

Marbled Murrelet
(*Brachyramphus marmoratus*)

5-Year Review



U.S. Fish and Wildlife Service
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1.3.2 Listing history

Original Listing

FR notice: 57 FR 45328

Date listed: October 1, 1992

Entity listed: Washington, Oregon, and California Distinct Population Segment

Classification: Threatened

1.3.3 Associated rulemakings: Critical Habitat Designation (61 FR 26256)

We originally designated critical habitat for the marbled murrelet (murrelet) in Washington, Oregon, and California on May 24, 1996 (61 FR 26256). At that time, we designated 3,887,800 acres of Federal and non-Federal lands, consisting of 78 percent Federal land; 21 percent city, county, or state land; and 1 percent private land. Primary constituent elements (PCEs) were described as (1) trees with potential nesting platforms and, (2) forested areas within 1/2 mile of potential nest trees with a canopy height of at least 1/2 of the site potential tree height. In June of 2008, the Service proposed to revise critical habitat for the murrelet by removing approximately 254,070 ac (102,820 ha) in northern California and Oregon from the 1996 designation, based on new information indicating that these areas do not meet the definition of critical habitat. This action, if adopted in its entirety, would result in a revised designation of approximately 3,633,800 ac (1,470,550 ha) as critical habitat for the murrelet. At this time, this proposed rule has not been finalized and critical habitat for the murrelet remains unchanged from the 1996 designation. In the 1996 murrelet critical habitat designation, critical habitat on Federal lands, including Forest Service lands, is only within Northwest Forest Plan (NWFP) Late Successional Reserves. The 1996 critical habitat rule did not designate matrix lands.

1.3.4 Review History:

In September 1, 2004, a 5-yr review was completed with no change in status. Under the DPS analysis portion, a determination was made that the population did not satisfy the criteria for designation as a DPS under the Service's 1996 DPS Policy.

1.3.5 Species' Recovery Priority Number at start of this 5-year review: 2

1.3.6 Current Recovery Plan or Outline

Name of plan or outline: Recovery plan for the threatened marbled murrelet (*Brachyramphus marmoratus*) in Washington, Oregon and California.

Date issued: September 24, 1997

Dates of previous revisions, if applicable: N/A

as updated population and habitat estimates for a comparison of conservation status and management of habitat across the international border.

Given the updated information, is the listed entity consistent with the DPS policy with regards to the Discreteness and Significance elements?

Yes, the currently listed entity is consistent with the DPS policy.

A) Is the currently listed murrelet population discrete according to the 1996 DPS Policy?

Yes, the murrelet population is discrete according to the 1996 DPS Policy.

Discreteness: A population segment of a vertebrate species may be considered discrete if it satisfies either one of the following conditions:

- It is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors. Quantitative measures of genetic or morphological discontinuity may provide evidence of this separation. [*Biological Issues*]
- It is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the Endangered Species Act of 1973 (Act; 50 CFR 1431 et seq.) . [*International Border Issues*]

(1) **Biological Issues:** We have no evidence of marked genetic or morphological discontinuity between populations at the United States - Canadian border.

(2) **International Border Issues:** If the species were not listed, there would be differences in management of habitat, conservation status, and regulatory mechanisms across the international border that are significant in light of section 4(a)(1)(D) of the Act.

(2)(a) *Control of exploitation.* Both countries similarly prohibit direct exploitation of murrelets therefore there are not substantive differences in the control of exploitation across the international border.

(2)(b) *Management of Habitat.* The management of habitat is different across the United States-Canada border (assuming removal of Act protections) because the two countries would rely on regulatory mechanisms that are not equally protective of the murrelet or its habitat (see *Regulatory Mechanisms* below).

(2)(c) *Conservation Status.* There is a difference in conservation status between the United States and Canada. If the murrelet were not listed under the Act, no Federal protections would be afforded it under the Act. In Canada, under SARA, the species would remain classified as “threatened,” that is, “a wildlife species that is likely to become an endangered species if nothing is done to reverse the factors leading to its extirpation or extinction.” SARA’s

Regulatory Mechanisms in Canada: In 2003, Canada implemented its Federal endangered species legislation, the Species At Risk Act (SARA). Under SARA the murrelet is classified as a “threatened” species (Statutes of Canada (S.C.) Chapter (ch). 29, Schedule 1, Part 3 (2002)). SARA defines a “threatened” species as “a wildlife species that is likely to become an endangered species if nothing is done to reverse the factors leading to its extirpation or extinction” (S.C. ch. 29 § 2). It is illegal to kill, harm, harass, capture, or take an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species, or to possess, collect, buy, sell, or trade an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species, or any part or derivative of such an individual (S.C. ch. 29 § 32). SARA also prohibits any person from damaging or destroying the residence of a listed species, or from destroying any part of its critical habitat (S.C. ch. 29 §§ 33, 58). For many of the species listed under SARA, the prohibitions on harm to individuals and destruction of residences are limited to Federal lands, but this limitation is inapplicable to migratory birds protected under the Migratory Birds Convention Act, including the murrelet (S.C. ch. 29, § 34). Hence, SARA protects murrelets from harm and destruction of their residences, not only on Federal lands, but also on provincial and private lands, where most of the remaining habitat for the species occurs. (Because critical habitat has not yet been designated for the marbled murrelet, SARA’s provisions protecting critical habitat are not yet effective.) SARA defines the “residence” of a species to mean “a dwelling-place, such as a den, nest or other similar area or place, that is occupied or habitually occupied by one or more individuals during all or part of their life cycles, including breeding, rearing, staging, wintering, feeding or hibernating”(S.C. ch. 29, § 2). Hence, to receive SARA’s protection, a “residence” need not be continuously occupied by the species. Thus, SARA protects the marbled murrelet, not only from direct killing, but also from indirect harm through destruction of its residence. Moreover, SARA mandates development and implementation of a recovery strategy and action plans (S.C. ch. 29, §§ 37, 47).

Violations of SARA are punishable by a fine of up to \$250,000 for an individual, or \$1,000,000 for a corporation, or imprisonment for up to 5 years, or both (SARA 2002, p.54-55; S.C. ch. 29 § 97). SARA provides that each day of a continuing violation constitutes a separate offense, and makes corporate officers and employers vicariously liable for actions of their agents and employees (S.C. ch. 29 §§ 97-99).

The murrelet is also protected under Canada’s Federal Migratory Birds Convention Act, 1994 (MBCA) (S.C. ch 22), which is their domestic legislation similar to our Migratory Bird Treaty Act of 1918 (MBTA). The MBCA and its implementing regulations prohibit the hunting of migratory nongame birds and the possession or sale of “migratory birds, their nests, or eggs” (S.C. ch. 22 §§ 5, 12).

Although British Columbia has no stand-alone endangered species act, the provincial Wildlife Act protects virtually all vertebrate animals from direct harm, except as allowed by regulation (e.g., hunting or trapping). Legal designation as endangered or threatened under this act increases the penalties for harming a species, and also enables the protection of habitat in a Critical Wildlife Management Area (British Columbia Wildlife Act 1996). The marbled murrelet is not listed under this act as an endangered or threatened species.

absent protection of the Act, Federal agencies would have no duty under section 7 of the Act to consult with the Service on the effects of their actions on the species, to avoid jeopardizing the species, or to avoid adversely modifying previously identified critical habitat.

The murrelet would continue to receive some protection under the MBTA (16 U.S.C. § 703), which makes it unlawful to take migratory birds, including the marbled murrelet. However, the MBTA's definition of "take" includes direct pursuit, killing and capturing, but does not include harm through habitat destruction, nor harassment (16 U.S.C. § 715n). The Ninth Circuit has held that MBTA does not protect migratory birds from habitat destruction such as logging of old growth forest (Seattle Audubon Society v. Evans, 952 F.2d 297 (9th Cir. 1991)). SARA, by contrast, protects the murrelet from not only direct killing, but also harm, harassment, and destruction of the species' "residence". Moreover, the MBTA's sanctions for violations are significantly lighter than SARA's, imposing only misdemeanor penalties of six months imprisonment and \$15,000 in fines (16 U.S.C. § 707), compared with the felony-level sanctions under SARA.

The murrelet receives some protection under State laws in Washington, Oregon, and California, but these laws are less protective than SARA. Washington law prohibits "maliciously" killing or harassing murrelets or destroying their nests, but does not prohibit indirect harm through habitat modification (Revised Code of Washington (RCW) § 77.15.120; and Washington Administrative Code (WAC) § 232-12-011). Violation of this law is a gross misdemeanor, punishable by no more than one year of imprisonment or a fine of no more than \$5000. This law is less protective than SARA because, by limiting its reach to "malicious" conduct, it does not govern as broad a range of conduct as does SARA's strict liability standard, and because the penalties it imposes are substantially lighter. Washington forest practice regulations limit, but do not entirely prohibit, timber harvest that would constitute "take" under the Act (WAC §§ 222-10-042, 222-16-080). Washington law (WAC 232-12-297) requires that recovery plans be written for species listed as endangered or threatened by the Washington Fish and Wildlife Commission; however, currently there is no State recovery plan for the murrelet. In order to delist the species, Washington Department of Fish and Wildlife would have to develop criteria for reclassifying to species of concern and delisting and then show the species has met these criteria.

In Washington, the State Forest Practices Rules (FPR) (Wash. Admin. Code Title 222) specifically establish marbled murrelet suitable habitat definitions, survey requirements, and review processes for forest practices that may impact murrelet habitat. The FPR provide protection to occupied (as defined by FPR) murrelet sites during the nesting season on private forest lands where the landowner owns more than 500 acres of land that are less than 50 miles from marine waters. For those lands that are presumed to have at least a 30 percent probability of occupancy, landowners are subject to survey requirements and those areas where occupancy is found are protected. The FPR provide for protection of marbled murrelets through minimization of take and jeopardy pursuant to the Washington Endangered Species Act and the Federal Endangered Species Act. However, the definitions of suitable habitat, inland distance, and occupied site are negotiated definitions; therefore not all of the lands the Service considers to have features essential for conservation of murrelet are considered to be suitable habitat under FPR, are not subject to the specific murrelet FPR, and therefore some suitable habitat may be harvested without review. In addition, landowners have the option to go through the State

In California, the California Forest Practice Rules (CFPR) were established to regulate timber harvest on non-Federal lands within the State of California. The CFPRs are implemented through the California Department of Forestry and Fire Protection (CALFIRE) individual Timber Harvest Plans (THP) and Nonindustrial Timber Management Plans (NTMP) review and approval processes. With the exception of plans that are exempted from the preparation and submission requirements under the CFPRs, all commercial timber harvest must go through this process (CALFIRE 2009).

The CFPRs do not contain a definition of suitable marbled murrelet nesting habitat. Consequently, each plan has a decision on habitat suitability on a stand by stand basis, and they may or may not disclose the presence of marbled murrelet habitat. Under the CFPR's Special Conditions section 898.2, CALFIRE is required to disapprove a plan if implementation of the plan would result in take or jeopardy in violation of the Federal Endangered Species Act (CALFIRE 2009). When recommendations to avoid unauthorized take of marbled murrelets are provided they are typically included in THPs or NTMPs. However because only a small percentage of these plans have been reviewed, suitable marbled murrelet habitat and possibly even occupied nesting habitat likely has been lost due to this lack of oversight. In summary, the practical application of the CFPRs are only partially effective at protecting suitable habitat pursuant to the Federal Act due to the lack of a detailed description of habitat suitability within the CFPRs and the lack of adequate resource agency staff to review THPs and NTMPs that may contain suitable marbled murrelet nesting habitat.

The adoption of the NWFP by the Forest Service and the Bureau of Land Management has greatly reduced the annual rate of habitat loss on Federal land in the United States since 1994. Nonetheless, estimated potential total loss of suitable murrelet habitat since listing of the species is about 10 percent of the current estimate of suitable habitat (USFWS 2004, p.16). If the murrelet were delisted, the NWFP could be amended to reduce protection for the species. The murrelet would still derive some incidental benefit from continued protection of the reserve system under the NWFP, although conservation benefits would not likely extend to all areas currently protected for the murrelet. In addition, even if the NWFP were not amended, delisting would relieve the Forest Service and the BLM of any obligation to consult with the Service on site-specific actions that may adversely affect the murrelet. These agencies would also be relieved of their duty under section 7(a)(1) of the Endangered Species Act (Act; 50 CFR 1531 et seq) to carry out programs for the conservation of the species. The British Columbia murrelet conservation assessment by comparison, states a central recovery goal is to down-list the species from Threatened to Special Concern, by creating conditions that will limit the decline of the British Columbia population and its nesting habitat to less than 30 percent over three generations (30 years) (Bertram et al. 2003, p.5), roughly the same habitat loss in arithmetical terms as that experienced during the period 1992 to 2003 in the United States.

Absent listing under the ESA, state laws would not necessarily protect murrelets on Federal lands. Other Federal laws governing management of Federal lands could preempt state law to the extent there is an irreconcilable conflict (National Audubon Society v. Davis, 307 F.3d 835, 854 (9th Cir. 2002)).

This DPS contains an ecologically distinct forest system, the coastal redwood zone. Citing Noss 1994, Fraser (1999, p. 50), declares that in order to maintain opportunities for speciation and future biodiversity, the conservation of peripheral and disjunct populations is critical. Recovery of species without the conservation of these peripheral populations may be impossible if these populations are eliminated or severely damaged (Fraser 1999, p.50).

Although there is no genetic distinction at the border, researchers have found significant genetic distinction throughout the range of the species. Friesen et al. (2005) reported significant differentiation of birds from peripheral sites (i.e., California and the Aleutian Islands), with the Aleutian and California populations each having one or more private control region haplotypes that occurred at high frequency. Friesen et al. (2007) results indicate that genetic variation changes clinally in this species, and provided additional resolution showing that murrelets in western and central Aleutian Islands and central California differ significantly from murrelets in the rest of the species' range. They concluded that murrelets appear to comprise three genetic units: (1) western and central Aleutian Islands; (2) eastern Aleutian Islands to northern California; and, (3) central California. Loss of any of these populations would result in the loss of a portion of the species' genetic resources and/or local adaptations, and may compromise its long-term viability (Piatt et al. 2007, p. 43).

Conclusion

We consider the Washington, Oregon, and California population of murrelets to be a valid distinct population segment under the 1996 DPS Policy. This population of murrelets is discrete based on differences in conservation status, management of habitat, and regulatory mechanisms between the United States and Canada that would result without the Federal protective measures afforded by the Endangered Species Act in the United States. The coterminus United States population of murrelets is also considered significant in accordance with the criteria of the DPS Policy, as the loss of this distinct population segment would result in a significant gap in the range of the taxon and the loss of unique genetic characteristics that are significant to the taxon.

2.2 Recovery Criteria

2.2.1 Does the species have a final, approved recovery plan¹ containing objective, measurable criteria?

 X *Yes, continue to section 2.2.2.*

2.2.2 Adequacy of recovery criteria.

2.2.2.1 Do the recovery criteria reflect the best available and most up-to date information on the biology of the species and its habitat? *Yes*

¹ Although the guidance generally directs the reviewer to consider criteria from final approved recovery plans, criteria in published draft recovery plans may be considered at the reviewer's discretion.

habitats, have been implemented to provide adequate protection of marbled murrelets in the six Conservation Zones for at least the near future (50 years).

The recovery objectives and delisting criteria have not been met, although each of the recovery actions, with the exception of establishing a Regional Coordination body, have been implemented to varying degrees. Research and monitoring has continued to be implemented since the analysis for the 2004 5-year review.

2.3 Updated Information and Current Species Status

2.3.1 Biology and Habitat

2.3.1.1 New information on the species' biology and life history:

Since the analysis for the 2004 5-year review, more information has become available regarding the biology, life history and habitat use of the murrelet.

Marine distribution and movements. McShane et al. (2004, pg. 2-12) observed that murrelet movements within and among seasons are poorly known, and included limited information on daily and seasonal movements, primarily from studies in Alaska and British Columbia. New information is available on movements and home range size during the breeding season, from research conducted in the listed range.

Daily flights to incubate an egg or feed a young were assumed to limit the distance murrelets can travel away from nesting habitat. In California, recent radio marked murrelets confirm that breeders forage more closely to nesting habitat once nesting is initiated than non-breeders (Peery et al. 2009, p. 120, and Hebert and Golightly 2008, p. 101). In northern California mean home range size was 655 kilometer squared (km^2) for non-nesters and 240 km^2 for nesters (Hebert and Golightly 2008, p. 101). Mean along shore movement was 69 km for nesting females and 78 km for nesting males (Standard Errors of 11 and 9 respectively, Hebert and Golightly 2008, p. 101). Mean offshore movement was within 1.4 km with a Standard Error of 0.1 km regardless of sex or nesting status (Hebert and Golightly 2008, p. 99).

In Washington, home range size during the breeding season was more variable. Here, average marine home range size was five times larger in 2005 (2,098 km^2) compared to 2004 (469 km^2) during the breeding season (Bloxtton and Raphael 2008, p. 4). In 2004, the radio-tagged murrelets had relatively confined home ranges within a single part of the study area. However, in 2005, they used multiple core feeding areas, likely in response to poor oceanographic conditions (Bloxtton and Raphael 2008, pp. 4-5). These numbers include both nesting and non-nesting individuals, and the 2005 mean home range size was considerably larger than observed in northern California by Hebert and Golightly (2008). No new information was available for Oregon.

New information is also available from Conservation Zone 6 on movements. In central California, nesting birds spent night time hours resting on the ocean an average of 5.1 km from the mouths of drainages used to reach nesting habitat, and commuted from these resting areas to

Table 1 Summary of 2000-2008 murrelet density and population size estimates in Conservation Zones 1 through 5 in the area of the Northwest Forest Plan.

Year	Density (birds/km ²)	Bootstrap Standard Error (birds/km ²)	Coefficient of Variation of Density (%)	Birds	Birds Lower 95% CL	Birds Upper 95% CL
2000	2.11	0.30	14.2	18,600	13,400	23,700
2001	2.52	0.27	10.5	22,200	17,600	26,800
2002	2.69	0.31	11.5	23,700	18,300	29,000
2003	2.53	0.24	9.5	22,200	18,000	26,400
2004	2.34	0.27	11.5	20,600	16,000	25,200
2005	2.30	0.25	10.8	20,200	16,000	24,500
2006	2.14	0.17	8.0	18,795	15,900	21,700
2007	1.98	0.26	13.4	17,400	12,800	21,900
2008	2.03	0.18	9.1	17,700	14,600	21,000

Conservation Zone 6: While the NWFP surveys did not include Conservation Zone 6, Peery et al. (2008) conducted at-sea population surveys for murrelets in Conservation Zone 6 offshore of breeding habitat between Half Moon Bay and Santa Cruz in 2007-2008, following a method used previously to survey Conservation Zone 6 during 1999-2003 (Peery et al. 2006a). Using distance sampling estimation techniques (same method as Conservation Zones 1-5), they estimated the 2007 Conservation Zone 6 population to be 367 birds (95% CL: 240-562) and the 2008 Conservation Zone 6 population to be 174 birds (95% CL: 91-256) (Table 2).

Table 2 Population estimates and 95 percent confidence intervals for Conservation Zone 6. Source: Peery et al. 2008. The 1999-2000 surveys used slightly different routes from later years, and estimates from those 2 years should not be compared directly with 2001-2008 data.

Survey Year	1999	2000	2001	2002	2003	2007	2008
Population Estimate	487	496	661	683	699	367	174
95% CI	333-713	338-728	556-786	561-832	567-860	240-562	91-256
Number of surveys	5	8	15	15	12	4	6

Listed Range:

Using the combined estimates from the Conservation Zone 1-5 surveys and the Conservation Zone 6 surveys for 2008, the estimated population size for the listed range in 2008 is about 18,000 birds (95 percent confidence interval of 14,700-21,200, figures rounded to nearest 100; Table 3). Based on McShane et al. (2004) using population estimates from 2002, the Service in the 2004 5-year review (USFWS 2004, p.18) estimated the population to be 24,400 birds (95 percent confidence interval of 18,800 to 29,800). The confidence intervals reported here for the population estimate for the listed range in 2002 differ from those reported in USFWS 2004; a calculation error has been corrected.

A significant population decline was detected for the combined 5-Conservation Zone area, both for the 2000-2008 and 2001-2008 periods (Tables 4 and 5). Based on the 2000-2008 data, the estimated decline was 490 birds per year (Standard Error of 241), or about 3,900 birds over the 9-year period (95% confidence limit: $\pm 4,553$ birds). For the analysis based on the shorter 2001-2008 period, the estimated loss was 870 birds per year (Standard Error of 129), or about 6,900 birds over the 8-year period (95% confidence limit: $\pm 2,533$ birds). Omitting the year 2000 population estimate from the shorter period (2001 to 2008) increases the estimated rate of decline and overall loss of birds. The 2000-2008 data represent a 2.4 percent annual decline, while the 2001-2008 data represent an annual decline of about 4.3 percent (Tables 2 and 3, Figure 1). The 2.4 and 4.3 percent values represent two estimates for the rate of decline based on the best available information. Using them this way, 2.4 and 4.3 percent decline rates represent overall declines of 19 and 34 percent, respectively, of the population in Conservation Zones 1 through 5 during the 2000-2008 period.

At the individual Conservation Zone scale, preliminary trend analyses did not detect statistically significant trends in any Conservation Zone for 2000-2008. For the 2001-2008 analysis, there was a significant decline in Conservation Zone 1 (Tables 4 and 5). Also, in Conservation Zone 3 the trend was not significant ($P=0.07$ for 2000-2008), but the pattern of declining population estimates is consistent with a decline. At the individual-Conservation Zone scale, the statistical power to detect decline rates of 2-to-4 percent per year was generally not high using 9 years of survey data (Miller et al. 2006; pg. 57). Therefore, the lack of a significant trend for individual Conservation Zones at this time is not conclusive evidence of population stability or instability for those Conservation Zones.

In Conservation Zone 6, the 2008 population estimate represented a decline of about 55 percent since 2007, and a 75 percent decline since 2003 (Peery et al. 2008), for an average decline of about 15 percent per year between 2003 and 2008. The 2007 and 2008 population estimates are the lowest estimate since surveys began in 1999, with the 95 percent confidence interval (CI) for 2008 not overlapping the 95 percent confidence intervals for the 2001-2003 period, and the confidence interval for the 2007 estimate barely or not overlapping 95 percent confidence intervals for 2001-2003 (Table 2; Figure 2). The authors concluded that the murrelet population in central California underwent a significant and rapid decline between 2003 and 2008 (Peery et al. 2008).

In the Service's analysis for the 2004 5-year review, trend results from the NWFP Effectiveness Monitoring program were stated to be from too short a time frame to evaluate for a trend but noted that other studies of more limited geographic scope reported either no evidence of population change, a possible decline, or an actual measured decline in the case of Oregon for 1992-1996 (USFWS 2004, pp. 5-6). As noted earlier, McShane et al. (2004, p. 3-58) evaluated future trends at the Conservation Zone scale using demographic models, and concluded that all Conservation Zone populations are in decline with mean annual rates of decline over 40 years between 2.1 and 6.2 percent, with modeling results generally consistent with earlier models that forecast declines of 4-7 percent. Conservation Zone decline rates were slightly higher, 2.8 to 6.2 percent, for a shorter future time period of 20 years (McShane et al. 2004, pg. 3-52).

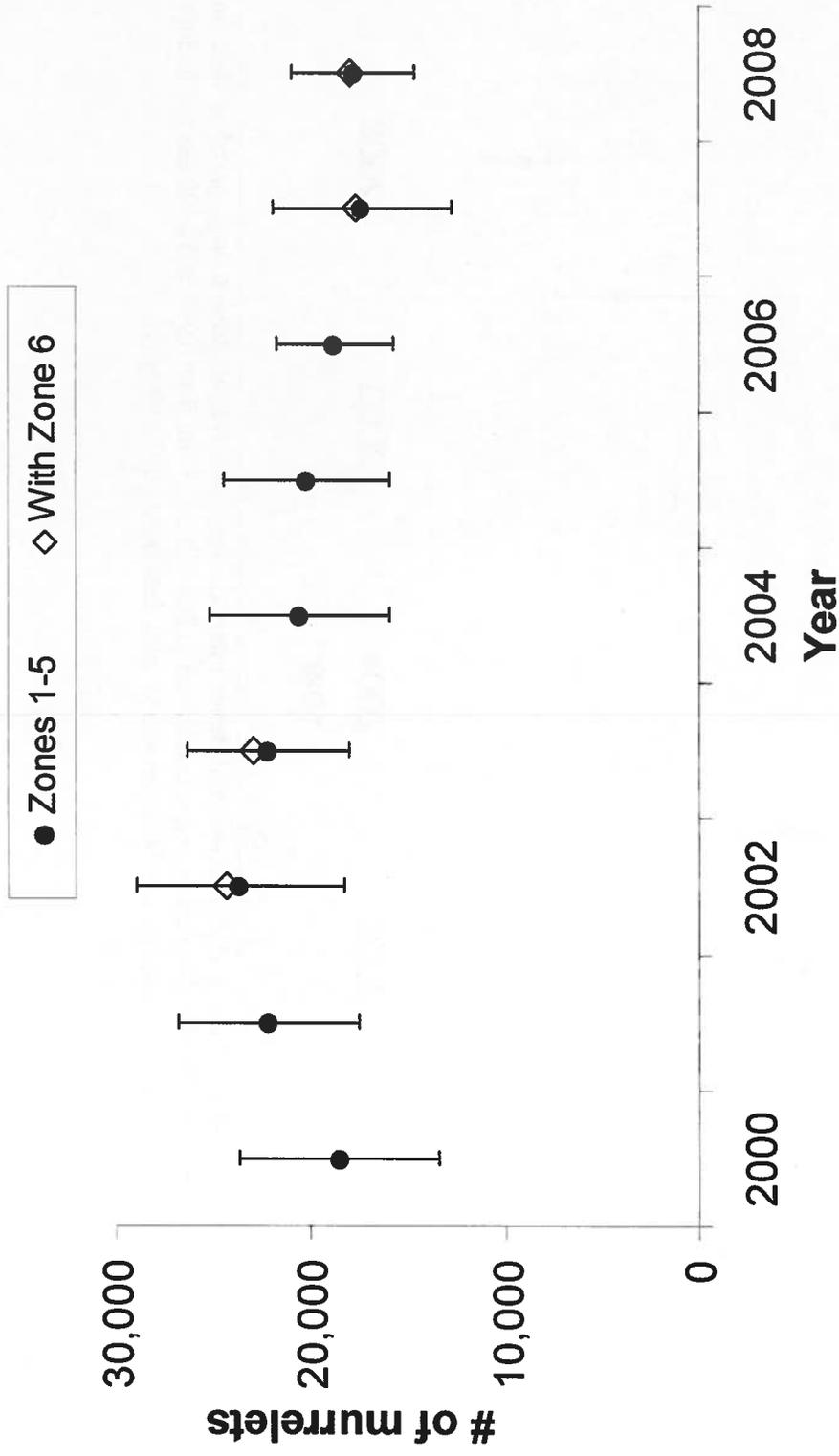


Figure 1 Annual population estimates and 95 percent confidence intervals, for Conservation Zones 1 - 5 combined, based on data from at-sea monitoring under the Effectiveness Monitoring Program of the Northwest Forest Plan. Population estimates with Conservation Zone 6 included are also shown for years when Conservation Zone 6 estimates were available. The shaded area represents the data that were included in the analysis for the 2004 5-year review (USFWS 2004).

Reproduction

McShane et al. (2004 p. 3-2) considered murrelet breeding success to be a function of nest predation, timing, foraging conditions, prey availability, and adult survival during the breeding season. Impacts to breeding success from predation are discussed under Factor C: predation. We have no new information on adult survival. The following discussion focuses on timing of nest initiation, new estimates of productivity from radio telemetry studies and adult:juvenile ratios gathered at-sea, and prey quantity and quality.

Hebert and Golightly (2006, pp.93-94) confirmed through radio telemetry that the nesting chronology of mid-March through mid-August was still appropriate for California. Although Hebert and Golightly's (2006, p.93) earliest nest initiation was April 22, they had captured murrelets in April that had fully developed brood patches, suggesting that nesting had already been attempted. Hebert and Golightly (2006, pp.89-90) also documented that egg laying occurred in the early morning and in all cases the male murrelet began the first incubation duties.

Three radio telemetry studies have documented low nest success. In central California, Peery et al. (2004, p.1094) estimated fecundity to be 0.027. This estimate is much lower than the 0.065 fecundity that McShane et al. (2004, p.3-53) used for modeling extinction within 20 years for Conservation Zone 6. In northern California, Hebert and Golightly (2006, p.95) documented a low hatching success of 22.2 percent. In Washington, Bloxton and Raphael (2008, pp.7 and 10) documented a high rate of nest failure with only two chicks fledging out of 40 nest initiations.

In central California, Peery et al. (2007, p.236) concluded that adult:juvenile ratios detected at sea may be an effective way of estimating productivity. A historic demography study estimated the adult:juvenile ratio at 0.297 in central California (Beissinger and Peery 2007, p. 299). Beissinger and Peery (2007, pp. 299 and 302) suggest that conserving murrelets in the long term will require improving the 1997-2003 ratio of 0.035 or 0.032 up to 0.2 to 0.3. Unadjusted and adjusted adult:juvenile ratios detected at sea, as an indirect index of breeding success, continue to suggest extremely low breeding success in northern California with ratios at 0.003 to 0.008 (Long et al. 2008, pp.18-19), and low breeding success in Oregon with ratios at 0.0254 – 0.0598 (Crescent Coastal Research, 2008, p.13). Adjusted adult:juvenile ratios in the San Juan Islands in Washington have been below 0.15 every year since surveys began in 1995, with three of those years below 0.05 (Raphael et al. 2007a, p.16).

The historic decline of murrelet reproduction is likely caused by a shift to a reduced trophic level of available prey (Becker et al. 2007, p.267; Becker and Beissinger 2006, p.476). Becker and Beissinger (2006, pp.470 – 473) suggest that modern murrelets (1998-2002) eat at a lower trophic level than historic murrelets (1895-1911) and that the change in available prey is linked to fishing pressures. Becker et al. (2007, p.267) suggest that cooler ocean temperatures support increased availability of krill and juvenile rockfish and that this improves successful reproduction. However, Becker and Beissinger (2006, p.476) also note that even in years with cooler ocean temperatures and improved reproduction, modern murrelets are eating prey at a lower trophic level than historic murrelets.

2.3.1.3 Genetics, genetic variation, or trends in genetic variation (e.g., loss of genetic variation, genetic drift, inbreeding, etc.):

New information since the analysis for the 2004 5-year review more clearly defines population structure and genetic viability.

Population Structure. A number of studies have examined the population structure of murrelets using genetic markers. These studies are relevant to the conservation status of the species because they can help identify populations that are demographically isolated or that contain unique genetic resources with adaptive advantages, which, if preserved, may help reduce extinction risk (reviewed by Friesen et al. (1996, p. 682). Below we review studies that have investigated murrelet population structure and report molecular methods, sample sizes, and significant conclusions.

Friesen et al. (1996) conducted the first large-scale genetics study of population structure in murrelets. They compared variation in the mitochondrial cytochrome b gene and 39 allozyme loci from 43 birds sampled between the western Aleutian Islands and Oregon and found low but significant population genetic structure. However, they could not determine the details of the structuring because of small sample sizes (Congdon et al. 2000, p. 975).

In an attempt to resolve the population structure of murrelets suggested by Friesen et al. (1996), Congdon et al. (2000), studied variation in nine nuclear introns in 120 birds from the western Aleutian Islands to southern British Columbia. Their study did not include any individuals from the contiguous United States. They found that murrelets from mainland Alaska and British Columbia were similar, but differed from those in the western and central Aleutian Islands. Furthermore, they determined that population genetic structure in murrelets was best explained by peripheral isolation in the Aleutian Islands, rather than by selection associated with different nesting habitats.

In a more recent and more comprehensive study, Friesen et al. (2005) compared variation in the mitochondrial control region, four nuclear introns, and three microsatellite loci among 194 murrelets from throughout their range (except Washington and Oregon). They reported significant differentiation of birds from peripheral sites (i.e., California and the Aleutian Islands), with the Aleutian and California populations each having one or more private control region haplotypes that occurred at high frequency. Furthermore, the two California populations together had private intron alleles, with three at high frequency. Significant isolation by distance was found, but there was little genetic structuring within the central portion of the species' range. Both Congdon et al. (2000) and Friesen et al. (2005) found evidence for a genetic cline (i.e., gradual change in the genetic makeup of populations across the geographic distribution of the species), and Friesen et al. (2005) argued for the recognition of five genetic management units: (1) western Aleutian Islands, (2) central Aleutian Islands, (3) mainland Alaska and British Columbia, (4) northern California, and (5) central California. However, these studies were limited in the number of sites and loci that were sampled.

In an update to their 2005 study, and in the most comprehensive rangewide analysis of population genetic structure for murrelets to date, Friesen et al. (2007; also reported in Piatt et al.

2.3.1.4 Taxonomic classification or changes in nomenclature:

As discussed in previous proposed rules for this species, the scientific name of the marbled murrelet (*Brachyramphus marmoratus marmoratus*) should be changed to *Brachyramphus marmoratus* to reflect recent (1997) taxonomic information.

Two subspecies of the marbled murrelet were previously recognized—North American murrelet (*Brachyramphus marmoratus marmoratus*) and Asiatic murrelet (*B. marmoratus perdix*). New information suggests that the Asiatic murrelet is a distinct species (Friesen et al. 1994, 1996). The American Ornithologists' Union, in its "Forty-first Supplement to the Checklist of North American Birds," officially recognized the long-billed murrelet (*B. perdix*) and the marbled murrelet (*B. marmoratus*) as distinct species (American Ornithologists' Union 1997).

2.3.1.5 Spatial distribution, trends in spatial distribution (e.g. increasingly fragmented, increased numbers of corridors, etc.), or historic range (e.g. corrections to the historical range, change in distribution of the species' within its historic range, etc.):

Since the analysis for the 2004 5-year review, there is no new information regarding spatial distribution or changes in the historic range.

2.3.1.6 Habitat or ecosystem conditions (e.g., amount, distribution, and suitability of the habitat or ecosystem):

Since the analysis for the 2004 5-year review, new modeling by Raphael et al (2006) has revised the previous information on amount and distribution of habitat. Results from Raphael et al. (2006) also indicate that losses of potential nesting habitat in the 1994-2003 period may be greater than previously estimated, with losses ranging from about 61,000 to 279,000 acres in the 5-Conservation Zone area, with about 10 to 28 percent of habitat loss occurring on Federal lands, and about 72 to 90 percent on non-Federal lands (difference of about 7 percent of total baseline habitat). For further information, see section 2.3.2.1.

2.3.1.7 Other: None**2.3.2 Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms)****2.3.2.1 Present or threatened destruction, modification or curtailment of its habitat or range:**

In the following sections, we provide an analysis of the new information pertinent to the murrelet's terrestrial and marine environments. Within each section we update the existing information and discuss existing and new threats. In each of the sections, we discuss the aspects of climate change that will most likely affect the terrestrial and marine habitats of the murrelet. We present information that indicates that climate change is occurring globally, and discuss literature related to climate change that has been published for the Pacific Northwest (PNW) and the western United States (US).

not account for some private lands in Washington. The Service also determined that the rate of habitat loss had declined since listing, particularly on Federal lands due to implementation of the NWFP (USFWS 2004, pp.11 and 13).

New information on the amount of suitable murrelet nesting habitat is available from an analysis of murrelet habitat, which covered both Federal and non-Federal lands within the five Conservation Zones within the NWFP area (Raphael et al. 2006). These new habitat estimates are believed to represent an improvement over previous estimates (Huff et al. 2006, Executive Summary). The new estimates summarized here were derived by 2 different modeling approaches, and were developed for the baseline period of 1994-1996 (Raphael et al. 2006, p.99; the satellite imagery used was from this span of years). For one of those approaches, the Expert Niche Factor Analysis (ENFA, Raphael et al. 2006), two different habitat suitability (HS) threshold criteria were used to estimate suitable habitat. Habitat suitability was on a scale of 0-100, where 100 is the highest suitability; HS>60 provided a more generous (inclusive) portrayal of habitat, and HS>80 a more conservative one (Raphael et al. 2006, p.130). A separate habitat change analysis then calculated net losses (net gains were not observed) of nesting habitat between the baseline period and 2002-2003 (2002 for Oregon, Washington, 2003 for California; Raphael et al. 2006, pp. 100 and 129). To estimate the amount of habitat available in 2002-2003 requires subtracting the net losses from the baseline period. These are the numbers presented in Table 6.

The NWFP divided the murrelet nesting habitat into 2 inland habitat zones, with habitat zone 1 comprising the area near the coast, and habitat zone 2 the most inland potential habitat. The two modeling methods differ in the area covered, with the Expert Judgment model covering both habitat zones, and ENFA including only habitat zone 1. Expert Judgment model results for habitat zone 1 are reported separately in Table 6 to allow more direct comparison with ENFA results. Overall, in the NWFP habitat zone 2 accounted for about 23 percent of the total habitat estimated by the Expert Judgment model. While excluding habitat zone 2 likely underestimates the amount of habitat, the inclusion of the NWFP habitat zone 2 likely overestimates habitat. This is because extensive studies have demonstrated that the distribution of likely nesting birds is not as far inland in southern Oregon and northern California as thought in 1996, when the NWFP inland boundaries were drawn (FR 73(148), July 31, 2008, p. 44680).

For Federal lands, McShane et al. (2004) estimated about 2 million acres of suitable habitat in 2003, but acknowledged this likely represented an overestimate because some administrative units used northern spotted owl habitat as a surrogate for murrelet habitat, and owl habitat includes younger forest than typical murrelet habitat. Nonetheless, the 2004 estimate is relatively similar to the estimates from the Expert Judgment model and from ENFA using HS>60 (Table 6). The similarity of these 3 estimates from different approaches, each roughly 2 million acres, suggests that this is the best estimate of suitable potential nesting habitat on Federal lands as of 2002-2003. This estimate may be something of an overestimate, considering the much smaller estimate of 0.6 million acres based on a more stringent minimum habitat quality threshold (ENFA HS>80), and the potential overestimate in the 2004 number from McShane et al. (2004), as noted above. The authors of the modeling work, however believed that the HS>60 criterion yielded a reasonable estimate of potential murrelet nesting habitat (Raphael et al. 2006, p. 141).

southwest Washington and northwest Oregon in December 2007. The Washington Department of Fish and Wildlife estimate the amount of occupied murrelet habitat affected by the December 2007 and subsequent windstorms as approximately 2,000 acres. This includes only those areas where the agency has information from assessments of damaged stands and/or from completed salvage logging. Not included are damaged stands that the agency has not been apprised of, nor impacts to potentially suitable (versus known occupied) murrelet habitat (Gary Bell, WDFW, pers. comm. 2009). WDFW hopes to complete a more accurate accounting during 2009.

Estimates of previous habitat losses. The analysis for the 2004 5-year review estimated total losses of murrelet habitat within the listed range, due to all causes combined. Between 1992 and 2003, the estimated loss of suitable murrelet habitat totaled 22,398 acres in Washington, Oregon, and California combined, of which 5,364 acres resulted from timber harvest and 17,034 acres resulted from natural events (McShane et al. 2004, pg. 4-64). Those data primarily represented losses on Federal lands, and did not include data for most private or State lands within the murrelets' range.

New information on habitat losses is available from the analysis of Raphael et al. (2006), which used habitat models to estimate losses of potential murrelet habitat for the period from 1994-1996 to 2002-2003, and covered both Federal and non-Federal lands within the five Conservation Zones in the NWFP area. Results from that study indicate that losses of potential nesting habitat may be greater than previously estimated, with losses ranging from about 61,000 to 279,000 acres in the 5-Conservation Zone area, with about 10 to 28 percent of habitat loss occurring on Federal lands, and 72 to 90 percent on non-Federal lands (Table 7). The variation in the acreage estimates provided by Raphael et al. (2006) is dependent upon the habitat model used to evaluate habitat suitability. However, the earlier estimates were based on direct reports of losses by agencies, and the newer numbers are based on habitat modeling; therefore, direct comparisons should be made cautiously. McShane et al. (2004, p.4-66) had incomplete data on habitat losses for non-Federal lands, thus the higher losses from the 2006 modeling may in part represent a capturing of unreported losses. Further complicating comparisons is that the same models (Expert Judgment, ENFA>60) which estimated much greater habitat losses on non-Federal lands than did McShane et al. (2004) also estimated more baseline habitat on those lands. If those models incorrectly classified mature second-growth forest as baseline murrelet habitat on non-Federal lands, the error could also inflate losses, via harvest of second-growth which was incorrectly classified as suitable nesting habitat, and thus also counted among losses.

In addition to direct habitat removal, forest management practices can fragment murrelet habitat; this reduces the amount and heterogeneous nature of the habitat, reduces the forest patch sizes, reduces the amount of interior or core habitat, increases the amount of forest edge, isolates remaining habitat patches, and creates "sink" habitats (McShane et al. 2004). There are no estimates available for the amount of suitable habitat that has been fragmented or degraded since 1992. However, the ecological consequences of these habitat changes to murrelets can include effects on population viability and size, local or regional extinctions, displacement, fewer nesting attempts, failure to breed, reduced fecundity, reduced nest abundance, lower nest success, increased predation and parasitism rates, crowding in remaining patches, and reductions in adult survival (Raphael et al. 2002).

Within designated critical habitat units since the last review, the Service has authorized incidental take associated with the removal of 80 acres and degradation of 21 acres of habitat in Conservation Zone 3, and the removal of 234 acres and the degradation of 6 acres of habitat in Conservation Zone 4. No removal or degradation of critical habitat was authorized via incidental take in Conservation Zones 5 and 6.

Climate Change:

Although the marine environment is the murrelet's principal habitat, terrestrial habitat serves a vital function seasonally for nesting and reproduction. The following section describes the effects or potential effects of climate change on murrelet's use of terrestrial habitat. In general, where climate models are informative, their projections for the forested habitat that murrelets occupy are largely unfavorable.

We discuss temperature, rainfall, and snowpack projections specific to the PNW as defined by Mote et al. (2003, 2008) and similarly by Millar et al. (2006, p.45), and Littell et al. (2009, p.3) to include Washington, Oregon, Idaho, western Montana and small portions of adjacent states. Fire, disease and insects, and tree mortality were examined across a much broader landscape in the western US. Changes in vegetation communities as a result of climate change were modeled for California (Lenihan et al. 2008, p.220) and the PNW (Millar et al. 2006, p.45).

During the next 20 to 40 years, the climate of the PNW is projected to change significantly with associated changes to forested ecosystems. Initially, the PNW is likely to see increased forest growth region-wide over the next few decades due to increased winter precipitation and longer growing seasons; however, forest growth is expected to decrease as temperatures increase and trees can no longer benefit from the increased winter precipitation and longer growing seasons (Littell et al. 2009, p.15). Additionally, the changing climate will likely alter forest ecosystems as a result of the frequency, intensity, duration and timing of disturbance factors such as fire, drought, introduced species, insect and pathogen outbreaks, hurricanes, windstorms, ice storms, landslides, and flooding (Kliejunas et al. 2008, p.25; Littell et al. 2009, p.14).

The climate in the PNW has already experienced a warming of 0.8° C during the 20th century (Mote et al. 2008, p.3). Using output from eight climate models the PNW is projected to warm further by 0.6 to 1.9° C by the 2020s, and 0.9 to 2.9° C by the 2040s (Mote et al. 2008, pp.5-6). Additionally, the majority of models project wetter winters and drier summers (Mote et al. 2008, p.7), and of greatest consequence, a reduction in regional snowpack, which supplies water for ecosystems during the dry summer (Mote et al. 2003). The small summertime precipitation increases projected by a minority of models do not change the fundamentally dry summers of the PNW and do not lessen the increased drying of the soil column brought by higher temperatures (Mote et al. 2003, p.8). Consequently, the potential for increased fire frequency and severity even in wet coastal ecosystems of the PNW is likely under climate change projections (Millar et al. 2006, p.49).

One of the largest projected effects on PNW forests is likely to come from an increase in fire frequency, duration and severity. In general, wet western forests have short dry summers and high fuel moisture levels that result in very low fire frequencies. However, high fuel accumulations and forest densities create the potential for fires of very high intensity and severity

well known, as different models provided widely varying estimates of losses, and the models have a number of sources of uncertainty (Raphael et al. 2006, p.137). However, the magnitude of the non-Federal losses reported by some models in Raphael et al. (2006) for non-Federal lands (as much as about 7 percent of total baseline habitat), suggests a need for investigation to better understand the status of habitat on non-Federal lands.

The new estimates of potential suitable murrelet nesting habitat are, for Federal lands, similar to the estimate in the Service's analysis for the 2004 5-year review. Considering the approximate nature of previous and current estimates, the new data do not indicate a change in status or threat level. For non-Federal lands, the recent habitat modeling work suggest that more habitat may be present than previously estimated. Considering that the previous numbers were known to be underestimates for non-Federal lands because of incomplete data for those lands, and the more recent modeling results likely overestimates, we conclude that the data available at this time does not indicate a significant change from previous estimates of suitable nesting habitat. However, improved data, especially for non-Federal lands, would be valuable to better assess the true amount and distribution of suitable nesting habitat.

Though considerable uncertainty exists with respect to any regional-scale impacts of climate change due to the differences in trajectories of climate change scenarios, modeling results underscore the potentially large impacts on the PNW and California ecosystems. From this review we can generalize that adverse consequences to forest ecosystems are predicted to increase as a result of climate change (Kliejunas et al. 2008, p.25), potentially negatively impacting habitat for many species including the murrelet.

Climate change is likely to further exacerbate some existing threats such as the projected potential for increased habitat loss from drought related fire, mortality, insects and disease, and increases in extreme flooding, landslides and windthrow events in the short-term (10 to 30 years). However, while it appears likely that the murrelet will be adversely affected, we lack adequate information to quantify the magnitude of effects to the species from the climate change projections described above.

Marine Environment

In this section we summarize new information regarding potential threats to the murrelet's marine environment. New information regarding the condition of the marine environment in the 3-state area includes harmful algal blooms, dead zones, prey availability and quality, and the potential exacerbation of these conditions from climate change.

California Current System. With the exception of Conservation Zone 1 (Puget Sound and Straits of Juan de Fuca), the listed range is entirely within the California Current System (CCS). The CCS extends about 190 mi (~300 km) offshore from southern British Columbia, Canada, to Baja California, Mexico, and is dominated by a southward surface current of colder water from the north Pacific (Miller et al. 1999, p.1; Dailey et al. 1993, pp.8-10). The system is characterized by upwelling, particularly in spring-summer. This is an oceanographic phenomenon involving wind-driven movement of dense, cooler, and usually nutrient-rich water towards the ocean surface, which replaces warmer and usually nutrient-depleted surface water (Smith 1983, pp.1-2433). Coastal upwelling replenishes nutrients near the surface where photosynthesis occurs,

- Fifty-two non-native species have been documented in Puget Sound; a large number of these were probably introduced via ship ballast. The European green crab, Chinese mitten crab, and zebra mussel are non-native species that could arrive at anytime and threaten Puget Sound's biological resources.
- Approximately 1 percent of Puget Sound sediments are highly degraded, 31 percent are of intermediate quality, and 68 percent are of high quality. The degraded sediments (as measured by toxicity, chemistry, and benthic infauna) are mainly associated with urban embayments that are often located near river deltas and other highly productive nearshore habitat of importance to Puget Sound species. Flame retardants [polybrominated diphenyl ethers (PBDEs)] occurred in 17 percent of sediment sites sampled in Hood Canal in 2004 and were detected in 16 percent of samples from 10 Puget Soundwide sediment sampling sites in 2005. The levels of polycyclic aromatic hydrocarbons (PAHs), such as creosote, have not changed significantly in Puget Sound sediments over the past decade, except in Bellingham Bay, Port Gardner, and Anderson Island, where levels have increased. Point Pully (in central Puget Sound) had a significant decrease in PAHs during this same period.
- PBDEs are now second to Polychlorinated biphenyls (PCBs) in order of importance in the Puget Sound food web. PBDEs levels in English sole from urban areas are almost 10 times higher than those levels measured in sole from the Georgia Basin. Pacific herring from Puget Sound have nearly three times the levels of PBDEs found in Georgia Basin herring. Harbor seals from Puget Sound have over twice the PBDEs found in seals near Vancouver, British Columbia. Scientists estimate that PBDE levels are doubling every four years in marine mammals, including harbor seals and orcas, and will surpass PCB levels in these species by 2020.

Harmful Algal Blooms and Biotoxins. Some algal species cause harm to animals and the environment through toxin production or excessive growth. These algal species are known as harmful algae and can include microalgae that live suspended in the water or macroalgae that live attached to plants or other substrates. Harmful algal blooms (HABs) are a natural phenomenon, but human activities are thought to contribute to the increased frequency of some HABs, for example increased nutrient loading is a factor that contributes to increased occurrence of high biomass HABs (Lopez et al. 2008, p.19). All coastal states in the United States have experienced HAB events and "it is generally believed that the frequency and distribution of HABs and their impacts have increased considerably in recent years" (Lopez et al. 2008, p.19).

The consequences of HABs can include the death of whales, sea lions, dolphins, manatees, sea turtles, birds, fish, and invertebrates from direct exposure to toxins; exposure to toxins via contaminated food, water, or aerosols; damaged gills; starvation due to low or poor food quality (Lopez et al. 2008, pp.19 and 22); and by producing compounds that reduce feather waterproofing which can result in hypothermia (Jessup et al. 2009). HABs can also exacerbate impacts of other stressors and indirectly lead to mortalities. Ecosystems can be degraded through the formation of such large blooms that they alter habitat quality through overgrowth, shading, or oxygen depletion (see dead zone section below). In addition, HAB-inflicted mortalities can degrade habitat quality indirectly through altered food webs or hypoxic events caused by the decay of dead animals (Lopez et al. 200, p.22).

of domoic acid caused beach closures at four places in north Puget Sound (Sequim Bay, Port Townsend, Holmes Harbor, and Penn Cove) (PSAT 2007, p.220). In 2007, domoic acid levels in water samples from southern California were reported as some of the highest ever recorded in natural samples (Lopez et al. 2008, p.28).

Recently published data confirms murrelets are susceptible to domoic acid poisoning. During a *Pseudo-nitzschia* bloom in California in 1998, domoic acid poisoning was documented as the cause of death of 2 of 17 radio-tagged murrelets (Peery et al. 2006b, pp.83-84). In addition, Peery et al. (2006b, p.83) showed murrelet survival was reduced in years with a *Pseudo-nitzschia* bloom. McShane et al (2004) acknowledged that biotoxins will affect murrelets in the near future. If HABs continue to increase in scope and frequency as predicted, effects to murrelet populations will continue to occur and likely will increase.

Dead Zones. Ecosystems can be degraded through the formation of such large algal blooms that they alter habitat quality through overgrowth, shading, or oxygen depletion (hypoxia or anoxia) (Lopez et al. 2008, pp.21-22). Hypoxia or anoxia (low or no dissolved oxygen) can suffocate fish and bottom-dwelling organisms and can sometimes lead to hydrogen sulfide poisoning (Lopez et al. 2008, p.22; Grantham et al. 2004, p.750; Chan et al. 2008). In addition, HAB-inflicted mortalities can degrade habitat quality indirectly through altered food webs or hypoxic events caused by the decay of dead animals (Lopez et al. 2008, p.22).

Hypoxic and anoxic events along the Pacific Coast can also be caused by large-scale changes in ocean conditions on near-shore upwelling ecosystem dynamics. Upwelling is part of the California Current coastal ecosystem, but typically, northerly winds alternate throughout the summer with southerly winds. The wind shifts suppress upwelling, mix the water, and prevent nutrient overload. However, every summer since 2002 the Oregon Coast has experienced an hypoxic/anoxic event (also referred to as "dead zone") (Grantham et al. 2004; Chan et al. 2008) due to changes in typical summer wind patterns along with upwelling of nutrient rich, but oxygen poor waters. While hypoxic conditions are known to be related to upwelling events, the hypoxic events off Oregon's coast extend from the shallowest reaches (inshore of 30 meter isobath) to the nearshore stations (2 to 5 kilometers offshore), which is unusual. Further complicating matters, phytoplankton are two to three times more abundant, resulting in increased respiration (expiration of carbon dioxide) exacerbating the dissolved oxygen deficits (Grantham et al. 2004, pp.751-752). The severe hypoxic event in 2006, extended into Washington at least as far north as the Quinault River (<http://www.Sciencedaily.com/releases/2006/07/060727090749.html>) and affected crabs in pots at depths of about 45 to 90 feet.

In addition to unusual summer wind patterns, researchers are also interested in large phytoplankton blooms that occur in the late spring and early summer in the waters off Washington and Vancouver Island. The large blooms in the north might explain why waters off the Oregon coast that now well up at the coastal shelf break are unusually low in oxygen. The change in wind patterns and the response of the marine ecosystem may be an interlude in a natural cycle or may signal a more permanent shift in the regional climate and the health of the ecosystem (Chan et al 2008).

Sound to be comparable to herring from northern Europe's severely contaminated Baltic Sea (PSAT 2007, p. 129). There is currently only one commercial herring fishery which operates primarily in south and central Puget Sound (WDFW 2005) where herring stocks are healthier. There are herring fisheries in Willapa Bay and Grays Harbor, but no direct harvest is allowed in the coastal waters. The decline of some herring stocks may be affecting the forage base for murrelets in Puget Sound.

Pacific herring abundance and distribution information for Oregon is not readily available. However, the Oregon Department of Fish and Wildlife has a Developmental Fisheries Program that requires a permit to harvest herring within state waters. Up to 15 permits are issued annually.

As of 2004, herring stocks in California had been depressed for the previous 8 to 10 years following the last major El Nino conditions. The predominant age classes were 2 and 3 year olds, with the much larger 6, 7, and 8 year-old fish very scarce in recent years (State of California 2004). There is little to no information on where the herring are during the non-breeding season. Most herring spawning occurs in the San Francisco Bay, where most of the commercial herring fishing occurs in California. In 2004, the San Francisco Bay herring population was near the lowest abundance level observed since the 1970s. A minor amount of spawning and minimal fishing occurs in Tomales and Humboldt Bays, and occasional spawning and no fishing occurs in Crescent City harbor. Herring fishing in Monterey Bay occurs outside the breeding season, and is for bait and aquarium fish food.

Surf smelt. No rigorous assessments of Washington's surf smelt stocks exist. However, recent smelt catch data show an uneven distribution of spawning activity and adults in Puget Sound (Rice 2006, p.69). Limited research undertaken by Rice (2006) documented significant differences in surf smelt embryo tolerance to environmental conditions between modified and natural beaches, suggesting continued human-caused modification of spawning beaches could contribute to surf smelt population declines. There are commercial and recreational fisheries for surf smelt in Washington. While WDFW contends the amount of harvest does not appear to be impacting the surf smelt stocks (Bargmann 1998, p.33), as stated previously, there are no stock assessments for this species on which to base this contention. We have no information on the status of this species in Oregon or California.

Sand lance. There are no population assessments of Washington sand lance. Nor are there directed commercial fisheries for sand lance in Washington (Bargmann 1998, p.30). We have no information on the status of this species in Oregon or California.

Anchovy. Northern anchovies (*Engraulis mordax*) have appeared in south Puget Sound over the past decade and their geographic distribution and abundance seems to be expanding (PSAT 2007, p. 54). Recent reports from many parts of the central and south Sound indicate prevalence of post-larval anchovies in the nearshore in late summer and early fall, with juvenile and adult fish visible in offshore waters throughout much of the year. Anchovies are taken commercially within coastal and estuarine waters of Washington. While the current harvest level doesn't appear to be impacting anchovy stocks, there is no current abundance information (Bargmann 1998, p.28). We have no information on the status of this species in Oregon or California.

could be in response to reductions of higher-trophic level prey (e.g sardines in California) as a consequence of over-fishing or regional changes in climate (Becker and Beissinger 2006, p.477; Norris et al. 2007, p.880). There are no similar diet-related studies for Oregon or Washington. However, we believe it is reasonable to assume similar shifts to lower-trophic-level food items have occurred in Washington's Puget Sound because the British Columbia study was conducted in Georgia Basin (adjacent/connected with Puget Sound waters), the available prey species are the same, and the historic level of fishing and/or climate variation would be similar. The same reasoning cannot be applied to the Washington coast, Oregon, or northern California at this time; therefore we are unable to determine or conclude whether the murrelets that occupy these areas are also feeding at a lower trophic level.

The potential effects of the decline in higher trophic-level food items are most significant during egg development (Becker and Beissinger 2006, p.477). Murrelets lay a single egg weighing about 25 percent of their prebreeding body mass, which suggests that egg production is energetically costly and dependant on the availability of adequate prey. For example, a large proportion (50-90 percent) of murrelets forego breeding in central California and may do so because they cannot find sufficient food resources during preparation for breeding (Peery et al. 2004, pp.1094-1095). Norris et al. (2007, p.879) found breeding success increased when murrelet's pre-breeding diet consisted of higher-trophic level prey (i.e. they found a strong correlation between the pre-breeding diet and murrelet abundance 3-4 years later (the time lag for young-of-the-year to attain breeding age)).

Climate Change. Climate change was not identified as a threat in the 1992 finding which listed the murrelet as threatened, nor in the analysis for the 2004 5-year review (USFWS 2004). In the intervening time, considerable research has provided further evidence for the likelihood and potential consequences of climate change associated with greenhouse gas emissions. While there is general consensus regarding global warming (as noted above), the effects to the coastal marine environment are less clear. Studies of future marine environments under global warming involve complex and interacting atmospheric and oceanic circulation dynamics, often requiring models, and different models can produce different outcomes.

Within the marine environment, effects on the murrelet food supply (amount, distribution, quality) provide the most likely mechanism for climate change impacts to murrelets. The murrelet diet is not well studied, which hampers assessment of climate change effects related to prey, but effects on nutrient levels, and primary productivity are of concern, as are effects on prey abundances, quality, and distribution. Climate-related factors most likely to affect murrelet prey and foraging include sea surface temperature, thermal stratification, nutrient input, increased storm effects, currents, upwelling and other circulation patterns, and increased turbidity.

Studies in British Columbia (Norris et al. 2007) and Conservation Zone 6 (Becker and Beissinger 2006) have documented long-term declines in quality of murrelet prey, and one of these studies (Becker and Beissinger 2006) linked variation in coastal water temperatures, murrelet prey quality during prebreeding, and murrelet reproductive success. These studies indicate that murrelet recovery may be affected as long-term trends in ocean climate affect prey resources and reproductive rate.

increased stratification. Within this uncertainty, positive changes (for murrelet food supply) appear rare in forecasts, with the possible exception of increased upwelling. While upwelling is generally associated with increased productivity, at some level increased winds and upwelling could negatively effect the coastal marine ecosystems, by reducing the concentration of marine organisms, through increased mixing and transport seaward of surface water and organisms (out of the murrelet's near-shore environment) (Snyder et al. 2003, p.4). In another example of the complexity of the system, Peery et al. (2009) examined murrelet foraging associated with upwelling dynamics in Conservation Zone 6 and found birds spent more time diving during upwelling, increased their foraging ranges with longer periods of sustained relaxation, and reduced their foraging ranges after transitions to upwelling. One hypothesis for this observation is that prey were less aggregated and thus less available in the mixed water column during upwelling (J. Adams, personal communication).

Water circulation in Puget Sound is sensitive to the timing and amount of freshwater inflow and salinity of ocean waters mixing within the Sound. The timing and amount of freshwater inflow is expected to shift, resulting in lower flows in late spring and summer. These changes will likely produce fresher waters during winter and saltier waters during summer, resulting in stronger stratification in winter and weaker stratification in the summer (Rucklehaus and McClure 2007, p.53).

Among potential negative effects, increasing SST and associated changes may have a high potential to negatively affect murrelets. If recent El Niño and warm-water events are an indicator of future effects of increased sea surface temperatures, murrelet prey base could be negatively affected. Based on the response of other seabirds such as Cassin's auklets (Sydeman et al. 2006), and of a study of historic versus recent murrelet diet in Conservation Zone 6 (Becker and Beissinger 2006), warmer coastal waters tend to adversely affect prey quality and result in lowered reproduction.

Warmer water temperatures and stronger winter stratification in Puget Sound is predicted to contribute to decreased dissolved oxygen in deep waters. As SST rises, biological productivity (plant and animals) will increase, resulting in more organic material delivered to the bottom (increased decomposition) which increases the consumption of dissolved oxygen at depth (Rucklehaus and McClure 2007, p.53), potentially leading to increased or more extensive "dead zones." The appearance of "dead zones" has been limited geographically to date, and not demonstrated to be the result of climate change, nor part of a larger emerging pattern. However, should this phenomenon become more widespread, it could affect the near-shore waters where murrelets feed. The absence of prey during such events could have local, short-term effects on murrelets, such as reduced reproduction.

Harmful algal blooms can impact coastal seabirds not only through prey toxicity, but by producing compounds that reduce feather waterproofing and result in hypothermia (Jessup et al. 2009). The frequency and duration of HABs in Puget Sound are expected to increase as a consequence of increased water temperatures allowing earlier and longer lasting blooms (Rucklehaus and McClure 2007, p.54). How climate change will influence HABs within the CCS will depend upon changes in SST and upwellings.

While the differing predictions prevent a conclusive threat assessment, the predicted direction of change for most variables considered suggests that few changes are likely to benefit murrelets, with many more having the potential to be neutral or adversely affect murrelets. In view of that, it appears most likely that the murrelet prey base will be adversely affected to some degree. While seabirds such as the murrelet have life-history strategies adapted to variable marine environments, ongoing and future climate change could present changes of a rapidity and scope outside the adaptive range of murrelets. The reduced distribution of nesting habitat also constrains the ability of the species to respond to shifts in prey conditions, as nesting birds are limited to foraging to waters relatively near their inland nest sites. Also, the limited evidence available indicates substantial nest site fidelity, and does not suggest that individual murrelets will abandon a nesting area that becomes unsuitable, and move to a new, distant nest site.

Therefore, the new information suggests there is a change in the level of threats in the marine environment.

2.3.2.2 Overutilization for commercial, recreational, scientific, or educational purposes:

The 2004 5-year review stated there was no evidence of overutilization of murrelets for commercial, recreational, scientific or educational purposes. This statement remains true regarding commercial, recreational, and educational purposes.

Since Oct 1, 2003, the Service has issued section 10(a)(1)(A) recovery permits to four individuals for scientific research on murrelets in Washington, Oregon, and California. Through 2008, these permits authorized the lethal take of 1 murrelet; the number of murrelets authorized to be harassed per year ranged from 55 to greater than 145; and one permit authorized the harassment of murrelets associated with 11 trees per year. Recovery permits for future years (through 2013) have been issued to four individuals. All of the harassment authorized by these permits is for climbing nest trees or the capture/handling/tagging of murrelets at sea.

At the time the permits for the at-sea capture/handling/tagging were issued, there was little or no data available regarding the effects of radio transmitters. Based on radio telemetry work done in California, Peery et al. (2006b, p.85) determined survival rates for transmittered birds are lower than for non-transmittered birds and the likely causes for the lower survival rates are increased underwater drag (which reduces diving speed and foraging efficiency) or increased vulnerability to predators. In California, Peery et al. (2006b, p.83) reported mortalities of 12 radio-tagged murrelets. While none of the mortalities appear to be directly related to the radio transmitter (2 predation, 2 domoic acid, and 1 physical injury/trauma), the cause of mortality is unknown for 7 of these cases. While no mortalities of radio-tagged murrelets have been reported in studies from Washington (Bloxtton and Raphael 2008) and Oregon, the amount of information available from those studies is not comparable to the California study and in some cases, not yet finalized.

The conclusion in McShane et al. (2004, p.6-10) regarding scientific research was that while individual murrelets are affected by telemetry and tree-climbing projects, these disturbances are relatively small scale, occur infrequently, and are unlikely to affect murrelet populations. The greatest impact to murrelet populations is removing adults. The recovery permits issued between October 1, 2003 and April 30, 2009, authorized the lethal removal of 1 adult and may have

and the first documentation of a Douglas squirrel rolling a recently abandoned egg off a murrelet nest (Thomas Bloxton, pers comm. as cited in Malt and Lank 2007, p.170). Corvids remain the predator with the likely greatest impact on murrelets.

Malt and Lank (2007, p.165) recorded predation rates of 35 percent on artificial nests in southwestern British Columbia. Hebert and Golightly (2006, pp.98-99) calculated nest predation rates in Redwood National and State Parks based on 37 nesting attempts detected with radiotelemetry. They found predators may have caused 64, 39, and 50 percent nest failure rates in 2001, 2002, and 2003, respectively, or an annual average of 51 percent. Peery et al. (2004, pp.1093-1094) documented predators as the cause of nest failure for 67 percent of known fate nests (n=9) in the Santa Cruz Mountains of California. When nests where no intact egg or chick was found were included, 13 of 16 failed nests (81 percent) were likely lost to predators.

The ultimate factors affecting rates of predation on murrelet nests remain somewhat elusive, though key elements still appear to be proximity to humans, abundance of avian predators, and proximity and type of forest edge to the nest (USFWS 2004, p.19).

Human presence and corvid abundance. Marzluff and Neatherlin 2006 (p.310) reported that the rate of predation of artificial nests on the Olympic Peninsula was significantly correlated with corvid abundance, primarily related to crow abundance near human settlements and campgrounds. Crows were shown to use campgrounds significantly more frequently relative to occurrence than other land cover types (Neatherlin and Marzluff 2004, p.712). The concentration of use by crows in campgrounds was significant and positively correlated with campground size (Neatherlin and Marzluff 2004, p.714), though there was high individual variation (Neatherlin and Marzluff 2004, p.713). In the Santa Cruz Mountains of California, Suddjian (2005, p.6) found Steller's jays 8.8 times more numerous in standard campgrounds or immediate vicinity than control areas more than 300 m from campgrounds, picnic areas, or residential areas. Jay density was significantly positively correlated with the number of occupied campsites. These patterns remained through 2008 (Suddjian 2008). Suddjian (2005, p.7) also found that raven numbers in campgrounds exceeded those in control areas by 28 times based on pooled data (ravens were generally uncommon). In Redwood National and State Parks, recent data show that campground areas contained a significantly higher number of Steller's jays (5 times higher) as compared to the two control category types. Picnic areas averaged approximately a third (compared to a half in 2007) as many jays as the campgrounds but were also significantly higher than the control areas (Bensen 2008, p.12).

Artificial nests in high Steller's jay use areas lasted only half as long as those in low-use areas (Vigallon and Marzluff 2005, p.45). While jays did not perform nest-specific searches, they predated nests they came upon. Hebert and Golightly (2006, p.38) noted that the presence of corvids in the vicinity of nest trees did not increase during periods of disturbance during a study in Redwood National and State Parks, though this was not the focus of the study.

The increase in predators in association with human presence (recreation sites or housing), and therefore the probability that predators will depredate a murrelet nest, is likely to be particularly important in California where 76 percent of habitat within 0.5 mile of known occupied sites and detections occur either within or immediately adjacent to lands managed primarily for recreation

2004.) in real nests, and 81 to 86 in artificial nests (Luginbuhl et al. 2001, Marzluff and Restani 1999). The key elements affecting predation rates appeared to be proximity to humans, abundance of avian predators, and proximity and type of forest edge to the nest. Based on the latest information, we still find murrelets to be highly vulnerable to nest predation. New information continues to confirm the importance of nest predation in limiting murrelet nest success.

2.3.2.4 Inadequacy of existing regulatory mechanisms:

Information is provided below to update the analysis since the 2004 5-year review. This includes information on the revisions of plans and regulations within the range of the murrelet that address increased or decreased regulatory protection with respect to murrelets. In addition, properties that are now managed for conservation benefits for the murrelet as a result of purchase, conservation easements or changes to land allocations are listed below. While these additions do not add to the amount of murrelet habitat, they now have adequate or additional regulatory mechanisms to protect them for murrelet conservation. Other than the revisions below we know of no new additional regulations that have been implemented to address the threats to the murrelet. Therefore, we continue to assume that the threat posed by the inadequacy of existing mechanisms has been reduced since listing. For additional information on relevant regulatory mechanisms please see Appendix B: Factor D.

Northwest Forest Plan (Survey and Manage and Aquatic Conservation Strategy): In 2004, the NWFP was revised to address concerns related to the Survey and Manage process. This revision discontinued the application of the Survey and Manage process. While significant to some species, this revision does not appear to have caused changes to the net conservation benefit of the Northwest Forest Plan for the murrelet. In addition, in March 2004, the Aquatic Conservation Strategy (ACS) was revised and the Services issued biological opinions that eliminated the requirement that each timber sale must promote attainment of the ACS objectives. However, in March 2006, the courts ruled that the amendment violated the Act. At this point no revision of ACS has occurred and therefore no change to conservation benefits for murrelet as a result of this proposed revision has resulted.

BLM Western Oregon Plan Revisions: The Records of Decision for the Bureau of Land Management (BLM) Western Oregon Plan Revisions under the Northwest Forest Plan (NWFP) were signed on December 30, 2008. These Records of Decision and associated resource management plans (RMPs) replace the RMPs for BLM-administered lands in western Oregon that were approved under the Northwest Forest Plan. Murrelet management under the new RMPs is accomplished by (1) blocked Late Successional Management Areas (LSMAs), (2) stand-level LSMAs for murrelets outside block LSMAs, (3) requirements to identify and protect occupied stands and certain nearby stands, and (4) prohibitions against disrupting occupied murrelet sites.

LSMAs were originally designed as blocks of BLM land managed to, in part, maintain habitat for northern spotted owls and murrelets and promote development of nesting habitat for murrelets where it does not currently occur, similar to the LSRs of the NWFP. In addition, stand-level LSMAs were designated for stands determined to be occupied by murrelets under the

Table 8 Acreages conserved under NRDA funds for murrelets

Spill Name/Year	Area	Total acreage
Tenyu Maru/1991	Teal Slough, WA	338
Tenyu Maru/1991	Anderson Point, WA	566
Tenyu Maru/1991	Waatch River Valley, WA	
Texaco-Anacortes/1991	Fidalgo Bay, WA	82
New Carissa/1999	Reed Creek, OR	3,851
New Carissa/1999	Arnold Creek, OR	412
Stuyvesant/Humboldt Coast/1999	Miracle Mile, CA	650 (142)
Stuyvesant/Humboldt Coast/1999	Big Mynot/E.Fork Hunter, CA	298 (77)
Stuyvesant/Humboldt Coast/1999	U.C. Regents Girl Scout Creek, CA	80

Quinault Indian Reservation North Boundary Area: In 2006, the Service completed conservation easements with the Bureau of Indian Affairs and the Quinault Indian Nation for 2,925 ac of forested land in the North Boundary Area (NBA). The NBA has been surveyed and is known to be occupied by murrelets (as determined by surveys under the PSG protocol). When the full extent of the conservation easements are implemented, they will apply to 4,262 acres (2,980 ac of old-growth and 1,282 ac of second growth). The purpose of the conservation easement is to preserve, protect, restore, enhance, maintain, and promote the functional value of existing and potential future late-successional forest and its use as habitat for the murrelet and other species dependent on late successional forest habitat.

Cooperative Endangered Species Conservation Funds (Non-traditional Section 6). We do not believe this program was discussed in the analysis for the 2004 5-year review. Since 1994, in Washington State, approximately 10,560 acres have been permanently conserved under the CESCOF (S6) that have or will have habitat that could benefit murrelets. In Oregon, the 193-acre Big Creek property will be purchased to benefit at least 11 species of conservation concern, including the murrelet. In California, approximately 25,000 acres was purchased through the Mill Creek acquisition. All properties are intended to be managed for the long term conservation benefit of murrelets. Management of these lands may not impede the conservation benefit of murrelets and the Service has approval over each of the management plans. Within these areas, not all of the acreage is currently suitable murrelet habitat. See Table 9 for total acreages and the amount of currently suitable murrelet habitat.

Table 9 Acreages conserved under CESCOF for murrelets in Pacific Northwest

Area	Total acreage	Acres of terrestrial murrelet habitat
Hoh, WA	6,000	1,000
Cedar, WA	20	0
Boulder, WA	1,894	200
Ellsworth, WA	800	200
Ashford, WA	1,800	Maybe 100
Barr, WA	46	46
Big Creek, OR	193	?
Mill Creek, CA	25,000	121
TOTAL	10753	

California. The Jackson Demonstration State Forest Management Plan (Plan), finalized in January 2008, directs the management of Jackson Demonstration State Forest (JDSF) for the next 10 to 15 years. The JDSF is a 48,652-acre redwood/Douglas-fir forest located in Mendocino County between Fort Bragg and Willits.

Murrelets are known to occur in Lower Russian Gulch on State Park property adjacent to the JDSF. The Plan addresses murrelet habitat through recruitment of late successional habitat along Class I and Class II streams, the designation of 1,549 acres in the Upper Russian Gulch and lower Big River, and designation of the Mendocino Woodlands special treatment area as areas devoted to development of late seral forest habitat. Areas composed of second-growth forest are delineated for three old-growth groves to enhance functional characteristics, minimize edge and increase size: Road 334 Grove (492 acres), Upper James Creek Grove (38 acres), and Waterfall Grove Complex (250 acres). Additionally, the Plan proposes a multi-agency assessment process to further assess the best approach to recruiting and protecting potential habitat on JDSF. Surveys for murrelets will be conducted on all project sites with potential habitat. Disturbance buffers and seasonal restrictions will be implemented.

Ocean Regulations

The Outer Continental Shelf Lands Act of 1953 (OCSLA) (43 U.S.C. 1331 et. seq.) provides the Secretary of the Interior, on behalf of the Federal Government, with authority to manage the mineral resources, including oil and gas, on the outer continental shelf (OCS) and defines the OCS as all submerged lands lying seaward of the State/Federal boundary. The Federal Oil & Gas Royalty Management Act of 1982 (30 U.S.C. 1701) mandates protection of the environment and conservation of Federal lands in the course of building oil and gas facilities.

A Federal moratorium on offshore drilling and platform development was initiated by the U.S. Congress in 1982 (U.S. Department of Energy (DOE) 2005). On October 1, 2008, the 1982 offshore drilling moratorium expired and was not renewed by the U.S. Congress. With the lifting of the moratorium, it will be several years before production in previously restricted areas could occur as the total time required to obtain a lease, explore and develop the area, and begin actual production is between 4 and 12 years, or more (Energy Information Administration 2009). In addition, the 2007-2012 plan does not include any leases planned for the DPS of the murrelet although that could change very rapidly. On September 16, 2008, the U.S. House of Representatives passed bill H.R. 6899, the Comprehensive American Energy Security and Consumer Protection Act, which would allow oil and natural gas exploration and production between 50 and 100 mi (80161 km) off the U.S. coasts. The U.S. Senate has received but not yet voted on H.R. 6899. Fossil fuel (e.g., petroleum and natural gas) energy use and production is and will likely continue to be a significant societal issue for the United States in the foreseeable future. Consequently, it is foreseeable that within the next 15 years, offshore oil and gas platform development may occur off the coasts of Washington, Oregon, and California. Oil development as it relates to oil spills (See Factor E), may have detrimental affects on murrelets.

The Oil Pollution Act of 1990 (33 U.S.C. 2701-2761) amended the Clean Water Act and addressed the wide range of problems associated with preventing, responding to, and paying for oil pollution incidents in navigable waters of the United States. It created a comprehensive prevention, response, liability, and compensation regime to deal with vessel- and facility-caused

The U.S. Coast Guard rated the Dungeness area in the Strait of Juan de Fuca as being in the top five high-risk areas of the United States for being impacted by oil spills (USFWS 2009). Therefore, even though the threat from oil spills appears to have been reduced since the murrelet was listed, the risk of a catastrophic oil spill remains, and could severely impact adult and/or juvenile murrelets in Conservation Zones 1 and 2 through direct mortality or impacting their ability to feed.

Oregon. We are not aware of any murrelet mortality from oil spills in Oregon since the analysis for 2004 5-year review. Table 11 has been updated to reflect two murrelets that were recovered in association with the Oregon-Washington Mystery Spill (so named because we do not know the source of the oil). This event happened at essentially the same time as New Carissa, but far to the north on the northern Oregon-southern Washington coasts. These murrelets were not visibly oiled, but that does not rule out oiling as a factor in their death. Other seabirds assumed to be associated with this spill also were found on beaches in Conservation Zone 2; however, no murrelets were found. When the modeling for this spill is completed, there may be murrelets attributed to Washington's Conservation Zone 2, in addition to Conservation Zone 3.

California. The updates for oil spills in California are provided in the Table 11. The mortality estimates for the Kure and Stuyvesant spills and have been changed to incorporate new information from Natural Resource Damage Assessments completed since analysis for the 2004 5-year review. There was one new spill in 2007 that resulted in the recovery of 3 murrelets. DNA indicated these murrelets were not from central CA (i.e., not Conservation Zone 6); however for the purposes of this review, these murrelets will be attributed to Conservation Zone 6.

Oil spill summary. Based on the new information available, we have determined that while localized impacts from oil spills can be severe, they do not appear to have increased from our analysis for the 2004 5-year review. Severe localized impacts result from direct mortality through oiling and impacts to reproductive success through changes in prey base, marine habitat and disturbance. There have been no additional regulations or changes to regulations to address this threat, nor have recovery actions reduced it. Its magnitude appears to be unchanged at this time.

⁶ Estimated mortality of 8 murrelets during the Nestucca oil spill and 12 murrelets during the Apex Houston oil spill probably were heavily underestimated. Numbers in square brackets were used in this review.

⁷ This spill occurred mainly in Conservation Zone 2 but also in northern Conservation Zone 3. Since the majority of this spill occurred in Washington in the breeding season (70% juveniles killed; Warheit 1996), we assumed that 40 of 45 murrelets recovered were from Conservation Zone 2 and 5 of 45 were from Conservation Zone 3.

⁸ Recovery of 1-10 murrelets was assumed, based on location and available spill information (Ford et al. 2001).

⁹ Some oil mortality has occurred at the lower end of Conservation Zone 5 but we have assumed that these birds belong to the Conservation Zone 6 breeding population.

¹⁰ These mortalities may be also be accounted for in the final total of 45 Luckenbach birds.

¹¹ Numbers were updated in 2009: Luckenbach total includes Point Reyes Tarball Incidents and 2000-2003 Luckenbach incidents cited in original 5-yr review table (which have been removed from this version of table); Kure and Stuyvesant spill mortalities were updated based on Final DARP.

¹² Spill occurred in Conservation Zone 6, but DNA analyses indicated that recovered birds were likely not from Conservation Zone 6 (data for Cosco Busan provided by Carolyn Mann, USFWS Sacramento FWO, 7 May 2009). However, for the purposes of this table and mortality estimation we have assigned the mortality to Conservation Zone 6.

Table 12 Summary of estimated oiling mortality of murrelets by Conservation Zone, 1977-2008. This table copies and updates Table 5.4-2 from McShane et al. (2004, p. 5-19). The gray shading indicates new/adjusted information.

Conservation Zone	Period	Reported Spills ¹	Chronic ²	Annual Mortality
1	1977-1992	30-60	16-32	2.9-5.8
	1993-2003	0	11-22	1.0-2.0
	2004-2008	0	5-10	1-2
2	1977-1992	205-630	16	13.8-40.4
	1993-2003	0	11	1
	2004-2008	0	5	1
3	1977-1992	65-530	16	5.1-34.1
	1993-2003	282	11	26.6
	2004-2008	0	5	1
4	1977-1992	0	16	1
	1993-2003	265	11	25.1
	2004-2008	0	5	1
5	1977-1992	0	0	0
	1993-2003	0	0	0
	2004-2008	0	0	0
6	1977-1992	80-260	16-48	6.0-19.3
	1993-2003	189-241	11-33	18.2-24.9
	2004-2008	3	5-15	1.6-3.6
Total	1977-1992	380-1,480	80-128	28.8-100.5
	1993-2003	704-768	55-88	69.0-77.8
	2004-2008	3	25-40	5.6-8.6

¹ See Table 12 for estimates per reported spill.

² Conservative annual chronic oiling mortality rates were assumed (Conservation Zone 1 = 1-2; Conservation Zone 2-4 = 1; Conservation Zone 5 = 0; Conservation Zone 6 = 1-3).

Gillnets

Murrelet mortality associated with gill-nets remains zero in California and Oregon, as discussed in McShane et al. (2004). McShane et al (2004) documented murrelet mortality in Washington and the following review updates or provides new information not considered in McShane et al.

Average catch rates for the derelict nets is 0.42 fish per day (i.e. maybe killing 120,000 fish per year) and 0.24 birds per day (i.e. may be killing 44,000 birds per year); however, these rates may be low because decomposition to a pile of bones can take as little as 3 days (Natural Resource Consultants 2008, pp. 8-11). To date, murrelets are not included in the list of birds known to be killed by derelict nets. However, the bone/species identification process has not been completed for the test nets. In addition, over 50 percent of the derelict nets in Puget Sound occur in waters where murrelet densities are the highest in Washington (i.e. Straits of Juan de Fuca and San Juan Islands) and the nets primarily occur within murrelet foraging depth. Therefore, it is reasonable to assume that murrelets are also victims of derelict nets in Puget Sound.

The Northwest Straits Initiative has an ongoing effort to remove all derelict gear from Puget Sound and the Straits of Juan de Fuca by 2012. As of November 2008, 972 derelict nets and 1,636 crab pots have been removed, restoring more than 211 acres of marine habitat (NRC 2008).

Based on the lack of near-shore net fisheries and the high energy environment, we anticipate the presence of derelict fishing nets along the coasts of Oregon and California to be limited. However, pot fisheries take place all along the coast. While pots are unlikely to result in murrelet mortality, they do present a potential danger to murrelet prey species. However, to our knowledge, there is no information regarding the number of derelict pots along the entire outer coast, nor is there information regarding the potential threat posed to murrelet prey species.

Impacts from derelict fishing gear (nets and pots) are a new threat. The threat from derelict fishing nets appears to be localized to Conservation Zone 1 and the severity of the threat in this Conservation Zone is high. The scope and severity of the threat posed to murrelet prey from derelict pot fishing gear has yet to be determined.

Energy Development Projects and Energy Production

Wave and tidal energy projects. Section 23(b)(1) of the Federal Power Act of 1920 grants jurisdiction to the Federal Energy Regulatory Commission (FERC) for the licensing of hydropower development (for example, wave energy projects) in offshore waters of the United States. FERC licensing procedures include analyzing potential project effects on natural resources including, but not limited to, water quality, water use, marine mammals, fish, birds, geology, land use, ocean use, navigation, recreation, aesthetics, and cultural resources.

The threat(s) these projects may pose to murrelets varies greatly, depending upon the proposed location and type of equipment. In some cases, such as tidal energy projects that will use underwater turbines, the threat may be mortality. In other cases, the projects may degrade marine habitat through shading, collision/entanglement obstacles, night-lighting, changes in prey abundance, and/or increased human presence. In some cases, the project may have little or no impact to murrelets. The following summarizes those wave and tidal projects that we are currently aware have been proposed and are moving forward through the permitting and testing phases or already occur within murrelet habitat.

over the site. Until all of the data have been obtained and WDNR has completed their analysis, the future installation of wind turbines at this location is uncertain. The Pe Ell project is currently undergoing analysis. The proposed installation site is a combination of private timber company and WDNR lands. The WDNR lands are under a conditional lease, which can be rescinded pending the outcome of the analysis.

In Oregon, we are unaware of any on-shore wind energy projects proposed along the coast. There is one land-based wind turbine project in California that has been proposed that could affect murrelets. The proposed Bear River Ridge project is located in Conservation Zone 4, on a ridgetop area in Humboldt County that murrelets have been documented to traverse. The proposed project is in a preliminary stage, and the proponent has not applied for nor received any permits to date.

Liquefied Natural Gas Terminals and Pipelines. Four liquefied natural gas (LNG) terminals have been proposed in Oregon, each with associated pipelines through the inland range of the murrelet. No such installations are currently proposed in California or Washington (except where Oregon projects extend).

A pre-application was filed for the Port Westward LNG facility in the Columbia River near Clatskanie, Oregon, on April, 2005. The project was suspended in 2006.

Bradwood Landing LNG Facility in the Columbia River near Bradwood, Oregon, began the regulatory process in March 2005. FERC approved the facility in January 2009. The State of Oregon and the U.S. Department of Justice are appealing the decision to the 9th Circuit Court. No construction has been initiated. There are two natural gas pipelines potentially associated with this facility. The 30 mile Northern Star pipeline goes from Bradwood to near Longview, Washington, and does not affect murrelet habitat. The 212 mile Palomar natural gas pipeline starts near Bradwood, Oregon and ends near Madras on the east side of the Cascades. This pipeline would traverse the murrelet inland range, potentially resulting in the loss or fragmentation of some murrelet nesting habitat. The pipeline route is not final yet, so exact amounts of habitat affected are not available.

A pre-application was filed on the Oregon LNG facility near Astoria, Oregon in June 2007. This process is ongoing. The associated 120 mile Oregon natural gas pipeline goes from Astoria to Mollala, Oregon. This pipeline would traverse the murrelet inland range, potentially resulting in the loss or fragmentation of some murrelet nesting habitat. The pipeline route is not final yet, so exact amounts of habitat affected are not available.

The Jordan Cover Energy Project, in Coos Bay, Oregon, was initiated with a notice of intent in November 11, 2004. FERC issued a final EIS on the project on May 1, 2009. The project also involved the construction of the 231 mile Pacific Connector Gas Pipeline from Coos Bay to Malin in the Klamath Basin. The pipeline would traverse the murrelet inland range, potentially resulting in the loss or fragmentation of some current and future murrelet nesting habitat. The pipeline route is not final yet, so exact amounts of habitat affected are not available.

multiple interrupted resting attempts, and precluded access to suitable foraging habitat. Since 2004, the Service has authorized incidental take in the form of harassment of all murrelets associated with 56,785 acres of marine habitat within Conservation Zones 1 and 2 and all murrelets that may occur within 4,624 meters of the Anacortes Ferry Terminal. In some instances multiple years of harassment occur, depending upon the duration of the project.

Boat traffic. Recent research by Speckman et al. (2004) and Bellefleur et al. (2009) further corroborate information presented in McShane et al. (2004, pp. 5-36 through 5-37) that boat traffic elicits behavioral responses in murrelets. Boat disturbance can decrease the amount of time available for murrelets to forage or murrelets may be unable to forage effectively due to increased vigilance and time spent escaping. Boat disturbance may cause an energetic impact on murrelets due to the cost of flight compounded with being flushed off preferred feeding grounds (Bellefleur et al. 2009, p. 536). Bellefleur et al. (2009, p. 536) suggest juveniles may be at greater risk of negative impacts from boat traffic because of their propensity to flush in response to boat traffic. Murrelets may or may not habituate to boat traffic. While Bellefleur et al. (2009, p. 536) found the mean flushing distance decreased in areas with high boat density, suggesting murrelets may tolerate close encounters; they also found the percentage of murrelets that flushed in high boat density areas increased, suggesting murrelets are less committed to foraging in areas with many boats.

Negative impacts on a birds' daily energy budget can occur when outside influences reduce foraging and/or increase energetically costly behaviors, such as diving and flight (diving ducks: Korschgen et al. 1985, American coot [*Fulica americana*]: Schummer and Eddleman 2003). Research on marbled and Kittlitz's (*Brachyramphus brevirostris*) murrelets document that these species are negatively affected by human activities in the marine environment (Agness et al. 2008; Bellefleur et al. 2009). Reactions to disturbances include both flying and diving. Flying is energetically expensive for alcids, due to their short wings and heavy bodies (Pennycuik 1987). Although significantly more murrelets choose to dive rather than fly (Bellefleur et al. 2009, p. 535), they will react by flying when approached from greater distances or at faster speeds and juveniles are more likely to fly than adults (Bellefleur et al. 2009, pp. 534-535). Of the murrelets that reacted by flying, 83 percent left the feeding area (> 200 m) (Bellefleur et al. 2009, p. 535).

Murrelet survival and reproduction is dependant upon an adequate quantity of high quality food throughout the year. Adequate food resources are necessary to survive winter, undergo molts, prepare for breeding in the spring, and to feed chicks during rearing. Wintertime distribution of murrelets appears to be related to concentrations of prey species (Dawson et al. 2007). Murrelets must select foraging sites that provide adequate prey resources, such as consistent levels of higher trophic-level fishes (Becker 2001), which are within swimming distance (Carter and Stein 1995, Nelson 1997) during the pre-basic molt when they are flightless. Murrelets can make substantial changes in foraging sites during the breeding season, but many birds routinely forage in the same general areas and at productive foraging sites (Carter and Sealy 1990, Whitworth et al. 2000, Becker 2001, Hull et al. 2001, Mason et al. 2002, and Piatt et al. 2007). Peery et al. (2009, p. 127) found murrelets (whether breeding or not) remained within a few kilometers of nesting habitat during the breeding season. During incubation, foraging murrelets double their diving activity because they must get two days worth of provisions during the one day on the water (Peery et al. 2009, p. 128), so they must select a highly productive foraging location.

that had incubating adults exposed to the sound of an operating chainsaw failed to produce a fledgling (Hebert and Golightly 2006, p. 29).

Chicks also spent more time with their heads raised, and their bill up during the disturbance trials, although compared to pre- and post-disturbance trials, the relationship was not statistically significant (Hebert and Golightly 2006, p. 36). All three chicks fledged (Hebert and Golightly 2006, p. 29).

In summary, Hebert and Golightly (2006, p. 40) continue to recommend avoiding extended disturbance to incubating adults and avoiding disturbance to chicks at the time food deliveries are most likely: early morning and late evening.

Since the analysis for the 2004 5-year review, the Service has authorized incidental take in the form of harm of 6 juveniles and all murrelets associated with 835 acres of activities in Washington. The Service has also authorized incidental take in the form of harassment of 80 murrelets, all murrelets associated with almost 30,000 acres, and an unquantified number of murrelets associated with helicopter and fixed-wing flights. These murrelets could be associated with either Conservation Zone 1 or 2. The Service authorized incidental take in the form of harm of 276 murrelets and the harassment of all murrelets associated with almost 9,500 acres of activities in Conservation Zone 3 and has authorized the harm of 18 murrelets and the harassment of all murrelets associated with almost 144,000 acres of activities in Conservation Zone 4. The Service authorized no incidental take in the form of harm or harassment of murrelets in Conservation Zone 5, and issued only 1 biological opinion in 2006 for harassment of an unknown low number of individuals in Conservation Zone 6.

Marine and Terrestrial Disturbance Summary. New information regarding disturbances from boat traffic corroborates the information provided in McShane et al. (2004); however, there have been no additional regulations or changes to regulations to minimize impacts, nor have recovery actions reduced the impacts.

The potential for mortality, injury, and disturbance due to exposure to elevated underwater sounds has been identified as a new threat. The scope of this threat appears to be localized to Washington and the severity is currently being ameliorated through section 7 consultations.

Our 2004 5-year review did not address disturbance in the terrestrial environment; however, McShane et al. (2004) indicated noise disturbance may affect murrelet fitness and reproductive success, but further research was needed. New information does not tie observed effects directly to human disturbance, but further corroborates the tie of human presence to increased predation. All of the new disturbance information is specific to the coastal redwood zone in California. Further research throughout the range is necessary to determine the severity of disturbance on murrelets.

Other Natural or Manmade Factors Summary. Since the analysis for the 2004 5-year review, we have determined the scope, severity and magnitude of the threat to murrelets from oil spills has not changed and the scope and severity of the threat from gill nets has not changed. However the magnitude of these threats in Puget Sound may be increasing. The scope and severity of

Based on the evaluation of the threats and the murrelet's population status and trends we have determined that the murrelet should remain listed as threatened. However we remain concerned about the apparent substantial downward trend of the population and the species' continued vulnerability from a broad range of threats across its entire listed range. Although some threats have been reduced, most continue unabated and new threats now strain the ability of the murrelet to successfully reproduce. In summary, if reproductive success continues to be too low to sustain the population, the observed population trends continue to decline significantly and manmade and natural threats continue at current or increased levels, a change in listing status to endangered may be warranted in the future.

3.0 RESULTS

3.1 Recommended Classification:

Downlist to Threatened
 Uplist to Endangered
 Delist
 No change is needed

3.2 New Recovery Priority Number : No change

Brief Rationale: None needed.

3.3 Listing and Reclassification Priority Number, not needed.

Reclassification (from Threatened to Endangered) Priority Number: _____

Reclassification (from Endangered to Threatened) Priority Number: _____

Delisting (regardless of current classification) Priority Number: _____

Brief Rationale: None needed.

4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

- Because the recovery plan is greater than 10 years old and information regarding threats and population has changed, a revision of the recovery plan is warranted.
- Information regarding marine threats, and general life history including reproduction is lacking, therefore research on these topics is needed.
- Further examine marbled murrelet population trends in the coastal redwood zone, given the magnitude and imminence of threats

5.0 REFERENCES –Follows Signature Page

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APPENDICES

Appendix B

Factor D. Regulatory Mechanisms

The following list includes a brief summary of laws and regulations that were considered in the evaluation of existing regulatory mechanisms for the 5-year review. Most if not all of these laws and regulations were considered in the analysis for the 2004 5-year review. Updates if available are provided.

State Protections in California

The State's authority to conserve rare wildlife and plants is comprised of four major pieces of legislation: the California Endangered Species Act, the Native Plant Protection Act, the California Environmental Quality Act, and the Natural Community Conservation Planning Act.

California Endangered Species Act (CESA): The CESA (California Fish and Game Code, section 2080 *et seq.*) prohibits the unauthorized take of State-listed threatened or endangered species. The CESA requires State agencies to consult with the California Department of Fish and Game on activities that may affect a State-listed species and mitigate for any adverse impacts to the species or its habitat. Pursuant to CESA, it is unlawful to import or export, take, possess, purchase, or sell any species or part or product of any species listed as endangered or threatened. The State may authorize permits for scientific, educational, or management purposes, and to allow take that is incidental to otherwise lawful activities. The marbled murrelet is listed as endangered by the State of California under the California Endangered Species Act

California Environmental Quality Act (CEQA): The CEQA requires review of any project that is undertaken, funded, or permitted by the State or a local governmental agency. If significant effects are identified, the lead agency has the option of requiring mitigation through changes in the project or to decide that overriding considerations make mitigation infeasible (CEQA section 21002). Protection of listed species through CEQA is, therefore, dependent upon the discretion of the lead agency involved.

Natural Community Conservation Planning Act: The Natural Community Conservation Program is a cooperative effort to protect regional habitats and species. The program helps identify and provide for area wide protection of plants, animals, and their habitats while allowing compatible and appropriate economic activity. Many Natural Community Conservation Plans (NCCPs) are developed in conjunction with Habitat Conservation Plans (HCPs) prepared pursuant to the Federal Endangered Species Act.

California Lake and Streambed Alteration Program: The Lake and Streambed Alteration Program (California Fish and Game Code sections 1600-1616) may promote the recovery of listed species in some cases. This program provides a permitting process to reduce impacts to fish and wildlife from projects affecting important water resources of the State, including lakes, streams, and rivers. This program also recognizes the importance of riparian habitats to sustaining California's fish and wildlife resources, including listed species, and helps prevent the loss and degradation of riparian habitats.

be harvested outside the breeding season. However, under the CFPR's Special Conditions section 898.2, CALFIRE is required to disapprove a plan if implementation of the plan would result in take or jeopardy in violation of the Federal Endangered Species Act (California Department of Forestry and Fire Protection 2009).

When recommendations to avoid unauthorized take of marbled murrelets are provided by CDFG or the Service they are typically included in THPs or NTMPs. However, as previously stated, CDFG only reviews a small percentage of THPs and NTMPs and RPFs do not consistently disclose the presence of murrelet habitat. Consequently, suitable marbled murrelet habitat and possibly even occupied nesting habitat likely has been lost due to this inconsistency and lack of oversight.

In summary, the practical application of the CFPRs are only partially effective at protecting suitable habitat pursuant to the Federal Endangered Species Act due to the lack of a detailed description of habitat suitability within the CFPRs and the lack of adequate resource agency staff to review THPs and NTMPs that may contain suitable marbled murrelet nesting habitat.

Marine Life Protection Act. In 1999, the California legislature approved and the governor signed the Marine Life Protection Act (MLPA; Stats.1999, Chapter 1015). Prior to the MLPA, the state of California had established three types of marine protected areas (MPAs): State Marine Reserves (SMR), State Marine Parks (SMP), and State Marine Conservation Areas (SMCA). The MLPA requires that the CDFG to reevaluate all existing MPAs, and to prepare and present to the Fish and Game Commission a master plan that will guide the adoption and implementation of a Marine Life Protection Program, which would include a statewide network of marine protected areas, including new MPAs if needed. These protection areas establish regulations on recreational and commercial harvest of marine resources. The following number and type of marine protection areas currently occur within the range of the murrelet in California: Humboldt County (1 SMR), Mendocino County (5 SMCAs); Sonoma County (1 SMP, 1 SMR, 4 SMCAs), Napa County (1 SMP), Marin County (3 SMPs, 3 SMCAs), San Francisco County (1 SMCA); Solano County (1 SMP), Alameda County (1 SMP, 1 SMCA), San Mateo County (3 SMPs, 1 SMCA), Santa Cruz County (1 SMR, 1 SMCA), and Santa Cruz County (8 SMRs, 9 SMCAs). The MLPA is being implemented through the MLPA Initiative, which has broken the marine area of California into 5 study regions, 4 of which overlap the range of the murrelet (North Coast, Central Coast, North Central Coast, and San Francisco Bay). To date, the MLPA planning process has been completed only for one of these 4 regions, the Central Coast study region, which extends from Pigeon Point (San Mateo County) south to Point Conception. The planning process established or modified 29 MPAs, which now include 17.7 percent of State waters (those out to 3 nautical miles from the shore) in the Central Coast study region.

State Protections in Oregon

Protection for State-listed Threatened or Endangered Plants: Oregon Revised Statute (ORS) 564.100 to 564.135 are pursuant to State-listed threatened or endangered plant species and are implemented, interpreted and/or prescribed in Oregon Administrative Rule (OAR) Chapter 603, Division 73. ORS 564.120(1) states that "no person shall take, import, export, transport, purchase or sell, or attempt to take, import, export, transport, purchase or sell any threatened species or endangered species" listed by the State. All federally listed plant species are automatically protected under State law as well. State agencies shall consult and cooperate with the Department of Agriculture prior to implementation of any ground- or vegetation-disturbing

authority to list species (RCW 77.12.020). State listed species are protected from direct take, but their habitat is not protected (RCW 77.15.120). Under the Washington State Forest Practices Act the Washington State Forest Practices Board has the authority to designate critical wildlife habitat for State listed species affected by forest practices (WAC 222-16-050, WAC 222-16-080). Washington has prepared a Comprehensive Wildlife Conservation Strategy (CWCS) (WDFW 2005). The plan is a non-regulatory statewide approach to conservation in Washington and fulfills a requirement to access two new Federal grant programs. The draft strategy describes basic biology and distribution, general and specific problems facing the species, and general conservation strategies for the species. It also identifies specific conservation actions for the species. Development of the Washington CWCS has proceeded on a parallel track with completion of ecoregional assessments for nine ecoregions within Washington. For each ecoregion, WDFW will complete Wildlife Action Plans that will include the species-specific proposed conservation actions. However, it is unknown when the Wildlife Action Plans will be completed, what actions will be proposed, or when such actions would be implemented.

The Washington State Forest Practices Rule. The Washington State Legislature established the authority for Forest Practices Rules (FPR) in 1974. The Forest Practices Board established rules to implement the Forest Practices Act in 1976 and has amended the rules continuously over the last 30 years. Washington Department of Natural Resources (WDNR) is responsible for implementing the FPR and is required to consult with Washington Department of Fish and Wildlife (WDFW) on matters relating to wildlife, including murrelets. The FPR specifically establish marbled murrelet suitable habitat definitions, survey requirements, and review processes of forest practices that may impact murrelet habitat. The FPR provide protection to occupied (as defined by FPR) murrelet sites on private forest lands where the landowner owns more than 500 acres of land that are less than 50 miles from marine waters. For those lands that are presumed to have at least a 30 percent probability of occupancy, landowners are subject to survey requirements and those areas where occupancy is found are protected. The Washington Forest Practice Rules provide for protection of marbled murrelets through minimization of take and jeopardy pursuant to the Washington Endangered Species Act and the Federal Endangered Species Act. However, the definitions of suitable habitat, inland distance, and occupied site are negotiated definitions; therefore not all of the lands the Service considers to have features essential for conservation of murrelet are considered to be suitable habitat under FPR, are not subject to the specific murrelet FPR, and may be harvested without review by WDFW. In addition, landowners have the option to go through SEPA and get approval to harvest (however this has not occurred to date). Current FPR protect occupied (as defined by State) habitat and a 300-foot managed buffer around occupied habitat. However, there are no reasonable assurances that the maximum site size and managed buffers are adequate to protect and maintain maintain complex-structured forest isolated from human development such that the risk of predation, windthrow, and changes in microclimate are reduced.

Federal Regulations

National Environmental Policy Act (NEPA): NEPA (42 U.S.C. 4371 *et seq.*) provides some protection for listed species that may be affected by activities undertaken, authorized, or funded by Federal agencies. Prior to implementation of such projects with a Federal nexus, NEPA requires the agency to analyze the project for potential impacts to the human environment, including natural resources. In cases where that analysis reveals significant environmental effects, the Federal agency must propose mitigation alternatives that would offset those effects

was purchased through the Mill Creek acquisition. All areas are intended to be managed for the long term conservation benefit of murrelets. Management of these lands may not impede the conservation benefit of murrelets and the Service has approval over each of the management plans. Within these areas, not all of the acreage is currently suitable murrelet habitat. See Table B1 for total acreages and the amount of currently suitable murrelet habitat ...

Table B1. Acreages conserved under CESCFC for murrelets in Washington

Area	Total acreage	Acres of terrestrial murrelet habitat
Hoh	6,000	1,000
Cedar	20	0
Boulder, WA	1,894	200
Ellsworth, WA	800	200
Ashford, WA	1,800	Maybe 100
Barr, WA	46	46
Big Creek, OR	193	?
Mill Creek, CA	25,000	121
TOTAL	10,753	

Section 7 of the Act. Section 7 of the Act directs all Federal agencies to use their existing authorities to conserve threatened and endangered species and, in consultation with the Service, to ensure that their actions do not jeopardize listed species or destroy or adversely modify critical habitat. Section 7 applies to management of Federal lands as well as other Federal actions that may affect listed species, such as Federal approval of private activities through the issuance of Federal permits, licenses, or other actions. A jeopardy determination is made for a project that is reasonably expected, either directly or indirectly, to appreciably reduce the likelihood of both the survival and recovery of a listed species in the wild by reducing its reproduction, numbers, or distribution (50 CFR 402.02). A non-jeopardy opinion may include reasonable and prudent measures that minimize the amount or extent of incidental take of listed species associated with a project. In some cases mitigation for a jeopardy opinion can include purchase or easement on a property to protect that species.

Quinault Indian Reservation North Boundary Area: In September 2004, the Secretary of the Interior and the President of the Quinault Indian Nation signed an agreement to preserve 4,207 ac of sensitive forest habitat on the Quinault Indian Reservation in Washington state. This agreement settled a lawsuit brought by the tribe after the Service issued a 1998 jeopardy biological opinion for the marbled murrelet on the Quinault's 1995 comprehensive timber management plan. Through implementation of the agreement, the Department is purchasing perpetual conservation easements on the late successional forests identified in the reasonable and prudent alternative of the biological opinion.

In 2006, the U.S. Fish and Wildlife Service completed conservation easements with the Bureau of Indian Affairs and the Quinault Indian Nation for 2,925 ac of forested land in the North Boundary Area (NBA). The NBA has been surveyed and is known to be occupied by marbled murrelets (as determined by surveys under the PSG protocol). When the full extent of the conservation easements are implemented, they will apply to 4,262 ac (2,980 ac of old-growth and 1,282 ac of second growth). The conservation easement conveys all future development rights to the Service in perpetuity, except for harvesting of minor forest products (such as brush

this approach is that the actions taken under the SHA will provide a net conservation benefit that contributes to the recovery of the covered species.

HCPs and SHAs developed since the analysis for the 2004 5-year Review.

Washington

Low-effect Geoduck HCP (WDNR). An incidental take permit (ITP) was approved and issued to Washington Department of Natural Resources (WDNR) on January 8, 2009, for the commercial harvest of wildstock geoducks clams (*Panopea abrupta*) on 30,000 acres of State-owned aquatic lands. The 50-year permit covers the commercial harvest of geoduck on submerged lands in Puget Sound, the Strait of Juan de Fuca, and the San Juan archipelago. Within this broad area, commercial geoduck harvest occurs subtidally between depth contours of -18 and -70 feet (corrected to mean lower low water [MLL]) in areas that have been surveyed and found to contain harvestable numbers of geoducks. The total acreage fluctuates as newly discovered beds are added to the inventory, or the status of an existing tract is changed. The commercial status of a tract can change if a tract is rendered unharvestable by pollution, a tract gets fished down to where it is put into recovery status, or geoduck densities are too low for a viable commercial fishery. The geoduck clam is among the most commercially valuable of Puget Sound's shellfish resources. Covered activities under the HCP include the subtidal harvest of wild stock geoduck clams on State-owned aquatic lands for commercial, research, and health sampling purposes. Harvest compliance and enforcement actions taken by WDNR are also covered by the ITP. Covered species include the marbled murrelet, brown pelican, bull trout, bald eagle, coastal cutthroat and the tufted puffin. Conservation measures developed to minimize and mitigate the effects of harvest on covered species include the buffering of eelgrass beds and submerged-aquatic vegetation, protection of forage fish spawning areas, minimization of surface noise levels, and the avoidance of nesting bald eagles and tufted puffins by limiting harvest activities to 600 feet or greater from the shoreline.

Tagshinny Tree Farm (TTF). The USFWS issued an Enhancement of Survival Permit to Tagshinny Tree Farm (TTF) on February 19, 2004, in accordance with their authority and responsibility under section 10(a)(1)(A) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). This type of permit is commonly known as a Safe Harbor Agreement (SHA) and/or a Candidate Conservation Agreement with Assurances (CCAA). Under the terms of both the SHA and CCAA, the tree farm owners will manage 144 acres in 5 parcels of commercial timberlands in Lewis County, Washington for a period of 80 years. The TTF is typical of other privately owned tree farms in Lewis County, Washington, in that these lands are generally composed of young and simple structured conifer forests, due to past timber management practices. These forests lack many of the important habitat features that many forest species in the Pacific Northwest need to survive. For instance, large, dominant snags and large down logs are mostly absent from the tree farm. Multiple canopy layers that develop in older stands are also generally not present on the TTF. Covered actions under the SHA/CCAA are: timber harvest (cutting, felling, limbing, yarding, and yarding corridors, construction and use of landings, loading and hauling of logs); road use, maintenance, and decommissioning; site preparation; tree planting; manual brush control; prescribed burning; fire suppression; erosion control; tree thinning and pruning; administration and monitoring; conducting stand examinations and inventories, and cruising timber; painting or marking of timber or stand boundaries; and entry by wildlife biologists, foresters, and other personnel for miscellaneous activities such as assessments, land surveys, and general reconnaissance. The use of pesticides is

conservation tool in promoting the recovery of endangered and threatened species on military lands.

National Park Service (NPS) Organic Act: The NPS Organic Act of 1916 (39 Stat. 535, 16 U.S.C. 1, as amended), states that the National Park Service “shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations ... to conserve the scenery and the national and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.” The National Park Service Management Policies indicate that the Park Service will “meet its obligations under the National Park Service Organic Act and the Endangered Species Act to both pro-actively conserve listed species and prevent detrimental effects on these species.” This includes working with the Service and undertaking active management programs to inventory, monitor, restore, and maintain listed species habitats, among other actions.

National Forest Management Act (NFMA): The National Forest Management Act (36 C.F.R. 219.20(b)(i)) has required the USDA Forest Service to incorporate standards and guidelines into Land and Resource Management Plans, including provisions to support and manage plant and animal communities for diversity and for the long-term, range-wide viability of native species. Recent changes to NFMA may affect future management of listed species, particularly rare plant occurrences, on National Forests. On January 5, 2005, the Forest Service revised National Forest land management planning under NFMA (70 FR 1023). The new planning rule changed the nature of Land Management Plans so that plans generally would be strategic in nature and could be categorically excluded from NEPA analysis, and thus not subject to public review. Under this new planning rule, the primary means of sustaining ecological systems, including listed species, would be through guidance for ecosystem diversity. If needed, additional provisions for threatened and endangered species could be provided within the overall multiple-use objectives required by NFMA. The final rule did not include a requirement to provide for viable populations of plant and animal species, which had previously been included in both the 1982 and 2000 planning rules. On March 30, 2007, however, the United States District Court in *Citizens for Better Forestry et al. v. USDA* (N.D. Calif.) enjoined the USDA from implementing and utilizing the 2005 rule until it complies with the court’s opinion regarding the Administrative Procedure Act, the Endangered Species Act, and the National Environmental Policy Act. On May 14, 2007, the Forest Service published a Notice of Intent to prepare an environmental impact statement to analyze and disclose potential environmental consequences associated with a National Forest System land management planning rule. The impact of any revisions of this rule to listed species is unknown at this time. A new land and resource management planning regulation under NFMA (2008 rule, 36 CRF 219) was adopted on April 21, 2008 (73 FR 21467); the 2008 rule has provisions for social, economic, and ecological sustainability, and no longer has a provision regarding habitat to support species viability. The provision for ecological sustainability states an overall goal of providing “a framework to contribute to sustaining native ecological systems by providing appropriate ecological conditions to support diversity of native plant and animal species in the plan area. The 2008 rule also specifies: “If the responsible official determines that provisions in plan components [in addition to that for ecosystem diversity] are needed to provide appropriate ecological conditions for specific threatened and endangered species, species-of-concern, and species-of-interest, then the plan must include additional provisions for these species, consistent with the limits of Agency authorities, the

Northern spotted owl (mostly West of the Cascades, including Washington, Oregon, and Northern California) are currently governed by the NWFP's rules. The Northwest Forest Plan outlines management policies for several land designations that it specified in the Plan's allocations. In 2004, the Northwest Forest Plan was revised to address concerns related to the Survey and Manage process. This revision discontinued the application of the Survey and Manage process. While significant to some species, this revision does not appear to have caused changes to the net conservation benefit of the Northwest Forest Plan for the marbled murrelet. In addition, in March 2004, the Aquatic Conservation Strategy (ACS) was revised and the Services issued biological opinions that eliminated the requirement that each timber sale must promote attainment of the ACS objectives. However, in March 2006, the courts ruled that the amendment violated the Act. At this point no revision of ACS has occurred and therefore no change to conservation benefits for marbled murrelet as a result of this proposed revision has occurred.

Forest or Resource Management Areas could revise their plans under the Northwest Forest Plan at any time. On December 30, 2008, the Records of Decision for the BLM Western Oregon Plan Revisions were signed. These Records of Decision and associated resource management plans (RMPs) replace the RMPs for BLM-administered lands in western Oregon that were approved under the Northwest Forest Plan. Marbled murrelet management under the new RMPs is accomplished by 1) blocked Late Successional Management Areas (LSMAs), 2) stand-level LSMAs for murrelets outside block LSMAs, 3) requirements to identify and protect occupied stands and certain nearby stands, and 4) prohibitions against disrupting occupied murrelet sites.

LSMAs were originally designed as blocks of BLM land managed to, in part, maintain habitat for northern spotted owls and marbled murrelets and promote development of nesting habitat for marbled murrelets where it does not currently occur, similar to the LSRs of the NW Forest Plan. In addition, stand-level LSMAs were designated for stands determined to be occupied by murrelets under the NW Forest Plan. Within the range of the marbled murrelet on BLM lands in Oregon, 323,200 acres were initially mapped as LSMAs.

Additional stands were designated as LSMA outside the blocks, including all stands 80 years of age or older within the 1996 marbled murrelet critical habitat and 35 miles of the coast. This adds an additional 41,000 acres. Combined, 364,200 acres of Oregon BLM lands are protected as LSMAs under the Western Oregon BLM Records of Decision. This compares to 484,300 acres under the NW Forest Plan on the same landscape. Stands that are determined to be occupied by murrelets in the future would add additional LSMA acreage.

The RMPs include the requirement to survey suitable lands for marbled murrelets prior to activities that would degrade or remove marbled murrelet suitable habitat regardless of land use allocation, and to delineate and protect occupied stands. These requirements are the same as those in the NW Forest Plan. In addition, the plans prohibit disruptions in occupied murrelet habitat.

Migratory Bird Treaty Act (MBTA): The MBTA and its implementing regulations (50 CFR Parts 20 and 21) directly protect certain bird species, and their eggs and nests, from being killed, taken, captured, or pursued. However, it does not protect habitat except to the extent that habitat alterations would directly kill birds.

The land use agreements collectively cover about 566 ac in the Anderson Point and Waatch River Valley areas of the Reservation. The Trustees also surveyed potential marbled murrelet nesting areas, resulting in the increase of regulatory protection on an additional 3,000 acres of mature forest habitat in Washington.

Texaco-Anacortes Oil Spill: The Trustees purchased 82 acres of privately-owned tideland in Fidalgo Bay with settlement funds from the Texaco-Anacortes oil spills (1991). These newly-protected tidelands are now owned and managed by WDNR. Together with 450 acres acquired in 1999 through a similar transaction this brings the total protected area in the southern part of the bay to 532 acres. The area is proposed for management as an Aquatic Reserve. The tidelands contain important eel-grass beds and inter-tidal habitats that support and help restore forage fish, important to marbled murrelets.

Oregon

M/V New Carissa Oil Spill. Since the analysis for the 2004 5-year review was completed, two new conservation easements have provided long term commitments to manage for marbled murrelet habitat on 4,263 acres. The Reed Creek property (3,851 acres) and the Arnold Creek Property (412 acres) were purchased and will be managed to compensate the public for injuries to marbled murrelet caused by the M/V New Carissa Oil Spill that began on February 4, 1999 on the OR coast. Both parcels occur in Lincoln County, OR and will be managed by the Confederated Tribes of Siletz Indians (CTSI). The CTSI will manage the property with the purpose of creating and maintaining 2,842 acres or 2/3 of the property in murrelet habitat and were consistent with the first purpose, to provide sufficient revenue for management of the property through limited commercial timber harvest and other activities to protect and promote other late seral or mature forest conditions, native fish and wildlife.

California

Stuyvesant/Humboldt Coast Oil Spill. In California, three parcels of commercial timberlands containing murrelet nesting habitat have been protected since October 1, 2003. In 2008, 650 acres of forest in the "Miracle Mile" parcel, including 142 acres of nesting habitat, were protected by conservation easement, as part of the mitigation for the Stuyvesant/Humboldt Coast oil spill. Also in 2008, 298 acres of forest in the "Big Mynot/E. Fork Hunter" complex, including about 77 acres of nesting habitat, were protected by conservation easement, as part of the mitigation for the Kure/Humboldt Bay oil spill. For both of the above, the conservation easements were purchased from the Green Diamond Resource Company, are located in Conservation Zone 4 in Del Norte County, and are being held and managed by the Save the Redwoods League, a non-profit conservation organization. In 2006, 80 acres of forest in the "U.C. Regents Girl Scout Creek" parcel, including clusters of residual redwood old-growth trees, were protected by purchase as part of the mitigation for the Command oil spill. The Girl Scout Creek parcel is located in Conservation Zone 6 in San Mateo County, and has been transferred to California State Parks (Butano State Park) for management. All three parcels above include habitat determined to be occupied.

The Outer Continental Shelf Lands Act of 1953. The Outer Continental Shelf Lands Act of 1953 (OCSLA) (43 U.S.C. 1331 et. seq.) provides the Secretary of the Interior, on behalf of the Federal Government, with authority to manage the mineral resources, including oil and gas, on the outer continental shelf (OCS) and defines the OCS as all submerged lands lying seaward of the State/Federal boundary. The Federal Oil & Gas Royalty Management Act of 1982 (30

resulting from an incident in which oil is discharged into navigable waters or adjoining shorelines or the exclusive economic zone

Currently, there are State and Federal requirements for tug escorts of laden oil tankers transiting the waters of Puget Sound east of Dungeness Spit. However, the Federal requirements do not apply to double-hulled tankers and will no longer be in effect once the single-hull tanker phase-out is complete (WDOE 2005). Washington State has considered revising their tug escort requirements (WDOE 2005); however, the current requirement of an escort of a tug or tugs for all oil tankers 40,000 deadweight tonnage or greater when not in ballast (WAC 363-116-500) remain in place.

California Coastal National Monument. Under the authority of the Antiquities Act of 1906, the California Coastal National Monument (CCNM) was established by Presidential Proclamation number 7264, on January 11, 2000. The Presidential Proclamation defined the CCNM as all unappropriated or unreserved lands and interest in lands owned or controlled by the United States in the form of islands, rocks, exposed reefs, and pinnacles above mean high tide within 12 nautical miles of the shoreline of the State of California. The CCNM is comprised of more than 20,000 small islands, rocks, exposed reefs, and pinnacles within the corridor extending 12 nautical miles from the shoreline between Mexico and Oregon. This proclamation directed the Secretary of the Interior to manage the monument through the Bureau of Land Management (BLM). In 2005, the BLM approved a resource management plan for the CCNM (BLM 2005), which contains broad direction for the protection of the geologic formations and habitats for seabirds, and focuses on multi-agency and other partnerships and involvement of local communities as the keys to management and protection. The section 7 consultation on the resource management plan concluded that increased visitor use in the waters surrounding the CCNMs may subject foraging or loafing murrelets to some increased disturbance; however, increased educational and interpretive activities were expected to minimize the potential for such disturbance.

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Part II

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Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and
Plants; Final Designation of Critical
Habitat for the Marbled Murrelet; Final
Rule

inland lakes (Carter and Sealy 1986; Strachan *et al.* 1995).

Dispersal mechanisms are not well understood, however, social interactions may play an important role. The presence of marbled murrelets in a forest stand may attract other pairs to currently unoccupied habitat within the vicinity. This may be one of the reasons marbled murrelets have been observed in habitat not currently suitable for nesting, but in close proximity to known nesting sites (Hamer and Cummins 1990, Hamer *et al.* 1991, Suddjian 1995). Although marbled murrelets appear to be solitary in their nesting habits, they are frequently detected in groups in the forest (Nelson and Peck 1995; USFWS 1995a). Two nests discovered in Washington during 1990 were located within 46 meters (150 feet) of each other (Hamer and Cummins 1990), and two nests discovered in Oregon during 1994 were located within 33 meters (100 feet) of each other (S. K. Nelson, Oregon Cooperative Wildlife Research Unit, pers. comm. 1995). Therefore, unoccupied habitat in the vicinity of occupied habitat may be more important for recovering the species than suitable habitat isolated from occupied habitat (USFWS 1995a). Similarly, murrelets are more likely to discover newly developing habitat in proximity to occupied sites.

Nesting occurs over an extended period from late March to late September (Carter and Sealy 1987; Hamer and Nelson 1995b). During the breeding period, the female marbled murrelet lays a single egg in a tree containing a suitable nesting platform (e.g., large or forked limbs, dwarf mistletoe (*Arceuthobium* spp.) infections, witches' brooms, deformities, etc. (Hamer and Nelson 1995b). Both sexes incubate the egg in alternating 24-hour shifts for approximately 30 days, and the young fledge after an additional 27 to 40 days (Simons 1980; Hirsch *et al.* 1981; Singer *et al.* 1991; Hamer and Nelson 1995a; Nelson and Hamer 1995a). Adults feeding young fly from ocean feeding areas to nest sites at all times of the day, but most often at dusk and dawn (Nelson and Hamer 1995a). Chicks are fed at least once a day. The adults usually carry only one fish at a time to the young (Hamer and Cummins 1991; Singer *et al.* 1992; Nelson and Hamer 1995a). The young are semi-precocial. Before leaving the nest, the young molt into a distinctive juvenile plumage. A fledgling's first flight is from the nest directly to the marine environment (Hamer and Cummins 1991).

Marbled murrelets have been observed at some inland sites during all

months of the year (Paton *et al.* 1987; Naslund 1993). Attendance at breeding sites during the non-breeding season may enhance pair bond maintenance, facilitate earlier breeding, or reinforce familiarity with flight paths to breeding sites (Naslund and O'Donnell 1995; O'Donnell *et al.* 1995).

With respect to critical habitat, the Service considered two components of marbled murrelet habitat that are biologically essential—(1) terrestrial nesting habitat and associated forest stands, and (2) marine foraging habitat used during the breeding season. Forested areas with conditions that support nesting marbled murrelets are referred to as "suitable nesting habitat." Marine areas with conditions that support foraging marbled murrelets are referred to as "suitable foraging habitat." Because only terrestrial habitat is being designated as critical habitat, the primary focus of this description will be on the terrestrial environment.

Throughout the forested portion of the species' range, marbled murrelets typically nest in forested areas containing characteristics of older forests (Binford *et al.* 1975; Hamer and Cummins 1991; Quinlan and Hughes 1990; Kuletz 1991; Singer *et al.* 1991, 1992; Hamer *et al.* 1994; Hamer and Nelson 1995b; Ralph *et al.* 1995a). The marbled murrelet population in Washington, Oregon, and California nests in most of the major types of coniferous forests in the western portions of these states, wherever older forests remain inland of the coast. Although marbled murrelet nesting habitat characteristics are somewhat variable throughout the range of the species, some general habitat attributes are characteristic throughout its range, including the presence of nesting platforms, adequate canopy cover over the nest, landscape condition, and distance to the marine environment.

Individual tree attributes that provide conditions suitable for nesting include large branches (average of 32 centimeters (13 inches), range of 10 to 81 centimeters (4 to 32 inches) in Washington, Oregon, and California) or forked branches, deformities (e.g., broken tops), dwarf mistletoe infections, witches' brooms, or other structures large enough to provide a platform for a nesting adult murrelet (Hamer and Cummins 1991; Singer *et al.* 1991, 1992; Hamer and Nelson 1995b). These structures are typically found in old-growth and mature forests, but may be found in a variety of forest types including younger forests containing remnant large trees.

Northwestern forests and trees typically require 200 to 250 years to

attain the attributes necessary to support marbled murrelet nesting, although characteristics of nesting habitat sometimes develop in younger coastal redwood (*Sequoia sempervirens*) and western hemlock (*Tsuga heterophylla*) forests. Forests with older residual trees remaining from previous forest stands may also develop into nesting habitat more quickly than those without residual trees. These remnant attributes can be products of fire, wind storms, or previous logging operations that did not remove all of the trees (Hansen *et al.* 1991; McComb *et al.* 1993). Other factors that may affect the time required to develop suitable nesting habitat characteristics include site productivity and microclimate.

Through the 1995 nesting season, at least 95 active or previously used tree nests had been located in North America, including 9 in Washington, 41 in Oregon, and 12 in California (S. K. Nelson, pers. comm. 1996; W. Ritchie, Washington Dept. of Fish and Wildlife, pers. comm. 1996; Binford *et al.* 1975; Quinlan and Hughes 1990; Hamer and Cummins 1990, 1991; Kuletz 1991; Singer *et al.* 1991, 1992; Hamer and Nelson 1995b). All of the nests for which data are available in Washington, Oregon, and California were in large trees that were more than 81 centimeters (32 inches) diameter at breast height (dbh) (Hamer and Nelson 1995b). Of the 37 nests for which data were available, 70 percent were on a moss substrate and 30 percent were on litter, such as bark pieces, conifer needles, small twigs, or duff. Fifty-nine percent of the nests were on large or deformed branches, 16 percent were on forked limbs, 6 percent were on a limb where it attached to the tree bole, 11 percent were on dwarf mistletoe, and 8 percent were on other structures (Hamer and Nelson 1995b; T. Hamer, Hamer Environmental, pers. comm. 1995).

More than 94 percent of the nests for which data were available were in the top half of the nest trees, which may allow easy nest access and provide shelter from potential predators and weather. Canopy cover directly over the nests was typically high (average 84 percent; range 5 to 100 percent) in Washington, Oregon, and California (Hamer and Nelson 1995b; T. Hamer, pers. comm. 1995). This cover may provide protection from predators and weather. Such canopy cover may be provided by trees adjacent to the nest tree, and/or by the nest tree itself. Canopy closure of the nest stand/site varied between 12 and 99 percent and averaged 48 percent (Hamer and Nelson 1995b; T. Hamer, pers. comm. 1995).

low densities of murrelets were adjacent to heavily logged watersheds.

In contrast, where nesting habitat is limited in southwest Washington, northwest Oregon, and portions of California, few marbled murrelets are found at sea during the nesting season (Ralph and Miller 1995; Ralph *et al.* 1995b; Strong 1995; Varoujean and Williams 1995; Thompson 1996). The area between the Olympic Peninsula in Washington and Tillamook County in Oregon (160 kilometers (100 miles)) has few occupied sites or sightings at sea of marbled murrelets. In California, approximately 480 kilometers (300 miles) separate the large breeding populations to the north in Humboldt and Del Norte Counties from the southern breeding population in San Mateo and Santa Cruz Counties. Currently this reach contains few marbled murrelets during the breeding season; however, the area likely contained significant numbers of marbled murrelets before extensive logging (Paton and Ralph 1988, Larsen 1991).

In addition to the proximity of suitable nesting habitat, it is likely that marine factors such as prey abundance influence the local distribution of breeding murrelets (Ralph and Miller 1995; Strachen *et al.* 1995; Strong 1995). The influence of prey distribution and abundance on the distribution of other alcids has been well documented (Bradstreet and Brown 1985). In general, nesting murrelets, which must return to their nest at least once per day, must balance the energetic costs of foraging trips with the benefits for themselves and their young (Skutch 1979; Ydenberg 1989; USFWS 1995a). Therefore, breeding adults are energetically justified in taking relatively long foraging trips only when they can gain access to high quality foraging areas (Bradstreet and Brown 1985; Gaston 1985; Carter and Sealy 1990). Breeding murrelets are known to cover large areas at sea to take advantage of foraging opportunities (Carter and Sealy 1990; Ralph and Miller 1995; Rodway *et al.* 1995). Therefore, use of marine habitat is constrained during the breeding season by its distance from nesting habitat and the quality of forage resources available. This is consistent with the observed juxtaposition of suitable nesting habitat and distribution of murrelets during the breeding season described above, and it may explain the differences observed in marine distribution patterns between murrelets and other non-forest nesting seabirds (Varoujean *et al.* 1994). During years of low prey availability, the distance from nesting areas to adequate foraging areas

is probably a critical determinant of reproductive success (USFWS 1995a).

Marbled murrelets can be adversely affected by impacts to their nesting habitat, marine foraging habitat, and food supply, as well as direct mortality from human activities such as oil spills and gillnet fisheries. These impacts, and the resulting decline from historical population levels, formed the basis for the listing of the species as threatened in 1992 (57 FR 45328). Based on an analysis of likely ranges of fecundity and survivorship of this species, Beissinger (1995) developed a population model that estimated that marbled murrelets in Washington, Oregon, and California may be declining at a rate between 4 and 6 percent per year. These results are consistent with the evidence of a long-term decline from historical populations.

This decline may be a result of several factors. In addition to habitat loss and fragmentation, which may reduce nesting success, declines may be exacerbated by high mortality rates of the young of the year prior to reaching the ocean, and high mortality rates of juveniles and adults in the marine and terrestrial environments.

Marbled murrelets are believed to be highly vulnerable to predation when on the nesting grounds, and the species has evolved a variety of morphological and behavioral characteristics indicative of selection pressures from predation (Ralph *et al.* 1995b). For example, plumage and eggshells exhibit cryptic coloration, and adults fly to and from nests by indirect routes and often under low-light conditions (Nelson and Hamer 1995a). Potential nest predators include the common raven (*Corvus corax*), Steller's jay (*Cyanocitta stelleri*), American crow (*Corvus brachyrhynchos*), gray jay (*Perisoreus canadensis*), great horned owl (*Bubo virginianus*), sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*Accipiter cooperii*), northern goshawk (*Accipiter gentilis*), raccoon (*Procyon lotor*), marten (*Martes americana*), Townsend chipmunk (*Eutamias townsendii*), northern flying squirrel (*Glaucomys sabrinus*), Douglas squirrel (*Tamiasciurus douglasii*), and fisher (*Martes pennanti*) (Marzluff *et al.* 1996). Ravens, Steller's jays, and possibly great horned owls are known predators of eggs or chicks (Nelson and Hamer 1995b).

From 1974 through 1993, of those marbled murrelet nests in Washington, Oregon, and California where success/failure was documented, approximately 64 percent of the nests failed. Of those nests, 57 percent failed due to predation (Nelson and Hamer 1995b). The

relatively high predation rate could be biased because nests near forest edges may be more easily located by observers and more susceptible to predation and because observers may attract predators. Hamer and Nelson (1995b) believed that researchers had minimal impacts on predation in most cases because the nests were monitored from a distance and relatively infrequently, and precautions were implemented to minimize predator attraction.

Several possible reasons exist for the high observed predation rates of marbled murrelet nests. The first possibility is that these high predation rates are normal, although it is unlikely that a stable population could have been maintained under the predation rates presently being observed (Beissinger 1995).

Another reason could be that populations of marbled murrelet predators such as corvids (jays, crows, and ravens) and great horned owls are increasing in the western United States, largely in response to habitat changes and food sources provided by humans (Robbins *et al.* 1986; Rosenberg and Raphael 1986; Johnson 1993; Marzluff *et al.* 1994, 1996; National Biological Service 1996), resulting in increased predation rates on marbled murrelets. It has also been proposed that creation of excessive forest edge habitat may increase the vulnerability of murrelet nests to predation and ultimately lead to higher rates of predation. Edge effects have been implicated in increased forest bird nest predation rates for other species of birds (Chasko and Gates 1982; Yahner and Scott 1988).

The potential relationship between forest fragmentation, edge, and adverse effects on forest nesting birds has received increased attention during the last few decades. In a comprehensive review of the many studies on this topic, Paton (1994) concluded that "strong evidence exists that avian nest success declines near edges." Small patches of habitat have a greater proportion of edge than do large patches of the same shape (Schieck *et al.* 1995). However, Paton (1994) noted that many of these studies involved lands where forests and agricultural or urban areas interface, or they involved experiments with ground nests that are not readily applicable to canopy nesters such as marbled murrelets. Paton (1994) therefore stressed the need for studies specific to forests fragmented by timber harvest in the Pacific Northwest and elsewhere.

Some research on this topic has been conducted in areas dominated by timber production and using nests located off the ground (Ratti and Reese 1988;

Tenyo Maru spill in 1991 at the mouth of the Strait of Juan de Fuca in Washington was the greatest number of murrelets recovered in any oil spill, with the exception of the *Exxon Valdez* oil spill, and represented a significant portion of the local population (Carter and Kuletz 1995). Oil spills may also affect forage fish populations (Irons 1992; Oakley and Kuletz 1994; Piatt and Anderson In press), reduce reproductive success, and disrupt breeding activity (Carter and Kuletz 1995). Chronic oil pollution can cause mortality through oiling and ingestion of oil. Other forms of pollution may also affect birds directly through toxic effects on their food supply.

Mortality of marbled murrelets from entanglement and drowning in fishing nets has declined in recent years in Washington, Oregon, and California, as fishing effort has declined and regulations to reduce mortality have been implemented. However, mortality is still a concern, particularly in Washington. Gillnet fisheries are most significant as a threat to murrelets in the marine environment in Washington, although closures of some areas, specifically to protect marbled murrelets, were implemented in the 1995 season (USFWS 1995b, 1995c). Gillnet fisheries no longer occur in Oregon, with the exception of those in the Columbia River. In California, fishing regulations protect most murrelets from this type of mortality (Carter *et al.* 1995).

Gillnet fisheries may occur at the mouth of the Columbia River, in Willapa Bay, Grays Harbor, the Strait of Juan de Fuca, and Puget Sound, although fishing efforts in coastal fisheries have been greatly reduced because of depressed salmon (*Oncorhynchus* spp.) runs. An observer program in 1994 in the all-citizens and Tribal sockeye salmon (*Oncorhynchus nerka*) drift gillnet fishery of north Puget Sound, which is the most significant fishery in Puget Sound, estimated an entanglement of 15 murrelets, with a range of 2 to 59 murrelets (Pierce *et al.* 1996). A National Marine Fisheries observer program for marine mammals on the outer coast fisheries of Washington, where low numbers of marbled murrelets are present, did not document marbled murrelet mortality (Jeffries and Brown 1993). However, a number of entangled birds of the Alcidae family were not identified to species. Entanglement in other Washington drift net and set gillnet fisheries has also been documented (Speich and Wahl 1989; Craig and Cave 1994; BIA 1994; J. Grettenberger, USFWS, pers. comm. 1995). Observer

programs in 1993 and 1994 in Puget Sound salmon purse seine fisheries indicated that entanglement rates of marbled murrelets were much lower with this gear type (Natural Resources Consultants 1995). To date, there has not been any documented murrelet mortalities from gillnet fisheries at the mouth of the Columbia River.

It is likely that marbled murrelets, like many other seabirds, are affected by fluctuations in marine environmental conditions such as El Niño events (USFWS 1995a). In general, increased mortality of adult seabirds and decreased reproductive efforts have been linked with El Niño episodes when food supplies are depressed (Schrieber and Schrieber 1984; Hodder and Graybill 1985; Boekelheide *et al.* 1990), although there may be marked differences in effects across regions and among species with different foraging styles (Hatch 1987). Marbled murrelets are relatively opportunistic foragers and probably have a great flexibility in prey choice (USFWS 1995a). This capability may enable them to respond, to some degree, to changes in prey availability caused by fluctuating environmental conditions (USFWS 1995a). In general, unfavorable conditions can result in adult mortality and reduced productivity. However, a seabird's relatively long life span is an adaptation which allows an individual to reproduce successfully despite adverse conditions during its lifetime. This life history strategy serves to maintain a population despite environmental fluctuations (USFWS 1995a). However, cumulative impacts (including nest habitat loss, oil spills, etc.), in addition to repeated El Niño events in localized areas over a short time period could cause serious population declines or extirpations (USFWS 1995a).

Management Considerations

Marbled murrelets are found in forests containing a variety of forest structure, which is in part the result of varied management practices and natural disturbance (Hansen *et al.* 1991; McComb *et al.* 1993). In many areas, management practices have resulted in fragmentation of the remaining older forests and creation of large areas of younger forests that have yet to develop habitat characteristics suitable for marbled murrelet nesting (Hansen *et al.* 1991). Past and current forest management practices have also resulted in a forest age distribution skewed toward younger even-aged stands at a landscape scale (Hansen *et al.* 1991; McComb *et al.* 1993).

In many portions of the range of the marbled murrelet during the last 50–70

years, forest management has concentrated on clear-cut logging (Hansen *et al.* 1991). After forests are clear-cut, the sites are traditionally replanted to a single or few tree species and maintained as even-aged stands for maximum wood-fiber production. Site-preparation and management activities may further decrease species diversity (Hansen *et al.* 1991). These methods include prescribed burning and the use of herbicides or mechanical methods to control competing vegetation.

Prior to the widespread application of clearcut timber harvest, historical logging practices in some portions of the species' range consisted of more selective timber harvest, leaving remnant patches of forests of varying ages with older forest characteristics. The uneven-aged management practices used in these areas usually resulted in more diverse forests that may currently provide some nesting habitat where a few trees containing suitable marbled murrelet nesting structure remain (Hansen *et al.* 1991).

Current and historic loss of marbled murrelet nesting habitat is generally attributed to timber harvest and land conversion practices, although, in some areas, natural catastrophic disturbances such as forest fires have caused losses (Hansen *et al.* 1991; Ripple 1994; Bunnell 1995). Reduction of the remaining older forest has not been evenly distributed in western Washington, Oregon, and California. Timber harvest has been concentrated at lower elevations and in the Coast Ranges (Thomas *et al.* 1990), generally overlapping the range of the marbled murrelet.

Habitat for marbled murrelets has been generally declining since the arrival of European settlers. Bolsinger and Waddell (1993) estimated that old-growth forest in Washington, Oregon, and California has declined by two-thirds statewide during the last five decades. Information specific to the range of the marbled murrelet is not available. Historic forest conditions have been estimated for western Washington and Oregon by several authors. Marbled murrelet habitat represents a significant portion of area included in these estimates; therefore, trends in habitat are assumed to follow the same general pattern identified for the larger area.

Although the extent of mature and old-growth forest before the 1800s is difficult to quantify, western Washington and Oregon are estimated to have been covered by approximately 9.7 to 12.8 million hectares (24 to 32 million acres) of forest at the time of euroamerican settlement in the early to

associated inland habitat extending 80 km (50 miles) from eastern Puget Sound and bisecting of the Olympic Peninsula; (2) the Western Washington Coast Range Conservation Zone includes the outer coast of Washington, the western waters of the Strait of Juan de Fuca and associated inland habitat extending inland to the midpoint of the Olympic Peninsula and in southwest Washington as far as 80 km (50 miles) from the Pacific Ocean shoreline; (3) the Oregon Coast Range Conservation Zone includes most of the coastal waters of Oregon (between the Columbia River and Coos Bay) within 2 km (1.2 miles) of the shoreline and associated inland habitat extending inland a distance of 56 km (35 miles); (4) the Siskiyou Coast Range Conservation Zone includes a portion of the coastal waters of Oregon and California (between Coos Bay, Oregon and the southern boundary of Humboldt County, California) within 2 km (1.2 miles) of the shoreline and associated inland habitat extending inland a distance of 56 km (35 miles) from the Pacific Ocean shoreline; (5) the Mendocino Conservation Zone includes a portion of the California coastal waters (from the Humboldt County line to the mouth of San Francisco Bay) within 2 km (1.2 miles) of the shoreline and associated inland habitat extending inland a distance of up to 40 km (25 miles) from the Pacific Ocean shoreline; and (6) the Santa Cruz Mountains Conservation Zone includes a portion of the central California coastal waters (from the mouth of San Francisco Bay to Point Sur, Monterey County) within 2 km (1.2 miles) of the shoreline and associated inland habitat extending inland a distance of up to 24 km (15 miles) from the Pacific Ocean shoreline (USFWS 1995a).

In the marine environment, several laws apply that benefit murrelets directly or indirectly. The Oil Pollution Act of 1990 addresses the development of a national planning and response system for spills in marine and freshwater environments. A variety of planning efforts are underway that address responses to worst-case discharges of oil or hazardous substances, and mitigation or prevention of a substantial threat of discharge from a vessel, offshore facility, or onshore facility. Planning efforts include the development of a national contingency plan, regional area contingency plans, and local geographic response plans. The Service has worked extensively with the U.S. Coast Guard, industry representatives, local response communities, and other State, Federal, and Tribal natural resource trustees to

develop area contingency plans and geographic response plans for Pacific coastal areas. These plans address mechanical recovery, use of dispersants, in-situ burning, shoreline cleanup, protection of sensitive areas, and protection, rescue, and rehabilitation of fish and wildlife. These planning efforts and associated spill exercises should help prevent or minimize the impact of spills on natural resources.

Several other marine laws address threats to murrelets. These include the Clean Water Act, which regulates the discharge of pollution into marine waters and establishes National Contingency plans to minimize damage from oil spills; the Coastal Zone Management Act, which establishes the Coastal Nonpoint Source Pollution Control Program; the Marine Protection, Research and Sanctuaries Act, which restricts ocean dumping of waste, including dredged materials, and establishes marine sanctuaries; and the Outer Continental Shelf Act, which regulates offshore oil development.

Mortality of marbled murrelets in commercial net fisheries in Washington is being addressed through changes in State and Tribal regulations. In 1995, the State of Washington and the Tribes instituted area closures in a number of areas with high densities of marbled murrelets to reduce the potential for entanglement. In 1995, the first year of a 2-year study to evaluate modified gillnets designed to reduce seabird entanglement was completed, and the initial results were encouraging (Melvin and Conquest 1996). Research was also conducted in 1995 to evaluate the extent of fisheries/murrelet overlap and factors that affect entanglement. Educational programs have been implemented that provide material to fishermen on marbled murrelet identification and distribution. As a result of section 7 consultation, observer programs were required in 1993 and 1994 to evaluate and quantify the extent of marbled murrelet mortality in purse seine and gillnet salmon fisheries (USFWS 1995b, 1995c).

Finally, the Forest Service published the "Ecology and Conservation of the Marbled Murrelet," a compilation of original studies and literature reviews that represents the most current treatise on marbled murrelets (Ralph *et al.* 1995a). The document is particularly valuable for management, because it has assembled and synthesized most of what is known about the marbled murrelet.

Critical Habitat

Critical habitat is defined in section 3(5)(A) of the Act as "(i) the 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 (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by a species at the time it is listed * * * upon a determination * * * that such areas are essential for the conservation of the species." 16 U.S.C. 1532(5)(A). The term "conservation," as defined in section 3(3) of the Act, means "* * * to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary * * *" 16 U.S.C. 1532(3).

Role in Species Conservation

The use of the term "conservation" in the definition of critical habitat indicates that its designation would include habitat essential to a species' eventual recovery and delisting. However, when critical habitat is designated at the time a species is listed or before a recovery plan is completed, the Service frequently does not know all of the habitat areas that are essential for a species' recovery. Thus, the Act provides that critical habitat designations may be revised from time to time (16 U.S.C. 1533(a)(3)(B)).

The designation of critical habitat is only one of several measures available to contribute to the conservation of a listed species. Critical habitat helps focus conservation activities by identifying areas that contain essential habitat features (primary constituent elements), thus alerting Federal agencies and the public to the importance of an area in the species' conservation. Critical habitat also identifies areas that may require special management or protection. The identification of these areas may be helpful in planning federally regulated land use activities. The added emphasis on these areas for conservation of the species may shorten the time needed to achieve recovery.

Critical habitat receives consideration under section 7 of the Act with regard to actions carried out, authorized, or funded by a Federal agency. As such, designation may affect non-Federal lands only where such a Federal nexus exists. Federal agencies must insure that their actions are not likely to result in destruction or adverse modification of critical habitat. Aside from this added consideration under section 7, the Act does not provide any additional protection to lands designated as critical

throughout the area. Potential nesting areas may contain fewer than one suitable nesting tree per acre.

Within the boundaries of designated critical habitat, only those areas that contain one or more primary constituent element are, by definition, critical habitat. Areas without any primary constituent elements are excluded by definition.

Criteria Used To Identify Critical Habitat

Several qualitative criteria were considered in the selection of specific areas for inclusion in critical habitat. These criteria are similar to criteria used in the development of several recent Federal management proposals, such as the Scientific Panel (Johnson *et al.* 1991) and Northwest Forest Plan (USDA and USDI 1994). The following is a description of the criteria considered:

Suitable Nesting Habitat: The presence of suitable nesting habitat as defined in the previous section. Suitable habitat was located through the use of specific site knowledge, GIS data, remote sensing data, and aerial photos.

Survey Data: Information about presence/absence and occupancy were used to indicate murrelet use areas. Critical habitat units include most of the known sites occupied by marbled murrelets on Federal, State, county, and private lands. However, known occupied sites may represent only a small portion of the population due to the limited coverage of past survey efforts.

Proximity to Marine Foraging Habitat: During the nesting season, marbled murrelets forage in the marine environment and return to the nest at least once daily carrying a prey item to their young. Foraging and nesting habitat areas must be juxtaposed within the flight capabilities and energetic limits of the species. Critical habitat units were designated taking into account the distance of murrelet detections from the marine environment in a given area.

Large, Contiguous Blocks of Nesting Habitat: In response to the problems of fragmentation of suitable habitat, potential increases in predation, and reduced reproductive success, the Service concentrated on defining critical habitat units in terms of large, contiguous blocks of late-successional forest. The Service used the Late-Successional Reserve system identified in the Northwest Forest Plan (USDA and USDI 1994) to the extent possible to provide large blocks of habitat. Marbled murrelet locations and habitat were considered in the development of these reserves. State, county, private, and city

lands were included where large blocks of Federal reserve areas were insufficient or not available, but where critical habitat was crucial to retaining distribution of the species.

Rangewide Distribution: To maintain the current distribution of the species and reduce the impact of catastrophic losses of habitat or murrelets, critical habitat units were identified throughout the range of the species in the three states. Well distributed critical habitat reduces the probability that a natural or human-caused catastrophe would threaten the survival or recovery of the species in Washington, Oregon, and California. Catastrophes that might threaten the species include wildfires, windstorms or oil spills. Given the intense site fidelity of many alcid species, maintaining rangewide distribution may also be needed to provide potential source populations for the recolonization of future habitat.

Adequacy of Existing Protection and Management: The Service considered the existing legal status of lands in designating areas as critical habitat. Areas with permanent legal protection of wildlife, such as congressionally designated wilderness areas, National Parks, and National Wildlife Refuges are not proposed unless specific threats were identified that are not addressed by existing management and protection. State park regulations vary, but are often more recreation oriented, and less restrictive or protective of wildlife.

Designated Areas Identified by Applying Criteria

Application of the foregoing criteria and consideration of comments and information received as a result of the supplemental proposal has resulted in the designation of most of the Late-Successional Reserves (LSR), as described in the Northwest Forest Plan, on Federal lands within the range of the marbled murrelet in Washington, Oregon, and California. These areas, as managed under the Northwest Forest Plan, should develop into large blocks of suitable murrelet nesting habitat given sufficient time. However, LSRs are plan-level designations with less assurance of long-term persistence than areas designated by Congress. Designation of LSRs as critical habitat compliments and supports the Northwest Forest Plan and helps to ensure persistence of this management directive over time. In some areas, these large blocks of Federal land can provide the necessary contribution for recovery of the species. In other areas, Federal ownership is limited and Federal lands alone cannot meet recovery needs to reverse the current population decline

in marbled murrelets and maintain a well-distributed population.

The FEMAT report recognized the limited ability of Federal agencies to recover this species on Federal lands alone. "Although the Forest Ecosystem Management Assessment was designed to address only Federal lands within the range of the northern spotted owl, the marbled murrelet is an example of a species whose life history requirements cannot be accommodated only on Federal lands. The marbled murrelet is a seabird that nests inland and therefore is influenced by both the marine and terrestrial environments. Its nesting range in the three-state area includes land that is south of the range of the northern spotted owl. In addition, several areas that are considered key to the recovery of the marbled murrelet involve private and state lands" (FEMAT Report at IV-151 and IV-152, USDA *et al.* 1993a).

Based on information provided in public comments, including the recommendations of the Marbled Murrelet Recovery Team in the draft Recovery Plan (USFWS 1995a), the Service is designating selected non-Federal lands that meet the requirements identified in the Criteria for Identifying Critical Habitat section, where Federal lands alone are insufficient to provide suitable nesting habitat for the recovery of the species.

Non-Federal lands are designated as critical habitat where Federal lands are limited or nonexistent, and where non-Federal lands are essential for maintaining marbled murrelet populations and nesting habitat. State lands are particularly important in southwestern Washington, northwestern Oregon, and California south of Cape Mendocino. Small segments of county lands are also included in northwestern Oregon and central California. This is consistent with the Memorandum of Understanding between the Service and the State of California signed in 1991.

Some private lands are being designated as critical habitat because they provide essential elements and occur where Federal lands are very limited, although habitat availability on private land is typically much more limited than on public lands. These areas include the Arlecho Basin, which supports occupied sites in the lowlands of northern Washington; land supporting known occupied sites in southwestern Washington and in the Siletz River drainage in Oregon; nesting habitat and occupied sites for the at-sea murrelet population in the southern portion of the Draft Recovery Plan's proposed Marbled Murrelet Conservation Zone 4 in California,

area descriptions accordingly. Generally, the corrections were relatively minor adjustments to boundary lines.

A number of proposed units in southwest Washington on private and State lands were reduced in size if it was determined that: (1) primary constituent elements were not present or, (2) the area removed was not considered necessary for the conservation of the species. The north portion of Capital Forest (WA-04-a) was removed because of the lack of primary constituent elements, coupled with high levels of motorized recreational use that further reduce habitat potential.

In Oregon, the Elliott State Forest was originally proposed for designation as critical habitat. The State of Oregon has since completed the Elliott State Forest Habitat Conservation Plan that includes provisions for the marbled murrelet and received an incidental take permit. This permit describes how the area will be managed for murrelets. Therefore, the Service has removed this area from the final designation.

On Federal lands in Oregon, the Service included approximately 100 acres and deleted approximately 300 acres of land on the Siuslaw National Forest at the request of the Forest Service. This change reflects a land exchange intended to protect marbled murrelet occupied sites. The Service deleted areas managed by the Siskiyou National Forest (portions of subunits OR-07-e and OR-07-f); and the Eugene, Roseburg and Medford Districts of the Bureau of Land Management (subunits OR-04-h, and portions of subunits OR-06-d, OR-04-f, and OR-04-l) based on survey information provided by the agencies during the public comment period. Survey information included the location and results (positive and negative) of murrelet surveys in the eastern portion of these areas. The survey locations were based on planned timber sales and habitat-based surveys in many areas, rather than a statistically designed study to determine the inland distribution of marbled murrelets. Therefore, the Service was only able to utilize the survey information in critical habitat units where the survey effort was greatest. The Service interprets lack of detections or occupied sites, when coupled with habitat information, to indicate that these areas are currently likely to support much lower densities of murrelets than areas closer to the coast. The Service does not consider these survey data to be sufficient at this time to define the full inland distribution of murrelets in these areas and does not propose to change the

murrelet zones used in the Northwest Forest Plan.

In California, some portions of proposed critical habitat on private and Federal lands in the Siskiyou Coast Range Zone (unit CA-10-b and the east half of unit CA-10-a) and on city and state lands in the Santa Cruz Mountains Zone were dropped based on information provided by the landowners and land management agencies or other new information available to the Service. These areas were dropped because the Service determined that they did not contain the primary constituent elements or were not considered essential to the conservation of the species. All of Golden Gate National Recreation Area was dropped based on information provided by the National Park Service indicating that the Federal government owns the timber rights to any potentially suitable murrelet habitat within the area. After reviewing this information, the Service has determined that Federal lands within the Golden Gate National Recreation Area do not require special management.

Portions of primary constituent element (3) from the supplemental rule (forested areas of at least one-half the site-potential tree height regardless of the presence of potential nest platforms) have been incorporated into primary constituent element (2) in the final rule, and the remainder dropped. Forested areas surrounding nest trees were retained because they likely contribute to successful reproductive efforts by providing the microclimate suitable for maintaining nest tree characteristics and potentially reducing predation. The contribution of forested areas to successful reproduction likely decreases with increasing distance from the nest tree and at some distance the contribution becomes indistinguishable. Raphael *et al.* (1995) found an increased chance of occupancy in landscape conditions with increased amounts of large saw timber and old growth components within a 0.8 km (0.5 mile) radius circle. Specific studies are lacking to document the value of forested conditions to marbled murrelet nesting beyond the 0.8 km (0.5 mile) radius. Therefore, until these studies are completed, it is the best professional judgement of Service biologists that forested conditions within 0.8 km (0.5 mile) of a potential nest tree contribute more significantly to successful reproduction than those beyond this area and the Service has changed the primary constituent elements accordingly.

Congressionally Withdrawn Areas

Congressionally Withdrawn Areas (e.g., wilderness areas and national parks) are limited in the range of the marbled murrelet in Washington, Oregon, and California. Few wilderness areas are within the flight distance of marbled murrelets from the marine environment, although those that are provide crucial contributions to the conservation of the species. Wilderness areas and national parks contain approximately 302,000 hectares (747,000 acres) of marbled murrelet nesting habitat, representing 29 percent of the suitable nesting habitat on Federal lands in the range of the marbled murrelet. However, a substantial portion of the remainder of these areas is incapable of producing marbled murrelet nesting habitat because of forest composition, lack of forest cover, elevation, and other constraints. By themselves, Congressionally Withdrawn Areas are incapable of supporting stable and interactive populations of marbled murrelets.

Marbled murrelet habitat in congressionally designated wilderness areas, national parks, national monuments (natural areas), and national wildlife refuges is generally managed by statutory requirements to protect natural ecosystems and for the benefit of wildlife. Thus, habitat in these areas does not require special management consideration or protection. For example, a potential highway realignment through the Redwood National Park in northern California could result in the removal of occupied habitat. The Park's statutory authority and general management goals, however, are considered adequate to conserve the species without the additional designation of critical habitat.

However, not all Congressionally Withdrawn Areas are managed in this manner. For example, some national recreation areas may not be managed to maintain older forest habitats or may face external actions (e.g., outside ownership of mineral or timber rights) which may threaten marbled murrelet habitat within the area. One congressionally withdrawn area in California, the Golden Gate National Recreation Area, was proposed for designation. Area staff indicated that potential marbled murrelet habitat within the area might still be subject to timber harvest and loss, because the National Park Service does not control rights to the standing timber on some parts of the recreation area. During the public comment period the National

discussed the potential effects of critical habitat and the various regulatory activities of the agencies, to assist in determining whether the proposed designation would have a potential to affect the agency's actions, including funding and permitting activities on non-federal lands. Each agency contact was sent a questionnaire requesting information on the potential impacts of the designation on any projects or activities funded, permitted, or carried out by their agency, followed by personal contact. Follow-up contacts were made with the various agencies to answer any additional questions. For the final rule, updates were requested.

Several portions of critical habitat were dropped from the proposed rule due to new information made available to the Service during the public comment period. Because the effects of critical habitat designation vary by ownership and State regulation, the Service evaluated the effect of the designation on areas defined by state

and ownership, beginning with critical habitat areas on Federal land in the three States. Federal lands are managed under the same requirements, through the Northwest Forest Plan. Therefore, potential effects of critical habitat are similar for all these lands. Baseline condition of Federal lands was established in the Northwest Forest Plan.

Within each state, the Service examined the potential effects of critical habitat on the various ownerships and areas defined by differences in the baseline condition. Effects examined included any potential effects where Federal permits or funding were involved. In addition, any effects of state regulations that tier to Federal critical habitat were examined.

Based on the impacts revealed by the economic analysis summarized above, and careful examination of the conservation benefits of the critical habitat units, the Service has determined that the overall conservation

and other benefits to be gained from the designation outweigh the benefits of excluding any remaining areas.

Therefore, the Service did not exclude any areas during this process and has made a final determination to designate critical habitat for the marbled murrelet. A copy of the economic analysis and description of the exclusion process with supporting documents are included in the Service's administrative record.

Effects of the Designation

This designation of critical habitat for the marbled murrelet identifies 32 critical habitat units encompassing approximately 1,573,340 hectares (3,887,800 acres) of Federal and non-Federal lands based on information available in the Interagency Geographic Information System (GIS). Twenty-two critical habitat units include State, county, city, or private lands. See Table 1.

TABLE 1.—DESIGNATED CRITICAL HABITAT BY STATE, OWNERSHIP, AND LAND ALLOCATION

	Hectares	Acres
Washington:		
Federal Lands:		
Congressionally Withdrawn Lands	740	1,800
Late-Successional Reserves	485,680	1,200,200
Non-Federal Lands:		
State Lands	172,720	426,800
Private Lands	1,020	2,500
Oregon:		
Federal Lands:		
Late-Successional Reserves	541,530	1,338,200
Non-Federal Lands:		
State Lands	70,880	175,100
County Lands	440	1,100
Private Lands	350	900
California (Northern):		
Federal Lands:		
Late-Successional Reserves	193,150	477,300
Non-Federal Lands:		
State Lands	71,040	175,500
Private Lands	16,360	40,400
California (Central):		
State Lands	14,080	34,800
County Lands	3,230	8,000
City Lands	400	1,000
Private Lands	1,720	4,200

Some small areas of naturally occurring or human-created unsuitable habitat (i.e., areas that have never been or will likely never be marbled murrelet nesting habitat, such as alpine areas, water bodies, serpentine meadows, lava flows, airports, roads, buildings, parking lots, etc.) are inside the boundaries of critical habitat units but are not affected by the designation because they do not contain primary constituent elements. Where possible, these areas were not included within the critical habitat

boundaries and acreage totals were adjusted to reflect the exclusion of this non-suitable habitat. However, many of these areas are small and could not be physically identified on the GIS maps. Current mapping information does not allow precise identification of the location of all forest areas containing primary constituent elements. This is particularly true for potential nest trees. These trees are often a small component of the forest stands and are not recorded on many timber-oriented data systems.

The Service used the best existing data to locate the forest areas most likely to contain the primary constituent elements. Where possible in the time frame available, the Service refined the boundaries of the critical habitat units to eliminate significant identified areas that do not contain one or more of the primary constituent elements based on the best data available.

Efforts by Federal agencies to survey for marbled murrelets have been concentrated in areas of proposed

while the permit is active. The State of Oregon is currently operating under an incidental take permit for murrelets on the Elliott State Forest, therefore this area has been excluded from critical habitat.

Basis for Section 7 Analysis

Designation of critical habitat focuses on the primary constituent elements within the designated habitat units and their contribution to the species' survival and recovery. The evaluation of actions that may affect critical habitat for the marbled murrelet would consider the effects of a Federal action on any of the factors that were the basis for determining the habitat to be critical, including the primary constituent elements of potential nest trees and surrounding forest.

The range of the marbled murrelet has been subdivided by the Recovery Team into six Marbled Murrelet Conservation Zones (USFWS 1995a), as discussed in the Previous Management Efforts section. These subdivisions were not based on identification of separate populations of marbled murrelets, but rather on the need for potentially different recovery actions in various portions of the marbled murrelet's range, and the need to maintain well-distributed populations. Marbled murrelets within the conservation zones are likely to interact across zone boundaries at some level.

For a wide-ranging species such as the marbled murrelet, where multiple critical habitat units are designated, each unit has a regional (conservation zone) and range-wide role in contributing to the conservation of the species. The basis for an adverse modification opinion would be whether a proposed action appreciably reduces the ability of critical habitat to function in achieving the regional conservation zone goals. In evaluating the effect of a proposed action, the Service will analyze the impacts to individual units in light of their overall contribution to the survival and recovery of murrelets in the conservation zone described in the Previous Management Efforts section, and the overall range of the marbled murrelet in Washington, Oregon, and California. Thus, an adverse modification finding would be based upon a broader inquiry than the mere assessment of adverse effects at the local unit level. The loss of populations throughout one or more conservation zones, or even a major part of a conservation zone, could lead to genetic and demographic isolation of parts of the population.

Examples of Proposed Actions

Section 4(b)(8) of the Act requires, for any proposed or final regulation concerning critical habitat, a brief description and evaluation of those activities (public or private) that may adversely modify such habitat or may be affected by the critical habitat designation. Regulations found at 50 CFR 402.02 define destruction or adverse modification of critical habitat as a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical.

A variety of ongoing or proposed activities that disturb or remove primary constituent elements may adversely affect, though not necessarily "adversely modify" marbled murrelet critical habitat as that term is used in section 7 consultations. Examples of such activities include, but are not limited to, (1) forest management activities which greatly reduce stand canopy closure, appreciably alter the stand structure, or reduce the availability of nesting sites; (2) land disturbance activities such as mining, sand and gravel extraction, construction of hydroelectric facilities and road building, and (3) harvest of certain types of commercial forest products (e.g. moss). These activities have the following effects on the primary constituent elements of murrelet critical habitat:

(1) Removal or degradation of individual trees with potential nesting platforms, or the nest platforms themselves, that results in a significant decrease in the value of the trees for future nesting use. Moss may be an important component of nesting platforms in some areas.

(2) Removal or degradation of trees adjacent to trees with potential nesting platforms that provide habitat elements essential to the suitability of the potential nest tree or platform, such as trees providing cover from weather or predators.

(3) Removal or degradation of forested areas with a canopy height of at least one half the site-potential tree height and regardless of contiguity, within 0.8 km (0.5 mile) of individual trees containing potential nest platforms. This includes removal or degradation of trees currently unsuitable for nesting that contribute to the structure/integrity of the potential nest area (i.e., trees that contribute to the canopy of the forested area). These trees provide the canopy

and stand conditions important for marbled murrelet nesting.

For a proposed action to result in the destruction or adverse modification of critical habitat, it must appreciably diminish the value of critical habitat for both the survival and recovery of a listed species in the affected conservation zone. Each proposed action requiring a section 7 consultation must be evaluated individually, in light of the baseline condition of the critical habitat unit and conservation zone, unique history of the area, and effect of the impact on the critical habitat unit in light of its regional and range-wide role in the conservation of the species. Activities that are acceptable in one critical habitat unit or conservation zone may cause serious effects in another, due to differences in current condition and conservation needs. Therefore, the Service cannot provide, in this rule, a detailed description of the threshold for future actions that would result in the destruction or adverse modification of critical habitat applicable throughout the range of the species.

A variety of activities would not affect the primary constituent elements and therefore would not adversely modify critical habitat. Such activities would include, but are not limited to, certain recreational use and personal-use commodity production (e.g., mushroom picking, Christmas tree cutting, rock collecting, recreational fishing along inland rivers) and certain commercial commodity production (e.g., mushroom picking, brush picking). Actions that affect forest stands not within 0.8 km (0.5 miles) of individual trees with potential nesting platforms (are not primary constituent elements) also would not adversely modify critical habitat, even if they are within the boundaries of the area designated as critical habitat.

Activities that do not affect the primary constituent elements in the forests are unlikely to be affected by the designation. However, even though an action may not adversely modify critical habitat, it may still affect marbled murrelets (e.g. through disturbance) and may, therefore, still be subject to consultation under section 7 of the Act.

Activities conducted according to the standards and guidelines for Late-Successional Reserves, as described in the ROD for the Northwest Forest Plan would be unlikely to result in the destruction or adverse modification of marbled murrelet critical habitat. Activities in these areas would be limited to manipulation of young forest stands that are not currently marbled murrelet nesting habitat. These forest management activities would be

areas acquired, as well as the potential effects of the lands traded in determining whether the action as a whole would destroy or adversely modify critical habitat. Even in the event that a proposed exchange would result in the destruction or adverse modification of critical habitat, the Service will work with the action agency and any applicants to craft reasonable and prudent alternatives that would allow the action to proceed.

Changes in ownership do not by themselves change an area's status as critical habitat. If a portion of land is moved from Federal to non-Federal ownership, the effects of the designation may change. Regardless of the original ownership, activities on non-Federal lands are likely to be affected by the designation only when there is a Federal nexus or where State law is triggered by the Federal designation.

Issue 9: One commenter charged that the Service did not use the best scientific information. The commenter interpreted the Act to allow and require the use of only data, not theories or interpretations of the data.

Service Response: The Service believes it has used the best scientific information available, and will continue to review new information as it arises. The Service reviewed all information provided by commenters on the supplemental rule to determine if it supported alternative conclusions. Science involves not only the use of raw data, but the hypotheses, theories, and interpretations derived from those data. Failure to use such information would be contrary to good scientific practice and would not satisfy the Act's requirements. The commenter provided several specific examples, which have been addressed in the "Ecological Considerations" section as well as the Biological Issues in this section of the rule.

Issue 10: One commenter contends that the Service erred by designating areas not "occupied by murrelets at the time of listing." The commenter asserts that on September 28, 1992 (the time of listing), the species had completed nesting and were all on the ocean, therefore no nesting habitat could be considered occupied at the time of listing.

Service Response: The commenter's interpretation of "geographical areas occupied by the species at the time of listing" is erroneous. The commenter appears to have confused the definition of "occupied" in the Pacific Seabird Protocol (designed to determine potential breeding by birds located in a specific area in a specific year) with the biological determination of species

occupancy. Biologists consider all areas used by members of a species, regardless of life stage or season, as within the occupied range of the species.

Issue 11: One commenter suggested that the legal descriptions of critical habitat in areas of intermingled Federal ownership should specifically exclude the non-Federal lands through description, rather than by definition.

Service Response: In the supplemental proposed rule, the Service specified the ownerships included in the designation for each area described. Within Federal LSRs, only Federal lands are included by definition, thereby excluding any non-federal lands. In addition, only lands that contain the primary constituent elements are included by definition. This approach satisfies the requirements of the Act. The Service continues to work on improving the descriptions of critical habitat units. We appreciate the specific information provided by private landowners on their ownerships within the Federal and State lands designated. However, in this court-ordered final designation, the Service has included and excluded areas by definition.

Issue 12: One commenter maintained that the Service had ignored the presence of marbled murrelet habitat in Congressionally-withdrawn areas, thereby increasing the area of non-Federal lands designated as critical habitat.

Service Response: The Service is cognizant of the murrelet habitat in lower-elevation, Congressionally-withdrawn areas, including Redwood National Park. The Service assumes these areas will retain murrelet habitat based on the statutory requirements applicable to these areas and considered this in its designation of murrelet critical habitat.

Issue 13: Several commenters suggested that the rationale for excluding Congressionally-withdrawn lands from designation as critical habitat should also apply to the Late-Successional Reserves under the Northwest Forest Plan because these areas were being managed to provide old-growth habitat.

Service Response: Congressionally-withdrawn lands are designated by statute, which secures their status. Any change to their management requires an act of Congress. Those areas designated for management in a manner consistent with murrelet conservation are expected to remain so. Therefore, there is no added value to designating them as critical habitat. In contrast, plan-level designations, such as Late-Successional Reserves, are reviewed and revised

periodically (at least every 10-15 years), and therefore do not have the secure status of Congressionally-withdrawn areas. Critical habitat designation serves to remind future planners of the importance of these areas to the conservation of the marbled murrelet. Therefore, designation of these areas as critical habitat is valuable, even if current management is consistent with murrelet conservation.

Issue 14: Several commenters suggested that the explanation for the exclusion of Tribal lands, Congressionally-withdrawn areas, and marine habitat could also be applied to all terrestrial critical habitat.

Service Response: The Service discussed of the reasons for each of these exclusions in the final rule. A major consideration in the exclusion of Tribal lands were factors related to the Federal government's trust responsibilities and government relationships with Native American tribes. Congressionally-withdrawn lands have special and statutory designations that provide management protection for wildlife.

In examining the information provided on marine habitat, the Service identified two key components of the marine habitat that are essential to the conservation of the murrelet, clean water and food. Marine habitat is not generally subject to incremental and continuing losses or removal as terrestrial habitat is. Threats in the marine environment are often related to catastrophic events that cause loss of individuals, not habitat. The primary identified threats to marine murrelet habitat are pollution and toxic spills. Fishing does not appear to be a threat to habitat at this time. Several laws regulate activities that could result in pollution or toxic spills in the marine environment that have no counterparts in the terrestrial environment, and are briefly described in the Previous Management Efforts section. Other marine concerns, such as the effect of El Niño and ocean currents, are outside human control and would not be affected by the designation of critical habitat. The Service will continue to monitor the degree to which these and other regulatory measures ameliorate identified threats and the need for special management consideration or protection.

Issue 15: A number of commenters identified areas that they thought should not be designated as critical habitat.

Service Response: If site-specific documentation on a site was provided to the Service providing a rationale as to why an area should not be designated

has been statistically analyzed and verified. Under "occupied stands" (p. 13 and again on pg. 21) in the 1994 protocol, Ralph *et al.* (1994) clearly state that birds circling above the canopy is a criterion indicating occupancy. This conclusion was affirmed in the March 8, 1995 addendum to the 1995 protocol (Ralph *et al.* 1995c), as well as in a signed declaration prepared by Dr. C.J. Ralph on September 27, 1995 (Ralph 1995).

Issue 23: Some commenters suggested that the Service designate additional habitat to compensate for the loss of high quality occupied murrelet nesting habitat that may be harvested as a consequence of timber sales released by the so-called "Salvage Rider" (Public Law 104-19, Section 2001).

Service Response: The government's position is that section 2001(k)(2) of P.L. 104-19 expressly forbids the harvest of identified nesting sites. The Federal District Court for the District of Oregon disagreed with the government's position and directed the government to release for harvest the majority of these sites. The Government has appealed this decision to the Ninth Circuit Court of Appeals, and as of this writing the harvest is temporarily stayed until the Ninth Circuit rules on the case. Therefore, the Service believes any compensatory designation of additional critical habitat is unwarranted at this time.

Issue 24: Several commenters expressed concern that critical habitat is a disincentive to landowners contemplating developing habitat conservation plans (HCPs) within designated areas.

Service Response: The Service does not intend to discourage HCPs with the designation of critical habitat. We expect that critical habitat may be used as a tool to help identify areas within the range of the murrelet more critical for the conservation of the species. The Service considers HCPs to be one of the most important methods by which non-Federal landowners can resolve endangered species conflicts.

All HCPs are reviewed to determine whether they are likely to jeopardize the continued existence of the species or cause adverse modification to designated critical habitat. In most cases, the Service provides technical assistance and works closely with the applicant throughout the development of the HCP to reduce the probability of the applicant developing an HCP that would not meet these criteria. Well developed HCPs should be able to meet the section 7 requirement to avoid adverse modification of critical habitat by providing sufficient special

management considerations for the constituent elements identified for murrelet critical habitat. The Service does not anticipate that the designation of critical habitat for the marbled murrelet will affect ongoing negotiations for HCPs with landowners like the State of Washington or various large timber companies.

Issue 25: Several commenters disagreed with removing areas covered under an HCP from designation. Whereas in contrast, another commenter felt that planning approaches such as the development of multi-species HCPs were preferable to critical habitat designation.

Service Response: The Service recognizes that critical habitat is only one of many conservation measures for federally-listed species. HCPs are perhaps one of the most important tools for reconciling land use with the conservation of listed species on non-Federal lands. Since HCPs can provide an alternative means of addressing the special management considerations necessary for the constituent elements of marbled murrelet critical habitat, those areas covered by a legally-operative incidental take permit for marbled murrelets based on an approved HCP are excluded from critical habitat.

Consistent with this approach, the Service has not designated the Elliott State Forest in Oregon as critical habitat based on the State completing an HCP for that forest. Other areas without completed HCPs have been included in this designation. When those HCPs are completed and incidental take permits for marbled murrelets issued, critical habitat will be lifted.

Issue 26: Numerous commenters recommended that the Service designate marine critical habitat. Several commenters recommended addition of the following terrestrial areas as critical habitat:

In California, commenters recommended inclusion of private lands in Del Norte, Humboldt, Mendocino, Sonoma, San Mateo, and Santa Cruz Counties. One private property owner requested designation of her 60 acres in the Santa Cruz Mountains Zone. The Midpeninsula Regional Open Space District requested that the District's Purisima Creek Redwoods Open Space Preserve be designated in San Mateo County. Commenters also suggested inclusion of county parks along the Van Duzen River. State lands recommended for inclusion included Van Damme State Park and Navarro River Redwood State Park in the Mendocino Zone, and Nisene Marks State Park and Soquel State Demonstration Forest in the Santa

Cruz Mountains Zone. In Washington, commenters recommended the inclusion of Washington Department of Natural Resource lands in the Clallam Bay block and the Chehalis State Forest, Deception Pass State Park, additional lands adjacent to Jim Creek, private lands in the Mineral block, and private lands with occupied sites in the north Cascades.

Service Response: Under the Administrative Procedures Act (5 U.S.C. 553), the Service cannot finally designate areas as critical habitat unless they were proposed for designation in a proposed rule. Further, the Service is under a court order to finalize this critical habitat designation by May 15, 1996. These recommendations will be considered in any future revisions of critical habitat for the marbled murrelet.

Biology

Issue 27: Commenters suggested that prey distribution and abundance, rather than inland forest conditions, may dictate murrelet distributions at sea.

Service Response: As described in the *Ecological Considerations* section, the Service agrees that prey distribution and abundance is an important ecological factor for murrelets at sea. However, particularly during the nesting season, marbled murrelets are found in high numbers in close proximity to areas where inland forested conditions are considered suitable for nesting throughout large portions of coastal Washington, Oregon, and California (Carter and Erickson 1992; Ralph and Miller 1995; Ralph *et al.* 1995b; Strong 1995, Varoujean and Williams 1995). Conversely, marine concentrations tend to be low where on-shore habitat is limited. Concentrations of other alcid during the nesting season in 1994 did not correspond closely to murrelet distribution patterns (Varoujean *et al.* 1994), which one would expect if prey distribution was the single or most important determinant of seabird distribution.

The distribution of marbled murrelets in the marine environment changes after the nesting season. This suggests that proximity to their nesting habitat is important for marbled murrelets during the breeding season even though food may be more abundant elsewhere (Ralph *et al.* 1995b). However, changes in prey distribution and abundance may sometimes occur coincidentally with the end of the nesting season. Marbled murrelets have been documented to use a variety of prey species, which suggests that they are capable of exhibiting flexibility regarding food resources available to them during the nesting season. Therefore, the Service believes

timber were greater among sites occupied by murrelets compared to unoccupied sites, and (2) mean size of patches of old-growth and large saw timber were also greater among occupied sites compared to unoccupied sites. As Raphael *et al.* (1995) state, these findings are consistent with earlier research documenting the value of large old-growth stands to nesting murrelets.

These findings support, rather than contradict, the hypothesis that murrelets are preferentially selecting larger stands of older trees for breeding because these stands and trees have the specific structural features the birds require. That the murrelets occur more often in larger patches (i.e., less edge relative to area) of old-growth compared to smaller patches is also consistent with the edge-effect concerns expressed in this rule. The Service believes that resident marbled murrelets may be made more vulnerable to predation associated with the newly created edges when existing old-growth stands are further fragmented into smaller patches.

Issue 32: One commenter suggested that the Service conduct a population viability analysis (PVA) of the marbled murrelet before designating critical habitat.

Service Response: This final rule is directly related to management directives that preceded or were developed simultaneously with the critical habitat rule. Of greatest significance were the draft Recovery Plan (USFWS 1995a) and the marbled murrelet viability panels of the FEMAT process (USDA *et al.* 1993a). It is the Service's opinion that these efforts incorporate many of the concepts which should be considered when a formal PVA is not conducted (Ruggiero *et al.* 1994), and provide the best guidance for management. The function of a PVA is to incorporate what is known about population dynamics of a species, and to analyze the effects of stochastic events and changes in parameters, as well as to identify factors for study, management and monitoring (Lacey in Press). However, PVA's can be compromised because of a lack of natural history data (Minta and Kareiva 1994). Therefore, the Service believes that a PVA developed based on current knowledge of the marbled murrelet would be premature, and is not a suitable tool for determining critical habitat.

Issue 33: Several commenters suggested that the Service has dismissed natural marine phenomena as unimportant in affecting marbled murrelet population fluctuations and distributions. One commenter used the extinction of the Labrador duck

(*Camptorhynchus labradorus*) as an example of how marine fluctuations can cause natural extinctions of marine birds, and suggested that the current decline of the marbled murrelet is analogous to the extinction of the Labrador duck.

Service Response: As stated in the *Ecological Considerations* section and elsewhere, the Service appreciates the role that natural marine fluctuations play in the demography of the marbled murrelet. The murrelet, like many other seabirds, is affected by stochastic factors such as gross water temperature changes and shifting patterns of prey abundance. Likewise, it is affected by terrestrial stochastic factors such as fire and windthrow. It is a generally accepted tenet of conservation biology that extinction for a declining species becomes more likely due to natural stochastic factors as a population becomes smaller and more fragmented. Maintenance of high quality nesting habitat in key areas will better enable the species to successfully endure marine and terrestrial stochastic events when they do occur. For example, Clark *et al.* (1990) found that limited availability of suitable nest sites hindered the population growth and recovery of red-tailed tropicbirds (*Phaethon rubricauda*) following catastrophic ocean events.

The Service disagrees with the commenter's assertion that the Labrador duck went extinct solely from natural causes, and that this so-called natural decline is analogous to marine forces acting to depress the marbled murrelet population. Although the Labrador duck was never very abundant, the best available information suggests that over-exploitation by humans caused the extinction of the species; the bird was hunted for market and for down, and its eggs were collected (Ehrlich *et al.* 1988; Terres 1980; Bellrose 1976).

Issue 34: Some commenters questioned the quality of the data that the Service used to determine critical habitat. One commenter questioned the Service's use of satellite imagery to identify critical habitat.

Service Response: The Act requires the Service to make biological decisions involving designation of critical habitat based on the best scientific and commercial data available. The Service utilized a number of sources to identify critical habitat including aerial photographs and personal knowledge. The Service maintains that sufficient data are available to warrant designation of critical habitat and that this final rule is based on the best information available.

Issue 35: Two commenters suggested exclusion of the proposed critical habitat units that contain Bishop pine.

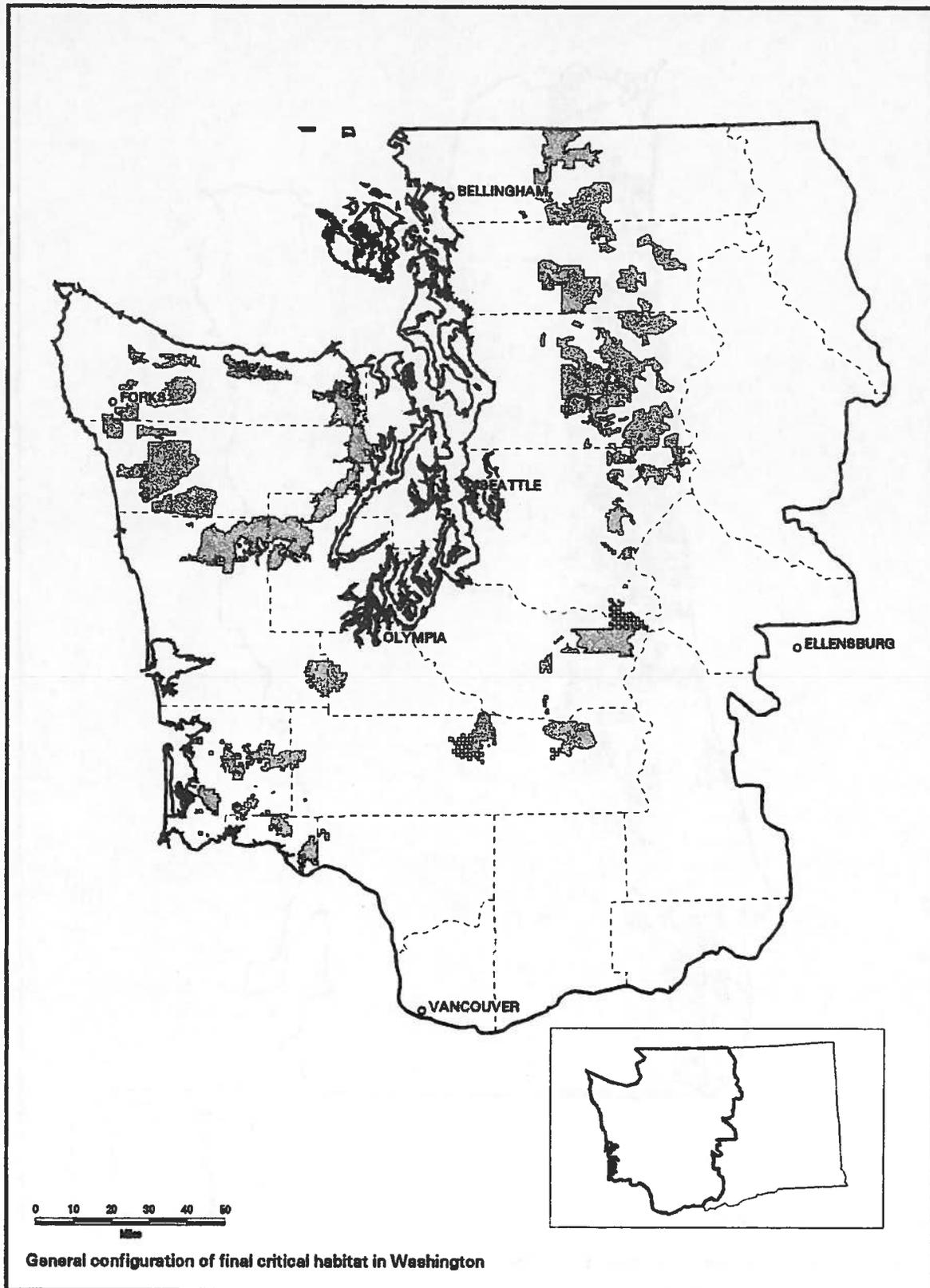
Service Response: Two critical habitat units in California contain mature Bishop pine forests, Tomales Bay State Park and Salt Point State Park. These areas currently do not have any known records of murrelet detections; however, the Service is unaware of any surveys which have been conducted to determine if Bishop pine forests are used by marbled murrelets. The Service has determined that it is appropriate to designate these Bishop pine areas as critical habitat because of the lack of survey data, proximity of these areas to the ocean, availability of suitable nesting platforms, and high canopy cover. In the future, if surveys determine that murrelets are not nesting in these stands the boundaries of these critical habitat units may be revised.

National Environmental Policy Act

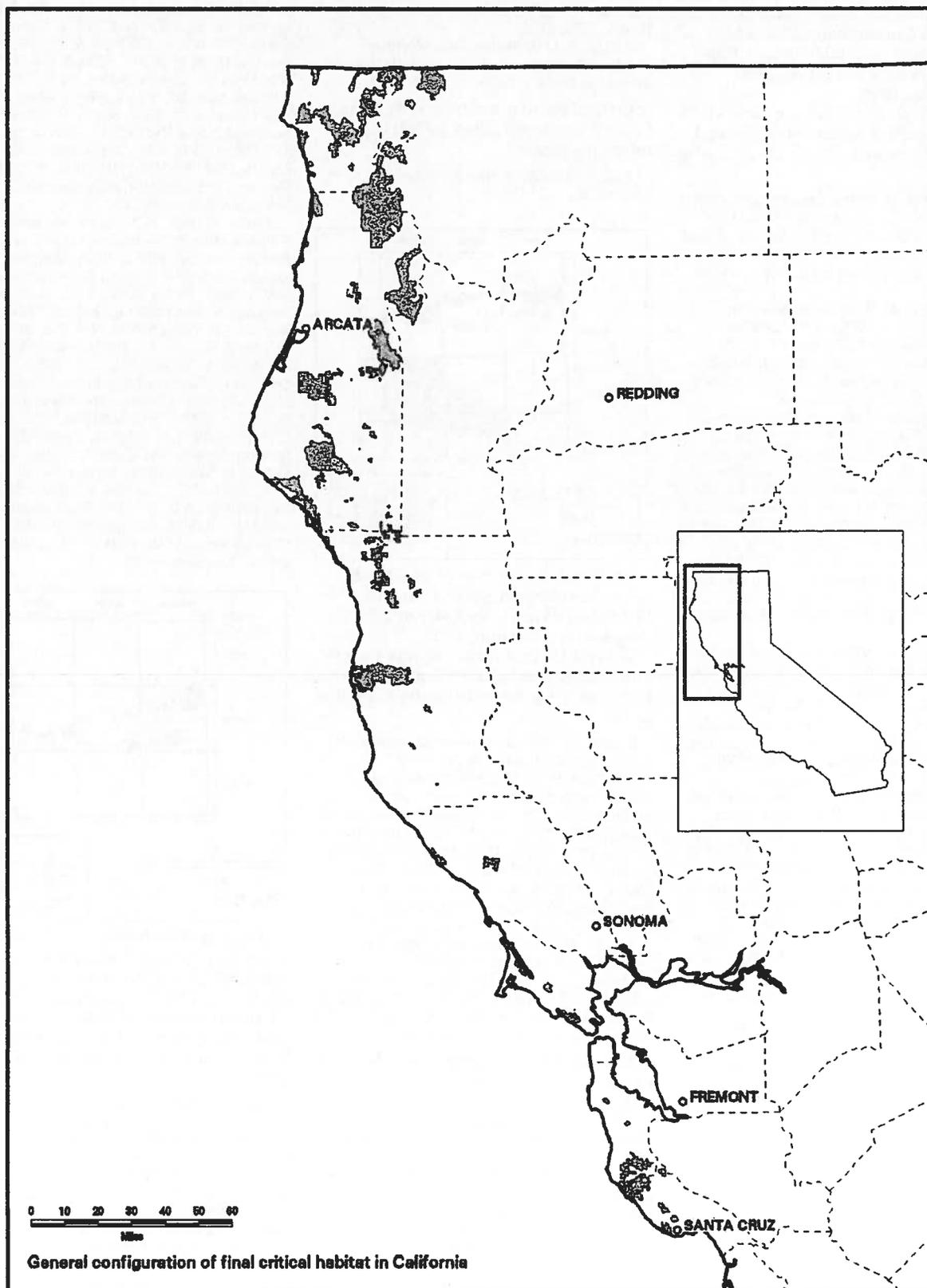
The Service has determined that Environmental Assessments and Environmental Impact Statements, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in conjunction with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the Federal Register on October 25, 1983 (48 FR 49244).

Required Determinations

The final rule has been reviewed by the Office of Management and Budget under Executive Order 12866. The Department of the Interior finds that timely compliance with the provisions of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) is impracticable in light of the emergency situation resulting from the court order requiring designation by May 15, 1996. Consequently, the completion of a Regulatory Flexibility Analysis is deferred at this time and will be completed within 180 days. Based on the information discussed in this final rule concerning public projects and private activities within critical habitat units, it is not clear whether significant economic impacts would result from the critical habitat designation. Also, no direct costs, enforcement costs, information collection, or record-keeping requirements would be imposed on small entities by this designation. Further, the rule contains no record-keeping requirements as defined by the Paperwork Reduction Act of 1980.



General configuration of final critical habitat in Washington



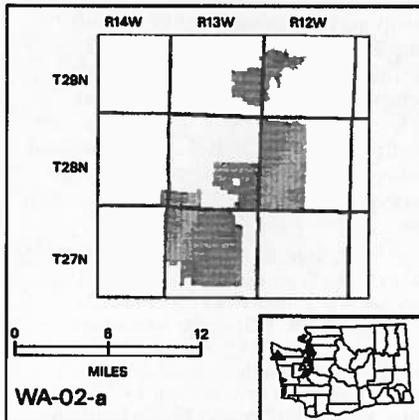
General configuration of final critical habitat in California

Critical Habitat includes only State or County lands described within the following areas:

T.27N., R.13W. Willamette Meridian: W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ Section 2; Sections 3–11; Sections 14–18; N $\frac{1}{2}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 19; Sections 20–23; Sections 26–28; N $\frac{1}{2}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 29.

T.28N., R.13W. Willamette Meridian: Sections 22–25; W $\frac{1}{2}$ NW $\frac{1}{4}$, S $\frac{1}{2}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 26; N $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 27; SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 28; Sections 31–32; W $\frac{1}{2}$ W $\frac{1}{2}$ Section 33; E $\frac{1}{2}$ E $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 35; Section 36.

T.28N., R.14W. Willamette Meridian: E $\frac{1}{2}$ Section 36.



Map and description of WA-02-b taken from United States Fish and Wildlife Service 1:100,000 map; Forks and Mt Olympus, Washington; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.25N., R.10W. Willamette Meridian: Sections 29–30; Section 31 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 32.

Critical Habitat includes only State or County lands described within the following areas:

T.24N., R.11W. Willamette Meridian: N $\frac{1}{2}$ N $\frac{1}{2}$ Section 1; N $\frac{1}{2}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ Section 2; Sections 3–8; Section 9 except SE $\frac{1}{4}$; N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 10; NW $\frac{1}{4}$ Section 16; NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$ Section 17; Section 18 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 19.

T.24N., R.12W. Willamette Meridian: NW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 1; SE $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 2; W $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 10; Section 11; Section 12 except NE $\frac{1}{4}$ SE $\frac{1}{4}$; W $\frac{1}{2}$, W $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 13; N $\frac{1}{2}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 14; NE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 23; N $\frac{1}{2}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ Section 24.

T.25N., R.09W. Willamette Meridian: NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 6.

T.25N., R.10W. Willamette Meridian: Sections 1–11; W $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 12; NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$.

NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 14; Section 15 except SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$; Sections 16–20; N $\frac{1}{2}$ Section 21.

T.25N., R.11W. Willamette Meridian: Section 1–19; Section 20 except NE $\frac{1}{4}$ NW $\frac{1}{4}$; Sections 21–36.

T.25N., R.12W. Willamette Meridian: Section 1 except N $\frac{1}{2}$ N $\frac{1}{2}$; Section 2 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 3 except NE $\frac{1}{4}$ NW $\frac{1}{4}$; E $\frac{1}{2}$ Section 4; SE $\frac{1}{4}$ Section 5; SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 6; Section 7; N $\frac{1}{2}$ Section 8; Section 9; Section 10 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; SE $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ Section 11; Section 12; Section 13 except S $\frac{1}{2}$ SW $\frac{1}{4}$; W $\frac{1}{2}$ W $\frac{1}{2}$, E $\frac{1}{2}$ Section 14; Sections 15–16; W $\frac{1}{2}$ W $\frac{1}{2}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 17; Section 18; E $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 19; N $\frac{1}{2}$ N $\frac{1}{2}$ Section 20; N $\frac{1}{2}$ N $\frac{1}{2}$ Section 21; N $\frac{1}{2}$ N $\frac{1}{2}$ Section 22; NW $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 23; NE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ Section 24; Section 25; Section 26 except W $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$; Sections 35–36.

T.25N., R.13W. Willamette Meridian: Section 1 except NE $\frac{1}{4}$ SE $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 2 except NW $\frac{1}{4}$; NE $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ S $\frac{1}{2}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 11; Section 12; Section 13 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 14; N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 23; NE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 24.

T.26N., R.09W. Willamette Meridian: S $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 19; W $\frac{1}{2}$ Section 29; Sections 30–31; W $\frac{1}{2}$ W $\frac{1}{2}$ Section 32.

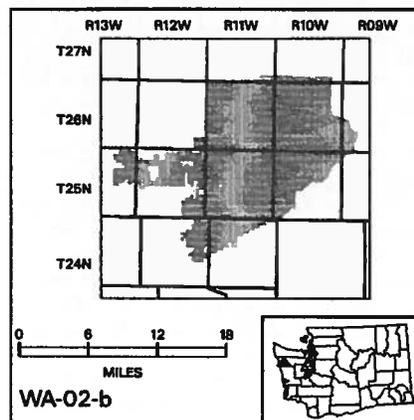
T.26N., R.10W. Willamette Meridian: Sections 2–11; W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 13; Sections 14–36.

T.26N., R.11W. Willamette Meridian: Sections 1–36.

T.26N., R.12W. Willamette Meridian: Section 36.

T.27N., R.10W. Willamette Meridian: S $\frac{1}{2}$ Section 31; S $\frac{1}{2}$ Section 32; S $\frac{1}{2}$ Section 33; S $\frac{1}{2}$ Section 34; S $\frac{1}{2}$ Section 35.

T.27N., R.11W. Willamette Meridian: SE $\frac{1}{4}$ Section 35; S $\frac{1}{2}$ Section 36.



Map and description of WA-02-c taken from United States Fish and Wildlife Service 1:100,000 map; Forks and Mt Olympus, Washington; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.23N., R.9W. Willamette Meridian: NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 6.

T.23N., R.10W. Willamette Meridian: N $\frac{1}{2}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 1; N $\frac{1}{2}$ N $\frac{1}{2}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 2; NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 3; E $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ Section 4; N $\frac{1}{2}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 15; S $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 16; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 22.

T.23N., R.11W. Willamette Meridian: E $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 1.

T.24N., R.09W. Willamette Meridian: S $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$ Section 3; Sections 4–10; Section 15 except SE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$; Sections 16–21; Sections 28–33.

T.24N., R.10W. Willamette Meridian: Sections 1–3; S $\frac{1}{2}$, NE $\frac{1}{4}$ Section 4; S $\frac{1}{2}$ Section 5; S $\frac{1}{2}$ Section 6; Sections 7–30; N $\frac{1}{2}$, N $\frac{1}{2}$ S $\frac{1}{2}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 31; Sections 32–36.

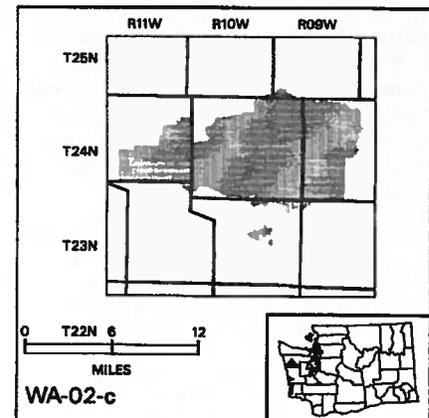
T.24N., R.10 $\frac{1}{2}$ W. Willamette Meridian: S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 1; Section 12 except W $\frac{1}{2}$ W $\frac{1}{2}$; Section 13; Section 14 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; Sections 23–26; NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 35; N $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ Section 36.

T.25N., R.09W. Willamette Meridian: S $\frac{1}{2}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 31; NW $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 32.

T.25N., R.10W. Willamette Meridian: S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 36.

Critical Habitat includes only State or County lands described within the following areas:

T.24N., R.11W. Willamette Meridian: S $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 12; Sections 13–14; SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 15; S $\frac{1}{2}$ S $\frac{1}{2}$ Section 20; S $\frac{1}{2}$ Section 21; E $\frac{1}{2}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ Section 22; Sections 23–29; Sections 32–36.



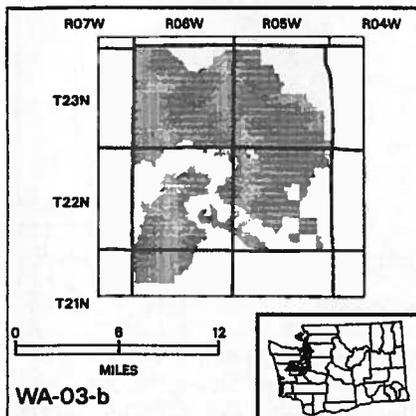
Map and description of WA-02-d taken from United States Fish and Wildlife Service 1:100,000 map; Forks, Washington; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.27N., R.11W. Willamette Meridian: N $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 27; S $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 28; NE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 29; SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 34.

SE $\frac{1}{4}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$; NW $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 24; W $\frac{1}{2}$ Section 25; Sections 26–35; Section 36 except NE $\frac{1}{4}$.

T. 23N., R.06W. Willamette Meridian: SE $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 1; E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 2; SW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 4; Sections 5–9; NW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$ Section 10; Sections 11–32; Section 33 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 34 except SW $\frac{1}{4}$; Sections 35–36.



Map and description of WA-04-a taken from United States Fish and Wildlife Service 1:100,000 map; Shelton and Chehalis River, Washington; 1995.

Critical Habitat includes only State or County lands described within the following areas:

T. 16N., R.03W. Willamette Meridian: NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$ Section 4; Sections 5–7; NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 8; NW $\frac{1}{4}$ NW $\frac{1}{4}$; NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 16; W $\frac{1}{2}$, NE $\frac{1}{4}$ Section 17; Section 18; Section 19 except S $\frac{1}{2}$ SE $\frac{1}{4}$.

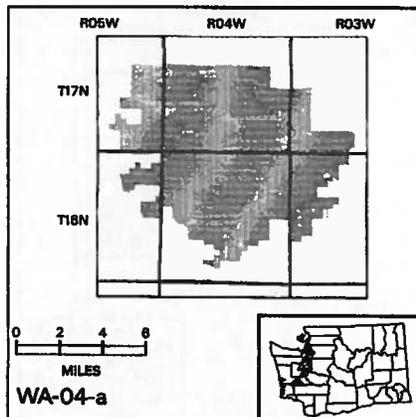
T. 16N., R.04W. Willamette Meridian: Sections 1–17; Section 18 except SW $\frac{1}{4}$; NE $\frac{1}{4}$ Section 19; Section 20 except W $\frac{1}{2}$ SW $\frac{1}{4}$; Sections 21–23; N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 26; Section 27 except E $\frac{1}{2}$ SE $\frac{1}{4}$; N $\frac{1}{2}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 28; N $\frac{1}{2}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$ Section 33.

T. 16N., R.05W. Willamette Meridian: S $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 1; S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 2; N $\frac{1}{2}$, SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 11; N $\frac{1}{2}$ Section 12; Section 13 except N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$.

T. 17N., R.03W. Willamette Meridian: Section 19; Sections 30–32; Section 33 except SE $\frac{1}{4}$ SE $\frac{1}{4}$.

T. 17N., R.04W. Willamette Meridian: Sections 14–36.

T. 17N., R.05W. Willamette Meridian: Section 13; E $\frac{1}{2}$ Section 14; S $\frac{1}{2}$, NE $\frac{1}{4}$ Section 23; Sections 24–25; NW $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ S $\frac{1}{2}$ Section 26; S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 27; Sections 35–36.



Map and description of WA-05-a taken from United States Fish and Wildlife Service 1:100,000 map; Chehalis River, Washington; 1995.

Critical Habitat includes only State or County lands described within the following areas:

T. 12N., R.08W. Willamette Meridian: Section 2 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; Sections 3–5; Section 9; Section 10 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; W $\frac{1}{2}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 11; W $\frac{1}{2}$, W $\frac{1}{2}$ NE $\frac{1}{4}$ Section 14; Sections 15–16.

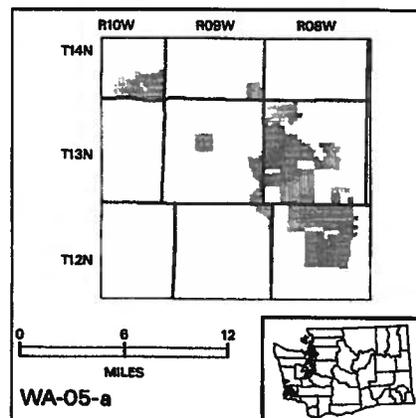
T. 12N., R.09W. Willamette Meridian: N $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 1.

T. 13N., R.08W. Willamette Meridian: SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 4; Section 5 except N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$; SE $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 6; Section 7 except SE $\frac{1}{4}$ NW $\frac{1}{4}$; NW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 8; SW $\frac{1}{4}$ Section 14; NE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 15; Sections 16–20; N $\frac{1}{2}$ Section 21; SW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$, S $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 22; W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ Section 23; Section 28–29; Section 30 except N $\frac{1}{2}$ N $\frac{1}{2}$; Sections 32–33.

T. 13N., R.09W. Willamette Meridian: Section 16; S $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 24; E $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 25; Section 36 except N $\frac{1}{2}$ NW $\frac{1}{4}$.

T. 14N., R.09W. Willamette Meridian: Section 36 except NE $\frac{1}{4}$ NE $\frac{1}{4}$.

T. 14N., R.10W. Willamette Meridian: S $\frac{1}{2}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 25; S $\frac{1}{2}$ Section 26; SE $\frac{1}{4}$ Section 27; Section 34 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 35 except NW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 36.



Map and description of WA-05-b taken from United States Fish and Wildlife Service 1:100,000 map; Astoria, Oregon-Washington; 1995.

Critical Habitat includes only State or County lands described within the following areas:

T. 10N., R.09W. Willamette Meridian: N $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 3; N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 4.

T. 11N., R.09W. Willamette Meridian: Sections 4–10; W $\frac{1}{2}$ Section 14; Sections 15–18; Section 19 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; Sections 20–22; Sections 27–29; NW $\frac{1}{4}$, E $\frac{1}{2}$ Section 33; Section 34 except SW $\frac{1}{4}$.

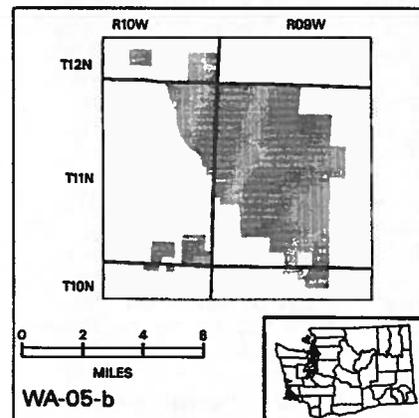
T. 11N., R.10W. Willamette Meridian: Section 1; E $\frac{1}{2}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ Section 2; E $\frac{1}{2}$ E $\frac{1}{2}$ Section 11; Section 12; N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 13; Section 36 except E $\frac{1}{2}$ SE $\frac{1}{4}$.

T. 12N., R.10W. Willamette Meridian: NW $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 34; Section 36.

Critical Habitat includes only Private lands described within the following areas:

T. 11N., R.10W. Willamette Meridian: S $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, that portion of the SE $\frac{1}{4}$ SW $\frac{1}{4}$ west of Ellsworth Creek, NW $\frac{1}{4}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 35.

T. 10N., R.10W. Willamette Meridian: NW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 2; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 3.



Map and description of WA-05-c taken from United States Fish and Wildlife Service 1:100,000 map; Astoria, Oregon-Washington; 1995.

Critical Habitat includes only State or County lands described within the following areas:

T. 10N., R.10W. Willamette Meridian: Section 36.

Critical Habitat includes only Private lands described within the following areas:

T. 09N., R.09W. Willamette Meridian: NW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$ Section 5.

T. 10N., R.09W. Willamette Meridian: That portion of the S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 32 south of Bean Creek.

T.12N, R.08W. Willamette Meridian: NE $\frac{1}{4}$ Section 1.

T.13N, R.05W. Willamette Meridian: S $\frac{1}{2}$ S $\frac{1}{2}$ Section 7; NE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 8; S $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 9; S $\frac{1}{2}$ Section 10; Sections 15–21; Section 22 except SE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ E $\frac{1}{2}$; N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 27; NE $\frac{1}{4}$ Section 28; Section 29–31; Section 32 except W $\frac{1}{2}$ SW $\frac{1}{4}$.

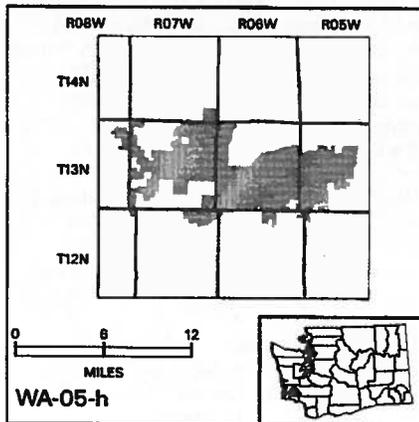
T.13N, R.06W. Willamette Meridian: NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$ Section 5; Sections 6–7; W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 8; S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 10; S $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 11; S $\frac{1}{2}$ Section 12; Sections 13–15; SE $\frac{1}{4}$ Section 16; Sections 18–33; Section 34 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 35; N $\frac{1}{2}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 36.

T.13N, R.07W. Willamette Meridian: Sections 1–2; Section 3 except N $\frac{1}{2}$ NW $\frac{1}{4}$; N $\frac{1}{2}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 6; W $\frac{1}{2}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 7; SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 9; Section 10 except NE $\frac{1}{4}$; Sections 11–16; W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 17; NW $\frac{1}{4}$, E $\frac{1}{2}$ Section 18; S $\frac{1}{2}$ NW $\frac{1}{4}$, S $\frac{1}{2}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 19; N $\frac{1}{2}$, SE $\frac{1}{4}$ Section 20; Sections 21–24; Section 27; Section 29 except W $\frac{1}{2}$ NW $\frac{1}{4}$; S $\frac{1}{2}$ Section 30; W $\frac{1}{2}$ Section 31; NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, Section 32; Section 36.

T.13N, R.08W. Willamette Meridian: S $\frac{1}{2}$ Section 1; S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 2; N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ Section 12.

T.14N, R.06W. Willamette Meridian: SW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 31.

T.14N, R.07W. Willamette Meridian: SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 34; SW $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 35; Section 36.



Map and description of WA-06-a taken from United States Fish and Wildlife Service 1:100,000 map; Port Angeles, Mt Olympuss and Seattle, Washington; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.26N., R.02W. Willamette Meridian: W $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 2; Section 3 except E $\frac{1}{2}$ NE $\frac{1}{4}$; NW $\frac{1}{4}$, E $\frac{1}{2}$ Section 4; W $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 5; Sections 6–7; W $\frac{1}{2}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 8; S $\frac{1}{2}$ S $\frac{1}{2}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 9; Section 10 except SW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 14 except E $\frac{1}{2}$ SE $\frac{1}{4}$; N $\frac{1}{2}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 15; Section 16–21; W $\frac{1}{2}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 22; Section 27 except NE $\frac{1}{4}$ NE $\frac{1}{4}$.

T.26N., R.03W. Willamette Meridian: Sections 1–3; E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$ Section 10; Sections 11–13; Section 14 except the SW $\frac{1}{4}$ SW $\frac{1}{4}$; S $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 15; S $\frac{1}{2}$ Section 16; SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 17; S $\frac{1}{2}$ N $\frac{1}{2}$, N $\frac{1}{2}$ S $\frac{1}{2}$ Section 19; S $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ Section 20; NE $\frac{1}{4}$ Section 21; N $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 22; Section 23 except SW $\frac{1}{4}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 24 except N $\frac{1}{2}$ SW $\frac{1}{4}$.

T.26N., R.04W. Willamette Meridian: E $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ Section 24.

T.27N., R.02W. Willamette Meridian: SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 5; Section 6 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 7; W $\frac{1}{2}$ W $\frac{1}{2}$ Section 8; W $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 17; Sections 18–19; Section 20 except the NE $\frac{1}{4}$ NE $\frac{1}{4}$; S $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ Section 28; Sections 29–33; W $\frac{1}{2}$, N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 34; N $\frac{1}{2}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ Section 35.

T.27N., R.03W. Willamette Meridian: Sections 1–2; N $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 3; Section 11–13; Section 14 except SW $\frac{1}{4}$ NW $\frac{1}{4}$; SE $\frac{1}{4}$ Section 15; E $\frac{1}{2}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 22; Sections 23–26; Section 27 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; S $\frac{1}{2}$ Section 28; E $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ Section 33; N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ Section 34; Sections 35–36.

T.28N., R.02W. Willamette Meridian: N $\frac{1}{2}$ N $\frac{1}{2}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 5; SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 7; S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 8; N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 17; NW $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 18; NW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 20; SW $\frac{1}{4}$ Section 28; NW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$ Section 29; SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 30; S $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 31.

T.28N., R.03W. Willamette Meridian: N $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 1; W $\frac{1}{2}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 2; Sections 3–10; W $\frac{1}{2}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 11; S $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 12; Sections 13–23; N $\frac{1}{2}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 24; N $\frac{1}{2}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 25; Sections 26–29; N $\frac{1}{2}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 30; NE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ Section 32; Section 33 except S $\frac{1}{2}$

SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$; Section 34; Section 35 except NE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$; SE $\frac{1}{4}$ Section 36.

T.28N., R.04W. Willamette Meridian: NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 1; SE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 12; S $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 13; E $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 23; Sections 24–25; SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 26; E $\frac{1}{2}$ W $\frac{1}{2}$, E $\frac{1}{2}$ Section 35; NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 36.

T.29N., R.02W. Willamette Meridian: W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 30; SW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 31; W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 32.

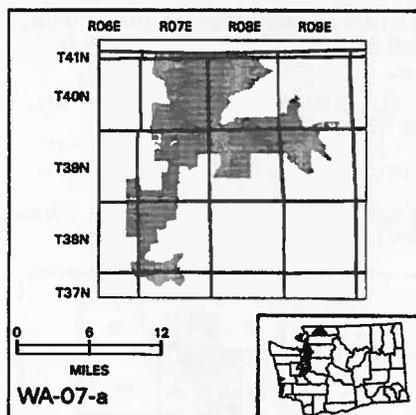
T.29N., R.03W. Willamette Meridian: Section 19; NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 20; SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 22; SE $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 23; Section 24 except NE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 25; N $\frac{1}{2}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 26; S $\frac{1}{2}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 27; SE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ Section 28; Section 29 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; Sections 30–34; S $\frac{1}{2}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 35; Section 36.

T.29N., R.04W. Willamette Meridian: S $\frac{1}{2}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 19; S $\frac{1}{2}$ Section 20; S $\frac{1}{2}$ Section 21; E $\frac{1}{2}$ W $\frac{1}{2}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 22; E $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{2}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 23; Section 24 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; W $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ Section 26; N $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 27; Sections 28–30; N $\frac{1}{2}$ Section 32; N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 33; E $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 34; W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 35; Section 36 except SW $\frac{1}{4}$ SW $\frac{1}{4}$.

Critical Habitat includes only State or County lands described within the following areas:

T.29N., R.03W. Willamette Meridian: W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 4; S $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 5; SW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 6; Section 7 except E $\frac{1}{2}$ NW $\frac{1}{4}$; Sections 8–9; W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 10; NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 11; NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 13; Section 14 except W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$; N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 15; W $\frac{1}{2}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 16; Section 17; NW $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ Section 18; S $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 21; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 28.

T.29N., R.04W. Willamette Meridian: E $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 1; E $\frac{1}{2}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 12; E $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 18.



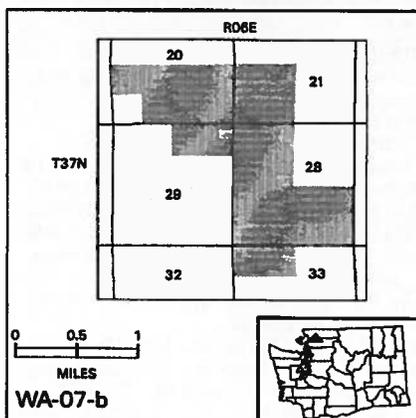
Map and description of WA-07-b taken from United States Fish and Wildlife Service 1:100,000 map; Bellingham, Washington; 1995.

Critical Habitat includes only State or County lands described within the following areas:

T.37N., R.06E. Willamette Meridian: SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 20; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 28.

Critical Habitat includes only Private lands described within the following areas:

T.37N., R.06E. Willamette Meridian: N $\frac{1}{2}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 20; SW $\frac{1}{4}$ Section 21; Section 28 except NE $\frac{1}{4}$; N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 29; N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 33.



Map and description of WA-07-c taken from United States Fish and Wildlife Service 1:100,000 map; Mt Baker and Sauk River, Washington; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.35N., R.09E. Willamette Meridian: Sections 1-2; E $\frac{1}{2}$ W $\frac{1}{2}$, E $\frac{1}{2}$ Section 11; Section 12; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 13; NE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 14.

T.35N., R.10E. Willamette Meridian: W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 6; Section 7; Section 8 except N $\frac{1}{2}$ NE $\frac{1}{4}$; W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 9; N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 17; N $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ Section 18.

T.36N., R.07E. Willamette Meridian: Section 1; E $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 2; Section 3; E $\frac{1}{2}$ E $\frac{1}{2}$ Section 4.

T.36N., R.08E. Willamette Meridian: Section 5; W $\frac{1}{2}$ W $\frac{1}{2}$ Section 6.

T.36N., R.09E. Willamette Meridian: Sections 1-4; E $\frac{1}{2}$ Section 5; Section 8 except S $\frac{1}{2}$ SE $\frac{1}{4}$; W $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 9; N $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 10; Section 11 except S $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$; Sections 12-15; Sections 21-24; S $\frac{1}{2}$ NW $\frac{1}{4}$ Section 26; Section 27 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 28 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; S $\frac{1}{2}$, S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 33.

T.36N., R.10E. Willamette Meridian: SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 5; S $\frac{1}{2}$ S $\frac{1}{2}$ Section 6; Section 7; W $\frac{1}{2}$ W $\frac{1}{2}$ Section 8; W $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 17; Sections 18-20; SW $\frac{1}{4}$ Section 21; W $\frac{1}{2}$ Section 28; Sections 29-30; N $\frac{1}{2}$, SW $\frac{1}{4}$ Section 31; N $\frac{1}{2}$ N $\frac{1}{2}$ Section 32; N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 33.

T.37N., R.07E. Willamette Meridian: S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 9; S $\frac{1}{2}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 10; S $\frac{1}{2}$, NE $\frac{1}{4}$ Section 11; SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 12; W $\frac{1}{2}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 13; Sections 14-15; Section 16 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 17; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 20; Sections 21-27; Section 28 except E $\frac{1}{2}$ E $\frac{1}{2}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$; E $\frac{1}{2}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 33; Sections 34-36.

T.37N., R.08E. Willamette Meridian: Sections 1-3; N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 4; NE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 7; S $\frac{1}{2}$ Section 8; Section 9 except N $\frac{1}{2}$ NW $\frac{1}{4}$; Sections 10-16; N $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 17; SW $\frac{1}{4}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 18; Section 19; Section 20 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 21 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; Sections 22-36.

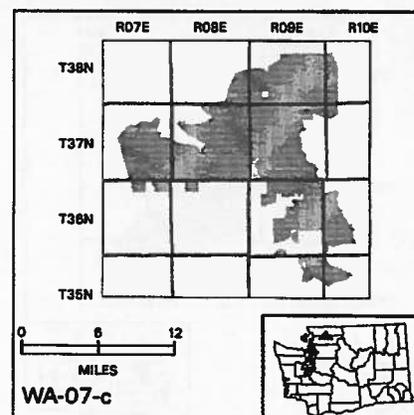
T.37N., R.09E. Willamette Meridian: Sections 1-10; N $\frac{1}{2}$ N $\frac{1}{2}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 11; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 12; N $\frac{1}{2}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 14; Sections 15-22; W $\frac{1}{2}$ W $\frac{1}{2}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 23; SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 25; W $\frac{1}{2}$, SE $\frac{1}{4}$ Section 26; Sections 27-29; Section 30 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 31 except NW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$; Sections 32-35; W $\frac{1}{2}$ Section 36.

T.37N., R.10E. Willamette Meridian: Section 6; N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 7.

T.38N., R.08E. Willamette Meridian: E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 23; S $\frac{1}{2}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 24; Section 25; E $\frac{1}{2}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 26; S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 33; S $\frac{1}{2}$ S $\frac{1}{2}$ Section 34; Section 35 except W $\frac{1}{2}$ NW $\frac{1}{4}$; Section 36.

T.38N., R.09E. Willamette Meridian: Sections 13-15; Section 16 except W $\frac{1}{2}$ NW $\frac{1}{4}$; S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 17; Section 19 except N $\frac{1}{2}$ N $\frac{1}{2}$; Section 20 except N $\frac{1}{2}$ NW $\frac{1}{4}$; Sections 21-31; Section 32 except NW $\frac{1}{4}$; Sections 33-36.

T.38N., R.10E. Willamette Meridian: Section 18 except N $\frac{1}{2}$ NE $\frac{1}{4}$; Section 19; Sections 30-31.



Map and description of WA-07-d taken from United States Fish and Wildlife Service 1:100,000 map; Cape Flattery, Mt Baker and Sauk River, Washington; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.34N, R.12E. Willamette Meridian: Sections 1-3; NE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 10; N $\frac{1}{2}$ N $\frac{1}{2}$ Section 11; N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 12.

T.34N, R.13E. Willamette Meridian: W $\frac{1}{2}$ Section 4; Sections 5-6; N $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 8; NW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$ Section 9.

T.35N, R.11E. Willamette Meridian: N $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 1; N $\frac{1}{2}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 2; N $\frac{1}{2}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 3; Section 4.

T.35N, R.12E. Willamette Meridian: S $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 5; W $\frac{1}{2}$, SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 6; Sections 7-8; Section 9 except NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$; SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 10; N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 13; Section 14 except S $\frac{1}{2}$ SE $\frac{1}{4}$; Sections 15-18; Section 19 except SW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$; Sections 20-22; NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 23; S $\frac{1}{2}$, S $\frac{1}{2}$ N $\frac{1}{2}$ Section 25; S $\frac{1}{2}$, S $\frac{1}{2}$ N $\frac{1}{2}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 26; Sections 27-29; NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 30; NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 31; Sections 32-36.

T.35N, R.13E. Willamette Meridian: SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 30; Section 31 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 32; S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 33.

T.36N, R.11E. Willamette Meridian: SE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 23; SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 24; W $\frac{1}{2}$ Section 25; Section 26; Section 27 except N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$; E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 28; Sections 33-35; Section 36 except E $\frac{1}{2}$ NE $\frac{1}{4}$.

28; N $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 29; Section 30 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 31 except N $\frac{1}{2}$ NE $\frac{1}{4}$; SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 32; NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 33; Sections 34–36.

T.30N., R.11E. Willamette Meridian: SW $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ Section 5; Sections 6–8; SW $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 9; Section 10 except N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$; Section 15 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; Sections 16–22; NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 27; Section 28 except E $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$; Sections 29–31; Section 32 except SE $\frac{1}{4}$; Section 33 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 34 except NE $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$.

T.31N., R.07E. Willamette Meridian: S $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 1; Sections 12–13.

T.31N., R.08E. Willamette Meridian: W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 3; S $\frac{1}{2}$ Section 4; S $\frac{1}{2}$ Section 5; SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 6; Section 7; Section 8 except S $\frac{1}{2}$ SE $\frac{1}{4}$; N $\frac{1}{2}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 9; W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 10; W $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 17; Sections 18–21; Section 22 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; S $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 23; Section 25 except N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$; Sections 26–36.

T.31N., R.09E. Willamette Meridian: Section 1; E $\frac{1}{2}$ E $\frac{1}{2}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 2; E $\frac{1}{2}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 3; E $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$ Section 10; NE $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ Section 12; Section 13 except W $\frac{1}{2}$ NW $\frac{1}{4}$; Section 23 except N $\frac{1}{2}$ NW $\frac{1}{4}$; Sections 24–26; S $\frac{1}{2}$ Section 27; N $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 28; W $\frac{1}{2}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 31; N $\frac{1}{2}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ Section 35; Section 36.

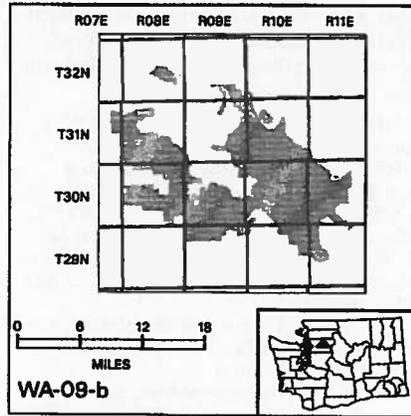
T.31N., R.10E. Willamette Meridian: Section 6 except E $\frac{1}{2}$ E $\frac{1}{2}$; Sections 7–8; W $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 9; SE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 10; Section 15 except E $\frac{1}{2}$ E $\frac{1}{2}$; NW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 16; Sections 17–21; Section 22 except E $\frac{1}{2}$ NE $\frac{1}{2}$; SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 23; SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 25; Section 26 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; Sections 27–36.

T.31N., R.11E. Willamette Meridian: W $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ Section 31.

T.32N., R.08E. Willamette Meridian: SW $\frac{1}{4}$ Section 14; S $\frac{1}{2}$ Section 15; E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 21; N $\frac{1}{2}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 22; Section 23 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; W $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 24; W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 25; N $\frac{1}{2}$ N $\frac{1}{2}$ Section 26.

T.32N., R.09E. Willamette Meridian: S $\frac{1}{2}$ Section 26; N $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 27; N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 28; E $\frac{1}{2}$ Section 34; E $\frac{1}{2}$, N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 35; Section 36 except NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$.

T.32N., R.10E. Willamette Meridian: Section 31 except E $\frac{1}{2}$ E $\frac{1}{2}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$.



Map and description of WA-09-c taken from United States Fish and Wildlife Service 1:100,000 map; Sauk River and Skykomish River, Washington; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.27N., R.09E. Willamette Meridian: E $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ Section 1.

T.27N., R.10E. Willamette Meridian: N $\frac{1}{2}$ N $\frac{1}{2}$ Section 6.

T.28N., R.09E. Willamette Meridian: S $\frac{1}{2}$ S $\frac{1}{2}$ Section 23; S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 24; Section 25; Section 26 except N $\frac{1}{2}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$; SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 36.

T.28N., R.10E. Willamette Meridian: S $\frac{1}{2}$ Section 19; Section 20 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; SW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 21; SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 23; S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 24; NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$ Section 25; S $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 26; S $\frac{1}{2}$ Section 27; NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 29; N $\frac{1}{2}$, SW $\frac{1}{4}$ Section 30; Section 31 except SW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 32 except E $\frac{1}{2}$ E $\frac{1}{2}$.

T.29N., R.08E. Willamette Meridian: SE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 22; NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 25; NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 27; E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 28.

T.29N., R.09E. Willamette Meridian: Section 30 except N $\frac{1}{2}$ N $\frac{1}{2}$.

Critical Habitat includes only State or County lands described within the following areas:

T.27N., R.09E. Willamette Meridian: NW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ Section 2; N $\frac{1}{2}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 3; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 4; N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 10; NW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 11; Section 12; Section 13 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; N $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 14.

T.27N., R.10E. Willamette Meridian: Section 7; S $\frac{1}{2}$ Section 8; Section 9 except N $\frac{1}{2}$ NW $\frac{1}{4}$; NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 10; N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 16; N $\frac{1}{2}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 17; Section 18 except W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$.

T.28N., R.08E. Willamette Meridian: Sections 1–2; Section 3 except N $\frac{1}{2}$ NW $\frac{1}{4}$; Sections 4–5; W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 6; Section 7; E $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 8; SE $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ E $\frac{1}{2}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$

Section 9; Sections 10–12; N $\frac{1}{2}$ N $\frac{1}{2}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 13; N $\frac{1}{2}$ Section 14; Section 15; S $\frac{1}{2}$ S $\frac{1}{2}$, E $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 16; Section 17 except NW $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$; Section 18 except SW $\frac{1}{4}$; W $\frac{1}{2}$ Section 20; N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 21; NE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ Section 36.

T.28N., R.09E. Willamette Meridian: Sections 1–4; S $\frac{1}{2}$ Section 5; N $\frac{1}{2}$, SW $\frac{1}{4}$ Section 6; W $\frac{1}{2}$, W $\frac{1}{2}$ E $\frac{1}{2}$ Section 7; NE $\frac{1}{4}$ Section 8; Sections 9–11; Section 12 except S $\frac{1}{2}$ SE $\frac{1}{4}$; S $\frac{1}{2}$ S $\frac{1}{2}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 13; Sections 14–16; N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ Section 17; SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 20; Section 21; Section 27; Section 28 except E $\frac{1}{2}$ SW $\frac{1}{4}$; Section 29 except NW $\frac{1}{4}$; N $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 31; N $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$ NW $\frac{1}{4}$ Section 32; N $\frac{1}{2}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ Section 33; Section 34 except NE $\frac{1}{4}$ SE $\frac{1}{4}$; SW $\frac{1}{4}$ Section 35.

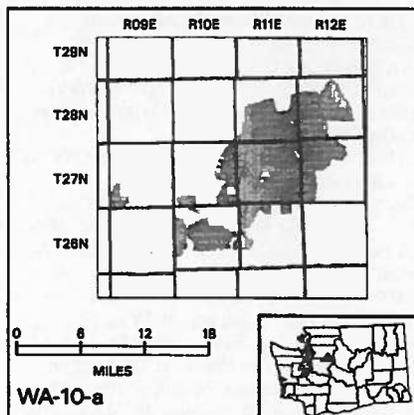
T.28N., R.10E. Willamette Meridian: W $\frac{1}{2}$ Section 2; Section 3; Section 4 except N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$; Sections 5–6; NW $\frac{1}{4}$ Section 7.

T.29N., R.08E. Willamette Meridian: Sections 1–21; Section 22 except SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$; Section 23 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 24; N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$, S $\frac{1}{2}$ S $\frac{1}{2}$ Section 25; SW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 26; Section 27 except NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$; N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 28; Sections 29–30; Sections 32–34; Section 35 except S $\frac{1}{2}$ SW $\frac{1}{4}$; Section 36.

T.29N., R.09E. Willamette Meridian: S $\frac{1}{2}$ Section 2; S $\frac{1}{2}$ Section 7; S $\frac{1}{2}$ Section 8; S $\frac{1}{2}$ Section 9; S $\frac{1}{2}$, NE $\frac{1}{4}$ Section 10; Sections 11–12; W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 13; Sections 14–19; Section 20 except S $\frac{1}{2}$ SW $\frac{1}{4}$; Section 21; Section 22 except S $\frac{1}{2}$ S $\frac{1}{2}$; Section 23 except S $\frac{1}{2}$ S $\frac{1}{2}$; NE $\frac{1}{4}$ Section 24; Section 25; Section 26 except NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$; SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 27; S $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 29; N $\frac{1}{2}$ N $\frac{1}{2}$ Section 30; W $\frac{1}{2}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 31; Section 32 except W $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 33 except NE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$; Section 34 except SW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$; Sections 35–36.

T.29N., R.10E. Willamette Meridian: Section 4 except W $\frac{1}{2}$ SW $\frac{1}{4}$; SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 6; Sections 7–8; S $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 9; Section 10 except SE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 14; Section 15 except N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$; Sections 16–24; Section 25 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 26 except NW $\frac{1}{4}$ SW $\frac{1}{4}$; Sections 28–33; SW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 34; Section 36.

T.30N., R.10E. Willamette Meridian: S $\frac{1}{2}$ Section 27; S $\frac{1}{2}$ Section 28; Sections 29–34; SW $\frac{1}{4}$ Section 35; Section 36.



Map and description of WA-10-b taken from United States Fish and Wildlife Service 1:100,000 map; Skykomish River, Washington; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.25N., R.10E. Willamette Meridian: Sections 3-5; S $\frac{1}{2}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 6; Sections 7-8; W $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 9; NE $\frac{1}{4}$ Section 10; W $\frac{1}{2}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 16; Section 17; N $\frac{1}{2}$, SE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 18; NE $\frac{1}{4}$ Section 20; N $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 21; W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ Section 22; SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 23; W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 25; NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 26; NE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 27.

T.25N., R.11E. Willamette Meridian: Sections 1-4; Sections 9-12; N $\frac{1}{2}$, N $\frac{1}{2}$ S $\frac{1}{2}$ Section 13; N $\frac{1}{2}$, N $\frac{1}{2}$ S $\frac{1}{2}$ Section 14; Section 15; N $\frac{1}{2}$, SW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section

16; SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 17; SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 19; NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 20; Section 22 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; W $\frac{1}{2}$ W $\frac{1}{2}$ Section 23; NE $\frac{1}{4}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 27.

T.25N., R.12E. Willamette Meridian: Sections 1-5; W $\frac{1}{2}$ Section 6; Section 7; Section 8 except NE $\frac{1}{4}$ NW $\frac{1}{4}$; Sections 9-13; N $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 14; Sections 16-20; NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 21; W $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 28; N $\frac{1}{2}$, N $\frac{1}{2}$ S $\frac{1}{2}$ Section 29; NE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 30.

T.25N., R.13E. Willamette Meridian: W $\frac{1}{2}$ W $\frac{1}{2}$ Section 6; W $\frac{1}{2}$ Section 7; W $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 18; W $\frac{1}{2}$ Section 19.

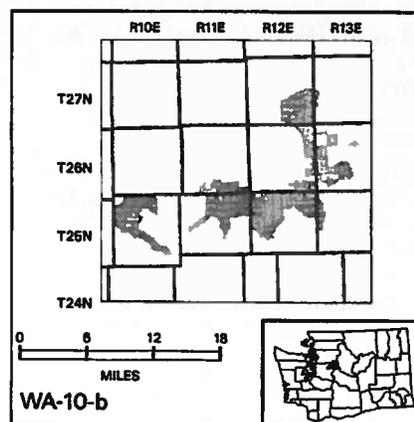
T.26N., R.11E. Willamette Meridian: S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 27; SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 28; S $\frac{1}{2}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ Section 32; N $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ Section 33; Sections 34-35; S $\frac{1}{2}$ Section 36.

T.26N., R.12E. Willamette Meridian: Section 1; NW $\frac{1}{4}$, E $\frac{1}{2}$ Section 2; N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 3; E $\frac{1}{2}$ E $\frac{1}{2}$ Section 11; Sections 12-13; E $\frac{1}{2}$ E $\frac{1}{2}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 24; N $\frac{1}{2}$, N $\frac{1}{2}$ S $\frac{1}{2}$ Section 25; S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 34; Sections 35-36.

T.26N., R.13E. Willamette Meridian: S $\frac{1}{2}$ S $\frac{1}{2}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 6; Section 8; S $\frac{1}{2}$ Section 10; Sections 18-19; W $\frac{1}{2}$ W $\frac{1}{2}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 20; S $\frac{1}{2}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 21; W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 22; W $\frac{1}{2}$ Section 27; Section 28 except SW $\frac{1}{4}$ SE $\frac{1}{4}$; N $\frac{1}{2}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ S $\frac{1}{2}$ Section 29; N $\frac{1}{2}$, SW $\frac{1}{4}$ Section 30; E $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 31; N $\frac{1}{2}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ Section 32.

T.27N., R.12E. Willamette Meridian: S $\frac{1}{2}$ S $\frac{1}{2}$ Section 13; NE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 22; Section 23 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; Sections 24-27; Section 34 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; Sections 35-36.

T.27N., R.13E. Willamette Meridian: SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 18; W $\frac{1}{2}$ Section 19; NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 30.



Map and description of WA-10-c taken from United States Fish and Wildlife Service 1:100,000 map; Cape Flattery, Skykomish River and Snoqualmie Pass, Washington; 1995.

Critical Habitat includes only Federal lands designated as Late Successional

Reserves described within the following areas:

T.20N., R.10E. Willamette Meridian: S $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$ Section 2.

T.21N., R.10E. Willamette Meridian: NE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 36.

T.22N., R.09E. Willamette Meridian: S $\frac{1}{2}$ S $\frac{1}{2}$ Section 2; N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$

Section 11; W $\frac{1}{2}$ NW $\frac{1}{4}$, S $\frac{1}{2}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 12.

T.22N., R.10E. Willamette Meridian: S $\frac{1}{2}$, NE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$ Section 13; S $\frac{1}{2}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 14; W $\frac{1}{2}$, SE $\frac{1}{4}$ Section 18; Section 20; S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 22; Sections 23-26; SE $\frac{1}{4}$ Section 28; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 34; N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 35; N $\frac{1}{2}$ N $\frac{1}{2}$ Section 36.

Wildlife Service 1:100,000 map; Mt. Rainier, Washington; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.13N., R.07E. Willamette Meridian: Section 10; Section 12; Section 14; Section 22.

T.13N., R.08E. Willamette Meridian: Sections 1-8; Section 9 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; N $\frac{1}{2}$ N $\frac{1}{2}$ Section 10; N $\frac{1}{2}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 11; N $\frac{1}{2}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 12; W $\frac{1}{2}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 16; Section 17; Section 18 except S $\frac{1}{2}$ S $\frac{1}{2}$; N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 20; NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ Section 21.

T.13N., R.09E. Willamette Meridian: NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 3; Section 4 except S $\frac{1}{2}$ SE $\frac{1}{4}$; Sections 5-6; N $\frac{1}{2}$, N $\frac{1}{2}$ S $\frac{1}{2}$ Section 7; N $\frac{1}{2}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ Section 8; N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 9.

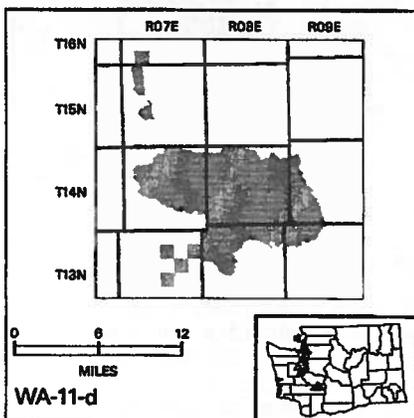
T.14N., R.07E. Willamette Meridian: SW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ Section 1; Section 2 except N $\frac{1}{2}$ NE $\frac{1}{4}$; Section 3; S $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 4; E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 7; S $\frac{1}{2}$, S $\frac{1}{2}$ N $\frac{1}{2}$ Section 8; Sections 9-17; N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 18; Section 20 except SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$; N $\frac{1}{2}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 21; Sections 22-24; Section 25 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 26 except S $\frac{1}{2}$ S $\frac{1}{2}$; N $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 27; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 28; NE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 36.

T.14N., R.08E. Willamette Meridian: S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 2; SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 3; Section 4; Section 5 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; SW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ Section 6; Sections 7-36.

T.14N., R.09E. Willamette Meridian: Section 7; W $\frac{1}{2}$ W $\frac{1}{2}$ Section 8; W $\frac{1}{2}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 17; Sections 18-19; Section 20 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 21; W $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 28; Section 29-32; Section 33 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 34.

T.15N., R.07E. Willamette Meridian: W $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 5; E $\frac{1}{2}$ E $\frac{1}{2}$ Section 6; E $\frac{1}{2}$ E $\frac{1}{2}$ Section 7; W $\frac{1}{2}$, W $\frac{1}{2}$ E $\frac{1}{2}$ Section 8; SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 16; N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 17; S $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ Section 20; W $\frac{1}{2}$ W $\frac{1}{2}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 21; S $\frac{1}{2}$ S $\frac{1}{2}$ Section 34.

T.16N., R.07E. Willamette Meridian: Section 32.



Map and description of OR-01-a taken from United States Fish and Wildlife Service 1:100,000 map; Astoria, Nehalem River, Oregon; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.05N., R.07W. Willamette Meridian: S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 3; N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 10.

Critical Habitat includes only State lands described within the following areas:

T.08N., R.06W. Willamette Meridian: W $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 17; Section 18 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 19; W $\frac{1}{2}$ W $\frac{1}{2}$ Section 20; W $\frac{1}{2}$ Section 28; E $\frac{1}{2}$ Section 29; NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ Section 30; W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 31; E $\frac{1}{2}$ Section 32; W $\frac{1}{2}$ Section 33.

T.08N., R.07W. Willamette Meridian: Section 13; E $\frac{1}{2}$ Section 14; Section 23 except NW $\frac{1}{4}$; Section 24-26; Section 36.

T.07N., R.06W. Willamette Meridian: N $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 2; W $\frac{1}{2}$ W $\frac{1}{2}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 3; Section 4; Sections 9-11; Sections 13-14; Section 16; Sections 25-36.

T.07N., R.07W. Willamette Meridian: Sections 30-31; NW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 32.

T.07N., R.08W. Willamette Meridian: Section 22 except N $\frac{1}{2}$ N $\frac{1}{2}$; Section 23 except N $\frac{1}{2}$ NW $\frac{1}{4}$; Section 24 except NE $\frac{1}{4}$; Section 25; Section 26 except S $\frac{1}{2}$ SW $\frac{1}{4}$; N $\frac{1}{2}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 27; NE $\frac{1}{4}$ Section 28; S $\frac{1}{2}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 35; Section 36.

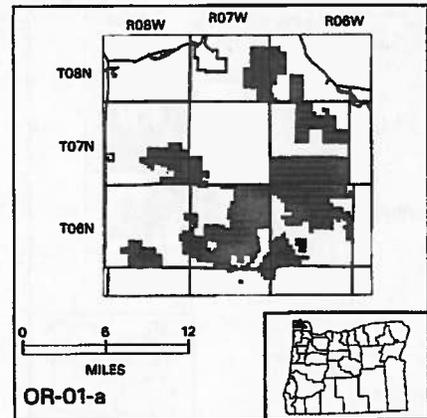
T.06N., R.06W. Willamette Meridian: Section 1 except N $\frac{1}{2}$ NE $\frac{1}{4}$; Sections 2-6; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 7; Sections 8-10; S $\frac{1}{2}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$ Section 11; W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 12; Section 13 except SW $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 14 except S $\frac{1}{2}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$; Section 15; Section 16 except SW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 17 except N $\frac{1}{2}$ NW $\frac{1}{4}$; SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 18; S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 19; E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 21; N $\frac{1}{2}$ N $\frac{1}{2}$ Section 22; N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 23; NE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ Section 24; W $\frac{1}{2}$ Section 28; SW $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 29; Sections 30-32; S $\frac{1}{2}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 33.

T.06N., R.07W. Willamette Meridian: Sections 1-3; N $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 4; NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 5; N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 6; E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 9; Sections 10-15; NE $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 16; S $\frac{1}{2}$ S $\frac{1}{2}$ Section 17; W $\frac{1}{2}$ Section 18; S $\frac{1}{2}$, W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 19; Sections 20-23; W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 24; W $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 25; Sections 26-28; S $\frac{1}{2}$, W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 29; Section 30; NE $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 31; E $\frac{1}{2}$ SE $\frac{1}{4}$, N $\frac{1}{2}$ Section 32; Section 33; NE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 34; N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 35; E $\frac{1}{2}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 36.

T.06N., R.08W. Willamette Meridian: NE $\frac{1}{4}$ Section 13; SE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 24; E $\frac{1}{2}$ Section 25; SW $\frac{1}{4}$ Section 27; Section 28 except NE $\frac{1}{4}$; Section 29 except NW $\frac{1}{4}$; E $\frac{1}{2}$ Section 32; Sections 33-34.

T.05N., R.06W. Willamette Meridian: N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 6.

T.05N., R.07W. Willamette Meridian: E $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 1; N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 3; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 4.



Map and description of OR-01-b taken from United States Fish and Wildlife Service 1:100,000 map; Nehalem River, Oregon; 1995.

Critical Habitat includes only State lands described within the following areas:

T.03N., R.08W. Willamette Meridian: Sections 6-7; Sections 16-17; Section 18 south of Foss River; Sections 19-21; Sections 27-28.

T.03N., R.09W. Willamette Meridian: Section 1 except W $\frac{1}{2}$ NW $\frac{1}{4}$; SE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 2; NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 3; E $\frac{1}{2}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 4; Section 5 except W $\frac{1}{2}$ NW $\frac{1}{4}$; Section 8 except SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$; Sections 9-16; Section 21 except W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$; Section 23 lying N of Foss River; E $\frac{1}{2}$, NW $\frac{1}{4}$ Section 24 lying N of Foss River; Section 28.

T.03N., R.10W. Willamette Meridian: W $\frac{1}{2}$ 2 Section 1; Section 2 except NW $\frac{1}{4}$; SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 5; Section 6 except NW $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 7; N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 8; W $\frac{1}{2}$ NE $\frac{1}{4}$ Section 11; Section 12 except E $\frac{1}{2}$ E $\frac{1}{2}$, W $\frac{1}{2}$ SW $\frac{1}{4}$; NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 13; S $\frac{1}{2}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 17; Section 18 except N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$.

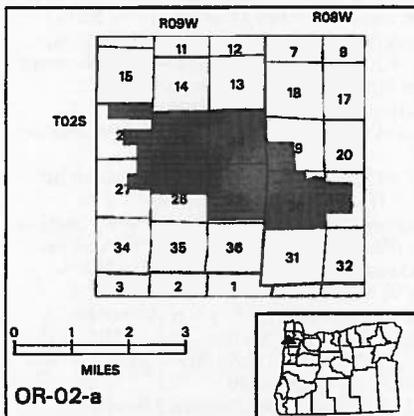
T.03N., R.11W. Willamette Meridian: S $\frac{1}{2}$ Section 1; Section 12.

T.04N., R.08W. Willamette Meridian: SW $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 8; SE $\frac{1}{4}$ Section 10; S $\frac{1}{2}$ S $\frac{1}{2}$, W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 14; Section 15 except NW $\frac{1}{4}$; Section 17 except NW $\frac{1}{4}$ SW $\frac{1}{4}$; Sections 19-20; Section 21 except N $\frac{1}{2}$ NW $\frac{1}{4}$; Section 22 except S $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$; E $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$ Section 23; Section 27-29; SE $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 31; Sections 32-34.

T.04N., R.09W. Willamette Meridian: Section 10 except NW $\frac{1}{4}$; SW $\frac{1}{4}$ Section 11; Sections 13-14; NE $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 15; NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 22; Section 23 except S $\frac{1}{2}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$; N $\frac{1}{2}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 24; SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 28; Section 32 except W $\frac{1}{2}$ W $\frac{1}{2}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$; W $\frac{1}{2}$ W $\frac{1}{2}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 33; Section 34 except N $\frac{1}{2}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$; SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 35.

T.04N., R.10W. Willamette Meridian: S $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 30; E $\frac{1}{2}$ W $\frac{1}{2}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 31.

NE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$; Sections 23–25; N $\frac{1}{2}$ Section 26; E $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 27.
T.02S., R.08W. Willamette Meridian: SW $\frac{1}{4}$ Section 19; N $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ Section 29; Section 30.



Map and description of OR-02-b taken from United States Fish and Wildlife Service 1:100,000 map; Yamhill River, Oregon; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.03S., R.09W. Willamette Meridian: SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 3; S $\frac{1}{2}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$; Section 4; E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 8; Section 9; Section 10 except N $\frac{1}{2}$ SE $\frac{1}{4}$; NW $\frac{1}{4}$ Section 15; N $\frac{1}{2}$ Section 16; S $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ Section 19; S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 32.

T.03S., R.10W. Willamette Meridian: SE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 22; Section 23 except N $\frac{1}{2}$ NW $\frac{1}{4}$; S $\frac{1}{2}$, E $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 24; W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 25; Section 26; Section 27 except SW $\frac{1}{4}$ NE $\frac{1}{4}$; E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$ Section 28; Section 32 except N $\frac{1}{2}$ N $\frac{1}{2}$, W $\frac{1}{2}$ SW $\frac{1}{4}$; Section 33; N $\frac{1}{2}$ NE $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ Section 34; Section 35 except S $\frac{1}{2}$ S $\frac{1}{2}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$.

T.04S., R.09W. Willamette Meridian: S $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 4; W $\frac{1}{2}$, W $\frac{1}{2}$ E $\frac{1}{2}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 5; Section 6 except W $\frac{1}{2}$ W $\frac{1}{2}$; Section 7 except W $\frac{1}{2}$ NW $\frac{1}{4}$; Sections 8–9; SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$ Section 10; NW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$ Section 15; N $\frac{1}{2}$, SE $\frac{1}{4}$ Section 16; N $\frac{1}{2}$ Section 17; N $\frac{1}{2}$ Section 18.

T.04S., R.10W. Willamette Meridian: SW $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ E $\frac{1}{2}$ Section 3; E $\frac{1}{2}$, N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 4; N $\frac{1}{2}$, SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 5; E $\frac{1}{2}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ Section 6; N $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 7; NE $\frac{1}{4}$ Section 9.

T.05S., R.09W. Willamette Meridian: SW $\frac{1}{4}$ Section 5; SE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 6; Section 7; W $\frac{1}{2}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 8; NW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ Section 17; Section 18; N $\frac{1}{2}$ Section 19; NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 20.

T.05S., R.10W. Willamette Meridian: Section 1; Section 2 except S $\frac{1}{2}$ S $\frac{1}{2}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$; NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 3; S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 4; N $\frac{1}{2}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 10; NW $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$

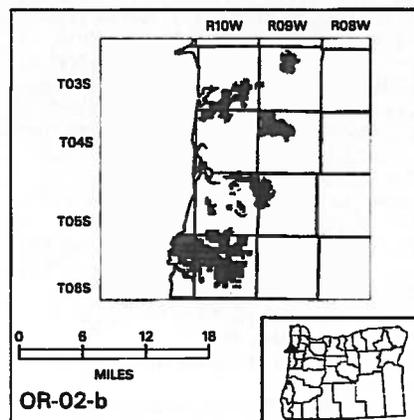
SW $\frac{1}{4}$ Section 11; E $\frac{1}{2}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 12; NE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ Section 13; SW $\frac{1}{4}$ Section 14; SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 17; Section 20 except W $\frac{1}{2}$ W $\frac{1}{2}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$; NW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 22; SE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, N $\frac{1}{2}$ N $\frac{1}{2}$ Section 23; NW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$ Section 24; N $\frac{1}{2}$ N $\frac{1}{2}$ Section 26; S $\frac{1}{2}$ Section 32; S $\frac{1}{2}$ S $\frac{1}{2}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 33; W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 34.

T.06S., R.10W. Willamette Meridian: Section 2; W $\frac{1}{2}$ W $\frac{1}{2}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 3; Section 4; N $\frac{1}{2}$ S $\frac{1}{2}$, N $\frac{1}{2}$ Section 5; W $\frac{1}{2}$ W $\frac{1}{2}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 6; Section 7; Section 8 except N $\frac{1}{2}$ NE $\frac{1}{4}$; Section 9 except NW $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$; Section 10; Section 11 except NE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$; SW $\frac{1}{4}$ Section 12; S $\frac{1}{2}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 14; W $\frac{1}{2}$, SE $\frac{1}{4}$ Section 15; Section 16 except N $\frac{1}{2}$ NE $\frac{1}{4}$; Section 17–18; NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ E $\frac{1}{2}$ Section 19; W $\frac{1}{2}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$ Section 20; Sections 21–22; W $\frac{1}{2}$, W $\frac{1}{2}$ E $\frac{1}{2}$ Section 23; S $\frac{1}{2}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 26; W $\frac{1}{2}$ W $\frac{1}{2}$, NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 27; Section 28 except SW $\frac{1}{4}$ NW $\frac{1}{4}$; NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 30.

T.06S., R.11W. Willamette Meridian: Section 1–2; Section 11; Section 12; Section 13 except SE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$; NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 14; Section 24 except SE $\frac{1}{4}$ SE $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$.

Critical Habitat includes only State lands described within the following areas:

T.05S., R.10W. Willamette Meridian: S $\frac{1}{2}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 10; E $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 11.



Map and description of OR-02-c taken from United States Fish and Wildlife Service 1:100,000 map; Yamhill River and Corvallis, Oregon; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

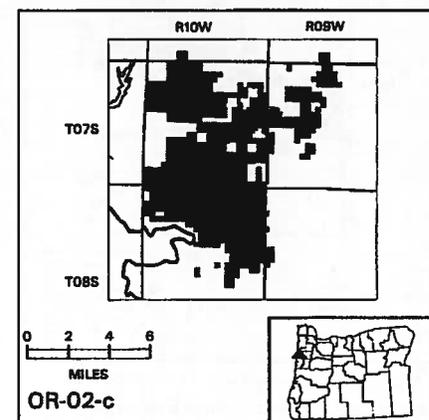
T.06S., R.10W. Willamette Meridian: SE $\frac{1}{4}$ Section 32.

T.07S., R.09W. Willamette Meridian: SW $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 3; SE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$

SW $\frac{1}{4}$ Section 4; W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 5; Section 8 except S $\frac{1}{2}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$; Section 9 except N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 16 except E $\frac{1}{2}$ E $\frac{1}{2}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$; S $\frac{1}{2}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 17; Section 18 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; SW $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$ Section 19; NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 20; W $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 21; N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 28; SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 29; N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 30.

T.07S., R.10W. Willamette Meridian: SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 3; Section 4 except E $\frac{1}{2}$ NE $\frac{1}{4}$; Section 5; Sections 7–9; Section 10 except E $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$; N $\frac{1}{2}$ S $\frac{1}{2}$, E $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 11; Section 12 except S $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$; Section 13; Section 14 except N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 15 except S $\frac{1}{2}$ S $\frac{1}{2}$; Section 16 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 17; N $\frac{1}{2}$ Section 18; S $\frac{1}{2}$ S $\frac{1}{2}$ Section 20; NE $\frac{1}{4}$, SW $\frac{1}{4}$ Section 21; Sections 22–23; Section 24 except NW $\frac{1}{4}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 25 except NW $\frac{1}{4}$; Section 26 except NW $\frac{1}{4}$; Sections 27–29; Section 31 except N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$; Sections 32–35.

T.08S., R.10W. Willamette Meridian: Sections 1–5; Section 6 except NW $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 7 except NW $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ S $\frac{1}{2}$ NE $\frac{1}{4}$; Section 8 except S $\frac{1}{2}$ S $\frac{1}{2}$; Sections 9–14; Section 15 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; E $\frac{1}{2}$ E $\frac{1}{2}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 16; SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 22; Sections 23 except SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 24 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; NE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 25; Section 26 except SE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$; W $\frac{1}{2}$ NE $\frac{1}{4}$ Section 28.



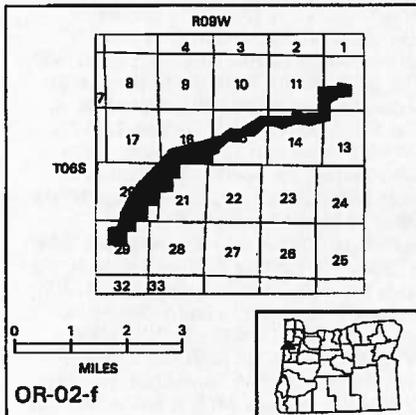
Map and description of OR-02-d taken from United States Fish and Wildlife Service 1:100,000 map; Corvallis, Oregon; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.07S., R.06W. Willamette Meridian: SW $\frac{1}{4}$ Section 4; Section 5 except N $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 6 except NE $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$; Section 7; S $\frac{1}{2}$ S $\frac{1}{2}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 9; Section 17 except NW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$.

T.07S., R.07W. Willamette Meridian: Section 1 except N $\frac{1}{2}$ NE $\frac{1}{4}$; Sections 2–3;

T.06S., R.09W. Willamette Meridian: E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 11; N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 12; NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 13; N $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ Section 14; S $\frac{1}{2}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 15; S $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 16; E $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 20; W $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 21; W $\frac{1}{2}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$ Section 29.



Map and description of OR-03-a taken from United States Fish and Wildlife Service 1:100,000 map; Corvallis, Oregon; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.09S., R.09W. Willamette Meridian: SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 33; SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 34.

T.10S., R.10W. Willamette Meridian: NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 2.

Critical Habitat includes only State lands described within the following areas:

T.09S., R.09W. Willamette Meridian: E $\frac{1}{2}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 34.

T.10S., R.09W. Willamette Meridian: NW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$ Section 16; N $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 17.

Critical Habitat includes only County lands described within the following areas:

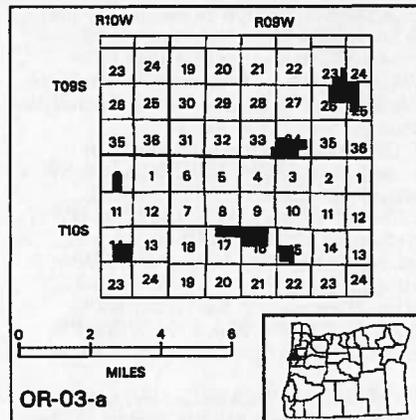
T.10S., R.10W. Willamette Meridian: SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 2.

Critical Habitat includes only Private lands described within the following areas:

T.09S., R.09W. Willamette Meridian: S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 23; W $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 25; NE $\frac{1}{4}$ Section 26; W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 34.

T.10S., R.09W. Willamette Meridian: SW $\frac{1}{4}$ Section 15.

T.10S., R.10W. Willamette Meridian: SE $\frac{1}{4}$ Section 14.



Map and description of OR-03-b taken from United States Fish and Wildlife Service 1:100,000 map; Corvallis, Oregon; 1995.

Critical Habitat includes only State lands described within the following areas:

T.10S., R.06W. Willamette Meridian: W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 30.

T.10S., R.07W. Willamette Meridian: S $\frac{1}{2}$ Section 25; N $\frac{1}{2}$ Section 36.

T.11S., R.07W. Willamette Meridian: S $\frac{1}{2}$ N $\frac{1}{2}$, SE $\frac{1}{4}$ Section 16; N $\frac{1}{2}$ Section 21; S $\frac{1}{2}$, NW $\frac{1}{4}$ Section 29; Section 31; Section 32 except E $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$.

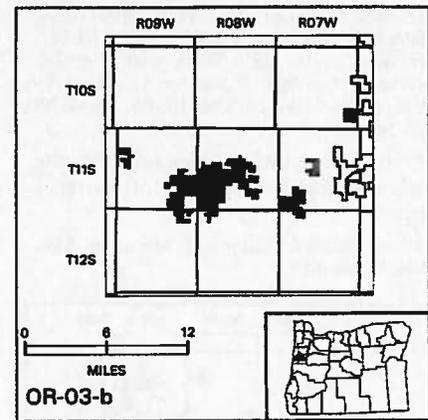
T.11S., R.08W. Willamette Meridian: W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 14; Section 15 except N $\frac{1}{2}$ NE $\frac{1}{4}$; Section 16 except S $\frac{1}{2}$ SW $\frac{1}{4}$; SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 17; S $\frac{1}{2}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 18; Sections 19-21; W $\frac{1}{2}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 22; SW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 23; SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ N $\frac{1}{2}$ Section 26; Section 27 except SW $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$; N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 28; Sections 29-31; Section 32 except SE $\frac{1}{4}$; N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 35.

T.11S., R.09W. Willamette Meridian: S $\frac{1}{2}$ Section 7; NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 17; SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 18; Section 23 except NW $\frac{1}{4}$; S $\frac{1}{2}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 24; Section 25; Section 26 except S $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$; NE $\frac{1}{4}$ Section 27; E $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 34; Section 35.

T.12S., R.07W. Willamette Meridian: Section 5 except S $\frac{1}{2}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$.

T.12S., R.08W. Willamette Meridian: NW $\frac{1}{4}$ Section 5; E $\frac{1}{2}$ E $\frac{1}{2}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 6.

T.12S., R.09W. Willamette Meridian: S $\frac{1}{2}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 1; E $\frac{1}{2}$, E $\frac{1}{2}$ NW $\frac{1}{4}$ Section 2.



Map and description of OR-03-c taken from United States Fish and Wildlife Service 1:100,000 map; Corvallis, Oregon; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.08S., R.06W. Willamette Meridian: SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ Section 31; W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 33.

T.08S., R.07W. Willamette Meridian: Section 31 except S $\frac{1}{2}$ SE $\frac{1}{4}$.

T.09S., R.06W. Willamette Meridian: N $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ Section 5; NE $\frac{1}{4}$, NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 7.

T.09S., R.07W. Willamette Meridian: Section 1 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 3 except NE $\frac{1}{4}$; Section 9 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 11; Section 13; W $\frac{1}{2}$, W $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 15; SE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 17; NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 21; E $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 23; Section 29 except SE $\frac{1}{4}$; Section 31; S $\frac{1}{2}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 33; W $\frac{1}{2}$ W $\frac{1}{2}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 35.

T.09S., R.08W. Willamette Meridian: N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 11; Section 27 except N $\frac{1}{2}$ NE $\frac{1}{4}$; Section 35.

T.10S., R.05W. Willamette Meridian: SW $\frac{1}{4}$ NE $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 29.

T.10S., R.07W. Willamette Meridian: N $\frac{1}{2}$ Section 1; W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 4; N $\frac{1}{2}$ Section 5.

Critical Habitat includes only State lands described within the following areas:

T.08S., R.07W. Willamette Meridian: SE $\frac{1}{4}$ Section 11; SE $\frac{1}{4}$ Section 12; N $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 13; E $\frac{1}{2}$, SW $\frac{1}{4}$ Section 14.

T.09S., R.08W. Willamette Meridian: Section 28 except N $\frac{1}{2}$ N $\frac{1}{2}$; S $\frac{1}{2}$, NW $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 29; SE $\frac{1}{4}$ Section 32; NE $\frac{1}{4}$ Section 33; Section 34 except NW $\frac{1}{4}$; Section 36 except N $\frac{1}{2}$ N $\frac{1}{2}$.

T.10S., R.07W. Willamette Meridian: Section 6; N $\frac{1}{2}$ N $\frac{1}{2}$ Section 7; NW $\frac{1}{4}$, SW $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 18; Section 19 except W $\frac{1}{2}$ SW $\frac{1}{4}$.

T.10S., R.08W. Willamette Meridian: Section 1 except SE $\frac{1}{4}$; Section 2; NE $\frac{1}{4}$, NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 3; Section 4 except SW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 5; E $\frac{1}{2}$

T.14S., R.09W. Willamette Meridian: SE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 28; Section 29 except N $\frac{1}{2}$ NE $\frac{1}{4}$; S $\frac{1}{2}$, S $\frac{1}{2}$ N $\frac{1}{2}$ Section 30; Section 31; Section 32; Section 33 except SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 34 except W $\frac{1}{2}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$; S $\frac{1}{2}$ S $\frac{1}{2}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ Section 35.

T.14S., R.10W. Willamette Meridian: SE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 25; Section 29 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; Sections 30–32.

T.14S., R.11W. Willamette Meridian: SE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 35; Section 36 except NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$.

T.15S., R.09W. Willamette Meridian: W $\frac{1}{2}$ W $\frac{1}{2}$ Section 1; Sections 2–5; Section 6 except S $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$; E $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 7; N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 8; Section 9 except S $\frac{1}{2}$ SW $\frac{1}{4}$; Section 10 except SE $\frac{1}{4}$; Section 11; N $\frac{1}{2}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 12; E $\frac{1}{2}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 13; Section 14 except NE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 15; E $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 16; E $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 17; Section 18 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 19; SE $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 20; Section 21; Section 22 except E $\frac{1}{2}$ SW $\frac{1}{4}$; Sections 23–26; E $\frac{1}{2}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 27; Section 28; E $\frac{1}{2}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 29; N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 30; Section 32 except W $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$; Sections 33–36.

T.15S., R.10W. Willamette Meridian: Section 1 except N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$; E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 2; W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 4; Sections 5–8; W $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 9; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 11; NW $\frac{1}{4}$, E $\frac{1}{2}$ Section 12; E $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 13; SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 14; SW $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ Section 15; S $\frac{1}{2}$ S $\frac{1}{2}$ Section 16; Sections 17–22; E $\frac{1}{2}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 23; Section 24 except NE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$; SW $\frac{1}{4}$ Section 25; Section 26 except NE $\frac{1}{4}$; Sections 27–34; E $\frac{1}{2}$, N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 35; NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 36.

T.15S., R.11W. Willamette Meridian: Section 1; N $\frac{1}{2}$ N $\frac{1}{2}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 2; E $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 3; Section 4 except N $\frac{1}{2}$ NW $\frac{1}{4}$; NW $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 5; SW $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ Section 6; W $\frac{1}{2}$ Section 7; NE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 8; Section 9 except SW $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$; Section 10–11; Section 12 except SE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 13 except N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$; Section 14; Section 15 except SW $\frac{1}{4}$; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 16; E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 21; E $\frac{1}{2}$ E $\frac{1}{2}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ Section 22; Sections 23–27; Section 28 except N $\frac{1}{2}$ N $\frac{1}{2}$; S $\frac{1}{2}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 29; S $\frac{1}{2}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 30; Section 31 except N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 32 except S $\frac{1}{2}$ N $\frac{1}{2}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 33 except S $\frac{1}{2}$ SE $\frac{1}{4}$; Section 34 except S $\frac{1}{2}$ S $\frac{1}{2}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 35 except SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$; Section 36.

T.15S., R.12W. Willamette Meridian: Section 1 except NW $\frac{1}{4}$; Section 2; E $\frac{1}{2}$, E $\frac{1}{2}$

NW $\frac{1}{4}$ Section 3; N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 10; Section 11 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 12 except S $\frac{1}{2}$ S $\frac{1}{2}$; SE $\frac{1}{4}$ Section 22; Section 25 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; S $\frac{1}{2}$, NE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$ Section 26; E $\frac{1}{2}$ E $\frac{1}{2}$ Section 27; E $\frac{1}{2}$ Section 34; Section 35; Section 36 except N $\frac{1}{2}$ N $\frac{1}{2}$.

T.16S., R.09W. Willamette Meridian: Section 1 except N $\frac{1}{2}$ S $\frac{1}{2}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 2 except E $\frac{1}{2}$ SE $\frac{1}{4}$; Sections 3–5; Section 6 except N $\frac{1}{2}$ N $\frac{1}{2}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$; Section 7 except E $\frac{1}{2}$ NE $\frac{1}{4}$; Sections 8–15; Section 16 except SE $\frac{1}{4}$; Section 17; Section 18 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 19; NW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 20; Section 21 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; Sections 22–24; N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 25; Section 26 except S $\frac{1}{2}$ SE $\frac{1}{4}$; Sections 27–28; Section 29 except N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$; Section 30; W $\frac{1}{2}$ Section 31; Sections 32–34; Section 35 except NE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$.

T.16S., R.10W. Willamette Meridian: SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 1; SW $\frac{1}{4}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ Section 2; Section 3 except E $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$; SW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 4; Section 5 except SE $\frac{1}{4}$ NE $\frac{1}{4}$; Sections 6–9; Section 10 except SE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$; N $\frac{1}{2}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 11; Section 12 except SW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$; Section 13 except S $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 14; Section 15 except W $\frac{1}{2}$ W $\frac{1}{2}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$; Section 16 except N $\frac{1}{2}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$; Section 17–21; Section 22 except W $\frac{1}{2}$ E $\frac{1}{2}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 23; Section 24 except NW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$; N $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 25; Section 26 except S $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 27 except S $\frac{1}{2}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$; Section 28; Section 29 except SW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 30 except NW $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 31; Section 32 except N $\frac{1}{2}$ N $\frac{1}{2}$; Section 33 except W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$; NW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 34; NE $\frac{1}{4}$ Section 35.

T.16S., R.11W. Willamette Meridian: E $\frac{1}{2}$, E $\frac{1}{2}$ NW $\frac{1}{4}$ Section 1; Section 2 except SW $\frac{1}{4}$ NW $\frac{1}{4}$; W $\frac{1}{2}$ Section 3; Section 4–6; N $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 8; N $\frac{1}{2}$ Section 9; Section 10 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 11 except S $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$; Section 12 except NE $\frac{1}{4}$ NW $\frac{1}{4}$; Section 13; Section 14 except N $\frac{1}{2}$ NW $\frac{1}{4}$; S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ Section 15; Section 19 except N $\frac{1}{2}$ N $\frac{1}{2}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$; S $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 20; S $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ Section 21; Section 22 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; Sections 23–27; Section 28 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 29 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; Sections 30–36.

T.16S., R.12W. Willamette Meridian: Sections 1 except S $\frac{1}{2}$ S $\frac{1}{2}$; Section 2; E $\frac{1}{2}$ Section 3; NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 10; N $\frac{1}{2}$ Section 11; S $\frac{1}{2}$ S $\frac{1}{2}$ Section 14; W $\frac{1}{2}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 15; N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 22; Section 23 except N $\frac{1}{2}$ NE $\frac{1}{4}$; Sections 24–26; Sections 35–36.

T.17S., R.08W. Willamette Meridian: N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 18.

T.17S., R.09W. Willamette Meridian: Section 1 except E $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$; Section 2 except E $\frac{1}{2}$ W $\frac{1}{2}$, S $\frac{1}{2}$ NE $\frac{1}{4}$; Section 3 except S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 4 except S $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$; Section 5; Section 6 except NW $\frac{1}{4}$; Section 7;

Section 8; W $\frac{1}{2}$ Section 9; N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 10; W $\frac{1}{2}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 11; SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 14; W $\frac{1}{2}$ W $\frac{1}{2}$ Section 16; Section 17 except W $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$; Sections 18–19; Section 20 except E $\frac{1}{2}$ E $\frac{1}{2}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$; NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 21; S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 25; S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 26; W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 28; N $\frac{1}{2}$ Section 29; N $\frac{1}{2}$ N $\frac{1}{2}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 30; Section 31 except S $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$; E $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 32; S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 33; S $\frac{1}{2}$ S $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 34; S $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 35.

T.17S., R.10W. Willamette Meridian: SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 1; Section 3 except E $\frac{1}{2}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$; Section 4; Section 5 except SW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 6 except S $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$; Section 7–9; N $\frac{1}{2}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 10; SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 11; E $\frac{1}{2}$ E $\frac{1}{2}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 12; Section 13; S $\frac{1}{2}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 14; SE $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 15; Section 16 except W $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$; Sections 17–18; Section 19 except SW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$; Section 20–21; Section 22 except N $\frac{1}{2}$ NW $\frac{1}{4}$; Section 23 except N $\frac{1}{2}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$; NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ Section 24; Section 25 except N $\frac{1}{2}$ NE $\frac{1}{4}$; Section 26; Section 27 except SW $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$; Section 28 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 29 except S $\frac{1}{2}$ SW $\frac{1}{4}$; Sections 30–31; Section 32 except N $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$; Section 33 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; NE $\frac{1}{4}$, SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 34; Section 35 except SW $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$.

T.17S., R.11W. Willamette Meridian: Section 1 except SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$; Section 2; S $\frac{1}{2}$, E $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$ Section 3; Sections 4–5; Section 6 except S $\frac{1}{2}$ SE $\frac{1}{4}$; S $\frac{1}{2}$ NE $\frac{1}{4}$, S $\frac{1}{2}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$ Section 7; Sections 8–9; NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 10; Section 11 except SE $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$; Section 12; SE $\frac{1}{4}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ N $\frac{1}{2}$ Section 13; NE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 14; Section 16 except E $\frac{1}{2}$ E $\frac{1}{2}$; W $\frac{1}{2}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 17; Section 18; Section 19 except NW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 20; W $\frac{1}{2}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 21; E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 22; NW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ S $\frac{1}{2}$ Section 23; SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 24; Section 25 except N $\frac{1}{2}$ NW $\frac{1}{4}$; E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 26; W $\frac{1}{2}$ Section 28; Section 29; S $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 30; Section 31 except NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 32; W $\frac{1}{2}$ Section 33; SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 34; Section 35 except N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$; Section 36.

T.17S., R.12W. Willamette Meridian: Section 1; Section 2 except W $\frac{1}{2}$ NW $\frac{1}{4}$; SE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 3; NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 10; N $\frac{1}{2}$ Section 11; Section 12 except S $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$; E $\frac{1}{2}$ Section 13; E $\frac{1}{2}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 24.

T.18S., R.09W. Willamette Meridian: W $\frac{1}{2}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 1; Section 2 except S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 3; Section 4 except W $\frac{1}{2}$ SW $\frac{1}{4}$; N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 5; N $\frac{1}{2}$ NE

except E $\frac{1}{2}$ SE $\frac{1}{4}$; Section 9 W $\frac{1}{2}$ SW $\frac{1}{4}$; NW $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 17.

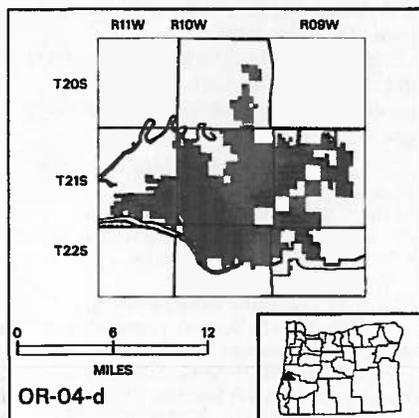
T.22S., R.10W. Willamette Meridian: Sections 1-5; E $\frac{1}{2}$ Section 6; Section 8 except W $\frac{1}{2}$ W $\frac{1}{2}$; Sections 9-12; N $\frac{1}{2}$ Section 13; N $\frac{1}{2}$ N $\frac{1}{2}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 14; NW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 15; NE $\frac{1}{4}$ Section 17.

T.22S., R.11W. Willamette Meridian: NE $\frac{1}{4}$ Section 1.

Description of Lands Using Protracted Public Land Survey Lines

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.22S., R.11W., Willamette Meridian: SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 1.



Map and description of OR-04-e taken from United States Fish and Wildlife Service 1:100,000 map; Cottage Grove and Roseburg, Oregon; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.23S., R.08W. Willamette Meridian: Section 3 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 5; S $\frac{1}{2}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 6; Section 7; Section 9; NW $\frac{1}{4}$, S $\frac{1}{2}$ S $\frac{1}{2}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 11; Section 13 except N $\frac{1}{2}$ NE $\frac{1}{4}$; Section 14 except N $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$; Section 15; Section 17-19; Section 20 except N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 21; Section 23 except S $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 27; Section 28 except N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$; Sections 29-33; Section 35 except E $\frac{1}{2}$ NE $\frac{1}{4}$.

T.23S., R.09W. Willamette Meridian: Section 3 except NE $\frac{1}{4}$; Sections 7-8; Section 13 except NE $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$; Sections 14-17; Section 20 except S $\frac{1}{2}$ N $\frac{1}{2}$; Sections 21-22; N $\frac{1}{2}$ Section 23; Sections 24-25; Section 26 except NW $\frac{1}{4}$; Section 27; Section 28 except E $\frac{1}{2}$ SE $\frac{1}{4}$; Section 29.

T.23S., R.10W. Willamette Meridian: Section 1.

T.24S., R.07W. Willamette Meridian: SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 6; Section 7; E $\frac{1}{2}$ Section 18; Section 19 except E $\frac{1}{2}$ E $\frac{1}{2}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$.

T.24S., R.08W. Willamette Meridian: Section 1; Section 3; E $\frac{1}{2}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section

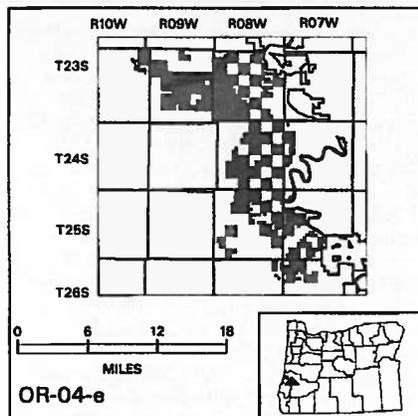
9; Sections 10-11; Section 13; Section 15; SW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ Section 17; Section 20 except NW $\frac{1}{4}$; Section 21; SE $\frac{1}{4}$ Section 22; Section 23; Section 25; Sections 27-29; Section 33; Section 35.

T.25S., R.07W. Willamette Meridian: S $\frac{1}{2}$ S $\frac{1}{2}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 6; S $\frac{1}{2}$ S $\frac{1}{2}$ Section 7; S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 9; NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 15; Section 17; Section 18 except W $\frac{1}{2}$ W $\frac{1}{2}$; Section 19; NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 20; S $\frac{1}{2}$ S $\frac{1}{2}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 21; Section 27 except NE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$; SW $\frac{1}{4}$ Section 28; SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 29; NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 30; E $\frac{1}{2}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 31; W $\frac{1}{2}$ Section 32; W $\frac{1}{2}$, W $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 33; NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 34.

T.25S., R.08W. Willamette Meridian: Section 1; Sections 3-4; E $\frac{1}{2}$ E $\frac{1}{2}$ Section 5; Section 8 except W $\frac{1}{2}$; Section 9; N $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 10; Section 11; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 12; Section 13; S $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 14; N $\frac{1}{2}$ N $\frac{1}{2}$, SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 15; Section 20; Section 23; Section 24 except SE $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$; Section 25; Section 30 except SW $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$; Section 32 except SE $\frac{1}{4}$.

T.26S., R.07W. Willamette Meridian: Section 5; Section 6 except NW $\frac{1}{4}$; Section 7 except NW $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$; N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 8; Section 9 except N $\frac{1}{2}$ NW $\frac{1}{4}$.

T.26S., R.08W. Willamette Meridian: W $\frac{1}{2}$, E $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 1; NW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 12.



Map and description of OR-04-f taken from United States Fish and Wildlife Service 1:100,000 map; Cottage Grove and Roseburg, Oregon; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

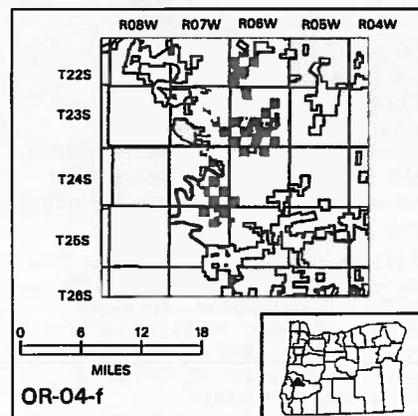
T.22S., R.06W. Willamette Meridian: S $\frac{1}{2}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 17; Section 19; Section 21; Section 29; Section 30 except W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 31; NW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 32.

T.23S., R.06W. Willamette Meridian: W $\frac{1}{2}$ W $\frac{1}{2}$ Section 4; Section 5; N $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 8; NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 9; Section 19; Section 31; W $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 32.

T.23S., R.07W. Willamette Meridian: N $\frac{1}{2}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 3; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 4; SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 14; E $\frac{1}{2}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 15; Section 23 except N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 25; S $\frac{1}{2}$ S $\frac{1}{2}$ Section 27; S $\frac{1}{2}$ S $\frac{1}{2}$ Section 33.

T.24S., R.07W. Willamette Meridian: N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 2; S $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 3; Section 11 except NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$; N $\frac{1}{2}$ N $\frac{1}{2}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 15; E $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 21; Section 23; Section 25; Section 27 except SW $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$; SE $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 28; Section 35.

T.25S., R.07W. Willamette Meridian: Section 1; NE $\frac{1}{4}$ Section 2; Section 3; Section 11 except N $\frac{1}{2}$ NW $\frac{1}{4}$; NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 12.



Map and description of OR-04-g taken from United States Fish and Wildlife Service 1:100,000 map; Cottage Grove, Oregon; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.21S., R.06W. Willamette Meridian: Section 31.

T.21S., R.07W. Willamette Meridian: W $\frac{1}{2}$ Section 7; Section 16 except NW $\frac{1}{4}$; Section 17; N $\frac{1}{2}$ Section 18; Section 19; NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 20; Section 21; Section 25; NE $\frac{1}{4}$ Section 28; Section 29; N $\frac{1}{2}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 30; Section 31; Section 33; Section 35.

T.21S., R.08W. Willamette Meridian: Section 1; Section 2 except W $\frac{1}{2}$ SW $\frac{1}{4}$; Section 10 except N $\frac{1}{2}$ NE $\frac{1}{4}$; Section 11; Section 12 except S $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 13; Section 23; E $\frac{1}{2}$ Section 24; Section 25; N $\frac{1}{2}$ N $\frac{1}{2}$ Section 26; Section 35 except SW $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$.

T.22S., R.06W. Willamette Meridian: Section 5; NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ Section 7.

T.22S., R.07W. Willamette Meridian: Section 1; W $\frac{1}{2}$ Section 6; Section 7 except W $\frac{1}{2}$ NW $\frac{1}{4}$; Section 11 except NW $\frac{1}{4}$; NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 15.

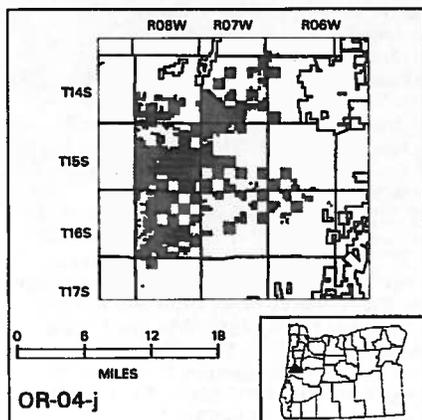
NW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$; Section 7 except N $\frac{1}{2}$ N $\frac{1}{2}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 9 except E $\frac{1}{2}$ E $\frac{1}{2}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$; Section 11; Sections 13–14; Section 15 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; Sections 16–20; Section 21 except SW $\frac{1}{4}$ NW $\frac{1}{4}$; Sections 22–27; N $\frac{1}{2}$ Section 28; Sections 29–31; N $\frac{1}{2}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 32; Section 33; Section 35; W $\frac{1}{2}$ Section 36.

T.16S., R.06W. Willamette Meridian: SE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 3; Section 5 except S $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 7 except S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 9; SW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 12; NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 17; S $\frac{1}{2}$ S $\frac{1}{2}$ Section 33.

T.16S., R.07W. Willamette Meridian: Section 1; Section 3 except S $\frac{1}{2}$ SW $\frac{1}{4}$; Section 5 except W $\frac{1}{2}$ SW $\frac{1}{4}$; S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 6; Section 7 except NE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$; NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 11; Section 13; E $\frac{1}{2}$, SW $\frac{1}{4}$ Section 15; W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 18; S $\frac{1}{2}$ Section 19; Section 21.

T.16S., R.08W. Willamette Meridian: Section 1; Sections 3–4; Section 5 except S $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$; NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 6; Section 7 except W $\frac{1}{2}$, S $\frac{1}{2}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$; Sections 8–9; W $\frac{1}{2}$ W $\frac{1}{2}$ Section 10; Section 11; Section 13 except S $\frac{1}{2}$ SE $\frac{1}{4}$; Section 15; Section 17 except SW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 18 except NW $\frac{1}{4}$, W $\frac{1}{2}$ E $\frac{1}{2}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 19 except E $\frac{1}{2}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$; Section 20 except W $\frac{1}{2}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$; Sections 21–23; SW $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 24; Section 25; N $\frac{1}{2}$ Section 26; Section 27; Section 28 except S $\frac{1}{2}$ SE $\frac{1}{4}$; Section 29 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; S $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 30; Section 31 except N $\frac{1}{2}$ NW $\frac{1}{4}$; Section 32 except SE $\frac{1}{4}$, Section 33; S $\frac{1}{2}$ Section 34; N $\frac{1}{2}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 35.

T.17S., R.08W. Willamette Meridian: Section 5; N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 6.



Map and description of OR-04-k taken from United States Fish and Wildlife Service 1:100,000 map; Corvallis, Eugene, Oregon; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.12S., R.07W. Willamette Meridian: SE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 10; Section 11 except N $\frac{1}{2}$ N $\frac{1}{2}$; W $\frac{1}{2}$ W $\frac{1}{2}$ Section 13; Sections 14–15; Section 16 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 19 except N $\frac{1}{2}$ N $\frac{1}{2}$; Section 20 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; Sections 21–23; W $\frac{1}{2}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 24; Section 25; Section 26 except SW $\frac{1}{4}$; Section 27; Section 28 except NE $\frac{1}{4}$ NW $\frac{1}{4}$; Sections 29–31; Section 32 except NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$; Sections 33–35; W $\frac{1}{2}$ W $\frac{1}{2}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 36.

T.12S., R.08W. Willamette Meridian: SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 3; NE $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 5; N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 8; Section 9 except NE $\frac{1}{4}$ NE $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$; SE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 10; Section 11 except N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$; S $\frac{1}{2}$ Section 12; E $\frac{1}{2}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 13; N $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 15; N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 16; Section 17 except NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$; SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 18; W $\frac{1}{2}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 19; S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 20; Section 21; Section 22 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; SE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 23; W $\frac{1}{2}$ W $\frac{1}{2}$ Section 24; Section 25; N $\frac{1}{2}$ Section 26; Section 27; Section 29 except NE $\frac{1}{4}$; W $\frac{1}{2}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 30; Section 31; Section 33 except SE $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$; Section 35 except SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$.

T.12S., R.09W. Willamette Meridian: SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 13; E $\frac{1}{2}$ E $\frac{1}{2}$ Section 24.

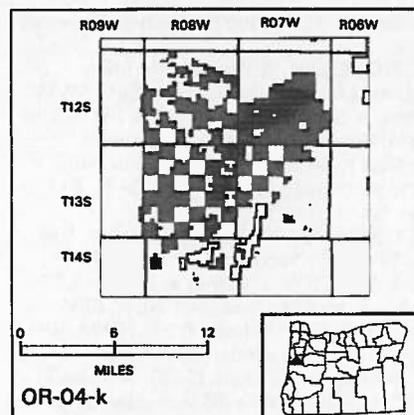
T.13S., R.07W. Willamette Meridian: Section 2 except N $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 3; Section 5; W $\frac{1}{2}$ Section 6; Section 7; Section 9; N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 15; Section 17; SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 18; Section 19 except NE $\frac{1}{4}$ SE $\frac{1}{4}$; E $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$ Section 21; S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 23; SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 27; N $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$ Section 35.

T.13S., R.08W. Willamette Meridian: Section 1; NE $\frac{1}{4}$ Section 2; Section 3 except N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$; Section 5; S $\frac{1}{2}$ Section 6; Section 7; E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 8; Section 9 except NW $\frac{1}{4}$ NE $\frac{1}{4}$; Section 11; W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 12; Section 13; E $\frac{1}{2}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 14; Section 15; Section 17; Sections 19–21; Section 23; W $\frac{1}{2}$ W $\frac{1}{2}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 24; Section 25; W $\frac{1}{2}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 26; Section 27; Section 29; NW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 30; Section 31; SE $\frac{1}{4}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 32; Section 33; SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 34; Section 35 except E $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$.

T.13S., R.09W. Willamette Meridian: E $\frac{1}{2}$ E $\frac{1}{2}$ Section 25.

T.14S., R.07W. Willamette Meridian: SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 5; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 7.

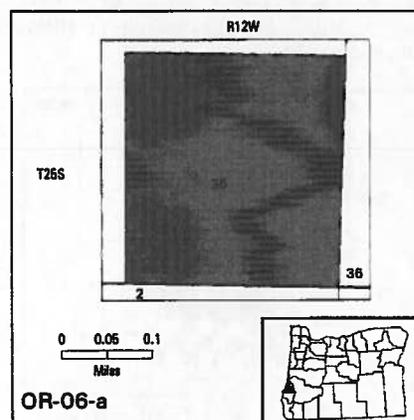
T.14S., R.08W. Willamette Meridian: N $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 3; Section 5 except S $\frac{1}{2}$ SE $\frac{1}{4}$; Section 7 except W $\frac{1}{2}$ W $\frac{1}{2}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 11 except NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$; N $\frac{1}{2}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 15.



Map and description of OR-06-a taken from United States Fish and Wildlife Service 1:100,000 map; Coos Bay, Oregon; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.25S., R.12W. Willamette Meridian: SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 35.



Map and description of OR-06-b taken from United States Fish and Wildlife Service 1:100,000 map; Roseburg, Oregon; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.25S., R.10W. Willamette Meridian: Section 31; Section 33.

T.26S., R.09W. Willamette Meridian: SE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 9; Section 10 except NE $\frac{1}{4}$; Section 17; S $\frac{1}{2}$ S $\frac{1}{2}$ Section 18; Section 19; SW $\frac{1}{4}$ Section 20; Section 21; N $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$ S $\frac{1}{2}$ Section 28; Section 29; Section 31 except N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$; SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 32; Section 33.

T.26S., R.10W. Willamette Meridian: Sections 3–5; E $\frac{1}{2}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 6; Section 7; SW $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 8; Section 9; Section 11; Section 13; N $\frac{1}{2}$ Section 14; Sections 15–17; Section 19; SE $\frac{1}{4}$ Section 20; N $\frac{1}{2}$ Section 21; W $\frac{1}{2}$ Section 22; Section 23; N $\frac{1}{2}$ N $\frac{1}{2}$, N $\frac{1}{2}$ S $\frac{1}{2}$ Section 24; Section 25; Section 27; NE $\frac{1}{4}$ Section 28; Sections 29–31;

T.33S., R.12W. Willamette Meridian:
 Section 7 except W $\frac{1}{2}$ SW $\frac{1}{4}$; Section 8; W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 9; Section 10 except N $\frac{1}{2}$ NW $\frac{1}{4}$; Sections 11–32; Section 33 except E $\frac{1}{2}$ SE $\frac{1}{4}$; Section 34 except N $\frac{1}{2}$ SW $\frac{1}{4}$; Sections 35–36.

T.33S., R.13W. Willamette Meridian: E $\frac{1}{2}$ Section 8; Sections 9–11; Section 12 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 13 except N $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 14 except S $\frac{1}{2}$ S $\frac{1}{2}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$; SW $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 15; S $\frac{1}{2}$, S $\frac{1}{2}$ NW $\frac{1}{4}$ Section 16; SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 17; Sections 19–20; Section 21 except SE $\frac{1}{4}$; E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 22; Section 23 except SW $\frac{1}{4}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$; Sections 24–25; S $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 26; NW $\frac{1}{4}$ Section 28; Section 29 except S $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$; Section 30 except S $\frac{1}{2}$ SE $\frac{1}{4}$; NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ Section 31; E $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ Section 34; Sections 35–36.

T.33S., R.14W. Willamette Meridian:
 Section 7 except N $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$; S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 13; SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 15; S $\frac{1}{2}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 17; SE $\frac{1}{4}$ Section 18; NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 20; Section 21 except NW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$; Section 22 except SW $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$; Section 23 except

N $\frac{1}{2}$ N $\frac{1}{2}$, SW $\frac{1}{2}$ NE $\frac{1}{4}$; Sections 24–28; Section 29 except NW $\frac{1}{4}$; Sections 32–35; Section 36 except NW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$.

T.34S., R.11W. Willamette Meridian:
 NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 4; Sections 5–6; Section 7 except NE $\frac{1}{4}$ SE $\frac{1}{4}$; NW $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 8; W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 9; NE $\frac{1}{4}$ Section 18; N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 19; NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$ Section 30; W $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 31.

T.34S., R.12W. Willamette Meridian:
 Sections 1–3; Section 4 except W $\frac{1}{2}$ SW $\frac{1}{4}$; Section 5 except S $\frac{1}{2}$ S $\frac{1}{2}$; Section 6 except N $\frac{1}{2}$ NE $\frac{1}{4}$; Section 7 except E $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$; SE $\frac{1}{4}$ Section 8; Sections 9–36.

T.34S., R.13W. Willamette Meridian:
 Sections 1–2; NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$ Section 3; Sections 11–14; E $\frac{1}{2}$ Section 15; SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 17; Section 20 except NW $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$; Section 21 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 22 except NW $\frac{1}{4}$ NE $\frac{1}{4}$; Section 23 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; Sections 24–26; N $\frac{1}{2}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 27.

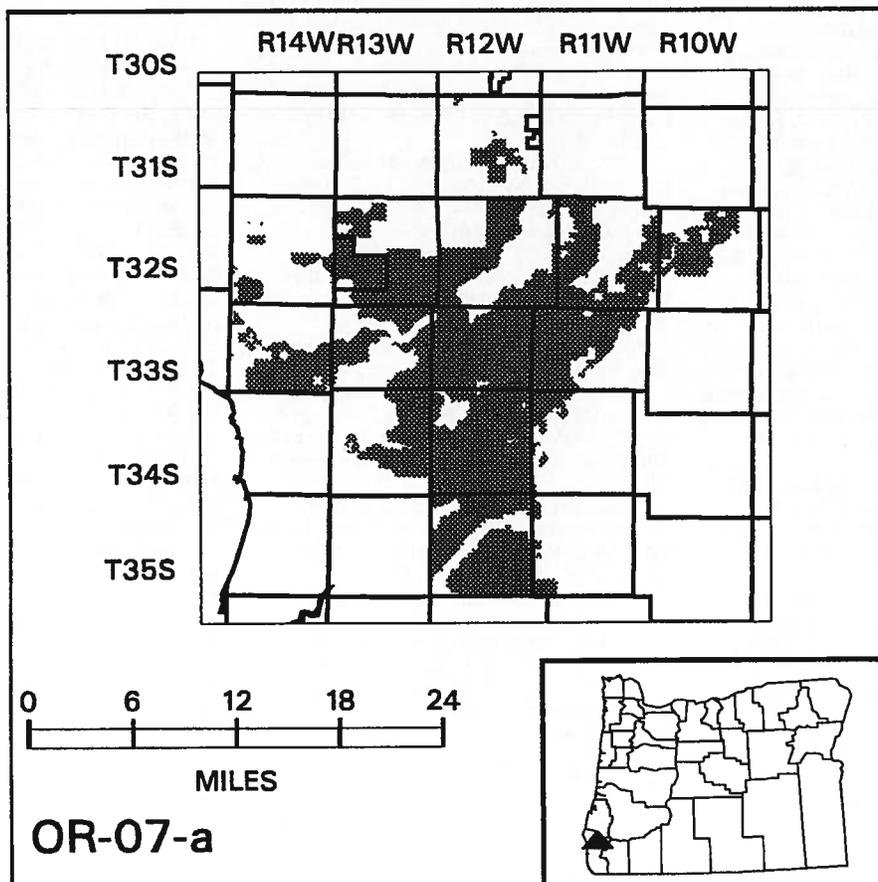
T.35S., R.11W. Willamette Meridian:
 SW $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 6; NW $\frac{1}{4}$ Section 7; S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 18; N $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 19; Section 31; W $\frac{1}{2}$ Section 32.

T.35S., R.12W. Willamette Meridian:
 Sections 1–4; Section 5 except SW $\frac{1}{4}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 6 except SE $\frac{1}{4}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$; SE $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ Section 7; Sections 8–9; N $\frac{1}{2}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 10; N $\frac{1}{2}$ N $\frac{1}{2}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 11; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 12; Section 13 except SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, N $\frac{1}{2}$ N $\frac{1}{2}$; Section 14; Section 15 except NW $\frac{1}{4}$; SE $\frac{1}{4}$ SE $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ Section 16; Sections 17–19; Section 20 except E $\frac{1}{2}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$; Section 21 except NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$; Sections 22–28; Section 29 except N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$; Section 30 except SE $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 32 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; Sections 33–36.

Description of Lands Using Protracted Public Land Survey Lines

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.32S., R.13W. Willamette Meridian:
 Sections 18–21; Sections 28–29; N $\frac{1}{2}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 30.



T.40S., R.10W. Willamette Meridian: SW¹/₄ SW¹/₄ Section 1; SE¹/₄, S¹/₂ SW¹/₄, E¹/₂ NE¹/₄ Section 2; S¹/₂ SW¹/₄ Section 3; SE¹/₄ SE¹/₄ Section 4; SE¹/₄, S¹/₂ NE¹/₄ Section 8; Section 9 except N¹/₂ NW¹/₄; Sections 10–11; Section 12 except NW¹/₄ NE¹/₄; Sections 13–16; Section 17 except N¹/₂ NW¹/₄, SW¹/₄ NW¹/₄; Section 19 except NW¹/₄, NW¹/₄ SW¹/₄, NW¹/₄ NE¹/₄; Sections 20–36.

T.40S., R.11W. Willamette Meridian: N¹/₂ NW¹/₄, SW¹/₄ NW¹/₄, NW¹/₄ NE¹/₄ Section 4; Sections 5–8; W¹/₂ NW¹/₄, S¹/₂ SE¹/₄, SW¹/₄ Section 9; Section 16 except E¹/₂ E¹/₂; Sections 17–21; E¹/₂ SE¹/₄, SW¹/₄ SE¹/₄ Section 25; Section 27 except E¹/₂, NE¹/₄ NW¹/₄; Sections 28–33; W¹/₂ Section 34; SE¹/₄ SE¹/₄, SE¹/₄ NE¹/₄ Section 35; Section 36.

T.40S., R.12W. Willamette Meridian: Sections 1–30; Section 31 except W¹/₂ SW¹/₄, SW¹/₄ NW¹/₄; Sections 32–36.

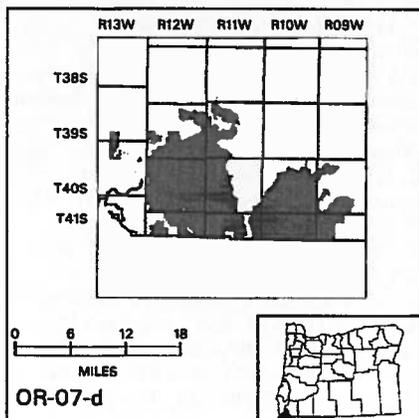
T.40S., R.13W. Willamette Meridian: Section 4 except SE¹/₄ SE¹/₄; W¹/₂, NW¹/₄ NE¹/₄, S¹/₂ SE¹/₄, NE¹/₄ SE¹/₄ Section 9; W¹/₂, NE¹/₄ Section 10; SE¹/₄ SW¹/₄ Section 12; N¹/₂ NW¹/₄ Section 13.

T.41S., R.09W. Willamette Meridian: Sections 4–8; Sections 17–18.

T.41S., R.10W. Willamette Meridian: Sections 1–18.

T.41S., R.11W. Willamette Meridian: Section 1; Section 2 except NW¹/₄ NE¹/₄, NE¹/₄ NW¹/₄; Sections 3–15; Sections 17–18.

T.41S., R.12W. Willamette Meridian: Sections 1–4; Section 5 except W¹/₂, SW¹/₄ SE¹/₄; Section 7 except NW¹/₄, W¹/₂ SW¹/₄, NW¹/₄ NE¹/₄; W¹/₂, S¹/₂ SE¹/₄ Section 8; Section 9 except S¹/₂ S¹/₂, NW¹/₄ SW¹/₄; Section 10; Section 11 except SE¹/₄ SW¹/₄, W¹/₂ SW¹/₄; Sections 12–13; Section 14 except NE¹/₄ NW¹/₄, NW¹/₄ NE¹/₄; Section 15; Section 17; Section 18 except W¹/₂ W¹/₂.



Map and description of OR-07-f taken from United States Fish and Wildlife Service 1:100,000 map; Port Orford, Canyonville, Gold Beach and Grants Pass, Oregon; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.32S., R.09W. Willamette Meridian: Section 34.

T.32S., R.10W. Willamette Meridian: Section 25; E¹/₂, NE¹/₄ NW¹/₄, SE¹/₄ SW¹/₄ Section 26; Section 35 except W¹/₂ NW¹/₄; Section 36 except SE¹/₄ SW¹/₄, SW¹/₄ SE¹/₄.

T.33S., R.09W. Willamette Meridian: Section 2; Sections 3–4; Section 5 except SE¹/₄ NW¹/₄, E¹/₂ SW¹/₄; Section 6 except SE¹/₄; Section 7 except E¹/₂ NW¹/₄, W¹/₂ NE¹/₄; Section 8 except NE¹/₄ NW¹/₄; Sections 9–10; Sections 17–19.

T.33S., R.10W. Willamette Meridian: Section 1 except NE¹/₄, N¹/₂ SW¹/₄, S¹/₂ NW¹/₄; Section 2 except NE¹/₄ SE¹/₄; Section 3 except NW¹/₄, N¹/₂ NE¹/₄, SW¹/₄ SW¹/₄, N¹/₂ SW¹/₄; Section 9 except W¹/₂, N¹/₂ NE¹/₄, SW¹/₄ SE¹/₄; Section 10; Section 11 except NE¹/₄ NW¹/₄; Section 12 except NW¹/₄, SE¹/₄ NE¹/₄; Sections 13–14; Section 15 except W¹/₂ SW¹/₄; Section 21 except W¹/₂; Sections 22–24; Sections 26–27; Section 28 except N¹/₂ NW¹/₄; Section 29 except NW¹/₄ SW¹/₄; SE¹/₄ SE¹/₄ Section 30; Section 31 except W¹/₂, W¹/₂ SE¹/₄; Sections 32–34.

T.34S., R.10W. Willamette Meridian: Sections 4–5; Section 6 except NW¹/₄ NE¹/₄, N¹/₂ NW¹/₄, SW¹/₄ NW¹/₄; Sections 7–8; Section 18.

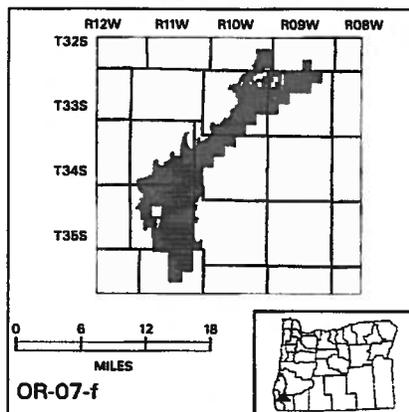
T.34S., R.10 1/2 W. Willamette Meridian: S¹/₂ Section 7; Section 18 except NW¹/₄ NW¹/₄; Sections 19; Sections 30–31.

T.34S., R.11W. Willamette Meridian: E¹/₂ SE¹/₄, SE¹/₄ NE¹/₄ Section 11; Section 12 except E¹/₂; Section 13 except NE¹/₄; E¹/₂ E¹/₂, SW¹/₄ SW¹/₄ Section 14; SE¹/₄ SE¹/₄ Section 15; Section 21 except N¹/₂, E¹/₂ SE¹/₄, NW¹/₄ SW¹/₄; Section 22 except NW¹/₄, W¹/₂ NE¹/₄, NW¹/₄ SE¹/₄, N¹/₂ SW¹/₄, SW¹/₄ SW¹/₄; Section 23 except NE¹/₄ NW¹/₄, NW¹/₄ NE¹/₄; Sections 24–28; S¹/₂ NE¹/₄, SE¹/₄ Section 31; Section 32 except N¹/₂ NW¹/₄; Sections 33–36.

T.35S., R.10 1/2 W. Willamette Meridian: Section 6; Section 7 except E¹/₂ E¹/₂, W¹/₂ SE¹/₄, NE¹/₄ SW¹/₄; Section 18 except E¹/₂, E¹/₂ SW¹/₄; NW¹/₄, W¹/₂ SW¹/₄, NW¹/₄ NE¹/₄ Section 19; W¹/₂ SW¹/₄ Section 30; Section 31.

T.35S., R.11W. Willamette Meridian: Sections 1–4; Section 5 except SW¹/₄ SW¹/₄; E¹/₂ NE¹/₄ Section 6; E¹/₂ E¹/₂ Section 7; Sections 8–15; Section 17; E¹/₂ NE¹/₄, NW¹/₄ NE¹/₄ Section 18; Section 20 except SW¹/₄ NW¹/₄, W¹/₂ SW¹/₄; Section 21 except SW¹/₄ NE¹/₄; Sections 22–28; NE¹/₄ NW¹/₄, E¹/₂ E¹/₂ Section 29; Section 33 except W¹/₂ SW¹/₄; Sections 34–36.

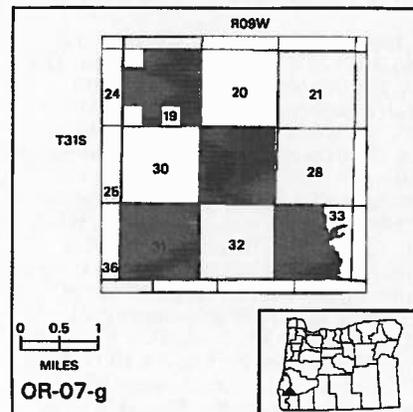
T.36S., R.11W. Willamette Meridian: Sections 2–3; N¹/₂ N¹/₂, SE¹/₄ NE¹/₄, E¹/₂ SE¹/₄ Section 4; NE¹/₄ NW¹/₄, N¹/₂ NE¹/₄ Section 5; E¹/₂ E¹/₂ Section 9; Sections 10–11; Section 15; E¹/₂ E¹/₂ Section 16.



Map and description of OR-07-g taken from United States Fish and Wildlife Service 1:100,000 map; Canyonville, Oregon; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.31S., R.09W. Willamette Meridian: Section 19 except NW¹/₄ NW¹/₄, SW¹/₄ SW¹/₄, SW¹/₄ SE¹/₄; Section 29; Section 31; Section 33 except NE¹/₄ NE¹/₄.

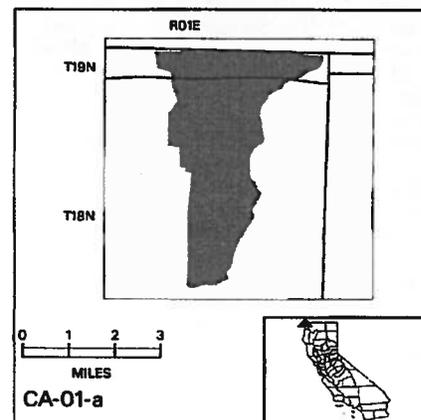


Map and description of CA-01-a taken from United States Fish and Wildlife Service 1:100,000 map; Grants Pass, Oregon; Crescent City and Happy Camp, California; 1995.

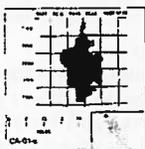
Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.18N., R.01E. Humboldt Meridian: NW¹/₄ NW¹/₄ Section 1; W¹/₂, NE¹/₄, NW¹/₄ SE¹/₄ Section 2; Section 3; E¹/₂ Section 4; NE¹/₄, E¹/₂ SE¹/₄ Section 9; Section 10; W¹/₂ NE¹/₄, NW¹/₄, SW¹/₄, Section 11; W¹/₂ Section 14; Section 15; NE¹/₄ NE¹/₄ Section 16; Section 22; NW¹/₄, NW¹/₄ SW¹/₄ Section 23; N¹/₂, N¹/₂ SW¹/₄, NW¹/₄ SE¹/₄ Section 27.

T.19N., R.01E. Humboldt Meridian: Section 33 except W¹/₂ SW¹/₄; Sections 34–35; Section 36 except SE¹/₄ SE¹/₄.



Map and description of CA-01-b taken from United States Fish and



Map and description of CA-01-d taken from United States Fish and Wildlife Service 1:100,000 map; Happy Camp California; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.17N., R.03E. Humboldt Meridian: NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 24; E $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$, Section 25; N $\frac{1}{2}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 36.

T.16N., R.03E. Humboldt Meridian: S $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 1; E $\frac{1}{2}$ E $\frac{1}{2}$ Section 11; Section 12; Section 13 except W $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$; NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 24; SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 25; Section 36 except SW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$.

T.15N., R.07E. Humboldt Meridian: SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 7.

T.15N., R.06E. Humboldt Meridian: NW $\frac{1}{4}$ Section 13.

T.15N., R.03E. Humboldt Meridian: E $\frac{1}{2}$ E $\frac{1}{2}$ Section 1; E $\frac{1}{2}$, SE $\frac{1}{4}$ Section 12.

T.14N., R.06E. Humboldt Meridian: N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 4; Section 5; Section 8; SW $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 9; W $\frac{1}{2}$ Section 16; Section 17; N $\frac{1}{2}$ Section 20; Section 21 except S $\frac{1}{2}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 21.

Description of Lands Using Protracted Public Land Survey Lines

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.18N., R.04E. Humboldt Meridian: SE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 33; E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 35; SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$ Section 36.

T.17N., R.06E. Humboldt Meridian: S $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 14; S $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 15; S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 16; E $\frac{1}{2}$ Section 21; Section 22; Section 23 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 24; Section 26 except E $\frac{1}{2}$ SE $\frac{1}{4}$; Section 27 except SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 28.

T.17N., R.05E. Humboldt Meridian: SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 4; Section 5 except N $\frac{1}{2}$ N $\frac{1}{2}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 6 except NE $\frac{1}{4}$; Section 7 except S $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$; Section 8 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 9.

T.17N., R.04E. Humboldt Meridian: Section 1 except SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 2 except NE $\frac{1}{4}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$; Section 3 except N $\frac{1}{2}$ N $\frac{1}{2}$; Section 4; SE $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ Section 5; Section 8 except NW $\frac{1}{4}$; Sections 9-10; NE $\frac{1}{4}$, NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 11; NE $\frac{1}{4}$ Section 12; Sections 16-17; W $\frac{1}{2}$, W $\frac{1}{2}$ E $\frac{1}{2}$ Section 20; SE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 21; S $\frac{1}{2}$, S $\frac{1}{2}$ N $\frac{1}{2}$ Section 22; S $\frac{1}{2}$, S $\frac{1}{2}$ N $\frac{1}{2}$ Section 23; W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 24; W $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 25; Section 26; Section 27 except SW $\frac{1}{4}$; NE $\frac{1}{4}$, SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 28; Section 29 except E $\frac{1}{2}$ NE $\frac{1}{4}$; SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 32; Section 33; N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 34; N $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 35.

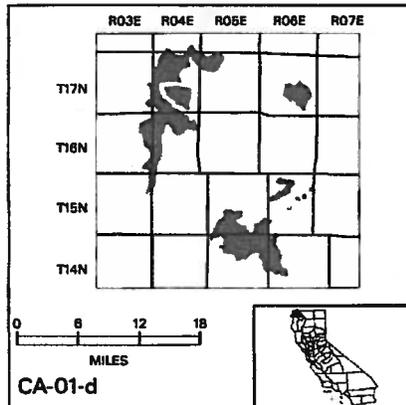
T.16N., R.04E. Humboldt Meridian: S $\frac{1}{2}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 1; Section 2 except NE $\frac{1}{4}$; Sections 3-4; Section 5 except N $\frac{1}{2}$ NW $\frac{1}{4}$; Section 8; W $\frac{1}{2}$ W $\frac{1}{2}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 9; Section 10 except W $\frac{1}{2}$ SW $\frac{1}{4}$; Section 11 except SE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$; S $\frac{1}{2}$ Section 12; E $\frac{1}{2}$ E $\frac{1}{2}$ Section 17; E $\frac{1}{2}$ E $\frac{1}{2}$ Section 20; Section 29 except SE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$; W $\frac{1}{2}$ Section 32.

T.15N., R.06E. Humboldt Meridian: W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 2; S $\frac{1}{2}$ Section 3; N $\frac{1}{2}$, E $\frac{1}{2}$ Section 4; SE $\frac{1}{4}$ Section 9; Section 10 except W $\frac{1}{2}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$ Section 11; NE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 12; NW $\frac{1}{4}$ Section 13; SE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 14; N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 15; NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 16; NE $\frac{1}{4}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 17; SW $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 29; S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 30.

T.15N., R.05E. Humboldt Meridian: SE $\frac{1}{4}$ Section 20; S $\frac{1}{2}$ Section 21; S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 22; S $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 25; NW $\frac{1}{4}$ Section 27; Section 28 except E $\frac{1}{2}$ SE $\frac{1}{4}$; NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 29; SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 30; E $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ Section 31; Sections 32-33; Section 34 except N $\frac{1}{2}$ N $\frac{1}{2}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 34; E $\frac{1}{2}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 35; Section 36.

T.15N., R.04E. Humboldt Meridian: W $\frac{1}{2}$ Section 6; W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 7.

T.14N., R.05E. Humboldt Meridian: Sections 1-4; E $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 5; NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$ Section 6; NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 8; Section 9 except S $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$; Section 10; Section 11 except S $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 12 except W $\frac{1}{2}$ SW $\frac{1}{4}$; W $\frac{1}{2}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 13; N $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ Section 15; NE $\frac{1}{4}$ Section 24.



Map and description of CA-01-e taken from United States Fish and Wildlife Service 1:100,000 map; Grants Pass, Oregon; Happy Camp, California; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.41S., R.07W. Willamette Meridian: S $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 6; N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 7; SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 8; S $\frac{1}{2}$ SE $\frac{1}{4}$, W $\frac{1}{2}$ Section 9; Section 16; E $\frac{1}{2}$ E $\frac{1}{2}$ Section 17.

T.41S., R.08W. Willamette Meridian: Section 1 except SE $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$; Section 2 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 4; Section 9 except W $\frac{1}{2}$ W $\frac{1}{2}$; Section 11 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 12 except E $\frac{1}{2}$ SE $\frac{1}{4}$; Section 13 except NE $\frac{1}{4}$; Sections 14-16; E $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 17.

T.19N., R.06E. Humboldt Meridian: E $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 31; Section 32 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; NW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ Section 33.

T.19N., R.05E. Humboldt Meridian: Section 32 except S $\frac{1}{2}$ SW $\frac{1}{4}$; Section 33; Section 34 except E $\frac{1}{2}$ SE $\frac{1}{4}$; Section 35 except S $\frac{1}{2}$ SW $\frac{1}{4}$; W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 36.

T.19N., R.04E. Humboldt Meridian: Sections 32-34; SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 35.

T.18N., R.05E. Humboldt Meridian: Section 5 except NW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$; SE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 6; Section 7 except S $\frac{1}{2}$ S $\frac{1}{2}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$; Sections 16-17; SE $\frac{1}{4}$, S $\frac{1}{2}$ N $\frac{1}{2}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, Section 18; N $\frac{1}{2}$ Section 19.

T.18N., R.04E. Humboldt Meridian: W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 2; Section 3 except SE $\frac{1}{4}$ SE $\frac{1}{4}$, Section 4; N $\frac{1}{2}$ N $\frac{1}{2}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 9.

T.18N., R.03E. Humboldt Meridian: Section 1; SE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 2; SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 10; Section 11 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; NW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 12; W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 14; E $\frac{1}{2}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 15; W $\frac{1}{2}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 22; W $\frac{1}{2}$ Section 27; SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 28; E $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 32; Section 33; W $\frac{1}{2}$ Section 34.

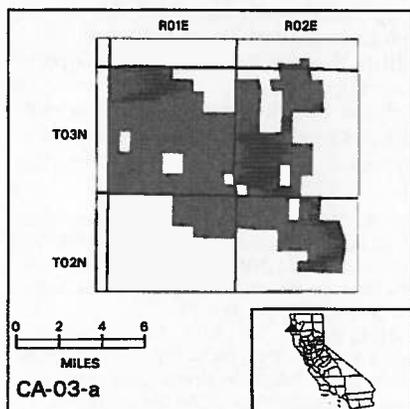
T.17N., R.03E. Humboldt Meridian: NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 3; Section 4 except S $\frac{1}{2}$ S $\frac{1}{2}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 5.

Description of Lands Using Protracted Public Land Survey Lines

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.18N., R.06E. Humboldt Meridian: Section 5 except E $\frac{1}{2}$ E $\frac{1}{2}$; E $\frac{1}{2}$ NE $\frac{1}{4}$; SE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 6; Section 7; Section 8 except E $\frac{1}{2}$ NE $\frac{1}{4}$; Section 17 except E $\frac{1}{2}$ SE $\frac{1}{4}$; Sections 18-19; W $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 20; Section 30 except E $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 31 except E $\frac{1}{2}$ E $\frac{1}{2}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$.

T.18N., R.05E. Humboldt Meridian: Section 1 except N $\frac{1}{2}$ NE $\frac{1}{4}$; Sections 2-4; Sections 8-12; Section 13 except SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$; Section 14 except SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$; Section 15; Section 20 except SW $\frac{1}{4}$; Section 21 except S $\frac{1}{2}$ SE $\frac{1}{4}$; Section 22 except SW $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$;



Map and description of CA-04-a taken from United States Fish and Wildlife Service 1:100,000 map; Cape Mendocino and Garberville, California; 1995.

Critical Habitat includes only State lands described within the following areas:

T.01N., R.01E. Humboldt Meridian: SW $\frac{1}{4}$ Section 23; S $\frac{1}{2}$ Section 24; SW $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ N $\frac{1}{2}$ Section 25; NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$ Section 26.

T.01N., R.02E. Humboldt Meridian: E $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 11; NW $\frac{1}{4}$ Section 12; S $\frac{1}{2}$ Section 19; W $\frac{1}{2}$ W $\frac{1}{2}$ Section 29; N $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 30; NW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 32.

T.01S., R.01E. Humboldt Meridian: S $\frac{1}{2}$ S $\frac{1}{2}$ Section 13; S $\frac{1}{2}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ Section 14; E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 15; E $\frac{1}{2}$ E $\frac{1}{2}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 22; Sections 23-27; Section 28 except W $\frac{1}{2}$ NW $\frac{1}{4}$; Section 33 except SW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$; Sections 34-36.

T.01S., R.02E. Humboldt Meridian: S $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 3; Section 4 except SW $\frac{1}{4}$ NW $\frac{1}{4}$; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 9; NW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 10; SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 11; W $\frac{1}{2}$ Section 14; SE $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 15; S $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 16; S $\frac{1}{2}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 17; S $\frac{1}{2}$ S $\frac{1}{2}$ Section 18; Sections 19-22; W $\frac{1}{2}$ Section 23; W $\frac{1}{2}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 26; Sections 27-34; W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 35.

T.02S., R.01E. Humboldt Meridian: Sections 1-3; E $\frac{1}{2}$ E $\frac{1}{2}$ Section 4; E $\frac{1}{2}$ E $\frac{1}{2}$ Section 9; Sections 10-14; Section 15 except W $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 22 except SW $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$; Sections 23-25; Section 26 except SW $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$.

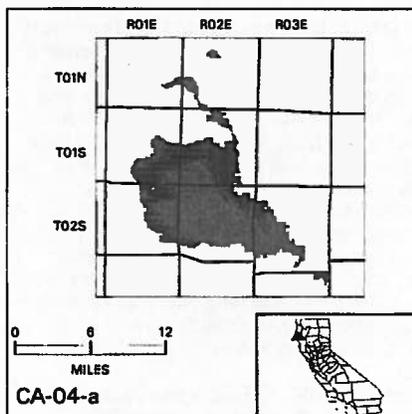
T.02S., R.02E. Humboldt Meridian: SW $\frac{1}{4}$ Section 1; Section 2 except NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$; Sections 3-24; Section 25 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; N $\frac{1}{2}$ Section 26; Section 27 except S $\frac{1}{2}$ S $\frac{1}{2}$; Section 28 except S $\frac{1}{2}$ S $\frac{1}{2}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 29 except NE $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$; Section 30 except S $\frac{1}{2}$ SW $\frac{1}{4}$; NE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 36.

T.02S., R.03E. Humboldt Meridian: Section 7 except N $\frac{1}{2}$; SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 8; Section 17 except NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$; Sections 18-20; Section 21 except NW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$; S $\frac{1}{2}$ S $\frac{1}{2}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 27; Section 28 except

NE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 29 except W $\frac{1}{2}$ NW $\frac{1}{4}$; Section 30 except SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 31 except S $\frac{1}{2}$ S $\frac{1}{2}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$; Section 32 except SE $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$; N $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 33; E $\frac{1}{2}$, NW $\frac{1}{4}$ Section 34; SE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 35.

T.03S., R.03E. Humboldt Meridian: NW $\frac{1}{4}$ Section 3; E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 11; N $\frac{1}{2}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 12; SE $\frac{1}{4}$ SE $\frac{1}{4}$, Section 13.

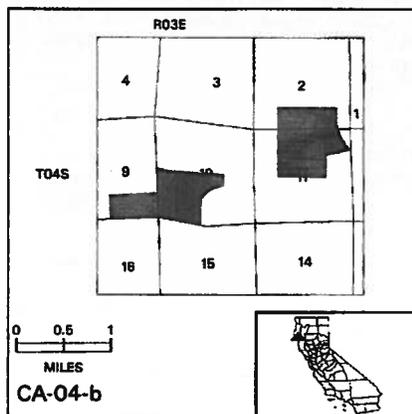
T.03S., R.04E. Humboldt Meridian: SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 18; NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 30.



Map and description of CA-04-b taken from United States Fish and Wildlife Service 1:100,000 map; Garberville, California; 1995.

Critical Habitat includes only State lands described within the following areas:

T.04S., R.03E. Humboldt Meridian: SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 2; S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 9; SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 10; E $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 11.



Map and description of CA-05-a taken from United States Fish and Wildlife Service 1:100,000 map; Cape Mendocino, Garberville and Covelo, California; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.02S., R.02E. Humboldt Meridian: SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 31; S $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 32.

T.03S., R.02W. Humboldt Meridian: SE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 12; Sections 13-14; Section 15-16 East of Mean High Water (MHW); Section 22-23 East of MHW; Section 24 except SE $\frac{1}{4}$; N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 26 East of MHW.

T.03S., R.01W. Humboldt Meridian: SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 9; NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 10; S $\frac{1}{2}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 11; SW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ Section 12; Sections 13-18; N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 19; N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, Section 20; Sections 21-26; N $\frac{1}{2}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 27; N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 28; NE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 35; N $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 36.

T.03S., R.01E. Humboldt Meridian: N $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 12; N $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 13; SW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 18; W $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 19; SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 24; W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 29; Section 30 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 31; W $\frac{1}{2}$ W $\frac{1}{2}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 32.

T.03S., R.02E. Humboldt Meridian: W $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 5; E $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 6; Section 7 except SW $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$; W $\frac{1}{2}$ W $\frac{1}{2}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 8; S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 9; E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 18; NE $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 19; SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 20; NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 22; NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 28; NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 30.

T.04S., R.01W. Humboldt Meridian: S $\frac{1}{2}$ S $\frac{1}{2}$, Section 1; SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 2; SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 10; S $\frac{1}{2}$, NE $\frac{1}{4}$ Section 11; N $\frac{1}{2}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 12; Section 14 east of MHW.

T.04S., R.01E. Humboldt Meridian: SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 4; Section 5; Section 6 except S $\frac{1}{2}$ SW $\frac{1}{4}$; NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 7; N $\frac{1}{2}$ Section 8; Section 9 except N $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$; S $\frac{1}{2}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 10; SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 11; Section 15; Section 16 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 20; E $\frac{1}{2}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 21; Sections 22-23; S $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ Section 24; W $\frac{1}{2}$ Section 25; Section 26-27; Section 28 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; N $\frac{1}{2}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 29; N $\frac{1}{2}$ N $\frac{1}{2}$ Section 33; E $\frac{1}{2}$ Section 34; Section 35; W $\frac{1}{2}$ Section 36.

T.04S., R.02E. Humboldt Meridian: S $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 31.

T.05S., R.01E. Humboldt Meridian: Section 1; Section 2 except N $\frac{1}{2}$ SW $\frac{1}{4}$; E $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 3; NE $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 11; Section 12 except N $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 13 except W $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$; E $\frac{1}{2}$ Section 14; Section 23 East of MHW; Section 24; Section 25 East of MHW.

Description of Lands Using Protracted Public Land Survey Lines

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.05S., R.02E. Humboldt Meridian: Western $\frac{1}{2}$ of the Western $\frac{1}{2}$ of the Township T.05S., R.02E.

NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 17; W $\frac{1}{2}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 18; Section 19 except SW $\frac{1}{4}$ SE $\frac{1}{4}$; W $\frac{1}{2}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$ Section 20; S $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ Section 27; Section 28 except N $\frac{1}{2}$ N $\frac{1}{2}$ and SE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 29 except N $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 30 except N $\frac{1}{2}$ NE $\frac{1}{4}$; Section 31; Section 32 except SE $\frac{1}{4}$ NE $\frac{1}{4}$ and E $\frac{1}{2}$ SE $\frac{1}{4}$; N $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 33; NW $\frac{1}{4}$ Section 34.

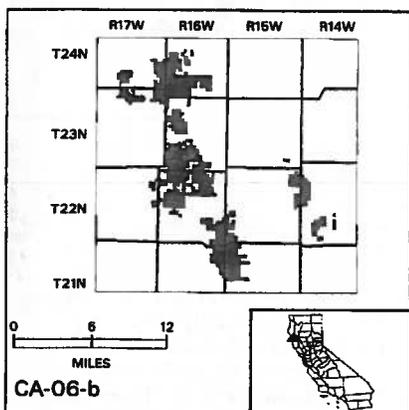
T.24N., R.17W. Mt. Diablo Meridian: NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 23; Section 24 except NE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$; E $\frac{1}{2}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 25, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 26, Section 36.

Critical Habitat includes only State lands described within the following areas:

T.21N., R.16W. Mt. Diablo Meridian: SW $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$ Section 26.

T.23N., R.17W. Mt. Diablo Meridian: N $\frac{1}{2}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$ Section 2; Section 3 except NE $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$; E $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 4.

T.24N., R.17W. Mt. Diablo Meridian: Section 28 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; NW $\frac{1}{4}$ Section 27; W $\frac{1}{2}$ Section 33; SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 34.



Map and description of CA-07-a taken from United States Fish and Wildlife Service 1:100,000 map; Ukiah, California; 1995.

Critical Habitat includes only State lands described within the following areas:

T.17N., R.14W. Mt. Diablo Meridian: W $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 6; W $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 7.

T.17N., R.15W. Mt. Diablo Meridian: W $\frac{1}{2}$, SE $\frac{1}{4}$ Section 2; Sections 3-8; Section 9 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 10 except S $\frac{1}{2}$ S $\frac{1}{2}$; Section 11; Section 12 except SW $\frac{1}{4}$ SE $\frac{1}{4}$; N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 14; Section 18 except SE $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$.

T.17N., R.16W. Mt. Diablo Meridian: N $\frac{1}{2}$ N $\frac{1}{2}$ Section 1; Section 3 except W $\frac{1}{2}$ W $\frac{1}{2}$; Sections 4-6; NE $\frac{1}{4}$, SW $\frac{1}{4}$ Section 7; N $\frac{1}{2}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ Section 8; N $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 9; Section 10 except NE $\frac{1}{4}$ NE $\frac{1}{4}$; Section 18 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 19; W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 30.

T.17N., R.17W. Mt. Diablo Meridian: Sections 1-3; NE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ Section 4; NE $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$,

S $\frac{1}{2}$ S $\frac{1}{2}$ Section 5; N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 6; Section 8 except W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$; Sections 9-15; SE $\frac{1}{4}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ Section 16; S $\frac{1}{2}$ Section 17; S $\frac{1}{2}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 18; NW $\frac{1}{4}$ Section 19; N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 20; Section 21 except SE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 22 except E $\frac{1}{2}$ SW $\frac{1}{4}$; Section 23 except NW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 24; NE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 26; Section 27 except SW $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$; Section 28 except NE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$.

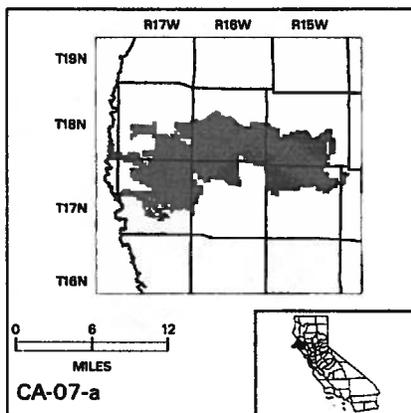
T.17N., R.18W. Mt. Diablo Meridian: SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 13.

T.18N., R.15W. Mt. Diablo Meridian: SW $\frac{1}{4}$ Section 18; Section 19; SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 20; Section 21; Section 22 except NE $\frac{1}{4}$; Section 23 except N $\frac{1}{2}$ NW $\frac{1}{4}$; W $\frac{1}{2}$ W $\frac{1}{2}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 24; W $\frac{1}{2}$ Section 25; Section 26 except E $\frac{1}{2}$ E $\frac{1}{2}$; Sections 27-34; Section 35 except NE $\frac{1}{4}$ SE $\frac{1}{4}$.

T.18N., R.16W. Mt. Diablo Meridian: S $\frac{1}{2}$ Section 13; SE $\frac{1}{4}$ Section 14; SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 15; S $\frac{1}{2}$ N $\frac{1}{2}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ Section 16; Section 17 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; S $\frac{1}{2}$ Section 18; Sections 19-33; Section 34 except E $\frac{1}{2}$ SE $\frac{1}{4}$; Section 35 except W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 36.

T.18N., R.17W. Mt. Diablo Meridian: Section 20 except N $\frac{1}{2}$ N $\frac{1}{2}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 21 except NW $\frac{1}{4}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$; NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 23; Section 24; Section 25 except S $\frac{1}{2}$ S $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$; Section 26 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 27; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 28; N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 29; NW $\frac{1}{4}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ S $\frac{1}{2}$ Section 31; S $\frac{1}{2}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ Section 32; S $\frac{1}{2}$ N $\frac{1}{2}$, N $\frac{1}{2}$ S $\frac{1}{2}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 33; Sections 34-36.

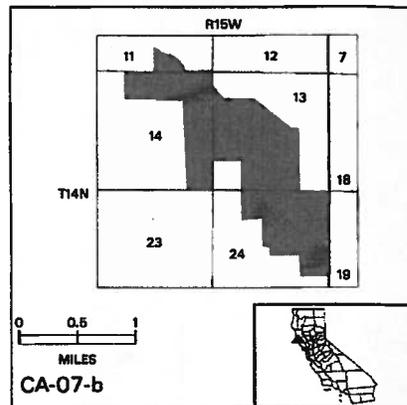
T.18N., R.18W. Mt. Diablo Meridian: SW $\frac{1}{4}$ Section 25; W $\frac{1}{2}$, SE $\frac{1}{4}$ Section 36.



Map and description of CA-07-b taken from United States Fish and Wildlife Service 1:100,000 map; Ukiah, California; 1995.

Critical Habitat includes only State lands described within the following areas:

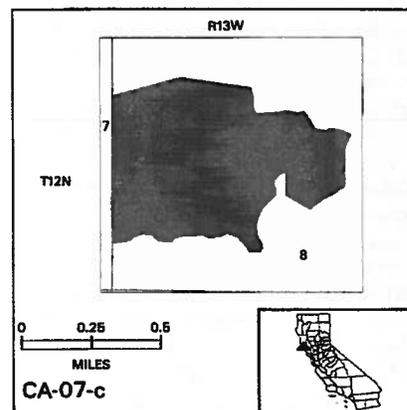
T.14N., R.15W. Mt. Diablo Meridian: E $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 11; Section 13 except E $\frac{1}{2}$ E $\frac{1}{2}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$; E $\frac{1}{2}$ E $\frac{1}{2}$, NE $\frac{1}{4}$, NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 14; NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 24.



Map and description of CA-07-c taken from United States Fish and Wildlife Service 1:100,000 map; Point Arena, California; 1995.

Critical Habitat includes only State lands described within the following areas:

T.12N., R.13W. Mt. Diablo Meridian: S $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 8.

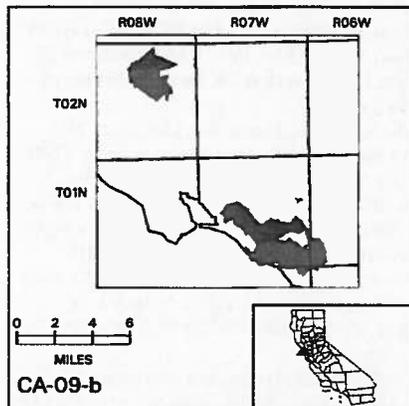


Map and description of CA-07-d taken from United States Fish and Wildlife Service 1:100,000 map; Ukiah, California; 1995.

Critical Habitat includes only State lands described within the following areas:

T.16N., R.14W. Mt. Diablo Meridian: S $\frac{1}{2}$ S $\frac{1}{2}$ Section 14; E $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 15; E $\frac{1}{2}$ Section 22; Section 23 except E $\frac{1}{2}$ NE $\frac{1}{4}$; W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 25; E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 26.

with the Rancho Las Baulines Spanish Land Grant line, north along the Rancho Las Baulines Spanish Land Grant boundary to the intersection with McKinnan Gulch.



Map and description of CA-10-a taken from United States Fish and Wildlife Service 1:100,000 map; Grants Pass, Oregon; Happy Camp, California; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.17N., R.07E. Humboldt Meridian: Section 1; Section 2 except NW $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$; N $\frac{1}{2}$ Section 3; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 4; NE $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ Section 11; N $\frac{1}{2}$ N $\frac{1}{2}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 12; NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 13; NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 14.

T.17N., R.08E. Humboldt Meridian: Section 6 except E $\frac{1}{2}$ E $\frac{1}{2}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$.

T.18N., R.07E. Humboldt Meridian: Section 30 except NW $\frac{1}{4}$; NE $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$, Section 31; N $\frac{1}{2}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 32; Section 36.

T.18N., R.08E. Humboldt Meridian: Section 31 except SE $\frac{1}{4}$ SE $\frac{1}{4}$.

T.41S., R.06W. Willamette Meridian: Section 4 except N $\frac{1}{2}$ NE $\frac{1}{4}$; Section 5 except N $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$; SE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 6; Sections 7-8; Section 9 except N $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$; NW $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 10; S $\frac{1}{2}$, NW $\frac{1}{4}$ Section 16; Sections 17-18.

T.41S., R.07W. Willamette Meridian: Section 10 except W $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 11 except NW $\frac{1}{4}$; Section 12 except NE $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$; Sections 13-15.

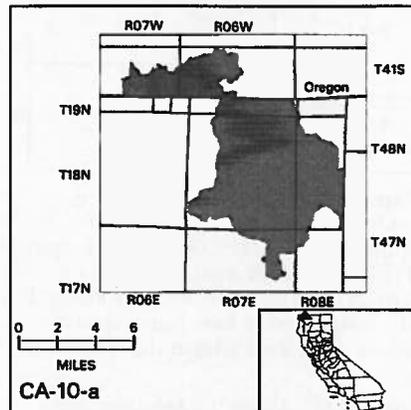
Description of lands using protracted Public Land Survey Lines

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.18N., R.07E. Humboldt Meridian: Section 1-4; E $\frac{1}{2}$ Section 5; NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 8; Sections 9-16; E $\frac{1}{2}$ Section 17; SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 19; E $\frac{1}{2}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 20; Sections 21-29; E $\frac{1}{2}$, N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 33; Sections 34-35.

T.18N., R.08E. Humboldt Meridian: SW $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 6; Section 7; Section 8 except N $\frac{1}{2}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$; W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 9; W $\frac{1}{2}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 16; Sections 17-21; Section 28; Section 29 except SW $\frac{1}{4}$ SE $\frac{1}{4}$; Section 30; NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 32; N $\frac{1}{2}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ Section 33.

T.19N., R.07E. Humboldt Meridian: E $\frac{1}{2}$ Section 32; Sections 33-36.



Map and description of CA-11-a taken from United States Fish and Wildlife Service 1:100,000 map; Hoopa and Hayfork, California; 1995.

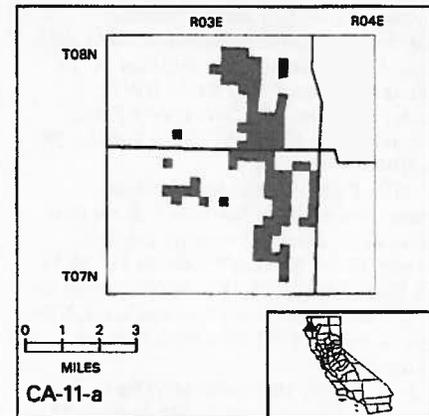
Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.07N., R.03E. Humboldt Meridian: E $\frac{1}{2}$ SE $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 1; E $\frac{1}{2}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 2; N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 3; SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 4; SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 5; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 8; W $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 9; SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 10; E $\frac{1}{2}$ E $\frac{1}{2}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 11; W $\frac{1}{2}$ W $\frac{1}{2}$, E $\frac{1}{2}$ E $\frac{1}{2}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 12; W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 13; E $\frac{1}{2}$ W $\frac{1}{2}$, W $\frac{1}{2}$ E $\frac{1}{2}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 14; W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 24.

Description of Lands Using Protracted Public Land Survey Lines

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.08N., R.03E. Humboldt Meridian: SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 22; SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 23; W $\frac{1}{2}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 26; NE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 27; NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 33; SE $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$, Section 34; Section 35.



Map and description of CA-11-b taken from United States Fish and Wildlife Service 1:100,000 map; Hayfork, California; 1995.

Critical Habitat includes only Federal lands designated as Late Successional Reserves described within the following areas:

T.03N., R.02E. Humboldt Meridian: SE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ N $\frac{1}{2}$ Section 1; NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 2.

T.03N., R.03E. Humboldt Meridian: N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, Section 6.

T.03N., R.04E. Humboldt Meridian: W $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ Section 1; Section 2 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; E $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 3; W $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ Section 5; E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 6.

T.03N., R.05E. Humboldt Meridian: NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 6; SW $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 7; NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 18.

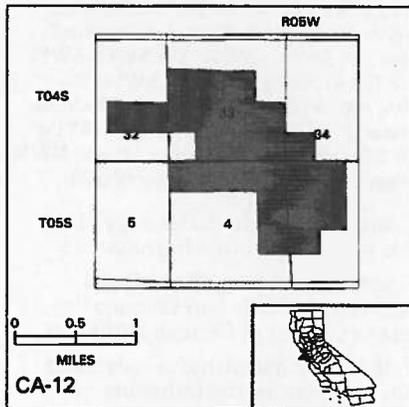
T.04N., R.02E. Humboldt Meridian: S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 25.

T.04N., R.03E. Humboldt Meridian: S $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 31.

T.04N., R.04E. Humboldt Meridian: NE $\frac{1}{4}$ Section 1; E $\frac{1}{2}$ E $\frac{1}{2}$ Section 12; S $\frac{1}{2}$ Section 25; SE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ Section 26; S $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 27; N $\frac{1}{2}$, S $\frac{1}{2}$ S $\frac{1}{2}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 28; SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 29; S $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 30; W $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 31; SE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ Section 32; N $\frac{1}{2}$ N $\frac{1}{2}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 33; Section 34 except N $\frac{1}{2}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$; Section 35 except N $\frac{1}{2}$ N $\frac{1}{2}$.

T.04N., R.05E. Humboldt Meridian: Sections 1-7; S $\frac{1}{2}$ Section 8; Sections 9-12; Section 13 except E $\frac{1}{2}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$; Section 14; Section 15 except W $\frac{1}{2}$ NW $\frac{1}{4}$ and SW $\frac{1}{4}$; NE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 16; NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 17; N $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 18; Section 19 except W $\frac{1}{2}$ W $\frac{1}{2}$; Section 20; NE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ Section 21; NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$ Section 22; Section 23; Section 24 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 25; NW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 26; NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 28; Section 29 except S $\frac{1}{2}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 30; Section 31 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 32.

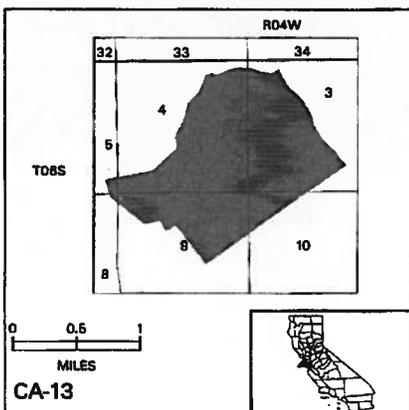
T.04N., R.06E. Humboldt Meridian: W $\frac{1}{2}$ W $\frac{1}{2}$ Section 6; W $\frac{1}{2}$ Section 7.



Map and description of CA-13 taken from United States Fish and Wildlife Service 1:100,000 map; California; 1995.

Critical Habitat includes only County lands bounded by the following description within Spanish Land Grant Canada de Raymundo:

Starting at the intersection of West Union Creek with the San Francisco State Fish and Game Refuge boundary, west along the San Francisco State Fish and Game Refuge boundary to the intersection with State Highway 35, southeast on State Highway 35 to the intersection with the San Francisco State Fish and Game Refuge boundary, southeast along the San Francisco State Fish and Game Refuge boundary to Woodside City boundary, northeast along Woodside City boundary to the intersection with Greer Road, northwest on Greer Road to the intersection with West Union Creek, north along West Union Creek to the intersection with the San Francisco State Fish and Game Refuge boundary.



Map and description of CA-14-a taken from United States Fish and Wildlife Service 1:100,000 map; California; 1995.

Critical Habitat includes only County lands described within the following areas:

T.07S., R.03W. Mount Diablo Meridian: S $\frac{1}{2}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 31; W $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 32.

T.07S., R.04W. Mount Diablo Meridian: S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ Section 22; S $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 23; SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 25; Section 26 except SW $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$; E $\frac{1}{2}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 33; S $\frac{1}{2}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 34; Section 35 except N $\frac{1}{2}$ N $\frac{1}{2}$; Section 36 except E $\frac{1}{2}$ NE $\frac{1}{4}$.

T.08S., R.03W. Mount Diablo Meridian: Sections 6-7; S $\frac{1}{2}$ S $\frac{1}{2}$ Section 8; SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 9; NW $\frac{1}{4}$ Section 16; N $\frac{1}{2}$ N $\frac{1}{2}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 17; N $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 18.

T.08S., R.04W. Mount Diablo Meridian: Sections 1-2; SE $\frac{1}{4}$ Section 3; NE $\frac{1}{4}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 10; NE $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 11; Section 12 except SW $\frac{1}{4}$ SW $\frac{1}{4}$.

Critical Habitat includes only Private lands described within the following areas:

T.07S., R.04W. Mount Diablo Meridian: N $\frac{1}{2}$ NE $\frac{1}{4}$ Section 35.

T.08S., R.04W. Mount Diablo Meridian: S $\frac{1}{2}$ Section 4; SE $\frac{1}{4}$ Section 5; Sections 7-8; N $\frac{1}{2}$ Section 9; Section 16-18; Section 20 except NW $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$; NW $\frac{1}{4}$ Section 21.

Description of Lands Using Protracted Public Land Survey Lines

Critical Habitat includes only State lands described within the following areas:

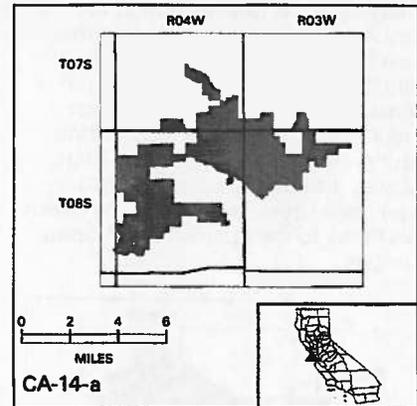
T.07S., R.03W. Mount Diablo Meridian: W $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 33.

T.08S., R.03W. Mount Diablo Meridian: N $\frac{1}{2}$ SW $\frac{1}{4}$ Section 2; S $\frac{1}{2}$ Section 3; E $\frac{1}{2}$ Section 4; S $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$ Section 5; Section 8 except SW $\frac{1}{4}$ SW $\frac{1}{4}$; Section 9 except S $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$; NW $\frac{1}{4}$ Section 10.

T.08S., R.04W. Mount Diablo Meridian: Section 19; S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 20; Section 21 except NW $\frac{1}{4}$; Section 22 except SE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$; Section 23 except S $\frac{1}{2}$ S $\frac{1}{2}$; W $\frac{1}{2}$ SW $\frac{1}{4}$ Section 24; NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 28; Sections 29-30; N $\frac{1}{2}$ Section 32.

Critical Habitat includes only State lands within Rancho Punta del Ano Nuevo Spanish Land Grant bounded by the following description:

Starting at the intersection of Butano Park Road with Cloverdale Road, south along Cloverdale Road to the intersection with Gazos Creek Road, east along Gazos Creek Road to the intersection with Punta del Ano Nuevo Spanish Land Grant boundary, north along the Punta del Ano Nuevo Spanish Land Grant boundary to the intersection with Butano Park Road, west along Butano Park Road to the intersection of Butano Park Road with Cloverdale Road.



Map and description of CA-14-b taken from United States Fish and Wildlife Service 1:100,000 map; California; 1995.

Description of Lands Using Protracted Public Land Survey Lines

Critical Habitat includes only State lands described within the following areas:

T.08S., R.03W. Mount Diablo Meridian: SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 19; S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 20; NE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 26, Section 29; Section 30 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; Sections 31-33.

T.08S., R.04W. Mount Diablo Meridian: SE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ Section 25; S $\frac{1}{2}$ Section 35; Section 36.

T.09S., R.03W. Mount Diablo Meridian: NW $\frac{1}{4}$ Section 3; Sections 4-8; SE $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 9; S $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, Section 10; NW $\frac{1}{4}$ Section 15; NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ Section 16; W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 17; Section 18; N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ Section 19; S $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 30; S $\frac{1}{2}$ N $\frac{1}{2}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 31.

T.09S., R.04W. Mount Diablo Meridian: Sections 1-2; Section 3 except N $\frac{1}{2}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$; NW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 4; SE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ Section 9; Section 10 except NW $\frac{1}{4}$; Sections 11-12; Section 13 except SW $\frac{1}{4}$ SE $\frac{1}{4}$; Section 14; Section 15 except SE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 16; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 21; Section 22 except SW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$; Section 23; Section 24; N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 25; W $\frac{1}{2}$, W $\frac{1}{2}$ E $\frac{1}{2}$ Section 26; Section 27 except NW $\frac{1}{4}$ NW $\frac{1}{4}$; Section 34; NE $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ W $\frac{1}{2}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 35.

T.10S., R.04W. Mount Diablo Meridian: Sections 2-3.

Critical Habitat includes only Private lands described within the following areas:

T.09S., R.04W. Mount Diablo Meridian: Section 16; Section 21 except S $\frac{1}{2}$, E $\frac{1}{2}$ NE $\frac{1}{4}$.

Critical Habitat includes only State lands bounded by the following description within Spanish Land Grant Punta de Ano Nuevo: