Marbled Murrelet

The marbled murrelet (*Brachyramphus marmoratus*) was federally listed as threatened by the U.S. Fish and Wildlife Service in October 1992 (Federal Register 1992b, 45328-45337). A recovery plan was finalized in 1997 (USDI USFWS 1997). The recovery plan outlines the conservation strategy for the species. A draft rule for the revision of critical habitat was published in September 2006 (Federal Register 2006d). In March, 2008, the U.S. Fish and Wildlife Service declined to make changes to critical habitat based on this proposal; therefore, critical habitat remains as designated in 1996.

The short-term actions that are necessary to stabilize the murrelet population according to the recovery plan include:

- maintain occupied habitat
- maintain large blocks of suitable habitat
- maintain and enhance buffer habitat
- decrease risks of nesting habitat loss due to fire and windthrow
- reduce predation
- minimize disturbance

The long-term conservation needs for the murrelet according to the recovery plan include:

- increase productivity (abundance, ratio of juveniles to adults, and nest success) and population size
- increase the amount (stand size and number of stands), quality, and distribution of suitable nesting habitat
- protect and improve the quality of the marine environment
- reduce or eliminate threats to survivorship by reducing predation in the terrestrial environment and anthropogenic sources of mortality at sea

The U.S. Fish and Wildlife Service (USDI USFWS 1997) estimates that recovery of the marbled murrelet will require at least 50 years.

Six conservation zones were designated in the marbled murrelet recovery plan (USDI USFWS 1997). The recovery objectives for the marbled murrelet are measured in each conservation zone with the objective of ensuring a well-dispersed population of marbled murrelets. Conservation Zone 3 (in its entirety) and the northern half of conservation Zone 4 overlay the planning area. See *Figure 3-64 (Marbled murrelet conservation zones)* (USDI USFWS 1997). Conservation Zone 3 extends from the Columbia River, south to North Bend, Oregon; extending 1.2 miles out to sea and approximately 35 miles inland (coinciding with "Zone 1", as designated by the Northwest Forest Plan). Conservation Zone 4 extends from North Bend, Oregon to the southern end of Humbolt County, California; extending 1.2 miles out to sea and approximately 35 miles inland (coinciding with "Zone 1", as designated by the Northwest Forest Plan).

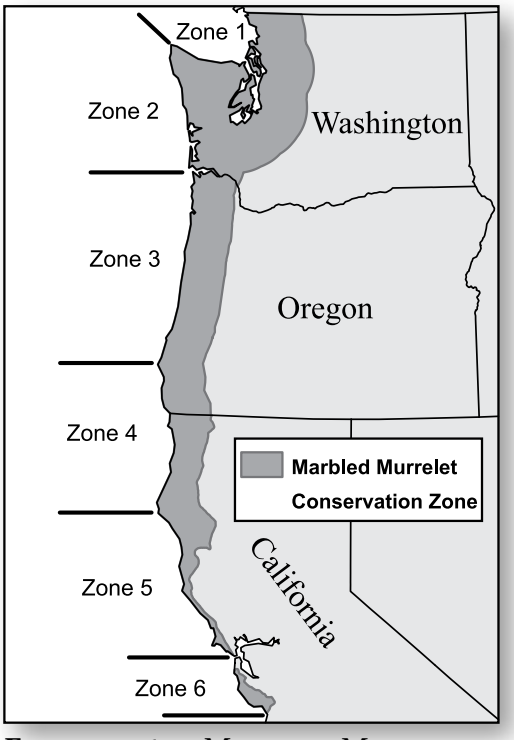


Figure 3-64. Marbled Murrelet Conservation Zones

The following recent documents summarize the condition of the marbled murrelet across its range and are incorporated by reference:

- evaluation report for the five-year status review of the marbled murrelet in Washington, Oregon, and California (McShane et al. 2004)
- marbled murrelet five-year review (USDI USFWS 2004b)
- status and trends of populations and nesting habitat for the marbled murrelet (Huff et al. 2006)

A panel of scientific experts was convened by the U.S. Fish and Wildlife Service to evaluate, synthesize, and interpret the information pertaining to the relevant scientific issue concerning the marbled murrelet. The threats to marbled murrelets and any changes since the 1992 listing were also evaluated. The report was used in the five-year status review (USDI USFWS 2004b) of the marbled murrelet. The status review sought to answer the following questions:

- Does the currently listed distinct population segment meet the criteria established in the U.S. Fish and Wildlife Service 1996 Distinct Vertebrate Species Policy?
- Is there new information about the threats or population status of the marbled murrelet?
- If so, does the new information suggest that a change in listing status may be warranted?

The U.S. Fish and Wildlife Service determined that:

- The Washington, Oregon, and California populations do not constitute a discrete population from the remainder of the species and therefore do not constitute a distinct population segment.
- All of the threats to the species identified in the listing are still relevant; new information confirms the importance of predation in limiting nesting success; and new gill-netting regulations in California and Washington may reduce impacts to the species.

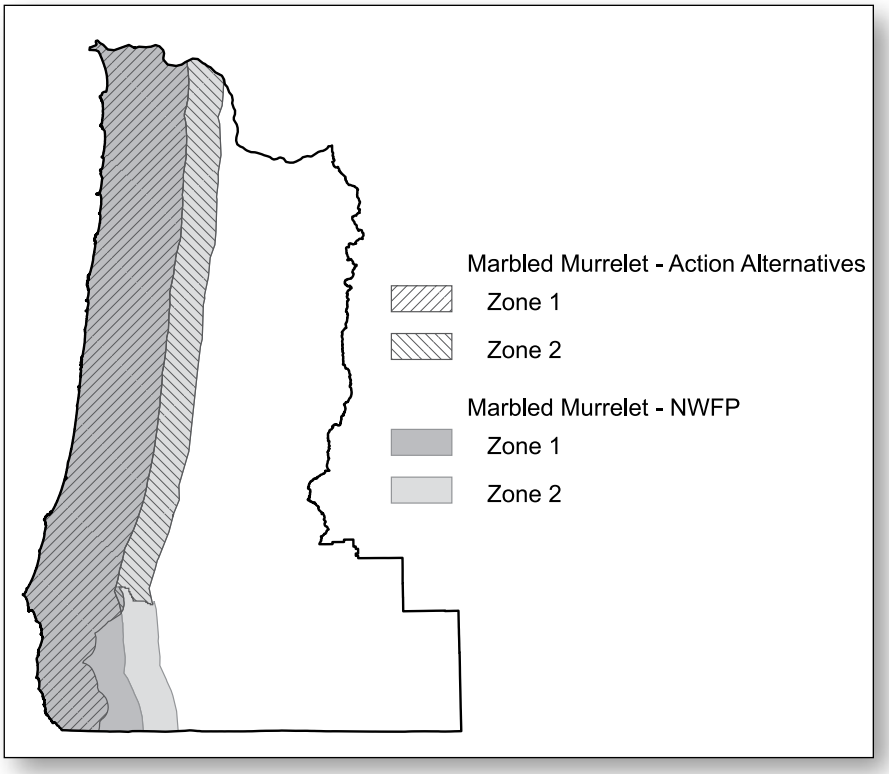


Figure 3-65. Range Of The Marbled Murrelet Within The Planning Area

The marbled murrelet remains listed as a threatened species at this time (USDI USFWS 2004b).

The Northwest Forest Plan established two management zones for the marbled murrelet. Zone 1 extended from the coast to approximately 35 miles inland. Zone 2 extended from the eastern boundary of Zone 1 to approximately 50 miles inland from the coast. Combined, these zones include 14,825 square miles. See *Figure 3-65 (Range of the marbled murrelet within the planning area)*.

Systematic surveys in the Klamath province have indicated that marbled murrelets are likely confined to the hemlock-tanoak vegetation zone (USDA and USDI 2002). The portion formally considered part of the range of the marbled murrelet in the Medford District is highlighted in *Figure 3-65. (Range of the marbled murrelet within the planning area)*.

The range of the marbled murrelet for this management plan includes approximately 6,010,000 acres in Zone 1 and 2,536,000 acres in Zone 2, and incorporates portions of the Salem, Eugene, Roseburg, and Medford Districts, and incorporates the Coos Bay District in its entirety.

A report by Huff et al. (2006) regarding the effects of the first 10 years after the implementation of the Northwest Forest Plan on the population and habitat of the marbled murrelet was completed as part of the Northwest Forest Plan's 10-year effectiveness monitoring effort. The team reported that:

- There was an estimated marbled murrelet population of 22,000 birds for coastal waters adjacent to the Northwest Forest Plan area.
- The available sampling effort was insufficient to detect significant population change.
- The highest densities of marbled murrelets occurred along the Oregon and northern Californian coasts.
- The lowest densities of marbled murrelets occurred from the Mendocino and Humboldt county line south to San Francisco Bay.
- Habitat models predicted that marbled murrelet nesting habitat is more likely at sites that:
  - — are closer to the sea;
  - — are on relatively flat terrain;
  - — are topographically cooler;
  - — have relatively few conifers that are greater than or equal to 10 inches (diameter at breast height);
  - — have greater basal areas of trees that are greater than or equal to 10 inches (diameter at breast height); or
  - — have greater basal areas of trees that are greater than or equal to 30 inches (diameter at breast height).
- Inland management Zone 2 (furthest from the coast) accounted for less than 2 percent of the estimated high-quality habitat on federally administered lands.
- Only 13% of the federal lands provide more than medium-quality nesting habitat for the marbled murrelet.

Nelson et al. (2006) completed a recent review of marbled murrelet biology and nesting habitat. The results included:

- Marbled murrelets are secretive, noncolonial nesters that forage at sea and nest inland.
- The majority of marbled murrelets nest within 37 miles of the coast, although nests have been documented up to 52 miles inland in Washington and 47 miles inland in Oregon (Espinosa, pers. comm. 2007).
- The most important component in the nesting habitat for the marbled murrelet is the presence of large platforms (i.e. limbs or other structures that are at least 4 inches in diameter with a substrate [moss or other duff] capable of forming a nest cup).
- Other important factors include vertical and horizontal cover location with respect to forest openings or edge, and height of platform. Platforms should be high enough to provide for jump-off departures and open enough to provide for stall landings, while still providing protection from predators and the weather.
- Nest trees documented in the Northwest Forest Plan area are greater than 19 inches (diameter at breast height) and greater than 98 feet tall. Nest trees are typically taller than the average non-nest tree.
- Vertical cover (cover above the nest) is typically above 70%.

Nest stands typically possess a high density of large trees with platforms, have multiple canopy layers, and are typically older. Studies summarized for Oregon indicate that the density of trees with platforms and the

number of platforms in general were the most important variable in predicting marbled murrelet nesting habitat at the stand level.

Actual nests and behaviors indicate that marbled murrelets select old-growth forests for nesting. The proportion of older forest (mature and old growth) on the landscape and size of the forest patch were greater in occupied sites than unoccupied sites. Marbled murrelets nest in landscapes with larger stands with less edge, farther from logged areas than random watersheds. Habitat modeling efforts have shown that distance from the coast is an important factor in determining marbled murrelet occurrence. Patches of suitable nesting trees of only a few acres and with only a few suitable nesting trees are thought to be capable of supporting marbled murrelet nesting. The resolution and attributes of the vegetation maps used in this planning effort limited the identification of small stands with only a few suitable nesting trees.

For this plan revision, marbled murrelet nesting habitat was modeled as those stands in the mature (with multilayered canopy) and structurally complex structural stages of forest within the range described in *Figure 3-65 (Range of the marbled murrelet within the planning area)*.

Mature stands in the western hemlock and tanoak retention zones are those that contain more than 23 trees per acres with a diameter at breast height greater than or equal to 20 inches. In the Douglas fir zone, mature stands are those with more than 11 trees per acre with a diameter at breast height greater than or equal to 20 inches.

There are approximately 377,000 acres of marbled murrelet nesting habitat within the planning area; 156,000 acres are greater than 200 years of age. See *Table 3-30 (Summary of marbled murrelet nesting habitat on BLM-administered lands within the planning area)*.

Studies to determine the characteristics of marbled murrelet nesting habitat at the landscape scale include:

- McShane et al. (2004, 4-103) reported that "[a]t the landscape level, areas with evidence of occupancy tended to have higher proportions of large, old-growth forest, larger stands and greater habitat complexity, but distance to the ocean (up to about 37 miles [60 km]) did not seem important."
- Elevation had a negative association in some studies with marbled murrelet habitat occupancy (Burger 2002). Hamer and Nelson (1995) sampled 45 nesting trees in British Columbia, Washington, Oregon, and California and found the mean elevation to be 1,089 feet (332 meters).

Table 3-30. Summary Of Marbled Murrelet Nesting Habitat On BLM-Administered Lands Within The Planning Area

BLM Districts	Habitat-Capable (acres)	Nesting Habitat		Existing Old Forests[a]	
		(acres)	Percent of Habitat-capable	(acres)	Percent of Total Nesting Habitat
Salem	214,000	80,000	37	9,000	11
Eugene	148,000	50,000	34	25,000	51
Roseburg	180,000	99,000	55	51,000	52
Coos Bay	301,000	122,000	41	57,000	47
Medford	49,000	26,000	53	14,000	56
Totals	**892,000**	**377,000**	**42**	**156,000**	**41**

[a]Forested stands greater than 200 years of age; a component of total nesting habitat.

- Multiple radar studies (Burger 2001, Cullen 2002, Raphael et al. 2002, and Steventon and Holmes 2002) in British Columbia and Washington have shown radar counts of marbled murrelets to be positively associated with total watershed area, increasing amounts of late-seral forests, and with increasing age and height class of associated forests.
- The radar counts of marbled murrelets are also negatively associated with increasing forest edge and areas of logged and immature forests (McShane et al. 2004).
- There are also several studies concluding marbled murrelets do not pack into higher densities within remaining habitat when nesting habitat is removed (Burger 2001, Manley et al. 2001, and Cullen 2002).

Studies about the relationship between the proximity of human-modified habitat and an increased abundance of avian predators and increased predation on marbled murrelet nests include:

- Luginbuhl et al. (2001, p. 565) reported in a study, which used simulated marbled murrelet nests, that "[c]orvid numbers were poorly correlated with the rate of predation within each forested plot." Luginbuhl et al. (2001, p. 569), conclude, "that using measurements of corvid abundance to assess nest predation risk is not possible at the typical scale of homogenous plots (0.5 to 1.0 km^2 in our study) [0.19 to 0.39 mi^2]. Rather this approach should be considered useful only at a broader, landscape scale on the order of 5 to 50 km^2 [1.93 to 19.31 mi^2] (based on the scale of our fragmentation and human-use measures)".
- Artificial marbled murrelet nest depredation rates were found to be highest in western conifer forests where stand edges were close to human development (De Santo and Willson 2001, and Luginbuhl et al. 2001).
- Bradley (2002) found increased corvid densities within 3 miles of an urban interface (probably due to supplemental feeding opportunities from anthropogenic activities).
- Golightly et al. (2002) found extremely low reproductive success for marbled murrelets nesting in large old-growth blocks of redwoods in the California Redwoods National and State Parks. Artificially high corvid densities from adjacent urbanization and park campgrounds are suspected to be a direct cause of the high nesting failure rates for marbled murrelets in the redwood parks (Golightly et al. 2002).
- If the surrounding landscape has been permanently modified to change the predators' numbers or densities due to agriculture, urbanization, or recreation, and predators are causing unnaturally high nest failures, then reproductive success of the marbled murrelet may remain depressed. Because corvids account for the majority of depredations on marbled murrelet nests and corvid density can increase with human development, corvid predation on marbled murrelet habitat is a primary impact consideration. The threat of predation on marbled murrelet populations (both nests and adults) appears to be greater than previously anticipated (McShane et al. 2004).

The present population estimates for the marbled murrelet include 9,500 birds (± 3,000) in Oregon and 23,700 birds (± 5,200) within the conterminous United States (Huff et al. 2003, Strong 2003a, and Strong 2003b). Spiech and Wahl (1995) concluded that marbled murrelet populations in Puget Sound are lower now than they were at the beginning of this century, and total estimates for Washington are still about 9,800 marbled murrelets (Huff et al. 2003). Ralph and Miller (1995) estimated the California population to be approximately 6,500 birds, and this estimate remains within the statistical confidence interval (Strong 2003a and 2003b).

The estimates of marbled murrelet populations that are based on monitoring data have fluctuated between approximately 5,800 and 7,800 birds in Conservation Zone 3 and between approximately 3,600 and 4,900 birds in Conservation Zone 4. See *Table 3-31 (Marbled murrelet population estimates for Conservation Zones 3 and 4)* and *Figure 3-64 (Marbled murrelet population estimates in Conservation Zones 3 and 4)*. Conservation Zones 3 and 4 overlay the planning area. See *Figure 3-67 (Marbled murrelet conservation zones)* (USDI USFWS 1997). Estimates are based on at-sea monitoring (USFWS pers. comm. 2006).

Studies on the demographic trends of the marbled murrelet include:

- Beissinger (1995) constructed a demographic model of the marbled murrelet and concluded that the population may be declining at rates of 4 to 6 percent per year, but this estimate is hampered by the possibility that the age-ratio data used in the model are reflective of a relatively temporary decline due to unusual ocean conditions (Ralph et al. 1995).
- Boulanger et al. (1999) found that change in adult survivorship is the single most important factor when projecting demographic trends for marbled murrelets.
- Similarly, Strong and Carten (2000) suggest that there may have been a 50 percent decline from 1992 to 1996 in the Oregon population, but the population appears to have stabilized since then (Strong 2003a and 2003b).
- Ralph et al. (1995) summarized some of the reasons for variability in population estimates among researchers, including differences in methodology, assumptions, spatial coverage, and survey and model errors.

Table 3-31. Marbled Murrelet Population Estimates For Conservation Zones 3 And 4

Year	Conservation Zones			
	Zone 3		Zone 4	
	Density[a]	Number of Birds	Density[a]	Number of Birds
2000	10.9	6,724	10.9	4,880
2001	12.2	7,538	8.6	3,851
2002	10.2	6,271	10.8	4,816
2003	9.5	5,866	10.0	4,495
2004	12.6	7,781	9.3	4,169
2005	9.5	5,843	8.1	3,642
2006	10.3	6,375	8.9	3,968

[a]Density equals the number of birds per square mile.

Figure 3-66. Marbled Murrelet Populations Estimates In Conservation Zones 3 And 4

- Lank et al. (2003) states that "[r]egardless of the approaches taken to estimate [(sic) vital rate] parameter values, the output from the Leslie Matrix models representing survivorship and fecundity values for all populations in Washington, Oregon and California (Beissinger and Nur 1997) suggest negative population growth rates." Present at-sea surveys for effectiveness monitoring have a 95 percent chance of detecting annual population changes of ± 20 percent or greater.

McShane et al. (2004) produced a demographic model of marbled murrelet populations in Washington, Oregon, and California by each of the six conservation zones. Similar to previous studies, they found that populations in all conservation zones are in decline with mean annual rates of decline between 2.1 percent and 6.2 percent. The highest rates of decline were in Zone 6 at the southern extent of the range. Furthermore, they conclude it is likely that populations in Zone 5 and 6 could become nonviable in the near future.

At the conservation zone scale, marbled murrelet abundance is positively correlated with the estimated amount of inland habitat (McShane et al. 2004). The precise number of acres of nesting habitat in Washington, Oregon, and California is unknown. However, suitable habitat for the marbled murrelet on federal lands is estimated at 2,223,048 acres of which 154,838 acres (7 percent) are classified as remnant habitat within the listed range of this species (McShane et al. 2004). Approximately 93 percent of the suitable habitat occurs on federal lands.

There are 233 known occupied marbled murrelet sites on BLM-administered lands within the planning area. Surveys are currently being conducted in conjunction with timber sales. See *Table 3-32. (Occupied marbled murrelet sites on BLM-administered lands within the planning area)*.

The marbled murrelet recovery plan identified the primary threats to the species as:

- predation
- loss of nesting habitat
- by-catch in gill nets
- oil pollution both chronic and from major spills

More recently, McShane et al. (2004) has concluded that all of these threats are still present, although loss of nesting habitat, particularly on federal lands, has declined, and the new gill-netting regulations in northern California and Washington have reduced the threat from by-catch in gill nets. The threat from oil pollution continues to be unpredictable and effects are variable. New information on predation indicates a high threat level due to limiting marbled murrelet nesting success (Hebert and Golightly 2003, Peery et al. 2004, Luginbuhl et al. 2001, Marzluff and Restani 1999).

Marbled murrelets, adult and chicks, appear to be fairly tolerant of disturbance, both visual and auditory. Several studies noted changes in adult feeding behaviors, but not nest abandonment. Chicks appear to be very tolerant of visual and auditory disturbance, habituating very quickly. The predominant response of marbled murrelet chicks to disturbances is to freeze or flatten out in the nest cup. Noise disturbance to nest sites is thought to be minimal, although much is unknown (Nelson et al. 2006).

The recovery plan states that four of the six zones must be functional in order to effectively recover the marbled murrelet in the short term and long term (e.g., to maintain viable populations that are well distributed). However, based on the newest population estimates, it appears only three of the zones contain relatively robust numbers of marbled murrelets (Zones 1, 3, and 4). Zones 1 and 4 contain the largest number of marbled murrelets compared to the other four zones, but areas of concern remain. Of the population in Zone 4, there were 10 percent killed in oil spills in 1997 (Bentivoglio et al. 2002; Ford et al. 2002).

Table 3-32. Occupied Marbled Murrelet Sites On BLM-Administered Lands Within The Planning Area

District	Number of Occupied Marbled Murrelet Sites
Salem	34
Eugene	20
Roseburg	15
Coos Bay	164
Medford	0
Total	**233**

Marbled murrelets in Conservation Zones 3, 5, and 6 are also experiencing significant declines in reproduction, numbers, and distribution, resulting in reduced population viability. Marbled murrelets have suffered variously from past oil spills that killed a large number of birds (Zone 3) (Ford et al. 2002), extremely small population sizes (Zones 5 and 6), and alarmingly low reproductive rates (Zone 6) (Peery et al. 2002). In at least two of these four zones (Zones 5 and 6), these factors taken singly or in combination have brought the status of the species to a point where recovery in Conservation Zones 5 and 6 may be precluded (Beissinger 2002). The poor status of marbled murrelet populations in the southern zones emphasizes the importance of supporting marbled murrelet populations in Zones 1 and 2 in order to achieve marbled murrelet recovery objectives.

Critical habitat was designated for the marbled murrelet in January 1996 and encompasses 1,515,300 acres of land in Oregon. Of this, 1,338,200 acres are federally administered (Federal Register 1996a, 26256-26320). The U.S. Fish and Wildlife Service is currently reviewing the critical habitat designation. A proposed rule that revises designated critical habitat was published on July 31, 2008 (Federal Register 2008b). The proposal removes approximately 250,000 acres of critical habitat in northern California and Oregon based on new information indicating these areas do not meet the definition of critical habitat.

Critical habitat includes those lands that may be needed for a species' eventual recovery and delisting. Critical habitat units were identified based on the need to protect current nesting habitat and provide for future development of the primary constituent elements necessary for the conservation of the marbled murrelet. The primary constituent elements include individual trees with potential nesting platforms and forested areas within 0.5 miles that possess a canopy height of at least one-half the site-potential tree height (Federal Register 1996a, 26264). Approximately 463,000 acres of critical habitat occur on Bureau of Land Management managed lands. See *Table 3-33* (*Summary of critical habitat units and marbled murrelet nesting habitat on BLM-administered lands within the planning area)* and *Map 3-7 (Critical habitat for the marbled murrelet within the planning area).* Also see *Appendix H- Wildlife* for detailed information on the effects of the alternatives on specific critical habitat units.

Sage Grouse

Sage grouse (*Centrocercus urophasianus*) were once found throughout most of the sagebrush (*Artemisia* sp.) habitat of eastern Oregon (Hagan 2005). There are currently no known populations within the planning area but there are four historically known sage grouse leks within the Klamath Falls Resource Area. The last of these leks was occupied in 1993 (Hagen 2005). The historic range for sage grouse encompasses 630,000 acres (all ownerships) in the Klamath Falls Resource Area as shown in *Figure 3-67* (*Historic range of sage grouse within the planning area*).

Map 3-7. Critical Habitat As Of 1996 For The Marbled Murrelet Within The Planning Area

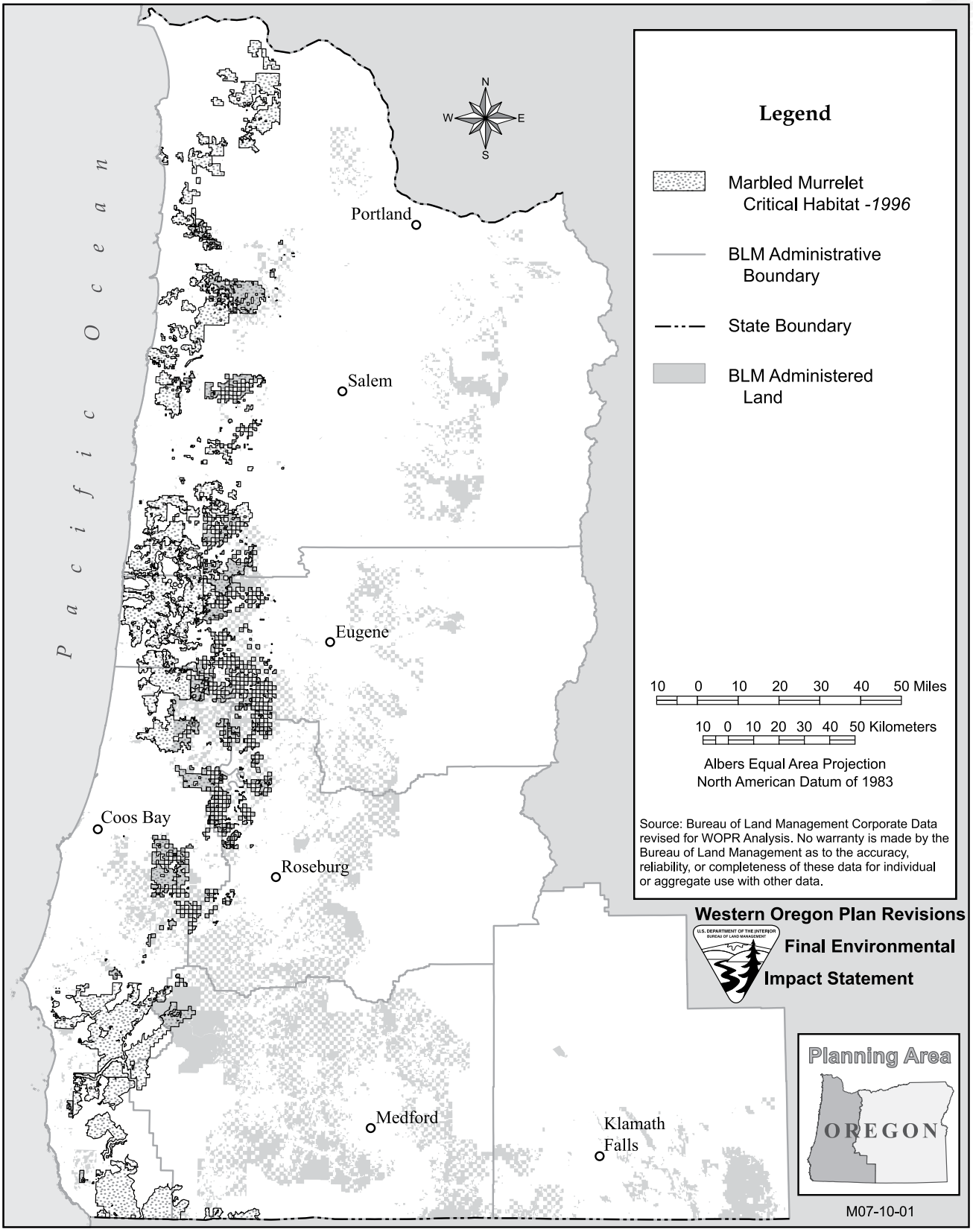


Table 3-33. Summary Of Critical Habitat Units (1996)And Marbled Murrelet Nesting Habitat On BLM-Administered Lands Within The Planning Area

Critical Habitat Unit	Habitat-Capable	Nesting Habitat	
	(acres)	(acres)	(%)
CA-01-e	14	10	71
OR-01-c	7,217	5,025	70
OR-02-b	11	1	9
OR-02-c	3,526	1,898	54
OR-02-d	25,937	6,731	26
OR-02-e	38,666	20,858	54
OR-03-a	41	41	100
OR-03-c	8,530	4,012	47
OR-04-a	1,300	802	62
OR-04-b	1,084	940	87
OR-04-c	13,388	8,012	60
OR-04-d	20,073	11,097	55
OR-04-e	50,534	27,656	55
OR-04-f	20,109	12,220	61
OR-04-g	15,368	8,354	54
OR-04-i	79,983	40,807	51
OR-04-j	56,450	30,882	55
OR-04-k	25,919	16,083	62
OR-06-a	39	26	67
OR-06-b	49,904	28,609	57
OR-06-c	4,608	3,524	76
OR-06-d	16,178	8,792	54
OR-07-a	2,366	1,252	53
OR-07-b	2,171	990	46
OR-07-d	1,840	845	46
OR-07-f	15,611	8,616	55
OR-07-g	2,086	984	47
Totals	**462,953**	**249,069**	**54**

Suitable sage grouse habitat occurs on BLM-administered lands in two units, the Campbell and the Gerber blocks within the Klamath Falls Resource Area. The Campbell block contains less than 10% BLM- administered land and will not be analyzed further because of the dispersed nature of the BLM-administered lands. The Gerber block contains 117,949 acres of which 71% (83, 276 acres) are on BLM-administered lands. There is a third block within the boundaries of the planning area, Devils Garden, but there is no BLM-administered land within this block so it will not be analyzed further. See *Figure 3-68* (*Sage grouse habitat management blocks within the Klamath Falls Resource Area*).

Ecological Site Inventory data does not contain sufficient information to differentiate between the individual habitat needs (lekking, nesting, brood rearing, and wintering). Therefore, they are lumped together and referred to as suitable sage grouse habitat. Potential habitat includes sage brush communities, meadows, ephemeral wetlands, and non-forested riparian habitats.

Figure 3-67. Historic Range Of Sage Grouse Within The Planning Area

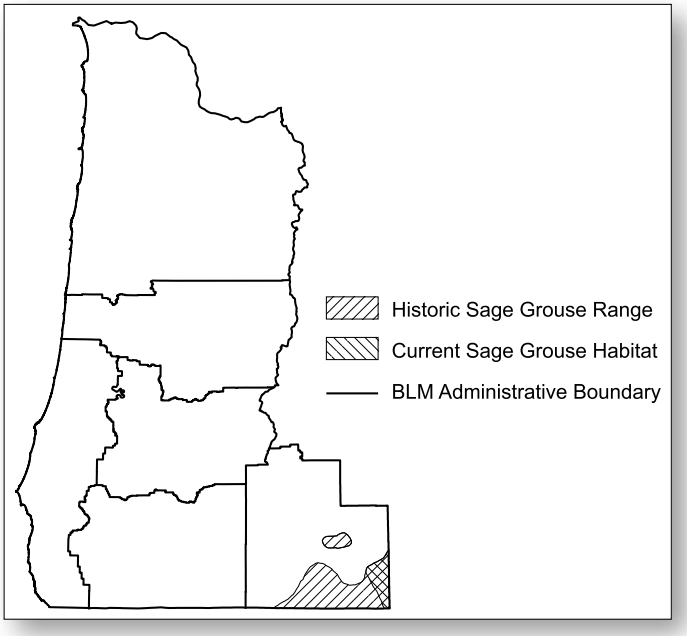
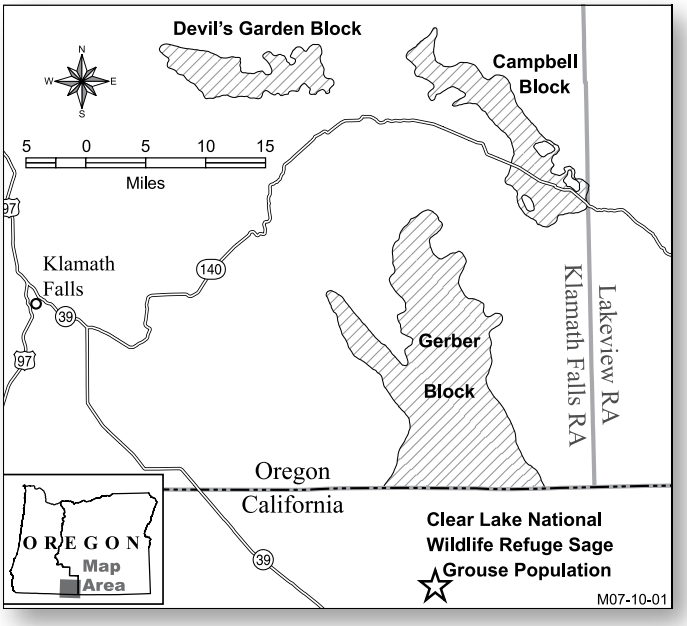


Figure 3-68. Sage Grouse Habitat Management Blocks Within The Klamath Falls Resource Area



Approximately 47,000 acres of habitat-capable land (including all biological and behavioral needs: lekking, nesting, brood rearing, and wintering habitat) was identified on BLM-administered lands using data derived from the Ecological Site Inventory as shown in *Table 3-34* (*Sage grouse habitat on the Gerber block, Klamath Falls Resource Area*). The Gerber block contains approximately 28,000 acres of habitat that is currently suitable for sage grouse and an additional 19,000 acres that could be developed or converted to suitable habitat. Gerber is the largest and most important block of sage grouse habitat-capable land within the planning area.

The major threat to the species is habitat modification and its resultant effects on reproductive capacity and predation of sage grouse (Holloran and Anderson 2005, Gregg et al. 1994, Hagen 2005). Within Oregon, since the 1940s, the sage grouse population has exhibited an overall decline (Hagan 2005, Gregg et al. 1994). However, population indices (e.g., lek counts, lek searches, brood production, and wing collections) in the last decade have shown a stable to slightly increasing population (Hagan 2005).

Between 2002 and 2004, the U.S. Fish and Wildlife Service received multiple petitions to list one or more sage grouse populations. In 2005, the U.S. Fish and Wildlife Service came out with a combined finding that the petitions were not warranted (Federal Register 2005a, p. 2244). Concurrent with the status reviews, there was an assessment of the nationwide condition of the sage grouse. Connelly et al. (2004) compiled a comprehensive review of the status of the sage grouse and sagebrush habitats entitled *Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats*.

The Oregon Department of Fish and Wildlife, in conjunction with the BLM and other land management organizations, produced the *Greater sage-grouse conservation assessment and strategy for Oregon: a plan to maintain and enhance populations and habitat* (Hagan 2005). The information contained within the Oregon conservation assessment regarding natural history and habitat condition is incorporated by reference. The following is a brief synopsis:

Table 3-34. Sage Grouse Habitat On The Gerber Block, Klamath Falls Resource Area

Unit	Total BLM Area	Habitat-Capable[a]		Habitat[b]		Non-habitat	
	(acres)	(acres)	(%)	(acres)	(%)[c]	(acres)	(%)[c]
Gerber Block	83,276	47,143	57	27,707	59	19,436	41

[a] Vegetative communities that would likely develop into, or could be converted into, sage grouse habitat.
[b] Provides for all biological and behavioral needs – lekking, nesting, brood rearing, and wintering.
[c] Percent of habitat-capable.

- Sage grouse are a sagebrush obligate species. Sagebrush provides important habitat components necessary for their nesting and diet. There are three main habitat requirements for the sage grouse: breeding (lekking and nesting), brood rearing, and over-wintering habitat.
- Males attract females by displaying (strutting) on open sites called leks, which are used annually. Leks are typically devoid of or contain short vegetation. Adjacent sagebrush provides escape cover.
- Females use areas rich in forbs to facilitate egg development. Nesting habitat consists of a sagebrush community containing sagebrush and a herbaceous understory of grasses and forbs. Nests are typically located under sagebrush plants.
- Cover, both overhead and vertical, is critical to nesting success. Good habitat provides concealment from predators, herbaceous forage for females prior to egg laying and during nesting, and insect forage for chicks.
- When broods move off the nest, they move to more open sagebrush habitat that still maintains a rich growth of grasses and forbs and has at least 15% canopy closure. Chicks feed on forbs and invertebrates. Later in the summer, broods move to moister habitats where succulent vegetation is still available.
- Winter diets consist mainly of sagebrush. Sage grouse may congregate in areas of higher canopy closure and taller sagebrush.
- Oregon sagebrush habitats have been reduced 21% from the late 1800s. The lack of connectivity (contiguity) between patches compounds the loss of habitat. High viability patches are those that have greater than 2,500 acres of contiguous habitat.
- The greater loss of sagebrush habitat in eastern Oregon has been due to the conversion of such habitat to agricultural and grazing uses. Fire and seeding with nonnative species continue play a significant role in converting sagebrush habitat to grasslands. Roads and utility corridors play an additional role in habitat degradation by providing corridors and perches for predators, spreading nonnative vegetation, and introducing disturbances. Human disturbances, both low intensity such as bird-watching and high intensity off-highway vehicle use, may cause lek or nest abandonment.

Bald Eagle

The bald eagle of North America (*Haliaeetus leucocephalus*) was delisted under the Endangered Species Act in 2007 (Federal Register 2007, 37345) in Oregon. Breeding and wintering populations occur throughout the planning area and are addressed in the Pacific States Bald Eagle Recovery Plan (USDI USFWS 1986).

Bald eagles in the Pacific Northwest nest predominantly in conifer stands adjacent to or near large rivers or other large bodies of water (USDI USFWS 1986, Anthony et al. 1982, Buehler 2000, Federal Register 2006a, 71 FR 8239).

- Distances to water bodies from nests vary, but could extend up to 1,378 yards in portions of the planning area (USDI USFWS 1986, Buehler 2000, Anthony et al. 1982). Vessely et al. (2001) modeled potential nesting habitat up to 3 kilometers (1.9 miles) away from water.
- Nesting habitat can encompass a wide range of stand types, but they all can be described as having a variety of canopy layers and some component of large diameter or old-growth trees. Anthony et al. (1982) found that the diameters of nesting trees vary by forest types, but, invariably, they were some of the largest trees in the stand. The average diameters of nesting trees varied between:
  — 41 inches (diameter at breast height) in Oregon mixed conifer stands
  — 46 inches in ponderosa pine forests
  — 69 inches in Douglas fir forests.
- Douglas fir is the dominant species for nesting trees west of the Cascade Mountains, and ponderosa pine is dominant east of the Cascade Mountains (Anthony et al. 1982).

Fish, waterfowl, jackrabbits, and carrion provide the most common source of food for eagles in the Pacific Northwest (USDI USFWS 1986). Nesting sites, roosts, and wintering areas tend to be associated with sources of food (Anthony et al. 1982, USDI USFWS 1986, Buehler 2000, Federal Register 2006a, 8242), although overwintering area locations may also be driven by remoteness (Federal Register 2006a, 8239; USDI USFWS 1986).

There are 3,600 miles of streams and 291,000 acres of ponds and lakes on BLM-administered lands that provide foraging habitat for the bald eagle. There are approximately 442,000 acres of BLM-administered lands that are capable of providing eagle nesting and roosting habitat in the planning area (those forest-capable lands within 2 miles of, and within sight of, foraging waters). Approximately 54 percent of those acres are currently providing bald eagle nesting and roosting habitat. See *Table 3-35 (Potential bald eagle nesting habitat within the planning area)*.

Communal roosts are selected for and favor those stands that have a high degree of stratification (Anthony et al. 1982). Roost trees are the largest trees in the stand or have open branching patterns, provide visibility, and may be close to a consistent food source (Anthony et al. 1982, Buehler 2000).

There are 149 bald eagle nesting trees on BLM-administered lands within the planning area. These nests are contained within 89 known territories (Isaacs and Anthony 2005). Monitoring data indicates that bald eagle numbers have increased steadily since 1973 (Isaacs and Anthony 2005). See *Table 3-36 (Summary of the 2005 monitoring data for the bald eagle)* for the current population data for the management zones that overlap the planning area (Isaacs and Anthony 2005). Monitoring data indicates that the bald eagle population and productivity numbers are increasing (Anthony and Isaacs 2007).

There are 177 bald eagle management areas designated on BLM-administered lands within the planning area. They range in size from 4 to 960 acres and total 17,966 acres. See *Table 3-37 (Bald eagle management areas within the planning area)*. Bald eagle management areas are designed to protect existing nest sites, winter and communal roosting areas, and potential nesting habitat.

Western Snowy Plover

The Pacific Coast population of the western snowy plover (*Charadrius alexandrinus nivosus*), hereafter referred to as the snowy plover, is listed as threatened under the federal Endangered Species Act (Federal Register 1993,12864) and by the state of Oregon (ODFW 2006). The primary threats to the snowy plover were identified as the loss and degradation of habitat from human activities (Federal Register 1993, 12864).

Table 3-35. Potential Bald Eagle Nesting Habitat Within The Planning Area

BLM Administrative Unit	Habitat-Capable	Nesting Habitat	
	(acres)	(acres)	(%)
Coos Bay District	44,517	20,741	47
Eugene District	31,728	14,684	46
Medford District	146,912	76,036	52
Roseburg District	56,276	33,030	59
Salem District	140,000	80,251	57
Klamath Falls Resource Area[a] (of the Lakeview District)	22,841	14,841	65
Totals	**442,274**	**239,583**	**54**

[a] The amount of habitat-capable and nesting habitat presented is only for the western portion of the Klamath Falls Resource Area.

Table 3-36. Summary Of The 2005 Monitoring Data For The Bald Eagle

Bald Eagle Conservation Zones	Breeding Areas Surveyed (number)	Breeding Areas Occupied (number)[a]	Occupied Breeding Areas with Known Outcomes	Successful Breeding Areas (%)[b]	5-year Average of Successful Breeding Areas (%)	Young/Breeding Area (number)	5-year Average of Young/ Breeding Area (number)	Young/Successful Breeding Pair (number)
10 – Columbia River (OR)	12	11	71	70.0	63.8	1.00	1.04	1.43
11 – High Cascades	69	64	63	61.9	65.7	0.94	1.01	1.51
12 – Willamette Basin	63	61	55	70.9	68.8	1.15	1.17	1.62
13 – Oregon Coast	93	91	90	72.2	70.0	1.11	1.10	1.54
22 – Klamath Basin	134	129	119	60.5	62.2	0.87	0.96	1.43
23 – CA/OR Coast	25	22	20	70.0	67.3	1.05	1.05	1.50

[a]Where one or two adults and a nest were observed.
[b]Breeding areas where one or more nestlings or fledglings were observed.

Table 3-37. Bald Eagle Management Areas Within The Planning Area

BLM Administrative Unit	Bald Eagle Management Areas #	Bald Eagle Management Areas Total Acres
Coos Bay District	26	769
Eugene District	73	8,266
Medford District	21	1,091
Roseburg District	25	3,682
Salem District	10	2,227
Klamath Falls Resource Area[a] (Lakeview District)	22	1,931
Total	**177**	**17,966**

[a] The amount of habitat-capable and nesting habitat presented is only for the western portion of the Klamath Falls Resource Area.

The snowy plover occurs along the Pacific Coast from British Columbia, Canada to Baja California, Mexico; and at interior areas in Oregon, California, Nevada, Utah, New Mexico, Colorado, Kansas, Oklahoma, and north-central Texas (Federal Register 1993, 12864; Page et al. 1995). The coastal population is genetically distinct from the interior population (Federal Register 1993, 12864; Federal Register 2006b and 20607).

The coastal population occurs within the geographic boundaries of the Salem, Eugene, and Coos Bay districts. The BLM manages snowy plover nesting and wintering habitat only on the Coos Bay District. The Coos Bay District manages 436 acres of snowy plover nesting and overwintering habitat, which is located on the Coos Bay North Spit (138 acres) and the New River Area of Critical Environmental Concern (298 acres). See *Figure 3-69 (Locations of the Pacific coast population of the western snowy plover on BLM-administered lands within the planning area).*

Snowy plovers nest above the high tide line on "wide-open sandy beaches, river mouths, or dredge spoils, often with scattered driftwood or vegetation. Driftwood, wrack, and native dune plants often harbor snowy plover food sources, and provide cover for chicks hiding from predators" (OPRD 2004, pp. 42-43) Much open sand habitat was lost in Oregon when European beachgrass (*Ammophila arenaria*) was introduced in the early to mid 1900s. European beachgrass created extensive vegetated foredunes that narrowed beaches and provided thick cover for predators.

The Coos Bay North Spit has been the most productive snowy plover breeding area since intensive monitoring began in the early 1990s. Unique to Oregon, snowy plover habitat on the Coos Bay North Spit is found along the beach, as well as inland of the ocean foredune on old dredge material deposits and restored open sand habitat. Through time, much of this habitat has been lost or degraded due to beachgrass encroachment. Most of the BLM-administered lands in this area are designated as an area of critical environmental concern. The Shorelands Plan (USDI BLM 2005a) contains direction for plover management. Management measures were developed in cooperation with the U.S. Fish and Wildlife Service and Oregon State agencies. Management measures include recreational restrictions, predator control, outreach activities, and habitat restoration.

In cooperation with the Army Corps of Engineers, the Oregon Department of Fish and Wildlife, and the U.S. Fish and Wildlife Service, the BLM has restored and maintained approximately 76 acres of habitat inland of the ocean foredune of the Coos Bay North Spit. A variety of methods have been used to remove European beachgrass and other invasive plant species from these habitat restoration areas (including heavy equipment, saltwater treatments, hand pulling, and herbicides). In addition to the habitat restoration areas, snowy plovers also nest on the adjacent ocean beach.

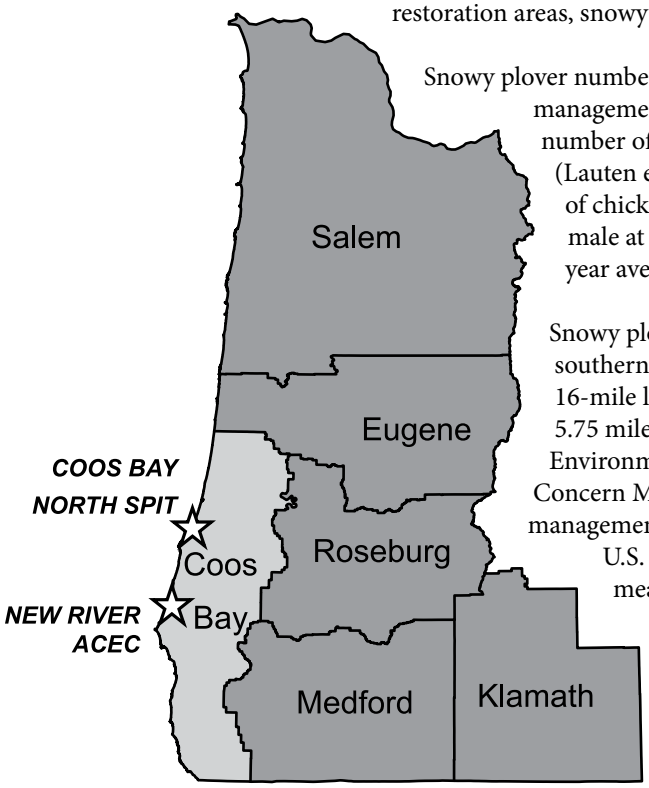


Figure 3-69. Locations Of The Pacific Coast Population Of The Western Snowy Plover On Blm-Administered Lands Within The Planning Area

Snowy plover numbers have increased on the Coos Bay North Spit since active management measures and monitoring began in the early 1990s. The total number of fledglings has risen from a low of 3 in 1990 to a high of 35 in 2004 (Lauten et al. 2006). Plover reproductive success is measured by the number of chicks fledged per male and is currently estimated at 1.57 fledglings per male at the Coos Bay North Spit, which is approximately 10% below the 15-year average of 1.71 fledglings per male (Lauten et al. 2006).

Snowy plovers also use a long, relatively isolated stretch of beach from the southern portion of Bandon's beaches to Floras Lake. This approximately 16-mile length of beach is managed under several jurisdictions including 5.75 miles that are included in the BLM New River Area of Critical Environmental Concern. The New River Area of Critical Environmental Concern Management Plan (USDI BLM 2004a) contains direction for plover management. Management measures were developed in cooperation with the U.S. Fish and Wildlife Service and Oregon State agencies. Management measures include recreation restrictions, predator control, outreach activities, and habitat restoration.

Approximately 120 acres of habitat (nearly 2.75 miles in length) have been restored and maintained using heavy equipment, burning, and hand pulling to remove European beachgrass and other invasive plant species in the New River Area of Critical Environmental Concern. In addition, the BLM cooperatively manages approximately 1 mile of ocean beach and inland snowy plover habitat north of Floras Lake.

Over the past several years, locations of snowy plover activity have varied in the New River area. In general, numbers

have increased on the New River spit, including the area of critical environmental concern since active management measures and monitoring began in the early 1990s. The total number of fledglings associated with the New River spit has risen from a low of zero in 1993 to a high of 21 in 2004 (Lauten et al. 2006). This fledgling rate has increased through time and is currently at 1.33 chicks per male at New River, which is 49% higher than the 15-year average of 0.89 fledglings per male (Lauten et al. 2006). Predation is a greater problem at this location than other Oregon snowy plover sites (Lauten et al. 2006). The New River area is the only location with nonnative red fox (*Vulpes vulpes*) present in the area. The beaches also abut extensive ranch lands with sheep and cattle operations.

The final rule for listing the snowy plover (Federal Register 1993, 12864) and the draft recovery plan (Federal Register 2001a) provide comprehensive discussions of the following threats to the snowy plover:

- loss or degradation of habitat through over-utilization for commercial, recreational, scientific, or educational purposes
- disease and predation
- inadequacy of existing regulatory mechanism
- other natural or manmade factors affecting their continued existence

The state of Oregon describes threats to the snowy plover as habitat degradation, introduction of nonnative vegetation, beach development, resource extraction, human disturbance, and predation (OPRD 2004).

Beaches are unstable habitats, changing with each winter storm event and are constantly being broken down and renewed. Human activities (building jetties and seawalls, and stabilizing dunes) modify or eliminate these natural destabilizing cycles (OPRD 2004). The introduction of European beachgrass has stabilized foredunes and prevented the replenishment of the open sand areas thus diminishing the availability of snowy plover habitat and changing the natural vegetative and sand dynamics (OPRD 2004, Federal Register 2001a). Beachgrass also provides cover for predators, which benefit from its dense growing habit.

Nest losses due to predation at some sites on the Oregon coast have been as high as 68% (Stern et al. 1990; Hogan 1991; Federal Register 1993, 12871). Predator numbers are thought to increase with increased human presence for a number of reasons:

- Trash near nesting areas attracts such predators as crows, ravens and rats.
- European beachgrass, and the subsequent vegetation changes to dune plant communities results in increased hiding cover.
- Greater human presence may lead to an increase in human disturbance, which can flush snowy plover adults and chicks from nests thereby increasing their vulnerability to predation.

Human activity has been documented as a major threat to the breeding success of the snowy plover (OPRD 2004). Human disturbance, either on foot or in off-highway vehicles, may flush birds from nests, resulting in nest abandonment or lengthening of the incubation period. As adult plovers stay off the eggs for extended periods of time due to disturbance, eggs and birds may be trampled or crushed and adult plovers may be separated from broods. Critical habitat was designated for the Pacific coast population of the snowy plover in 2005 (Federal Register 2005b, 26970). The primary constituent elements for the designated critical habitat units are:

- sparsely vegetated areas above daily high tides that are relatively undisturbed by the presence of humans, pets, vehicles, or human–attracted predators
- sparsely vegetated sandy beach, mud flats, gravel bars, or artificial salt ponds that are subject to daily tidal inundation, but not currently under water, that support such small invertebrates such as crabs, worms, flies, beetles, sand hoppers, clams, and ostracods
- surf or tide cast organic debris (such as seaweed or driftwood) located on open substrates (such as those mentioned above) (Federal Register 2005b, 56994)

Table 3-38. Critical Habitat For The Pacific Coast Populations Of The Western Snowy Plover

Critical Habitat Units	Total Area (acres)	Federal Area (acres)	BLM Area (acres)	Habitat Capability[a] (number of breeding plovers)
OR 9 – Coos Bay North Spit	278	278	138	54
OR 10A – Bandon to Floras Creek	632	304	178	54

[a]Number of breeding plovers that the critical habitat unit is capable of supporting if managed properly (Federal Register 2005b, 56999).

These primary constituent elements provide essential habitat for invertebrate food sources, and provide shelter from predators and inclement weather. Two designated critical habitat units for the snowy plover (OR 9 and OR 10A) contain BLM-administered lands in the Coos Bay District. See *Table 3-38 (Critical habitat for the Pacific coast populations of the western snowy plover)* and *Figure 3-69 (Locations of the Pacific coast population of the western snowy plover on BLM-administered lands within the planning area)*.

Special Status Species

The BLM special status species include those species that are federally listed or federal candidate species, state-listed species, or federally delisted species.

The primary resource management objectives of the BLM special status species policy are to:

- conserve species and the ecosystems on which they depend.
- ensure that actions requiring authorization and approval by the BLM are consistent with the conservation needs of special status species and do not contribute to the need to list any special status species under the provisions of the Endangered Species Act.
- use all methods and procedures necessary to improve the condition of special status species and their habitats to a point where their special status recognition is no longer warranted.

There are two categories of BLM-designated special status species:

- **Sensitive Species.** In Oregon and Washington, the BLM sensitive species are those taxa that have federal-listed, federal-candidate, state-listed or state-candidate (plant) status; or have a Natural Heritage rank of G1-G3, N1-N3, T1-T3, or S1-S2 and are on the Oregon Heritage List 1 or 2.
- **Strategic Species.** Species that are not included as federal-listed, federal-candidate, or state-listed; but have a Natural Heritage rank of G1-G3, N1-N3, T1-T3, or S1-S2 and are on the Oregon Heritage List 3.

As of January 24, 2008, there were 98 sensitive (amphibians, reptiles, birds, invertebrates, and mammals) documented or suspected to occur within the planning area. See *Appendix H - Wildlife*. Between 24 and 50 species occur in each district. See *Table 3-39 (Animal special status species in BLM districts within the planning area)*.

Federally-Listed Threatened and Endangered Species

The federally listed threatened northern spotted owl, marbled murrelet, and snowy plover are addressed individually within this FEIS and will not be discussed in detail under *Special Status Species*. There are other federally listed threatened and endangered, or federal candidate animal species that either occur on the periphery of the planning area (i.e. in the ocean) or inhabit habitats that constitute a very small portion of

the planning area. See *Table 3-40 (Documented or suspected federally listed animal species within the planning area that are not typically found in forested habitat)* and *Table 3-41 (Habitat requirements for federally listed animal species within the planning area that are not typically found in forested habitat)*.

Bureau Sensitive Species

Bureau sensitive species within the planning area are discussed based on five broad categories of habitat types: (1) westside forest habitats, (2) habitat on the Eastside Management Lands (i.e. east side of the Klamath Falls Resource Area), (3) non-forested habitats, (4) riparian habitats, and (5) forest floor habitats. See *Appendix H – Wildlife* for more information about these habitats.

Westside Forest Habitat

The Bureau sensitive species that are generally associated with forested habitats have been categorized based on their association with habitat found in the physiographic provinces (i.e. Coast Range, West Cascades, Klamath, and Eastern Cascades physiographic provinces) and structural stages (i.e. stand establishment, young, mature, and structurally complex) as previously described in *Forest Structure and Spatial Pattern*. Refer to *Figure 3-12 (Physiographic provinces and BLM-administered lands within the planning area)* and *Table 3-2 (Structural stage subdivisions)*. Even though there is habitat from the Eastern Cascades physiographic province included in this broad category, it is still referred to as "westside forest habitat" because the Eastern Cascades comprises approximately 2 percent of the BLM-administered lands within the planning area (see *Figure 3-11. Percent of BLM-administered land within each of the physiographic provinces within the planning area*). The current condition of Westside forested habitat is also described in *Forest Structure and Spatial Pattern*. Refer to *Table 3-3 (Current structural stage abundance on forested lands)*, *Table 3-4 (Current mean patch size by structural stage by province)*, and *Table 3-5 (Current connectance on BLM-administered lands by structural stage)* in the *Forest Structure and Spatial Pattern* section of this chapter.

Table 3-39. Animal Special Status Species In BLM Districts Within The Planning Area

	Districts					
Status[a]	**Salem**	**Eugene**	**Roseburg**	**Coos Bay**	**Medford**	**Klamath Falls**
			Birds			
FE/FT	2	3	2	4	2	1
Sensitive	7	11	7	20	8	17
Total	**9**	**14**	**9**	**24**	**10**	**18**
			Amphibians and Reptiles			
FE/FT	0	0	0	0	0	0
Sensitive	5	4	2	3	5	4
Total	**5**	**4**	**2**	**3**	**5**	**4**
			Invertebrates			
FE/FT	2	1	0	1	1	0
Sensitive	18	13	8	14	13	14
Total	**20**	**14**	**8**	**15**	**14**	**14**
			Mammals			
FE/FT	1	0	0	4	0	0
Sensitive	4	4	5	4	4	6
Total	5	4	5	8	4	6
Grand Total	**39**	**36**	**24**	**50**	**33**	**42**

[a] FE - federally listed as endangered FT - federally listed as threatened

Table 3-40. Documented Or Suspected Federally Listed Animal Species Within The Planning Area That Are Not Typically Found In Forested Habitat

Status [a]	*Scientific Name*	Common Name
FT	*Branchinecta lynchi*	Vernal pool fairy shrimp
FT	*Charadrius alexandrinus nivosus*	Western snowy plover
FT	*Eumetopias jubatus*	Steller sea lion
FT	*Speyeria zerene hippolyta*	Oregon silverspot butterfly
FE	*Balaenoptera musculus*	Blue whale
FE	*Eschrichtius robustus*	Gray whale
FE	*Icaricia icarioides fenderi*	Fender's blue butterfly
FE	*Megaptera novaeangliae*	Humpback whale
FE	*Pelecanus occidentalis californicus*	California brown pelican

[a] FT - federally listed as threatened FE - federally listed as endangered

Table 3-41. Habitat Requirements For Federally Listed Animal Species Within The Planning Area That Are Not Typically Found In Forested Habitat

Common Name	Habitat Conditions
Vernal pool fairy shrimp	• Small, cooler ephemeral pools (ODFW 2006) • Found on BLM-administered lands in the Medford District • Recovery plan and designated critical habitat available (USDI USFWS 2005 and Federal Register 2006c:7118-7166
Western snowy plover	• Coastal beaches • Found on BLM-administered lands in the Coos Bay District
Steller sea lion	• Marine habitats including coastal waters near shore and over the continental slope • Sometimes rivers as ascended in pursuit of prey • Terrestrial habitats include beaches that are commonly used as rookeries and haul outs (NatureServe 2006)
Oregon silverspot butterfly	• Salt spray meadows • Host plants – early blue and western blue violets (*Viola* spp.) (ODFW 2006) • Recovery plan and designated critical habitat available (USDI USFWS 2001b, Federal Register 1980:44935-44938)
Blue whale	• Mainly pelagic • Generally prefers cold waters and open seas (NatureServe 2006)
Gray whale	• Mostly in coastal and shallow shelf waters • Young are born in lagoons and bays (NatureServe 2006)
Fender's blue butterfly	• Seasonally wet native prairies in Willamette Valley • Host plant is Kincaid's lupine (*Lupinus sulphureus kincaidii*) (ODFW 2006) • Critical habitat available (Federal Register 2006:63861-63910)
Humpback whale	• Pelagic and coastal waters • Sometimes frequents inshore areas such as bays (NatureServe 2006)
California brown pelican	• A coastal, marine species rarely found inland • Roosts on sandy shores and offshore rocks • Nests on island and offshore rocks (Marshall et al. 2003)

Eastside Management Land Habitat

Those lands on the east side of the Klamath Falls Resource Area that occur outside of the O&C portion are referred to as the Eastside Management Lands and were categorized into habitat associations to facilitate effects analyses. Some habitat associations were further sub-divided by age class to facilitate a more in-depth analysis. See *Table 3-42 (Habitat on Eastside Management Lands)*.

Non-forested Habitat

Non-forested and special habitat types are found throughout the planning area and typically include such features as: rock outcrops, cliffs, talus areas, westside grasslands, westside shrublands, herbaceous wetlands, vernal pools/ponds, bodies of open water (e.g., ponds, small lakes, reservoirs, and rivers), agricultural lands, coastal dunes/open sand, coastal grasslands, saltmarshes, and marine. Approximately 4 percent (104,486 acres) of the planning area is currently non-forested habitat. However, the abundance and distribution of the different types of non-forested habitat, such as those previously listed, have not been mapped or quantified.

Riparian Habitat

Riparian habitat typically includes the aquatic ecosystems and adjacent upland areas that directly affect it or are affected by it. The existing condition of riparian habitat is described in the *Fish* section of this chapter, including *Figure 3-85 (Current riparian conditions by BLM district*). The current condition of the aquatic component of riparian habitat is discussed in the *Water* section of this chapter.

Forest Floor Habitat

Forest floor habitat is found in westside forests and Eastside Management Land forests of all structural stages. The relative quality of forest floor habitat is generally more developed in mature and structurally complex stands. In mature and structurally complex stands, the amount of down wood material is typically more abundant and of larger sizes than in younger stands and there is also a more developed canopy to regulate soil temperature and soil moisture.

Taxa such as some amphibians, reptiles, and invertebrates are associated with forest floor habitat and respond to changes in canopy cover, down wood, and soil moisture.

Fisher

The west coast population of the fisher (*Martes pennanti*) was petitioned for listing under the federal Endangered Species Act in 2000. In 2004, the U.S. Fish and Wildlife Service found that listing was

Table 3-42. Habitat On Eastside Management Lands

	Age Class (acres)			
Habitat Associations	**Open**	**Young**	**Medium**	**Old**
Grassland	3,368	0	493	158
Juniper	27,855	487	30,307	22,278
Ponderosa Pine	38,725	1,357	9,734	26,121
Sagebrush	387	0	11	90
White Fir	2,323	859	842	1,834
Water	5,037	-	-	-
Uncategorized	123	13	80	200
Total	**77,818**	**2,716**	**41,466**	**50,902**

"warranted but precluded" by higher priority actions (Federal Register 2004, 18770). Subsequently, the fisher was added to the U.S. Fish and Wildlife Service's candidate species list (Federal Register 2004, 18770). Within the planning area, the fisher has been documented to occur in three districts (Coos Bay, Eugene, and Medford) and suspected to occur in two others (Klamath Falls and Roseburg). See *Appendix H - Wildlife*.

Fisher historically occurred throughout the Cascades Range, Coast Range, the Siskiyou Mountains, and Blue Mountains of Oregon (Bailey 1936). Fishers have declined since the late 1800s and early 1900s as a result of overtrapping, loss of habitat, and predator control programs (Aubry and Lewis 2003). Aubry and Lewis (2003) recognized two disjunct populations of fisher within the planning area—one in the southern Cascade Range and another in the northern Siskiyou Mountains. The southern Cascade fisher population is separated from the northern Siskiyou Mountains population by Interstate Highway 5, large expanses of non-habitat (non-forested and agricultural lands), and the populated Rogue River Valley.

Genetic studies found the population in the southern Cascades originated from animals that were introduced from British Columbia and Minnesota at various times from the 1960s through the early 1980s (Aubrey and Lewis 2003). Genetic analysis has determined that "[t]he high degree of relatedness among fishers in the southern Cascade Range (R-.56) is consistent with the hypothesis that this population is small and isolated" (Aubry et al. 2003).

Small population sizes and isolation make the "Oregon populations vulnerable to extirpation" (Federal Register 2004, 18789). Recent survey efforts in southwestern Oregon have detected fisher in the landscape between the southern Cascades and other northern Siskiyou Mountains population centers, but the extent of connectivity between the two populations is still believed to be limited (Aubrey et al. 2004; Aubrey and Lewis 2003; Federal Register 2004, 18771).

Forest structure and associated prey are thought to be the critical features of habitat requirements for the fisher (Buskirk and Powell 1994). Powell (1993) (as cited in Federal Register 2004, 18773) stated "that forest type is probably not as important to fishers as the vegetative and structural aspects that lead to abundant prey populations and reduced fisher vulnerability to predation, and they may select forest that have low and closed canopies." The fisher selects habitat based on factors measured at the home-range scale or higher and is strongly associated with forest cover (Carroll et al. 1999). The fisher uses different forest structures for different stages of its life. The four stages of life include:

- natal sites (where young are born and weaned)
- maternal habitat (where young are raised)
- resting sites
- foraging habitat

Aubry and Raley (2002) found that female fishers use trees (alive or dead) with hollows created by heart rot for natal sites. Natal den trees ranged from 61 to 138 centimeters (24 to 54 inches) in diameter, with an average of 93 centimeters (37 inches) (Aubry and Raley 2002). Weir and Harestad (2003) reported natal dens in cottonwoods averaging 103 centimeters (40 inches) in diameter. The U.S. Fish and Wildlife Service (Federal Register 2004, 18774) cited studies in northern California reporting average diameters of natal den trees of 62.5 to 295 centimeters (24 to 116 inches).

Maternal dens were located in cavities in live trees and snags, between the bole and sloughing bark, on mistletoe brooms, on rodent nests, and in hollow logs that were greater than 50 centimeters (20 inches) in diameter (Aubry and Raley 2002). Approximately 56% of natal and maternal den sites in the southern Cascades study were located in unmanaged forests, 38% in managed forests (some evidence of past harvest activities), and 6% in second growth forests (Aubry and Raley 2002). For analysis purposes, maternal habitat was synonymous with natal habitat.

Rest sites occur predominantly in live trees. Aubry and Raley (2002) found that mistletoe brooms were used more than any other platform or microsite. Snags and down logs were also used as resting sites (Aubry and Raley 2002, Zielinski et al. 2004, Yeager 2005). In the southern Cascades, resting sites were found in unmanaged forests 63% of the time, in managed forests 22% of the time, and in managed second growth forests 25% of the time (Aubry and Raley 2002). In the Klamath Province of northern California, Yeager (2005) determined that rest sites were located in trees with a significantly larger diameter at breast height than the average diameter at breast height of the four largest trees on a plot (0.4 hectare [1 acre]) that was centered on the rest site structure.

Trees providing rest sites in the Shasta-Trinity National Forest and the Hoopa Valley Indian Reservation averaged from 87 to 124 centimeters (34 to 40 inches) in diameter at breast height (Yeager 2005). Rest sites in northern California averaged approximately 118 centimeters (46 inches) in diameter (Zielinski et al. 2004). Resting structures need to be sufficiently large in diameter to provide resting substrates that can accommodate the large-bodied fishers. Trees must be old enough for ecological processes to form cavities of sufficient size to be of use to fishers (Zielinski et al. 2004). Zielinski et al. (2004) described resting locations in their coast study areas of northern California as being best distinguished from random locations by having large trees, dense canopies, and large diameter snags.

Foraging habitat is a function of coarse woody debris and stand structural complexity, which translates into a diverse prey base (Weir and Harestad 2003, Buskirk and Powell 1994). The fisher is a predator of small- to medium-sized mammals and birds. They also feed on a variety of vegetable matter, including berries and nuts (Powell and Zielinski 1994). Fungal spores found in fisher scats indicate that fishers may also directly consume fungi (Zielinski et al. 1999). Throughout their range, fishers commonly feed on ungulate carrion (e.g., deer, elk, moose, and cattle), especially in the winter, when other prey species are less available.

Fishers may select prey based upon their availability (Banci 1989). Fishers tend to occur in habitat that provides both prey numbers and the opportunity to capture them (Powell 1993, as cited in Federal Register 2004, 18772; Weir and Harestad 2003).

Literature reviews have shown that home ranges for fishers vary up to 122 square kilometers (47 square miles) for males and 53 square kilometers (20 square miles) for females (Banci 1989, Powell and Zielinski 1994). Zielinski et al. (2003) found that home ranges averaged 5,806 hectares (14,350 acres) for males and 1,498 hectares (3,700 acres) for female fisher in their coastal study area (northern California). Approximately 76% of the home range was composed of mature and older Douglas fir and true fir habitat types (Zielinski et al. 2004). Fishers avoid habitats without overstory or shrub cover (Weir and Harestad 2003; Federal Register 2004, 18773).

Approximately 2.2 million acres of BLM-administered lands within the planning area are commercial forest lands capable of growing into fisher natal (including denning) and foraging habitat. See *Table 3-43 (Available fisher natal habitat on BLM-administered lands within the planning area) and Table 3-44 (Available fisher foraging habitat on BLM-administered lands within the planning area)*. Within the planning area, fisher natal habitat currently comprises 25 percent (543,000 acres) of the BLM forest lands capable of developing into natal habitat. Forests older than 200 years comprise 65 percent (351,000 acres) of natal habitat and 16 percent of the habitat-capable acres. It is assumed that natal habitat older than 200 years is of a better quality because of the increased time that it has had to develop decadent features (e.g., snags and trees with large cavities) than natal habitat less that is less than 200 years old.

Foraging habitat constitutes 62 percent (1,356,000 acres) of the BLM forest lands capable of developing into foraging habitat. The Medford District contains the most fisher foraging habitat at approximately 612,000 acres. See *Table 3-44 (Available fisher foraging habitat on BLM-administered lands within the planning area).*

In their finding on the petition to list the fisher, the U.S. Fish and Wildlife Service concluded that habitat loss and fragmentation appeared to be significant threats to the fisher (Federal Register 2004, 18780). Timber

harvesting is a primary threat (Powell 1993) by reducing the amount of suitable natal and foraging habitat, fragmenting the remaining landscape, and changing the forest structure. Timber management activities tend to simplify stands by reducing species diversity, removing snags and down wood, and creating simple canopy structures (Federal Register 2004, 18778-18779).

Land Birds

"The temperate rain forests of the Pacific Northwest support the highest abundance of birds of any coniferous forest system in North America" (Altman 1999). There are potentially 164 species of birds that could occur within the planning area (Olson et al. 2001). See *Table 3-45 (Land bird occurrence within the forest habitat types of found within the planning area.)*.

Detailed descriptions of the habitat needs and conservation concerns of land birds are detailed in *Birds of Oregon* (Marshall et al. 2003)*, Wildlife-Habitat Relationships in Oregon and Washington* (Johnson and O'Neil 2001), and in the numerous species accounts contained within the *The Birds of North America* (Poole and Gill 2002).

Table 3-43. Available Fisher Natal Habitat On BLM-Administered Lands Within The Planning Area

BLM Districts	Habitat-capable (acres)	Natal Habitat		Natal habitat 200 years of age and older	
		(acres)	(%)[a]	(acres)	(%)[b]
Salem	365,000	48,000	13	30,000	63
Eugene	296,000	51,000	17	38,000	75
Roseburg	399,000	156,000	39	119,000	75
Coos Bay	302,000	84,000	28	57,000	68
Medford	788,000	197,000	25	101,000	51
Klamath Falls Resource Area[c]	47,000	8,000	17	6,000	75
Totals	**2,197,000**	**543,000**	**25**	**351,000**	**65**

[a] Percentage of habitat-capable acres
[b] Percentage of natal habitat
[c] Western (O&C) portion of the resource area

Table 3-44. Available Fisher Foraging Habitat On BLM-Administered Lands Within The Planning Area

BLM Districts	Habitat-capable	Foraging Habitat	
	(acres)	(acres)	% of habitat-capable acres
Salem	365,000	196,000	54
Eugene	296,000	134,000	45
Roseburg	399,000	227,000	57
Coos Bay	302,000	149,000	49
Medford	788,000	612,000	78
Klamath Falls Resource Area of the Lakeview District (western O&C portion of the resource area)	47,000	38,000	81
Totals	**2,197,000**	**1,356,000**	**62**

Threats facing land birds include loss of habitat, habitat fragmentation, declining populations, and forest simplification (Altman 1999, Marshal et al. 2003, Rich et al. 2004, Pashley et al. 2000). Past management practices (including clearcutting, commercial thinning, fire suppression, salvage, slash burning, and herbicide use) has tended to simplify the forest habitat (Altman 1999). More recent management has begun to improve habitat structure and diversity by recognizing the need to provide for diverse forest structures (including legacy trees, snags, down wood, multiple canopy layers, and variable densities of tree retentions).

The U.S. Fish and Wildlife Service recognizes two group of birds of management concern, outside of the endangered species listing process, including birds of conservation concern and game birds below desired condition. See *Table 3-46* (*Birds of conservation concern within the western Oregon plan revision planning area*) and *Table 3-47* (*Game birds below desired condition within the western Oregon plan revision planning area*).

The Oregon/Washington Partners in Flight has developed a tiered scheme of segregating species into management groups based on forest conditions and habitat attributes. Focal species are then identified for each group (Altman 1999, 2000a, and 2000b; Altman and Holmes 2000). "By managing for a group of species representative of important components in a functioning…forest ecosystem, many other species and elements of biodiversity also will be conserved" (Altman 1999).

Data is not available to analyze all the possible combinations of groups of forest conditions and habitat attributes described in the conservation strategies. Habitat for land birds is discussed based on three broad categories: (1) westside forested land bird habitat, (2) nonforested habitat, and (3) land bird habitat on Eastside Management Lands (i.e., east side of the Klamath Falls Resource Area).

Westside Forested Land Bird Habitat

Westside land bird habitat includes habitat found in the Coast Range, West Cascades, Klamath, and Eastern Cascades physiographic provinces. Even though there is habitat from the Eastern Cascades physiographic province included in this broad category, it is still referred to as "westside forest habitat" because the Eastern Cascades only comprise 9 percent of the BLM-administered lands within the planning area (see *Figure 3-11. Percent of BLM-administered land within each of the physiographic provinces within the planning area*).

Effects analysis for westside land bird habitat was based on the habitat associations and structural stages described in *Table 3-48* (*Habitat associations and structural groups for land birds on westside lands*).

The structural stages used in the land bird analysis are identical to those used in *Forest Structure and Spatial Pattern* except that "mature with multilayered canopy and structurally complex" is a combination of both mature stands with multilayered canopies and structurally complex stands. The amount of habitat within each westside habitat association for land birds is described in *Table 3-49 (Abundance of westside land bird habitat)*.

Legacy Components

Legacy components for land birds (as well as for other wildlife species) include snags, coarse woody debris, and live remnant trees. Forests with legacy components include those that are either: mature & structurally complex, young with structural legacies, or stand establishment with structural legacies. The amount of forest with legacy components within each westside habitat association is described in *Table 3-49 (Abundance of westside land bird habitat)*.

Table 3-45. Land Bird Occurrence Within The Forest Habitat Types Found In The Planning Area

Habitat	Number of Bird Species
Montane mixed conifer	107
Southwest Oregon mixed conifer-hardwood	161
Westside oak and dry Douglas fir and woodlands	119
Westside lowlands and conifer-hardwood	120
Mixed conifer	116
Lodgepole pine	83
Ponderosa pine	131

Table 3-46. Birds Of Conservation Concern Within The Western Oregon Plan Revision Planning Area

Common Name	Scientific Name	Birds of Conservation Concern[a]	
		BCR 5[b]	BCR 9[c]
Black swift	*Cypseloides niger*	X	X
Flammulated owl	*Otus flammeolus*	X	X
Lewis's woodpecker	*Melanerpes lewis*	X	X
Long-billed curlew	*Numunius americanus*	X	X
Marbled godwit	*Limosa fedoa*	X	X
Peregrine falcon	*Falco peregrinus*	X	X
Whimbrel	*Numenius phaeopus*	X	X
White-headed woodpecker	*Picoides albolarvatus*	X	X
Yellow-billed cuckoo	*Coccyzus americanus*	X	X
Black oystercatcher	*Haematopus bachmani*	X	
Black turnstone	*Arenaria melanocephala*	X	
Black-footed albatross	*Phoebastria nigripes*	X	
Olive-sided flycatcher	*Contopus cooperi*	X	
Red knot	*Calidris canutus*	X	
Short-billed dowitcher	*Limnodromus griseus*	X	
Brewer's sparrow	*Spizella breweri*		X
Burrowing owl	*Athene cunicularia*		X
Gray vireo	*Vireo vicinior*		X
Greater sage-grouse (*Columbia Basin population only*)	*Centrocercus urophasianus*		X
Prairie falcon	*Falco mexicanus*		X
Snowy plover (*except where endangered*)	*Charadrius alexandrinus*		X
Swainson's hawk	*Buteo swainsoni*		X
Tricolor blackbird	*Agelaius tricolor*		X
Williamson's sapsucker	*Sphyrapicus thyroides*		X
Yellow rail	*Coturnicops noveboracensis*		X

[a]Compilation of tables 8,9, and 41 in: USFWS. 2002. Birds of Conservation Concern 2002. U.S. Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 99 pp.

[b] Bird Conservation Region 5 (Northern Pacific Rainforest) - Includes West Cascades, Coast Range, Willamette Valley, and Klamath physiographic provinces; Salem, Eugene, Roseburg, Coos Bay, and Medford BLM Districts.

[c]Bird Conservation Region 9 (Great Basin) - Includes eastern Cascade physiographic province in Klamath Falls Resource Area (of the Lakeview BLM District.)

Table 3-47. Game Birds Below Desired Condition Within The Western Oregon Plan Revision Planning Area

Common name	Scientific Name
American Widgeon	*Anas americana*
Band-tailed Pigeon	*Columba fasciata*
Black Brant	*Branta bernicla nigricans*
Canada (Cackling) Goose	*Branta canadensis minima*
Canada (Dusky) Goose	*Branta canadensis occidentalis*
Greater Scaup	*Aythya marila*
Greater White-fronted Goose	*Anser albifrons frontalis*
Greater White-fronted Goose	*Anser albifrons gambelli*
Harlequin Duck	*Histrionicus histronicus pacificus*
King Rail	*Rallus elegans*
Lesser Scaup	*Aythya affinis*
Mallard	*Anas platyrhynchos*
Mourning Dove	*Zenaida macroura*
Northern Pintail	*Anas acuta*
Redhead	*Aythya americana*
Ring-necked Duck	*Aythya collaris*
White-fronted (Tule) Goose	*Anser albifrons elgasi*
Wood Duck	*Aix sponsa*

Table 3-48. Habitat Associations And Structural Stages For Land Birds On Westside Lands

Habitat Association[a]	Description
Western Conifer	Dry to moist coniferous forest; generally in the Coast Range, Willamette Valley, West Cascades, and Klamath Provinces
Western Hardwood	Hardwood-dominated stands in the Coast Range, Willamette Valley, West Cascades, and Klamath Provinces
Eastside Conifer	Conifer dominated stands in the Eastern Cascades Province
Eastside Hardwood	Hardwood dominated stands in the Eastern Cascades Province
Eastside Ponderosa Pine	Ponderosa pine dominated stands in the Eastern Cascades Province
Structural Stage	**Description**
Structurally Complex	Structurally complex structural stage
Mature with multi-layered canopy and structurally complex	Mature with multi-layered canopy and the structurally complex structural stages
Young Forest	Young and mature structural stages
Stand Establishment	Stand establishment structural stage

[a]Habitat association was further analyzed for these five habitats, based on structural group.

Table 3-49. Abundance Of Habitat For Westside Land Birds

Habitat Association	Structural Stage (acres)				
	Stand Establishment	Young	Mature with multi-layered canopy and structurally complex	Structurally Complex	Forest with Legacy Components
Western Conifer	123,605	686,733	793,982	447,576	992,816
Western Hardwood	17,652	170,472	188,575	83,613	293,840
Eastern Conifer	1,235	4,170	30,763	7,345	34,560
Eastern Hardwood	278	1,169	181	125	961
Eastern Ponderosa Pine	3,571	4,064	1,070	367	5,795

Nonforested Habitat

Nonforested habitat is found throughout the planning area and typically includes such features as: rock outcrops, cliffs, talus areas, westside grasslands, westside shrublands, herbaceous wetlands, vernal pools/ponds, bodies of open water (e.g., ponds, small lakes, reservoirs, and rivers), agricultural lands, coastal dunes/open sand, coastal grasslands, salt marshes, and marine. Approximately 4 percent (104,486 acres) of the planning area is currently non-forested habitat. However, the abundance and distribution of the different types of non-forested habitat, such as those previously listed, have not been mapped or quantified.

Land Bird Habitat on Eastside Management Lands

Those lands on the east side of the Klamath Falls Resource Area that occur outside of the O&C portion are referred to as the Eastside Management Lands and were categorized into habitat associations to facilitate effects analysis. Some habitat associations were further subdivided by age class to facilitate a more indepth analysis. See *Table 3-42 (Habitat on Eastside Management Lands)* in the *Wildlife-Special Status Species* section.

Partners-in-Flight Conservation Strategies

Habitats and focal species described in the conservation strategies have been assigned to appropriate habitat association/structural groups. See *Appendix H - Wildlife* and the table entitled *Matrix relating Partners-in-Flight focal land bird species to habitat analysis groups.*

Oregon/Washington Partners-in-Flight provide habitat objectives that are expected to serve as the foundation for developing conservation strategies to ensure functional ecosystems with healthy populations of birds (Altman 1999). They are derived from the current knowledge about bird-habitat relationships (Altman 1999). However, these objectives are not regulatory (Altman 1999).

Habitat objectives from the land bird conservation strategies of the Oregon/Washington Partners-in-Flight for the western Oregon forests include (Altman 1999):

- Maintain existing old-growth forests and manage the landscape for 15 percent old-growth forest conditions.
- Maintain 15 percent, or more, of the landscape in a mature forest condition.
- Maintain 20 to 40 percent of the landscape in a young forest condition.
- Maintain 20 to 40 percent of the landscape in a stand establishment condition.

Habitat objectives from the land bird conservation strategies of the Oregon/Washington Partners-in-Flight for the eastern Oregon forests include (Altman 2000a):

- Maintain existing ponderosa pine forests and manage to provide at least 30 percent in a mature or older condition by 2025, or be on trend to accomplish.
- Maintain existing mixed conifer forests and manage to provide at least 25 percent in a mature or older condition by 2025, or be on trend to accomplish.
- Maintain existing oak-pine forests.

Habitat objectives from the land bird conservation strategies of the Oregon/Washington Partners-in-Flight for the western lowland Oregon forests include (Altman 2000b):

- Maintain existing grassland-savannah, oak woodland, and chapparal habitats.

Habitat objectives from the land bird conservation strategies of the Oregon/Washington Partners-in-Flight for the Columbia Basin include (Altman and Holmes 2000):

- Maintain existing shrub-steppe habitats and manage to provide at least 50 percent in a late-seral condition.
- Maintain existing riparian habitats.

Deer and Elk

Deer (*Odocoileus sp.*) and elk (*Cervus elaphus*) occur across the planning area. Two species of deer (Columbian white-tailed deer (*Odocoileus virginianus leucurus*) and mule and black-tailed deer (*Odocoileus hemionus*)) occur within the planning area. This includes two subspecies of *Odocoileus hemonius*. Columbian black-tailed deer (*Odocoileus hemionus columbianus*) occurs west of the crest of the Cascades and mule deer (*Odocoileus hemionus*) occurs east of the Cascades (ODFW 2003a, Verts and Carraway 1998). Two subspecies of elk are found within the planning area. Roosevelt elk (*Cervus elaphus roosevelti*) occur west of the Cascades and Rocky Mountain elk (*Cervus elaphus nelsoni*) is found east of the Cascades (ODFW 2003b, Verts and Carraway 1998). For management purposes, the Oregon Department of Fish and Wildlife divides the range of the two subspecies along State Highway 97 (ODFW 2003b).

There are two populations of Columbian white-tailed deer in Oregon—one along the Columbia River in the Clatsop, Columbia, and Multnomah counties; and a second population in Douglas County (Verts and Carraway 1998; Federal Register 2003, 54647; USDI USFWS 1983). These populations were among the first species listed under the Endangered Species Act. In 2003, the U.S. Fish and Wildlife Service determined that (Federal Register 2003, 43658):

- Columbia River and Douglas County populations were "distinct population segments."
- Douglas County population had reached recovery goals and no longer warranted listing.

The Columbia River population is still listed as a federally endangered species (Federal Register 2003: 43658). All subspecies of elk and of mule and black-tailed deer are classified as game animals by the state of Oregon.

Columbian White-Tailed Deer

White-tailed deer inhabit more mesic habitats (Smith 1987, Verts and Carraway 1998). White-tailed deer in the Columbia River population are found on the islands of the Columbia River and on the bottomlands that are adjacent to the river (USDI USFWS 1983). Preferred habitats are plant communities that provide both forage and cover, including the park forest community (Suring 1975, Suring and Vohs 1979, USDI USFWS 1983). White-tailed deer in Douglas County is found in habitats associated with riparian areas (Ricca 1999 and 2003, Smith 1987, USDI USFWS 1983). The U.S. Fish and Wildlife Service (1983) suggests that the oak

woodland/ grassland ecotone is very important to white-tailed deer in Douglas County. Open areas, oak savannah, and grasslands are important for feeding (Ricca 1999 and 2003).

White-tailed deer in both populations consume a variety of forbs, shrubs, grasses, and other plants (in order of preference) (Federal Register 2003, 43647; Whitney 2002).

The BLM manages 6,100 acres of Columbian white-tailed deer habitat on the North Bank Habitat Management Area, in the Roseburg District. See *Figure 3-70 (North Bank Habitat Management Area in the Roseburg District)* (USDI BLM 2001a). This area was acquired in 1994 with the expressed purpose of providing secure habitat (habitat managed primarily for the Columbian white-tailed deer).

Mule/Black-Tailed Deer

Mule/black-tailed deer occur across a broad range of habitat types from the Coast Range and Cascade Mountains to the desert shrublands, generally occupying open habitat types (Verts and Carraway 1998, ODFW 2003a). On the west side of the Cascades, black-tailed deer prefer dense, early-seral communities (Verts and Carraway 1998, Brown 1961, Bender et al. 2004). Hanley (1984) found that where black-tailed deer overlapped elk, they preferred the more xeric habitat. During summer, both mule and black-tailed deer may be found at higher elevations—migrating to lower elevations in the fall and winter (McCullough 1960 [Verts and Carraway 1998], ODFW 2003a). In the Coast Range, where winters are less severe, seasonal migration does not occur. Cover is an important habitat component for each subspecies and is provided by stands of dense vegetation (Kremsater and Bunnell 1992, ODFW 2003a).

Figure 3-70. North Bank Habitat Management Area in the Roseburg District

Both subspecies are characterized as browsers, foraging in the younger seral stages (Hanley 1984, Verts and Carraway 1998, Anderson and Wallmo 1984). Forbs are an important component of the summer diets of mule deer. In winter, sagebrush (*Artemisia* sp.), bitter-brush (*Purshia tridentata*), rabbit-brush (*Chrysothamnus* sp.), juniper (*Juniperus* sp.), mountain-mahogany (*Cercocarpus* sp.), and winterfat (*Eurotia lanata*) are common components (Verts and Carraway 1998).

Winter range and associated forage are important components for those mule and black-tailed deer herds that migrate (ODFW 2003a). The BLM has identified 193,000 acres of

winter range to be managed with consideration for deer. See *Table 3-50 (Deer management areas within the planning area)* and *Figure 3-71 (Deer habitat management areas on BLM-administered lands within the planning area)*. Threats to deer include loss of forage habitat, loss of hiding cover, and unregulated road use. Unregulated road use causes an increase in deer vulnerability during hunting seasons, increases the potential for illegal kills, and provides opportunities for other disturbances to foraging, fawning, breeding, and resting habitat.

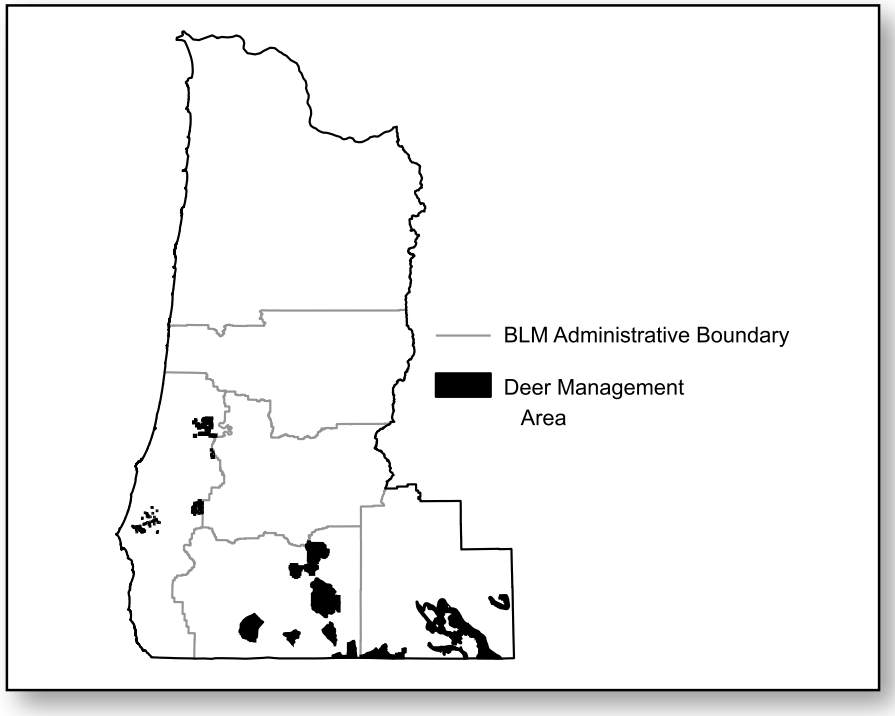
Elk

Elk are found across a wide range of habitats within the planning area. The dominant factors for elk occurrence are the availability of forage and hiding cover (Harper et al. 1987, Verts and Carraway 1998). Early-seral habitat provides important foraging habitat (Verts and Carraway 1998, Witmer and Wisdom 1986, Hanley 1984). Like deer, elk will migrate from high elevation summer habitat to low elevation winter range in areas with harsh winter conditions. However, elk in the Coast Range do not display this migratory

Table 3-50. Deer Management Areas Within The Planning Area

BLM District	Deer Habitat Management Area	Concern	Total Area (acres)	BLM (acres)
Coos Bay	Camp Creek	Cover	12,600	12,500
	Edson Butte	Cover	4,100	4,100
	Millicoma Tree Farm N Edge	Cover	600	600
	Millicoma Tree Farm NE Edge	Cover	6,100	6,100
	Rock Creek	Cover	6,900	6,800
		Total Cover	**30,300**	**30,100**
Klamath Falls	Bly	Winter	17,500	4,500
	Bly Mt	Winter	46,000	6,300
	Hogback	Winter	18,000	2,300
	Horton Windy	Winter	25,000	8,000
	Keno Worden	Winter	8,400	600
	Lorella	Winter	14,600	4,100
	South Bryant	Winter	7,800	2,700
	South Gerber	Winter	41,400	4,900
	Stukel	Winter	12,500	1,800
	Swan Lake	Winter	20,800	6,500
	Topsy Pokegama	Winter	30,600	13,500
Medford	Little Applegate	Winter	14,200	11,100
	Little Butte Creek South	Winter	83,900	25,700
	Burnt Peak	Winter	3,600	1,800
	Camel Hump	Winter	43,000	19,000
	Elk Creek	Winter	40,800	17,500
	Salt Creek	Winter	17,200	7,700
	Shady Cove West	Winter	14,100	8,900
	Williams	Winter	55,300	29,200
	Monument East	Winter	16,600	10,400
	Monument West	Winter	6,500	6,400
		Total Winter Habitat	**537,800**	**192,900**
		Total Cover & Winter Habitat	**568,100**	**223,000**

Figure 3-71. Deer Habitat Management Areas On BLM-Administered Lands Within The Planning Area



behavior (Verts and Carraway 1998, ODFW 2003b).

Elk forage on grasses, forbs, shrubs, and trees (ODFW 2003b, Hanley 1984, Verts and Carraway 1998, Findholt et al. 2004). Foraging habitat value decreases with distance from cover (Witmer and Wisdom 1986, ODFW 2003b). Cover was originally thought to provide both a hiding function and to ameliorate the effect of harsh weather (ODFW 2003b). Recent work in northeastern Oregon has shown that this is not the case (Cook et al. 1998). No positive effects of thermal cover were demonstrated. In fact, possible negative effects may occur (Cook et al. 1998). Cook et al. (2004) reviewed three other studies that looked at the effects of thermal cover and all studies failed to find any benefits.

Threats to elk include loss of forage habitat, loss of cover, and unregulated road access. Unregulated roads cause an increase in elk vulnerability during hunting seasons, increases the potential for illegal kills, provides opportunities for other disturbances during critical calving periods and winter, and causes elk to move away from available forage (ODFW 2003b, Rowland et al. 2000, Wisdom et al. 2004, Rowland et al. 2004, Cole 1996, Cole et al. 1997).

The BLM has identified 124,000 acres to be managed with consideration for elk winter habitat. See *Table 3-51 (Elk management areas within the planning area)* and *Figure 3-72 (Elk habitat management areas on BLM-administered lands within the planning area)*.

Table 3-51. Elk Management Areas Within The Planning Area

District	Elk Hbitat Management Area	Concern	Total Area (acres)	BLM (acres)
Coos Bay	Camp Creek	Cover	12,600	12,500
	Edson Butte	Cover	4,100	4,100
	Millicoma Tree Farm North Edge	Cover	600	600
	Millicoma Tree Farm Northeast Edge	Cover	6,100	6,100
	Rock Creek	Cover	6,900	6,800
Salem	Bummer Ridge Elk Emphasis Area	Cover	3,600	3,600
	Luckiamute Elk Emphasis Area	Cover	2,000	2,000
		Total Cover	**35,900**	**35,700**
Medford	Burnt Peak	Winter	3,600	1,800
	Camel Hump	Winter	14,100	8,900
	Elk Creek	Winter	43,000	19,000
	Salt Creek	Winter	41,600	17,500
	Shady Cove West	Winter	17,200	7,700
	Mule Creek	Winter	20,900	19,400
	Far Out	Winter	9,300	8,900
	Peavine	Winter	27,400	26,300
	Elk Valley	Winter	24,200	14,300
		Total Winter Habitat	**201,500**	**123,700**
		TOTAL	**474,700**	**318,800**

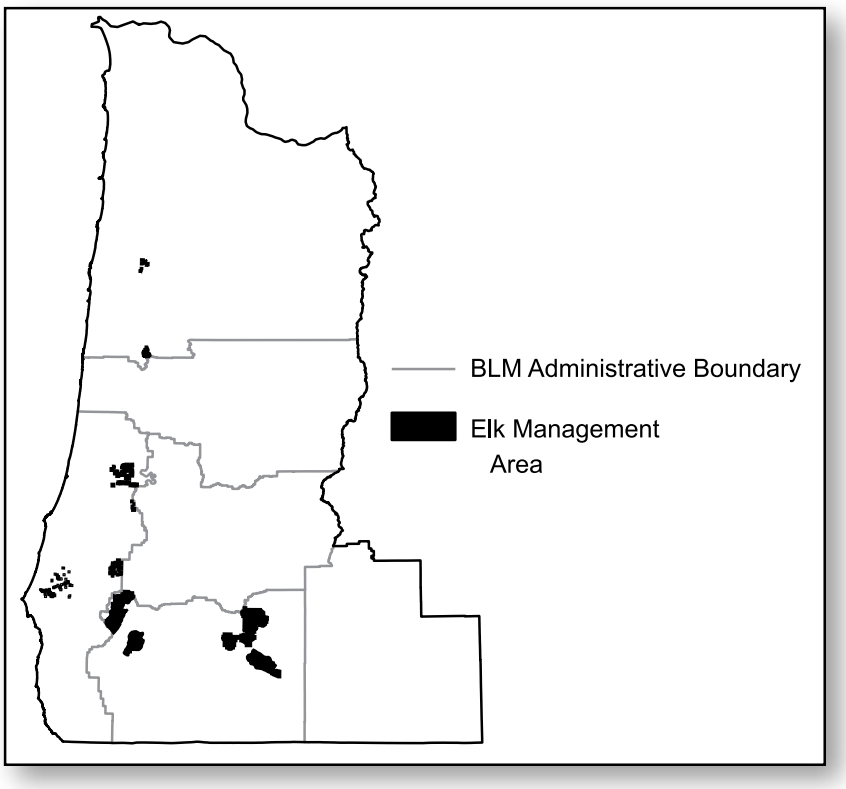


Figure 3-72. Elk Habitat Management Areas On BLM-Administered Lands Within The Planning Area