrated Resource Management Plans (IRMPs) for all three tracts in conjunction with the forest certification programs. Under the IRMPs, the northern spotted owl is identified as an indicator species for assessing ecosystem change and for guiding adaptive management strategies. Due to the history of intensive forest harvesting under previous owners, younger forest age classes are over-represented in current timber inventories; though there is enough suitable breeding habitat to support at least 17 owl activity sites on the three tracts combined. Forest management and carbon storage goals over the next several decades are to expand the standing forest inventory through reliance on uneven-aged silviculture and constrained harvest levels. Combined with the current inventory picture, this management direction indicates, at minimum, that there will be substantial recruitment of suitable foraging habitat on these lands over the next 2 to 3 decades.

Mendocino Redwood Company Proposed Habitat Conservation Plan

We may consider excluding forest lands owned and managed by the Mendocino Redwood Company in the Redwood Coast CHU in California. The company is in the process of negotiating a multispecies terrestrial and aquatic HCP and Natural Communities Conservation Plan with the Service and with National Marine Fisheries Service. In our best estimate, this process will not be completed before the final critical habitat rule is issued. However, if the spotted owl provisions of the HCP are finalized, and the permit is issued prior to our final rulemaking, we may consider these lands for exclusion in the final critical habitat designation. The Mendocino Redwood Company manages 232,584 ac (94,123 ha) of forestland in Mendocino and Sonoma counties and continuously monitors more than 160 northern spotted owl activity sites. Based on our regional analysis of habitat suitability and connectivity, company lands contain an abundance of high-quality owl habitat. Three management units on this ownership, Rockport, Garcia and Annapolis, are in key locations for regional habitat connectivity.

Usal Forest

We propose to exclude the forest tract known as Usal Forest in northwestern Mendocino County, in Subunit 2 of the Redwood Coast CHU from the final critical habitat designation. The tract is owned by the Redwood Forest Foundation, Inc. (RFFI, non-profit), and is under a conservation easement is held by The Conservation Fund. On-the-ground management is carried out by the Campbell Group, LLC. RFFI and Campbell Group have issued a draft northern spotted owl management plan, which is under review by the California Department of Forestry and Fire Protection. The foundation has only recently acquired the land, but they have begun two initiatives, one for forest certification with the Forest Stewardship Council program, and another for certification of carbon sequestration through the California Climate Action Registry. The Usal Forest is approximately 50,000 ac (20,235 ha) and includes approximately 20 northern spotted owl activity sites under continuous monitoring. There are substantial amounts of high-quality owl habitat and the tract is in a key location for local and regional habitat connectivity. Among the conservation measures in the draft management plan are provisions for continued monitoring of owl activity sites, reporting of the monitoring results to State agencies and the Service, establishment of mapped polygons of suitable habitat around each activity site wherein no timber harvest or limited timber harvest may occur, and introduction of silvicultural practices designed to maintain or improve habitat suitability within northern spotted owl nesting, roosting, and foraging areas.

Van Eck Forest Foundation

The Van Eck Forest is discussed in detail under Safe Harbor Agreements. This land is also under a conservation easement held by the Pacific Forest Trust.

State of Oregon

The Oregon Department of Forestry (ODF) collectively manages about 700,000 ac (283,290 ha) in the Tillamook, Clatsop, and Elliott State Forests (co-managed with Oregon Department of State Lands) in addition to other parcels in western Oregon, and we are proposing approximately 228,733 ac (92,565 ha) of these lands as critical habitat for the northern spotted owl. The Tillamook and Clatsop State Forests are managed under the criteria contained within the Northwestern Oregon Forest Management Plan (revised April 2010). ODF is in the process of withdrawing from the 1995 Elliott State Forest Habitat Conservation Plan due to an inability to develop a revised HCP because of disagreements related to salmonid management. The Elliott State Forest Management Plan, which was approved by the Board of Forestry and State Land Board in the fall of 2011, covers the Elliott State Forest and scattered tracts in Coos, Curry, and Douglas Counties. These plans are available online at *http://egov.oregon.gov/ODF/STATE_FORESTS/Forest_Management_Plans.shtml*).

State forest management plans are long-range plans that provide policy goals and strategies under which more specific district implementation plans and annual operation plans are developed. We are currently working with ODF to understand how portions of these State forest lands are currently managed to contribute to the long-term maintenance and enhancement of spotted owls, in alignment with the recommendations in the Revised Recovery Plan (USFWS 2011, pp. III–57 to III–58). In this context, ODF has recently provided the Service with maps and information about ODF's plans to develop structurally complex habitat on portions of the State Forest's landscape. Work is currently underway between the Service and ODF to evaluate this

information, which may form the basis for adjustments in the final designation of critical habitat. The continued implementation of ODF's forest management plans, and commitments to adaptive management improvements over time articulated in these plans, are the State of Oregon's voluntary contributions to spotted owl recovery on forestlands managed by the ODF. If future management is sufficient to meet the standards of exclusion from designated critical habitat as described in this proposed revised rule, we will consider excluding some or all of these lands from the final designation of critical habitat.

State of Washington

Washington State Park Lands

We propose to exclude 104 ac (42 ha) of Washington State Park lands, as these lands are managed consistent with the conservation and recovery needs of the northern spotted owl.

Scofield Corporation Deed Restriction (Formerly Habitat Conservation Plan)

We propose to exclude lands that were formerly covered under the Scofield Corporation HCP in the East Cascades North CHU from the final critical habitat designation. This HCP for 40 ac (16 ha) of forest lands in Chelan County, Washington, covered forest-management activities and the associated incidental take permit included only the northern spotted owl. The HCP provided for mitigation and minimization measures by retaining a buffer of intact habitat, implementing selective timber-harvest practices, and placing a perpetual deed restriction on the property permanently prohibiting further timber harvest or tree removal except with the express written consent of the U.S. Fish and Wildlife Service. These measures were designed to ensure the retention of some owl habitat and approximately 72 percent of the total number of trees after harvest. Although the permit issued under this HCP in 1996 had a duration of only 1 year (noticed February 20, 1996 (61 FR 6381), and issued April 3, 1996), as provided in the permit terms, the lands under this HCP are now covered by a deed restriction for those lands in perpetuity.

Federal Lands

As noted above, Federal agencies have an independent responsibility under section 7(a)(1) of the Act to use their programs in furtherance of the Act and to utilize their authorities to carry out programs for the conservation of endangered and threatened species. We consider the development and implementation of land management plans by Federal agencies to be consistent with this statutory obligation under section 7(a)(1) of the Act. Therefore, Federal land management plans, in and of themselves, are generally not an appropriate basis for excluding essential habitat. Some broad-scale Federal resource management plans (e.g., the Northwest Forest Plan) provide conservation benefits to the northern spotted owl as well as all other species within the plan boundaries. In addition, in some places, Federal land management agencies may actively manage for the northern spotted owl and conduct specific conservation actions for the species. Congressionally reserved natural areas (e.g., wilderness areas, national parks, national scenic areas) were not included in the 1992 and 2008 northern spotted owl critical habitat designations. In this rulemaking, we propose to exclude 2,631,736 ac (1,065,026 ha) of Congressionally reserved natural areas from the final critical habitat designation. We request public comment regarding existing specific conservation actions that Federal land management agencies have or are currently implementing on their lands, and will take this information into account when conducting our exclusion analysis in the final critical habitat designation.

Consideration of Indian Lands

In accordance with the Secretarial Order 3206, ''American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act'' (June 5, 1997); the President's memorandum of April 29, 1994, ''Government-to-Government Relations with Native American Tribal Governments'' (59 FR 22951); Executive Order 13175, ''Consultation and Coordination with Indian Tribal Governments'' (November 6, 2000, and as reaffirmed November 5, 2009); and the relevant provision of the Departmental Manual of the Department of the Interior (512 DM 2), we believe that fish, wildlife, and other natural resources on Indian lands may be better managed under Indian authorities, policies, and programs than through Federal regulation where Indian management addresses the conservation needs of listed species. In addition, such designation may be viewed by tribes as unwarranted and an unwanted intrusion into Indian self-governance, thus compromising the government-to-government relationship essential to achieving our mutual goals of managing for healthy ecosystems upon which the viability of threatened and endangered species populations depend.

In developing proposed revised critical habitat designation for the northern spotted owl, we considered inclusion of some Indian lands. As described in the above section Criteria Used to Identify Critical Habitat, and detailed in our supporting documentation (Dunk *et al.* 2012, entire), we evaluated numerous potential habitat scenarios to determine those areas that are essential to the conservation of the northern spotted owl. In all cases, we assessed the effectiveness of the habitat scenario under consideration in terms of its ability to meet the recovery goals for the species. Furthermore, the habitat scenarios under consideration included a comparison of different prioritization schemes for landownership; we prioritized areas under consideration for critical habitat such that we looked first to Federal lands, followed by State, private, and Tribal or Indian lands. Indian lands are those defined in Secretarial Order 3206 ''American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act'' (June 5, 1997), as: (1) Lands held in trust by the United States for the benefit of any Indian tribe or individual; and (2) lands held by any Indian Tribe or individual subject to restrictions by the United States against alienation. In evaluating Indian lands under consideration as potential critical habitat for the northern spotted owl, we further considered the directive of Secretarial Order 3206 that stipulates ''Critical habitat shall not be designated in such areas unless it is determined essential to conserve a listed species. In designating critical habitat, the Services shall evaluate and document the extent to which the conservation needs of the listed species can be achieved by limiting the designation to other lands.''

Although some Indian lands identified in our habitat modeling demonstrated the potential to contribute to the conservation of the northern spotted owl, our analysis did not suggest that these areas were essential to conserve the northern spotted owl. This determination was based on our relative evaluation of the various habitat scenarios under consideration; if the population performance results from our habitat modeling indicated that we could meet the recovery goals for the species without relying on Indian lands, we did not consider the physical and biological features on those lands, or the lands themselves, to be essential to the conservation of the species, therefore they did not meet our criteria for inclusion in critical habitat. Our

evaluation of the areas under consideration for designation as critical habitat indicated that we could achieve the conservation of the northern spotted owl by limiting the designation of revised critical habitat to other lands. Therefore, no Indian lands are included in the proposed revised designation of critical habitat.

Peer Review

In accordance with our joint policy on peer review published in the **Federal Register** on July 1, 1994 (59 FR 34270), we will seek the expert opinions of at least three appropriate and independent specialists regarding this proposed rule and appropriate supporting materials that were used in its development that may have not otherwise undergone peer review. The purpose of peer review is to ensure that our critical habitat designation is based on scientifically sound data, assumptions, and analyses. We have invited these peer reviewers to comment during this public comment period on our specific assumptions and conclusions in this proposed revised designation of critical habitat. All sources we have relied upon in the development of this proposed rule, including all published peer-reviewed literature and the Revised Recovery Plan, are cited and full references are provided for download at *http://www.regulations.gov,* or in hard copy upon request (see **FOR FURTHER INFORMATION CONTACT**).

In addition, we note that the Revised Recovery Plan for the Northern Spotted Owl (USFWS 2011), which provides the recovery criteria and habitat modeling framework upon which this proposed revised designation of critical habitat is based, in part, was subject to a rigorous peer review process. The Wildlife Society and the American Ornithologists' Union/Society for Conservation Biology (jointly) provided peer review of the draft Revised Recovery Plan. We also received reviews from experts on our Scientific Review Committee, as well as numerous unsolicited reviews from other specialists and organizations, that contributed to the scientific integrity of the habitat modeling framework presented in Appendix C of the Revised Recovery Plan.

We will consider all comments and information received during this comment period on this proposed rule during our preparation of a final determination. Accordingly, the final decision may differ from this proposal.

Public Hearings

Section 4(b)(5) of the Act provides for one or more public hearings on this proposal, if requested. Requests must be received within 45 days after the date of publication of this proposed rule in the **Federal Register**. Such requests must be sent to the address shown in **FOR FURTHER INFORMATION CONTACT**. We will schedule public hearings on this proposal, if any are requested, and announce the dates, times, and places of those hearings, as well as how to obtain reasonable accommodations, in the **Federal Register** and local newspapers at least 15 days before the hearing.

Required Determinations

Regulatory Planning and Review—Executive Order 12866/13563

The Office of Management and Budget (OMB) has determined that this rule is significant and has reviewed this proposed rule under Executive Order 12866 and 13563 (E.O. 12866 and E.O. 13563). OMB based its determination upon the following four criteria:

(1) Whether the rule will have an annual effect of $100 million or more on the economy or adversely affect an economic sector, productivity, jobs, the environment, or other units of the government;

(2) Whether the rule will create inconsistencies with other Federal agencies' actions;

(3) Whether the rule will materially affect entitlements, grants, user fees, loan programs, or the rights and obligations of their recipients; or

(4) Whether the rule raises novel legal or policy issues.

Executive Order 13563 reaffirmed the principles of E.O. 12866 while calling for improvements in the nation's regulatory system to promote predictability, to reduce uncertainty, and to use the best, most innovative, and least burdensome tools for achieving regulatory ends. The executive order directs agencies to consider where relevant, feasible, and consistent with regulatory objectives, and to the extent permitted by law, regulatory approaches that reduce burdens and maintain flexibility and freedom of choice for the public. E.O. 13563 emphasizes further that regulations must be based on the best available science and that the rulemaking process must allow for public participation and an open exchange of ideas. This proposed rule has been developed in a manner consistent with these requirements and the Service is committed to respecting them in the development of the final critical habitat designation.

Regulatory Flexibility Act (5 U.S.C. 601 et seq.)

Under the Regulatory Flexibility Act (RFA; 5 U.S.C. 601 *et seq.*) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 (5 U.S.C 801 *et seq.*), whenever an agency must publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effects of the rule on small entities (small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of the agency certifies the rule will not have a significant economic impact on a substantial number of small entities. The SBREFA amended the RFA to require Federal agencies to provide a certification statement of the factual basis for certifying that the rule will not have a significant economic impact on a substantial number of small entities.

Small entities include small organizations, such as independent nonprofit organizations; small governmental jurisdictions, including school boards and city and town governments that serve fewer than 50,000 residents; as well as small businesses. Small businesses include manufacturing and mining concerns with fewer than 500 employees, wholesale trade entities with fewer than 100 employees, retail and service businesses with less than $5 million in annual sales, general and heavy construction businesses with less than $27.5 million in annual business, special trade contractors doing less than $11.5 million in annual business, and agricultural businesses with annual sales less than $750,000. To determine whether potential economic impacts to these small entities are significant, we consider the types of activities that might trigger regulatory impacts under this rule, as well as the types of project modifications that may result. In general, the term ''significant economic impact'' is meant to apply to a typical small business firm's business operations.

To determine whether a designation of critical habitat could significantly affect a substantial number of small entities, we consider the number of small entities affected within particular types of economic activities (e.g., housing development, grazing, oil and gas production, timber harvesting). We apply the ''substantial number'' test individually to each industry to determine if certification is appropriate. However, the SBREFA does not

explicitly define ''substantial number'' or ''significant economic impact.'' Consequently, to assess whether a ''substantial number'' of small entities is affected by this designation, this analysis considers the relative number of small entities likely to be impacted in an area. In some circumstances, especially with critical habitat designations of limited extent, we may aggregate across all industries and consider whether the total number of small entities affected is substantial. In estimating the number of small entities potentially affected, we also consider whether their activities have any Federal involvement.

Under the Act, designation of critical habitat only affects activities carried out, funded, or permitted by Federal agencies. Some kinds of activities are unlikely to have any Federal involvement and so would not result in any additional effects under the critical habitat provisions of the Act. However, there are some State laws that limit activities in designated critical habitat even where there is no Federal nexus. If there is a Federal nexus, Federal agencies will be required to consult with us under section 7 of the Act on activities they fund, permit, or carry out that may affect critical habitat. If we conclude, in a biological opinion, that a proposed action is likely to destroy or adversely modify critical habitat, we can offer ''reasonable and prudent alternatives.'' Reasonable and prudent alternatives are alternative actions that can be implemented in a manner consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that would avoid destroying or adversely modifying critical habitat.

A Federal agency and an applicant may elect to implement a reasonable and prudent alternative associated with a biological opinion that has found adverse modification of critical habitat. An agency or applicant could alternatively choose to seek an exemption from the requirements of the Act or proceed without implementing the reasonable and prudent alternative. However, unless an exemption were obtained, the Federal agency or applicant would be at risk of violating section 7(a)(2) of the Act if it chose to proceed without implementing the reasonable and prudent alternatives. We may also identify discretionary conservation recommendations designed to minimize or avoid the adverse effects of a proposed action on critical habitat, help implement recovery plans, or to develop information that could contribute to the recovery of the species.

Any existing and planned projects, land uses, and activities that could affect the proposed critical habitat but have no Federal involvement would not require section 7 consultation with the Service, so they are not restricted by the requirements of the Act. Federal agencies may need to reinitiate a previous consultation if discretionary involvement or control over the Federal action has been retained or is authorized by law and the activities may affect critical habitat.

At this time, we lack the available economic information necessary to provide an adequate factual basis for the required RFA finding specific to this proposed revised designation of critical habitat. Therefore, we defer the RFA finding until completion of the draft economic analysis prepared under section 4(b)(2) of the Act and Executive Order 12866. This draft economic analysis will provide the required factual basis for the RFA finding. Upon completion of the draft economic analysis, we will announce availability of the draft economic analysis of the proposed designation in the **Federal Register** and reopen the public comment period for the proposed designation. We will include with this announcement, as appropriate, an initial regulatory flexibility analysis or a certification that the rule will not have a significant economic impact on a substantial number of small entities accompanied by the factual basis for that determination.

We do have a recent economic analysis that was completed for the 2008 designation of critical habitat for the northern spotted owl. Because this proposed revised designation of critical habitat on Federal, State, and private lands differs from the current designation in that the current designation is limited entirely to Federal lands, the previous economic analysis is of somewhat limited utility in informing our analysis of the potential impacts of the proposed designation on any small entities. In our previous economic analysis, we concluded that in areas where the species is present, Federal agencies already are required to consult with us under section 7 of the Act on activities they fund, permit, or implement that may affect the northern spotted owl. Federal agencies also must consult with us if their activities may affect critical habitat. The designation of critical habitat, therefore, could result in an additional economic impact due to the requirement to reinitiate consultation for ongoing Federal activities that could be transferred to a small business entity.

In general, two different mechanisms in section 7 consultations could lead to additional regulatory requirements that the Federal action agency may be required to consult with us on regarding their project's impact on the northern spotted owl and its habitat. First, if we conclude, in a biological opinion, that a proposed action is likely to jeopardize the continued existence of a species or adversely modify its critical habitat, we can offer ''reasonable and prudent alternatives.'' Reasonable and prudent alternatives are alternative actions that can be implemented in a manner consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that would avoid jeopardizing the continued existence of listed species or result in adverse modification of critical habitat. A Federal agency and an applicant (potentially a small business) may elect to implement a reasonable and prudent alternative associated with a biological opinion that has found jeopardy or adverse modification of critical habitat. An agency or applicant could alternatively choose to seek an exemption from the requirements of the Act or proceed without implementing the reasonable and prudent alternative. However, unless an exemption were obtained, the Federal agency or applicant would be at risk of violating section 7(a)(2) of the Act if it chose to proceed without implementing the reasonable and prudent alternatives.

Second, if we find that a proposed action is not likely to jeopardize the continued existence of a listed animal or plant species, we may identify reasonable and prudent measures designed to minimize the amount or extent of take and require the Federal agency or applicant to implement such measures through non-discretionary terms and conditions. We may also identify discretionary conservation recommendations designed to minimize or avoid the adverse effects of a proposed action on listed species or critical habitat, help implement recovery plans, or to develop information that could contribute to the recovery of the species.

Based on our experience with consultations under section 7 of the Act for all listed species, virtually all projects—including those that, in their initial proposed form, would result in jeopardy or adverse modification determinations in section 7 consultations—can be implemented successfully with, at most, the adoption of reasonable and prudent alternatives.

These measures, by definition, must be economically feasible and within the scope of authority of the Federal agency involved in the consultation. We can only describe the general kinds of actions that may be identified in future reasonable and prudent alternatives. These are based on our understanding of the needs of the species and the threats it faces, as described in the final listing rule and this critical habitat designation. Within the final critical habitat units of the 2008 critical habitat, the types of Federal actions or authorized activities that were identified as potential concerns were:

(1) Regulation of activities affecting waters of the United States by the U.S. Army Corps of Engineers under section 404 of the Clean Water Act;

(2) Regulation of activities by the Fish and Wildlife Service under section 10(a)(1)(B) of the Endangered Species Act; and

(3) Activities involving other Federal actions (such as funding from the Federal Highway Administration, Federal Aviation Administration, or the Federal Emergency Management Agency).

We determined that it was likely that a developer or other project proponent could modify a project or take measures to protect the northern spotted owl. The kinds of actions that may be included if future reasonable and prudent alternatives become necessary include conservation set-asides, management of competing nonnative species, restoration of degraded habitat, and regular monitoring. We concluded that these measures were not likely to result in a significant economic impact to project proponents.

As noted above, this proposed revised designation of critical habitat for the northern spotted owl differs significantly from the current designation in terms of both scope and landownerships affected. Therefore, the Service has concluded that deferring the RFA until completion of the draft economic analysis specific to this proposed rulemaking is necessary to meet the purposes and requirements of the RFA. Deferring the RFA in this manner will ensure that the Service makes a sufficiently informed determination based on adequate economic information and provides the necessary opportunity for public comment. In the meantime, for the public's consideration, we have tentatively identified several categories of activities that we anticipate may potentially be affected by the proposed revised critical habitat; these activities include: (1) Timber management, (2) barred owl management and control, (3) northern spotted owl surveys and monitoring, (4) fire management, (5) linear projects (i.e., roads, pipelines, and powerlines), (6) restoration, (7) recreation, and (8) administrative costs associated with consultations under section 7 of the Act.

Determining the economic impacts of a critical habitat designation involves evaluating the ''without critical habitat'' baseline versus the ''with critical habitat'' scenario, to identify those effects expected to occur solely due to the designation of critical habitat and not from the protections that are in place due to the species being listed under the Act. Effects of a designation equal the difference, or the increment, between these two scenarios. Measured differences between the baseline (without critical habitat) and the designated critical habitat (with critical habitat) may include (but are not limited to) the economic effects stemming from changes in land or resource use or extraction, environmental quality, or time and effort expended on administrative and other activities by Federal landowners, Federal action agencies, and in some instances, State and local governments or private third parties. These are the ''incremental effects'' that serve as the basis for the economic analysis.

As a result of our preliminary evaluation, we expect that any potential incremental effects of the critical habitat designation would be due to: (1) An increased workload for action agencies and the Service to conduct re-initiated consultations for ongoing actions in newly designated critical habitat (areas proposed for designation that are not already included within the extant designation); (2) the cost to action agencies of including an analysis of the effects to critical habitat for new projects occurring in occupied areas of designated critical habitat; and (3) potential project alterations in unoccupied critical habitat. As in the prior designation, we therefore expect any incremental costs of critical habitat to be borne primarily by Federal agencies, since the majority of incremental effects are associated with consultation costs under section of the Act. On private lands, we expect that for a proposed action to result in a finding of adverse modification (i.e., that it would likely substantially reduce the conservation value of spotted owl critical habitat to such an extent that it would affect the ability of critical habitat to serve its intended recovery role), it would likely have to significantly alter large areas or restrict spotted owl connectivity through such areas. In light of our history of consultations, we believe that an adverse-modification finding is unlikely. This is based on our experience that in over 20 years of conducting consultations on the spotted owl, we have never had such a case. Nonetheless, should this occur, to avoid adverse modification we would most likely recommend reducing the scale of impacts to spotted owl habitat in the vicinity of areas important for connectivity or near population strongholds. In this rare event, there would potentially be some cost to the landowner in terms of reduced potential harvest. However, in general, we anticipate that actions that promote ecological restoration and those that apply ecological forestry principles as described in the Revised Recovery Plan for the Northern Spotted Owl (USFWS 2011, pp. III–11 to III–41) and elsewhere in this document are likely to be consistent with the conservation of the northern spotted owl and the management of its critical habitat, therefore we expect any potential economic impacts of the designation to be minimized. These are only tentative conclusions, however; the comprehensive evaluation of the potential economic impacts of the proposed revised designation will be presented in our draft economic analysis, which will be made available for public comment subsequent to the publication of this proposed rule.

Energy Supply, Distribution, or Use—Executive Order 13211

Executive Order 13211 (Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use) requires agencies to prepare Statements of Energy Effects when undertaking certain actions. While this proposed rule to designate revised critical habitat for the northern spotted owl is a significant regulatory action under Executive Order 12866, it is not expected to significantly affect energy supplies, distribution, or use. Therefore, this action is not a significant energy action, and no Statement of Energy Effects is required. However, we will further evaluate this issue as we conduct our economic analysis, and review and revise this assessment as warranted.

Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.)

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501 *et seq.*), we make the following findings:

(1) This rule will not produce a Federal mandate. In general, a Federal mandate is a provision in legislation, statute, or regulation that would impose

an enforceable duty upon State, local, or Indian governments, or the private sector, and includes both ''Federal intergovernmental mandates'' and ''Federal private sector mandates.'' These terms are defined in 2 U.S.C. 658(5)–(7). ''Federal intergovernmental mandate'' includes a regulation that ''would impose an enforceable duty upon State, local, or Indian governments'' with two exceptions. It excludes ''a condition of Federal assistance.'' It also excludes ''a duty arising from participation in a voluntary Federal program,'' unless the regulation ''relates to a then-existing Federal program under which $500,000,000 or more is provided annually to State, local, and Indian governments under entitlement authority,'' if the provision would ''increase the stringency of conditions of assistance'' or ''place caps upon, or otherwise decrease, the Federal Government's responsibility to provide funding,'' and the State, local, or Indian governments ''lack authority'' to adjust accordingly. At the time of enactment, these entitlement programs were: Medicaid; Aid to Families with Dependent Children work programs; Child Nutrition; Food Stamps; Social Services Block Grants; Vocational Rehabilitation State Grants; Foster Care, Adoption Assistance, and Independent Living; Family Support Welfare Services; and Child Support Enforcement. ''Federal private sector mandate'' includes a regulation that ''would impose an enforceable duty upon the private sector, except (i) a condition of Federal assistance or (ii) a duty arising from participation in a voluntary Federal program.''

The designation of critical habitat does not impose a legally binding duty on non-Federal Government entities or private parties. Under the Act, the only regulatory effect is that Federal agencies must ensure that their actions do not destroy or adversely modify critical habitat under section 7. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency. Furthermore, to the extent that non-Federal entities are indirectly impacted because they receive Federal assistance or participate in a voluntary Federal aid program, the Unfunded Mandates Reform Act would not apply, nor would critical habitat shift the costs of the large entitlement programs listed above onto State governments.

(2) We do not believe that this rule will significantly or uniquely affect small governments because most of the lands in the proposed revised designation are under Federal or State ownership, and do not occur within the jurisdiction of small governments. Therefore, a Small Government Agency Plan is not required. However, we will further evaluate this issue as we conduct our economic analysis, and review and revise this assessment if appropriate.

Takings—Executive Order 12630

In accordance with Executive Order 12630 (''Government Actions and Interference with Constitutionally Protected Private Property Rights''), this rule is not anticipated to have significant takings implications. As discussed above, the designation of critical habitat affects only Federal actions. Although private parties that receive Federal funding, assistance, or require approval or authorization from a Federal agency for an action may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency. Due to current public knowledge of the species protections and the prohibition against take of the species both within and outside of the proposed areas, we do not anticipate that property values will be affected by the critical habitat designation. However, we have not yet completed the economic analysis for this proposed rule. Once the economic analysis is available, we will review and revise this preliminary assessment as warranted, and prepare a Takings Implication Assessment.

Federalism—Executive Order 13132

In accordance with Executive Order 13132 (Federalism), we have determined that this proposed rule does not have direct federalism implications that would require a federalism summary impact statement; however, we are aware of the State level interest in this rule, and we both summarize below and explain in more detail in other parts of this package activities and responsibilities on Federal, State, and private lands.

From a federalism perspective, the designation of critical habitat directly affects only the responsibilities of Federal agencies. As explained in detail earlier, section 7(a)(2) of the Act requires Federal agencies—and only Federal agencies—to ensure that the actions they authorize, fund, or carry out are not likely to destroy or adversely modify critical habitat. The Act imposes no other duties with respect to critical habitat, either for States and local governments, or for anyone else. As a result, the proposed rule does not have substantial direct effects either on the States, or on the relationship between the national government and the States, or on the distribution of powers and responsibilities among the various levels of government. However, in keeping with Department of the Interior and Department of Commerce policy and the federalism principals set forth in Executive Order 13132, we are requesting information from, and consulting with appropriate State resource agencies in Washington, Oregon, and California on the effect of the proposed revised designation of critical habitat. We will use this information to more thoroughly evaluate the probable economic effects of this proposed designation in our draft economic analysis, to inform the development of our final rule, and to consider the appropriateness of excluding specific areas from the final rule.

The proposed revision of critical habitat also is not expected to have substantial indirect impacts. As explained in more detail above, activities within the areas proposed to be designated as critical habitat are already subject to a broad range of requirements, including: (1) The various requirements of the Northwest Forest Plan, including those applicable to its Late Successional Reserves, Riparian Reserves, and ''survey and manage'' restrictions; (2) the prohibition against ''taking'' northern spotted owls under sections 4(d) and 9 of the Act; (3) the prohibition against Federal agency actions that jeopardize the continued existence of the northern spotted owl under section 7(a)(2) of the Act; (4) the prohibition against taking other Endangered Species Act listed species that occur in the area of the proposed critical habitat (e.g., salmon, bull trout, and marbled murrelets); and (5) the prohibition against Federal agency actions that jeopardize the continued existence of such other listed species. All of these requirements are currently in effect and will remain in effect after the final revision of critical habitat.

Some indirect impacts of the proposed rule on States are, of course, possible. Section 7(a)(2) of the Act requires Federal agencies (action agencies) to consult with the Service whenever activities that they undertake, authorize, permit, or fund may affect a listed species or designated critical habitat. States or local governments may

be indirectly affected if they require Federal funds or formal approval or authorization from a Federal agency as a prerequisite to conducting an action. In such instances, while the primary consulting parties are the Service and the Federal action agency, State and local governments may also participate in section 7 consultation as an applicant. It is therefore possible that States may be required to change project designs, operation, or management of activities taking place within the boundaries of the designation in order to receive Federal funding, assistance, permits, approval, or authorization from a Federal agency. Also, to the extent that the designation of critical habitat affects timber harvest amounts on Federal land, county governments that receive a share of the receipts from such harvests may be affected.

On the other side of the ledger, the designation of critical habitat may have some benefit to State and local governments because the areas that contain the physical or biological features essential to the conservation of the species are more clearly defined, and the elements of the features of the habitat necessary to the conservation of the species are specifically identified. It may also assist local governments in long-range planning (rather than having them wait for case-by-case section 7 consultations to occur).

We will be examining these potential indirect impacts in connection with the forthcoming economic analysis that is being prepared pursuant to section 4(b)(2) of the Act, which will be made available for public comment prior to the finalization of this rule. We are committed to interactive management and will continue to consult with affected parties to minimize indirect impacts of this rulemakings on non-Federal entities.

We note, finally, that we intend to consult closely with State and local governments to ensure both that they understand the effects of such designation, and that we fully understand any concerns they may have. In particular, we will give careful consideration to any recommendations they may offer with respect to the exclusion of particular areas pursuant to section 4(b)(2) of the Act.

Civil Justice Reform—Executive Order 12988

In accordance with Executive Order 12988 (Civil Justice Reform), the Office of the Solicitor has determined that the rule does not unduly burden the judicial system and that it meets the requirements of sections 3(a) and 3(b)(2) of the Order. We have proposed revised critical habitat in accordance with the provisions of the Act. This proposed rule uses standard mapping conventions and identifies the elements of physical or biological features essential to the conservation of the northern spotted owl within the designated areas to assist the public in understanding the habitat needs of the species.

Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)

This rule does not contain any new collections of information that require approval by OMB under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*). This rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

National Environmental Policy Act (42 U.S.C. 4321 et seq.)

It is our position that, outside the jurisdiction of the U.S. Court of Appeals for the Tenth Circuit, we do not need to prepare environmental analyses pursuant to the National Environmental Policy Act (NEPA), 42 U.S.C. 4321 *et seq.,* in connection with designating critical habitat under the Act for the reasons outlined in a notice published in the **Federal Register** on October 25, 1983 (48 FR 49244). This position was upheld by the U.S. Court of Appeals for the Ninth Circuit (in a challenge to the first rulemaking designating critical habitat for the northern spotted owl. *Douglas County* v. *Babbitt,* 48 F.3d 1495 (9th Cir. 1995), cert. denied 516 U.S. 1042 (1996)). Nevertheless, given the scope of this particular proposed designation, the Service plans, as a matter of discretion and not as a legal requirement, to prepare an environmental assessment prior to making a final decision. We are in the process of drafting the environmental assessment, and plan to make it available at the same time that we release our draft economic analysis on this proposed rule; the comment period for the draft environmental assessment and the draft economic analysis will therefore run concurrently. One of the purposes in developing an environmental assessment is to determine whether an environmental impact statement may be warranted. However, based on our experience in the Tenth Circuit, where the Service routinely conducts NEPA analyses of critical habitat designations, to date we have found that environmental assessments have proven adequate.

Clarity of the Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

(1) Be logically organized;

(2) Use the active voice to address readers directly;

(3) Use clear language rather than jargon;

(4) Be divided into short sections and sentences; and

(5) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in the **ADDRESSES** section. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

Government-to-Government Relationship With Tribes

In accordance with the President's memorandum of April 29, 1994 (Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951), Executive Order 13175, ''Consultation and Coordination with Indian Tribal Governments'' (November 6, 2000, and as reaffirmed November 5, 2009), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. The United States recognizes the right of Indian tribes to self-government and supports tribal sovereignty and self-determination, and recognizes the need to consult with tribal officials when developing regulations that have tribal implications. In accordance with Secretarial Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with tribes in developing programs for healthy ecosystems, to acknowledge that Indian lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to tribes. Even though we have determined that there are no Indian lands that meet the definition of critical habitat for the northern spotted owl, and

therefore no Indian lands are included in this proposal, we will continue to coordinate and consult with tribes regarding resources within the proposed revised designation that are of cultural significance to them.

References Cited

A complete list of references cited in this rulemaking is available on the Internet at *http://www.regulations.gov* and upon request from the Oregon Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this package are the staff members of the Oregon Fish and Wildlife Office.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500; unless otherwise noted.

2. Amend § 17.95(b) by revising critical habitat for ''Northern Spotted Owl *(Strix occidentalis caurina)*'' to read as follows:

§ 17.95 Critical habitat—fish and wildlife.

* * * * *

(b) *Birds.*

* * * * *

Northern Spotted Owl *(Strix occidentalis caurina)*

(1) Critical habitat units are depicted for the States of Washington, Oregon, and California on the maps below.

(2) Critical habitat for the northern spotted owl includes the following four primary constituent elements (PCEs) set forth in paragraph (2)(i) (PCE 1) through paragraph (2)(iv) (PCE 4) of this entry. Each critical habitat unit must include PCE 1 and PCE 2, 3, or 4:

(i) PCE 1: Forest types that may be in early-, mid-, or late-seral stages and that support the northern spotted owl across its geographical range. These forest types are primarily:

(A) Sitka spruce;

(B) Western hemlock;

(C) Mixed conifer and mixed evergreen;

(D) Grand fir;

(E) Pacific silver fir;

(F) Douglas-fir;

(G) White fir;

(H) Shasta red fir;

(I) Redwood/Douglas-fir (in coastal California and southwestern Oregon); and

(J) The moist end of the ponderosa pine coniferous forest zones at elevations up to approximately 3,000 ft (900 m) near the northern edge of the range and up to approximately 6,000 ft (1,800 m) at the southern edge.

(ii) PCE 2: Habitat that provides for nesting and roosting. In many cases the same habitat also provide for foraging (PCE (3)). Nesting and roosting habitat provides structural features for nesting, protection from adverse weather conditions, and cover to reduce predation risks for adults and young. This PCE is found throughout the geographical range of the northern spotted owl, because stand structures at nest sites tend to vary little across the spotted owl's range. These habitats must provide:

(A) Sufficient foraging habitat to meet the home range needs of territorial pairs of northern spotted owls throughout the year (or must occur in conjunction with this habitat); and

(B) Stands for nesting and roosting that are generally characterized by:

(*1*) Moderate to high canopy closure (60 to over 80 percent).

(*2*) Multilayered, multispecies canopies with large (20–30 inches (in) (51–6 centimeters (cm) or greater diameter at breast height (dbh)) overstory trees.

(*3*) High basal area (greater than 240 ft^2/acre; 55 m^2/ha).

(*4*) High diversity of different diameters of trees.

(*5*) High incidence of large live trees with various deformities (e.g., large cavities, broken tops, mistletoe infections, and other evidence of decadence).

(*6*) Large snags and large accumulations of fallen trees and other woody debris on the ground.

(*7*) Sufficient open space below the canopy for northern spotted owls to fly.

(iii) PCE 3: Habitat that provides for foraging, which varies widely across the northern spotted owl's range, in accordance with ecological conditions and disturbance regimes that influence vegetation structure and prey species distributions. Across most of the owl's range, nesting and roosting habitat is also foraging habitat, but in some regions northern spotted owls may additionally use other habitat types for foraging as well. The specific foraging habitat PCEs for the four ecological zones within the geographical range of the northern spotted owl are the following:

(A) *West Cascades/Coast Ranges of Oregon and Washington.*

(*1*) Stands of nesting and roosting habitat; additionally, owls may use younger forests with some structural characteristics (legacy features) of old forests, hardwood forest patches, and edges between old forest and hardwoods.

(*2*) Moderate to high canopy closure (60 to over 80 percent).

(*3*) A diversity of tree diameters and heights.

(*4*) Increasing density of trees greater than or equal to 31 in (80 cm) dbh increases foraging habitat quality (especially above 12 trees per ac (30 trees per ha)).

(*5*) Increasing density of trees 20 to 31 in (51 to 80 cm) dbh increases foraging habitat quality (especially above 24 trees per ac (60 trees per ha)).

(*6*) Increasing snag basal area, snag volume (the product of snag diameter, height, estimated top diameter, and including a taper function), and density of snags greater than 20 in (50 cm) dbh all contribute to increasing foraging habitat quality, especially above 10 snags/ha.

(*7*) Large accumulations of fallen trees and other woody debris on the ground.

(*8*) Sufficient open space below the canopy for northern spotted owls to fly.

(B) *East Cascades.*

(*1*) Stands of nesting and roosting habitat; in addition, stands composed of Douglas-fir and white fir/Douglas-fir mix.

(*2*) Mean tree size (quadratic mean diameter greater than 16.5 in (42 cm).

(*3*) Increasing density of large trees (greater than 26 in (66 cm)) and increasing basal area (the cross-sectional area of tree boles measured at breast height) increases foraging habitat quality.

(*4*) Large accumulations of fallen trees and other woody debris on the ground.

(*5*) Sufficient open space below the canopy for northern spotted owls to fly.

(C) *Klamath and Northern California Interior Coast Ranges.*

(*1*) Stands of nesting and roosting habitat; in addition, other forest types with mature and old-forest characteristics.

(*2*) Presence of conifer species such as incense-cedar, sugar pine, and Douglas-fir and hardwood species such as bigleaf maple, black oak, live oaks, and madrone, as well as shrubs.

(*3*) Forest patches within riparian zones of low-order streams and edges between conifer and hardwood forest stands.

(*4*) Brushy openings and dense young stands or low-density forest patches within a mosaic of mature and older forest habitat.

(*5*) High canopy cover (87 percent at frequently used sites).

(*6*) Multiple canopy layers.

(*7*) Mean stand diameter greater than 21 in (52.5 cm).

(*8*) Increasing mean stand diameter and densities of trees greater than 26 in (66 cm) increases foraging habitat quality.

(*9*) Large accumulations of fallen trees and other woody debris on the ground.

(*10*) Sufficient open space below the canopy for northern spotted owls to fly.

(D) *Redwood Coast.*

(*1*) Nesting and roosting habitat; in addition, stands composed of hardwood tree species, particularly tanoak.

(*2*) Early-seral habitats 6 to 20 years old with dense shrub and hardwood cover and abundant woody debris; these habitats produce prey, and must occur in conjunction with nesting, roosting, or foraging habitat.

(*3*) Increasing density of small-to-medium sized trees (10 to 22 in; 25 to 56 cm), which increases foraging habitat quality.

(*4*) Trees greater than 26 in (66 cm) in diameter or greater than 41 years of age.

(*5*) Sufficient open space below the canopy for northern spotted owls to fly.

(iv) PCE 4: Habitat to support the transience and colonization phases of dispersal, which in all cases would optimally be composed of nesting, roosting, or foraging habitat (PCEs 2 or 3), but which may also be composed of other forest types that occur between larger blocks of nesting, roosting, and foraging habitat. In cases where nesting, roosting, or foraging habitats are insufficient to provide for dispersing or nonbreeding owls, the specific dispersal habitat PCEs for the northern spotted owl may be provided by the following:

(A) Habitat supporting the transience phase of dispersal, which includes:

(*1*) Stands with adequate tree size and canopy closure to provide protection from avian predators and minimal foraging opportunities; and

(*2*) Younger and less diverse forest stands than foraging habitat, such as even-aged, pole-sized stands, if such stands contain some roosting structures and foraging habitat to allow for temporary resting and feeding during the transience phase.

(B) Habitat supporting the colonization phase of dispersal, which is generally equivalent to nesting, roosting and foraging habitat as described in PCEs 2 and 3, but may be smaller in area than that needed to support nesting pairs.

(3) Critical habitat does not include manmade structures (such as buildings, aqueducts, runways, roads, other paved areas, or surface mine sites) and the land on which they are located; developed recreation sites, administrative sites, or roadways, and the land on which they are located, including a safety buffer for hazard tree management; or any meadows, grasslands, oak woodlands, or aspen woodlands existing on the effective date of this rule and not containing the primary constituent elements.

(4) Critical habitat map units. The designated critical habitat units for the northern spotted owl are depicted on the maps below.

(5) **Note:** Index map of critical habitat units for the northern spotted owl in the State of Washington follows:

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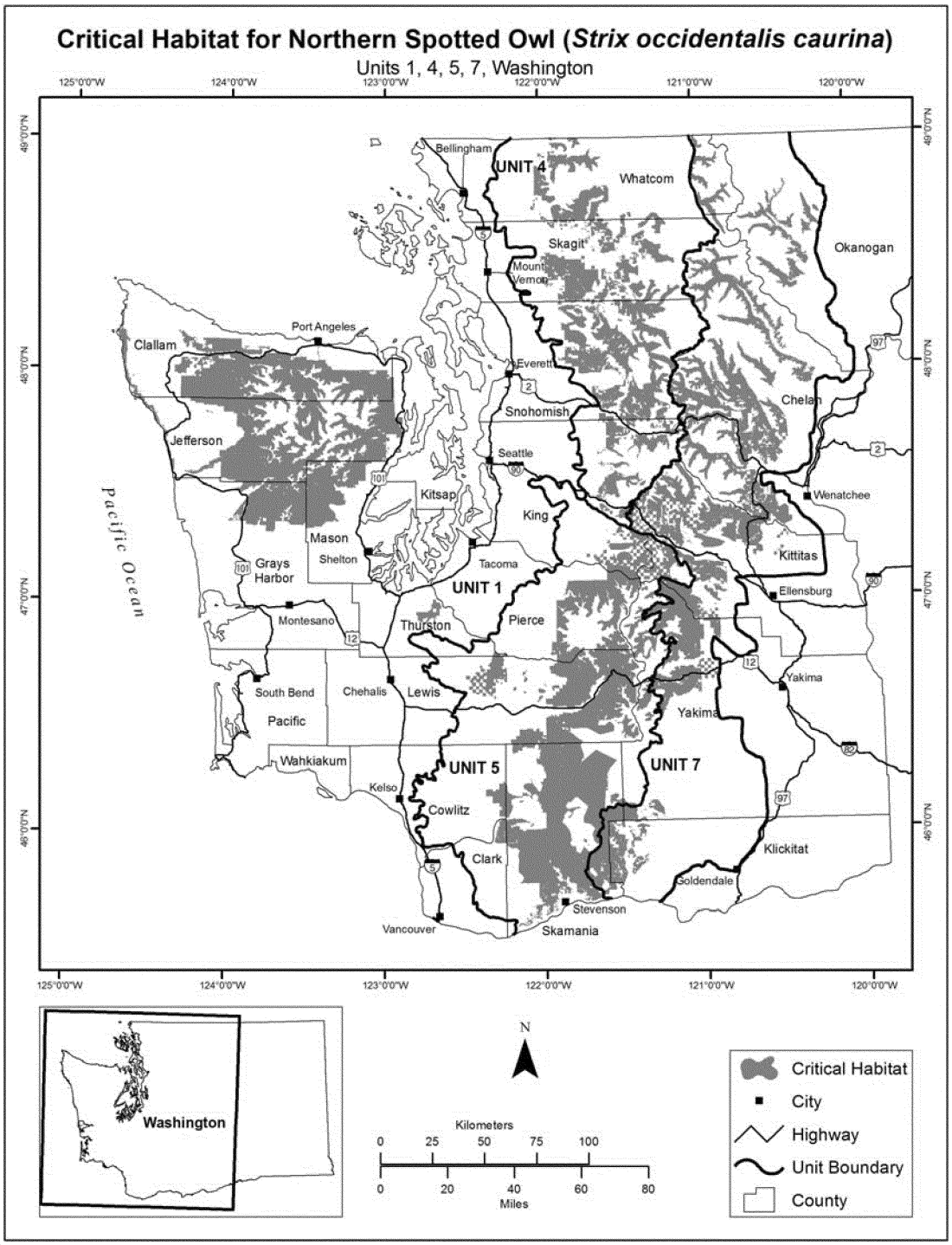
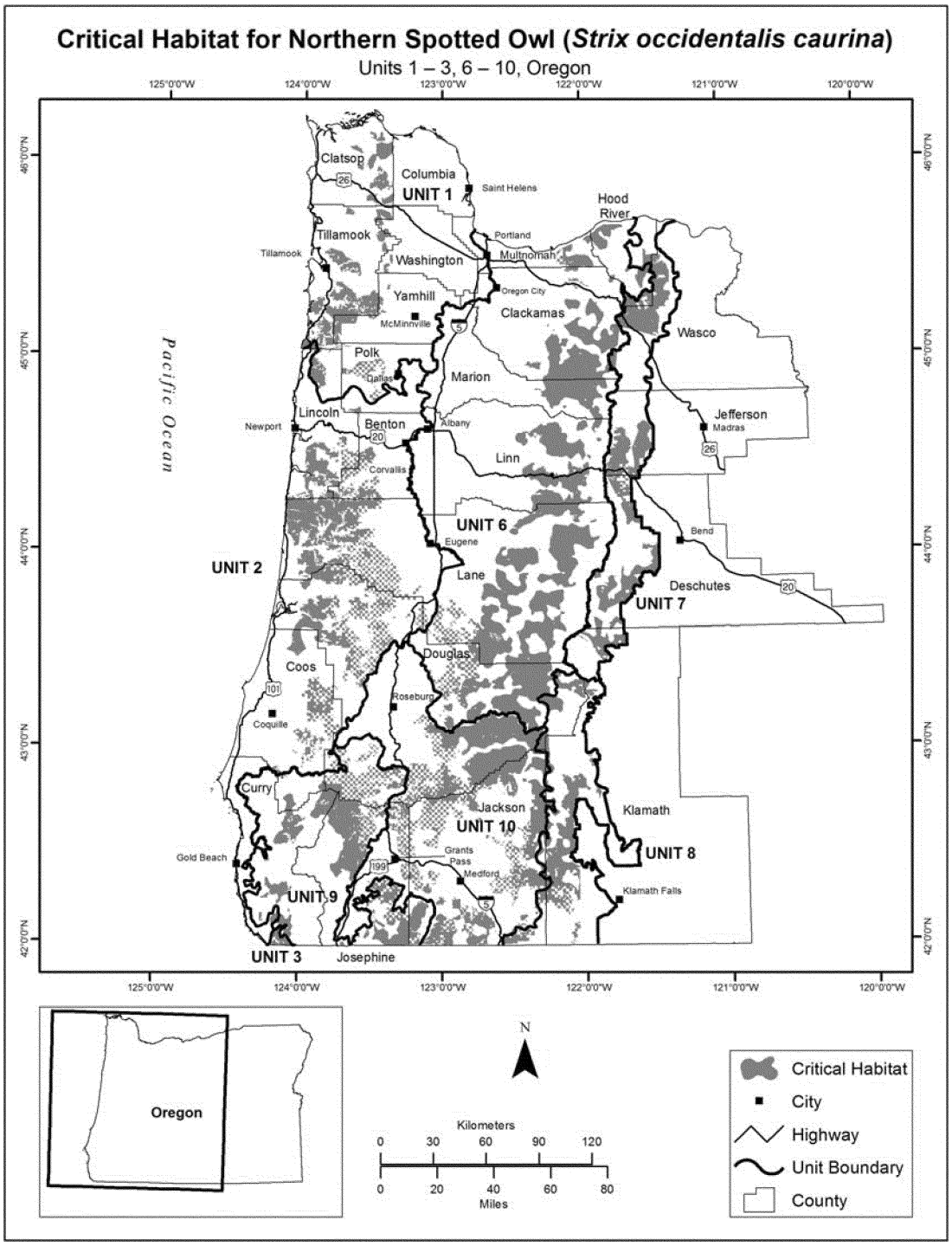
Index Map of Critical Habitat Units in the State of Washington



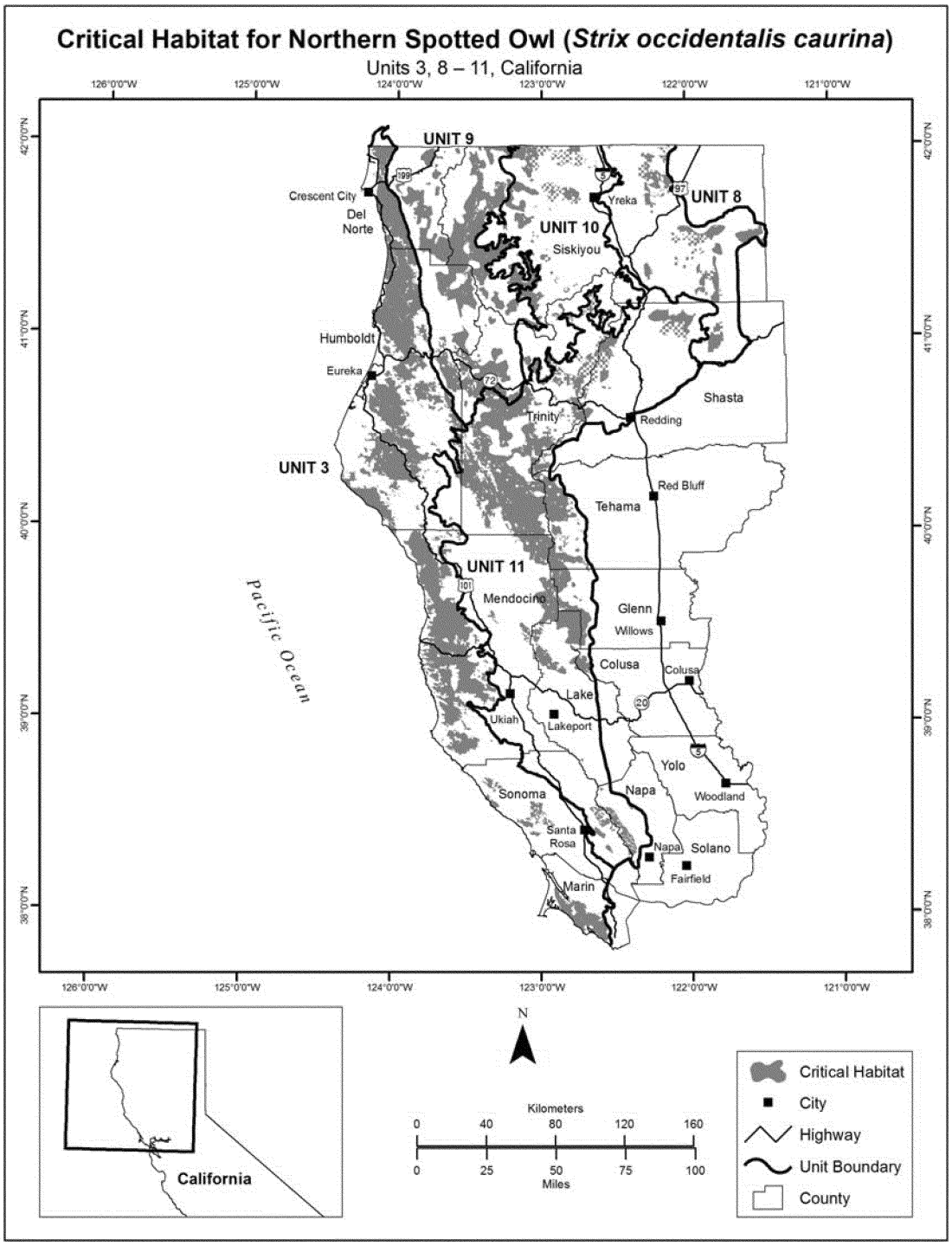
(6) **Note:** Index map of critical habitat units for the northern spotted owl in the State of Oregon follows:

Index Map of Critical Habitat Units in the State of Oregon



(7) **Note:** Index map of critical habitat units for the northern spotted owl in the State of California follows:

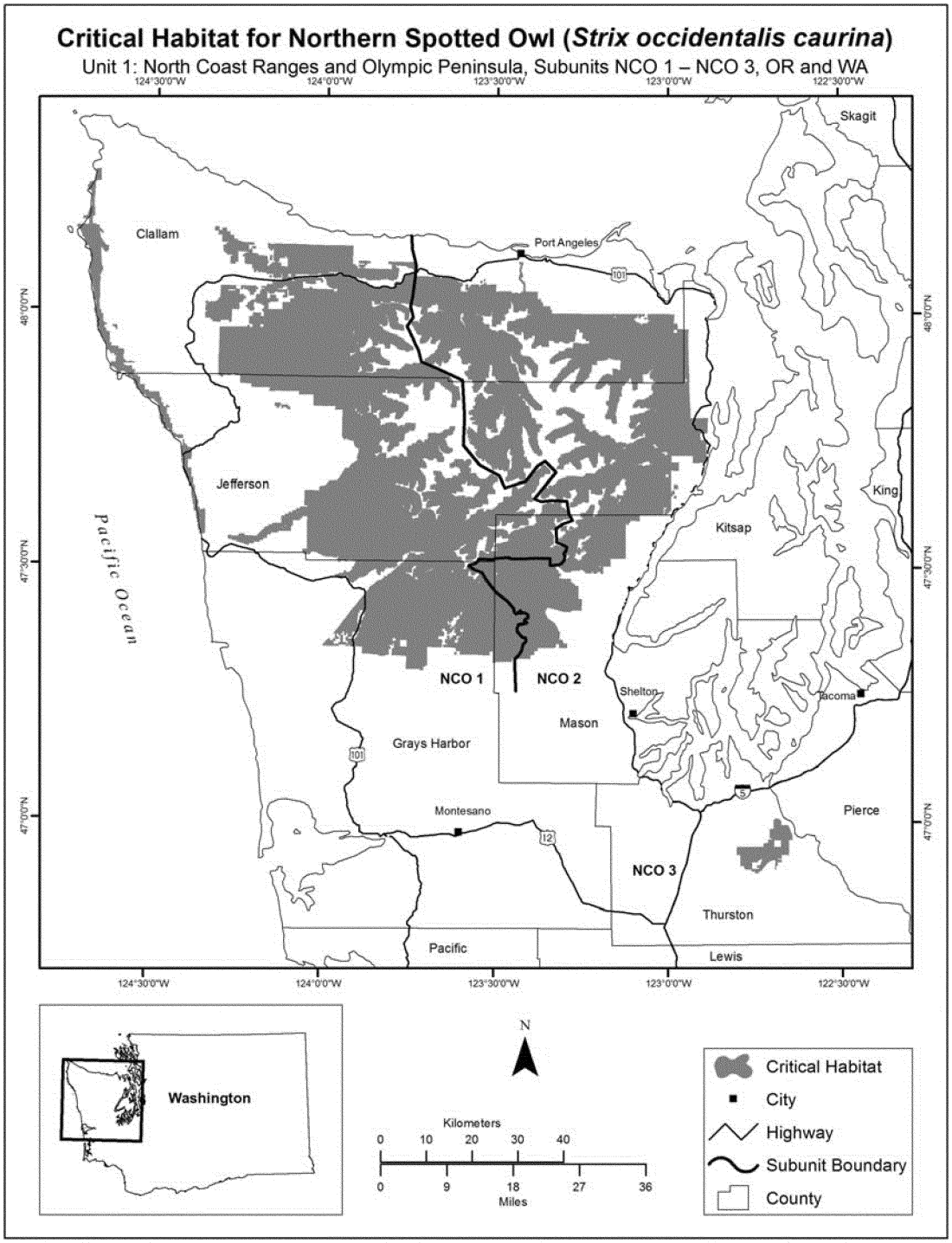
Index Map of Critical Habitat Units in the State of California

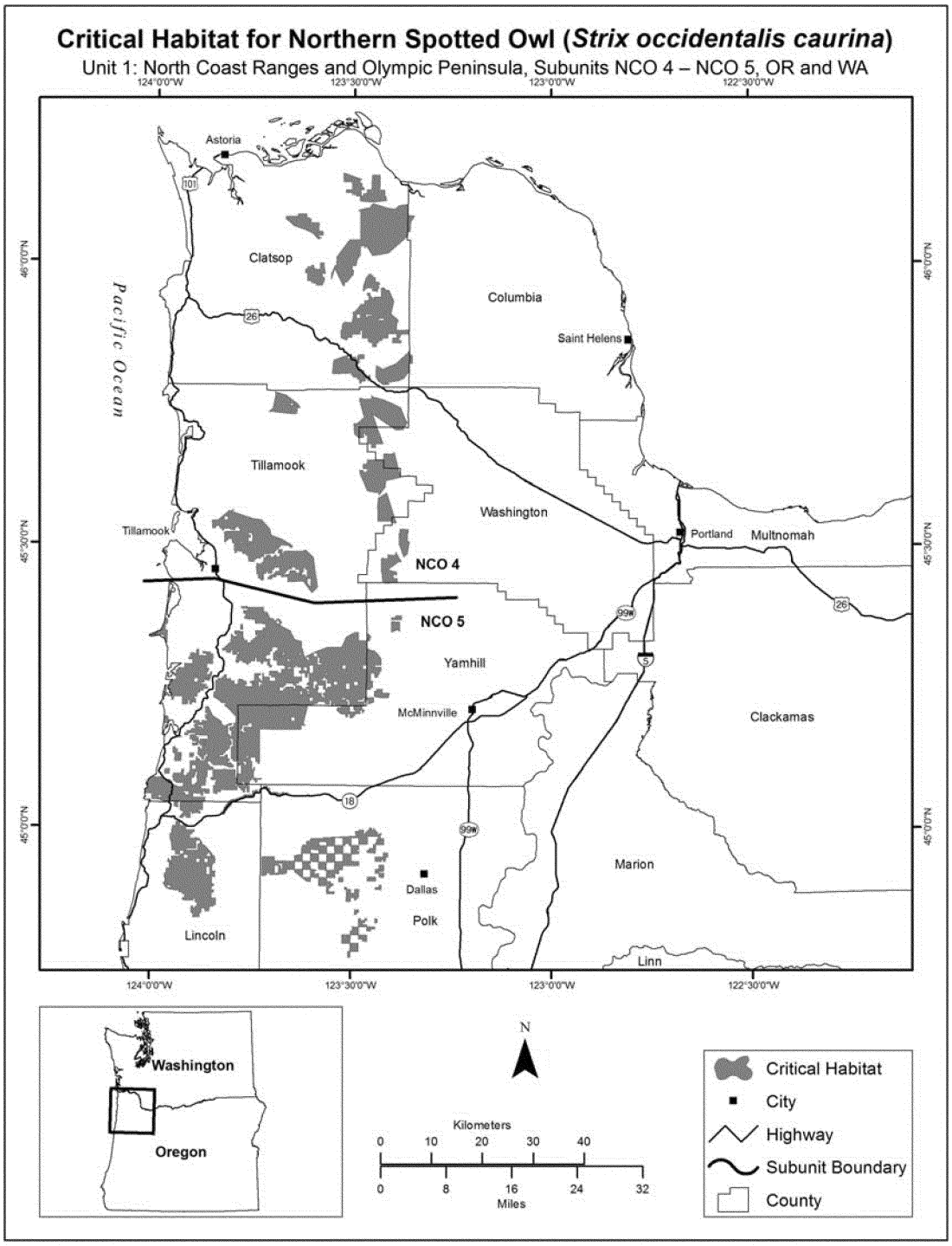


(8) Unit 1: North Coast Ranges and Olympic Peninsula, Oregon and Washington.

(i) [Reserved for textual description of Unit 1: North Coast Ranges and Olympic Peninsula, Oregon and Washington].

(ii) **Note:** Maps of Unit 1: North Coast Ranges and Olympic Peninsula, Oregon and Washington, follows:

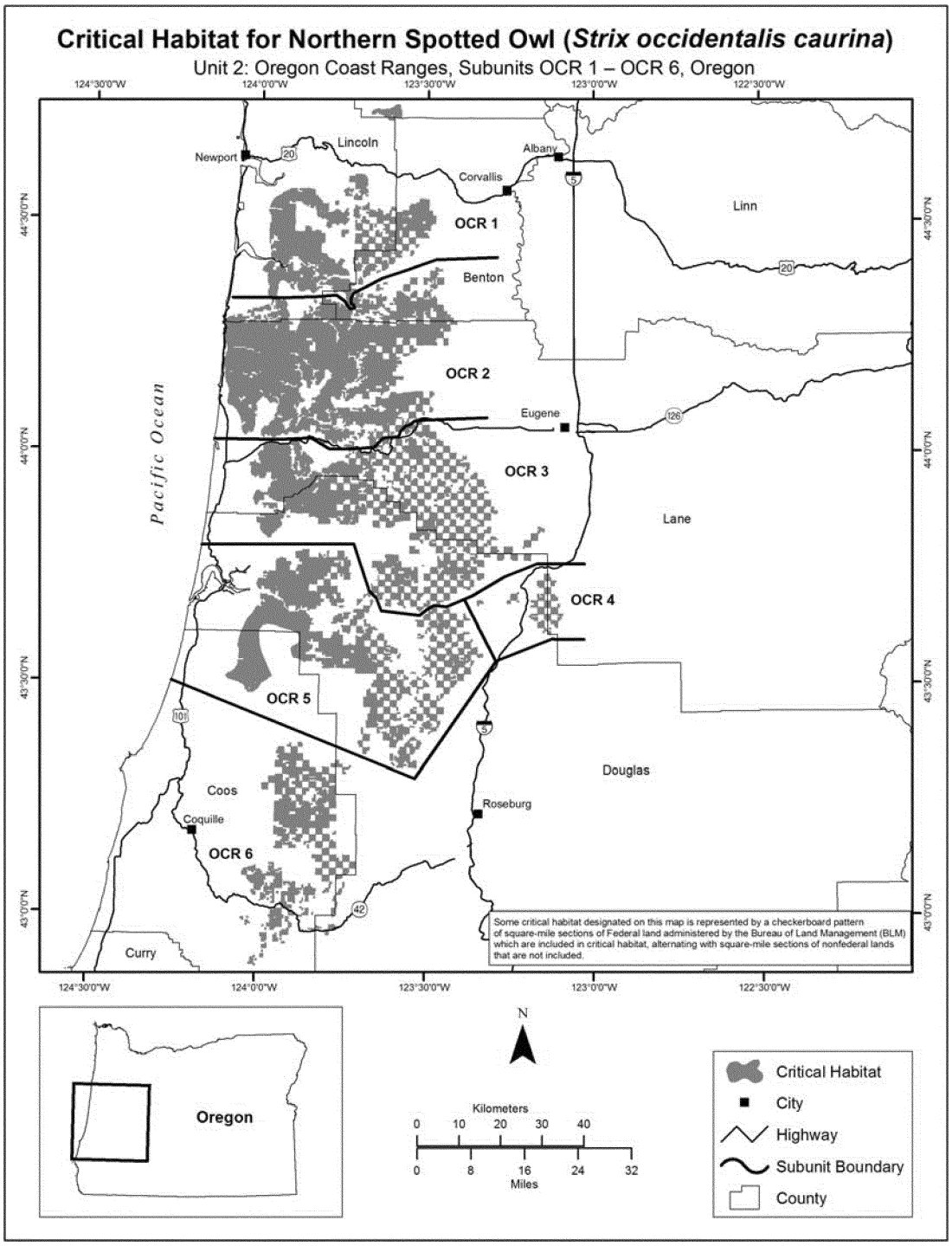



Critical Habitat for Northern Spotted Owl (*Strix occidentalis caurina*)
Unit 1: North Coast Ranges and Olympic Peninsula, Subunits NCO 4 – NCO 5, OR and WA
124°0'0"W
123°30'0"W
123°0'0"W
122°30'0"W
46°0'0"N
45°30'0"N
45°0'0"N
Astoria
101
Clatsop
Columbia
Saint Helens
26
Pacific Ocean
Tillamook
Washington
Tillamook
Portland
Multnomah
NCO 4
NCO 5
99W
5
Yamhill
McMinnville
Clackamas
18
Marion
Dallas
Polk
Lincoln
Linn
Washington
Oregon
N
Kilometers
0 10 20 30 40
0 8 16 24 32
Miles
Critical Habitat
City
Highway
Subunit Boundary
County

(9) Unit 2: Oregon Coast Ranges, Oregon.

(i) [Reserved for textual description of Unit 2: Oregon Coast Ranges, Oregon].

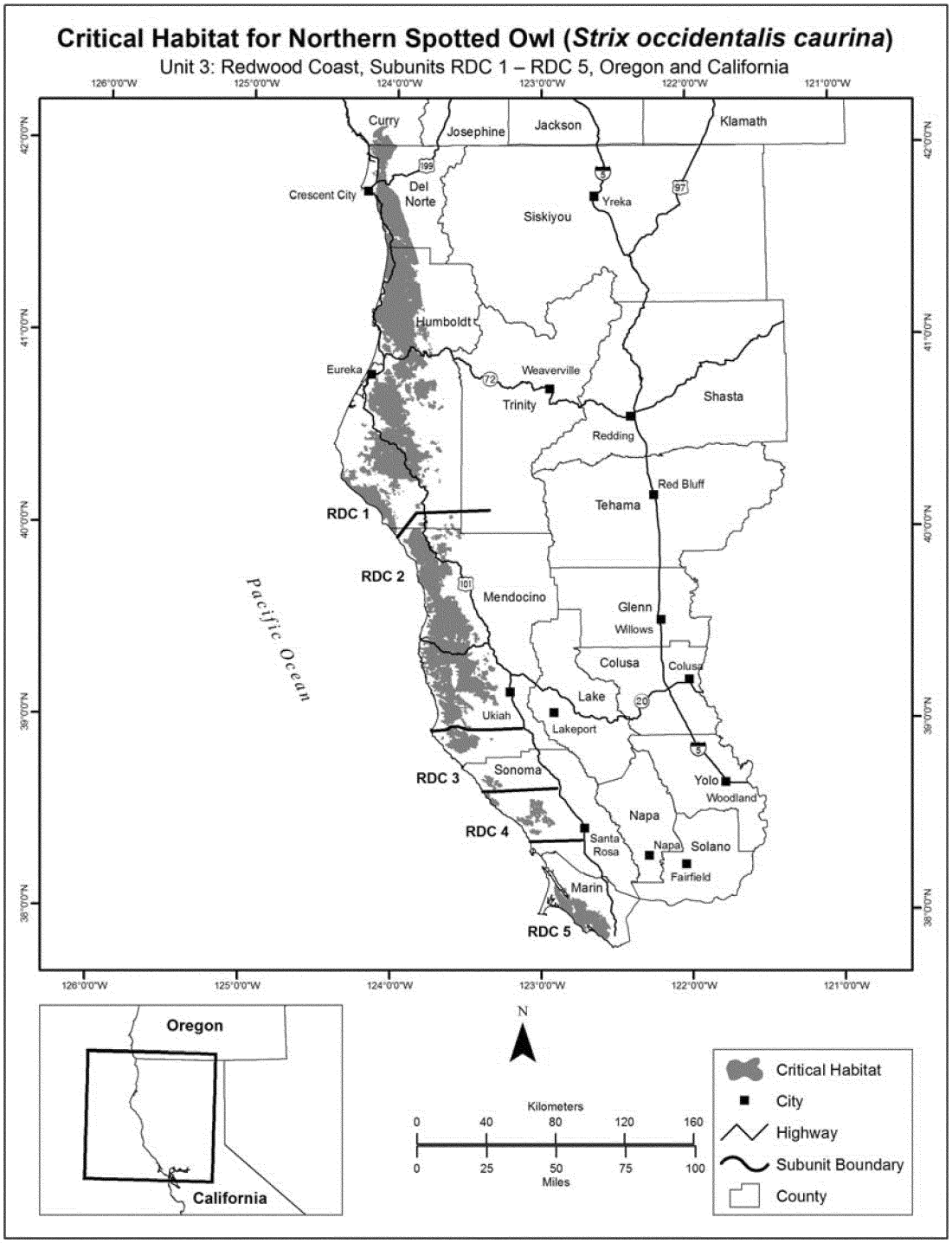
(ii) **Note:** Map of Unit 2, Oregon Coast Ranges, Oregon, follows:



(10) Unit 3: Redwood Coast, Oregon and California.

(i) [Reserved for textual description of Unit 3: Redwood Coast, Oregon and California]

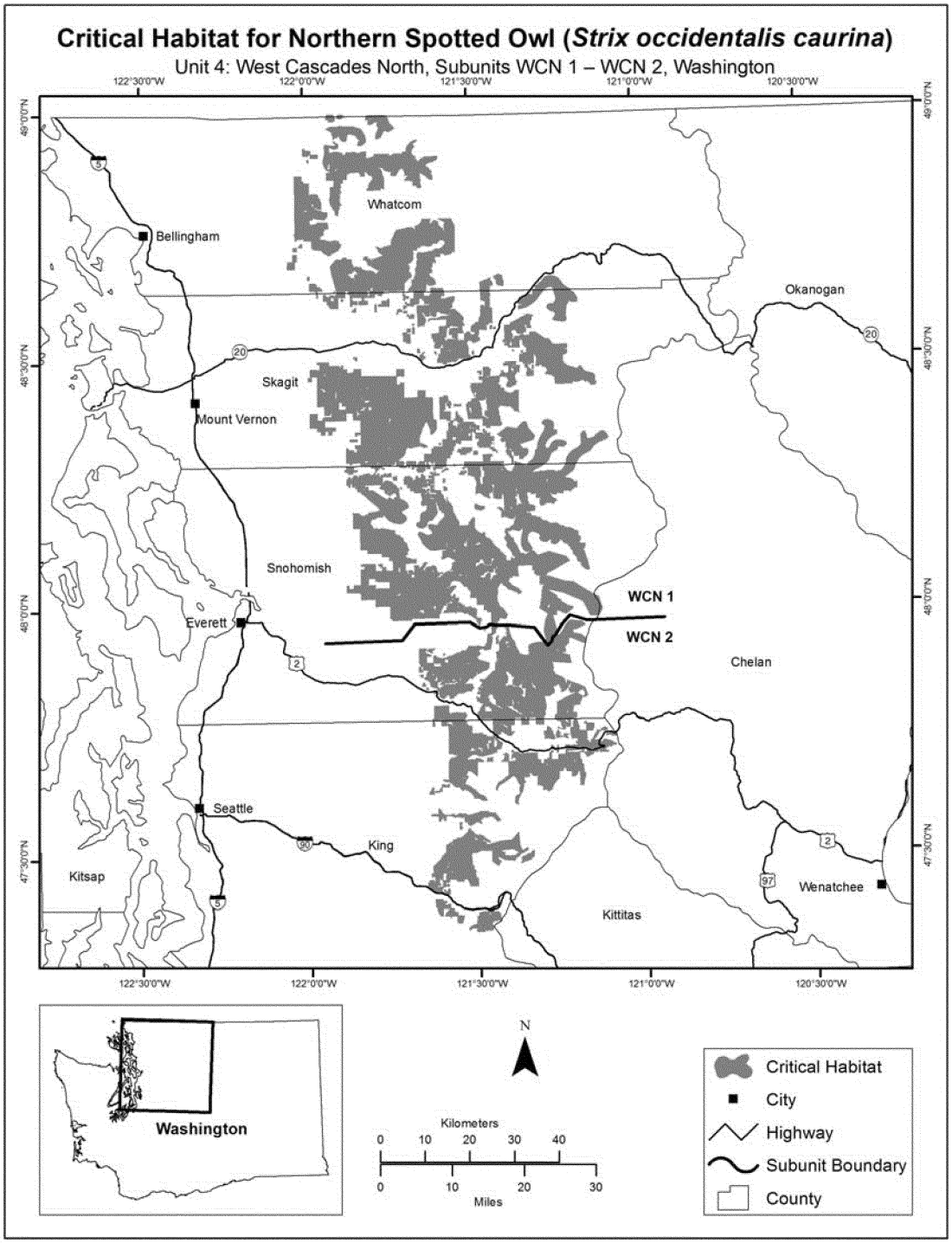
(ii) **Note:** Map of Unit 3, Redwood Coast, Oregon and California, follows:



(11) Unit 4: West Cascades North, Washington.

(i) [Reserved for textual description of Unit 4: West Cascades North, Washington].

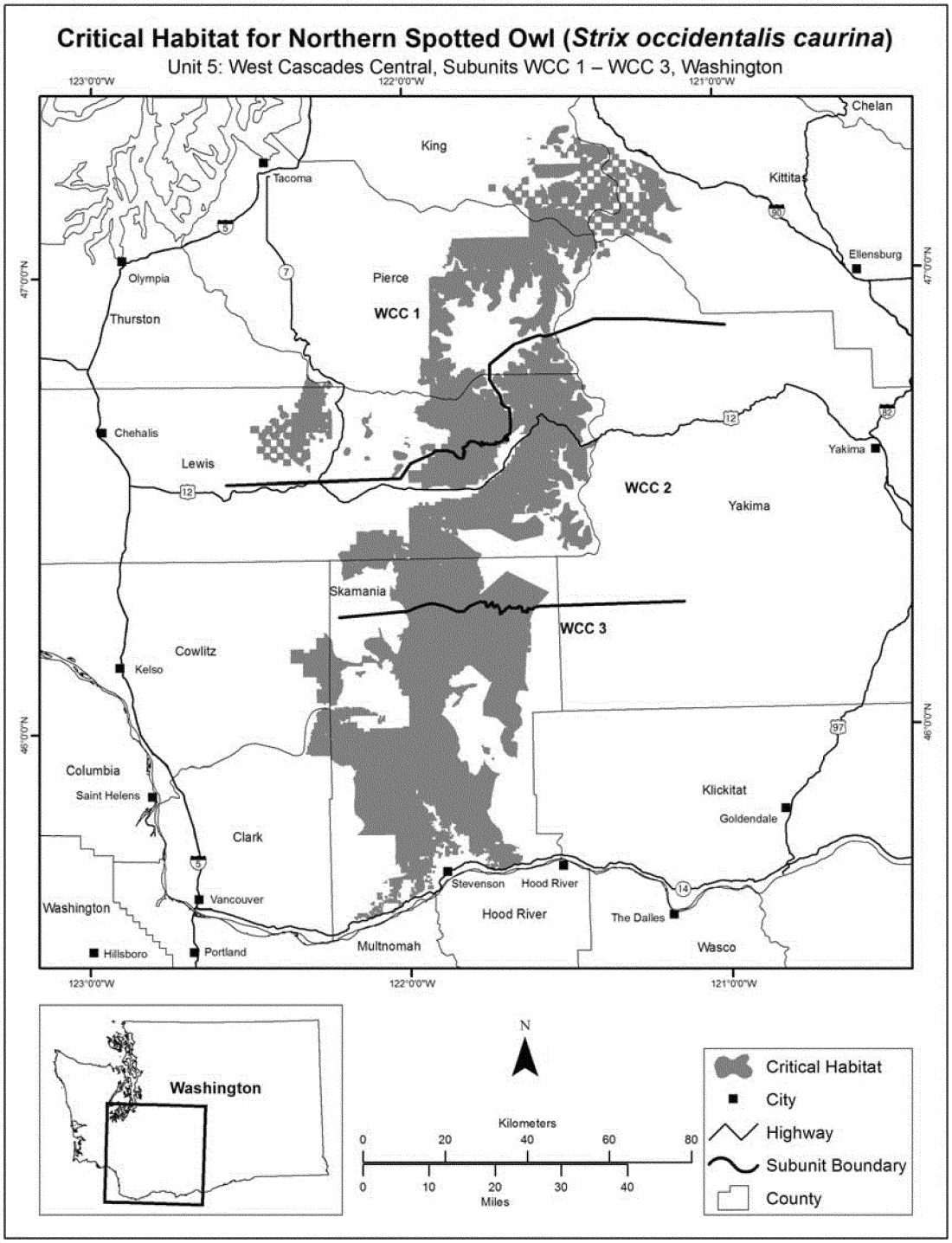
(ii) **Note:** Map of Unit 4, West Cascades North, Washington, follows:



(12) Unit 5: West Cascades Central, Washington.

(i) [Reserved for textual description of Unit 5: West Cascades Central, Washington].

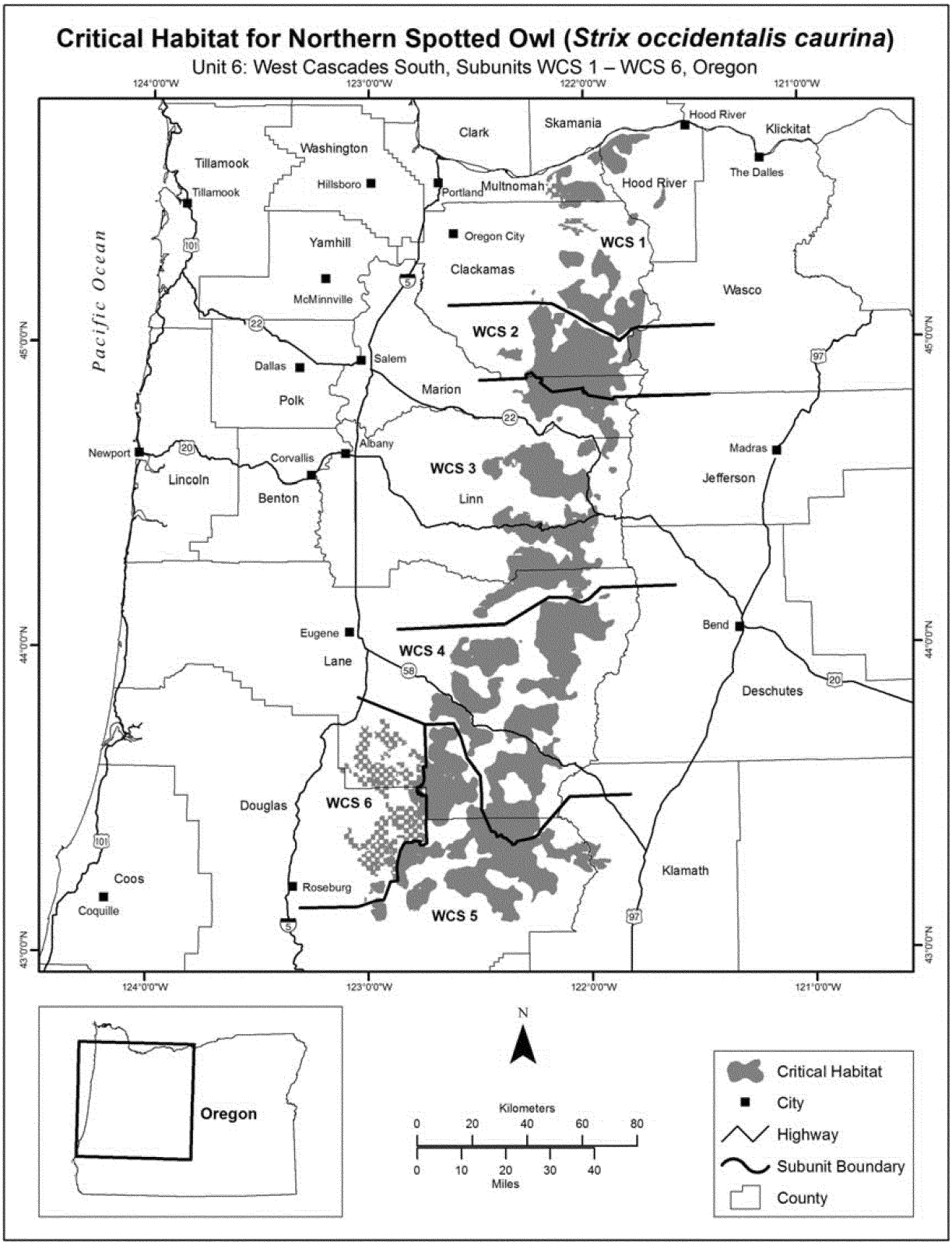
(ii) **Note:** Map of Unit 5, West Cascades Central, Washington, follows:



(13) Unit 6: West Cascades South, Washington.

(i) [Reserved for textual description of Unit 6: West Cascades South, Washington].

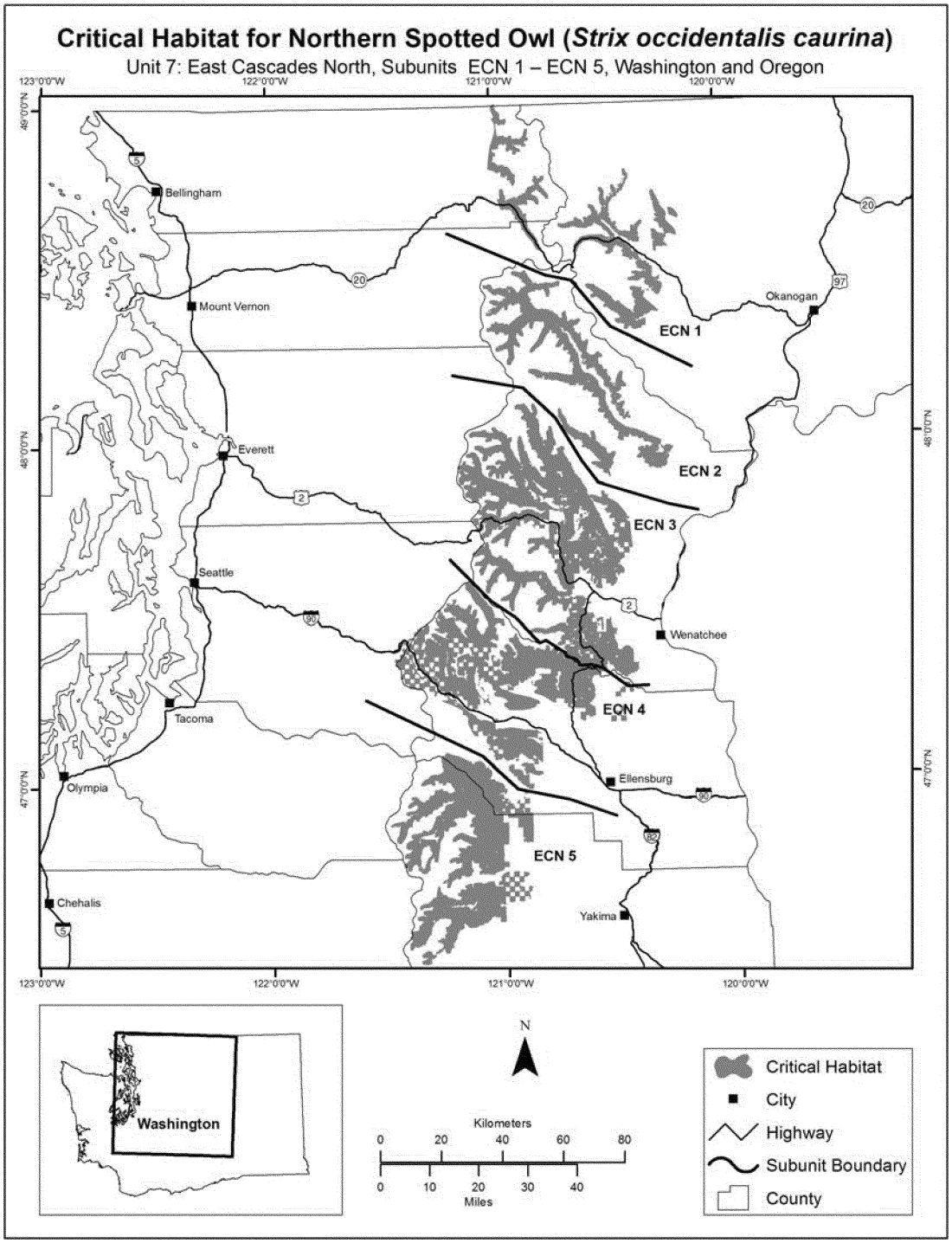
(ii) **Note:** Map of Unit 6, West Cascades South, Washington, follows:

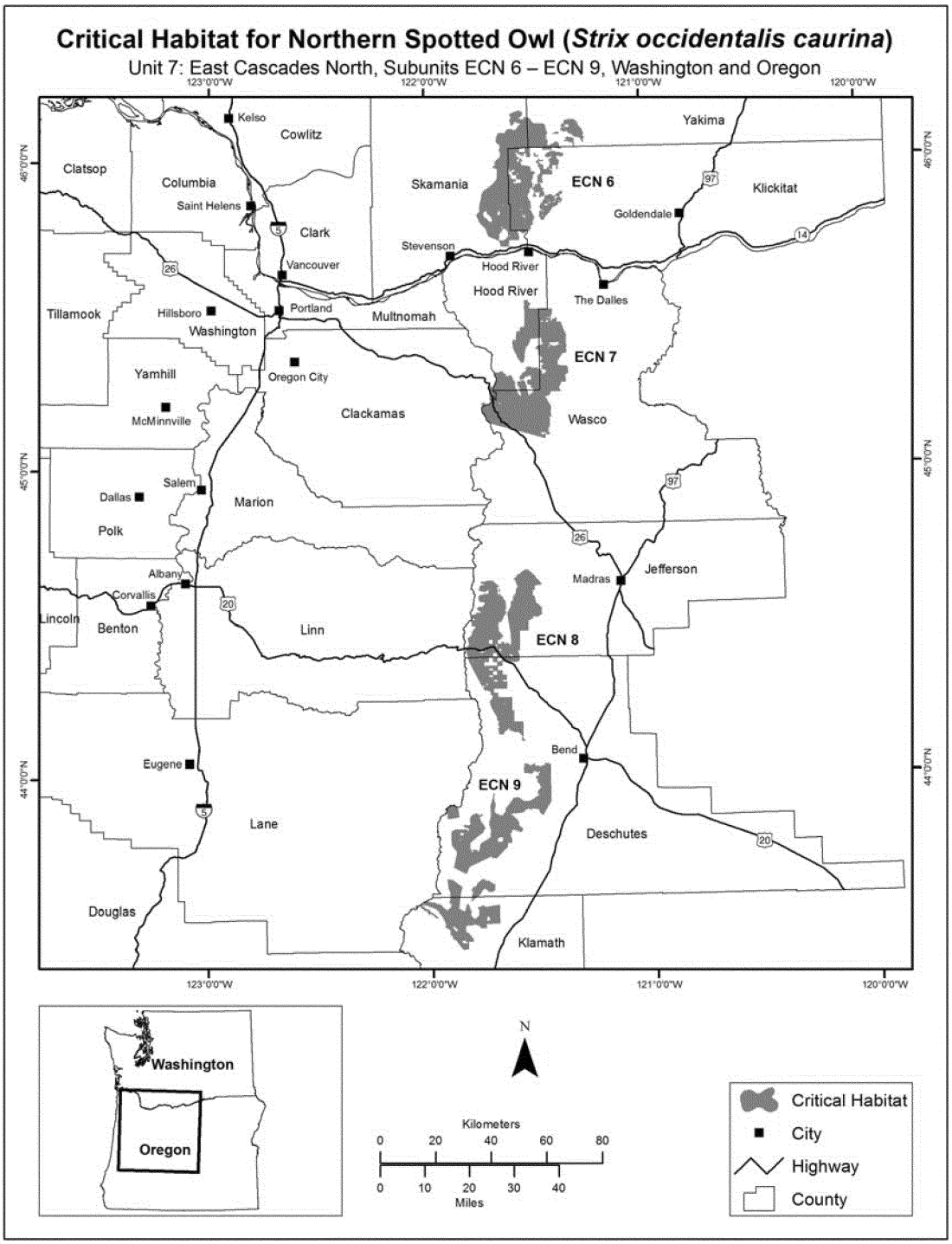


(14) Unit 7: East Cascades North, Washington and Oregon

(i) [Reserved for textual description of Unit 7: East Cascades North, Washington and Oregon].

(ii) **Note:** Maps of Unit 7, East Cascades North, Washington and Oregon, follow:




Critical Habitat for Northern Spotted Owl (Strix occidentalis caurina)
Unit 7: East Cascades North, Subunits ECN 6 – ECN 9, Washington and Oregon
123°0'0"W
122°0'0"W
121°0'0"W
120°0'0"W
46°0'0"N
45°0'0"N
44°0'0"N
Kelso
Cowlitz
Yakima
Clatsop
Columbia
Skamania
ECN 6
Klickitat
Saint Helens
Clark
Goldendale
Stevenson
Hood River
Vancouver
Hood River
The Dalles
Tillamook
Hillsboro
Portland
Multnomah
Washington
ECN 7
Yamhill
Oregon City
Clackamas
Wasco
McMinnville
Salem
Dallas
Marion
Polk
Jefferson
Madras
Albany
Corvallis
Lincoln
Benton
Linn
ECN 8
Bend
Eugene
ECN 9
Lane
Deschutes
Douglas
Klamath
Washington
Oregon
N
Kilometers
0 20 40 60 80
0 10 20 30 40
Miles
Critical Habitat
City
Highway
County

(15) Unit 8: East Cascades South, California and Oregon

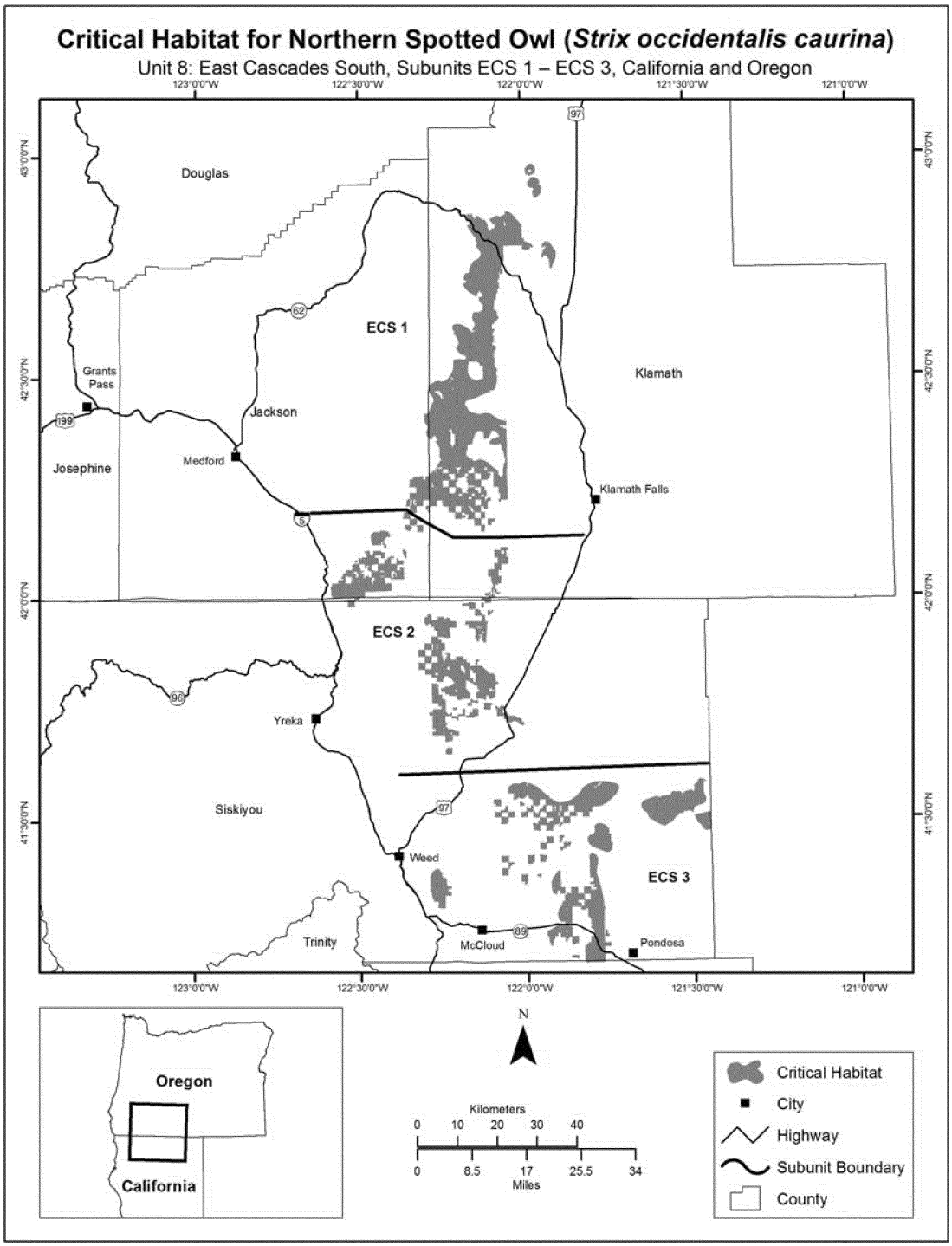
(i) [Reserved for textual description of Unit 8: East Cascades South, California and Oregon].

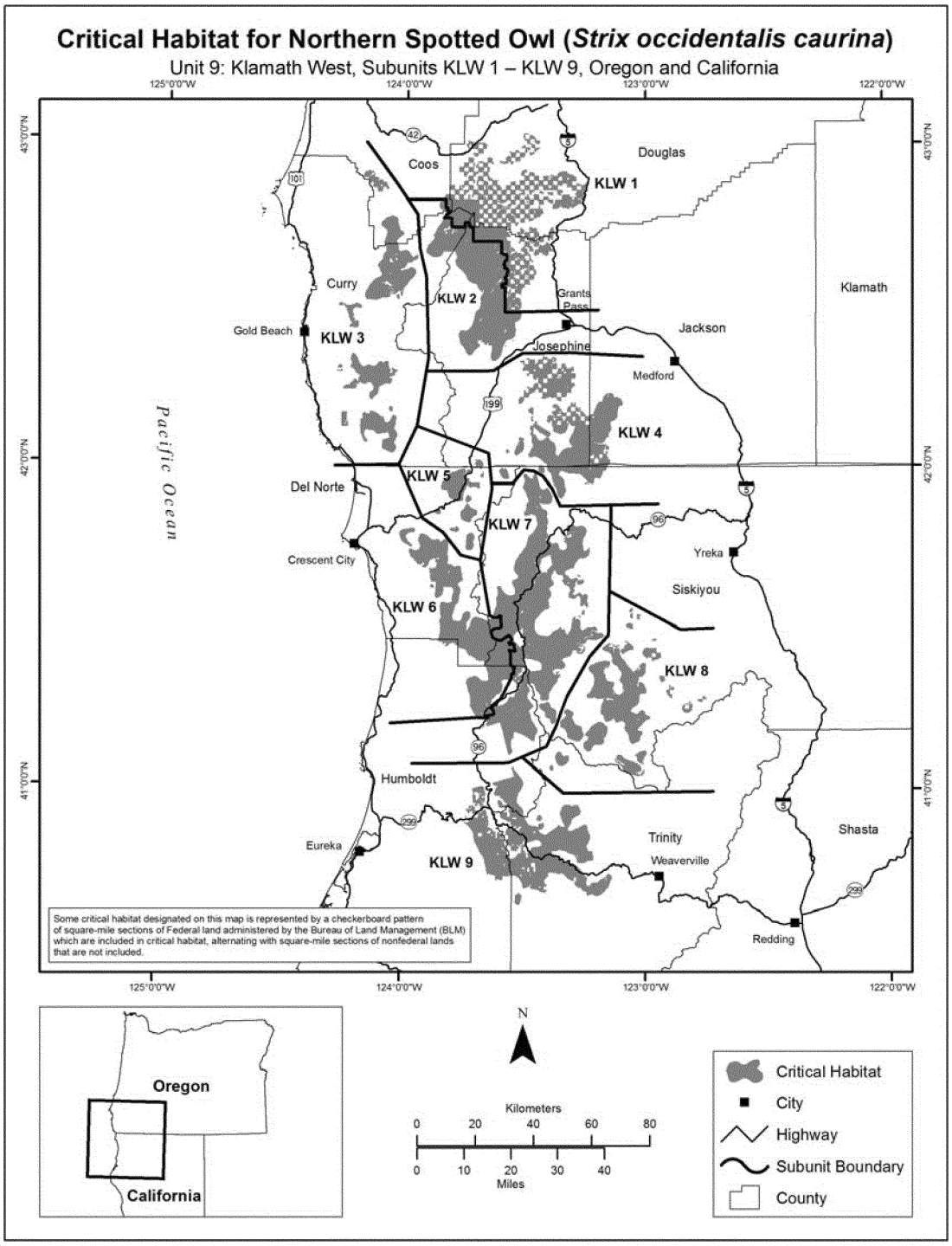
(ii) **Note:** Map of Unit 8, East Cascades South, California and Oregon, follows:

(16) Unit 9: Klamath West, Oregon and California.

(i) [Reserved for textual description of Unit 9: Klamath West, Oregon and California].

(ii) **Note:** Map of Unit 9: Klamath West, Oregon and California, follows:

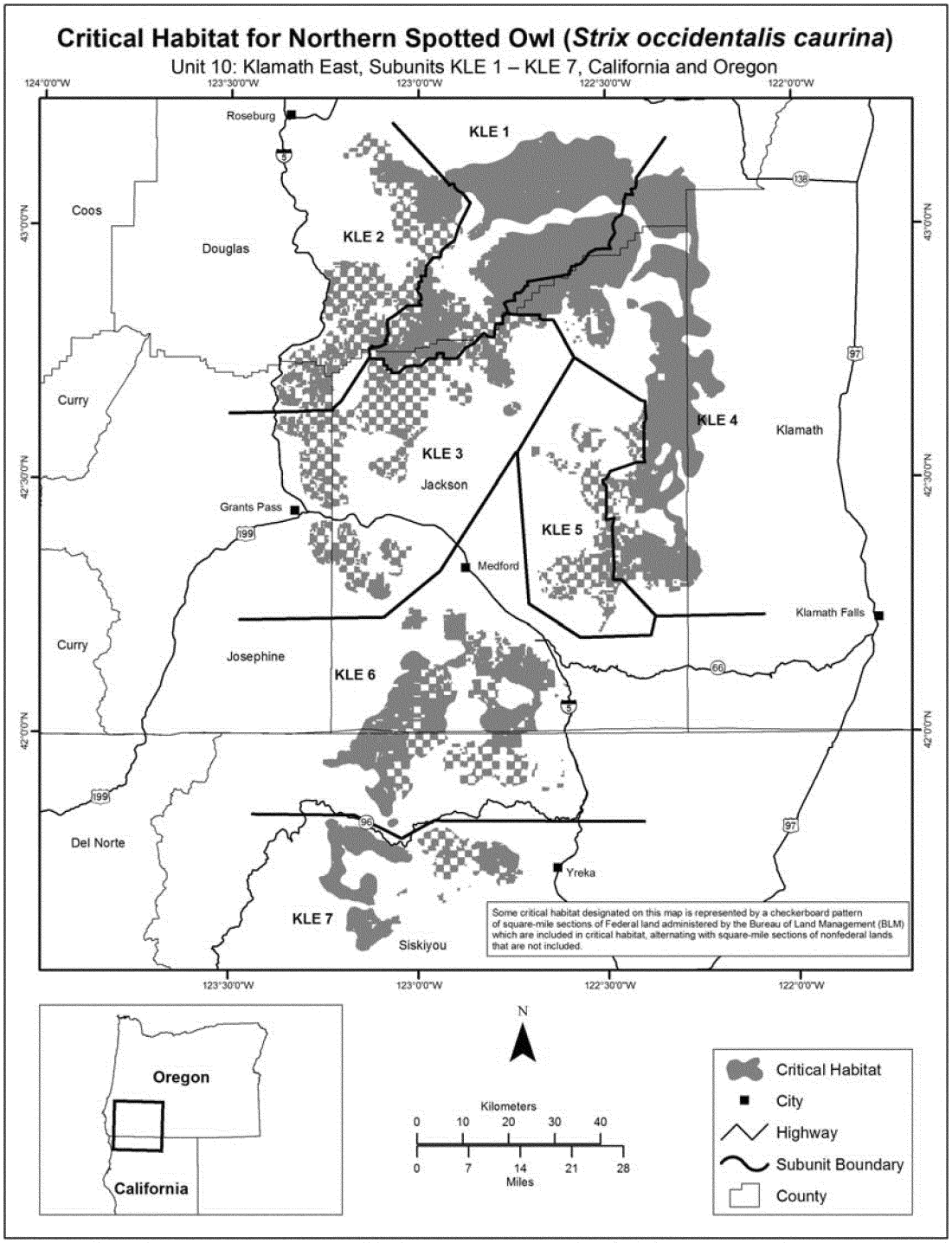



Critical Habitat for Northern Spotted Owl (Strix occidentalis caurina)
Unit 9: Klamath West, Subunits KLW 1 – KLW 9, Oregon and California
125°0'0"W
124°0'0"W
123°0'0"W
122°0'0"W
43°0'0"N
42°0'0"N
41°0'0"N
Coos
Douglas
KLW 1
Curry
KLW 2
Grants Pass
Klamath
Gold Beach
KLW 3
Jackson
Josephine
Medford
Pacific Ocean
KLW 4
Del Norte
KLW 5
KLW 7
Crescent City
Yreka
Siskiyou
KLW 6
KLW 8
Humboldt
Shasta
Trinity
Eureka
KLW 9
Weaverville
Redding
Some critical habitat designated on this map is represented by a checkerboard pattern of square-mile sections of Federal land administered by the Bureau of Land Management (BLM) which are included in critical habitat, alternating with square-mile sections of nonfederal lands that are not included.
Oregon
California
N
Kilometers
0 20 40 60 80
0 10 20 30 40
Miles
Critical Habitat
City
Highway
Subunit Boundary
County

(17) Unit 10: Klamath East, California.

(i) [Reserved for textual description of Unit 10: Klamath East, California].

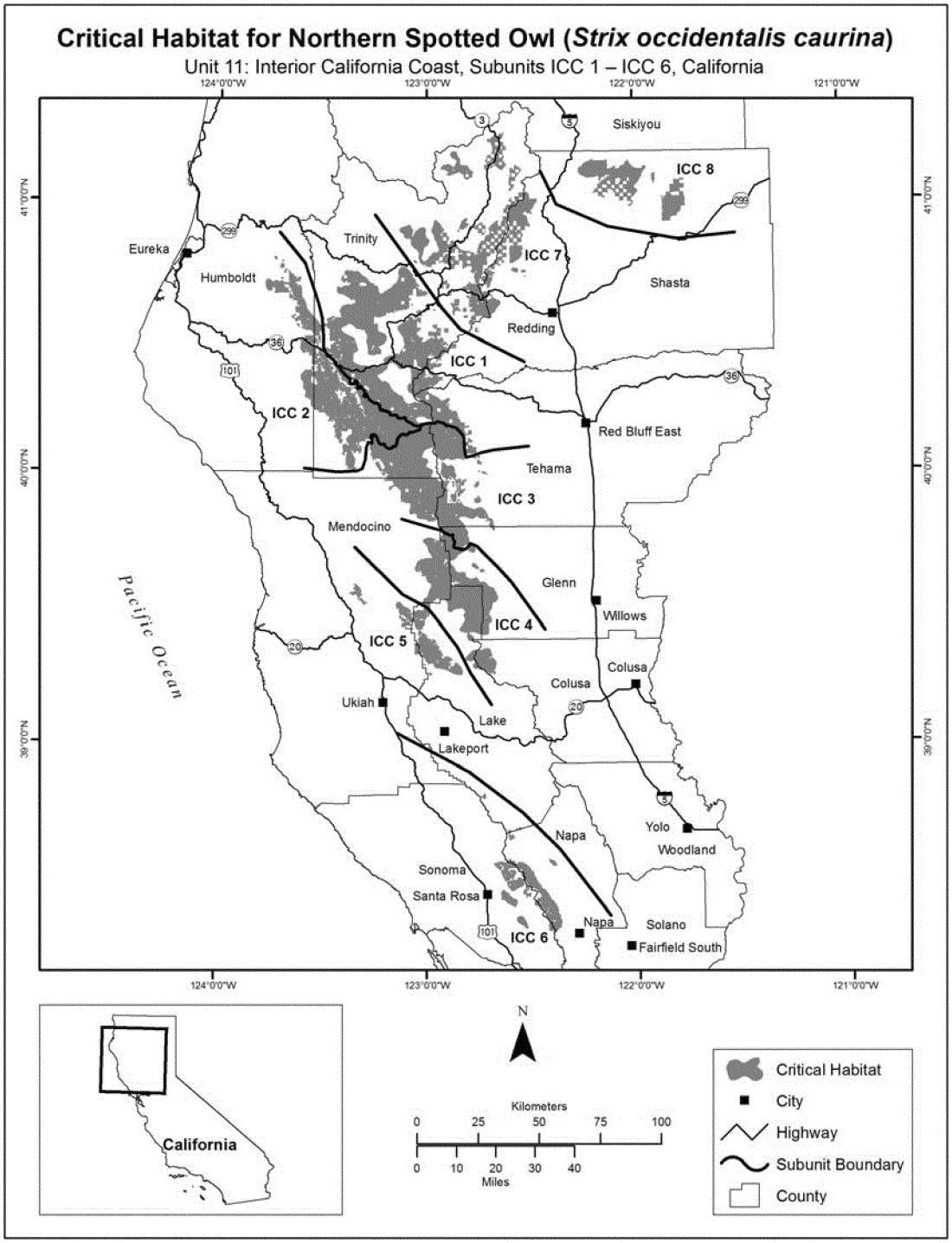
(ii) **Note:** Map of Unit 10: Klamath East, California, follows:



(18) Unit 11: Interior California Coast, California.

(i) [Reserved for textual description of Unit 11: Interior California Coast, California].

(ii) **Note:** Map of Unit 11: Interior California Coast, California, follows:



* * * * *

Dated: February 27, 2012.

Rachel Jacobsen,

Acting Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 2012–5042 Filed 3–7–12; 8:45 am]

BILLING CODE 4310–55–C