Marbled Murrelet

This analysis describes the abundance and development of marbled murrelet nesting habitat and the patch dynamics of marbled murrelet nesting habitat. This focus on nesting habitat instead of population levels is necessary and appropriate for several reasons. First, effects in terms of population levels cannot be analyzed based on habitat changes because population size is affected by numerous factors other than habitat. A large portion of the marbled murrelet life cycle is tied to at-sea conditions including food supplies and mortality due to oil spills and other sea conditions. Changes in sea conditions are likely to vary widely over the next 100 years. The interaction of sea conditions and habitat changes is unknown. Consequently, a model is not available that can predict population levels based on habitat amounts and configuration. Although it is not possible to predict what population levels would be supported by a particular amount or configuration of habitat, the characteristics of the habitat that is used by murrelets for nesting is known, and the relative abundance of such habitat among the alternatives can be analyzed. It is reasonable to assume that an alternative that would provide more nesting habitat opportunities for murrelets than another alternative would also support a potentially higher population of marbled murrelets. This is true even though the population level is affected by so many other factors unrelated to nesting habitat conditions, which is the only element of the species' life requirements that would be affected by BLM's management under the alternatives.

Surveys and Marbled Murrelet Sites

Under all alternatives, known occupied marbled murrelet sites would receive protection from harvest. There are currently 226 known occupied marbled murrelet sites on BLM-administered lands, which were found between 1993 and 2006.

Marbled murrelet surveys prior to any nesting habitat-disturbing activities would be required through management action under the No Action Alternative and the PRMP. Protection from harvest of occupied murrelet sites would be required through management action under Alternatives 1 and 3, and surveys are assumed to occur as an analytical assumption. The analysis for the No Action Alternative, Alternative 1, and Alternative 3 predicts discovery and protection of future marbled murrelet sites based on past detection rates of sites found per acre of planned harvest, by murrelet zone, since it is reasonable to assume future detection rates will reflect current experience. Based on past detection rates, 560 new sites would be located and protected under the No Action Alternative, 599 new sites under Alternative 1, and 868 new sites under Alternative 3 through 2016.

Under Alternative 3, occupied marbled murrelet sites would be protected from harvest until 50% of the acres in an assessment area are older than defined threshold stand ages. The year at which the 50% threshold would be met and the protection of the marbled murrelet sites would be removed under Alternative 3 are shown in *Table 4-60* (*Year at which the threshold age would be reached after which marbled murrelet sites would not be protected under Alternative 3*).

There would be no protection from timber harvests of occupied marbled murrelet sites through management actions under Alternative 2; therefore, it was assumed for analytical purposes that pre-disturbance surveys would not occur. Because of the secretive nature of nesting marbled murrelets, it is not reasonable to expect that additional sites would be found without surveys. Applying the same modeling assumptions as for No Action Alternative and Alternatives 1 and 3, which were based on past detection rates, approximately 1,650 murrelet sites would be harvested under Alternative 2 through 2016, in the absence of pre-project surveys.

The analysis used to project the discovery and protections of additional occupied marbled murrelet habitat for the PRMP involved a description of the minimum stand ages for existing occupied murrelet sites. It also involved calculation of detection rates by district, resource area (physiographic provinces were used in the Coos Bay District), and marbled murrelet zone (0 to 25 miles and 25+ miles from the coast were used in the Coos Bay District). This analysis projected 18,700 acres that would be protected from timber harvest in the next 10 years around occupied marbled murrelet sites under the PRMP.

Table 4-60. Year At Which The Threshold Age Would Be Reached After Which Marbled Murrelet Sites Would Not Be Protected Under Alternative 3

Sustained Yield Unit (BLM District)	Province	Year
Salem	Coast Range	2046
Eugene	Coast Range	2046
Roseburg	Coast Range	2016
Roseburg	Klamath	2106
Coos Bay	Coast Range	2056
Coos Bay	Klamath	2026
Medford	Klamath	2056

Marbled Murrelet Nesting Habitat

There are 881,000 acres of BLM-administered lands capable of growing nesting habitat for the marbled murrelet: 641,000 acres occur within marbled murrelet Zone 1, and 250,000 acres occur within marbled murrelet Zone 2. A map of these two zones is in the *Wildlife* section of *Chapter 3*. See *Table 4-61 (Available marbled murrelet nesting habitat on BLM-administered lands within the planning area*).

For this analysis, marbled murrelet habitat is classified as the mature, multiple canopy, and structurally complex structural stage classifications. This classification is based on marbled murrelet nesting suitability category 4 from Raphael et al. (2006). Category 4 structural classifications are stands with a greater than 20 inches quadratic mean diameter with complex canopy structures. Raphael et al. (2006) also classified simple canopy stands with a quadratic mean diameter greater than 30 inches as nesting suitability class 4. Although the data used for this analysis does not distinguish between the 30-inch and greater diameter class, the assumption is that the majority of those stands would fall into the structurally complex structural stage classification. Marbled murrelet nesting habitat is assumed to include all stands in the mature, multi-canopied, and structurally complex structural stages.

By the year 2106, marbled murrelet nesting habitat would increase from the current condition of 367,000 acres, which is 41% of the total area on BLM-administered lands capable of providing marbled murrelet nesting habitat, to:

- 707,000 acres under the No Action Alternative (79% of habitat capable)
- 618,000 acres under Alternative 1 (69% of habitat capable)
- 431,000 acres under Alternative 2 (48% of habitat capable)
- 489,000 acres under Alternative 3 (55% of habitat capable)
- 588,000 acres under PRMP (66% of habitat capable)

Figure 4-109 (*Marbled murrelet nesting habitat by the year 2106*) shows how habitat develops over time. In the first 50 years, there would be a 14-16% decrease in marbled murrelet nesting habitat under Alternatives 2 and 3 on BLM-administered lands, within the range of the marbled murrelet, from the current condition of 367,000 acres. Marbled murrelet nesting habitat on BLM-administered lands would decrease 2% in 20 years under the PRMP, but would recover to show a net 5% increase by 2056. Even though all five districts exhibit long-term increases in marbled murrelet nesting habitat, short-term declines in available nesting habitat are important to consider in evaluating the effects on the marbled murrelet. This is because a short-term decline of habitat, if large enough, could depress the population to a level from which the marbled murrelet would not recover.

Table 4-61. Available Marbled Murrelet Nesting Habitat On BLM-Administered Lands Within The Planning Area

	Marbled Murrelet Zone 1			Marbled Murrelet Zone 2			Total		
Year	Developed	Old Forest	Total	Developed	Old Forest	Total	Developed	Old Forest	Total
No Action Alternative									
2006	148,000	96,000	244,000	66,000	57,000	123,000	214,000	153,000	367,000
2016	174,000	96,000	270,000	69,000	56,000	125,000	242,000	153,000	395,000
2026	192,000	96,000	288,000	70,000	56,000	126,000	262,000	152,000	414,000
2056	234,000	96,000	330,000	85,000	54,000	139,000	319,000	149,000	468,000
2106	423,000	95,000	518,000	138,000	52,000	189,000	561,000	146,000	707,000
Alternative 1									
2006	148,000	96,000	244,000	66,000	57,000	123,000	214,000	153,000	367,000
2016	168,000	94,000	261,000	66,000	55,000	121,000	233,000	149,000	382,000
2026	173,000	94,000	267,000	63,000	55,000	117,000	236,000	148,000	384,000
2056	193,000	93,000	286,000	72,000	50,000	122,000	265,000	143,000	408,000
2106	364,000	92,000	457,000	114,000	47,000	161,000	478,000	139,000	618,000
Alternative 2									
2006	148,000	96,000	244,000	66,000	57,000	123,000	214,000	153,000	367,000
2016	144,000	90,000	234,000	59,000	52,000	111,000	202,000	142,000	345,000
2026	140,000	86,000	226,000	55,000	47,000	101,000	194,000	133,000	327,000
2056	145,000	69,000	214,000	57,000	36,000	93,000	203,000	105,000	307,000
2106	244,000	69,000	313,000	82,000	36,000	118,000	327,000	105,000	431,000
Alternative 3									
2006	148,000	96,000	244,000	66,000	57,000	123,000	214,000	153,000	367,000
2016	166,000	89,000	254,000	61,000	53,000	114,000	227,000	141,000	368,000
2026	173,000	80,000	254,000	54,000	48,000	102,000	228,000	128,000	356,000
2056	166,000	60,000	226,000	58,000	33,000	92,000	224,000	93,000	317,000
2106	314,000	34,000	348,000	123,000	18,000	141,000	437,000	52,000	489,000
PRMP									
2006	148,000	96,000	244,000	66,000	57,000	123,000	214,000	153,000	367,000
2016	157,000	96,000	253,000	59,000	57,000	116,000	216,000	153,000	369,000
2026	154,000	96,000	250,000	53,000	55,000	108,000	207,000	151,000	358,000
2056	185,000	93,000	277,000	62,000	45,000	108,000	247,000	138,000	385,000
2106	351,000	93,000	444,000	104,000	40,000	144,000	455,000	133,000	588,000

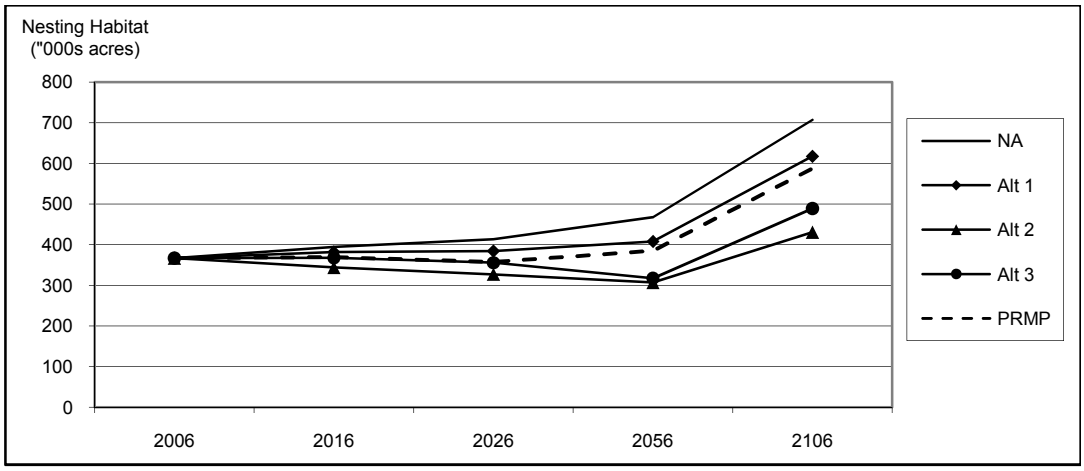


Figure 4-109. Total Marbled Murrelet Nesting Habitat By Year 2106

There are marbled murrelet habitat components that cannot be modeled. These components depend on time for their development and include nesting platform development and canopy gap development. For this reason, old forests structurally complex stands greater than 200 years of age have been analyzed as a component of the overall quantity of marbled murrelet nesting habitat

Structurally complex forests greater than 200 years of age (existing old forest and existing very old forest), as described in *Appendix B - Forest Structure and Spatial Patterns,* cannot increase. Marbled murrelet, old forest nesting habitat would decline from 153,000 acres under all alternatives. Marbled murrelet, old forest nesting habitat would decline 10% or less under the No Action Alternative, Alternative 1, and the PRMP. Marbled murrelet, old forest nesting habitat would follow a similar declining trajectory under Alternative 2, in which habitat would decline 31% by 2056 before it would stabilize by 2106. Marbled murrelet, old forest habitat would decline under Alternative 3 continuously through 2106, by 66% from 153,000 acres to 93,000 acres. *See Figure 4-110. (Old forest marbled murrelet nesting habitat).*

Marbled Murrelet Habitat in Zone 1

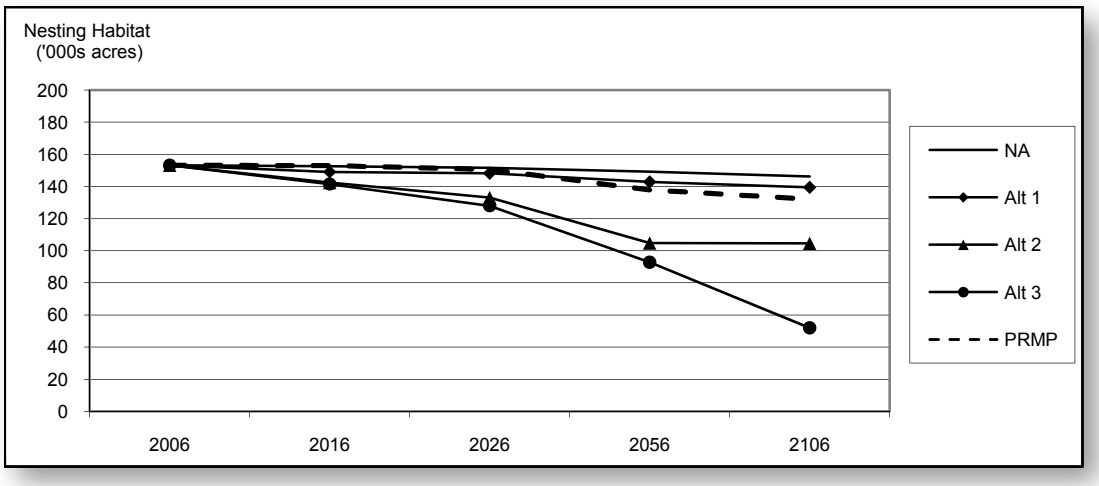
Marbled murrelet nesting habitat would increase under all alternatives, by 2106 in Zone 1. The increase in marbled murrelet nesting habitat would range from 65,000 acres (a 28% increase) under Alternative 2 to 277,000 acres (112% increase) under the No Action Alternative. Zone 1 is important because it represents the approximate area identified in the marbled murrelet recovery plan as the recovery area for the species (USDI USFWS 1997). See *Figure 4-111* (*District marbled murrelet nesting habitat fluctuations in Zone 1, expressed as percent change from 2006.*) for more information.

Under the No Action Alternative, marbled murrelet nesting habitat would increase in all BLM districts within Zone 1. Increases in marbled murrelet nesting habitat would range from 54% in the Roseburg District, to 151% in the Eugene District. There would be no time periods during which marbled murrelet nesting habitat would exhibit a net decline from the 2006 levels.

Under Alternative 1, marbled murrelet nesting habitat would increase 85% (213,000 acres) by 2106 in Zone 1. In all districts under Alternative 1, marbled murrelet nesting habitat would increase. These increases would range from 40 to 117%. The Coos Bay and Roseburg Districts would be the only districts that would exhibit 30 and 50-year declines, respectively, in marbled murrelet nesting habitat. Marbled murrelet nesting habitat would decline 3.3% over the next 20 years in the Coos Bay District and 3% in the Roseburg District in the next 50 years.

Under Alternative 2, marbled murrelet nesting habitat would increase in all BLM districts except the

Figure 4-110. Old Forest Marbled Murrelet Nesting Habitat



Medford District, by 2106 in Zone 1. Nesting habitat in the Medford District would decline 230 acres during this period. Western Oregon BLM would exhibit an 11% decline in marbled murrelet nesting habitat for the first 50 years under Alternative 2. Individually, marbled murrelet nesting habitat in the Roseburg and Coos Bay Districts would decline 12 and 30% , respectively; and would increase in the Salem and Eugene Districts, 71 and 33%, respectively, in the same time period.

Under Alternative 3, marbled murrelet nesting habitat would decrease 8% in the first 50 years, for BLM as a whole, but would recover to a net increase in available marbled murrelet nesting habitat of 43% (104,000 acres) in Zone 1 by 2106. Murrelet nesting habitat in the Salem and Eugene Districts would increase 70 and 86% (respectively) by 2106. The Roseburg and Coos Bay Districts would exhibit a net decrease in available murrelet nesting habitat for the first 50 years. This decrease would be up to 50% in the Roseburg District and 12% for the Coos Bay District before available marbled murrelet nesting habitat would increase by 17 and 18 %, respectively, by 2106.

Marbled murrelet nesting habitat would increase 82% under the PRMP on western Oregon BLM-administered lands. District-specific increases in murrelet nesting habitat would vary from 55 to 122% under the PRMP. The Coos Bay District is the only district that would exhibit a decline in murrelet nesting habitat in Zone 1 under the PRMP. Marbled murrelet habitat would initially decline 8% in the Coos Bay District by 2026, but additional habitat development thereafter would lead to a 63% increase by 2106.

Because of the increased amount of late-successional management areas and the increased Riparian Management Areas under the PRMP compared to Alternative 2, and because substantially all older and more structurally complex, multi-layered conifer forests would be maintained (deferred from harvest) until 2023 under the PRMP, more murrelet nesting habitat would be maintained and more would develop over time compared to Alternative 2. Marbled murrelet nesting habitat would increase from 38 to 55% in the various districts under the PRMP, compared to nesting habitat fluctuations ranging from a decrease of 47% to an increase of 71% in the various districts under Alternative 2. See *Figure 4-111 - District marbled murrelet nesting habitat fluctuations in Zone 1*, expressed as percent change from 2006. The decline in the amount of marbled murrelet nesting habitat in Alternatives 2 and 3 would be caused by the increase in the amount of lands that would be harvested each decade, compared to No Action, Alternative 1, and the PRMP.

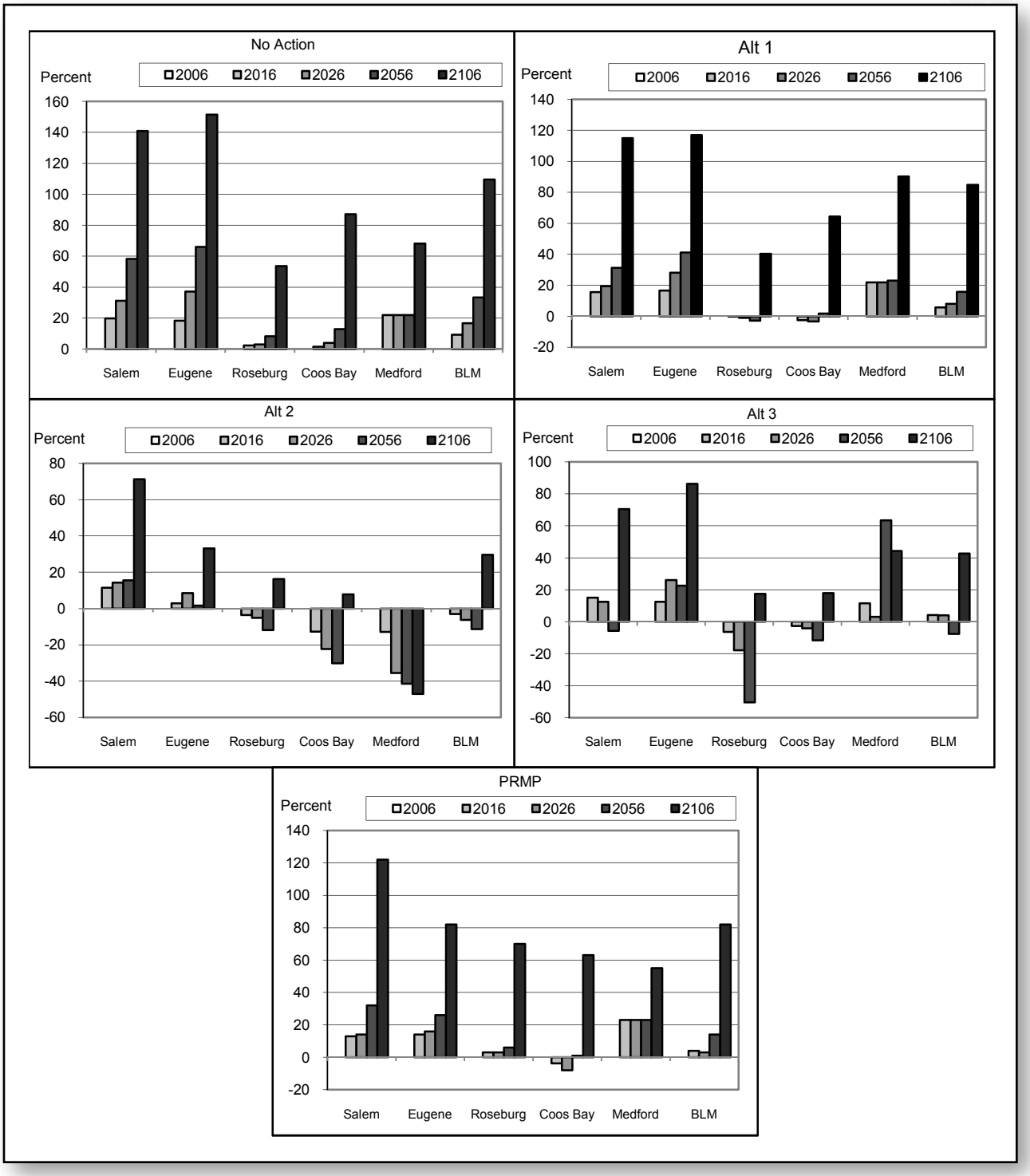
Figure 4-111 (*District marbled murrelet nesting habitat fluctuations in Zone 1*, expressed as percent change from 2006.) compares habitat fluctuations by district in Zone 1.

Old forest, marbled murrelet nesting habitat would decline under all alternatives. The scale of the decline varies with the amount of non-harvest land base and the cutting intensity on the harvest land base under the various alternatives (In Zone 1 the Medford District has so little available old forest, nesting habitat [314 acres] that any loss causes a large percentage change that is out of proportion to the actual importance of the few acres in question and is not considered in this analysis, although it is graphed for comparison.) Under the No Action Alternative and Alternative 1, which have the largest amount of Late-Successional Management Areas and Riparian Management Areas compared to the other alternatives, there would be less than 10% decline in the amount of old forest, marbled murrelet nesting habitat in all districts. The decline in old forest habitat would be delayed under the PRMP compared to Alternatives 1, 2, and 3, because substantially all older and more structurally complex, multi-layered conifer forests would be maintained (harvest would be deferred) until 2023.

Figure 4-112 (*Changes in the availability of marbled murrelet old forest, nesting habitat within the planning area in Zone 1.*) compares habitat fluctuations by district in Zone 1.

Under Alternatives 2 and 3, which have the least amount of land in the non-harvest land base and the shortest period between stand entries compared to other alternatives, there would be a loss of 29% and 65%, respectively, of old forest murrelet nesting habitat by 2106. These declines would be larger than what would occur under the other alternatives. The loss of old forest, marbled murrelet nesting habitat under the PRMP would be comparable to that which would occur under the No Action Alternative and Alternative 1. The loss of old forest, nesting habitat over 100 years would range from no change in the Salem District, to 6% in the Coos Bay District under the PRMP. For comparisons, see *Figure 4-112* (*Changes in the availability of marbled murrelet old forest, nesting habitat within the western Oregon plan revision area, Zone 1*).

Figure 4-111. District Marbled Murrelet Nesting Habitat Fluctuations In Zone 1, Expressed As Percent Change From 2006



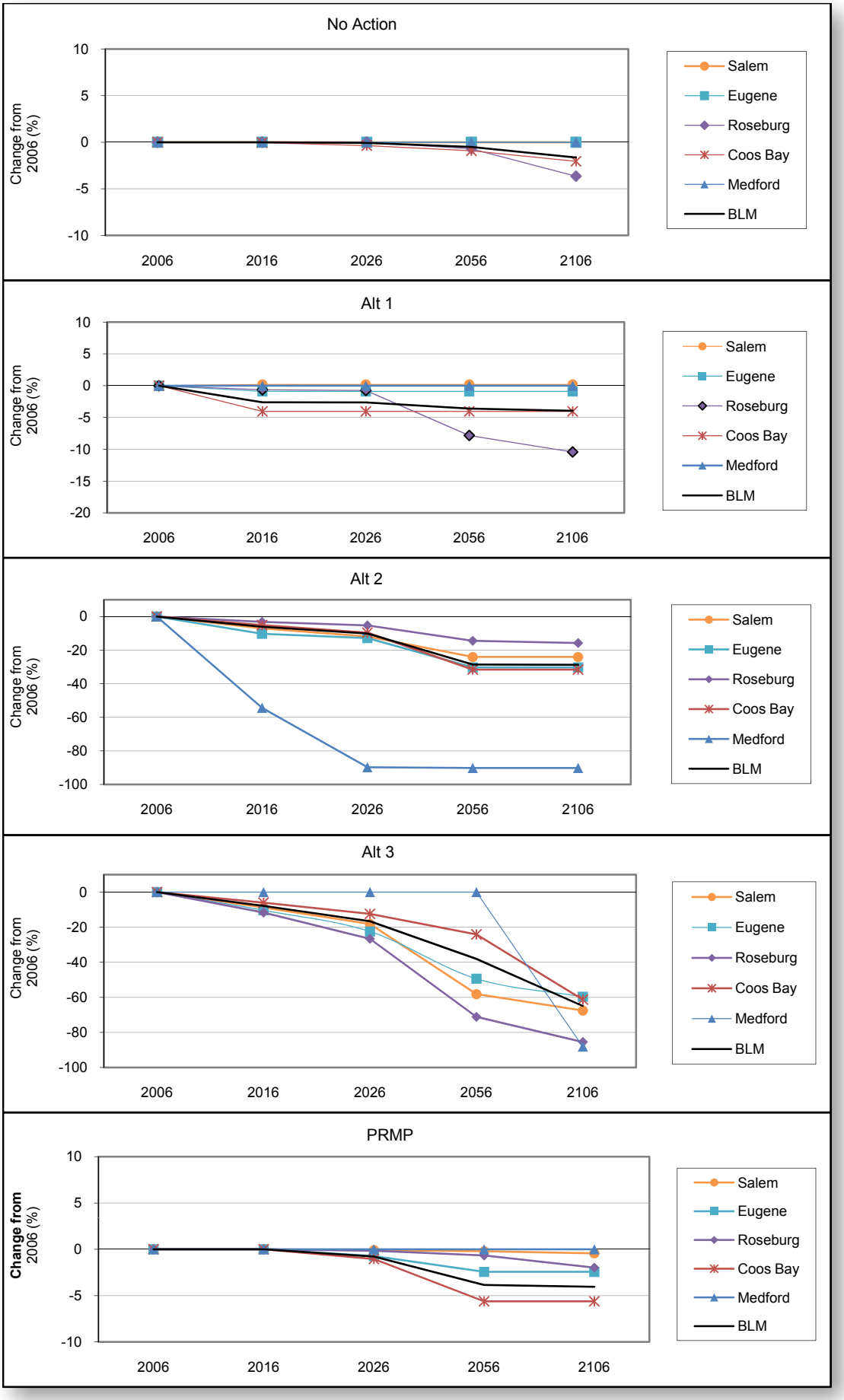


Figure 4-112. Changes In The Availability Of Marbled Murrelet Old Forest Nesting Habitat Within The Planning Area In Zone 1

The largest increase among the alternatives of marbled murrelet nesting habitat on all BLM-administered lands in Zone 1 would occur under the No Action Alternative and Alternative 1: an increase from 244,000 acres, to 518,000 acres and 457,000 acres, respectively. In addition, the No Action Alternative and Alternative 1 would maintain the most existing old forest, nesting habitat (95,000 and 92,000 acres, respectively). Under the PRMP, murrelet nesting habitat would increase from 244,000 to 444,000 acres, and 93,000 acres of existing old forest marbled murrelet nesting habitat would be maintained. The least amount of marbled murrelet nesting habitat would be created under Alternatives 2 and 3 (313,000 and 348,000 acres, respectively). In addition, Alternatives 2 and 3 would maintain the least amount of existing old forest, nesting habitat (69,000 and 34,000 acres, respectively).

Marbled Murrelet Habitat in Zone 2

Lands within Zone 2 have not been identified as crucial for the recovery of the marbled murrelet. Approximately 5% of marbled murrelet sites known on BLM-administered lands occur within Zone 2. There are no other murrelet sites known to occur in Zone 2 in western Oregon. Marbled murrelet nesting habitat within Zone 2 would increase under the No Action Alternative, Alternatives 1 and 3, and the PRMP by 2106. Marbled murrelet nesting habitat would increase from 123,000 acres available in 2006. The increases in available marbled murrelet nesting habitat would range from 15% under Alternative 3, to 54% under the No Action Alternative by 2106. Marbled murrelet nesting habitat under Alternative 2 would decline by 5,000 acres (0.3 %) by 2106. Under the PRMP, available marbled murrelet nesting habitat in Zone 2 would increase by 21,000 acres (19%).

Under the No Action Alternative marbled murrelet nesting habitat in all BLM districts in Zone 2 would increase by 2106. The increases in the districts would range between 41 and 150%. Marbled murrelet nesting habitat would decrease on the Salem and Roseburg Districts 4% by 2026 before recovering. A 4% decrease in marbled murrelet nesting habitat would occur on the Coos Bay District by 2056.

Under Alternative 1, overall marbled murrelet nesting habitat on all BLM-administered lands in the planning area would decline from 123,000 to 117,000 acres by 2026. The Eugene District is the only district that would not exhibit any decrease in murrelet nesting habitat. In the Eugene District, marbled murrelet habitat would increase from 12,000 acres to 25,000 acres by 2106. Marbled murrelet nesting habitat in Medford District would decline less than 1% from the existing 19,000 acres by 2026 before exhibiting a net increase of 23,000 acres by 2106. Marbled murrelet nesting habitat would decline in both the Roseburg and Coos Bay Districts (1% and 37%, respectively) by 2056 before exhibiting a net increase of 24,000 and 600 acres, respectively, (30% and 42%, respectively) by 2106. Murrelet nesting habitat in the Salem District would decline a total of 32%, from 10,000 acres to 7,000 acres by 2106.

Marbled murrelet nesting habitat would decline in all districts except the Eugene District under Alternative 2. There would be an overall decrease of available marbled murrelet nesting habitat of 26,000 acres (21%) by 2056 on BLM-administered lands in Zone 2. Marbled murrelet habitat would then increase from 2056 through 2106 to the point that would approximate the levels of habitat available in 2006. The greatest declines in marbled murrelet nesting habitat would occur by 2056 in Roseburg, Coos Bay, and Medford (23, 68, and 24 %, respectively) before available marbled murrelet nesting habitat would begin to increase. The decline in marbled murrelet nesting habitat in the Roseburg District would recover for a net decrease of 2% by 2106, in the Coos Bay District for a net decrease of 54% by 2106, and in the Medford District for a net decrease of 19% by 2106. Similar to Alternative 1, there would be a decline of nesting habitat in the Salem District from 10,000 acres to 3,000 acres by 2106.

Under Alternative 3, marbled murrelet nesting habitat on all BLM- administered lands within Zone 2 would increase by 15% (18,000 acres) by 2106. The increases in the individual districts would range from 2% to 100% by 2106. The largest increases in habitat would occur in the Eugene, Coos Bay, and Salem Districts. Within western Oregon BLM, marbled murrelet nesting habitat would decrease 25% in Zone 2 by 2056, from 123,000 to 92,000 acres. Marbled murrelet nesting habitat would decline 8% by 2056 in the Salem

District, by 28% in the Roseburg District, by 36% in the Coos Bay District, and by 6% in the Medford District. The Eugene District is the only district where marbled murrelet nesting habitat would increase in all time periods. Marbled murrelet nesting habitat would increase 100%, from 12,000 to 24,000 acres, in the Eugene District by 2106.

Marbled murrelet nesting habitat would increase 21,000 acres (19%) by 2106 under the PRMP in the western Oregon BLM, but would decline by 15,000 acres (11%) through 2056. Marbled murrelet nesting habitat would decline 47% in the Salem District under the PRMP by 2106. Nesting habitat would decline in the Eugene and Roseburg Districts by 41 and 7%, respectively, by 2056 before increasing by 3 and 29%, respectively, by 2106.

Figure 4-113 (District marbled murrelet nesting habitat fluctuations in zone 2) compares habitat fluctuations by district.

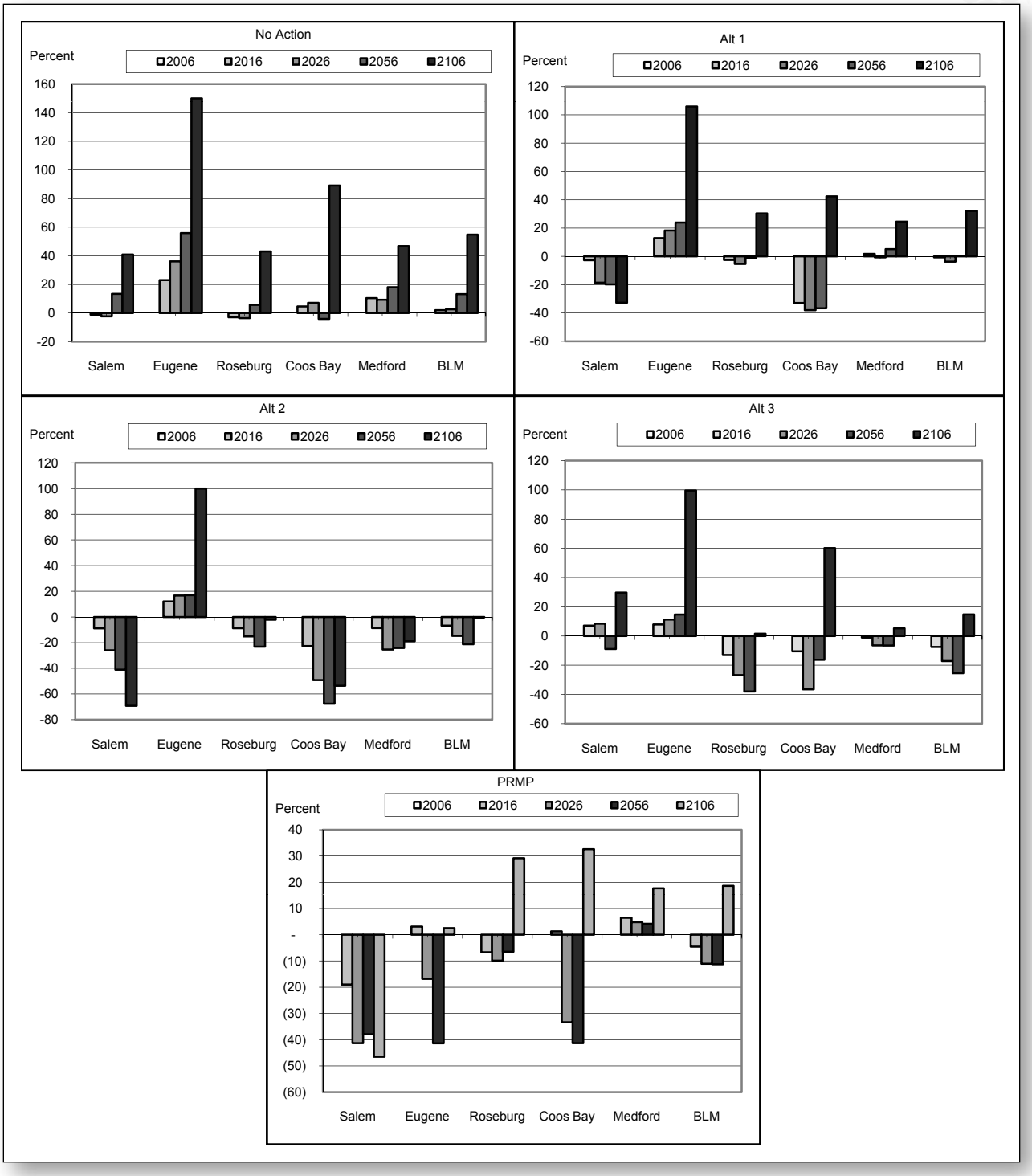
Old forest marbled murrelet nesting habitat would decline under all alternatives. The scale of this decline would depend on the amount of the non-harvest land base, as well as the periods between and the amount of timber removed in each stand entry on the harvest land base under each alternative. The Salem District contains no old forest; therefore, nesting habitat in Zone 2 will not be discussed further for that district.

The No Action Alternative and Alternative 1 would establish the largest amount of late-successional management areas and Riparian Management Areas and have the largest amount of lands in the nonharvest land base compared to the other alternatives. As a result of the large amount of lands in the nonharvest land base in these alternatives, there would occur the smallest decline in the amount of old forest nesting habitat in Zone 2 among the alternatives. This decline would consist of less than 10% under the No Action Alternative and 18% under Alternative 1. The decrease of this habitat in Zone 2 in the various districts would range from 3% in the Eugene District, to 25% in the Medford District by 2106 under the No Action Alternative. The decrease of this habitat in Zone 2 in the individual districts would range from 7% in the Eugene District, to 37% in the Medford District under Alternative 1 by 2106.

Alternatives 2 and 3 would establish the fewest acres in the nonharvest land base compared to the other alternatives. As a result, the largest decline in the amount of old forest marbled murrelet nesting habitat in Zone 2 would occur under Alternatives 2 and 3 compared to the other alternatives. This decline would be 37% under Alternative 2 and 68% under Alternative 3 by 2106. The declines in this habitat in Zone 2 by 2106 in individual BLM districts would range from 11 to 76% under Alternative 2, and from 59 to 73% under Alternative 3. For comparisons, see *Figure 4-114* (*Changes in the availability of marbled murrelet old forest, nesting habitat within the western Oregon plan revision area, Zone 2*). Under the PRMP, old forest marbled murrelet nesting habitat would decline 30% by 2106. This decline would vary among individual districts from 21 to 66%.

Marbled murrelet nesting habitat in Zone 2 on all BLM-administered lands would increase to the highest amounts under the No Action Alternative and Alternative 1 compared to the other alternatives. There are currently 123,000 acres of marbled murrelet habitat in Zone 2 on BLM-administered lands. This habitat would increase to 189,000 acres under the No Action Alternative and to 161,000 acres under Alternative 1. In addition, the No Action Alternative would maintain 52,000 acres of existing old forest marbled murrelet habitat in Zone 2; Alternative 1 would maintain 47,000 acres of this existing habitat in Zone 2. Marbled murrelet nesting habitat would increase under the PRMP to levels similar to that in Alternative 3; however, under Alternative 3 the existing old forest component in Zone 2 would decrease 68%, and under the PRMP this habitat in Zone 2 would decrease 30%. The decrease in existing old forest murrelet nesting habitat in Zone 2 under Alternative 1 would be 18%, and under Alternative 2 the decrease would be 37%. Under Alternative 3, marbled murrelet nesting habitat would increase to 141,000 acres; however, only 18,000 acres of old forest murrelet nesting habitat in Zone 2 would be maintained.

Figure 4-113. District Marbled Murrelet Nesting Habitat Fluctuations In Zone 2, Expressed As Percent Change From 2006



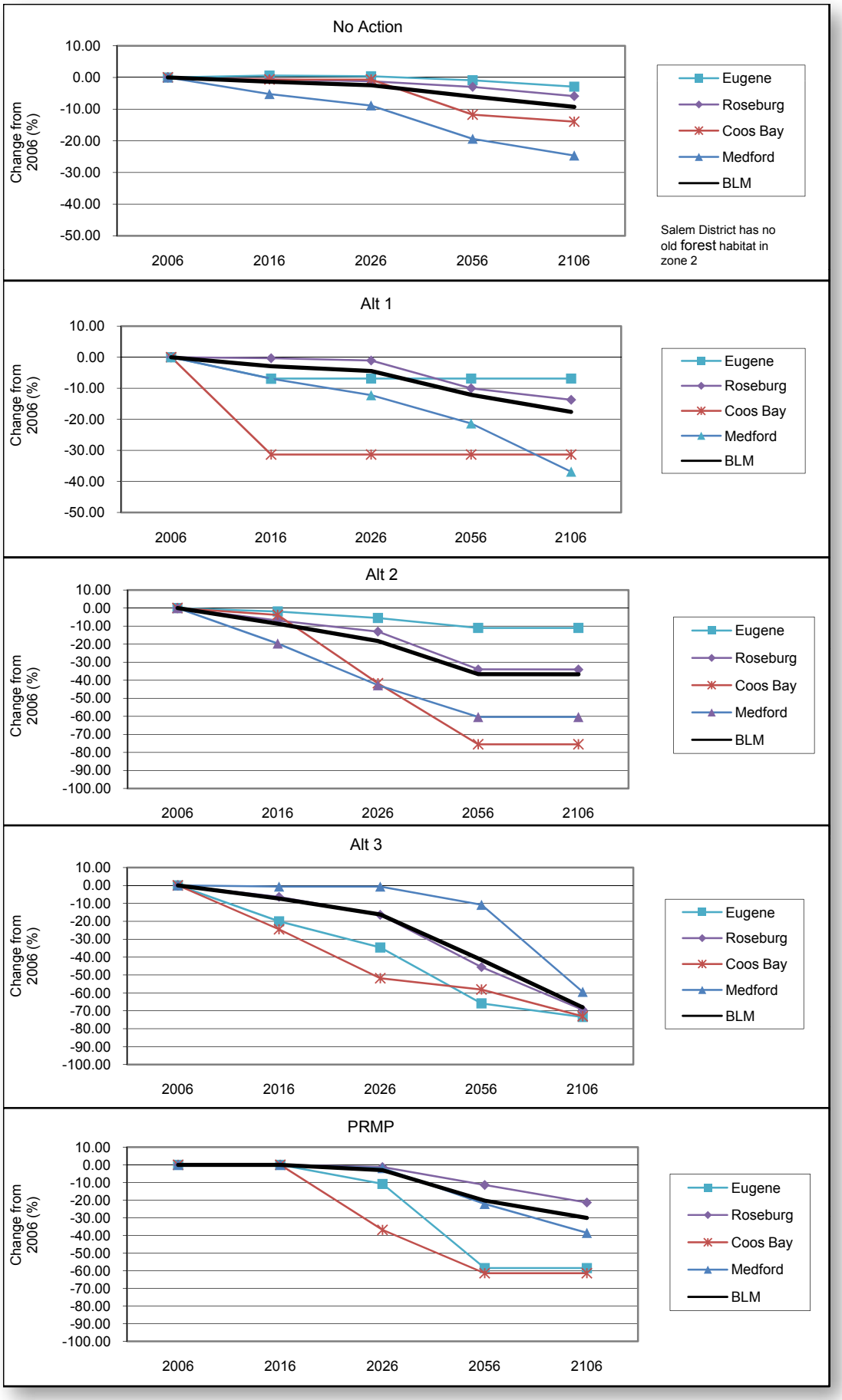


Figure 4-114. Changes In The Availability Of Marbled Murrelet Old Forest Nesting Habitat Within The Western Oregon Plan Revision Area, Zone 2

Marbled Murrelet Habitat in All Ownerships

To assess the impacts of the alternatives on marbled murrelet across all ownership is difficult because marbled murrelet nesting habitat data similar to that for BLM-administered lands is unavailable for non-BLM-administered lands. As described in the *Forest Structure and Spatial Pattern*, the Interagency Vegetation Mapping Project (IVMP) was used to categorize non-BLM lands. Habitat structure was simplified into three classes: stand establishment; young; and mature and structurally complex (see the *Forest Structure and Spatial Pattern* section for a full description of these habitat conditions and the modeling assumptions for projecting habitat conditions into the future.). The use of the mature and structurally complex stage data over-estimates marbled murrelet nesting habitat by approximately 19%, although this varies from 0 to 45%, depending on district. See *Table 4-62* (*Comparison of the amounts of marbled murrelet nesting habitat and mature and structurally complex forests within marbled murrelet zones 1 and 2 in 2006*). Nevertheless, the mature and structurally complex stage serves as a good surrogate to evaluate and compare the alternatives on a provincial scale over time. The analysis in the *Forest Structure and Spatial Pattern* section was not specifically implemented for the range of the marbled murrelet, but the findings for the Coast Range and Klamath Provinces can be used as a surrogate. The Coast Range closely approximates the range of the marbled murrelet in the Salem and Eugene Districts, Swiftwater Resource Area of the Roseburg District, and Umpqua Resource Area of the Coos Bay District. The southern portion of the murrelet range overlays approximately the western one-third of the Klamath Province.

This analysis is thoroughly discussed in the *Forest Structure and Spatial Pattern* section; below are the conclusions.

- All alternatives would increase in mature and structurally complex forests. These changes would move the landscape in the direction of the average historic condition, but mature & structurally complex would still remain below the historic averages. Structural conditions do not differ by more than 4% in any west-side province in 2106.
- At the broad scale of analysis across all ownerships, the management of the BLM –administered lands does not substantially alter the condition of the entire forested landscape.
- The principal determining factors on the condition of the entire forested landscape are the development of the U.S. Forest Service reserves into mature and structurally complex forests under the current forest plans and the continued intensive management of the nonfederal forests.

The BLM does not have the ability to influence the overall distribution of mature and structurally complex habitat at a provincial scale by more than a few percentage points.

Table 4-62. Comparison Of The Amounts Of Marbled Murrelet Nesting Habitat And Mature And Structurally Complex Forests With Marbled Murrelet Zones 1 And 2 In 2006

	Coos Bay	Eugene	Medford	Roseburg	Salem	Grand Total
Marbled murrelet nesting habitat (acres)	124,000	49,000	20,000	98,000	77,000	367,000
Mature and Structurally Complex forest (acres)	139,000	69,000	20,000	98,000	112,000	437,000
% difference between nesting habitat and mature & structurally complex	12	41	0	0	45	19

Patch and Core Area Size

The *Forest Structure and Spatial Patterns* section of this chapter analyzed the development of patch size over time for the mature and structurally complex forest structural stage classifications. Marbled murrelet habitat includes the mature, structurally complex forest structural stage classification, so although the absolute patch sizes would be different, the relative relationships would be similar. In the Coast Range physiographic province, the current patch size is 111 acres. The mean patch size of mature and structurally complex forest that would exist in 2106 on BLM- administered lands in the planning area would be:

- 338 acres under the No Action Alternative
- 254 acres under Alternative 1
- 101 acres under Alternative 2
- 37 acres under Alternative 3
- 176 acres under the PRMP

The mean core area size would follow the same trends as the mean patch size. An increase in the size of core areas would indicate that more nesting opportunities further from edge habitat would develop. This would result in a decrease in potential nest predation (Raphael et al. 2002a and 2002b, Meyer et al. 2002). Zharikov et al. (2006) concluded that fragmentation itself does not cause increased nest predation, but the impact of fragmentation on potential nest predators causes concerns. As stands treated with regeneration harvest age, production of berries and seeds would increase, which would lead to an increasing predator population (birds and small mammals). Zharikov et al. (2006) further cite evidence that populations of nest predators rarely increase in forested landscapes managed for timber production compared to data from more suburban or agricultural settings that indicates increases in nest predators does follow timber harvest activities.

The influences of patch dynamics on differing landscapes are often conflicting and reflect local situations more than concrete certainties. There have been no critical thresholds established for any of these criteria. Assumptions used in this analysis to base conclusions on regarding murrelet habitat, even when considering apparently conflicting research, include:

- More habitat is better for the murrelet.
- Larger blocks of habitat are better for the murrelet.
- Less edge is better for the murrelet (whether or not it contributes to predation).

Edge density[12] of mature and structurally complex stand in the Coast Range would increase under all alternatives. The increase compared to the current condition of 40 feet per acre would range from 35% under the No Action Alternative and Alternative 1, to 80 feet per acre under Alternative 3. Edge density of mature and structurally complex stands would increase from 59% under the PRMP, comparable to the 63% increase that would occur under Alternative 2.

In the Klamath Province, the current patch size is 137 acres. The mean patch size of mature and structurally complex forest in 2106 on BLM-administered lands in the planning area would be:

- 192 acres under the No Action Alternative
- 91 acres under Alternative 1
- 79 acres under Alternative 2
- 27 acres under Alternative 3
- 152 acres under the PRMP

[12]Edge density is defined as the length of stand edge between the target habitat type and others; it is expressed as a linear length per unit area and can range from 0 to infinity.

Edge density of Mature and Structurally Complex stands in the Klamath Province would increase under all alternatives. The increase compared to the current condition of 62 feet per acre would range from 19% under Alternative 2, to 50% under Alternative 3. Edge density of mature and structurally complex stands would increase from 35% under the PRMP; comparable to the 32 and 43% increases that would occur under the No Action Alternative and Alternative 1.

The quantity of marbled murrelet nesting habitat on BLM-administered lands in the planning area would increase under all alternatives by 2106. There would be decreases, however, in the quantity of marbled murrelet nesting habitat under Alternatives 2 and 3 through 2056.

The quality of marbled murrelet nesting habitat (as measured by patch and core area size and edge density) would vary under the alternatives. Under the PRMP and the No Action Alternative, patch and core area size would increase by 2106 in mature and structurally complex stands in the Coast Range and Klamath Provinces. This increase would indicate improving nesting habitat conditions for the marbled murrelet. The increase in core area size would offset increases in edge density. Edge density would become a limiting factor to improving murrelet reproduction only in those instances in which it is not offset with patch size increases.

Under Alternative 1, patch size and core area size would increase by 2106 in mature and structurally complex stands in the Coast Range Province, which would indicate improving habitat conditions. In the Klamath Province, the increase in the quantity of marbled murrelet nesting habitat and the decrease in patch size area would result in no change to the overall habitat conditions in the Klamath Province.

Under the No Action Alternative, Alternative 1, and the PRMP there would be short-term effects (20-50 years) due to decreases in available nesting habitat that would be small (less than 5% available habitat). Marbled murrelet nesting habitat conditions would remain stable in both the Coast Range and Klamath Provinces for the next 50 years due to habitat quantity changing little (less than 5%) and no measurable change in Mature and Structurally complex forest patch and core area size.

Under Alternatives 2 and 3, in the Coast Range and Klamath Provinces, a decline in habitat conditions would occur due to the decrease in mature and structurally complex patch and core area size, the increase in edge density of mature and structurally complex forests, and a decrease in the amount of nesting habitat over the next 50 years.

Increases in the amount of available nesting habitat in both the Coast Range and Klamath Provinces, combined with increases in mean patch size and core area, would result in increasing habitat conditions for the marbled murrelet on BLM-administered lands under the PRMP.

Deer and Elk

Columbian White-tailed Deer

The Douglas County population segment of the Columbian white-tailed deer would continue to be managed on the North Bank Habitat Management Area in accordance with the habitat management plan (BLM 2001c).

Management that converts forest from the mature and structurally complex forest structural stages to the stand establishment stage would result in the loss of hiding cover. This would occur only in those stands adjacent to the valley bottom habitats utilized as foraging habitat. Management of the BLM's forests that are adjacent to the Umpqua Valley and Columbia River, where the deer are located, would have little effect on the survival of the species. This is because recovery of the Douglas County population is tied to the presence of secure valley habitat and not the upland coniferous forest where timber harvest under the alternatives would occur. Recovery of the Columbia River population is tied to habitat conditions on the Julia Butler Hansen National Wildlife Refuge and surrounding valley bottom habitat.

Mule/Black-Tailed Deer

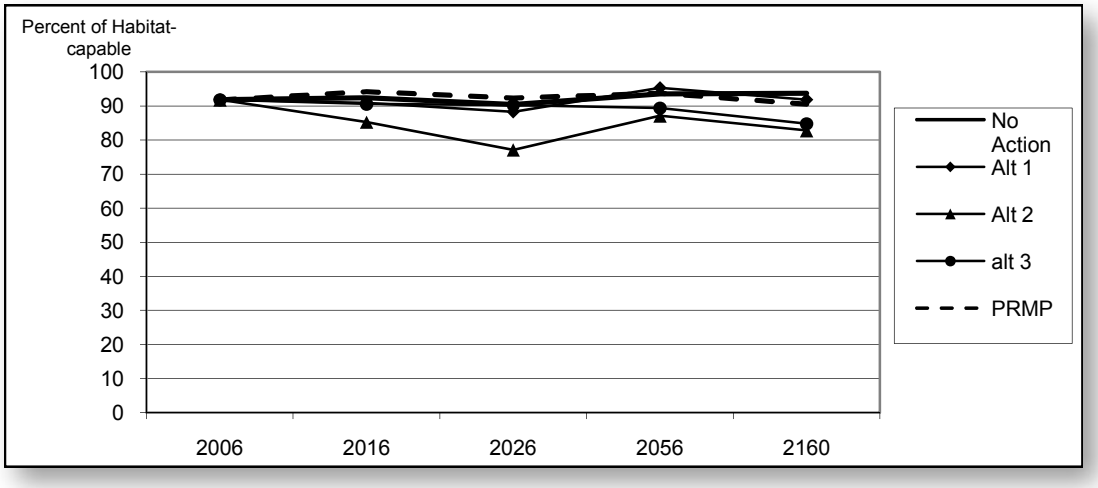
Mule deer and black-tailed deer occur across BLM-administered lands within the planning area. However, BLM (with input from the Oregon Department of Fish and Wildlife) has identified 26 deer habitat management areas where management consideration is given to important wintering areas and areas that provide hiding cover for this species. Hiding cover is provided when stand conditions are capable of concealing 90%, or more of the animal at 200 feet. For analytical purposes, three structural stages (young, high density; mature; and structurally complex) are considered to provide hiding cover.

Deer Habitat Management Areas in the Coos Bay District

Five of the 26 deer habitat management areas (approximately 30,000 acres) are designated in the Coos Bay District to provide hiding cover. Changes in the amount of hiding cover, on BLM-administered lands, in these five habitat management areas would vary less than 10% through 2106 under all alternatives, except Alternative 2. Deer hiding cover in Alternative 2 would decline from 92% of the deer habitat management areas providing cover in 2006, to 78% in 2026. The hiding cover would recover to 83% by 2106, which is approximately the amount of hiding cover that would develop under Alternative 3. The No Action Alternative and Alternative 1 would result in stable levels of hiding cover at approximately 90% of the deer habitat management areas. The amount of hiding cover under the PRMP would fluctuate between 91 and 94% of BLM-administered lands within the deer habitat management areas, over the next 100 years. See *Figure 4-115* (*Average hiding cover availability on deer habitat management units in the Coos Bay District.*) for more details.

However, Wisdom et al. (2004), citing work by others (Black et al. 1976 and Thomas et al. 1979), stated that the optimum cover to forage ratio for elk was 60:40 (60% cover habitat to 40% forage habitat). Although this number may not be prescriptive for deer, it would indicate that the amount of available cover on BLM-administered lands is currently extremely high; is projected to be extremely high under all alternatives; and is not and would not be a limiting factor on BLM-administered lands within in the deer habitat management areas even when considering the effects from roads.

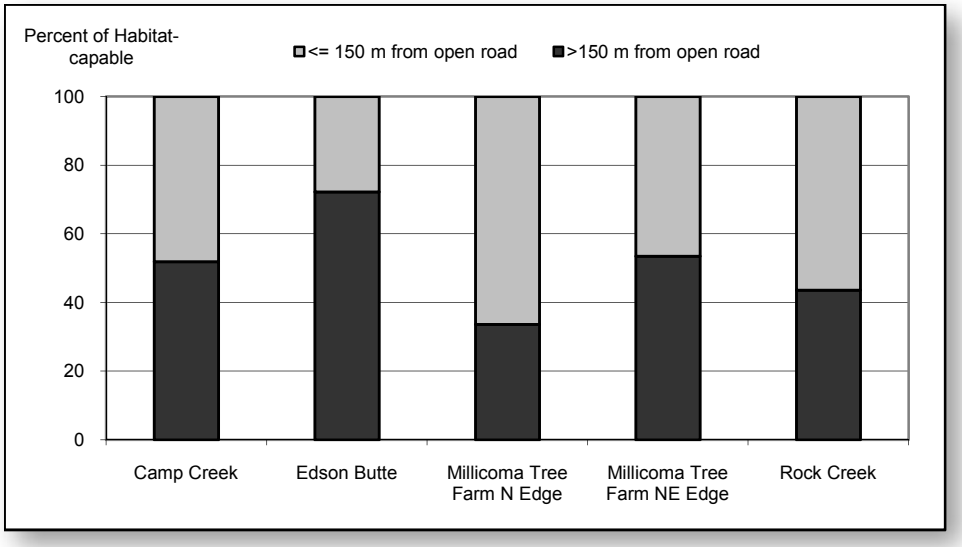
Figure 4-115. Average Hiding Cover Availability On The Deer Habitat Management Units In The Coos Bay District



Other habitat factors that contribute to the overall value of hiding cover include core area size (or distance from edge) and distance from a road open to vehicle use. Habitat models indicate that cover values increase with distance from the edge and from roads open to vehicles. Cole (1996) found that elk, on BLM-administered lands in the Oregon Coast Range, used habitat significantly more when it was greater than 492 feet (150 meters) from roads open to vehicles. Similar studies are not available for deer within the planning area, but 492 feet is a reasonable threshold distance to apply to deer as well. Deer habitat management areas in the Coos Bay District currently contain between 33 and 72% of their area more than 492 feet from roads that are open to vehicle traffic. *See Figure 4-116 (Percentage of deer habitat management area, in the Coos Bay District, greater than 492 feet from roads open to vehicle use).*

Areas more than 492 feet from open roads provide the deer respite from disturbance caused by road use (Wisdom et al. 2004). The effective loss of foraging habitat and hiding cover within 492 feet of open roads due to disturbance increases the vulnerability of deer to both legal and illegal harvest, and also increases stress and movement rates (Rowland et al. 2004). Although BLM has an estimate of the amount of new road construction in the next 10 years, it is not a geographic or spatial estimate and, therefore, changes in the amount of land in deer habitat management areas within 492 feet of roads cannot be estimated. As the amount of roads open to vehicle use increase there would be a decrease in the amount of land greater than 492 feet from open roads, which would increase deleterious impacts (such as those described previously) to deer. See the *Road Density in Deer Habitat Management Areas* section for a discussion of the effects of the alternatives on road density within the deer habitat management areas.

Figure 4-116. Percentage Of Deer Habitat Management Area In The Coos Bay District, Greater Than 492 Feet From Roads Open To Vehicle Use



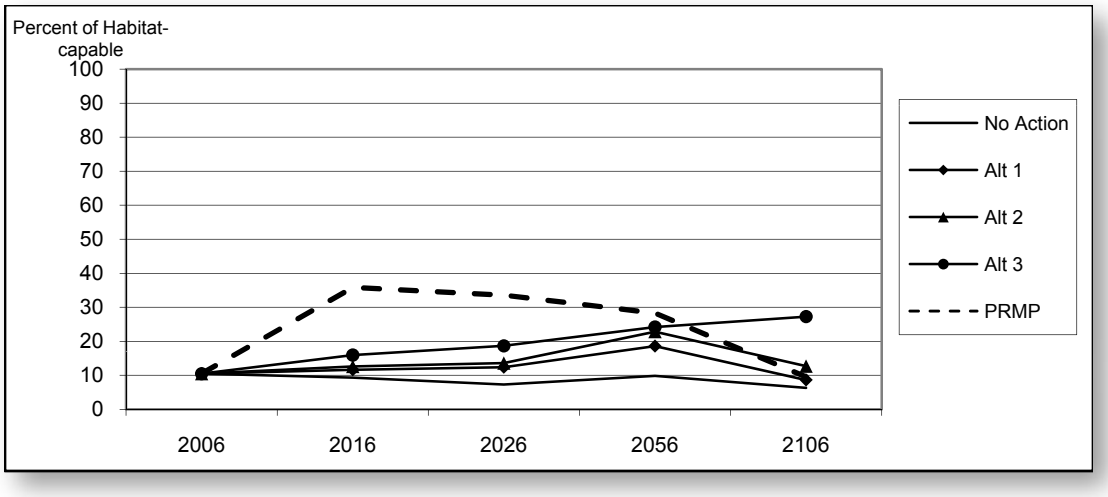
Deer Habitat Management Areas (Medford District & Western Klamath Falls Resource Area)

There are 12 deer habitat management areas totaling 143,000 acres that provide important winter foraging habitat on BLM-administered land in the Medford District and western Klamath Falls Resource Area Deer foraging habitat levels would fluctuate around 9% through 2106 under the No Action Alternative. Under Alternatives 1 and 2, foraging habitat would decline from the highs of 19 and 23% in 2056, to approximately the starting condition of 10% by 2106. Foraging habitat would increase from 10%, to 37 % of BLM-administered lands in the deer habitat management areas under Alternative 3. Under the PRMP, there would be a rapid increase in available foraging habitat on BLM-administered lands, which would peak in 2016 at 36%. By 2106, available foraging habitat under the PRMP would decline to 10% of the habitat-capable lands in the deer habitat management areas in the Medford District and Klamath Falls Resource Area. See *Figure 4-117 (Foraging habitat availability on the deer habitat management units in the Medford District and Klamath Falls Resource Area*).

Intensive forest management on intermingled private forestlands would provide more foraging habitat per unit area than on BLM-administered lands. This is due to shorter harvest rotations on private forestlands resulting in more land being in an early-seral stage than would be provided under a longer harvest rotation.

Wisdom et al. (2004), citing work by others (Black et al. 1976 and Thomas et al. 1979), stated that the optimum cover to forage ratio for elk was 60:40 (60% cover habitat to 40% forage habitat). Although optimum cover to forage ratio of 60:40 is not prescriptive for deer (see discussion above), it indicates that the amount of available foraging habitat on these deer habitat management areas is currently extremely low (10%) and would continue to be low under all alternatives. Winter foraging habitat is the limiting factor to deer management on BLM-administered lands in the deer habitat management areas in the Medford District and Klamath Falls Resource Area. Without adequate forage, the habitat management areas would not be able to support an over-wintering deer herd in as healthy a condition as they would at the 60:40 level. The stress of lower forage amounts would be translated into lower overall health of the animals and lower reproductive potential for the female deer. At best, under the PRMP, from 2016 through 2056, foraging habitat would account for approximately 28% or more of the BLM-administered lands within these deer habitat management areas. See *Figure 4-117 (Foraging habitat availability on the deer habitat management units in the Medford District and Klamath Falls Resource Area*).

Figure 4-117. Foraging Habitat Availability On The Deer Habitat Management Units In The Medford District and Klamath Falls Resource Area

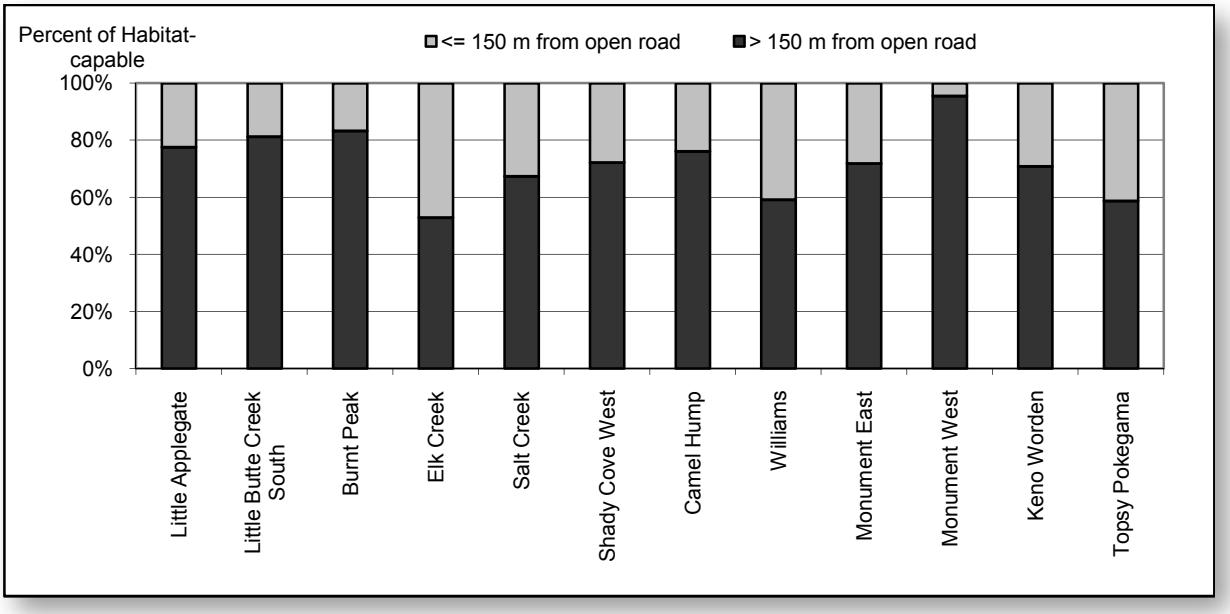


Winter foraging habitat would be better met on the industrial forest lands intermingled with BLM-administered lands in many of the deer habitat management areas. The intensive forest management on those lands would leave a higher percentage in early-seral conditions that would provide forage. However, due to the management practices on private industrial timberlands (such as large clearcuts and aggressive brush control), the foraging habitat created would be of differing quality than those on BLM-administered lands. There is no data to indicate whether or not intermingled private lands would tip the overall cover:forage ratio one way or the other. More accurate analysis of the cover to forage ratio that considers the specifics of intermingled private lands would need to occur at the project scale where the analysis could better account for specific circumstances of habitat juxtaposition and better forecast habitat changes over time on private lands.

As discussed previously under *Deer Habitat Management Areas in the Coos Bay District*, deer are assumed to use habitat more when it is greater than 492 feet (150 meters) from roads open to vehicles. Deer habitat management areas in the Medford District and western Klamath Falls Resource Area currently contain between 53 and 96% of their lands more than 492 feet from roads open to vehicle traffic. See *Figure 4-118 (Percentage of deer habitat management area, in the Medford District and western Klamath Falls Resource Area, greater than 492 feet [150 meters] from roads open to vehicle use).*

Areas more than 492 feet from open roads provide deer respite from disturbance caused by road use (Wisdom et al. 2004). The effective loss of foraging habitat and hiding cover within 492 feet of open roads due to disturbance increases vulnerability of deer to both legal and illegal harvest, and increases in stress and movement rates (Rowland et al. 2004). Although the BLM does have an estimate of the amount of new road construction in the next 10 years, it is not a geographic or spatial estimate and, therefore, changes in the amount of land in deer habitat management areas within 492 feet of roads cannot be estimated. As the amount of roads open to vehicle use increase, there would be a decrease in the amount of land greater than 492 feet from open roads deleterious impacts (such as those described previously) to deer would increase. See the *Road Density in Deer Habitat Management Areas* section for a discussion of the effects of the alternatives on road density within the deer habitat management areas.

Figure 4-118. Percentage Of Deer Habitat Management Area In The Medford District And Western Klamath Falls Resource Area, Greater Than 492 Feet (150 Meters) From Roads Open To Vehicle Use



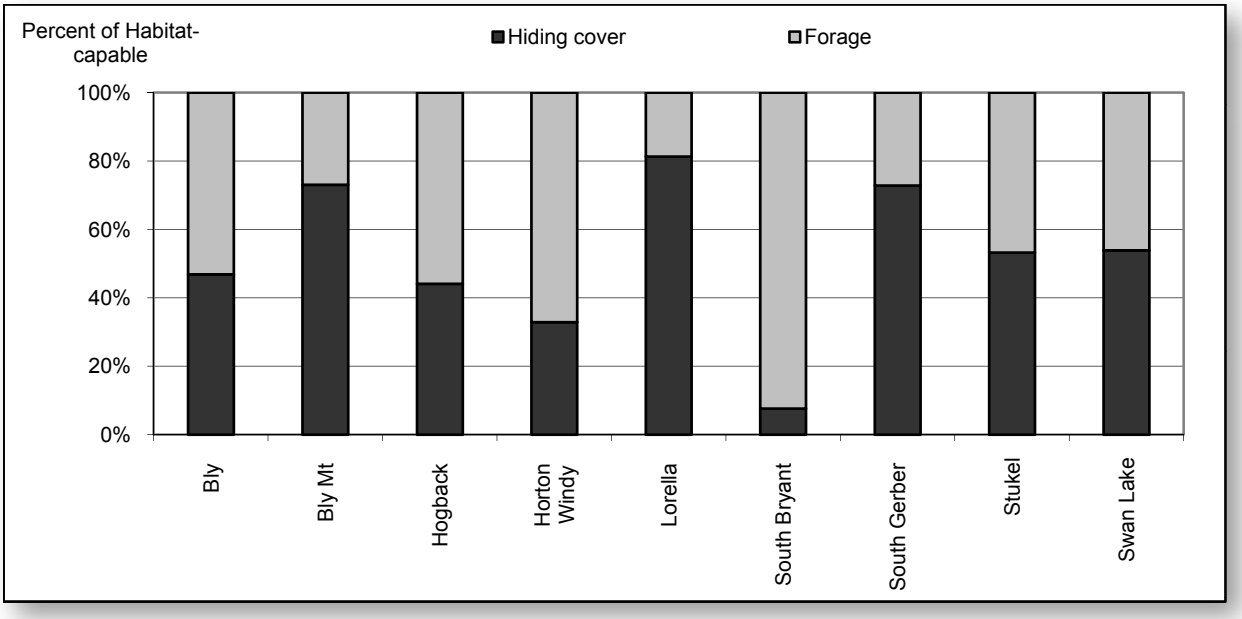
Deer Management Areas in Eastside Management Lands

There are nine deer habitat management areas on Eastside Management Lands in the Klamath Falls Resource Area managed for winter forage habitat. Forests in those areas would be managed with an uneven-aged management under all alternatives. Range and other non-forest types would continue to provide a similar habitat function for deer as they currently provide. The overall distribution of forest structural stages would not change in this area as a result of uneven-aged management. Conditions on the deer management areas on the Eastside Management Lands in 2006 vary from approximately 20 to 90% foraging habitat as shown in *Figure 4-119* (*Percent of foraging habitat in deer habitat management areas on Eastside Management Lands in the Klamath Falls Resource Area*).

Foraging habitat would be created as harvested stands regenerate, but would not persist as long as foraging habitat created under even-aged management. This is because the openings created through harvest under uneven-age management would typically be much smaller than those created under even-aged management.

Intensive forest management on intermingled private forestlands would provide more foraging habitat per unit area than on BLM-administered lands, due to shorter harvest rotations resulting in more land being in an early-seral stage than a longer rotation would provide. However, due to management practices on private forestlands such as larger clearcut harvest units and aggressive brush control, the foraging habitat would differ in quality from foraging habitat on BLM-administered lands. There is no data to indicate whether or not intermingled private lands would change the overall cover to forage ratio one way or the other. More accurate analysis of the cover to forage ratio that considers the specifics of intermingled private lands would need to occur at the project scale where the analysis could better account for specific circumstances of habitat juxtaposition and better forecast habitat changes over time on private lands.

Figure 4-119. Percentage Of Habitat In Deer Habitat Management Areas On Eastside Management Lands In The Klamath Falls Resource Area



Road Density in Deer Habitat Management Areas

In the first 10 years, the approximate miles of new roads open to public use that would be built in deer habitat management areas, by alternative, are:

- 12.2 miles of new roads under the No Action Alternative
- 32 miles under Alternative 1, Alternative 2, and Alternative 3
- 55 miles under the PRMP

New road construction would taper off in the future; however, the decade in which that would occur cannot be determined. There is enough detailed information available to analyze the first decade of anticipated levels of road construction for comparison of the alternatives. This level of construction would not continue indefinitely, because at some time the potential maximum road development would be reached. On average, for the first decade, open road density would increase from approximately 1.8 miles per square mile, to 1.9 miles per square mile under the No Action Alternative and Alternatives 1, 2, and 3.

Changes in individual habitat management areas range from 0 to 62%. Of 27 habitat management areas, 11 areas would exhibit no change in average road density. Under the PRMP, average road density would increase to 2 miles per square mile, and changes on individual habitat management areas would range from 0 to 77%. New roads that are open to public use would increase by 2016 by approximately 2% under the No Action Alternative; 4 to 5% under Alternatives 1, 2, and 3; and 8% under the PRMP. See *Table 4-63* (*Open road density on BLM-administered lands within deer habitat management units*).

The density of roads open to public vehicle use within deer habitat management areas on Eastside Management Lands varies between 0.64 and 1.53 miles per square mile and does not vary by alternative or time period.

The average road density would change by alternative, as follows:

Alternative	Number of Deer HMAs (of 27 HMAs) With Less Than 1% Increase in Average Road Density	Number of Deer HMAs (of 27 HMAs) With 5% Increase in Average Road Density
No Action	12	7
Alternative 1	15	8
Alternative 2	12	7
Alternative 3	17	3
PRMP	12	10

The effects of new roads on habitat use are difficult to evaluate based only on changes in road density. Road location compared to available habitat is critical to accurate forecasting of effects. For example, a road built in an area with already high road density would have relatively minor effects compared to a road built in previously undisturbed habitat.

Winter closures of open roads under all alternatives would remove or reduce the disturbance effects caused by vehicle use of roads and allow deer to gain maximum benefit from the available forage near roads within the Medford District and Klamath Falls Resource Area deer habitat management areas and on winter hiding cover within the Coos Bay District's deer habitat management areas. Due to legal constraints of binding road use agreements, not all roads would be closed to public use during these time periods.

Vehicles would cause disturbance to available cover adjacent to open roads As a result, the cover adjacent to open roads would be utilized to less than maximum benefit during the spring and summer seasons in the Coos Bay District's deer habitat management areas.

Table 4-63. Open Road Density On BLM-Administered Lands Within Deer Habitat Management Units

District	Deer Habitat Management Area	Density of Open roads (road miles per square mile)					
		2006	2016 Alt 1	2016 Alt 2	2016 Alt 3	2016 No Action	2016 PRMP
Coos Bay	Camp Creek	3.03	3.20	3.26	3.10	3.12	3.21
	Edson Butte	1.55	1.57	1.65	1.58	1.59	1.75
	Millicoma Tree Farm N Edge	4.34	4.35	4.34	4.34	4.34	4.34
	Millicoma Tree Farm NE Edge	2.97	3.05	2.98	3.20	3.01	3.05
	Rock Creek	3.83	4.24	4.18	3.97	4.06	3.98
Klamath Falls (Eastern Management Lands)	Bly	1.39	1.39	1.39	1.39	1.39	1.39
	Bly Mountain	1.42	1.42	1.42	1.42	1.42	1.42
	Hogback	0.98	0.98	0.98	0.98	0.98	0.98
	Horton Windy	1.09	1.09	1.09	1.09	1.09	1.09
	Keno Worden	1.40	1.43	1.40	1.44	1.41	1.53
	Lorella	0.94	0.94	0.94	0.94	0.94	0.94
	South Bryant	1.53	1.53	1.53	1.53	1.53	1.53
	South Gerber	0.64	0.64	0.64	0.64	0.64	0.64
	Stukel	1.14	1.14	1.14	1.14	1.14	1.14
	Swan Lake	0.65	0.65	0.65	0.65	0.65	0.65
Klamath Falls	Topsy Pokegama	2.91	2.92	2.93	2.94	2.95	3.02
Medford	Burnt Peak	0.59	0.67	0.95	0.68	0.64	0.59
	Camel Hump	1.47	1.55	1.58	1.53	1.48	1.60
	Elk Creek	3.34	3.40	3.48	3.50	3.36	3.42
	Little Applegate	1.30	1.38	1.37	1.37	1.34	1.60
	Little Butte Creek South A	1.12	1.15	1.17	1.21	1.13	1.38
	Little Butte Creek South B	0.25	0.29	0.28	0.31	0.27	0.45
	Monument East	1.58	1.58	1.58	1.58	1.58	1.58
	Monument West	0.53	0.54	0.53	0.53	0.53	0.53
	Salt Creek	2.01	2.11	2.10	2.08	2.05	2.14
	Shady Cove West	1.61	1.67	1.75	1.75	1.61	1.92
	Williams	2.74	2.96	2.89	2.98	2.77	3.13
	Average	1.83	1.91	1.91	1.92	1.86	1.97

Under all alternatives, off-highway vehicle travel would be limited to designated roads and trails. These limitations, along with the closure of roads in deer management areas, would limit the amount of disturbance to wintering animals. Reduced disturbance would decrease the amount of unnecessary movements animals make and, therefore, reduce their energy expenditure. Additionally, road closures that occur through limiting off-highway vehicles to designated roads and trails would result in more available foraging habitat, since animals would not need to move away from their former frequently used roads and trails that would not be designated for off-highway vehicle use.

Off-highway vehicle emphasis areas would be designated that would overlap four deer habitat management areas under Alternatives 2 and the PRMP. See *Table 4-64 (Off-highway vehicle emphasis areas proposal for deer habitat management areas in the Medford District)*. Off-highway vehicle emphasis areas would be managed to accommodate vehicle use that is more concentrated. Off-highway vehicles would be limited to designated roads and trails. Comprehensive travel management plans that would be completed for each off highway emphasis area would accommodate the needs of deer habitat management areas by restricting off-highway vehicle activity, such as identifying closures of certain roads and trails and seasonal restrictions.

Table 4-64. Off Highway Vehicle Emphasis Areas Proposal For Deer Habitat Management Areas In The Medford District

Deer Habitat Management Area	Alternative 2	PRMP
	(acres)	
Little Applegate	5,344	1,334
Little Butte Creek	6,550	0
Salt Creek	8,429	0
Williams	4,377	6,067
Total Acres	**24,700**	**7,401**

Elk

There are 16 elk habitat management areas on BLM-administered lands (see the *Wildlife* section of *Chapter 3*). These areas provide specific limited habitat needs for elk, including important winter foraging areas and areas that provide hiding cover. Elk forage on grasses, forbs, shrubs, and trees species that are characteristic of the stand establishment and young low density forest structural stage classifications. Additional forage (e.g., lichens) would be found in older structural stages. Hiding cover is provided when stand conditions are capable of concealing 90% or more of the animal at 200 feet. For analytical purposes, the young, high density; mature; and structurally complex structural stages are considered to provide hiding cover.

Elk Management Areas on the Coos Bay and Salem Districts

Seven of the 16 elk habitat management areas would be managed to provide hiding cover for elk in the Coos Bay and Salem Districts. Currently, hiding cover constitutes 92% of BLM-administered lands in the elk habitat management areas in the Coos Bay and Salem Districts. The percentage of hiding cover in elk habitat management areas would remain stable, between 90 and 95%, through 2106 under the No Action Alternative, Alternative 1, and the PRMP. Hiding cover would decrease to approximately 85% of the elk habitat management areas in the Coos Bay and Salem Districts by 2106 under Alternative 3. The largest decline in elk hiding cover among all alternatives would occur under Alternative 2 in which this habitat would decline to 60% of BLM-administered lands in elk habitat management areas by 2106. See *Figure 4-120* (*Elk hiding cover availability on the elk habitat management units in the Coos Bay and Salem Districts*) for trends in the abundance of elk hiding cover. Intermingled industrial forest lands would undoubtedly contribute to the hiding cover available to elk in these habitat management areas. There is no data to indicate whether or not intermingled private lands would change the overall cover to forage ratio one way or the other. More accurate analysis of the cover to forage ratio that considers the specifics of intermingled private lands would need to occur at a project scale where the analysis could better account for specific circumstances of habitat juxtaposition and better forecast habitat changes over time on private lands.

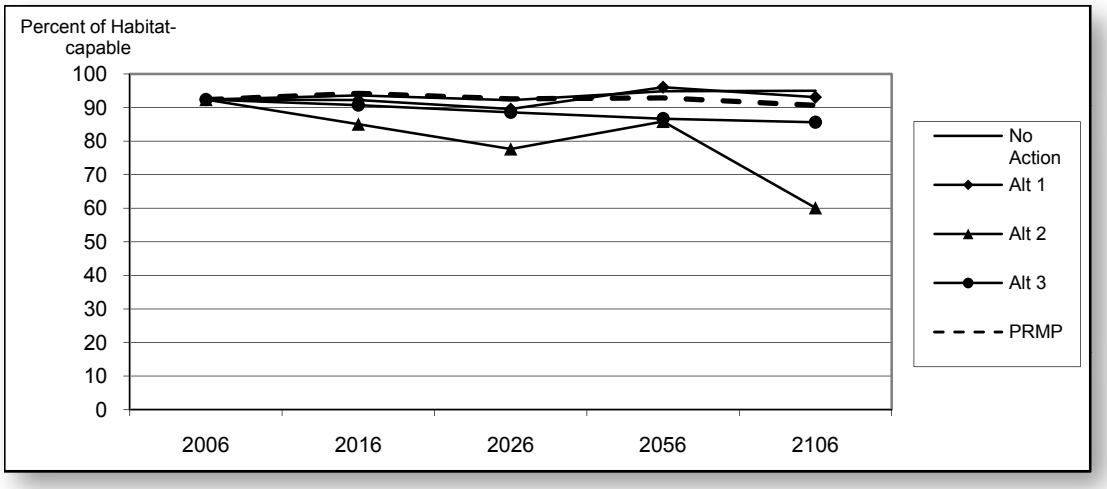


Figure 4-120. Elk Hiding Cover Availability On The Elk Habitat Management Units In the Coos Bay And Salem Districts

The functionality of hiding cover is affected by core area size (or distance from edge) and open road density. Habitat models indicate that cover value increases from the edge up to 200 yards into a stand. Cover value decreases with increasing density of roads that are open to vehicles (Wisdom et al. 2004). Using the mature and structurally complex analysis as a surrogate for hiding cover, mean patch size on BLM-administered lands would decrease by 9 acres under Alternative 2 and by 73 acres under Alternative 3 in the Coast Range by 2106. There would be increases in mean patch size in the other alternatives: 229 acres increase under the No Action Alternative; 144 acres increase under Alternative 1; and 26 acres increase under the PRMP.

For more information, see *Table 4-70* (*Quantitative assessment of patch size and connectance on fisher habitat condition in 2106*) later in this section.

The loss of hiding cover would not reduce the ratio of cover to forage below the optimum in the elk management areas in the Coos Bay and Salem Districts. Wisdom et al. (2004), citing work by others (Black et al. 1976 and Thomas et al. 1979), stated that the optimum cover to forage ratio for elk was 60:40 (60% cover habitat, to 40% forage habitat). Analysis indicates that the amount of available hiding cover is extremely high (e.g., greater than 85%) under the PRMP and all alternatives, except Alternative 2. See *Figure 4-120* (*Elk hiding cover availability on the elk habitat management units in the Coos Bay and Salem Districts*) for trends in the abundance of elk hiding cover.

As discussed previously under *Deer Habitat Management Areas in the Coos Bay District*, elk use habitat more when it is greater than 492 feet (150 meters) from roads open to vehicles. Elk habitat management areas in the Coos Bay and Salem Districts currently contain between 30 and 85% of their lands more than 492 feet from roads open to vehicle traffic. *See Figure 4-121 (Percentage of elk habitat management area, in the Coos Bay and Salem Districts, greater than 492 feet from roads open to vehicle use).*

Areas more than 492 feet from open roads provide elk respite from disturbance caused by road use (Wisdom et al. 2004). The effective loss of foraging habitat and hiding cover within 492 feet of open roads due to disturbance increases vulnerability of elk to both legal and illegal harvest, and increases in stress and movement rates (Rowland et al. 2004). Although BLM does have an estimate of the amount of new road construction in the next 10 years, it is not a geographic or spatial estimate and, therefore, changes in the amount of land in elk habitat management areas within 492 feet of roads cannot be estimated. As the amount of roads open to vehicle use increase the amount of land greater than 492 feet from open roads would decrease and deleterious impacts (such as those described previously) to elk would increase. See the *Road Density in Elk Habitat Management Areas* section for a discussion of the effects of the alternatives on road density within the elk habitat management areas.

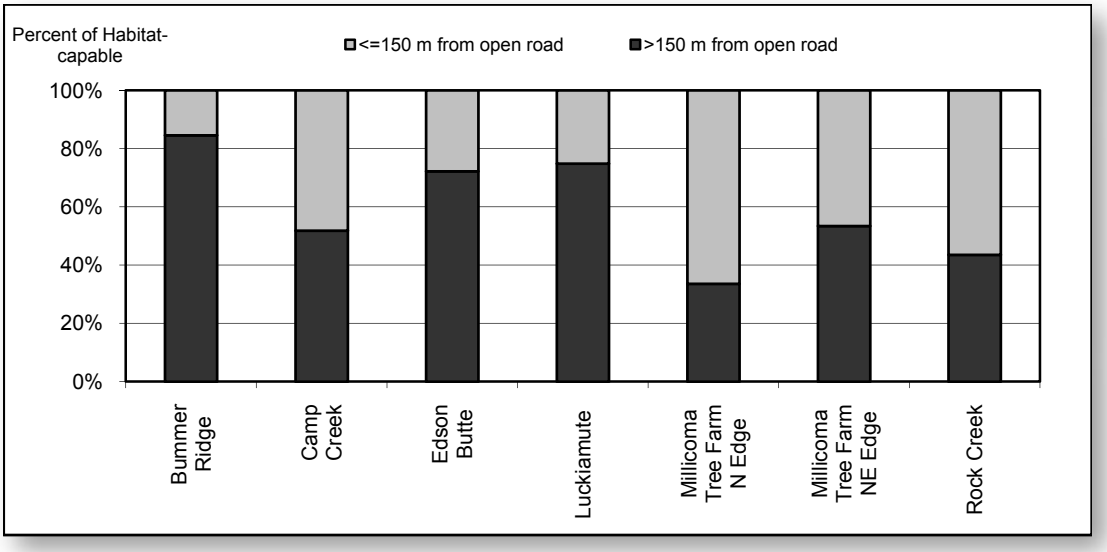


Figure 4-121. Percentage Of Elk Habitat Management Area In The Coos Bay And Salem Districts, Greater Than 492 Feet From Roads Open To Vehicle Use

Elk Habitat Management Areas on the Medford District

Under all alternatives, nine elk habitat management areas (totaling 123,700 acres) would be managed in areas of important winter foraging habitat in the Medford District. Following are several factors that affect the quality of elk foraging habitat:

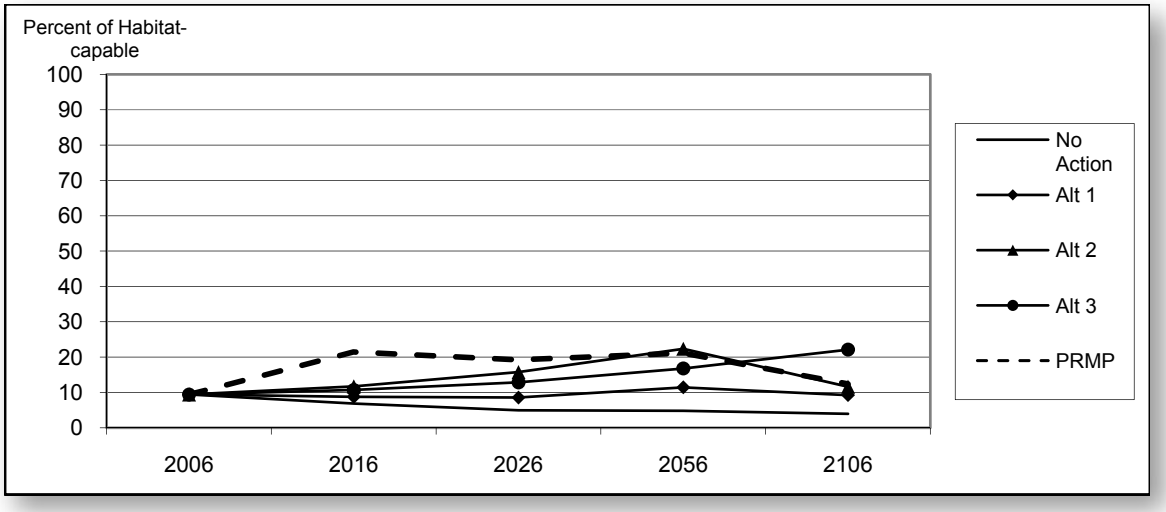
- effect that fuels treatments have on vegetation, after harvesting and site preparation
- size of the forage units. Elk use decreases with increased distance (greater than 100 yards) from hiding cover (Wisdom et al. 2004)
- disturbance caused by vehicles. Forage habitat quality decreases with increasing density of roads open to vehicle traffic (Wisdom et al. 2004)

The creation of foraging habitat would occur as a result of regeneration harvests. Forest stands would remain in the stand establishment phase and provide foraging habitat for elk for up to two to three decades following regeneration harvest. The differences among alternatives would be a result of the different amounts of regeneration harvests and partial harvests under the alternatives that would create the stand establishment forest structural stage classification. Natural grasslands and woodland areas would provide foraging habitat that would not vary among the alternatives. Intensive forest management on intermingled private forestlands would provide additional foraging habitat. It is assumed that the amount of forage habitat on privately owned commercial forest lands would remain approximately stable over time.

Foraging habitat availability on the Medford District elk habitat management areas would vary little amongst the alternatives. Foraging habitat would remain stable at approximately the current condition of 9% under Alternative 1. Foraging habitat would decline through 2106 from 9%, to 4% of the BLM-administered lands under the No Action Alternative. Foraging habitat would increase 12% by 2056 under Alternative 2 and the PRMP before decreasing to a more modest increase of 3% by 2106. Under Alternative 3, the amount of elk foraging habitat would increase to 22% of the BLM-administered lands within the elk habitat management areas by 2106. *Figure 4-122* (*Average foraging habitat on the elk habitat management units in the Medford District*) shows the trends in foraging habitat on elk management areas in the Medford District.

Intensive forest management on intermingled private forestlands would provide more foraging habitat per unit area than on BLM-administered lands due to shorter harvest rotations resulting in more land being in an early seral than a longer rotation would provide. However, since management practices on private forestlands include larger clearcut harvest units and aggressive brush control, the foraging habitat would differ in quality from foraging habitat on BLM-administered lands. There is no data to indicate whether or

Figure 4-122. Average Foraging Habitat On Elk Habitat Management Units In The Medford District



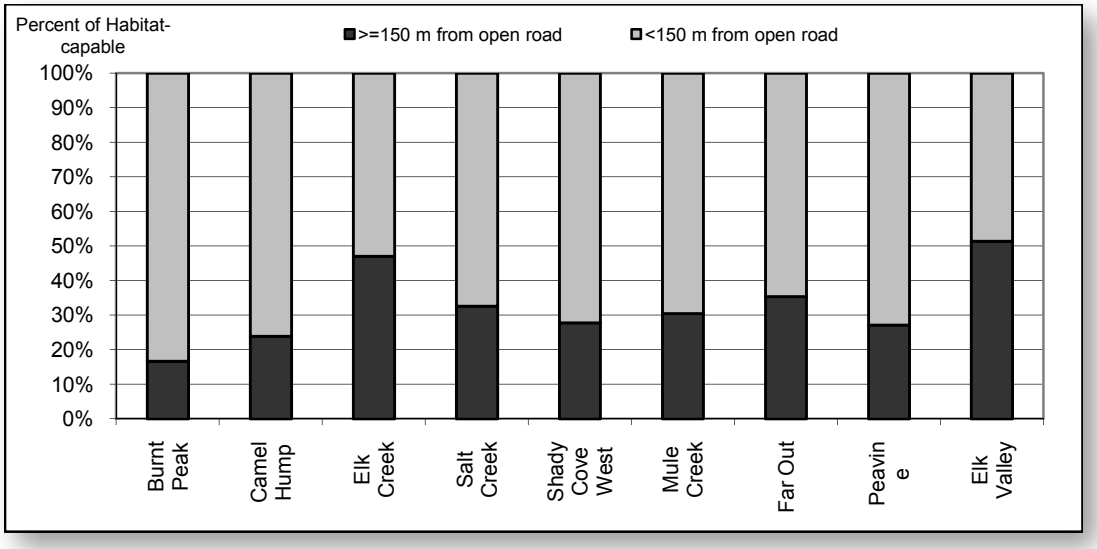
not intermingled private lands would change the overall cover to forage ratio one way or the other. More accurate analysis of the cover to forage ratio that considers the specifics of intermingled private lands would need to occur at a project scale where the analysis could better account for specific circumstances of habitat juxtaposition and better forecast habitat changes over time on private lands.

As discussed previously in *Elk Habitat Management Areas on the Coos Bay and Salem Districts*, Wisdom et al. (2004) stated that the optimum cover to forage ratio for elk was 60% cover habitat to 40% forage habitat. Under the PRMP, from 2016 to 2056, foraging habitat would account for 20% of the BLM-administered lands within the elk habitat management areas in the Medford District. None of the alternatives would provide elk foraging habitat at levels close to the 40% recommended by Wisdom et al. (2004). Winter foraging habitat would be better met on the industrial forestlands intermingled with BLM-administered lands in many of the elk habitat management areas where intensive forest management would leave a higher percentage of those lands in early-seral conditions. Management on industrial forest lands would create foraging habitat of differing quality than those on BLM-administered lands. There is no data to indicate whether or not intermingled private lands would change the overall cover to forage ratio one way or the other. More accurate analysis of the cover to forage ratio that considers the specifics of intermingled private lands would need to occur at a the project scale where the analysis could better account for specific circumstances of habitat juxtaposition and better forecast habitat changes over time on private lands.

As discussed previously under *Deer Habitat Management Areas in the Coos Bay District*, elk use habitat more when it is greater than 492 feet (150 meters) from roads open to vehicles. Elk habitat management areas in the Medford District currently contain between 15 and 50% of their lands more than 492 feet from roads open to vehicle traffic. *See Figure 4-123 (Percentage of deer habitat management area, in the Medford District greater than 492 feet from roads open to vehicle use).*

Areas more than 492 feet from open roads provide elk respite from disturbance caused by road use (Wisdom et al. 2004). The effective loss of foraging habitat and hiding cover within 492 feet of open roads due to disturbance increases vulnerability of elk to both legal and illegal harvest, and increases their stress and movement rates (Rowland et al. 2004). Although the BLM does have an estimate of amount of new road construction that would occur in the next 10 years, it is not a geographic or spatial estimate and, therefore, changes in the amount of land in elk habitat management areas within 492 feet of roads cannot be estimated. As the amount of roads open to vehicle use increases, the amount of land greater than 492 feet from open roads would decrease and deleterious impacts (such as those described previously) to elk would increase. See the *Road Density in Elk Habitat Management Areas* section for a discussion of the effects of the alternatives.

Figure 4-123. Percentage Of Elk Habitat Management Area In The Medford District Greater than 492 Feet From Roads Open To Vehicle Use



Road Density Within Elk Habitat Management Areas

The density of roads open to the public within elk habitat management areas on the Coos Bay, Salem, and Medford Districts currently varies from 0.24 to 4.35 road miles per mile and averages 2.35 road miles per mile. See *Table 4-65* (*Open road density on BLM-administered lands in elk habitat management units*)**.** Construction of new roads that would be open to public use would vary from 17 miles under the No Action Alternative, to more than 36 miles under the PRMP. The open road density in elk habitat management areas would increase 6% under the PRMP, from 2.35 to 2.49 road miles per square mile. Under Alternatives 1, 2, and 3, there would be a 6 to 7% increase in open road density. Under the No Action Alternative, open road density would increase 3% to 2.42 road miles per square mile.

The average road density would change by alternative, as follows:

Alternative	Number of Elk HMAs (of 16 HMAs) With Less Than 1% Increase in Average Road Density	Number of Elk HMAs (of 16 HMAs) With 5% Increase in Average Road Density
No Action	1	9
Alternative 1	2	10
Alternative 2	1	8
Alternative 3	4	4
PRMP	1	9

Table 4-65. Open Road Density On BLM-Administered Lands In Elk Habitat Management Units

District	Elk Habitat Management Area	Density of Open Roads (road miles per square mile)					
		Year	2016	2016	2016	2016	2016
		2006	Alt. 1	Alt. 2	Alt. 3	No Action	PRMP
Coos Bay	CAMP CREEK	3.03	3.20	3.26	3.10	3.12	3.21
	EDSON BUTTE	1.55	1.57	1.65	1.58	1.59	1.75
	MILLICOMA TREE FARM N EDGE	4.34	4.35	4.34	4.34	4.34	4.34
	MILLICOMA TREE FARM NE EDGE	2.97	3.05	2.98	3.20	3.01	3.05
	ROCK CREEK	3.83	4.24	4.18	3.97	4.06	3.98
Medford	BURNT PEAK	0.59	0.67	0.95	0.68	0.64	0.59
	CAMEL HUMP	1.47	1.55	1.58	1.53	1.48	1.60
	ELK CREEK	3.32	3.39	3.47	3.49	3.34	3.40
	ELK VALLEY	3.46	3.76	3.69	3.54	3.62	3.57
	FAR OUT	2.42	2.59	2.73	2.65	2.45	2.75
	MULE CREEK	1.77	2.06	2.11	1.92	1.95	1.87
	PEAVINE	1.93	1.99	1.97	2.10	1.96	2.01
	SALT CREEK	2.01	2.11	2.10	2.08	2.05	2.15
	SHADY COVE WEST	1.61	1.67	1.75	1.75	1.61	1.92
Salem	BUMMER RIDGE	0.24	0.36	0.45	0.34	0.28	0.38
	LUCKIAMUTE	0.91	0.97	0.94	1.13	0.93	1.54
	Average	**2.35**	**2.50**	**2.52**	**2.48**	**2.42**	**2.49**

The effects of new roads on habitat use are difficult to evaluate based only on changes in road density. Road location compared to available habitat is critical to accurate forecasting of effects. A road built in an area with already high road density would have relatively minor effects compared to a road built into previously undisturbed habitat.

Winter closures of open roads under all alternatives would remove or reduce the disturbance effects caused by vehicle use of existing and new roads and allow deer to gain maximum benefit from available forage near roads within the Medford District's elk habitat management areas and on winter hiding cover within the Coos Bay and Salem Districts' elk habitat management areas. Due to legal constraints of binding road use agreements, not all roads would be closed to public use during these time periods.

Vehicles would cause disturbance to available cover adjacent to open roads. As a result, the cover adjacent to open roads would be utilized to less than maximum benefit during the spring and summer seasons in the Coos Bay District's deer habitat management areas.

Under all alternatives, off-highway vehicles would be limited to designated roads and trails. These limitations, along with the seasonal closure of roads in elk management areas, would limit the amount of disturbance and risks of illegal hunting. Reduced disturbance would allow elk to make maximum use of foraging habitat and hiding cover, as well as lower the risk of illegal harvests.

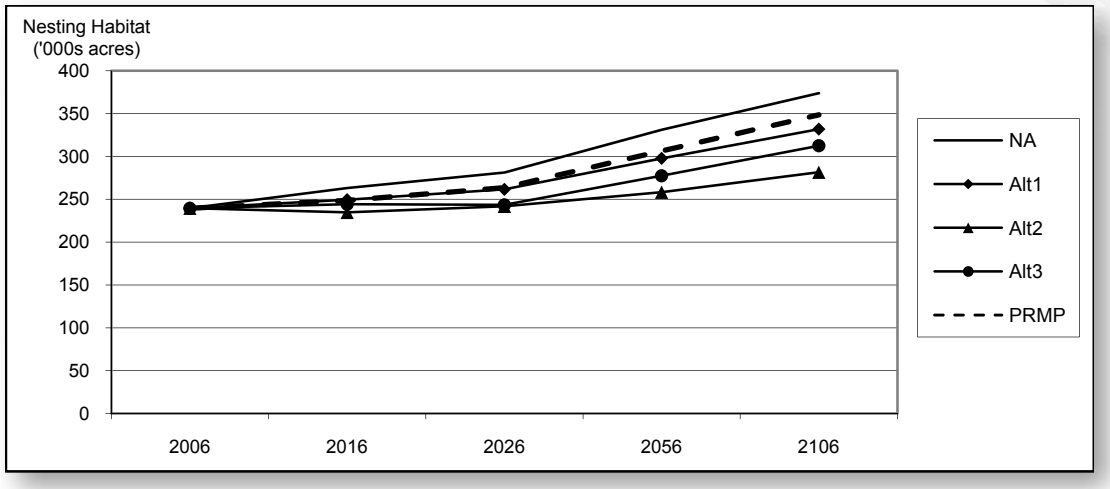
Bald Eagle

Within the planning area (except the Klamath Falls Resource Area), the amount of area where nesting and roosting habitat exists for bald eagles would increase by 2106 under all alternatives, including the PRMP. This would provide opportunities for the movement of existing bald eagle pairs and the establishment of new nest sites. Under Alternative 2, there would be a 2% decrease in nesting and roosting habitat between 2006 and 2016 (from 239,583 acres in 2006, to 234,775 acres in 2016) before increasing steadily from 2016 through 2106. The remaining alternatives, including the PRMP, would have a steady, gradual increase in the amount of nesting and roosting habitat. See *Table 4-66* (*Bald eagle nesting and roosting habitat development within the planning area*) and *Figure 4-124* (*Bald eagle nesting and roosting habitat development within the planning area*).

Table 4-66. Bald Eagle Nesting And Roosting Habitat Development Within The Planning Area

Alternative	2006	2016	2026	2056	2106
	(acres)				
No Action	240,000	263,000	281,000	331,000	374,000
Alternative 1	240,000	250,000	262,000	298,000	332,000
Alternative 2	240,000	235,000	242,000	258,000	282,000
Alternative 3	240,000	244,000	243,000	277,000	313,000
PRMP	240,000	249,000	264,000	306,000	349,000

Figure 4-124. Bald Eagle Nesting And Roosting Habitat Development Within The Planning Area



In the Klamath Falls Resource Area, the analysis and the effects to bald eagle nesting and roosting habitat would differ between the western and eastern portions of the resource area. The western portion of the Klamath Falls Resource Area contains bald eagle nesting and roosting habitat on the forested lands in the Klamath Physiographic Province (such as those described in *Forest Structure and Spatial Pattern*).

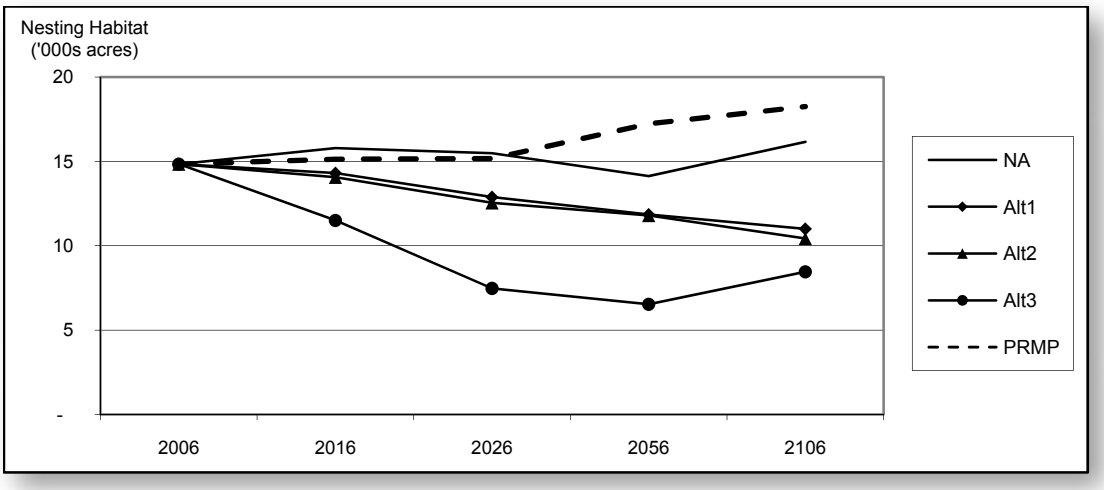
Under Alternatives 1, 2, and 3, bald eagle nesting and roosting habitat would decrease by 26 to 43% (4,000 to 7,000 acres) by 2106 in the western portion of the Klamath Falls Resource Area. See *Table 4-67 (Bald eagle nesting and roosting habitat in the west side of the Klamath Falls Resource Area)* and *Figure 4-125* (*Summary of bald eagle nesting and roosting habitat development in the west side of the Klamath Falls Resource Area*). Bald eagle nesting and roosting habitat would decline under Alternatives 1 and 2 due to lower site classes of the forest stands in the Klamath Falls Resource Area, which recover slower than high site classes after harvest and the increase in habitat loss due to increased regeneration harvests. Under Alternative 3, uneven-aged management coupled with the higher rate of stand entry would cause a higher rate of habitat loss compared to the other alternatives. Uneven-aged management under Alternative 3 would remove trees equally from all size classes, and stands would be entered more frequently, which would result in the largest reduction of bald eagle nesting and roosting habitat. Under Alternatives 1, 2, and 3, the opportunities for establishment of additional bald eagle nest sites and movement of the existing pairs of bald eagles on BLM-administered lands in the west side of the Klamath Falls Resource Area would diminish from the current condition; such opportunities would increase under the No Action Alternative and the PRMP.

Under the No Action Alternative, bald eagle nesting and roosting habitat would increase by 7% in the west side of the Klamath Falls Resource Area by 2106, and by 13% under the PRMP by 2106. See *Table 4-67 (Bald eagle nesting and roosting habitat in the west side of the Klamath Falls Resource Area)* and *Figure 4-125* (*Summary of bald eagle nesting and roosting habitat development in the west side of the Klamath Falls Resource Area*). Under the No Action Alternative and PRMP, the opportunities for the movement of existing bald eagle pairs and the establishment of new nest sites in the Klamath Falls Resource Area would be increasing, similar to those in the rest of the planning area.

Table 4-67. Bald Eagle Nesting And Roosting Habitat In The West Side Of The Klamath Falls Resource Area

Alternative	Bald Eagle Nesting and Roosting Habitat (acres)				
	2006	2016	2026	2056	2106
No Action	15,000	16,000	15,000	14,000	16,000
Alternative 1	15,000	14,000	13,000	12,000	11,000
Alternative 2	15,000	14,000	13,000	12,000	10,000
Alternative 3	15,000	12,000	7,000	7,000	8,000
PRMP	15,000	15,000	15,000	17,000	17,000

Figure 4-125. Summary Of Bald Eagle Nesting And Roosting Habitat Development In The West Side Of The Klamath Falls Resource Area

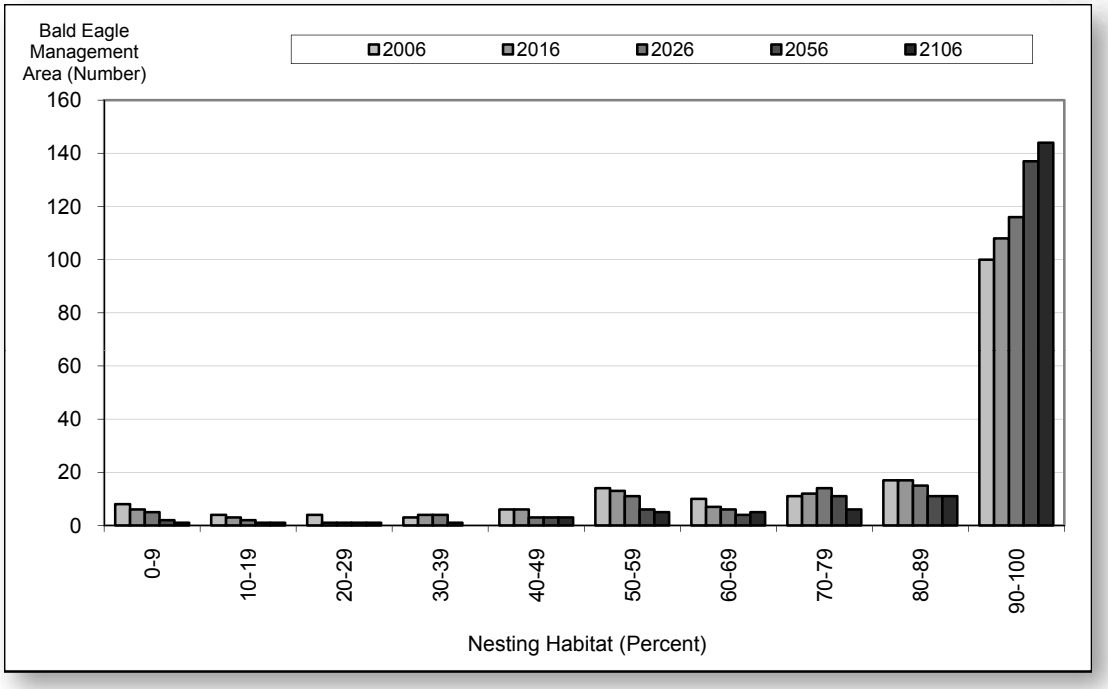


Forested lands in the eastern portion of the Klamath Falls Resource Area, within the Eastside Management Lands area, contain approximately 37,000 acres of bald eagle nesting and roosting habitat. Even though forest stands were not modeled through time for the Eastside Management Lands, no changes to the current management are anticipated. The effects to bald eagle nesting and roosting habitat are assumed to be similar to those described for the west side of the Klamath Falls Resource Area under the No Action Alternative.

Under all alternatives, occupied bald eagle nest sites, historic sites, potential sites, and wintering and congregation areas would be protected on BLM-administered lands. Management of these lands in compliance with the Bald Eagle Protection Act would provide protection for sites on both federal and private lands. The effects to the designated bald eagle management areas are common to all alternatives, including the PRMP.

Under all alternatives, the only management activity that would occur in bald eagle management areas would be treatments to reduce fire risk and thinning to promote development of larger trees. The amount of available eagle nesting and roosting habitat would increase within each bald eagle management area over time as stands continue to develop. The number of bald eagle management areas that have at least 90% nesting and roosting habitat would increase from 100 management areas in 2006, to 144 management areas by 2106. See *Figure 4-126* (*The abundance and development of bald eagle nesting and roosting habitat in bald eagle management areas*). In addition, the "taking" of bald eagles is prohibited under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Noise disturbance and physical disturbance of nesting bald eagles would be considered an unlawful taking of the species and would be prohibited under these acts. The BLM activities that would disturb nesting bald eagle pairs would be restricted during the critical nesting period (January 1 to August 31).

Figure 4-126. The Abundance And Development Of Bald Eagle Nesting And Roosting Habitat In Bald Eagle Management Areas



Fisher

Fisher historically ranged throughout BLM-administered lands within the planning area. The only remaining recognized population centers are in the southern Cascade Mountains and the northern Siskiyou Mountains of the Medford and Coos Bay Districts. There are currently 543,000 acres of natal habitat on BLM-administered lands within the planning area and 1,356,000 acres of foraging habitat (includes overlap with natal habitat). See *Table 4-68 (Available fisher natal habitat on BLM-administered lands with the planning area)* and *Table 4-69 (Available fisher foraging habitat on BLM-administered lands with the planning area)*.

Fisher forage in all habitat types that are capable of providing high canopy cover and that have some legacy component (Fed. Reg. 69[68]:18770-18792, and Powell 1981). Across BLM-administered lands, within the planning area, fisher foraging habitat would increase under all alternatives as shown in *Figure 4-127* (*Fisher foraging habitat summarized for BLM-administered lands within the planning area*). Under the No Action Alternative, there would be a 37% increase in fisher foraging habitat. There would be a similar trend under Alternatives 1, 3, and the PRMP, resulting in an increase of 23 to 27%. Under Alternative 2, foraging habitat would increase 8%. Under Alternative 2 and the PRMP, foraging habitat would decline by 3% by 2016; however, by 2056 fisher foraging habitat would increase by 15% over 2006 levels.

Figure 4-128 (*District summary of fisher forging habitat changes, compared to 2006.)* illustrates the response of fisher foraging habitat development to the alternatives in each district.

Fisher foraging habitat would increase under all alternatives and in all time intervals in the Salem, Eugene, and Coos Bay Districts. The PRMP would increase fisher foraging habitat by 74% by 2106 on BLM-administered lands in the Coos Bay District; this percentage would provide slightly less foraging habitat than the No Action Alternative at 77 % and Alternative 1 with 79%. However, the PRMP increase in fisher

Table 4-68. Available Fisher Natal Habitat On BLM-Administered Lands Within The Planning Area

BLM District	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[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 Klamath Falls Resource Area.

Table 4-69. Available Fisher Foraging Habitat On BLM-Administered Lands Within The Planning Area

BLM District	Habitat-capable (acres)	Foraging Habitat	
		(acres)	(%)[a]
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[b]	47,000	38,000	81
Totals	**2,197,000**	**1,356,000**	**62**

[a] Percentage of habitat-capable acres
[b] Western (O&C) portion of the Klamath Falls Resource Area

Figure 4-127. Fisher Foraging Habitat Summarized For BLM-Administered Lands Within The Planning Area

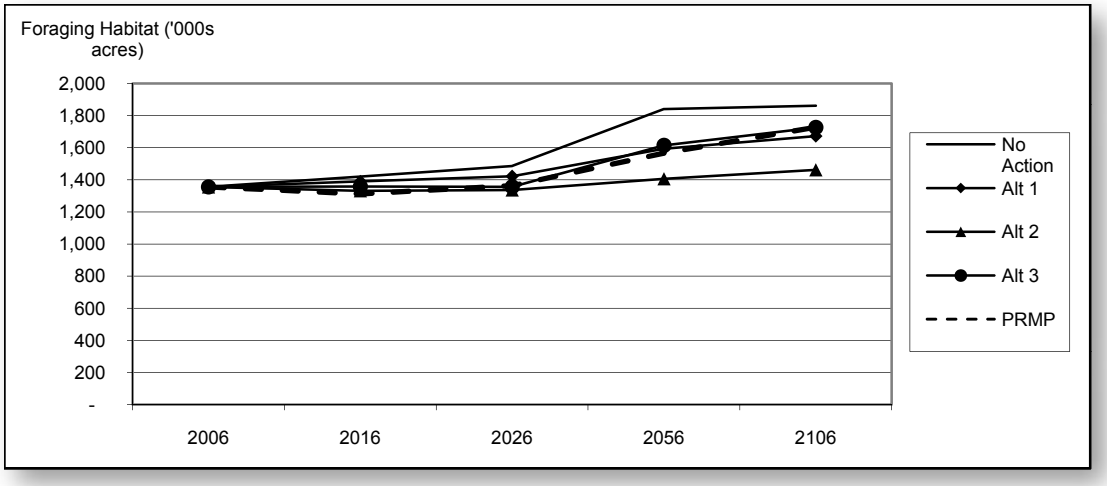
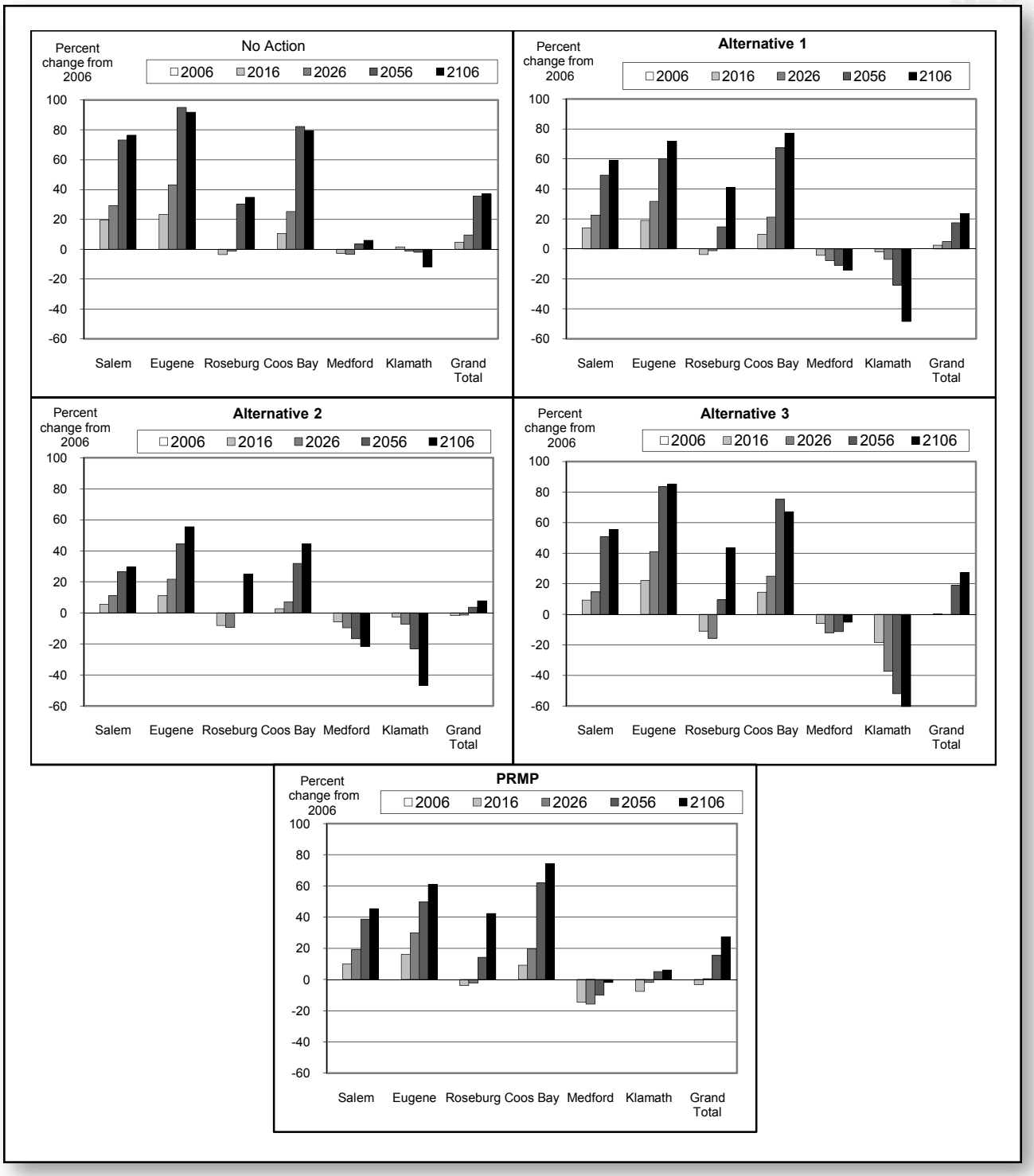


Figure 4-128. District Summary Of Fisher Foraging Habitat Changes Compared To 2006



foraging habit would be well above the 44% increase that would occur under Alternative 2. Fisher foraging habitat would increase 61% on BLM-administered lands in Eugene under the PRMP. The PRMP would have a 6% increase over the increase that would result from Alternative 2, but would be substantially less than the increases in fisher foraging habitat that would result from Alternative 1, Alternative 3, and the No Action Alternative (72, 85 and 92%, respectively). Increases in fisher foraging habitat resulting from the PRMP would follow similar trends in the Salem District. Habitat would increase 45% under the PRMP compared to a 30% increase underAlternative 2, but well short of the 56, 59, and 77% increase that would result from Alternatives 3, 1, and the No Action, respectively.

Under all alternatives, foraging habitat would decline through 2026 on the Roseburg District. This habitat on the Roseburg District would increase 41 to 44% under the PRMP and Alternatives 1 and 3 by 2106. Foraging habitat would increase 25 and 35% under Alternative 2 and the No Action Alternative, respectively.

Under all alternatives, there would be a decline in fisher foraging habitat (up to 22% under Alternative 2) in the Medford District for at least the first 20 years. The No Action Alternative, with a 6% increase, is the only alternative under which foraging habitat would increase by 2106. This increase would occur after a decline of 3% by 2026. Under the PRMP, fisher foraging habitat would decline 16% by 2026; under Alternative 2 this habitat would decline 10% by 2026. Under the PRMP, fisher foraging habitat would decline 2% by 2106 in the Medford District.

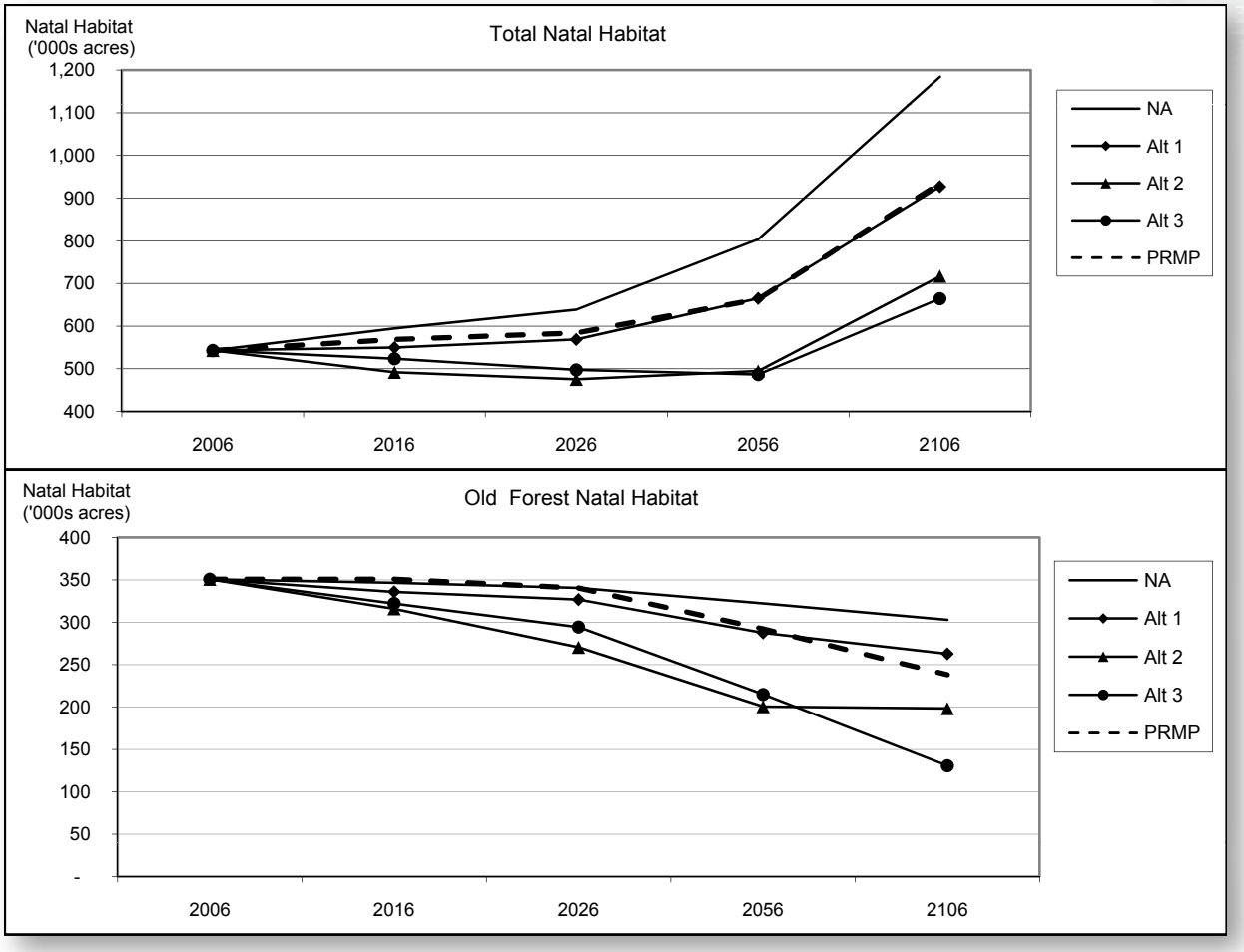
There would be a decline of up to 60% in fisher foraging habitat in the Klamath Falls Resource Area under the No Action Alternative and Alternatives 1, 2, and 3. Under the PRMP, there would be an increase of 10% by 2106 in foraging habitat in the Klamath Falls Resource Area. See *Figure 4-128 (District summary of fisher forging habitat changes, compared to 2006)*.

Total natal habitat would increase from current conditions under all alternatives by 2106, from 22% under Alternative 2, to 118% under the No Action Alternative. Total natal habitat would increase by 72%, from 543,000 to 934,000 acres under the PRMP by 2106, which would be equal to the increase under Alternative 1. See *Figure 4-129* (*Abundance of total and old fisher natal habitat within the planning area*) and *Figure 4-130* (*Total fisher natal habitat abundance on BLM districts*). Fisher natal habitat, on BLM-administered lands, would decline 12% under Alternative 2 through 2026, and 10% under Alternative 3 through 2056. Under Alternative 3, natal habitat would increase the least (22%) by 2106 due to the areas of partial and regeneration harvesting under this alternative. The areas of regeneration or partial harvesting would only provide natal habitat for a short period under Alternative 3 before the areas would be harvested again. Some stands would not re-develop into natal habitat because of the multiple-entry treatment under Alternative 3.

Natal habitat would decline during the first 20 to 50 years of plan implementation in all districts and the Klamath Falls Resource Area under all alternatives except for the Salem District. Fisher natal habitat would increase in all time periods and under all alternatives in the Salem District.

The No Action Alternative is the only alternative where the amount of fisher natal habitat would increase above current levels, 17%, in the Roseburg District. Natal habitat would decline through 2056 under Alternatives 1 and 2 and the PRMP before recovery would begin. Under the PRMP and Alternative 1, natal habitat would recover to between 99 and 97%, respectively, of current levels by 2106 in the Roseburg District. Fisher natal habitat would rebound to 76% of current levels by 2106, from a low of 67%. Natal habitat would continually decline through 2106 under Alternative 3, to 51% of current amounts in the Roseburg District.

Figure 4-129 Abundance Of Total And Old Fisher Natal Habitat Within The Planning Area



Natal habitat older than 200 years (defined as structurally complex old forest and very old forest) would decrease under all alternatives, on all districts within the planning area by 2106. Under the PRMP, old forest, natal habitat would be reduced to 68% (238,000 acres) of the existing level (351,000 acres) on BLM-administered lands.

The most marked loss of old natal habitat would occur in the Klamath Falls Resource Area where old forest natal habitat would decline more than 50% from current levels under all alternatives and the PRMP. Under the PRMP and Alternative 3, the most old forest natal habitat in the Klamath Fall Resource Area would be maintained under the PRMP and Alternative 3 (41 and 47%, respectively). See *Figure 4-131* (*Old forest natal habitat abundance on BLM Districts*).

The PRMP would retain an intermediate amount of old forest natal habitat when compared to the combinations of No Action/Alternative 1 (the high end) and Alternative 2/Alternative 3 (the low end) in various districts, and BLM (as a whole). Under the PRMP, between 60 and 75% of the existing old forest, natal habitat would be maintained in all districts except the Klamath Falls Resource Area as discussed above.

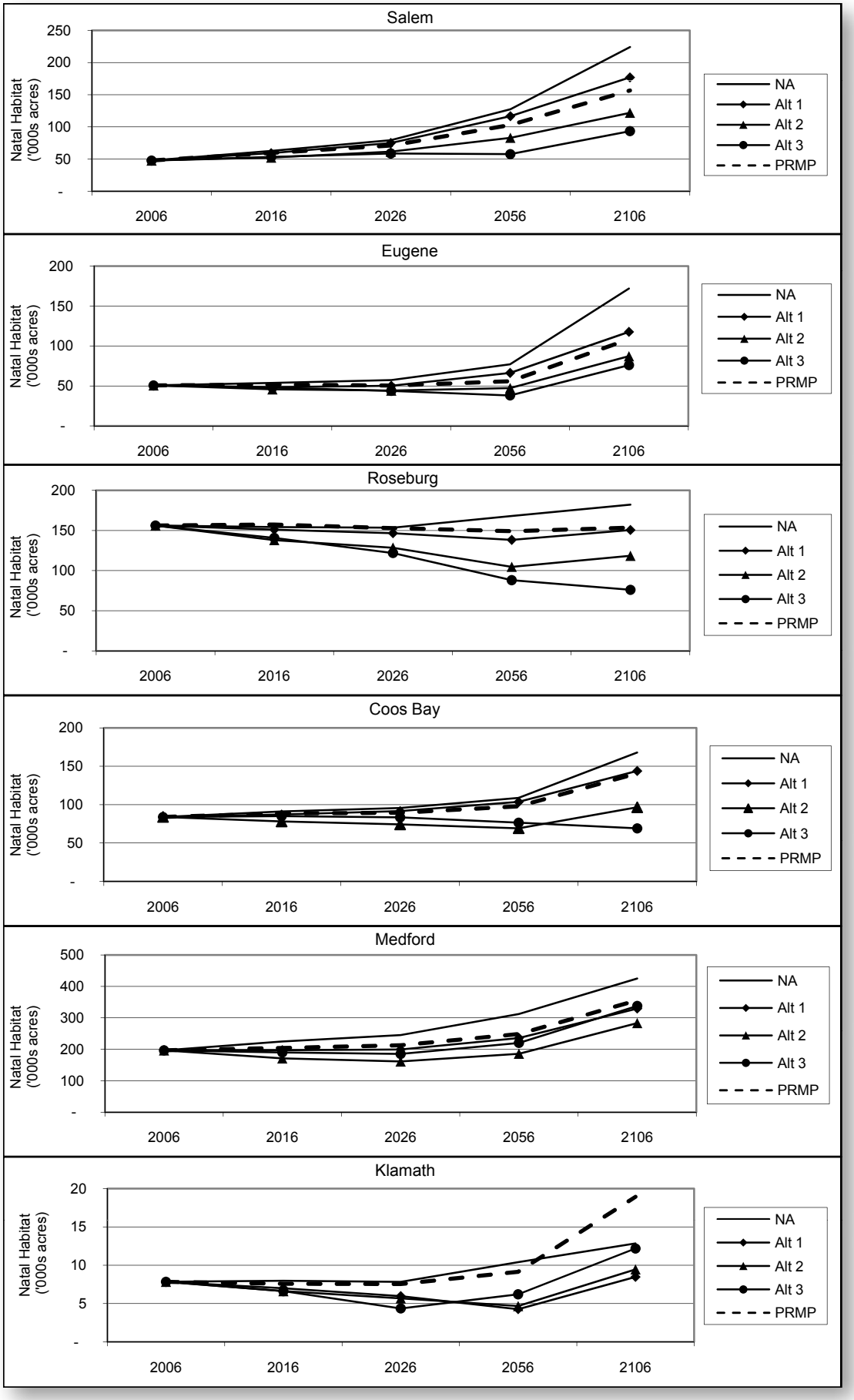


Figure 4-130. Total Fisher Natal Habitat Abundance On BLM Districts

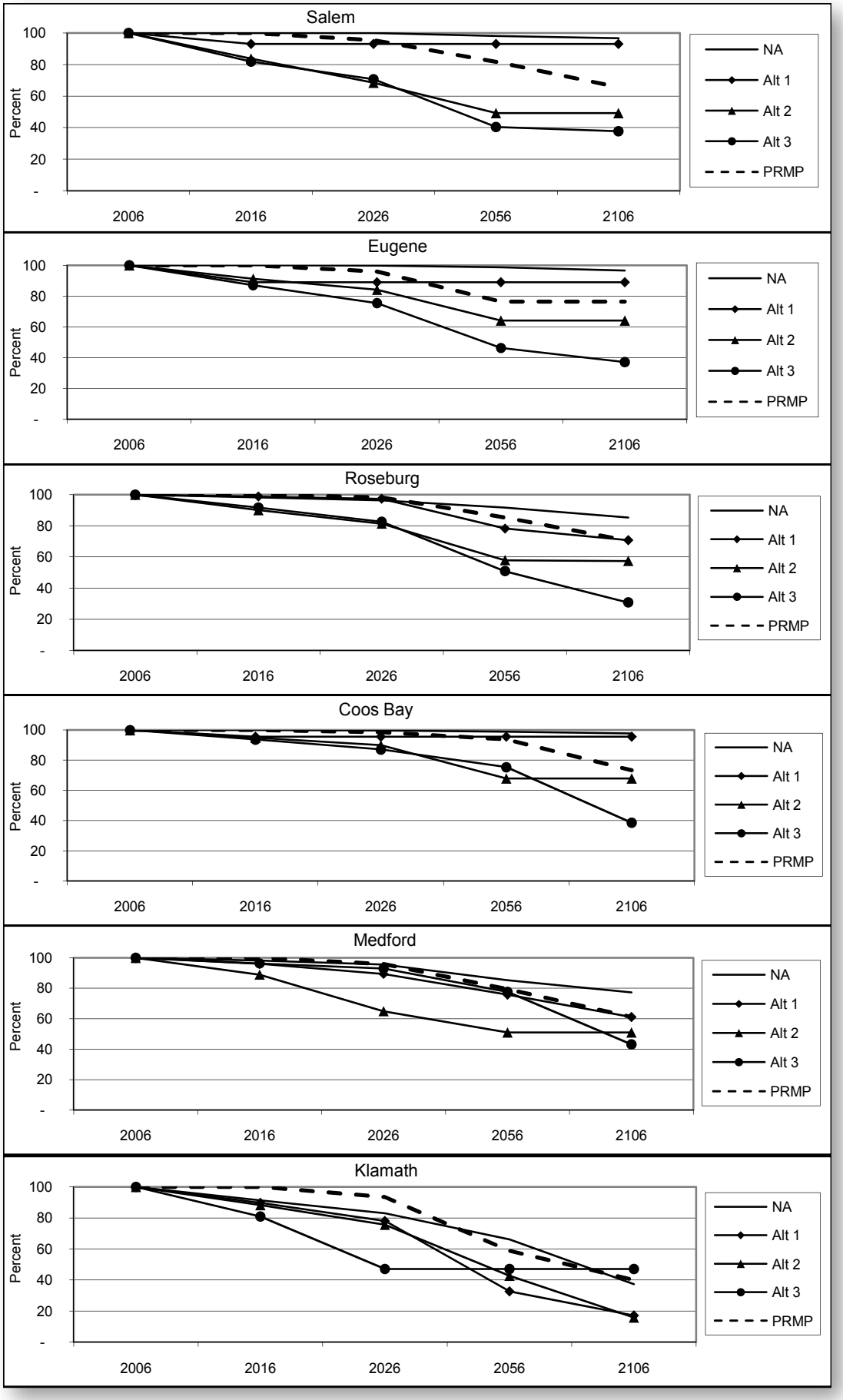


Figure 4-131.
Old Forest Natal Habitat abundance On BLM Districts

The spatial configuration of natal habitat is as important as the amount of acres. Lewis and Hayes (2004) concluded that landscapes comprised of large contiguous patches of late-seral forests were more likely to support the fisher than more fragmented landscapes. Large blocks of mature or structurally complex forest habitat would be expected to form within the Late-Successional Reserves under the No Action Alternative and within the Late-Successional Management Areas under Alternatives 1 and 2, and the PRMP.

The patterns found in mature and structurally complex forest habitat are used as indicators of natal habitat development. Landscape comparisons were done between the current condition and the condition in 2106 (see the *Forest Structure and Spatial Patterns* section of this chapter). The analysis concludes that the principal controls on the condition of the entire forested landscape are the development of the U.S. Forest Service reserves into mature and structurally complex forest and the continued intensive management of the nonfederal forests. The BLM-administered lands, however, play a significant role at the provincial scale by linking physiographic provinces and the U.S. Forest Service lands within them.

Genetic research on the fisher population centers in the southern Cascade Mountains and the northern Siskiyou Mountains indicate no genetic exchange has occurred (Aubry et al. 2004). The specific reasons for this lack of genetic exchange are unknown, but could include poor habitat quality and anthropogenic barriers (Aubry et al. 2004).

Assuming that fisher would respond positively to increases in the amount, mean patch size, and connectance of natal habitat, fisher habitat condition would improve under the No Action Alternative, Alternative 1, and the PRMP in the Coast Range Province. Fisher habitat condition would improve in the West Cascades Province under the No Action Alternative. Fisher habitat conditions would improve in the Klamath Province under the PRMP and No Action Alternatives, and in the Eastern Cascades Province under the PRMP. Decreases in patch size, mean core area size, and connectance would lead to decreasing habitat conditions for fishers under Alternatives 2 and 3. Habitat connectivity between the provinces is a limiting factor for fisher movements between the Klamath Province and the West Cascades Province. Connectance on BLM-administered lands would remain relatively stable in the Klamath and Western Cascade Provinces, and the mean patch size of mature and structurally complex forest habitat would increase under the No Action Alternative and the PRMP. See *Table 4-70* (*Quantitative assessment of patch size and connectance on fisher habitat condition in 2106*) for more information.

Table 4-70. Quantitative Assessment Of Patch Size And Connectance On Fisher Habitat Condition In 2106

Alternative	Mean Patch Size (Change From Current Condition)(acres)				Connectance (Percent Change From Current Condition)			
	CR[A]	WC	KL	EC	CR	WC	KL	EC
Current Condition	111.5	103.3	123.92	174.49	0.0883[B]	0.0984[B]	0.1009[B]	1.4433[B]
No Action	229.4[C]	43.2	55.1	-31.9	36.36	4.00	8.70	-7.38
Alternative 1	144.3	-12.5	-45.6	-123.2	35.29	-8.33	-8.33	-34.25
Alternative 2	-9.3	-45.7	-58.3	-142.6	13.33	-15.20	-9.33	-43.40
Alternative 3	-73.4	-58.4	-110.3	-159	-18.18	-21.10	-32.75	-45.41
PRMP	26.3	-6.5	5.0	6.1	30.35	2.03	4.26	16.38

[A]CR = Coast Range Province, WC = West Cascades Province, KL = Klamath Province, EC = Eastern Cascades Province

[B]Connectance expressed as number of connections.

[C]Shading indicates positive changes in landscape metric.

Land Birds

The Partners-in-Flight habitat objectives are useful for comparing the effects of the alternatives and their relative effectiveness of maintaining healthy bird populations. The analysis for land birds is expressed in terms of the proportion of each structural stage (for westside land bird habitat), or age class (for Eastside Management Lands habitat) available, referred to as "percent habitat-capable," within each habitat association (see *Chapter 3, Land Birds* section for discussion of habitat associations). The maximum value that percent habitat-capable can attain is 100%, but this does not generally occur because multiple structural stages occur at any given time within a given habitat association.

Westside Forested Land Bird Habitat

Western Conifer

Structurally Complex

Varying amounts of structurally complex forests, which approximates Partners-in-Flight's "old growth," would be harvested under all alternatives, including the PRMP. The No Action Alternative, Alternative 1, and the PRMP would provide a continuous increase in the amount of structurally complex, western conifer habitat through 2106. Under Alternatives 2 and 3, structurally complex forests that currently comprise 26% or 447,576 acres of western conifer forest would decline 23 to 24% (397,611 to 405,110 acres), respectively, by 2056 before further stand development of structurally complex forest would occur such that it would comprise 26 to 30% (436,090 to 506,560 acres), respectively, of the western conifer habitat association by 2106. Under the PRMP, structurally complex forest would increase to 40% (709,020 acres) of the western conifer forest by 2106. See *Figure 4-132 (Western conifer forest land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-71 (Western conifer land bird habitat on BLM-administered land within the planning area under the alternatives)*.

Under all alternatives, including the PRMP, there would be more than 15% of the western conifer habitat association in a structurally complex stage during all time periods. Therefore, the Oregon/Washington Partners-in-Flight recommended habitat objective to maintain existing old-growth forests and manage the landscape for 15% old-growth forest condition (Altman 1999) would be met.

Mature with Multi-layered Canopy and Structurally Complex

Mature with multi-layered canopy and structurally complex forests currently comprise 47% or 793,982 acres of the western conifer habitat association. Mature with multi-layered canopy and structurally complex forest would not decline during any decadal period under the No Action Alternative and would increase to 77% (1,312,717 acres) of the western conifer association by 2106. Under Alternatives 1, 2, and 3, mature with multi-layered canopy and structurally complex forest would decline to between 35 and 43% (591,039 to 735,043 acres) by 2056. Additional habitat would develop under Alternatives 1, 2, and 3 by 2106, so that 43 to 59% (739,116 to 1,009,874 acres) of western conifer habitat would be mature with multi-layered canopy and structurally complex forest. Under the PRMP, there would be a decrease in mature with multi-layered canopy and structurally complex forest to 43% (754,368 acres) of the western conifer association by 2026 before stand development would raise that proportion to 62% (1,093,218 acres) by 2106. See *Figure 4-132 (Western conifer forest land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-71 (Western conifer land bird habitat on BLM-administered land within the planning area under the alternatives)*.

Figure 4-132. Western Conifer Forest Land Bird Habitat Trends On BLM-Administered Land Within The Planning Area

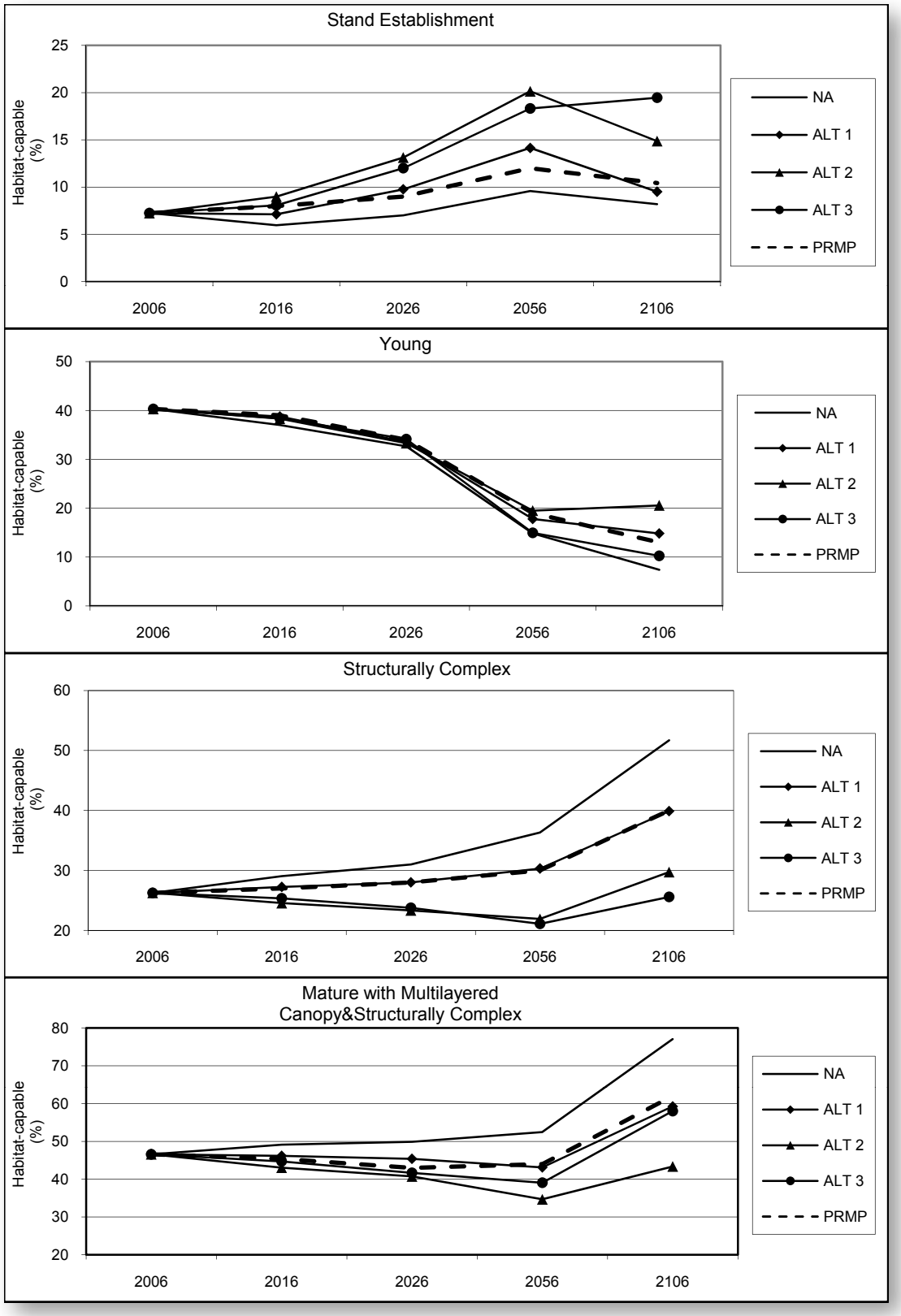


Table 4-71. Western Conifer Land Bird Habitat On BLM-administered Land Within The Planning Area Under The Alternatives

Structural Stage	Alternative	2006 (acres)	2006 (%)[a]	2016 (acres)	2016 (%)	2026 (acres)	2026 (%)	2056 (acres)	2056 (%)	2106 (acres)	2106 (%)
Stand Establishment	No Action	123,605	7	101,605	6	119,388	7	163,416	10	139,710	8
	Alternative 1	123,605	7	121,455	7	166,497	10	241,057	14	162,098	10
	Alternative 2	123,605	7	153,288	9	223,801	13	343,281	20	253,412	15
	Alternative 3	123,605	7	137,641	8	204,652	12	312,269	18	331,646	19
	PRMP	123,605	7	134,816	8	162,148	9	208,597	12	172,301	10
Young	No Action	686,733	40	631,007	37	556,645	33	252,940	15	126,128	7
	Alternative 1	686,733	40	660,357	39	571,653	34	303,426	18	252,769	15
	Alternative 2	686,733	40	653,073	38	567,675	33	332,557	20	350,756	21
	Alternative 3	686,733	40	654,175	38	581,791	34	255,100	15	174,824	10
	PRMP	686,733	40	682,225	39	605,929	34	343,466	19	233,550	13
Mature With Multi-layered Canopy & Structurally Complex	No Action	793,982	47	837,168	49	850,013	50	893,956	52	1,312,717	77
	Alternative 1	793,982	47	786,986	46	773,613	45	735,043	43	1,009,874	59
	Alternative 2	793,982	47	733,840	43	694,292	41	591,039	35	739,116	43
	Alternative 3	793,982	47	762,940	45	710,448	42	665,904	39	988,809	58
	PRMP	793,982	47	785,708	45	754,368	43	781,218	44	1,093,218	62
Structurally Complex	No Action	447,576	26	495,357	29	528,261	31	619,342	36	881,063	52
	Alternative 1	447,576	26	464,439	27	477,304	28	516,752	30	679,786	40
	Alternative 2	447,576	26	418,340	25	397,611	23	373,415	22	506,560	30
	Alternative 3	447,576	26	432,041	25	405,110	24	359,684	21	436,090	26
	PRMP	447,576	26	477,043	27	485,247	28	523,347	30	709,020	40

[a]For all years, percent is habitat-capable acres

Under all alternatives including the PRMP, there would be more than 15% of the western conifer habitat association in a mature with multi-layered canopy and structurally complex forest stage. Therefore, the Oregon/Washington Partners-in-Flight habitat objective to maintain 15% or more of the landscape in a mature forest condition (Altman 1999) would be met.

Young Forest

Under all alternatives including the PRMP, the amount of young forest would steadily decline from the current level of 40% (686,733 acres) of the western conifer habitat association to between 7 and 21% (126,128 to 350,756 acres) by 2106. This decline would be related to the relative size of the non-harvest land base in No Action Alternative, Alternative 1, Alternative 2, and the PRMP. See *Figure 4-132 (Western conifer forest land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-71 (Western conifer land bird habitat on BLM-administered land within the planning area under the alternatives)*.

The Oregon/Washington Partners-in-Flight habitat objective of maintaining 20 to 40% of the western conifer habitat association in a young forest structural stage (Altman 1999) would not be achieved under any alternative on BLM-administered lands. However, intensive forest management on intermingled industrial, private lands would provide forest habitat in both the young and stand establishment structural stages. It is assumed that the amount of young and stand establishment habitat on privately owned commercial forestlands would remain approximately the same over time. Therefore, it is assumed that when both BLM-administered lands and private industrial forest lands are considered that the Partners-in-Flight habitat objective of maintaining 20 to 40% of the western conifer habitat association in a young forest structural stage would be met.

Stand Establishment

The proportion of stand establishment forest within western conifer habitat association would increase from the current level of 7% (123,605 acres), to between 8 and 19% (139,710 to 331,646 acres) by 2106 under all alternatives. Under the PRMP, stand establishment forest would increase from the current level to 10% (172,301 acres) by 2106. See *Figure 4-132 (Western conifer forest land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-71 (Western conifer land bird habitat on BLM-administered land within the planning area under the alternatives)*.

None of the alternatives, including the PRMP, would achieve the Oregon/Washington Partners-in-Flight habitat objective to maintain 20 to 40% of the landscape in a stand establishment condition for western conifer habitat. However, intensive forest management on intermingled industrial, private lands would provide forest habitat in both the young and stand establishment structural stages. It is assumed that the amount of young and stand establishment habitat on privately owned commercial forest lands would remain approximately the same over time. Therefore, it is assumed that when both BLM-administered lands and private, industrial forest lands are considered that the Partners-in-Flight habitat objective of maintaining 20 to 40% of the western conifer habitat association in a stand establishment structural stage would be met.

Western Hardwood

The amount of western hardwood habitat in a stand establishment structural stage would increase from the current level of 5% (17,651 acres), to between 7 and 17% (27,557 to 67,228 acres) by 2106. An increase in the amount of habitat in the stand establishment stage would indicate that either existing young, mature, and/or structurally complex western hardwood habitat was reduced in abundance. The increase in stand establishment would be derived mainly from the conversion of young forest to stand establishment; although the amount of young forest would also decrease as it develops into mature with multi-layered canopy and structurally complex structural stage. See below for a more detailed discussion of the trends in individual structural stages within the western hardwood habitat association.

Therefore, the habitat objective recommended by the Oregon/Washington Partners-in-Flight to maintain existing western hardwood habitat (Altman 2000b) would not be achieved under any of the alternatives, including the PRMP. However, mature with multi-layered canopy and structurally complex forest would comprise a greater proportion of the western hardwood habitat association under all alternatives in 2106 (51% to 77%, or 198,536 to 298,407 acres) than in 2006 (49% or 188,575 acres).

Structurally Complex

The amount of structurally complex forest within the western hardwood association would increase from the current level of 22% (83,612 acres) in 2006 to between 45 and 66% (173,534 to 255,372 acres) by 2106 under the alternatives, including the PRMP. However, under Alternatives 1, 2, and 3, there would be an initial decline in the abundance of structurally complex forest within the western hardwood association to 16 to 21% (63,831 to 81,115 acres) during the first decade (i.e., by 2016). Under the PRMP, structurally complex habitat would increase from the current level to 53% (206,539 acres) in 2106. See *Figure 4-133 (Western hardwood forest land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-72 (Western hardwood land bird habitat on BLM-administered land within the planning area under the alternatives)*.

Mature with Multi-layered Canopy and Structurally Complex

Under the No Action Alternative, Alternative 1, and the PRMP, there would be a steady increase in the amount of mature with multi-layered canopy and structurally complex forest habitat from the current level of 49% or 188,575 acres of the western hardwood association, to between 63 and 77% (244,249 to 298,407 acres) by 2106. Under Alternatives 2 and 3, the amount of multi-layered canopy and structurally complex forest habitat would drop from the current level to 45% (175,092 to 175,515 acres) by 2026 and 2056, respectively before increasing to between 51 and 64% (198,536 to 247,550 acres) by 2106. See *Figure 4-133 (Western hardwood forest land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-72 (Western hardwood land bird habitat on BLM-administered land within the planning area under the alternatives)*.

Figure 4-133. Western Hardwood Forest Land bird Habitat Trends On BLM-Administered Land Within The Planning Area

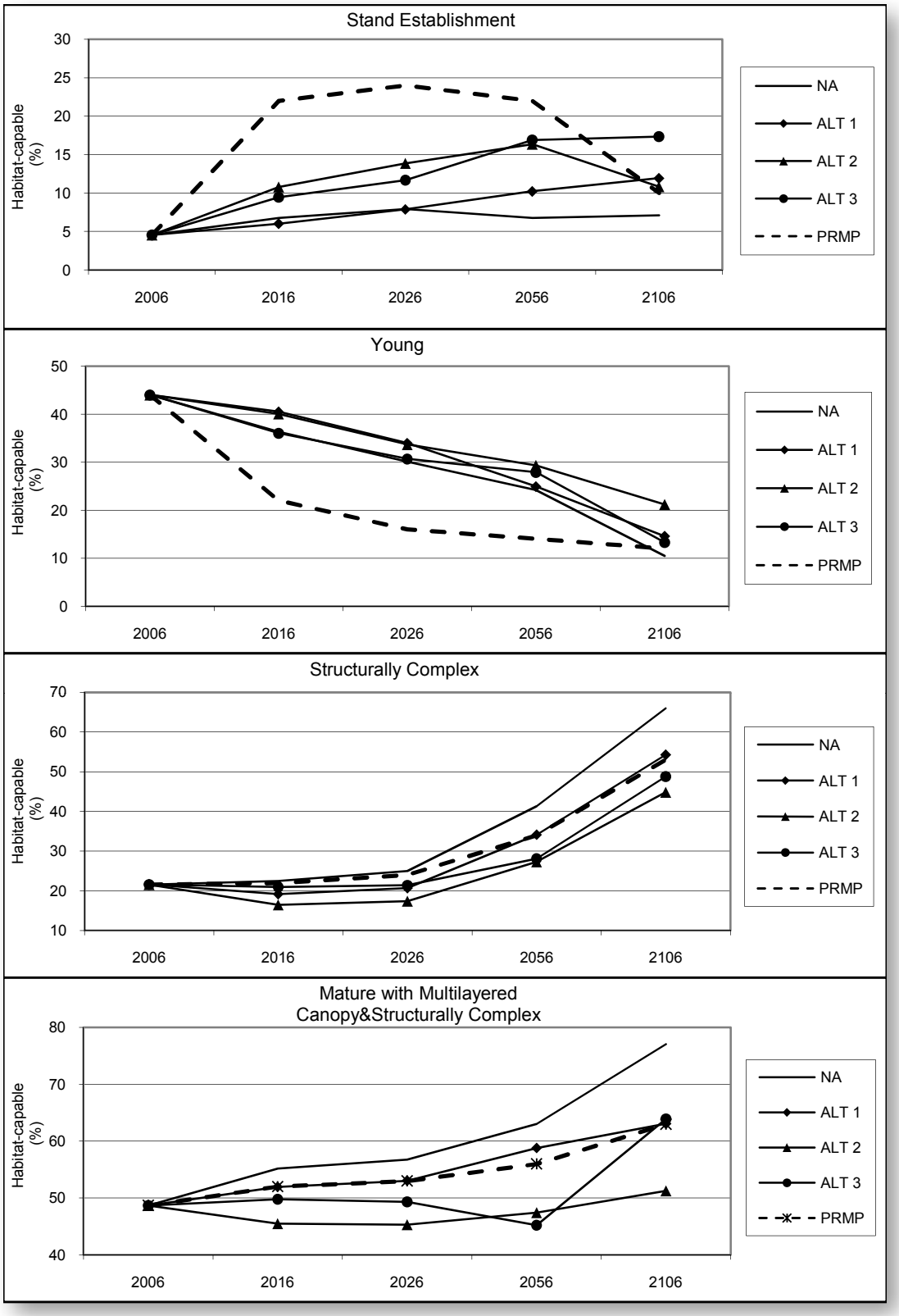


Table 4-72. Western Hardwood Land Bird Habitat On BLM-administered Land Within The Planning Area Under The Alternatives

Structural Stage	Alternative	2006 (acres)	2006 (%)[a]	2016 (acres)	2016 (%)	2026 (acres)	2026 (%)	2056 (acres)	2056 (%)	2106 (acres)	2106 (%)
Stand Establishment	No Action	17,651	5	26,237	7	30,662	8	26,144	7	27,557	7
	Alternative 1	17,651	5	23,313	6	30,535	8	39,588	10	46,240	12
	Alternative 2	17,651	5	41,802	11	53,657	14	63,345	16	41,918	11
	Alternative 3	17,651	5	36,653	9	45,316	12	65,467	17	67,228	17
	PRMP	17,651	5	85,568	22	92,318	24	84,862	22	40,054	10
Young	No Action	170,471	44	140,707	36	116,486	30	93,677	24	40,556	10
	Alternative 1	170,471	44	156,988	41	131,595	34	96,592	25	56,525	15
	Alternative 2	170,471	44	155,082	40	130,372	34	113,585	29	82,016	21
	Alternative 3	170,471	44	139,545	36	118,798	31	108,004	28	51,393	13
	PRMP	170,471	44	85,204	22	60,987	16	54,427	14	47,465	12
Mature With Multi-layered Canopy & Structurally Complex	No Action	188,575	49	213,678	55	219,906	57	244,030	63	298,407	77
	Alternative 1	188,575	49	201,190	52	205,392	53	227,667	59	244,249	63
	Alternative 2	188,575	49	176,235	46	175,515	45	183,786	47	198,536	51
	Alternative 3	188,575	49	192,866	50	191,024	49	175,092	45	247,550	64
	PRMP	188,575	49	200,545	52	204,135	53	215,772	56	245,724	63
Structurally Complex	No Action	83,612	22	87,153	23	96,826	25	160,008	41	255,372	66
	Alternative 1	83,612	22	74,156	19	80,006	21	132,128	34	210,096	54
	Alternative 2	83,612	22	63,831	16	67,458	17	105,678	27	173,534	45
	Alternative 3	83,612	22	81,115	21	82,841	21	108,823	28	188,823	49
	PRMP	83,612	22	84,158	22	91,326	24	130,798	34	206,539	53

[a]For all years, percent is habitat-capable acres

Young Forest

Under all alternatives, young forest habitat would decrease from the current level of 44% (170,471 acres) of the western hardwood association to between 10 and 21% (40,556 to 82,016 acres) by 2106 since young forest would develop into mature and structurally complex stands. Under the PRMP, young forest would comprise 12% (47,465 acres) of the western hardwood association in 2106. See *Figure 4-133 (Western hardwood forest land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-72 (Western hardwood land bird habitat on BLM-administered land within the planning area under the alternatives).*

Stand Establishment

Stand establishment would increase from the current level of 5% (17,651 acres) of the western hardwood association to between 7 and 17% (27,557 to 67,228 acres) under all alternatives. Under the PRMP, the proportion of western hardwood in a stand establishment condition would increase from the current level to 24% (92,318 acres) in 2026. Further stand development would lower the amount of stand establishment habitat from 24% in 2026, to 10% (40,054 acres) by 2106 under the PRMP. See *Figure 4-133 (Western hardwood forest land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-72 (Western hardwood land bird habitat on BLM-administered land within the planning area under the alternatives).*

Eastern Conifer

Structurally Complex

Under all alternatives, the amount of structurally complex habitat within the eastern conifer association would decrease, at least slightly for the first two decades; from the current level of 20% (7,344 acres) to between 11 and 20% (or 3,886 to 7,148 acres) by 2026. Structurally complex habitat within the eastern conifer association would continue to decrease through 2106 under Alternative 1 and Alternative 2, to 13% (4,618 acres) and 16% (5,702 acres), respectively. Under the No Action Alternative, Alternative 3, and the PRMP, by 2106 between 22 and 40% (8,058 to 14,411 acres) of the eastern conifer forest would be in a structurally complex condition. See *Figure 4-134 (Eastern conifer forest land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-73 (Eastern conifer land bird habitat on BLM-administered land within the planning area under the alternatives).*

Based on structurally complex habitat alone, none of the alternatives would meet the habitat objective recommended by the Oregon/Washington Partners-in-Flight (Altman 2000a) to provide at least 25% of existing mixed conifer forest in a mature or older condition by 2025. However, under the PRMP, 40% of eastern mixed conifer forest would be in a structurally complex stage by 2106, which would meet the Partners-in-Flight recommended habitat objective by that time.

Mature with Multi-layered Canopy and Structurally Complex

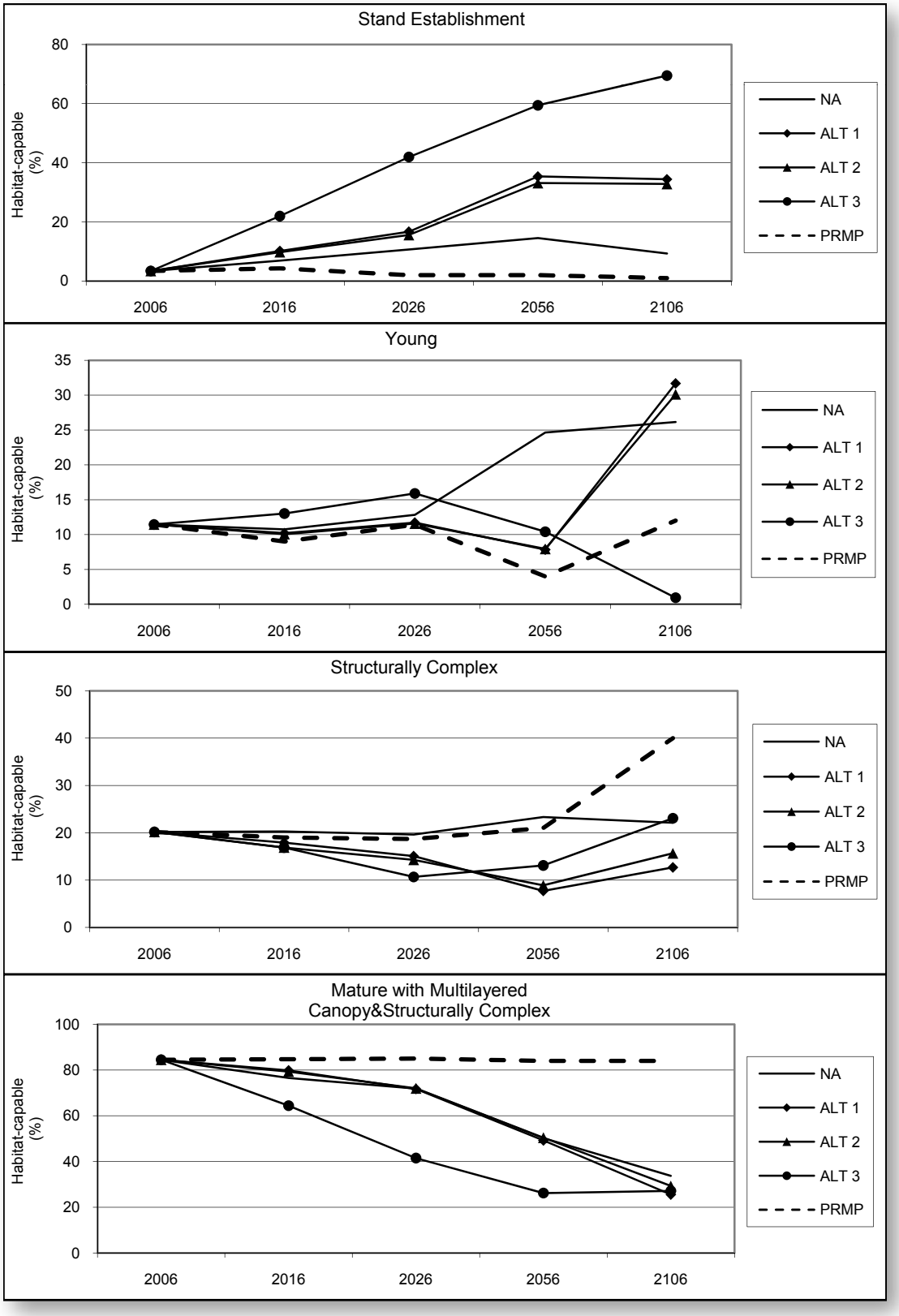
The mature with multi-layered canopy and structurally complex habitat (which currently comprises 84% or 30,762 acres of the habitat in the eastern conifer association) would decrease under the No Action Alternative and Alternatives 1, 2, and 3 between 26 and 34% (9,299 to 12,287 acres). Under the PRMP, the

Table 4-73. Eastside Conifer Forest Land Bird Habitat On BLM-Administered Land Within The Planning Area Under The Alternatives

Structural Stage	Alternative	2006 (acres)	2006 (%)[a]	2016 (acres)	2016 (%)	2026 (acres)	2026 (%)	2056 (acres)	2056 (%)	2106 (acres)	2106 (%)
Stand Establishment	No Action	1,235	3	2,513	7	3,892	11	5,295	15	3,399	9
	Alternative 1	1,235	3	3,700	10	6,074	17	12,876	35	12,530	34
	Alternative 2	1,235	3	3,558	10	5,667	16	12,062	33	11,957	33
	Alternative 3	1,235	3	7,990	22	15,271	42	21,634	59	25,298	69
	PRMP	1,235	3	1,322	4	833	2	897	2	518	1
Young	No Action	4,169	11	3,909	11	4,671	13	8,967	25	9,516	26
	Alternative 1	4,169	11	3,714	10	4,269	12	2,855	8	11,533	32
	Alternative 2	4,169	11	3,663	10	4,218	12	2,893	8	10,966	30
	Alternative 3	4,169	11	4,741	13	5,788	16	3,787	10	342	1
	PRMP	4,169	11	3,336	9	3,941	11	1,455	4	4,498	12
Mature with multi-layered canopy & structurally complex	No Action	30,762	84	27,868	77	26,176	72	18,306	50	12,287	34
	Alternative 1	30,762	84	29,059	80	26,115	72	17,916	49	9,299	26
	Alternative 2	30,762	84	28,885	79	26,206	72	18,356	50	10,665	29
	Alternative 3	30,762	84	23,444	64	15,105	41	9,540	26	9,893	27
	PRMP	30,762	84	31,119	85	30,912	85	30,699	84	30,730	84
Structurally Complex	No Action	7,344	20	7,389	20	7,148	20	8,495	23	8,058	22
	Alternative 1	7,344	20	6,521	18	5,488	15	2,807	8	4,618	13
	Alternative 2	7,344	20	6,147	17	5,198	14	3,237	9	5,702	16
	Alternative 3	7,344	20	6,144	17	3,886	11	4,769	13	8,393	23
	PRMP	7,344	20	7,084	19	7,067	19	7,614	21	14,411	40

[a] For all years, percent is habitat-capable acres.

Figure 4-134. Eastern Conifer Forest Land bird Habitat Trends On BLM-Administered Land Within The Planning Area



proportion of eastern conifer forest in a mature with multi-layered canopy and structurally complex stage would be relatively stable at 84 to 85% (30,699 to 31,119 acres) through 2106. See *Figure 4-134 (Eastern conifer forest land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-73 (Eastern conifer land bird habitat on BLM-administered land within the planning area under the alternatives).*

The Oregon/Washington Partners-in-Flight recommended habitat objectives for eastern Oregon forests to maintain existing mixed conifer forests and manage to provide at least 25% in a mature or older condition (i.e., which approximates mature with multi-layered canopy and structurally complex) by 2025 would be met under all alternatives. In 2026, between 41 and 85% (15,105 to 30,912 acres) of the eastern conifer habitat association would be in a mature with multi-layered canopy and structurally complex stage.

By 2106, mature with multi-layered canopy and structurally complex stands would decline under the No Action Alternative, and Alternatives 1, 2, and 3 to between 26 and 34% of the eastern conifer habitat association, but would still exceed the 25% habitat objective. The amount of mature with multi-layered canopy and structurally complex habitat within eastern conifer forest under the PRMP (i.e., 84%) would far exceed the Partners-in-Flight habitat objective of 25%.

Young Forest

Young forest would increase from the current level of 11% (4,169 acres) of eastern conifer forest habitat under the No Action Alternative, Alternatives 1 and 2, and the PRMP to 12 to 32% (4,498 to 11,533 acres) by 2106. Under Alternative 3, young forest would decrease from the current level to 1% (342 acres) by 2106. See *Figure 4-134 (Eastside conifer forest land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-73 (Eastside conifer forest land bird habitat on BLM-administered land within the planning area under the alternatives).*

Stand Establishment

Under the PRMP, the proportion of eastside conifer forest in a stand establishment structural stage would decrease from the current level of 3% (1,235 acres) to 1% (518 acres) by 2106. However, under the remaining alternatives, including the No Action Alternative, the amount of stand establishment habitat would increase from the current level to between 9 and 69% (3,399 to 25,298 acres). See *Figure 4-134 (Eastside conifer forest land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-73 (Eastside conifer forest land bird habitat on BLM-administered land within the planning area under the alternatives).*

Eastern Ponderosa Pine

Structurally Complex

The abundance of structurally complex forest would be stable at 4% (300 to 400 acres) of the eastern ponderosa pine habitat association for the first two decades under all alternatives. After 2026, the proportion of structurally complex forest within eastern ponderosa pine habitat association would increase to 35 to 44% (3,028 to 3,798 acres) under the alternatives by 2106. Under the PRMP, structurally complex forest would constitute 43% or 3,783 acres of the eastern ponderosa pine in 2106. See *Figure 4-135 (Eastside ponderosa pine land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-74 (Eastside ponderosa pine land bird habitat on BLM-administered land within the planning area under the alternatives).*

All alternatives, including the PRMP, would contribute to meeting the Oregon/Washington Partners-in-Flight recommended habitat objective to maintain existing ponderosa pine forests and manage to provide at least 30% in a mature or older condition by 2025, or be on trend to accomplish that goal. In 2026, only 4 to 5% (349 to 414 acres) of the eastern ponderosa pine habitat would be structurally complex under the alternatives, but development of additional structurally complex habitat would increase in subsequent decades. See *Figure 4-135 (Eastside ponderosa pine land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-74 (Eastside ponderosa pine land bird habitat on BLM-administered land within the planning area under the alternatives).*

Figure 4-135. Eastside Ponderosa Pine Land bird Habitat Trends On BLM-Administered Land Within The Planning Area

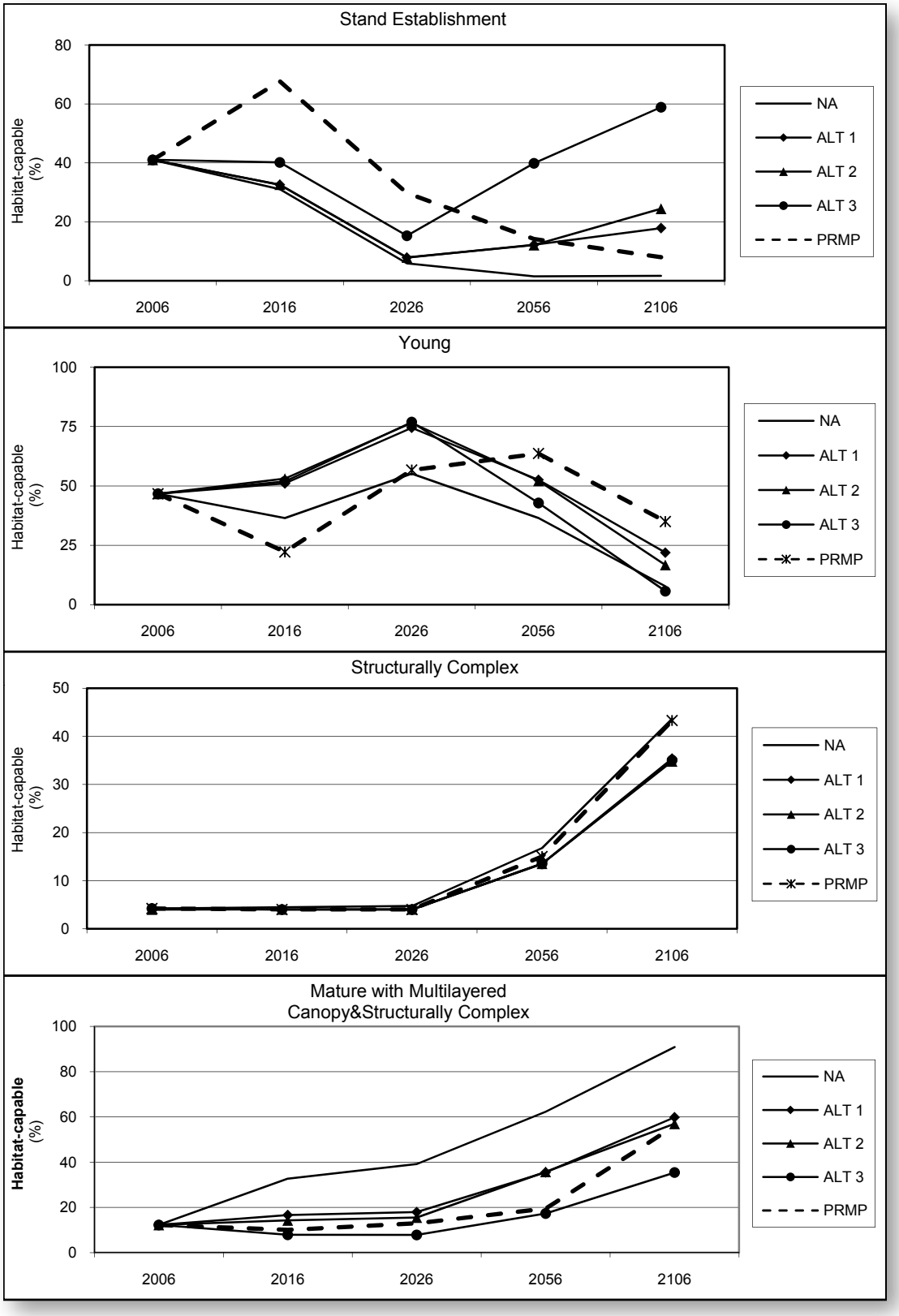


Table 4-74. Eastside Ponderosa Pine Land Bird Habitat On BLM-Administered Land Within The Planning Area Under The Alternatives

Structural Stage	Alternative	2006		2016		2026		2056		2106	
		(acres)	(%)[a]	(acres)	(%)	(acres)	(%)	(acres)	(%)	(acres)	(%)
Stand Establishment	No Action	3,570	41	2,705	31	513	6	130	2	148	2
	Alternative 1	3,570	41	2,834	33	683	8	1,062	12	1,555	18
	Alternative 2	3,570	41	2,839	33	690	8	1,055	12	2,127	24
	Alternative 3	3,570	41	3,496	40	1,328	15	3,468	40	5,125	59
	PRMP	3,570	41	5,913	68	2,609	30	1,255	14	718	8
Young	No Action	4,064	47	3,177	36	4,804	55	3,176	36	672	8
	Alternative 1	4,064	47	4,446	51	6,483	74	4,577	53	1,910	22
	Alternative 2	4,064	47	4,620	53	6,661	77	4,540	52	1,455	17
	Alternative 3	4,064	47	4,517	52	6,691	77	3,725	43	495	6
	PRMP	4,064	47	1,907	22	4,930	57	5,600	64	3,075	35
Mature with multi-layered canopy & structurally complex	No Action	1,070	12	2,848	33	3,414	39	5,424	62	7,911	91
	Alternative 1	1,070	12	1,451	17	1,564	18	3,091	36	5,210	60
	Alternative 2	1,070	12	1,245	14	1,353	16	3,109	36	4,957	57
	Alternative 3	1,070	12	691	8	685	8	1,510	17	3,084	35
	PRMP	1,070	12	885	10	1,166	13	1,658	19	4,912	56
Structurally Complex	No Action	366	4	391	4	414	5	1,461	17	3,798	44
	Alternative 1	366	4	349	4	349	4	1,179	14	3,079	35
	Alternative 2	366	4	349	4	349	4	1,176	14	3,028	35
	Alternative 3	366	4	349	4	349	4	1,176	14	3,049	35
	PRMP	366	4	367	4	350	4	1,262	15	3,783	43

[a] For all years, percent is habitat-capable acres

Mature with Multi-layered Canopy and Structurally Complex

Under all alternatives, the amount of mature with multi-layered canopy and structurally complex forest would increase from the current level of 12% (1,070 acres) of eastern ponderosa pine to between 35 to 91% (3,084 to 7,911 acres) by 2106. Under the PRMP, mature with multi-layered canopy and structurally complex forest would increase to 56% (4,912 acres) of the eastern ponderosa pine habitat association by 2106. There would be, however, a slight decrease in the amount of mature with multi-layered canopy and structurally complex forest in the first decade, down to 8% (691 acres) and 10% (885 acres), under Alternative 3 and the PRMP, respectively. See *Figure 4-135 (Eastside ponderosa pine land bird habitat trends on BLM-administered land within the planning area)* and *Table F102.9 (Eastside ponderosa pine land bird habitat on BLM-administered land within the planning area under the alternatives).*

The Oregon/Washington Partners-in-Flight recommended habitat objective to maintain existing ponderosa pine forests and manage to provide at least 30% in a mature or older condition by 2025, or be on a trend to accomplish that objective would be met under all alternatives. The No Action Alternative would have 39% (3,414 acres) of the eastern ponderosa pine habitat association in a mature with multi-layered canopy and structurally complex stage by 2026. The remaining alternatives, including the PRMP, would be on an upward trend of developing additional mature with multi-layered canopy and structurally complex habitat by 2025. See *Figure 4-135 (Eastside ponderosa pine land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-74 (Eastside ponderosa pine land bird habitat on BLM-administered land within the planning area under the alternatives).*

Young Forest

The proportion of young forest within eastern ponderosa pine habitat would increase for the first 20 years (i.e., 2026) from the current level of 47% (4,064 acres), to 55 to 77% (4,804 to 6,691 acres) under all alternatives. In subsequent decades, the amount of young forest would decrease to between 6 and 44% (495 to 3,802 acres) of the Eastside ponderosa pine habitat association. In 2106, 35% (3,075 acres) of eastern ponderosa pine habitat would be in a young forest condition under the PRMP. See *Figure 4-135 (Eastside ponderosa pine land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-74 (Eastside ponderosa pine land bird habitat on BLM-administered land within the planning area under the alternatives).*

Stand Establishment

Under all alternatives, except Alternative 3, the amount of stand establishment habitat within the Eastside ponderosa pine association would decrease from the current level of 41% (3,570 acres), to between 2 and 24% (148 to 2,127 acres) by 2106. Under Alternative 3, the amount of eastern ponderosa pine in a stand establishment structural stage would decrease to 15% (1,328 acres) by 2026 before increasing to 59% (5,125 acres) by 2106. Under the PRMP, there would be an increase in the proportion of eastern ponderosa pine habitat association in a stand establishment stage to 68% (5,913 acres) by 2016. After 2016, there would be a steady decline in the proportion of eastern ponderosa pine habitat association in a stand establishment stage to 8% (718 acres) by 2106 under the PRMP. See *Figure 4-135 (Eastside ponderosa pine land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-74 (Eastside ponderosa pine land bird habitat on BLM-administered land within the planning area under the alternatives).*

Eastside Hardwood

As discussed previously under *Western Hardwood*, an increase in the amount of habitat in the stand establishment stage would indicate that either existing young, mature, and/or structurally complex eastern hardwood habitat was reduced in abundance. The proportion of eastern hardwood forest in a stand establishment structural stage would increase under the PRMP from 17 to 45% (278 to 732 acres) by 2106; under the other alternatives, there would be a decrease in the amount of stand establishment habitat to 0

to 9% (0 to 149 acres). The increase in stand establishment would be derived mainly from the conversion of young forest to stand establishment, although the amount of young forest would also decrease as it developed into mature with multi-layered canopy and structurally complex structural stage. See below for a more detailed discussion of the trends in individual structural stages within the eastern hardwood habitat association.

Therefore, the Oregon/Washington Partners-in-Flight recommended habitat objective to maintain existing oak-pine forests in eastern hardwood habitat (Altman 2000a) would be achieved under the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3, but would not be achieved under the PRMP. Under the PRMP, young forest of the eastern hardwood association would be converted to the stand establishment stage, but mature and structurally complex eastern hardwood forest would increase in abundance. See *Figure 4-136 (Eastside hardwood land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-75 (Eastside hardwood land bird habitat on BLM-administered land within the planning area under the alternatives).*

Structurally Complex

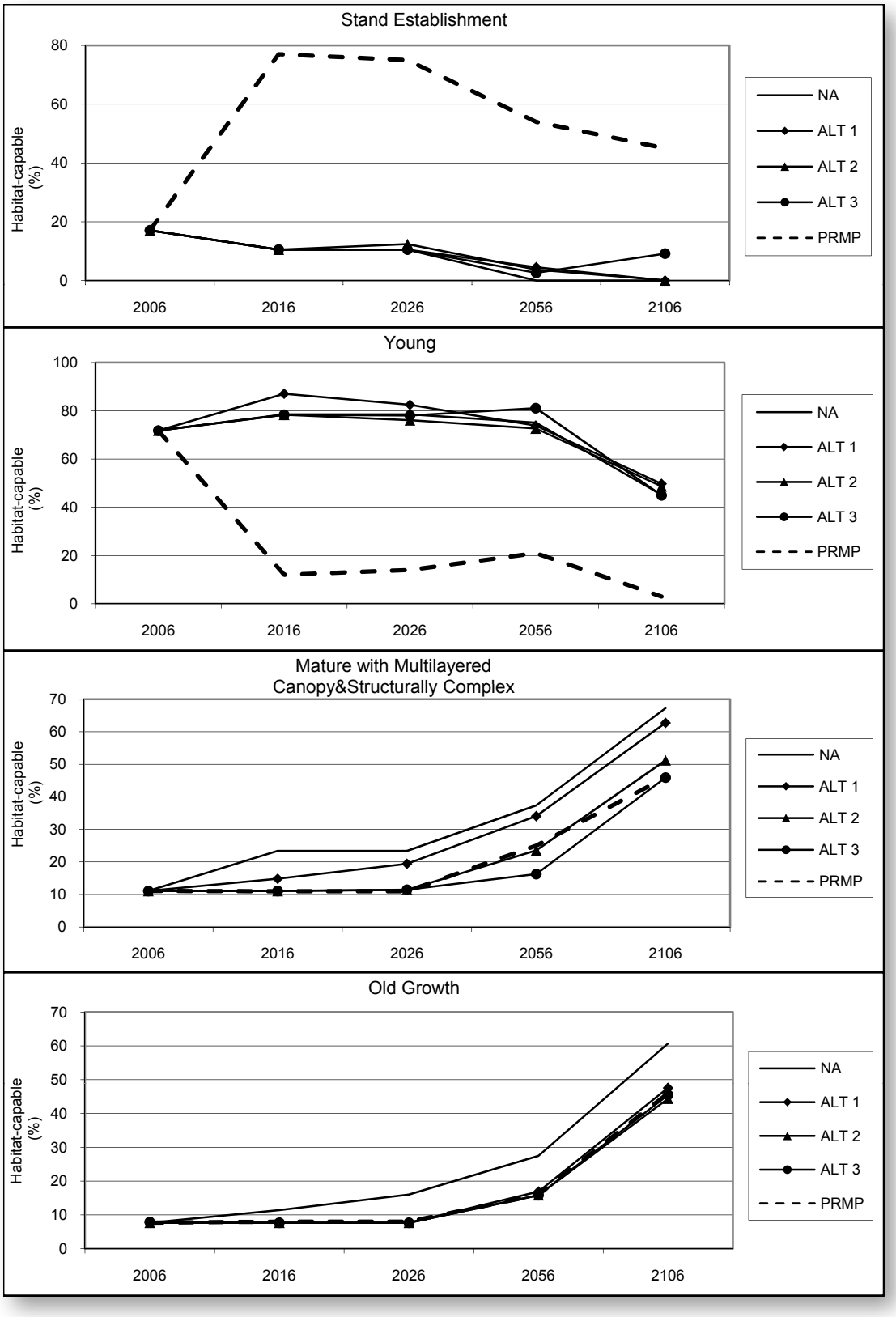
Structurally complex forest would increase from the existing level of 8% or 125 acres of the eastern hardwood habitat association, to between 44 and 61% (722 to 987 acres) by 2106 under all alternatives. Under the PRMP, 46% (741 acres) of eastern hardwood association would be structurally complex by 2106. See *Figure 4-136 (Eastside hardwood land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-75 (Eastside hardwood land bird habitat on BLM-administered land within the planning area under the alternatives).*

Table 4-75. Eastside Hardwood Land Bird Habitat On BLM-Administered Land Within The Planning Area Under The Alternatives

Structural Stage	Alternative	2006 (acres)	2006 (%)[a]	2016 (acres)	2016 (%)	2026 (acres)	2026 (%)	2056 (acres)	2056 (%)	2106 (acres)	2106 (%)
Stand Establishment	No Action	278	17	171	11	171	11	0	0	0	0
	Alternative 1	278	17	171	11	171	11	74	5	0	0
	Alternative 2	278	17	171	11	202	12	61	4	1	0
	Alternative 3	278	17	171	11	171	11	42	3	149	9
	PRMP	278	17	1,253	77	1,214	75	872	54	732	45
Young	No Action	1,168	72	1,278	79	1,278	79	1,222	75	735	45
	Alternative 1	1,168	72	1,417	87	1,342	82	1,202	74	809	50
	Alternative 2	1,168	72	1,275	78	1,239	76	1,182	73	792	49
	Alternative 3	1,168	72	1,275	78	1,270	78	1,320	81	731	45
	PRMP	1,168	72	194	12	228	14	342	21	43	3
Mature with multi-layered canopy & structurally complex	No Action	180	11	380	23	380	23	608	37	1094	67
	Alternative 1	180	11	241	15	316	19	554	34	1020	63
	Alternative 2	180	11	180	11	186	11	384	23	833	51
	Alternative 3	180	11	180	11	186	11	264	16	747	46
	PRMP	180	11	181	11	186	11	414	25	747	46
Structurally Complex	No Action	125	8	186	11	261	16	447	27	987	61
	Alternative 1	125	8	125	8	125	8	275	17	774	48
	Alternative 2	125	8	125	8	125	8	258	16	722	44
	Alternative 3	125	8	125	8	125	8	258	16	740	45
	PRMP	125	8	125	8	125	8	258	16	741	46

[a]For all years, percent is percent habitat-capable acres.

Figure 4-136 Eastside Hardwood Land bird Habitat Trends For Hardwood Forests On BLM-Administered Land Within The Planning Area



Mature with Multi-layered Canopy and Structurally Complex

The amount of eastern hardwood habitat in a mature with multi-layered canopy and structurally complex stage would increase under the alternatives from the current level of 11% or 180 acres to between 46 and 67% (747 to 1,094 acres). Under the PRMP, 46% (747 acres) of eastern hardwood forest would be mature with multi-layered canopy and structurally complex. See *Figure 4-136 (Eastside hardwood land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-75 (Eastside hardwood land bird habitat on BLM-administered land within the planning area under the alternatives).*

Young Forest

Under the No Action Alternative and Alternatives 1, 2, and 3, the amount of eastern hardwood habitat in a young forest condition would initially increase from the current level of 72% (1,168 acres), to between 78 and 89% (1,275 to 1,417 acres) in the first decade (by 2016) before dropping to between 45 and 50% (735 to 809 acres) by 2106. Under the PRMP, the amount of young forest in the eastern hardwood association would decrease from the current level, to 3% or 43 acres by 2106. See *Figure 4-136 (Eastside hardwood land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-75 (Eastside hardwood land bird habitat on BLM-administered land within the planning area under the alternatives).*

Stand Establishment

Stand establishment habitat would decrease from the current level of 17% or 278 acres of eastern hardwood forest, to between 0 and 9% (0 to 149 acres) under the No Action Alternative and Alternatives 1, 2, 3. Under the PRMP, the proportion of eastern hardwood in a stand establishment structural stage would increase from the current level to 77% or 1,253 acres in the first decade before decreasing to 45% or 732 acres by 2106. See *Figure 4-136 (Eastside hardwood land bird habitat trends on BLM-administered land within the planning area)* and *Table 4-75 (Eastside hardwood land bird habitat on BLM-administered land within the planning area under the alternatives).*

Nonforest Habitat

As previously discussed in the *Wildlife*; *Special Status Species* section of *Chapter 4*, the availability of nonforest habitat would be unchanged from its availability in 2006 under all alternatives, including the PRMP. Nonforest habitats tend to be comprised of features that are generally noncommercial. Habitat conversion would occur in the harvest land base under all alternatives where commercial timberland has not been successfully reforested to a desirable species mix. The amount of this activity would be inconsequential and, therefore, would have little to no impact on nonforest habitat.

All action alternatives contain a management objective to support natural species composition and vegetation on noncommercial areas, including: noncommercial forests, oak woodlands, shrublands, grasslands, cliffs, rock outcrops, talus slopes, meadows, wetlands, springs, fens, ponds, and vernal pools. With this management objective, the availability of nonforest habitat for land birds would, in general, be maintained.

Therefore, the Oregon/Washington Partners-in-Flight recommended habitat objective to maintain existing grassland-savannah, oak woodland, and chaparral habitats for nonforest habitat (Altman 2000b) would be met under the action alternatives, including the PRMP.

Land Bird Habitat on Eastside Management Lands

Under all alternatives, including the PRMP, Ponderosa pine and eastern conifer forests (e.g., juniper and white fir forests) on Eastside Management Lands would receive uneven-aged management. Uneven-aged forest management would cause little change in the structural condition of the Ponderosa pine and conifer forests on Eastside Management Lands. The availability of these conifer forests as habitat for land birds would also be changed little from the current condition.

The Oregon/Washington Partners-in-Flight recommended habitat objectives to maintain existing shrub-steppe habitats, manage to provide at least 50% in a late-seral condition, and maintain existing riparian habitats (Altman and Holmes 2000) would be met under all alternatives, including the PRMP. Approximately 65% (50,902 acres) of the 77,818 acres of habitat on Eastside Management Lands is old, which approximates the Partners-in-Flight late-seral condition. Little change in the structural condition would occur under all alternatives; therefore, existing habitats should be maintained under all alternatives.

It is assumed that woodland and rangeland management activities would occur at approximately the same rate under all action alternatives as under the 1995 resource management plan in the Klamath Falls Resource Area. Western juniper that is encroaching and competing and displacing native vegetation on rangelands and juniper woodlands would be treated utilizing a variety of treatments including: cutting, piling, burning, and utilization for biomass and other forest products. These treatments would remove competing vegetation and allow grassland and sagebrush habitats that are more typical of the native habitats to re-establish. Land birds associated with grassland and sagebrush habitats would have additional habitat made available to them through this re-establishment.

Under all alternatives, understocked forestlands would be reforested and rangeland would be converted from juniper back into the historical sagebrush or grassland communities. This conversion would cause an inconsequential reduction in hardwood habitat. Riparian hardwood communities would be maintained by controlling encroaching conifers and other activities to restore riparian hardwood communities (i.e., controlled grazing, burning, and planting).

It is assumed that under all action alternatives oil and gas exploration and development, mining and quarries, and infrastructure development such as roads, communication sites and recreation sites would occur at the same rate as under the 1995 resource management plans. These actions have caused an inconsequential loss of habitat and therefore under all alternatives, an inconsequential amount of habitat would be lost due to these activities within the planning area.

Legacy Components

Overall, there would be an increase in the amount of forests with legacy components (i.e., stands that are mature and structurally complex, young with structural legacies, or stand establishment with structural legacies) under all alternatives from the current level of 62% (1,327,973 acres) of the planning area to between 66 and 92% (1,421,858 to 1,971,964 acres) in 2106. The proportion of forests with legacy components in the western conifer, western hardwood, Eastside Ponderosa pine, and Eastside hardwood habitat associations would generally increase from current levels by 2106. The amount of Eastside conifer association with legacy components would decline under the No Action Alternative, Alternatives 1 and 2, and the PRMP. Under Alternative 2, the amount of western hardwood and Eastside Ponderosa pine habitat associations with legacy components would also decline. See *Table 4-76 (Forests with legacy structure on BLM-administered land within the planning area under the alternatives by habitat association)*.

The value of legacy structure in the stand establishment forests persists from stand establishment into the more advanced structural stages, typically providing larger diameter structure, a broader array of decay classes, and retention trees that provide a source of larger diameter snags and down wood than would otherwise develop in the subsequent structural stages. The influence of this initial input of snags, down wood, and remnant trees would be expected to provide habitat value for wildlife for approximately 100 years or longer.

Table 4-76. Forests With Legacy Structure On BLM-Administered Land Within The Planning Area Under The Alternatives By Habitat Association

Habitat Association	Alternative	2006 (acres)	2006 (%)[a]	2016 (acres)	2016 (%)	2026 (acres)	2026 (%)	2056 (acres)	2056 (%)	2106 (acres)	2106 (%)
Western Conifer	No Action	992,816	58	1,026,458	60	1,078,219	63	1,393,452	82	1,565,732	92
	Alternative 1	992,816	58	1,001,039	59	1,026,181	60	1,194,248	70	1,299,793	76
	Alternative 2	992,816	58	971,646	57	974,096	57	1,056,565	62	1,118,306	66
	Alternative 3	992,816	58	994,103	58	991,360	58	1,252,158	73	1,358,452	80
	PRMP	992,816	58	1,062,635	60	1,090,384	62	1,265,205	72	1,380,835	78
Western Hardwood	No Action	293,840	76	319,945	83	333,784	86	358,627	93	362,329	94
	Alternative 1	293,840	76	318,905	82	328,956	85	326,720	84	310,398	80
	Alternative 2	293,840	76	292,271	75	297,408	77	278,863	72	283,233	73
	Alternative 3	293,840	76	301,436	78	309,708	80	306,930	79	313,624	81
	PRMP	293,840	76	317,808	82	327,065	84	317,066	82	319,530	83
Eastern Conifer	No Action	34,560	95	34,937	96	34,949	96	35,623	98	33,965	93
	Alternative 1	34,560	95	32,035	88	29,077	80	21,927	60	12,637	35
	Alternative 2	34,560	95	31,922	88	29,252	80	22,509	62	13,576	37
	Alternative 3	34,560	95	34,177	94	33,845	93	35,207	97	35,921	99
	PRMP	34,560	95	34,529	95	34,506	95	35,438	97	35,178	97
Eastern Ponderosa Pine	No Action	5,794	67	5,739	66	5,739	66	6,929	80	8,669	100
	Alternative 1	5,794	67	5,666	65	5,670	65	5,768	66	5,809	67
	Alternative 2	5,794	67	5,638	65	5,641	65	5,830	67	5,736	66
	Alternative 3	5,794	67	5,716	66	5,739	66	7,363	85	8,702	100
	PRMP	5,794	67	5,795	67	5,795	67	5,800	67	6,636	76
Eastern Hardwood	No Action	960	59	1,159	71	1,159	71	1,266	78	1,266	78
	Alternative 1	960	59	1,094	67	1,266	78	1,181	73	1,192	73
	Alternative 2	960	59	960	59	929	57	1,006	62	1,005	62
	Alternative 3	960	59	960	59	960	59	961	59	1,067	66
	PRMP	960	59	961	59	961	59	1,068	66	1,068	66
Total	No Action	1,327,973	62	1,388,241	65	1,453,852	68	1,795,898	84	1,971,964	92
	Alternative 1	1,327,973	62	1,358,742	64	1,391,151	65	1,549,846	72	1,629,831	76
	Alternative 2	1,327,973	62	1,302,439	61	1,307,328	61	1,364,775	64	1,421,858	66
	Alternative 3	1,327,973	62	1,336,395	62	1,341,614	63	1,602,620	75	1,717,769	80
	PRMP	1,327,973	62	1,421,727	65	1,458,711	66	1,624,576	74	1,743,248	79

[a]For all years, percent is percent habitat-capable acres.

Snags

Snag retention or creation would occur at varying densities under the alternatives as shown in *Table 4-77 (Comparison of management actions for snag retention or creation under the alternatives)*.

Mellen et al. (2006) compiled forest inventory data from across Oregon and Washington and described snag density in terms of "tolerance levels." A tolerance level is the specific value at the edge of a tolerance interval. A tolerance interval is the range of values that represent a specific proportion or percentage of some sample or population. For example, if a 50% tolerance level of snag density used by wildlife species in a specific vegetation condition is, for example, 2.1 snags per acre, this means that 50% of all inventory plots had a density of 2.11 snags per acre or less. An 80% tolerance level of 7.98 snags per acre would be interpreted as 80% of the inventory plots had 7.98 snags per acre or less. A 100% tolerance interval corresponds to the maximum observed value, such as the highest snag density observed to be used by a wildlife species. Observed tolerance levels for snag density in the wildlife habitat types within the planning area are shown in *Table 4-78 (Snag density found in unharvested forests)*.

TABLE 4-77. COMPARISON OF MANAGEMENT ACTIONS FOR SNAG RETENTION OR CREATION UNDER THE ALTERNATIVES

No Action	Alternative 1	Alternative 2	Alternative 3	PRMP
• **In the Matrix and Riparian Reserve**: - 1.1 snags per acre • **In the LSR:** - Per LSRA guidance	• **In the TMA and RMA**: - Noncommercial snags only • **In the LSMA in stands with QMD > 14 inches:** - *In the Western hemlock series:* - 6 snags per acre > 14 inches dbh - *In the Douglas fir series*: 3 snags per acre > 14 inches dbh - *In the tanoak series*: 4 snags per acre > 14 inches dbh • **In the LSMA in stands with QMD < 14 inches**: - *In the Western hemlock series:* - 3 snags per acre > 12 inches dbh - *In the Douglas fir series*: 2 snags per acre > 10 inches dbh - *In the tanoak series*: 2 snags per acre > 10 inches dbh	• **In the TMA and RMA**: - None • **In the LSMA in stands with QMD > 14 inches**: - *In the Western hemlock series*: 6 snags per acre > 14 inches dbh - *In the Douglas fir series*: 3 snags per acre > 14 inches dbh - *In the tanoak series*: 4 snags per acre > 14 inches dbh • **In the LSMA in stands with QMD < 14 inches**: - *In the Western hemlock series:* 3 snags per acre > 12 inches dbh - *In the Douglas fir series*: 2 snags per acre > 10 inches dbh - *In the tanoak series*: 2 snags per acre > 10 inches dbh	• **In the GLMA in regeneration harvests**: - *In the Western hemlock series*: 4 snags per acre > 20 inches dbh - *In the Douglas fir series*: 2 snags per acre > 16 inches dbh - *In the tanoak series*: 2 snags per acre > 20 inches dbh • **In the GLMA in partial harvests**: - *In the Western hemlock series*: 4 snags per acre > 20 inches dbh - *In the Douglas fir series*: 2 snags per acre > 12 inches dbh - *In the tanoak series*: 2 snags per acre > 16 inches dbh • **In the RMA:** - Noncommercial snags only • **In RMAs in the BLM Management Area Adjacent to the Coquille Tribal Forest Land::** - All snags if safety allows 50 - 100 feet from perennial and intermittent fish-bearing streams - All snags if safety allows along intermittent non-fish-bearing streams	• **In the TMA and RMA**: - Noncommercial snags only • **In the Deferred TMA:** - All snags retained • **In the LSMA in stands with QMD > 14 inches:** - *In the Western hemlock series*: 6 snags per acre > 14 inches dbh - *In the Douglas fir series*: 3 snags per acre > 14 inches dbh - *In the tanoak series*: 4 snags per acre > 14 inches dbh • **In the LSMA in stands with QMD < 14 inches:** - *In the Western hemlock series:* 3 snags per acre > 12 inches dbh - *In the Douglas fir series*: 2 snags per acre > 10 inches dbh - *In the tanoak series*: 2 snags per acre > 10 inches dbh • **In the Eastside Forest Management Area**: - 2 snags per acre > 16 inches dbh

LSR – Late-Successional Reserve; LSRA – Late-Successional Riparian Area; TMA – Timber Management Area; LSMA – Late-Successional Management Area; GLMA – General Land Management Area; RMA – Riparian Management Area; QMD – quadratic mean diameter; dbh – diameter breast height

Tolerance levels of snag density were used to facilitate comparison of the different management actions for snags under the alternatives against the data for unharvested forests synthesized by Mellen et al. (2006). Under the alternatives, management actions for snag retention or creation are differentiated based on vegetation series (see *Figure 2-1 - Forest vegetation series* in *Chapter 2*, and *Appendix B - Forest Structure and Spatial Pattern*). Snag density requirements for the western hemlock vegetation series were compared with the tolerance levels for the Coast Range and West Cascades wildlife habitat types from Mellen et al. (2006). Snag density requirements for the tanoak vegetation series and the Douglas fir vegetation series were compared with the tolerance levels for the Southwest Oregon wildlife habitat type from Mellen et al. (2006).

Table 4-78. Snag Density Found In Unharvested Forests

Wildlife Habitat Type[a]	Tolerance Levels[a]						Comparable Vegetation Series
	Density of snags > 10 inches dbh (snags/acre)			Density of Snags > 20 inches dbh (snags/acre)			
	30%	50%	80%	30%	50%	80%	
Coast Range (Westside Lowland Conifer-Hardwood Forest Oregon Coast)	2.1	6.5	17.0	1.1	2.1	10.1	Western Hemlock
West Cascades (Westside Lowland Conifer-Hardwood Forest Oregon West Cascades)	8.3	14.6	29.2	2.1	4.4	10.6	Western Hemlock
Eastern Cascades (Eastside Mixed Conifer Forest E Cascades/Blue Mnts.)	4.0	9.1	22.2	0.0	2.0	6.4	Tanoak; Douglas Fir (Klamath Falls Resource Area)
Southwest Oregon (Southwest Oregon Mixed Conifer-Hardwood Forest)	3.2	6.4	14.6	1.1	2.1	5.3	Tanoak; Douglas Fir (Medford District)

[a]From stands of small/medium trees (QMD = 10 to 19 inches dbh) based on Mellen et al. (2006).

No Action Alternative

Under the No Action Alternative, snags would be provided at densities at or below the 30% tolerance level on approximately 47% of BLM-administered lands within the planning area (i.e., within the Matrix, Adaptive Management Areas, and Riparian Reserves land use allocations). Within the Late-Successional Reserves (36% of BLM-administered lands in the planning area), Late-Successional Reserve assessments provide guidance and/or recommendations on the density of snags to be provided and that density varies among the Late-Successional Reserves. On the remaining 17% of BLM-administered lands within the planning area (i.e., Congressionally Withdrawn or Administratively Withdrawn lands), current snag density would not change due to management actions. See *Table 4-77 (Comparison of management actions for snag retention or creation under the alternatives)* and *Table 4-78 (Snag density found in unharvested forests)*.

Alternative 1

Under Alternative 1, the management action for snags in the Western hemlock vegetation series would provide snags at densities between the 30% and 50% tolerance levels in the Coast Range and below the 30% tolerance level in the West Cascades within the late-successional management areas which constitute 28% of BLM-administered lands within the planning area. Management actions in the Late-Successional Management Area for snags in the Douglas fir vegetation series and the tanoak vegetation series would generally provide snag densities below the 30% tolerance level for observed densities in Southwestern Oregon.

Within the Timber Management Areas and Riparian Management Areas, which constitute 46% of BLM-administered lands within the planning area, noncommercial snags would be retained except where they would be removed for safety or operational reasons. Snag density within the Timber Management Area and Riparian Management Area would be provided below the 30% tolerance level. Snag density would not be altered by management actions on the remaining 26% of BLM-administered lands within the planning area (i.e., National Landscape Conservation System and Administratively Withdrawn lands). See *Table 4-77 (Comparison of management actions for snag retention or creation under the alternatives)* and *Table 4-78 (Snag density found in unharvested forests)*.

Alternative 2

Under Alternative 2, the management action for snags in the Western hemlock vegetation series would provide snags at densities between the 30% and 50% tolerance levels in the Coast Range and below the 30% tolerance level in the West Cascades within the Late-Successional Management Area (i.e., 19% of BLM-administered lands within the planning area). Management actions in the Late-Successional Management Area for snags in the Douglas fir vegetation series and the tanoak vegetation series would generally provide snag densities below the 30% tolerance level for observed densities in Southwestern Oregon.

Within the Riparian Management Areas (i.e., 6% of BLM-administered lands within the planning area), noncommercial snags would be retained, except where they would be removed for safety or operational reasons. No snags would be retained or created within the Timber Management Area (i.e., 48% of BLM-administered lands within the planning area). Snag density within the Riparian Management Areas and Timber Management Areas would be provided below the 30% tolerance level. Snag density would not be altered by management actions on the remaining 27% of BLM-administered lands within the planning area (i.e., National Landscape Conservation System lands and Administratively Withdrawn lands). See *Table 4-77 (Comparison of management actions for snag retention or creation under the alternatives)* and *Table 4-78. (Snag density found in unharvested forests)*.

Alternative 3

Under Alternative 3, the management action for snags in the Western hemlock vegetation series would provide snags at densities above the 30% tolerance level in the Coast Range, but below the 30% tolerance level in the West Cascades within the General Landscape Management Area (i.e., 66% of BLM-administered lands in the planning area). Management actions in the General Landscape Management Area for snags in the Douglas fir vegetation series and the tanoak vegetation series would provide snag densities below the 30% tolerance level for observed densities in southwestern Oregon.

Within the Riparian Management Area (i.e., 7% of BLM-administered lands within the planning area), noncommercial snags would be retained, except where they would be removed for safety or operational reasons. Snag density within the Riparian Management Area would be below the 30% tolerance level. In Riparian Management Areas within the BLM Management Area adjacent to Coquille Tribal Forest Land (i.e., 1% of BLM-administered lands within the planning area), snag densities retained would be variable since all existing snags would be retained except those removed for safety reasons. Snag density would not be altered by management actions on the remaining 26% of BLM-administered lands within the planning area (i.e., National Landscape Conservation System and Administratively Withdrawn lands). See *Table 4-77 (Comparison of management actions for snag retention or creation under the alternatives)* and *Table 4-78 (Snag density found in unharvested forests)*.

PRMP

Under the PRMP, the management action for snags in the Western hemlock vegetation series would provide snags at densities between the 30% and 50% tolerance levels in the Coast Range and below the 30% tolerance level in the West Cascades within the Late-Successional Management Areas and the Late-Successional Management Areas murrelet critical habitat units (i.e., 23% of BLM-administered lands in the planning area). Management actions in the late successional management areas for snags in the Douglas fir vegetation series and the tanoak vegetation series would generally provide snag densities below the 30% tolerance level for observed densities in Southwestern Oregon.

Within the Riparian Management Areas (i.e., 10% of BLM-administered lands within the planning area), noncommercial snags would be retained, except where they would be removed for biomass recovery or for safety or operational reasons. No snags would be retained or created within the Timber Management Areas (i.e., 27% of BLM-administered lands in the planning area). Snag density within Riparian Management Areas and Timber Management Areas would be provided below the 30% tolerance level.

Within the forest management areas of the Eastside Management Lands land use allocation (i.e., 1% of BLM-administered lands within the planning area), snags would be provided below the 30% tolerance level. Within the Uneven-aged Management Areas (i.e., 8% of BLM-administered lands within the planning area), there is no management direction for snag retention or creation. However, a reasonable analytical assumption is that existing non-merchantable snags would be retained, except where they would be removed for safety or operational reasons. Snag density would not be altered by management actions on the remaining 24% of BLM-administered lands within the planning area (i.e., Deferred Timber Management Areas, National Landscape Conservation Systems Lands, and Administratively Withdrawn Lands). See *Table 4-77 (Comparison of management actions for snag retention or creation under the alternatives)* and *Table 4-78 (Snag density found in unharvested forests)*.

Down Wood

For this analysis, the minimum diameters and lengths of down wood as prescribed by the management actions under the alternatives were assumed to be retained. The prescribed amounts of downed wood are summarized in *Table 4-79 (Comparison of management actions for downed wood retention or creation under the alternatives)*.

Tolerance levels of coarse woody debris cover were used to facilitate comparison of the different management actions for coarse woody debris under the alternatives against the data for unharvested forests synthesized by Mellen et al. (2006). Under the alternatives, management actions for coarse woody debris retention or creation are differentiated based on vegetation series. See *Figure 2-1 (Forest Vegetation Series* in *Chapter 2)* and *Appendix B - Forest Structure and Spatial Pattern*. Coarse woody debris requirements for the western hemlock

TABLE 4-79. COMPARISON OF MANAGEMENT ACTIONS FOR DOWNED WOOD RETENTION OR CREATION UNDER THE ALTERNATIVES

No Action	Alternative 1	Alternative 2	Alternative 3	PRMP
• **In Northern GFMA and Connectivity/Diversity Blocks:** - 240 feet per acre (0.7% cover) • **In Southern GFMA**: - 120 feet per acre (0.3% cover) • **In the LSR**: - Per LSRA guidance	• **In the TMA and RMA:** - Noncommercial coarse woody debris only • **In the LSMA in stands with QMD > 14 inches:** - *In the Western hemlock series*: 240 feet per acre (0.6% cover) - *In the Douglas fir series*: 120 feet per acre (0.3% cover) - *In the tanoak series*: 120 feet per acre (0.3% cover) • **In the LSMA in stands with QMD ≤ 14 inches**: - *In the Western hemlock series*: 120 feet per acre (0.2% cover) - *In the Douglas fir series*: 60 feet per acre (0.1% cover) - *In the tanoak series*: 60 feet per acre (0.1% acre)	• **In the TMA and RMA**: - None • **In the LSMA in stands with QMD > 14 inches**: - *In the Western hemlock series*: 240 feet per acre (0.6% cover) - *In the Douglas fir series*: 120 feet per acre (0.3% cover) - *In the tanoak series*: 120 feet per acre (0.3% cover) • **In the LSMA in stands with QMD ≤ 14 inches:** - *In the Western hemlock series*: 120 feet per acre (0.2% cover) - *In the Douglas fir series*: 60 feet per acre (0.1% cover) - *In the tanoak series*: 60 feet per acre (0.1% acre)	• **In the GLMA in regeneration harvests**: - *In the Western hemlock series*: 240 feet per acre (0.9% cover) - In the Douglas fir series: 120 feet per acre (0.3% cover) - *In the tanoak series*: 120 feet per acre (0.4% cover) • **In the GLMA in partial harvests:** - *In the Western hemlock series*: 240 feet per acre (0.9% cover) - *In the Douglas fir series*: 120 feet per acre (0.3% cover) - *In the tanoak series*: 120 feet per acre (0.3% cover) • **In the RMA:** • Noncommercial coarse woody debris only • **In the BLM Management Area Adjacent to the Coquille Tribal Forest Land::** - 120 feet per acre (0.3% cover) - All woody debris present in RMAs	• **In the TMA and RMA**: - Noncommercial coarse woody debris only • **In the Deferred TMA:** - All coarse woody debris retained • **In the LSMA in stands with QMD > 14 inches:** - *In the Western hemlock series*: 240 feet per acre (0.6% cover) - *In the Douglas fir series*: 120 feet per acre (0.3% cover) - *In the tanoak series*: 120 feet per acre (0.3% cover) • **In the LSMA in stands with QMD ≤ 14 inches:** - *In the Western hemlock series*: 120 feet per acre (0.2% cover) - *In the Douglas fir series:* 60 feet per acre (0.1% cover) - *In the tanoak series*: 60 feet per acre (0.1% acre) • **In the Eastside Forest Management Area:** - 40 feet per acre (0.1% cover)

LSR – Late-Successional Reserve; LSRA – Late-Successional Riparian Area; TMA – Timber Management Area; LSMA – Late-Successional Management Area; GLMA – General Land Management Area; RMA – Riparian Management Area; QMD – quadratic mean diameter; dbh – diameter breast height

vegetation series were compared with the tolerance levels for the Coast Range and West Cascades wildlife habitat types from Mellen et al. (2006). Coarse woody debris requirements for the tanoak vegetation series and the Douglas fir vegetation series were compared with the tolerance levels for the Southwest Oregon wildlife habitat type from Mellen et al. (2006).

Under all alternatives, except for Late-Successional Reserves under the No Action Alternative, the amount of down wood that would be provided by the management actions on BLM-administered lands would generally be below the 30% tolerance level described by Mellen et al. (2006). The amount of down wood provided in late-successional reserves under the No Action Alternative and how that amount compares to the tolerance levels from Mellen et al. (2006) would vary among the Late-Successional Reserves because the guidance for down wood retention and/or creation varies among the individual Late-Successional Reserve assessments. In addition, existing down wood present in Riparian Management Areas in the BLM management area adjacent to the Coquille tribal forest land under Alternative 3 would be retained, and existing down wood present in the deferred Timber Management Area under the PRMP would be retained, except where removed for operational reasons.

Under the No Action Alternative and Alternative 3, slightly more down wood would be provided than under Alternatives 1 and Alternative 2, or the PRMP, but down wood would still be provided at levels below the 30% tolerance level. See *Table 4-79 (Comparison of management actions for downed wood retention or creation under the alternatives)* and *Table 4-80 (Coarse woody debris cover found in unharvested forests).*

Green Tree Retention

The proportion of BLM-administered lands within the planning area that would contain green retention trees as a legacy component following regeneration harvest and the density of those retention trees would vary across the alternatives. All BLM-administered lands within the planning area would have green tree retention provided under the No Action Alternative following regeneration harvest. Under Alternative 3, zero green trees could be retained following regeneration on the BLM Management Area adjacent to the Coquille tribal forest land (1% of BLM-administered lands), since the management action would provide a range of retention from 0 to 6 trees per acre. Within the Timber Management Areas under Alternatives 1 and 2, and the PRMP, there would be zero green tree retention following regeneration harvest on 37, 48, and 27% of BLM-administered lands within the planning area, respectively. In addition, under the PRMP after the deferral of harvest is lifted in 2023 within the Deferred Timber Management Area (7% of BLM-administered lands in the planning area), there would be zero green tree retention following regeneration harvest.

Table 4-80. Coarse Woody Debris Cover Found In Unharvested Forests

Wildlife Habitat Type[a]	Tolerance Levels* Coarse Woody Debris (% cover)			Comparable Vegetation Series
	30%	50%	80%	
Coast Range (Westside Lowland Conifer-Hardwood Forest OR Coast)	2.9	5.0	9.4	Western Hemlock
Western Cascades (Westside Lowland Conifer-Hardwood Forest OR W Cascades)	2.1	4.0	8.7	Western Hemlock
Eastern Cascades (Eastside Mixed Conifer Forest E Cascades/Blue Mnts.)	0.6	2.1	4.9	Tanoak; Douglas Fir (Klamath Falls Resource Area)
Southwest Oregon (Southwest Oregon Mixed Conifer-Hardwood Forest)	0.8	1.7	4.1	Tanoak; Douglas Fir (Medford District)

[a] From stands of small/medium trees (QMD = 10-19 inches dbh) from Mellen, et al. (2006)

Following regeneration harvest, the stand establishment structural stage would have greater numbers of remnant green trees and, therefore, a greater number of legacy habitat features for land birds and other wildlife under the No Action Alternative and Alternative 3 compared to Alternatives 1, Alternative 2, and the PRMP. Alternatives 1 and 2, and the PRMP would provide stand establishment habitat of lower value for those species that use legacy structures than the No Action Alternative or Alternative 3, due to the lack of requirements in Alternatives 1, 2 and the PRMP to retain green trees in regeneration harvests. See *Table 4-81 (Comparison of management actions for green tree retention in regeneration under the alternatives)*.

Western Snowy Plover

Under all alternatives, including the PRMP, existing plans for western snowy plover habitat at the Coos Bay North Spit and the New River Area of Critical Environmental Concern would continue to be implemented. These plans are designed to prevent disturbance to known snowy plover nest sites, restore natural dune processes with a goal of providing additional nesting habitat, and provide predator control. Designated critical habitat for the western snowy plover is located within the Coos Bay North Spit and New River Area of Critical Environmental Concern.

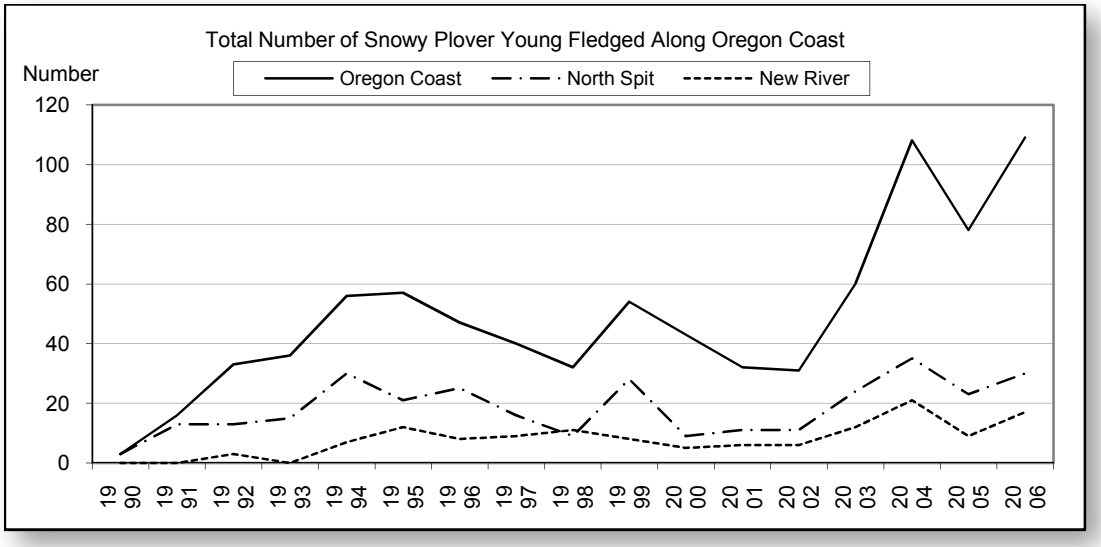
The Pacific Coast distinct population segment of the western snowy plover has exhibited "significant" progress towards recovery as shown in *Figure 4-137* (*Total number of western snowy plover young fledged along the Oregon Coast from 1990 to 2006*) (Lauten et al. 2006). Since the management that has led to this recovery would continue under all alternatives, it is anticipated that population numbers and nesting success in the long term would remain stable or increase under all alternatives.

TABLE 4-81. COMPARISON OF MANAGEMENT ACTIONS FOR GREEN TREE RETENTION IN REGENERATION HARVESTS UNDER THE ALTERNATIVES

No Action	Alternative 1	Alternative 2	Alternative 3	PRMP
• **In Northern GFMA**: - 6 – 8 tpa • **In Southern GFMA**: - 18 – 25 tpa • **In Connectivity/Diversity Blocks:** - 12 – 18 tpa	• **In the TMA:** - 0 tpa	• **In the TMA:** - 0 tpa	• **In the GLMA in regeneration harvests:** - In the Western hemlock series: 6 tpa - In the Douglas fir series: 9 tpa - *In the tanoak series*: 6 tpa • **In the GLMA in partial harvests:** - *In the Western hemlock series*: 30 tpa - *In the Douglas fir series:* 20 tpa - *In the tanoak series*: 20 tpa • **In the BLM Management Area Adjacent to the Coquille Tribal Forest Land:** 0 – 6 tpa	• **In the TMA:** - 0 tpa • **In the deferred TMA after 2023:** - 0 tpa • **In the Eastside Forest Management Area:** - Relative Density (Curtis) of green trees between 15 and 55 • **In the Uneven-Aged Management Area:** Relative Density (Curtis) of green trees between 25 and 55

GFMA – General Landscape Management Area; TMA – Timber Management Area; tpa – trees per acre

Figure 4-137. Total Number Of Western Snowy Plover Young Fledged Along the Oregon Coast From 1990 To 2006



Sage Grouse

The treatment of sage grouse habitat, which only occurs east of Highway 97 in the Klamath Falls Resource Area, would not vary between the alternatives. Therefore, the following impacts would occur under all alternatives, including the PRMP.

The Oregon conservation strategy for sage grouse was completed in 2005. The BLM was a partner in that process, along with the U.S. Forest Service and state agencies (Hagen et al. 2005). The conservation strategy includes managing at least 70% of the sage grouse habitat-capable lands in a suitable habitat condition and the remaining habitat-capable lands in a potential-habitat condition. Within the Gerber block this would equate to managing approximately 33,000 acres (70% of the 47,000 acres of habitat-capable land) in a suitable habitat condition. Currently, there are approximately 28,000 acres of suitable sage grouse habitat (59% of habitat-capable land) within the Gerber block.

Juniper encroachment prevents sage grouse non-habitat from developing into suitable habitat because it competes for moisture and light. Juniper encroachment is a major cause of the loss of sage grouse habitat in the Gerber block. Juniper woodlands occupy approximately 40,000 acres within the Gerber block. Juniper expansion has increased by a factor of 10 since the 1880s (Miller and Tausch 2001, as cited in Hagen 2005).

Current levels of vegetative treatments (e.g. juniper removal to enhance range and wildlife habitat) would increase the amount of sage grouse habitat. See *Table 4-3 (Estimated first decade levels of non-timber management activity by alternative*). These activities would continue at approximately the same levels under all alternatives, including the PRMP.

It is assumed that woodland and rangeland management activities in the next decade would occur at approximately the same rate as in the past decade under the 1995 resource management plan in the Klamath Falls Resource Area. Western juniper that is encroaching and competing and displacing native vegetation on rangelands and juniper woodlands would continue to be treated utilizing a variety of treatments including: cutting, piling, burning, and utilization for biomass and other forest products. Removal of juniper would remove competing vegetation and allow sage grouse habitat to re-establish.

Operations associated with ground disturbance that are used to remove encroaching junipers can also incidentally remove native vegetation and encourage the spread of invasive non-native grasses. The spread of invasive non-native grasses also causes the loss of sage grouse habitat. Site-disturbing activities can include the use of heavy equipment or burning, which allows the spread of invasive non-native grasses. These non-native grasses prevent establishment of sagebrush and other native forage species for sage grouse. Similar to juniper, non-native grasses limit the availability of food source and hiding cover for the sage grouse. However, because the amount of non-timber vegetative treatments would not vary among the alternatives, the incidence of spreading invasive, non-native grasses through these treatments would also not vary among the alternatives. See *Table 4-3 (Estimated first decade levels of non-timber management activity by alternative*),

Grazing allotments overlay the entire Gerber block. Rangeland surveys in the Gerber block have shown that range conditions have been on an upward trend towards late-successional forest and potential natural community since the late 1930s. In 1938, surveys indicated that 68% of range was dominated by cheatgrass communities. A 2004 report states: "[n]ative perennial bunchgrasses, desirable shrub species, and native forbs have all increased in abundance [since 1938], leaving only 4.5% dominated by cheatgrass (and other non-native annual grasses) and in an early to mid- seral successional forest state (USDI unpublished)." Grazing under the No Action Alternative has been compatible with the maintenance and the creation of sage grouse habitat. Grazing levels and practices in the Gerber block would not change under the action alternatives; therefore, grazing would not result in the loss of sage grouse habitat under any of the alternatives.

Forested areas do not provide suitable sage grouse habitat; therefore, timber harvest on the Eastside Management Lands in the Klamath Falls Resource Area would have no impact on the sage grouse habitat. Under all alternatives, understocked forestlands would be reforested and rangeland would be converted from juniper back into historic sagebrush or grassland communities.

It is assumed that under all action alternatives, oil and gas exploration and development, mining and quarries, and infrastructure development (such as roads, communication sites and recreation sites) would occur at the same rate as under the 1995 resource management plan. These actions have caused an inconsequential loss of sage grouse habitat; therefore under all alternatives, an inconsequential amount of habitat would be lost due to these activities within the planning area.

Sage grouse do not currently occur within the planning area; therefore, effects to sage grouse populations are difficult to predict. Disturbances, such as noise and activities associated with human developments, would limit suitable habitat from becoming occupied. Conservation measures to reduce or restrict disturbances would be implemented if a site were to become occupied or if reintroduction were attempted. Off-highway vehicle use in the Gerber block would be restricted to designated roads and trails. This would result in a reduction of disturbance due to off-highway vehicle use. No new campground or other large-scale recreation developments would occur under any of the alternatives within the Gerber block. There would be 18.2 miles of potential trail development for non-motorized users in the action alternatives. Avoiding historic lekking areas and seasonal trail closures would limit disturbance impacts to any new leks that may be established in the future.

West Nile virus in sage grouse was first documented in Oregon in 2006 from Malheur County (ODFW 2008) and Harney County (Hagen 2008). The prevalence of West Nile virus in wild populations of sage grouse in Oregon is unknown. None of the alternatives, including the PRMP, would affect the likelihood of West Nile virus from spreading.

Special Status Species

Federally Listed Threatened and Endangered Species

Under all alternatives, including the PRMP, the 12 federal candidate and listed species identified in *Table 4-82* (*Federally listed candidate, threatened, and endangered species not associated with forested ecosystems*) would be managed to provide for the conservation of the species. These 12 species occur in habitat types that are considered non-forest. In general, the availability of nonforest habitat would be unchanged from the current availability under all alternatives, including the PRMP. Nonforest habitats tend to be comprised of features that are generally noncommercial. All action alternatives contain a management objective to support natural species composition and vegetation on noncommercial areas. With this management objective, the availability of nonforest habitat for the 12 federal candidate and listed species identified in *Table 4-82* (*Federally listed candidate, threatened, and endangered species not associated with forested ecosystems*) would, in general, be maintained.

Bureau Sensitive

Under the No Action Alternative and the PRMP, the Oregon/Washington Special Status Species policy for sensitive species would be applied to O&C lands and public domain lands administered by the BLM within the planning area. Within the harvest land base under Alternatives 1, 2, and 3, sensitive species would be managed on public domain lands and on O&C lands where protection does not conflict with sustained yield forest management. Under Alternatives 1, 2, and 3, where conflicts with sustained yield management occur, protections on O&C lands would only be applied to prevent extinction of a species even if it is not yet listed under the Endangered Species Act.

Application of the current Oregon/Washington Special Status Species policy would include assessment and review of the effects of proposed actions on Bureau sensitive species. This assessment and review would be done by the districts during their project planning of individual projects. Application of this policy would not equate to guaranteed protection for individuals of a sensitive species, only that the conservation needs of the species would be further assessed at the project or implementation level in light of proposed actions.

When conservation measures are determined to be necessary at the project or implementation level, options for conservation would include, but not be limited to: (a) modifying a project (e.g., timing, placement, and/or intensity), (b) using buffers to protect sites, and/or (c) implementing habitat restoration actions (IM-OR-2003-054 Oregon/Washington Special Status Species Policy).

Westside Forest Habitat

The effects to westside forested habitat (i.e., Coast Range, West Cascades, Klamath, Eastern Cascades physiographic provinces) were previously described in this chapter under *Forest Structure and Spatial Pattern*. Refer to *Figure 4-10 (Comparison of the structural stage abundances on the BLM-administered forested lands by 2106 with the current conditions and the average historic conditions by alternative by province)*.

In the Coast Range, West Cascades, and Klamath Provinces, there would be an increase in the amount of mature and structurally complex forest habitat under all alternatives, including the PRMP by 2106. In these physiographic provinces, Bureau sensitive wildlife species that are associated with mature and structurally complex forest habitat would have more habitat available. In the Eastern Cascades Province, mature and structurally complex habitat would become less abundant under Alternatives 1, 2, and 3 by 2106, but would become more abundant under the PRMP by 2106. Under the No Action Alternative, the amount of mature and structurally complex habitat would be unchanged. Refer to *Figure 4-10 (Comparison of the structural stage abundances on the BLM-administered forested lands by 2106 with the current conditions and the average historic conditions by alternative by province)*.

Table 4-82. Federally Listed Candidate, Threatened, And Endangered Species Not Associated With Forested Ecosystems

Status[a]	Scientific Name	Common Name	Habitat Conditions	Critical Habitat
FC	*Eremophila alpestris strigata*	Streaked Horned Lark	Found in the Willamette Valley. Nesting habitat included native prairies and a wide range of agricultural fields (Marshall et al. 2003)	
FC	*Euphydryas editha taylori*	Whulge Checkerspot (Butterfly)	Low-elevation upland prairies; host plant is narrow-leaved plantain (Plantago lanceolata) (ODFW 2006)	
FC	*Polites mardon*	Mardon Skipper (Butterfly)	Meadow habitats; host plants are native fescues (ODFW 2006).	
FC	*Rana pretiosa*	Oregon Spotted Frog	Permanent ponds, marshes and meandering streams through meadows; bottom of dead and decaying vegetation. Springs and other slow moving water (ODFW 2006)	
FT	*Branchinecta lynchi*	Vernal Pool Fairy Shrimp	Ephemeral pools, small, cooler (ODFW 2006). Found on the BLM in Medford District.	432 acres in the Medford District
FT	*Eumetopias jubatus*	Steller Sea Lion	Marine habitats include coastal waters near shore and over the continental slope; sometimes rivers are ascended in pursuit of prey. The most commonly used terrestrial habitat types are beaches used as rookeries and haulouts (NatureServe 2006)	
FT	*Speyeria zerene hippolyta*	Oregon Silverspot Butterfly	Salt spray meadows; host plants early blue and western blue violets (Viola spp.) (ODFW 2006)	Critical habitat not designated for BLM-administered lands.
FE	*Balaenoptera musculus*	Blue Whale	Mainly pelagic; generally prefers cold waters and open seas (NatureServe 2006).	
FE	*Eschrichtius robustus*	Gray Whale	Mostly in coastal and shallow shelf waters. Young are born in lagoons and bays (NatureServe 2006).	
FE	*Icaricia icarioides fenderi*	Fender's Blue Butterfly	Seasonally wet native prairies; host plant is Kincaid's lupine (Lupinus sulphureus kincaidii) (ODFW 2006).	Eugene District
FE	*Megaptera novaeangliae*	Humpback Whale	Pelagic and coastal waters, sometimes frequenting inshore areas such as bays (NatureServe 2006).	
FE	*Pelecanus occidentalis californicus*	California Brown Pelican	A coastal marine species rarely found inland. Roost on sandy shores and offshore rocks; nests on islands and offshore rocks (Marshall et al. 2003)	

[a] Status Codes: FC - Federal candidate for listing, FT - Federally listed as threatened, FE - Federally listed as endangered.

There would be a decrease in the amount of young forest habitat under all alternatives, including the PRMP by 2106 in the Coast Range, West Cascades, and Klamath Provinces. In the Eastern Cascades Province, there would be an increase in the abundance of young forest habitat under the No Action Alternative and Alternatives 1 and 2. Under Alternative 3 and the PRMP, there would be a decrease in young forest habitat abundance within the Eastern Cascades by 2106. Less habitat would be available to sensitive species associated with young forest under all alternatives in the Coast Range, West Cascades, and Klamath Provinces; and under Alternative 3 and the PRMP in the Eastern Cascades Province. Young forest associated species would have more habitat available in the Eastern Cascades under the No Action Alternative and Alternatives 1 and 2. Refer to *Figure 4-10 (Comparison of the structural stage abundances on the BLM-administered forested lands by 2106 with the current conditions and the average historic conditions by alternative by province)*.

The abundance of stand establishment habitat would generally increase by 2106 under all alternatives in all physiographic provinces. Exceptions to this, where stand establishment habitat would decrease by 2106, include the No Action Alternative in the Coast Range and the Eastern Cascades Provinces, and the PRMP in the Eastern Cascades Province. Sensitive species associated with stand establishment habitat would, therefore, have more habitat available under:

- all alternatives in the West Cascades and Klamath Provinces
- Alternatives 1, 2, and 3 in the Eastern Cascades Province
- Alternatives 1, 2, 3, and the PRMP in the Coast Range Province

Under the No Action Alternative in the Coast Range and the Eastern Cascades Provinces, and under the PRMP in the Eastern Cascades Province, there would be less stand establishment habitat available for species associated with it. Refer to *Figure 4-10. (Comparison of the structural stage abundances on the BLM-administered forested lands by 2106 with the current conditions and the average historic conditions by alternative by province)*.

Eastside Management Land Habitat

Under all alternatives, including the PRMP, Ponderosa pine and eastern conifer forests (e.g., juniper and white fir forests) on Eastside Management Lands would have uneven-aged management applied to them. Uneven-aged forest management would cause little change in the structural condition of the Ponderosa pine and eastern conifer forests. The availability of these conifer forests as habitat for sensitive wildlife species would also be changed little from the current condition.

It is assumed that woodland and rangeland management activities in the next decade would occur at approximately the same rate as in the past under the 1995 resource management plan in the Klamath Falls Resource Area. Western juniper that is encroaching and competing and displacing native vegetation on rangelands and juniper woodlands would continue to be treated, utilizing a variety of treatments including: cutting, piling, burning, and utilization for biomass and other forest products. These treatments would remove competing vegetation and allow grassland and sagebrush habitats that are more typical of the native habitats to re-establish. Bureau sensitive species associated with grassland and sagebrush habitats would have additional habitat made available through this re-establishment.

Under all alternatives, understocked forestlands would be reforested and rangeland would be converted from juniper back into sagebrush or grassland communities, causing an inconsequential reduction in hardwood habitat. Riparian hardwood communities would be maintained by controlling encroaching conifers and other activities to restore riparian hardwood communities (i.e., controlled grazing, burning, and planting).

It is assumed that under all action alternatives, oil and gas exploration and development, mining and quarries, and infrastructure development such as roads, communication sites and recreation sites would occur at the same rate as under the 1995 resource management plans. These actions have caused an inconsequential loss of habitat; therefore, under all alternatives, an inconsequential amount of habitat would be lost due to to these activities within the planning area.

Nonforest Habitat

In general, the availability of nonforest habitat would be unchanged from the current availability under all alternatives, including the PRMP. Nonforest habitats tend to be comprised of features that are generally noncommercial. All action alternatives contain a management objective to support natural species composition and vegetation on noncommercial areas, including: noncommercial forests, oak woodlands, shrublands, grasslands, cliffs, rock outcrops, talus slopes, meadows, wetlands, springs, fens, ponds, and vernal pools. With this management objective, the availability of nonforest habitat for sensitive wildlife species would, in general, be maintained.

Riparian Habitat

Riparian Management Areas would constitute approximately 37% of BLM-administered lands under the No Action Alternative, 20% under Alternative 1, 13% under Alternative 2, 11% under Alternative 3, and 10% under the PRMP as shown in *Table 4-83* (*Riparian management areas across all land use allocations under the alternatives*). For a discussion of environmental consequences regarding water quality and fisheries, which are also pertinent to riparian habitat, see the *Water and Fish* sections of *Chapter 4*.

Riparian Reserves under the No Action Alternative and Riparian Management Areas under the action alternatives are designated along streams. Although the areas in Riparian Reserves or Riparian Management Areas beyond the width of one site-potential tree (generally greater than 150 feet in western Oregon) on either side of the stream would add little to maintenance of lotic and riparian species assemblages (Cockle and Richardson 2003, McComb et al. 1993, Vessely and McComb 2002, Haggerty et al. 2004, Gomez and Anthony 1996), studies found differences for at least some species out to 150-300 feet.

Vesely and McComb (2002) found buffer strips 66 feet wide contained approximately 80% of the detectable torrent salamanders, Pacific giant salamanders, and Dunn's salamanders. Additional width out 90 to 100 feet would assist in stabilizing diurnal variations in temperature and relative humidity. The abundance of species associated with riparian areas and streams abundance would be maintained under the No Action Alternative, Alternative 1, and the PRMP along intermittent streams, because Riparian Management Areas would be 100-feet wide; this width would be sufficient to maintain the environmental conditions, moisture, and temperature necessary to support riparian-associated species.

Under Alternatives 2 and 3, Riparian Management Areas would extend to 100 feet on either side of perennial and fish-bearing streams. Additionally, under Alternative 2, intermittent streams at high risk of debris flows would have a 100-feet Riparian Management Area. These Riparian Management Areas would be managed to maintain stream temperature, organic matter inputs, and large wood. Stands would be managed to maintain or develop mature or structurally complex forest structural stage classifications. Habitat for species associated with the stream channel and the area immediately adjacent to the streams would be maintained. Species not as strongly associated with the near-stream habitat would decline in abundance, because the canopy openings that would occur in the area between 25 and 100 feet from the stream and the regeneration of habitat beyond 100 feet from the stream channel would create habitat unfavorable to those species.

Table 4-83. Riparian Management Areas Across All Land Use Allocations Under The Alternatives

Alternative	Riparian Management Area (% Total BLM-administered Lands)
No Action	37
Alternative 1	20
Alternative 2	13
Alternative 3	11
PRMP	10

Riparian Management Areas under Alternative 2 would allow harvest within 25 feet of intermittent streams, except for debris-flow prone areas which would allow no harvest within 25 feet. The noncommercial vegetation that would be retained within 25 feet of intermittent streams (except debris- flow prone) would not maintain the thermal regime of the habitat within the Riparian Management Area. Amphibians associated with streams are especially susceptible to desiccation in dry environments, and they would be susceptible to localized declines in Riparian Management Areas. Harvesting in the adjacent forest within the shade zone of the stream (e.g., within 25 feet) would have effects on stream amphibian populations that last from 25 to over 50 years post harvest (Bury 2005, Karraker and Welsh 2006, Bury and Pearl 1999, Ashton et al. 2006).

Retention of trees in the 25-feet Riparian Management Area of intermittent non-fish-bearing streams under Alternative 3 would have similar effects to those described in the previous paragraph under Alternative 2. This is because the canopy provided by trees within 25 feet of the stream channel would be sparse, and the forest edges created between Riparian Management Areas and upland regeneration harvest would increase diurnal and seasonal temperature fluctuation and decrease the relative humidity and the microclimate within the Riparian Management Area (Vesely and McComb 2002, Anderson et al. in press). Amphibians associated with streams are especially susceptible to desiccation in dry environments, and they would be susceptible to localized declines in Riparian Management Areas that would be treated under Alternative 3. Harvesting in the adjacent forest within the shade zone of the stream (e.g., within 25 feet) would have effects on stream amphibian populations that last from 25 to over 50 years post harvest (Bury 2005, Karraker and Welsh 2006, Bury and Pearl 1999, Ashton et al. 2006).

Approximately 4,000 acres of harvest would occur over the next 10 years along non-debris flow prone, non-fish-bearing intermittent streams under Alternative 2 (approximately 1% of the total area within 100 feet of all intermittent streams) on BLM-administered lands within the planning area. A similar amount of harvest would occur within Riparian Management Areas under Alternative 3. At the local scale, Riparian Management Areas under Alternatives 2 and 3 adjacent to these intermittent streams would not maintain a stable assemblage of stream and riparian associated wildlife species. At the fifth-field watershed or larger scale, impacts to species assemblages and their connectivity are not anticipated under Alternative 2 or Alternative 3, because approximately 1% of the total area within 100 feet of intermittent streams would be impacted per decade.

Forest Floor Habitat

Regeneration harvests and the associated impact to adjacent forests would result in the loss of forest floor habitat. This loss would be a result of the breakage and removal of existing forest structure during harvest and the decreases in soil and down wood moisture levels because of increases light and wind penetration into adjacent stands.

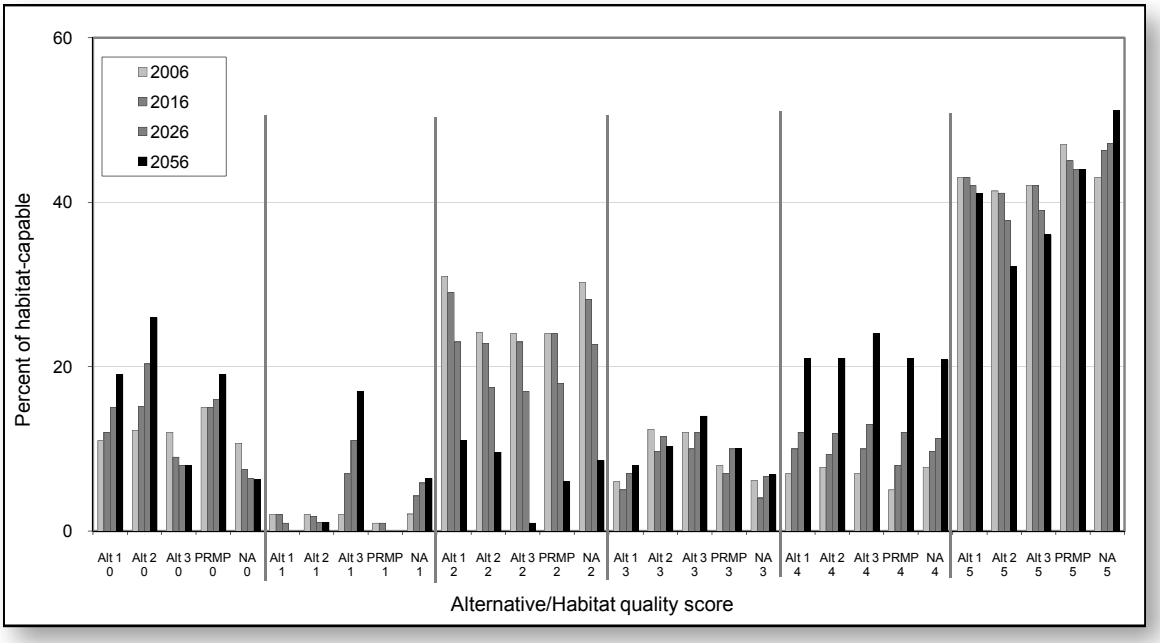
Twenty random watersheds were modeled to evaluate the effects of regeneration harvests and legacy retention direction on forest floor habitat. Structural stage sub-divisions as described in *Appendix B - Forest Structure and Spatial Pattern* were scored based on habitat values as shown in *Table 4-84* (*Forest floor habitat quality ratings*). Structural stage scores were decreased if there was a lack of legacy, if canopy cover was low, and if location occurred within 50 feet of a stand in the stand establishment structural stage. Habitat values for young stands (without legacy) were increased one point when they reached 50 years of age to account for natural development of legacy. The habitat quality scores have no proportional relationship to each other. A stand with a score of 4 would not provide twice as much habitat benefit as a score of 2.

As shown in *Figure 4-138* (*Forest floor habitat quality summary for each alternative*), under all alternatives at least 50% of the forested habitat would receive a habitat quality score of 4 or 5 by 2056. Differences between the alternatives in the amount of forest floor habitat within habitat quality categories 0 to 3 would occur as a result of legacy retention and the amount of harvesting activities. Since Alternative 1, Alternative 2, and the PRMP do not have legacy retention requirements in their land use allocations associated with the harvest land base (Timber Management Area, Deferred Timber Management Area, and Uneven-Age Timber Management Area), they would have more forest floor habitat with a 0 to 3 score (i.e., lower habitat quality) compared to the No Action Alternative and Alternative 1. Habitat quality 2 under Alternative 3 would be comprised mainly of young, low density forest stands with legacy. Under Alternative 3, this category would drop to 1% of the BLM-administered lands in 2056. This would be due primarily to the fact that harvested

Table 4-84. Forest Floor Habitat Quality Ratings

Structural Stage Condition	Habitat Quality Score
Road and non-forest	0
Stand establishment with legacy	1
Stand establishment without legacy	0
Young low density with legacy	2
Young low density without legacy	1
Young low density without legacy, > 50 years old	2
Young high density with legacy	3
Young high density without legacy	2
Young high density without legacy, >50 years old	3
Mature single canopy	4
Mature multiple canopy	5
Structurally complex	5

Figure 4-138. Forest Floor Habitat Quality Summary For Each Alternative



stands under Alternative 3 would move more quickly from the stand establishment (with legacy) structural stage directly to the mature, or structurally complex structural stages. Legacy structures (downed wood and snags) are key habitat features in enabling forest floor species to maintain a presence in a stand when regeneration harvests occur.

Under all alternatives, trends in each physiographic province would resemble those displayed in *Figure 4-138 (Forest floor habitat quality summary for each alternative)*. The model assumes that forest floor associates persist through harvest activities or recolonize from adjacent habitats, either Riparian Management Areas or upland areas. Based on the results of this modeling, at least 50% of the forest floor habitat would persist in habitat quality category 4 or 5 under all alternatives. Therefore, forest floor associated species would persist on BLM-administered lands under all alternatives, including the PRMP.