that the BLM manages its resources that would increase your community's capacity and resiliency?	

City of Sublimity

Date: July 28, 2014

Participants:
Sam Brentano, County Commissioner; Marion County Board of Commissioners, former Mayor of Sublimity
Hitesh Parekh, Management Analyst; Marion County
Clive Graham, Principal; ERM
Jill Bellenger, Associate Consultant; ERM

Table O-320. City of Sublimity interview.

Question	Discussion/Response
How do you view your community's "capacity," that is your community's ability to face changes, respond to external and internal stresses, create, and take advantage of opportunities, and meet its needs?	Commissioner Brentano (Sam) is a former Mayor of Sublimity (1983-1993) and understands its unique needs and challenges. He recalls that Sublimity was formerly an almost entirely agricultural- and timber- based economy, which has shifted dramatically in recent decades as all the mills in Marion County have closed. He recalled that in the 1970s and 1980s there were mills in many of the nearby towns and many mill owners lived in Sublimity; at that time, he said, the city had a high per capita income. Today he described Sublimity as a healthy, middle-class town – but essentially a bedroom community for Salem. There is little or no involvement by the city's residents in forest-related industries, whereas these used to be a key source of economic vitality. In spite of high household incomes (Sublimity's was the highest among the cities interviewed) its tax base is too low to cover many necessary services. The city contracts with Marion County for public safety (Sheriff), and relies on the county for many services including public safety, courts, and solid waste. The county spends 80% of its general fund on these services. The city depends on the county for so many services that as the county's ability to provide services is strained, the city's capacity is reduced.
How do you view your community's "resiliency," that	The city has changed over time as described above. Sam said that Marion County, by having less BLM acreage, is not as dependent as other O&C Counties on timber.

Question	Discussion/Response
is your community's ability to adapt to change over time?	The county payments (Secure Rural Schools and PILT) help, but they currently total $5 to $6 million a year and make up a small share of the county budget.
How do the ways the BLM manages its resources affect your community (its capacity and resiliency)?	Sam said that the BLM owns approximately 20,000 acres of land in Marion County while the U.S. Forest Service owns 200,000 acres making the BLM's impact on the county lower than in other counties. Sam's concern is with the way the BLM (and other agencies) manages the timber resources. In his view, it should be treated like a crop and managed to help communities. This is not how the timberlands are currently being managed, and as a result, they contribute little to the community's capacity. In some respects, lack of management is a drain on resources. For example, the county has to spend timber dollars to pay for Sheriff's deputies to patrol around the forest. Sam thought there was more federal patrol oversight in the past. Sam also believes that the mismanagement contributes to the number and extent of forest fires. The BLM has some small recreation areas near Sublimity, which are used by residents, namely the Elkhorn Valley Recreation Site (Little North Santiam Recreation Area, Yellowbottom Recreation Site, and Fishermen's Bend). These are small and contribute little to overall community capacity.
Have changes in the BLM's resource management over time affected your community? In what ways? Are there changes in the ways that the BLM manages its resources that would increase your community's capacity and resiliency?	In Sam's view, the key to increasing community capacity and resiliency is a sustainable timber harvest. The lack of timber harvest has hurt communities by reducing income and leaving a resource that is simply waiting to burn – this is bad policy. The market is there for Oregon. Canada stepped in and took market share as the U.S. stopped producing.

City of Winston

Date: August 25, 2014

Participants:
Sharon Harrison, Mayor; City of Winston
Ken Harrison, former U.S. Forest Service employee

Kevin Miller, Superintendent; Winston-Dillard School District
David M. Van Dermark, City Manager; City of Winston
Clive Graham, Principal; ERM
Jill Bellenger, Associate Consultant; ERM
Kristina Higgins, Intern; ERM

Table O-321. City of Winston interview.

Question	Discussion/Response
How do you view your community's "capacity," that is your community's ability to face changes, respond to external and internal stresses, create, and take advantage of opportunities, and meet its needs?	Both Mr. (Ken) and Mayor (Sharon) Harrison are long-time residents of Winston, having owned and operated the Harrison Hardware store for over 20 years prior to its sale in 2013. Ken is also a former timber industry employee; he worked for the U.S. Forest Service as well as private timber companies that worked with the BLM and the U.S. Forest Service. The city's population increased by 16% between 2000 and 2012 (from 4,613 to 5,352), but Winston's poverty rate in 2012 was 30%, twice the rate for the state as a whole. Kevin said that Winston struggles with economic resources and is "living close to the bone." The city is becoming a retirement community. While retirees help the city fiscally to some degree – paying property taxes, for example, - they don't tend to spend much and as a result do not contribute to the local economy as much as the family-wage jobs that used to be more prevalent. Kevin pointed out that the nearest major medical center is in Roseburg (roughly 10 miles north) where there is a VA hospital. Winston residents may spend their dollars in Roseburg when attending medical appointments. David says that the city is open to development and is very business-friendly. It has capacity for growth and is ready to grow. The Cow Creek Band of Umpqua Tribe of Indians owns land near Winston in the city's growth area, but it has little impact on the city's capacity. The Tribe raises alfalfa and beef cattle. The Tribe owns a casino in Canyonville approximately 25 miles south of Winston along Interstate 5.

Question	Discussion/Response
How do you view your community's "resiliency," that is your community's ability to adapt to change over time?	Sharon says that Winston was and remains a timber-dependent community. Roseburg Forest Products, which is in Dillard about 3 miles south of Winston, employs 1,200 to 1,500 people at several mills. (This accounts for the high number of jobs in the manufacturing sector in a 5-mile radius around the City in the Census data). There were many layoffs there in 2008 but employment has almost recovered. Kevin added that mechanization has affected employment. A shift that used to require 100 people now needs only 30. The city has struggled to adapt to a changing economy and demographics. Kevin said that in 1980s the school district had some 2,000 children; today there are approximately 1,400. There is a sense that the job growth is in Portland. The Winston community today is very mobile and people move to the jobs. The community has also lost truck farms. New businesses such as wineries have opened but the wages, relatively speaking, are lower. Sharon feels the overall income in Winston has been reduced.
How do the ways the BLM manages its resources affect your community (its capacity and resiliency)?	Ken said that the BLM's management practices affect the community greatly. He said that recent policy is marked by lack of management. The only tree cutting is thinning which leaves the old growth trees that can't be touched due to the Endangered Species Act. Winston and the surrounding Douglas County have a huge forestland base – which is a renewable resource, unlike minerals which are a one-time extraction. However, unlike 20 years ago when the BLM was more actively managing these lands and timber harvests were putting dollars into the county budgets, today the city does not get the benefits it used to. David points out that in the past the cities were given pass-through funds from Secure Rural Schools to help manage their road maintenance. Winston received $100,000 annually (a quarter of its $400,000/year road budget) until these funds were stopped in 2010. The lack of O&C funds has resulted in raised costs to the city, such as IT, jail beds, and radio communication. He does not blame the BLM; rather he puts the blame on environmental interests who file frequent lawsuits against the BLM. Kevin noted a recent lawsuit regarding the Elliott State Forest. The forest is part of the Common School Fund Lands to be managed for the benefit of the schools under the Oregon Constitution. A portion of the forestland, under the instruction of the State Land Board, is slated to be sold to a private entity, though environmental groups have claimed that this sale should not be allowed to take place. The Winston-Dillard School District has filed an amicus brief in support of the sale, as this will result in a harvest and sales benefits for schools. Kevin said that the BLM is decommissioning roads – creating a more natural environment but limiting access to the forest. This is a serious problem with respect to access for first responders in the event of a forest fire, preventing access for emergency vehicles. In addition, this reduces forest access from a recreation standpoint.

Question	Discussion/Response
	Kevin did wish to point to an alternative education program; a collaboration with the BLM that teaches children about working in the forests and on stream restoration. He sees this as a very beneficial program.
Have changes in the BLM's resource management over time affected your community? In what ways? Are there changes in the ways that the BLM manages its resources that would increase your community's capacity and resiliency?	David feels that if the BLM should get back to timber harvest and land management in the manner in which it did in the past. This would provide revenues and reduce the incidence of large forest fires and other problems. In his view, the BLM is not in compliance with the O&C Act - requiring that the lands be managed to contribute to the economic stability of local communities and industries. He feels that there is worldwide market demand for timber products, as well as a need to harvest the timber in an efficient and economically viable way. Oregon produces Douglas-fir, a great tree for framing houses. As Oregon scaled down its harvest, Canada has been increasing its timber exports and sends logs to the U.S. to be milled.

Confederated Tribes of the Grand Ronde Community of Oregon

Date: July 8, 2014

Participants:
Heather Ulrich, District Archaeologist; Bureau of Land Management
Michael Wilson, Natural Resources Department Manager; Confederated Tribes of the Grand Ronde Community of Oregon
Clive Graham, Principal; ERM
Jill Bellenger, Associate Consultant; ERM

Table O-322. Confederated Tribes of the Grand Ronde Community of Oregon interview.

Question	Discussion/ Response
How do you view your community's "capacity," that is your community's ability to face changes, respond to external and internal stresses, create and take advantage of opportunities, and meet its needs?	The word "community" needs to be understood broadly. It needs to consider the greater membership of the Grand Ronde tribes, not just those living on the reservation or in the tribally owned lands in the (unincorporated) town of Grand Ronde. The tribes have 5,000 to 6,000 members spread out over the lands that were ceded to the U.S. including, for example, in the BLM's Roseburg and Medford districts. Mike said he would look for membership data to supplement the census data that is specific to tribally owned lands. The Grand Ronde's capacity has increased over time, for example, since the Northwest Forest Plan, but the Community still faces challenges in serving its members and meeting its mission. There are more jobs today than back then but this is not attributable to the BLM.

Question	Discussion/ Response
	Funding for tribal functions comes from a variety of sources. Mike estimated the income from timber sales at approximately $2 to $3 million a year. The Tribes get the majority of their funds from the casino. The Tribe does not levy a property tax. Mike said he would look into measures of community income/wealth that might be comparable to, for example, the tax base of a city or county, in order to help the BLM understand the Tribes' financial capacity. The Grand Ronde has taken on community building functions such as housing, education, and health care. The State passed legislation allowing tribes to create their own police departments. Grand Ronde has a police department in the town of Grand Ronde (unincorporated), and has developed its own fire station. The members living in this area wanted to make sure they had these services (where county services were lacking). The Tribes have established a "Spirit Mountain Community Fund" to support members and projects throughout the Tribes' geographical areas of interest. The fund is supported by revenues from the casino. It has helped fund, for example, a charter school and an environmental project on the Willamette River.
How do you view your community's "resiliency," that is your community's ability to adapt to change over time?	The Tribes have shown their resiliency in the way they have diversified their economy; the Spirit Mountain Casino, for example, being a major economic driver. The diversification has helped the Tribe's resilience. During the recession, there was a significant drop in casino revenues.
How do the ways the BLM manages its resources affect your community (its capacity and resiliency)?	Members have an interest in gathering plants when needed on BLM land, hunting, and access to places of spiritual significance. Mike felt the BLM has done a good job in meeting those needs and interests. The way the BLM manages its timber resources affects the community. Many tribal members live in timber-dependent communities. The Grand Ronde sells timber from its reservation. The Tribes understand the need for mills, loggers, and competition. The BLM can play a role in maintaining the industry. A healthy industry is important to support the services that are important to tribal members such schools, police, fire, and roads. As Mike talks to people in the timber industry, the importance of having a predictable supply of raw material is very important. In addition, if the mills are too far away the logs lack value; competition is important. Mike said he would send the forest management plan (10-year plan) for the Grand Ronde's forest. Mike did not see a direct correlation between the BLM's resource management and the casino revenues that are driven by broader economic trends.

Question	Discussion/ Response
	There are management issues on the micro level. For example, there is about a mile of boundary sharing on the eastern side of the Grand Ronde reservation, where the tribes share a road with the BLM.
Have changes in the BLM's resource management over time affected your community? In what ways? Are there changes in the ways that the BLM manages its resources that would increase your community's capacity and resiliency?	The lack of predictability in the timber market and sales has affected tribal members in that timber supports the broader economy. If the broader economy is doing well then the Tribes will benefit too. The ways BLM manages cultural resources and natural resources/habitat affects the community. The BLM could work with the Tribes to find the right balance in protecting these resources, and provide more resource-based jobs to help industry. With respect to hunting there is disappointment over declining opportunities to hunt deer and elk - fewer openings and meadows due to lack of active management, so the hunting areas for those species have declined. But Mike thought this was more of a U.S. Forest Service issue than a BLM issue.

Coquille Indian Tribe

Date: July 14, 2014

Participants:
Brenda Meade, Tribal Chairperson, Coquille Indian Tribe
George Smith, Executive Director, Coquille Indian Tribe
Mark Johnston, Deputy Executive Director, Coquille Indian Tribe
Clive Graham, Principal; ERM
Jill Bellenger, Associate Consultant; ERM
Heather Ulrich, District Archaeologist; Bureau of Land Management

Table O-323. Coquille Indian Tribe interview.

Question	Discussion/Response
How do you view your community's "capacity," that is your community's ability to face changes, respond to external and internal stresses, create, and take advantage of opportunities, and meet its needs?	George gave a little background recent history about the Coquille Indian Tribe. The Coquille Indian Tribe was terminated in 1954, but the United States reinstituted federal recognition to the Tribe and restored its full sovereignty rights in 1989. Tribal membership is now approximately 1,000 across five counties in southwest Oregon. The 297 number in the Census data only reflects the population on the approximately 6,500 acres in the Census Bureau's boundary maps – mostly in the North Bend/Coos Bay area. The 1954 termination "cut loose" the membership resulting in more assimilation into local communities compared to reservations such as Warm Springs. This means that the socioeconomic state of the Tribe is

Question	Discussion/Response
	closely bound up with local communities; the counties and cities, such as Coos Bay and North Bend. For example, Coquille children attend community schools so when these schools are affected by cutbacks, tribal children and families are equally affected. Southwestern Oregon was historically heavily dependent on timber and fishing. Coos Bay was an export center for the Oregon coast. Since the 1990s, there has been an 80% reduction in timber sales. As a result, Coos County and the Coos Bay area became economically stressed. The recession that began in 2007 was one more blow and the area has not recovered. Brenda added that the Tribe is currently facing the strain of responding to increasing needs of the tribal membership; increased population and healthcare costs. Census data indicate a tribal poverty rate of 23% compared to 15% for the State as a whole. The Coquille Indian Tribe is the second largest employer in Coos County, making it a vital part of the wider economic landscape. In summary, the Tribe has internal capacity and resources but is located in a region of Oregon with macro level economic challenges that strain the Tribe's capacity to meet its needs.
How do you view your community's "resiliency," that is your community's ability to adapt to change over time?	The Tribe has shown its resiliency by its survival, resurgence, and recent population growth. The Tribe has adapted and continues to adapt to economic realities. The Mill Resort and Casino in Coos Bay is an important source of income for the Tribe, but revenues were significantly affected by the recession, and only now are they beginning to climb back to pre-recession numbers. Overall economic recovery in southwest Oregon has been much slower than in the metropolitan parts of the State. The Tribe is engaged in economic development initiatives through the Coquille Economic Development Corporation. These include business ventures in forestry, arts and exhibits, gaming and hospitality, assisted living and memory care, high-speed telecommunications (Optical Rural Community Access Communications) and renewable energy. Because tribal and tribal members' fortunes are closely tied to the local communities, resiliency is also affected by the communities' lack of resiliency. For example, Brenda pointed out that in attempting to address budget constraints, the Coos Bay School District went to a 4-day school week during the 2013-14 school year. This type of action affects tribal members' lives.
How do the ways the BLM manages its resources affect your community (its capacity	The timber industry is a major driver for Coos County and so that the way BLM manages its resources has a great effect on the community.

Question	Discussion/Response
and resiliency)?	The Tribe owns the Coquille Forest, comprised of 14 separate parcels of former BLM timberlands in eastern Coos County, totaling approximately 5,410 acres. The Tribe is legally mandated to manage the forest consistent with BLM's management practices. This places a financial management burden on the Tribe. Bureau of Indian Affairs funding covers some the need, but the Tribe has to supplement. The Tribe believes that the BLM's practices are not all in the Tribe's economic interests. For example, George said that BLM's practices follow guidelines in the Northwest Forest Plan but that these guidelines go beyond the requirements of the Endangered Species Act and NEPA. As a result, the forests are becoming overgrown and are not being given the opportunity to regenerate. The Tribe is proud of its management practices. The Coquille Forest is Forest Stewardship Council (FSC) certified. The Tribe is very concerned about habitat, water resources, and water quality – such as for salmon runs. George said that Tribal monitoring has been held up as a national model. Mark said that BLM's management of recreation resources had little effect on the Tribe. He did note BLM's role in helping manage the local Dunes National Recreation Area at the mouth of the Umpqua River that attracted visitors and some spinoff visitation to tribal facilities near Coos Bay.
Have changes in the BLM's resource management over time affected your community? In what ways? Are there changes in the ways that the BLM manages its resources that would increase your community's capacity and resiliency?	Brenda feels that the federal lands have not been managed well; very few jobs are generated. George added that the biggest change in resource management has been the decrease in the timber harvest. Practices have changed from allowing sales, Survey and Manage, then to only allowing thinning – all triggering lawsuits. George feels that BLM's forest management is driven more by risk aversion to lawsuits than by its obligations to manage for sustained yield. As noted above, he believes this has led the BLM to go over and above its obligations under the ESA and NEPA. A more balanced, science driven approach would increase the Allowable Sale Quantity (ASQ) which would result in higher timber sales and a stronger local economy; which would help the Tribe. The timber capacity is there; the forest is very productive. Most of the Coquille land is in a trust from the federal government, and the Tribe has been constrained by economic stress from litigations in the timber industry and increasing restrictions and requirements incurred by the BLM and other agencies related to how the Tribe is required to manage its timber. The way the BLM has been writing its management plans goes above and beyond, as George points out, what is required for endangered species protection and NEPA regulations. The Tribe supports federal legislation that would decouple management of the Coquille Forest from BLM management.

Question	Discussion/Response
	Brenda added that the Tribe is very concerned about fire; she believes that BLM's management has been "cookie cutter" easy to administer but having negative consequences such as allowing the buildup of material that is fuel for fire. Tribal lands are open to the public. The Tribe would like to work with the BLM to allow it to erect fences and gates to protect access to certain areas.

Issue 6

Would the alternatives result in environmental justice impacts (disproportionally high and adverse effects on minority, low-income, or Tribal populations or communities)?

Minority Populations Meeting Environmental Justice Criteria

Table O-324. Minority populations meeting environmental justice criteria.

Geography	Total Population	All minorities		Hispanic	
		Number	Percent	Number	Percent
Oregon	3,836,628	563,921	15%	449,888	12%
Benton County					
Summit CDP	66	33	50%	0	0%
Clackamas County					
Barlow City	302	24	8%	87	29%
Canby City	15,770	1,264	8%	3,735	24%
Happy Valley City	14,050	3,900	28%	697	5%
Johnson City	657	50	8%	244	37%
Coos County					
Glasgow CDP	1,057	232	22%	14	1%
Powers City	890	179	20%	83	9%
Jackson County					
White City CDP	7,392	1,027	14%	2,301	31%
Josephine County					
Merlin CDP	1,484	353	24%	65	4%
Selma CDP	579	56	10%	117	20%
Klamath County					
Bonanza Town	418	51	12%	76	18%
Chiloquin City	766	603	79%	44	6%
Malin City	712	156	22%	555	78%
Merrill City	805	110	14%	416	52%
Lincoln County					
Lincoln Beach CDP	1,982	482	24%	358	18%
Siletz City	1,400	441	32%	42	3%
Linn County					
Crabtree CDP	308	49	16%	66	21%
Waterloo Town	320	35	11%	73	23%
West Scio CDP	163	40	25%	21	13%
Marion County	315,391	61,715	20%	76,429	24%
Brooks CDP	665	173	26%	88	13%
Four Corners CDP	16,472	4,555	28%	6,360	39%
Gervais City	2,475	754	30%	1,700	69%
Hayesville CDP	18,224	6,383	35%	6,891	38%
Hubbard City	3,154	920	29%	1,221	39%
Keizer City	36,402	4,673	13%	7,015	19%
Labish Village CDP	195	113	58%	128	66%
Mount Angel City	3,347	603	18%	953	28%

Geography	Total Population	All minorities		Hispanic	
		Number	Percent	Number	Percent
Salem City (1)	154,835	28,403	18%	30,565	20%
St. Paul City	310	31	10%	73	24%
Stayton City	7,637	1,234	16%	1,535	20%
Woodburn City	23,879	9,067	38%	13,444	56%
Multnomah County	737,110	158,601	22%	79,791	11%
Fairview City	8,884	1,807	20%	1,268	14%
Gresham City	105,612	20,891	20%	21,074	20%
Maywood Park City	1,008	226	22%	4	0%
Portland City	585,888	131,729	22%	54,420	9%
Wood Village City	3,870	644	17%	1,160	30%
Polk County					
Independence City	8,535	1,724	20%	3,271	38%
Tillamook County					
Bayside Gardens CDP	804	156	19%	0	0%
Washington County	531,818	122,803	23%	83,085	16%
Aloha CDP	50,710	15,057	30%	10,664	21%
Beaverton City	90,254	25,072	28%	14,310	16%
Bethany CDP	20,505	7,914	39%	960	5%
Bull Mountain CDP	8,990	1,847	21%	224	2%
Cedar Hills CDP	9,273	1,919	21%	1,205	13%
Cedar Mill CDP (1)	15,118	2,919	19%	529	3%
Cornelius City	11,867	4,039	34%	5,916	50%
Forest Grove City	21,245	3,609	17%	5,338	25%
Hillsboro City	91,998	26,243	29%	22,885	25%
Oak Hills CDP	11,005	3,065	28%	418	4%
Rockcreek CDP	9,488	1,888	20%	572	6%
Tualatin City (1)	26,106	3,814	15%	4,852	19%
Yamhill County					
Dayton City	2,537	820	32%	1,021	40%
Grand Ronde CDP (1)	1,451	677	47%	115	8%
Lafayette City	3,709	445	12%	904	24%
McMinnville City	32,092	5,672	18%	6,324	20%
Sheridan City	6,086	966	16%	974	16%
Tribes					
Coos, Lower Umpqua, and Siuslaw Reservation and Off-Reservation Trust Land, OR	24	12	50%	0	0%
Coquille Reservation and Off-Reservation Trust Land, OR (2)	297	166	56%	15	5%
Grand Ronde Community and Off-Reservation Trust Land, OR	473	381	81%	7	1%
Klamath Reservation, OR	17	11	65%	0	0%
Siletz Reservation and Off-Reservation Trust Land, OR	476	420	88%	19	4%
Warm Springs Reservation and Off-Reservation Trust Land, OR	3,960	3,657	92%	372	9%

Notes: Geographies meeting the 50 percent criterion shown in gray with black border. Geographies meeting the meaningfully greater criterion shown in gray.
(1) Where a city or Census Designated Place (CDP) spans more than one county, the BLM assigned it to the county with largest share of population.
(2) Shows 2009 American Community Survey 5-Year Data since 2012 data not available
Sources:
U.S. Census Bureau; American Community Survey, 2012 American Community Survey 5-Year Estimates, Tables DP03, DP04, DP05, S1901 and S1701; American FactFinder; http://factfinder2.census.gov ; (July 2014).
U.S. Census Bureau; American Community Survey, 2011 American Community Survey 5-Year Estimates, Tables DP03, DP04, DP05, S1901 and S1701; American FactFinder; http://factfinder2.census.gov ; (July 2014).
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Low-Income Populations Meeting Environmental Justice Criteria

Table O-325. Low income populations meeting environmental justice criteria.

Geography	Type	Total Population	Poverty Population (Shaded Cells are ≥ 25% of State Percentage)		Total Households	Median Household Income	Low-Income Households (Shaded Cells are ≥ 25% of State Percentage)	
			Number	Percent			Number	Percent
Oregon		3,836,628	584,059	15%	1,512,718	$50,036	366,078	24%
Benton County	County	85,501	17,418	20%	33,502	$48,635	9,716	29%
Alpine CDP	CDP	114	37	32%	45	$19,750	24	53%
Alsea CDP	CDP	126	22	17%	52	$33,654	20	39%
Corvallis City	City	54,341	14,355	26%	21,391	$37,793	7,765	36%
Monroe City	City	635	73	11%	243	$36,328	78	32%
Clackamas County	County	377,206	36,265	10%	145,004	$63,951	24,506	17%
Estacada City	City	377,206	674	25%	1,071	$39,844	380	36%
Government Camp CDP	CDP	131	4	3%	64	$250,000	29	45%
Johnson City	City	657	176	27%	295	$33,456	120	41%
Clatsop County	County	37,068	5,725	15%	15,757	$44,330	4,286	27%
Astoria City	City	9,510	1,896	20%	4,171	$40,603	1,360	33%
Cannon Beach City	City	1,373	344	25%	650	$39,559	222	34%
Warrenton City	City	4,991	811	16%	2,047	$35,325	643	31%
Westport CDP	CDP	483	56	12%	227	$26,435	98	43%
Columbia County	County	49,317	6,797	14%	19,060	$55,358	4,289	23%
Clatskanie City	City	1,788	391	22%	723	$35,875	257	36%
Deer Island CDP	CDP	269	57	21%	140	$48,182	53	38%
Prescott City	City	34	5	15%	19	$23,750	12	63%
Coos County	County	62,937	10,661	17%	26,567	$37,853	8,581	32%
Bandon City	City	3,053	443	15%	1,684	$34,279	635	38%
Barview CDP	CDP	1,832	803	44%	752	$20,133	456	61%
Bunker Hill CDP	CDP	1,892	396	21%	573	$21,305	319	56%
Coos Bay City	City	15,938	2,899	18%	6,659	$38,820	2,224	33%
Lakeside City	City	1,444	230	16%	675	$36,779	213	32%
Myrtle Point City	City	2,496	635	25%	1,007	$29,702	391	39%
Powers City	City	890	192	22%	313	$28,750	146	47%
Curry County	County	22,344	3,048	14%	10,320	$38,401	3,488	34%
Gold Beach City	City	2,563	370	14%	1,029	$50,958	330	32%
Harbor CDP	CDP	2,098	384	18%	1,251	$26,629	589	47%
Langlois CDP	CDP	218	76	35%	92	$33,906	28	31%
Nesika Beach CDP	CDP	352	40	11%	200	$26,813	71	36%
Port Orford City	City	1,198	328	27%	568	$30,667	238	42%
Douglas County	County	107,391	18,777	17%	43,678	$40,096	12,667	29%
Gardiner CDP	CDP	94	25	27%	45	$85,625	9	20%
Glendale City	City	854	243	28%	323	$34,226	111	34%

Clide CDP	CDP	1,867	466	25%	698	$49,940	161	23%
Lookingglass CDP	CPD	1,227	371	30%	424	$41,802	126	30%
Melrose CDP	CDP	743	62	8%	323	$50,938	98	30%
Myrtle Creek City	City	3,446	805	23%	1,388	$37,650	557	40%
Reedsport City	City	4,165	903	22%	1,864	$28,293	805	43%
Riddle City	City	921	209	23%	409	$39,034	140	34%
Roseburg City	City	21,542	3,892	18%	9,454	$39,621	3,101	33%
Roseburg North CDP	CDP	6,493	1,462	23%	2,700	$30,951	948	35%
Tri-City CDP	CDP	3,866	829	21%	1,317	$43,220	302	23%
Winchester Bay CDP	CDP	243	19	8%	104	$55,652	46	44%
Winston City	City	5,352	1,584	30%	1,809	$31,627	662	37%
Yoncalla City	City	1,145	310	27%	486	$32,813	189	39%
Jackson County	County	203,613	33,346	16%	83,370	$43,664	23,093	28%
Butte Falls Town	Town	516	129	25%	179	$39,267	50	28%
Foots Creek CDP	CDP	861	105	12%	392	$37,917	153	39%
Gold Hill City	City	1,087	208	19%	470	$37,375	146	31%
Phoenix City	City	4,550	765	17%	2,126	$31,267	746	35%
Shady Cove City	City	2,893	502	17%	1,348	$35,695	506	38%
Talent City	City	6,086	1,156	19%	2,797	$32,961	1,108	40%
Trail CDP	CDP	203	26	13%	124	$28,125	44	36%
White City CDP	CDP	7,392	1,584	21%	2,338	$42,163	592	25%
Wimer CDP	CDP	708	149	21%	313	$18,375	173	55%
Josephine County	County	82,636	16,301	20%	34,373	$36,699	11,446	33%
Cave Function City	City	1,817	613	34%	740	$22,016	433	59%
Fruitdale CDP	CDP	900	229	25%	348	$39,231	120	35%
Grants Pass City	City	34,454	6,962	20%	14,545	$32,991	5,353	37%
Kerby CDP	CDP	397	219	55%	189	$18,250	145	77%
O'Brien CDP	CDP	143	38	27%	106	$25,987	38	36%
Selma CDP	CDP	579	300	52%	214	$23,438	117	55%
Takilma CDP	CDP	175	11	6%	99	$13,264	74	75%
Williams CDP	CDP	1,195	372	31%	492	$37,264	143	29%
Klamath County	County	66,350	12,143	18%	27,747	$41,066	8,740	32%
Bonanza Town	Town	418	90	22%	149	$35,179	51	34%
Chiloquin City	City	766	259	34%	281	$34,141	90	32%
Klamath Falls City	City	20,943	5,131	24%	9,054	$31,971	3,685	41%
Malin City	City	712	205	29%	207	$33,594	86	42%
Merrill City	City	805	116	14%	294	$37,500	99	34%
Lane County	County	351,794	64,705	18%	145,474	$42,628	42,478	29%
Cottage Grove City	City	9,671	1,833	19%	3,876	$35,158	1,430	37%
Eugene City	City	156,222	34,671	22%	65,907	$41,525	20,958	32%
Florence City	City	8,412	995	12%	4,438	$35,000	1,611	36%
Junction City	City	5,445	1,239	23%	2,049	$35,067	770	38%
Oakridge City	City	3,211	667	21%	1,514	$41,284	527	35%

Springfield City	City	59,347	12,143	20%	23,972	$38,315	7,455	31%
Lincoln County	County	45,992	7,262	16%	21,039	$41,996	6,480	31%
Lincoln City	City	7,926	1,616	20%	3,932	$29,686	1,687	43%
Newport City	City	9,989	1,815	18%	4,455	$47,270	1,417	32%
Siletz City	City	1,400	310	22%	495	$37,188	159	32%
Waldport City	City	1,818	263	14%	924	$35,889	398	43%
Linn County	County	116,871	19,237	16%	44,566	$47,129	11,364	26%
Cascadia CDP	CDP	20	15	75%	17	$6,417	15	88%
Crabtree CDP	CDP	308	33	11%	151	$72,526	50	33%
Halsey City	City	1,015	206	20%	295	$50,804	47	16%
Lacomb CDP	CDP	345	40	12%	129	$51,193	43	33%
Mill City (1)	City	1,625	393	24%	569	$40,313	177	31%
Shedd CDP	CDP	607	236	39%	183	$61,599	17	9%
Sweet Home City	City	8,938	1,930	22%	3,645	$36,205	1,185	33%
Waterloo Town	Town	320	78	24%	88	$48,750	24	27%
West Scio CDP	CDP	163	52	32%	111	$16,845	61	55%
Marion County	County	315,391	55,223	18%	113,227	$46,654	27,514	24%
Brooks CDP	CDP	665	160	24%	175	$11,161	95	54%
Four Corners CDP	CDP	16,472	3,754	23%	5,467	$45,372	1,438	26%
Gates City	City	675	161	24%	271	$39,750	91	34%
Gervais City	City	2,475	685	28%	629	$45,063	140	22%
Hayesville CDP	CDP	18,224	4,671	26%	6,437	$39,587	1,944	30%
Labish Village CDP	CDP	195	44	23%	70	$34,015	15	21%
Mehama CDP	CDP	238	56	24%	86	$56,406	22	26%
Woodburn City	City	23,879	5,362	22%	7,517	$41,818	2,195	29%
Multnomah County	County	737,110	123,434	17%	303,654	$51,582	74,699	25%
Wood Village City	City	3,870	1,211	31%	1,281	$42,917	369	29%
Polk County	County	75,448	10,788	14%	27,973	$52,365	6,658	24%
Falls City	City	1,089	251	23%	383	$36,083	148	39%
Independence City	City	8,535	2,244	26%	2,848	$40,719	946	33%
Monmouth City	City	9,549	2,167	23%	3,358	$29,697	1,461	44%
Tillamook County	County	25,254	4,197	17%	10,843	$41,869	3,123	29%
Bayside Gardens CDP	CDP	804	182	23%	365	$37,566	110	30%
Beaver CDP	CDP	189	6	3%	84	$45,750	39	46%
Cape Meares CDP	CDP	74	21	28%	45	$85,417	21	47%
Cloverdale CDP	CDP	337	124	37%	106	$41,429	11	10%
Garibaldi City	City	736	150	20%	353	$38,750	118	33%
Idaville CDP	CDP	395	79	20%	153	$23,444	107	70%
Neahkahnie CDP	CDP	115	41	36%	79	$9,659	41	52%
Neskowin CDP	CDP	91	1	1%	61	$32,566	30	49%
Pacific City CDP	CDP	1,078	250	23%	408	$31,348	106	26%
Rockaway Beach City	City	1,082	154	14%	555	$36,318	190	34%
Tillamook City	City	4,934	1,473	30%	2,100	$31,832	848	40%

Wheeler City	City	280	25	9%	139	$30,893	44	32%
Washington County	County	531,818	57,466	11%	200,160	$64,375	31,825	16%
King City	City	3,138	293	9%	1,967	$36,446	661	34%
Yamhill County	County	99,119	13,068	13%	33,920	$53,950	7,089	21%
Amity City	City	1,636	302	18%	557	$48,750	174	31%
Fort Hill CDP (1)	CDP	110	17	15%	97	$21,514	84	87%
Grand Ronde CDP (1)	CDP	1,451	257	18%	573	$35,240	225	39%
Willamina City (1)	City	1,685	319	19%	633	$34,844	201	32%
Tribes								
Coos, Lower Umpqua, and Siuslaw Reservation and Off-Reservation Trust Land, OR	Tribe	24	6	25%	15	$15,938	10	67%
Coquille Reservation and Off-Reservation Trust Land, OR (2)	Tribe	297	67	23%	102	$28,750	49	48%
Cow Creek Reservation, OR (2)	Tribe	21	-	0%	9	$22,250	5	56%
Grand Ronde Community and Off-Reservation Trust Land, OR	Tribe	473	130	27%	185	$24,861	95	51%
Klamath Reservation, OR	Tribe	17	9	53%	14	$6,944	12	86%
Warm Springs Reservation and Off-Reservation Trust Land, OR	Tribe	3,960	1,069	27%	1037	$47,526	209	20%

Notes:
(1) Where a city or Census Designated Place (CDP) spans more than one county, the BLM assigned it to the county with largest share of population.
(2) Shows 2009 American Community Survey 5-Year data since 2012 data not available.

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Appendix P – Off-highway Vehicle Management Guidelines

This section provides off-highway vehicle (OHV) management guidelines that the BLM would implement following adoption of the RMP until the BLM completes implementation level transportation management plans. The BLM has developed these interim guidelines at the district level, for Recreation Management Areas/Travel Management Areas that contain travel management opportunities (i.e., Class I, II, III, and IV motorized uses, mechanized, foot, and equestrian travel).

The BLM will defer travel management planning during this RMP revision process. The RMP will serve to document the decision-making process used to develop the initial transportation network, provide the basis for future management decisions, and set guidelines for making transportation network adjustments through the life of the RMP.

The BLM has developed these management guidelines consistent with BLM Handbook H-8342- Travel and Transportation. This handbook provides specific guidance for preparing, amending, revising, maintaining, implementing, monitoring, and evaluating BLM land use and travel management plans.

Designation of OHV Management Areas

All public lands are required to have OHV area designations (as defined in 43 CFR 8340.0-5 (a). The OHV area designations are land use allocations the must be determined in the RMP and classified as open, limited, or closed to motorized travel. The BLM bases these designations on protecting natural and cultural resources and public safety, limiting visitor conflicts, and providing diverse recreational opportunities. Criteria for open, limited, and closed are designations are established in 43 CFR 8340.0-5 (f, g, h). The OHV area designations are defined as follows:

- Open: areas where the BLM does not limit off-highway vehicle use since there are no issues regarding resources, visitor conflicts, or public safety to warrant limiting cross-country travel
- Limited: areas where the BLM has restricted off-highway vehicle use in order to meet recreational and resource management objectives[141]
- Closed: areas that the BLM has closed to all motorized vehicle use to protect resources, ensure visitor safety, or reduce visitor conflicts

Table P-1 displays the current OHV area designations within the decision area.

[141] Restrictions may include the number or types of vehicles, the time or season of use, permitted or licensed use only, or limiting use to existing or designated roads and trails.

Table P-1. Current OHV area designations within the decision area.

Travel Management Area Designation (1995 RMP)	Coos Bay	Eugene	Klamath Falls	Medford	Roseburg	Salem	Totals
Open	-	-	29,902	139,878	-	160,614	**330,394**
Limited to Existing Roads and Trails	-	320,883	137,154	26,514	416,560	48,771	**949,882**
Limited to Existing Roads and Designated Trails	-	-	-	-	-	87,144	**87,144**
Limited to Designated Roads and Trails	318,676	-	47,222	661,357	6,731	16,192	**1,050,178**
Limited to Designated Roads	-	-	-	-	-	69,508	**69,508**
Closed	3,489	3,547	10,702	46,371	3,283	17,197	**84,589**
Totals	**322,165**	**324,430**	**224,980**	**874,120**	**426,574**	**399,426**	**2,571,695**

Table P-2 displays the OHV area designations by alternative.

Table P-2. OHV area designations by alternative.

Trails and Travel Management	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)
Open	330,394	-	-	-	-
Limited to Existing Routes	1,037,026	2,339,820	2,319,908	2,290,558	2,315,232
Limited to Designated Routes	1,119,686	5,755	5,755	5,755	5,755
Closed	84,589	128,757	148,551	178,001	153,305

In addition to OHV area designations, the action alternatives include designation of some Recreation Management Areas (RMAs) for the exclusion of OHV use (**Table P-3**). The restrictions identify areas that would be designated for more primitive recreation opportunities. Closure acreages correspond proportionally to RMA total acreages by alternative.

Table P-3. OHV recreation opportunities, acres restricted within Recreation Management Areas.

Recreation Opportunities	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)
OHV Recreation Restricted	17,517	49,969	87,261	105,474

The OHV area designations do not apply to non-motorized uses (hiking, biking, equestrian), though areas can be designated for non-motorized transportation systems in the RMP process.[142] The designation of

[142] To restrict non-motorized travel to specific routes, the BLM must develop supplemental rules through a Federal Register process, consistent with 43 CFR 8365.1-6-Supplementary Rules.

OHV areas should consider the needs for a variety of road, primitive road, and trail systems tailored to a variety of users including non-motorized recreational uses.

Plan Maintenance and Changes to Route Designations

The RMP will include indicators that will guide plan maintenance, amendments, or revisions related to OHV area designations or the approved road and trail system within "Limited to Existing" areas. Future conditions may require the designation or construction of new routes or closure of routes to better address resources and resource use conflicts. The BLM will be able to modify actual route designations within the "Limited" category without completing an RMP amendment, although compliance with NEPA will still be required.

The BLM will accomplish plan maintenance through implementation-level travel management planning. The BLM will collaborate with affected and interested parties in evaluating changes to the existing and designated road and trail network in "Limited" area designations and changes to the broader Recreation Management Area designations that emphasize motorized OHV recreation. In conducting such evaluations, the BLM will consider the following:

- Routes suitable for various categories of OHVs (e.g., motorcycles, all-terrain vehicles, full size 4-wheel drive vehicles) and opportunities for shared trail use
- Needs for parking, trailheads, informational and directional signs, mapping and route profiles, and development of brochures or other materials for public dissemination
- Opportunities to tie into existing or planned route networks
- Measures needed to meet other resource objectives in the RMP (e.g., cultural resources, soil resources, special status species, and recreation)

The BLM will consider public land roads or trails determined to cause considerable adverse effects or to continue a nuisance or threat to public safety for relocation or closure and rehabilitation after appropriate coordination with applicable agencies and partners. In implementation-level travel management planning, areas designated as "Closed" will not be available for new motorized designation or construction without an RMP amendment changing the area designation.

Designated Motorized and Non-Motorized Trails

The BLM is currently working on an inventory of all user-created motorized and non-motorized routes within the decision area. The BLM will use this inventory as a baseline to guide future implementation-level route designations within the areas that are designated "Limited to Existing Routes." **Table P-4** displays the current designated trails within the decision area.

Recreation routes (authorized and unauthorized) have been created in response to demand for trail-based recreation. As demand for trail-based recreation (especially OHV riding) increased, the number of routes increased. The routes developed for administrative and resource uses provide primary access routes throughout most of the decision area. These primary access routes were created for administrative and resource uses, not for recreation. As a result, the routes are not always providing the recreation experience users are looking for. Over time, recreation use extended, connected, or pioneered new routes from the administrative and resource use routes. This pattern of route development has resulted in high route densities where the administrative and resource use routes provided access for recreation use.

Table P-4. Current designated motorized and non-motorized trails within the decision area.

District/Field Office	Recreation Trail	Miles
Coos Bay	Blue Ridge	10.0
	Doerner Fir	0.5
	Euphoria Ridge OHV Trail System	4.0
	Floras Lake	1.0
	Four Mile Creek	0.3
	Loon Lake Waterfall	0.5
	Lost Lake	1.0
	New River/Storm Ranch	2.0
	New River Water Trails	5.0
	New Fork Hunter Creek	2.0
	North Spit Trail System	9.0
	Subtotal	**35.3**
Eugene	Clay Creek Trail	0.6
	Eagles Rest Trail	0.2
	Lake Creek Falls Trail	0.2
	Row River Trail	13.5
	Shotgun Creek Non-Motorized Trails	6.2
	Shotgun Creek OHV Trail System	23.2
	Tyrrell Forest Succession Trail	1.0
	Whittaker Creek Trail	1.0
	Subtotal	**45.9**
Klamath Falls	Gerber-Miller Creek Potholes Trail	13.0
	Keno Spencer Snowmobile Trail	6.0
	Pacific Crest National Scenic Trail	1.0
	Pederson Snowmobile Trail	5.0
	Surveyor Peak Snowmobile Trail	3.0
	Wood River Wetland Trail	1.0
	Subtotal	**29.0**
Medford	Armstrong Gulch Trail	1.0
	Buck Prairie Cross Country Trails	17.0
	Cathedral Hills Trail System	10.0
	Grayback Mountain Trails	6.5
	Grizzly Peak	5.0
	Hidden Creek	1.0
	Jacksonville Historic Landmark	5.0
	Kelsey Peak	3.0
	Kerby Peak	8.0
	Listening Tree	1.0
	London Peak	1.0
	Lower London Peak	2.0
	Lower Table Rock	2.0
	Mt. Bolivar	1.5
	Mule Creek	3.0

District/Field Office	Recreation Trail	Miles
	Pacific Crest National Scenic Trail	22.4
	Sterling Mine Ditch Trail	10.0
	Tunnel Ridge	41.0
	Upper Table Rock	2.0
	Wolf Gap	4.0
	Subtotal	**146.4**
Roseburg	China Ditch Trail	0.4
	Emerald Trail	1.3
	Miner-Wolf Creek WW Trail	0.2
	North Bank Ranch Trail System	8.0
	North Umpqua Trail	12.3
	Sawmill Trail	12.3
	Susan Creek Trails	2.0
	Susan Creek Falls Trails	1.0
	Wolf Creek Falls Trails	1.2
	Subtotal	**38.7**
Salem	Alsea Falls Trail System	8.0
	Baty Butte-Silver King Trail	3.4
	Boulder Ridge Trail	0.2
	Eagle Creek Trail	0.5
	McIntyre Ridge Trail	0.5
	Molalla River Trail System	24.6
	Nasty Rock Trail	1.0
	Sandy Ridge Trail System	15.4
	Table Rock Wilderness Trails	20.4
	Upper Nestucca OHV Trail System	25.0
	Valley of the Giants Trail	0.8
	Subtotal	**99.8**
	Grand Total	**395.1**

Delineation of Travel Management Areas

The BLM will delineate Travel Management Areas to address particular concerns and prescribe specific management actions for a defined geographic area. The BLM typically identifies Travel Management Areas where travel and transportation management (either motorized or non-motorized) requires particular focus or increased intensity of management. While OHV area designations are a mandatory land use plan allocations, Travel Management Areas are an optional planning tool to frame transportation issues and help delineate travel networks that address specific uses and resource concerns.

The RMP process provides the opportunity to establish a link between Recreation and Transportation Management Areas. To help ensure that that travel decisions support program-specific management objectives, the BLM will identify Travel Management Area boundaries that correspond with the Recreation Management Areas defined for various outcomes. The RMP will management objectives and management direction for non-motorized trails and access. When delineating Recreation Management

Areas and Travel Management Areas and developing management direction for these areas, the BLM will consider the following:

- Other resource values and uses
- Primary travelers
- Emerging uses such as growing recreational-use types
- Setting characteristics that are to be maintained, including recreation setting characteristics and VRM settings
- Primary means of travel allowed to accomplish the objectives and to maintain the setting characteristics
- Social conflicts between different travel types
- Social conflicts between public land visitors and adjacent property owners
- Number and types of access points (motorized vs. non-motorized)
- Existing right-of-ways (ROWs) and future ROW requests
- Existing geographic identify and public knowledge of the area
- Identifiable boundaries of the Travel Management Area based on topography, major roads or other easily discernible elements

Road Maintenance Levels and OHV Use

BLM road maintenance levels that pertain to limitations on types of OHV use are described below.

Level 1 – This level is assigned to roads where minimum maintenance is required to protect adjacent lands and resource values. Emphasis is given to maintaining drainage and runoff patterns as needed to protect adjacent lands. Grading, brushing, or slide removal is not performed unless roadbed drainage is being adversely affected, causing erosion. Closure and traffic restrictive devices are maintained as needed.

Level 2 – This level is assigned to roads that are passable by high clearance vehicles. Drainage structures are to be inspected within a 3-year period and maintained as needed. Grading is conducted as necessary to correct drainage problems. Brushing is conducted as needed to allow access. These are typically low standard, low volume, single lane, natural and aggregate surfaced, and are functionally classified as a resource road.

Level 3 – This level is assigned to roads where management objectives require the road to be open seasonally or year-round for commercial, recreational, or administrative access. Typically, these roads are natural or aggregate surfaced, but may include low use bituminous surfaced road. These roads have a defined cross section with drainage structures (e.g., rolling dips, culverts, or ditches). These roads may be negotiated by passenger cars traveling at prudent speeds. User comfort and convenience are not considered a high priority. Drainage structures are to be inspected at least annually and maintained as needed. Grading is conducted to provide a reasonable level of riding comfort at prudent speeds for the road conditions. Brushing is conducted as needed to improve sight distance.

Level 4 – This level is assigned to roads where management objectives require the road to be open all year (except may be closed or have limited access due to snow conditions) and which connect major administrative features (recreational sites, local road systems, administrative sites, etc.) to County, State, or Federal roads. Typically, these roads are single or double lane, aggregate, or bituminous surface, with a higher volume of commercial and recreational traffic than administrative traffic.

Coos Bay District OHV Area Designations

Table P-5. Coos Bay District OHV area designations by alternative.

OHV Area Designation	No Action	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)
Open	160,614	-	-	-	-
Limited to Existing Routes	-	318,500	319,565	319,565	318,469
Limited to Designated Routes	-	-	1,401	1,401	1,401
Closed	17,197	5,191	2,724	2,724	3,821

Description: Includes all BLM-administered lands within the Coos Bay District. See additional guidelines for the Blue Ridge OHV Area.

Limited Area Management Guidelines:

- The BLM will manage Limited OHV areas in accordance with all applicable federal and state off-highway vehicle regulations.
- The BLM will limit motor vehicle use to administrative, commercial, and passenger vehicle traffic where not specifically signed or gated.
- Until road and trail designations are complete, all motorized vehicles will be limited in the interim to the existing road and trail network unless closed or restricted under a previous planning effort or due to special circumstances as defined below.
- The BLM may close or limit routes under seasonal or administrative restrictions. These restrictions may include, but are not limited to, fire danger, wet conditions, special requirements for wildlife species, to protect cultural resources, or for public safety.
- Vehicles may pull off roads or trails to park or allow others to pass, up to 25 feet from centerline of roads or up to 15 feet from centerline of trails.
- Limitations apply to all Class I (all-terrain vehicles), Class II (four-wheel drive vehicles), and Class III (motorcycles) vehicle use and to all activity types (recreational, commercial, etc.) unless authorized by the BLM for administrative purposes.

Closed Area Management Guidelines: All motorized vehicles are prohibited from entering closed OHV areas unless authorized by the BLM for administrative purposes.

Process for ongoing public collaboration and outreach:

- The principal venue for public collaboration is through public outreach and scoping during future travel management planning efforts, special projects, and local partnership.
- The BLM will send press releases as needed informing the public of OHV opportunities and restrictions. The BLM will post signs where appropriate.
- Upon completion of the transportation management plan, maps, and brochures shall be available to the public at the Coos Bay District office illustrating designations, describing specific restrictions, and defining opportunities.

Process for selecting a final road and trail network: The BLM has completed route designations for the New River ACEC and the Blue Ridge OHV Area. The BLM will accomplish final route designations for the rest of the district in a comprehensive, interdisciplinary travel and transportation management plan scheduled to be completed no later than five years after completion of the RMP revision.

BLM's geo-database will provide information for identifying roads and trails for both motorized and non-motorized activities. The BLM will conduct on-the-ground inventories if roads and trails cannot be

identified using remote-sensing techniques. The BLM will evaluate proposed designations through public scoping and a NEPA analysis. The BLM will consider changes to the designated system during the transportation management planning process.

Road and trail construction and maintenance standards: The BLM will construct and maintain roads and trails in accordance with the standards in BLM Manual H-9114-1(USDI BLM 1987) and other professional sources.

Blue Ridge OHV Travel Management Area

The BLM will manage the Blue Ridge OHV travel management area in the Coos Bay District as a Recreation Management Area with an off-highway vehicle focus. The following management guidelines apply to the Blue Ridge OHV area on the Coos Bay District:

Acres: 1,609

OHV Designation: Limited to designated roads and trails.

Niche: Offers a multiple-use, single-track trail riding experience for hikers, equestrians, mountain bikers, and motorcycle riders.

Management Guidelines:

- The single-track trail system is available to Class III (motorcycles) vehicles with Oregon all-terrain vehicle permits and all non-motorized modes of travel.
- Motorized, mechanized, and equestrian use is prohibited between December and April to prevent excessive damage to the trail tread when soil moisture conditions are high. Motorized use on the trail system may be restricted during summer months due to fire hazard conditions.

Process for ongoing public collaboration/outreach: The principal venue for public collaboration on the trail system is through local partnership relationships. A printed trail map is available to the public at the Coos Bay District office and on the Coos Regional Trail Partnership webpage. The trail system is marked on the ground with regulatory and directional signage.

Process for selecting a final road and trail network: The BLM completed route designations through the Blue Ridge Multiple Use Trail System environmental assessment (EA OR-125-98-18). The BLM will use adaptive management to adjust the system for commercial timber production demands, user needs and resource protection. The BLM will accomplish these modifications in collaboration with trail partners and users and through changes to the Blue Ridge Trail system plan and an environmental assessment.

Road and trail construction and maintenance standards: The BLM will construct and maintain roads and trails in accordance with the design features identified in the environmental assessment, standards in BLM Manual H-9114-1 (USDI BLM 1987), and other professional sources. Trail maintenance will be a priority within this OHV area to ensure a quality riding experience for trail users and to conserve natural resource values.

Eugene District OHV Area Designations

Table P-6. Eugene District OHV area designations by alternative.

OHV Area Designation	No Action	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)
Open	-	-	-	-	-
Limited to Existing Routes	-	289,796	283,963	281,750	279,757
Limited to Designated Routes	-	-	5,728	5,727	5,727
Closed	-	20,601	20,707	22,921	24,915

Description: Includes all BLM-administered lands within the Eugene District. See additional guidelines for the Shotgun Creek OHV Area.

Limited Area Management Guidelines:

- Until road and trail designations are complete, all motorized vehicles will be limited to the existing road and trail network unless closed or restricted under a previous planning effort or due to special circumstances as defined below.
- The BLM may close or limit routes under seasonal or administrative restrictions. These restrictions may include, but are not limited to, fire danger, wet conditions, special requirements for wildlife species, to protect cultural resources, or for public safety.
- Vehicles may pull off roads or trails to park or allow others to pass, up to 25 feet from centerline of roads or up to 15 feet from centerline of trails.
- Limitations apply to all Class I (all-terrain vehicles), Class II (four-wheel drive vehicles), and Class III (motorcycles) vehicles and to all activity types (recreational, commercial, etc.) unless authorized by the BLM for administrative purposes.

Closed Area Management Guidelines: All motorized vehicles are prohibited from entering closed OHV areas unless authorized by the BLM for administrative purposes.

Process for ongoing public collaboration/outreach:

- The principal venue for public collaboration is through public outreach and scoping during future travel management planning efforts, special projects, and local partnership.
- The BLM will send press releases as needed informing the public of OHV opportunities and restrictions. The BLM will post signs where appropriate.
- Upon completion of the transportation management plan, maps and brochures shall be available to the public at the main office illustrating designations, describing specific restrictions, and defining opportunities.

Process for selecting a final road and trail network: The BLM has completed route designations for the Upper Lake Creek Special Recreation Management Area and the Shotgun Creek OHV Area. The BLM will accomplish final route designations for the rest of the district in a comprehensive, interdisciplinary travel and transportation management plan scheduled to be completed no later than five years after completion of the RMP revision.

BLM's geo-database will provide information for identifying roads and trails for both motorized and non-motorized activities. The BLM will conduct on-the-ground inventories if roads and trails cannot be identified using remote-sensing techniques. The BLM will evaluate proposed designations through public scoping and a NEPA analysis. The BLM will consider changes to the designated system during the transportation management planning process.

Road and trail construction and maintenance standards: The BLM will construct and maintain roads and trails in accordance with the standards in BLM Manual H-9114-1 (USDI BLM 1987) and other professional sources.

Shotgun Creek OHV Travel Management Area

Acres: 5,755

OHV Designation: Limited to designated roads and trails

Niche: Offers a multiple-use trail riding experience for motorcycle riders, all-terrain vehicle riders, and four-wheel drive enthusiasts.

Management Guidelines:

- The trail system is available to Class I (all-terrain vehicles), Class II (four-wheel drive vehicles), and Class III (motorcycles) motorized vehicles with Oregon all-terrain vehicle permits.
- The BLM will sign and map routes open to OHV use.
- Routes available for OHV use may change periodically due to timber harvest activity or trail rehabilitation.

Process for ongoing public collaboration/outreach: The principal venue for public collaboration on the trail system is through local partnership relationships. A trail map is available to the public at the Eugene District Office and will be updated as trail routes change. The trail system is marked on the ground with regulatory and directional signs.

Process for selecting a final road and trail network: The BLM completed route designations through two Shotgun OHV Trail System environmental assessments (EA OR 090-00-04 and EA OR 090-06-04). The BLM will consider changes to the transportation system during the route designation planning process. The BLM will accomplish these modifications in collaboration with trail partners and users.

Road and trail construction and maintenance standards: Trail maintenance will be a priority within this OHV area to ensure quality riding experiences for trail users and to conserve natural resource values.

Klamath Falls Field Office OHV Area Designations

Table P-7. Klamath Falls Field Office OHV area designations by alternative.

OHV Area Designation	No Action	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)
Open	-	-	-	-	-
Limited to Existing Routes	-	213,266	209,559	200,501	202,759
Limited to Designated Routes	-	-	-	-	-
Closed	-	494	4,201	13,260	11,001

Description: Includes all BLM-administered lands within the Klamath Falls Field Office.

Limited Area Management Guidelines:

- The BLM will managed Limited OHV areas in accordance with all applicable federal and state off-highway vehicle regulations.
- The BLM will limit motor vehicle use to administrative, commercial, and passenger vehicle traffic where not specifically signed or gated.
- Until road and trail designations are complete, all motorized vehicles will be limited in the interim to the existing road and trail network unless closed or restricted under a previous planning effort or due to special circumstances as defined below.
- The BLM may close or limit routes under seasonal or administrative restrictions. These restrictions may include, but are not limited to, fire danger, wet conditions, special requirements for wildlife species, to protect cultural resources, or for public safety.
- Vehicles may pull off roads or trails to park or allow others to pass, up to 25 feet from centerline of roads or up to 15 feet from centerline of trails.
- Limitations apply to all Class I (all-terrain vehicles), Class II (four-wheel drive vehicles), and Class III (motorcycles) vehicles and to all activity types (recreational, commercial, etc.) unless authorized by the BLM for administrative purposes.

Seasonal restrictions:

- The Eastside seasonal OHV closure is in effect from November 1 to April 15 and applies to all BLM-administered lands within deer winter range cooperative wildlife areas, including the majority of Stukel and Bryant Mountain and portions of the Gerber block as mapped.
- The Pokegema wildlife area seasonal OHV closure is in effect from November 20 to April 1.
- For designated snowmobile trails, wheeled vehicles are prohibited once grooming of trails begins for winter season.
- The OHV use may be limited in other areas on a seasonal basis due to special conditions such as temporary fire restrictions, special wildlife requirements, etc.

Closed Area Management Guidelines: All motorized vehicles are prohibited from entering closed OHV areas unless authorized by the BLM for administrative purposes.

Process for ongoing public collaboration/outreach:

- The principal venue for public collaboration is through public outreach and scoping during future travel management planning efforts, special projects, and local partnership.
- The BLL will send press releases as needed informing the public of OHV opportunities and restrictions. The BLM will post signs where appropriate.
- Upon completion of the transportation management plan, maps and brochures shall be available to the public at the main office illustrating designations, describing specific restrictions, and defining opportunities.
- The BLM will continue to participate with other land managers in the cooperative management of the Pokegema wildlife area and deer winter range areas.

Process for selecting a final road and trail network: The BLM will accomplish final route designations for the rest of the district in a comprehensive, interdisciplinary travel and transportation management plan scheduled to be completed no later than five years after completion of the RMP revision.

BLM's geo-database will provide information for identifying roads and trails for both motorized and non-motorized activities. The BLM will conduct on-the-ground inventories if roads and trails cannot be identified using remote-sensing techniques. The BLM will evaluate proposed designations through public scoping and a NEPA analysis. The BLM will consider changes to the designated system during the transportation management planning process.

Road and trail construction and maintenance standards: The BLM will construct and maintain roads and trails in accordance with the standards in BLM Manual H-9114-1 (USDI BLM 1987) and other professional sources.

Medford District OHV Area Designations

Table P-8. Medford District OHV area designations by alternative.

OHV Area Designation	No Action	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)
Open	160,614	-	-	-	-
Limited to Existing Routes	-	715,439	730,596	734,121	769,047
Limited to Designated Routes	-	-	-	-	-
Closed	17,197	89,889	74,719	71,195	36,246

Description: Includes all BLM-administered lands within the Medford District.

Limited to Existing Area Management Guidelines:

- The BLM will manage Limited OHV areas in accordance with all applicable federal and state off-highway vehicle regulations.
- Paved roads are limited to licensed, street-legal vehicles only.
- Level 1 and 2 routes are open to Class I (all-terrain vehicles), Class II (four-wheel drive vehicles), and Class III (motorcycles) vehicles. Trails less than 50 inches in width are restricted to all-terrain vehicles and motorcycles.
- Roads on private property that do not have a secured public right-of-way are not necessarily open to public or recreational vehicle traffic, even if they are a "continuation" of the BLM road system or a road shown on the preliminary maps.
- Until road and trail designations are complete, all motorized vehicles will be limited in the interim to the existing road and trail network unless closed or restricted under a previous planning effort or due to special circumstances as defined below.
- The BLM may close or limit routes under seasonal or administrative restrictions. These restrictions may include, but are not limited to, fire danger, wet conditions, special requirements for wildlife species, to protect cultural resources, or for public safety.
- In the Butte Falls Resource Area, the Jackson Access and Cooperative Travel Management Area closure (32,822 acres) is in effect from mid-October through April 30. Only those roads shown in green on Oregon Department of Fish and Wildlife maps or posted with green reflectors are open to motorized vehicles during the period of the restriction.
- Vehicles may pull off roads or trails to park or allow others to pass, the minimum distance needed to allow for safe passage.
- Limitations apply to all Class I (all-terrain vehicles), Class II (four-wheel drive vehicles), and Class III (motorcycles) vehicle use and to all activity types (recreational, commercial, etc.) unless authorized by the BLM for administrative purposes.
- Non-motorized travel (e.g., horseback riding, hiking, and mountain biking) is allowed on all access routes.

Closed Area Management Guidelines: All motorized vehicles are prohibited from entering closed OHV areas unless authorized by the BLM for administrative purposes.

Process for ongoing public collaboration/outreach:

- The principal venue for public collaboration is through public outreach and scoping during future travel management planning efforts, special projects, and local partnership.
- The BLM will send press releases as needed informing the public of OHV opportunities and restrictions. The BLM will post signs where appropriate.
- Upon completion of the transportation management plan, maps and brochures shall be available to the public at the main office illustrating designations, describing specific restrictions, and defining opportunities.

Process for selecting a final road and trail network: The BLM will accomplish final route designations for the rest of the district in a comprehensive, interdisciplinary travel and transportation management plan scheduled to be completed no later than five years after completion of the RMP revision.

BLM's geo-database will provide information for identifying roads and trails for both motorized and non-motorized activities. The BLM will conduct on-the-ground inventories if roads and trails cannot be identified using remote-sensing techniques. The BLM will evaluate proposed designations through public scoping and a NEPA analysis. The BLM will consider changes to the designated system during the transportation management planning process.

Road and trail construction and maintenance standards: The BLM will construct and maintain roads and trails in accordance with the standards in BLM Manual H-9114-1 (USDI BLM 1987) and other professional sources.

Roseburg District OHV Area Designations

Table P-9. Roseburg District OHV area designations by alternative.

OHV Area Designation	No Action	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)
Open	-	-	-	-	-
Limited to Existing Routes	-	418,978	412,196	400,259	398,863
Limited to Designated Routes	-	-	-	-	-
Closed	-	3,808	10,591	22,528	23,924

Description: Includes all BLM-administered lands within the Roseburg District.

Limited Area Management Guidelines:

- The BLM will manage Limited to Existing OHV areas in accordance with all applicable federal and state off-highway vehicle regulations.
- Motor vehicle use will be limited to administrative, commercial, and passenger vehicle traffic where not specifically signed or gated.
- Until road and trail designations are complete, all motorized vehicles will be limited in the interim to the existing road and trail network unless closed or restricted under a previous planning effort or due to special circumstances as defined below.
- The BLM may close or limit routes under seasonal or administrative restrictions. These restrictions may include, but are not limited to, fire danger, wet conditions, special requirements for wildlife species, to protect cultural resources, or for public safety.

- Vehicles may pull off roads or trails to park or allow others to pass, up to 25 feet from centerline of roads or up to 15 feet from centerline of trails.
- Limitations apply to all Class I (all-terrain vehicles), Class II (four-wheel drive vehicles), and Class III (motorcycles) vehicle use and to all activity types (recreational, commercial, etc.) unless authorized by the BLM for administrative purposes.

Closed Area Management Guidelines: All motorized vehicles are prohibited from entering closed OHV areas unless authorized by the BLM for administrative purposes.

Process for ongoing public collaboration/outreach:

- The principal venue for public collaboration is through public outreach and scoping during future travel management planning efforts, special projects, and local partnership.
- The BLM will send press releases as needed informing the public of OHV opportunities and restrictions. The BLM will post signs where appropriate.
- Upon completion of the transportation management plan, maps and brochures shall be available to the public at the Roseburg District office illustrating designations, describing specific restrictions, and defining opportunities.

Process for selecting a final road and trail network: The BLM will accomplish final route designations for the rest of the district in a comprehensive, interdisciplinary travel and transportation management plan scheduled to be completed no later than five years after completion of the RMP revision.

BLM's geo-database will provide information for identifying roads and trails for both motorized and non-motorized activities. The BLM will conduct on-the-ground inventories if roads and trails cannot be identified using remote-sensing techniques. The BLM will evaluate proposed designations through public scoping and a NEPA analysis. The BLM will consider changes to the designated system during the transportation management planning process.

Road and trail construction and maintenance standards: The BLM will construct and maintain roads and trails in accordance with the standards in BLM Manual H-9114-1 (USDI BLM 1987) and other professional sources.

Salem District OHV Area Designations

Table P-10. Salem District OHV area designations by alternative.

OHV Area Designation	No Action	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)
Open	160,614	-	-	-	-
Limited to Existing Routes	-	389,595	361,780	346,806	340,067
Limited to Designated Routes	-	-	6,684	6,185	10,626
Closed	17,197	8,774	29,881	45,374	47,672

Description: Includes all BLM-administered lands within the Salem District. See additional guidelines for the Upper Nestucca OHV Area.

Limited to Existing Area Management Guidelines:

- The BLM will manage Limited OHV areas in accordance with all applicable federal and state off-highway vehicle regulations.

- Motor vehicle use will be limited to administrative, commercial, and passenger vehicle traffic where not specifically signed or gated.
- Until road and trail designations are complete, all motorized vehicles will be limited in the interim to the existing road and trail network unless closed or restricted under a previous planning effort or due to special circumstances as defined below.
- The BLM may close or limit routes under seasonal or administrative restrictions. These restrictions may include, but are not limited to, fire danger, wet conditions, special requirements for wildlife species, protection of cultural resources, or for public safety.
- Vehicles may pull off roads or trails to park or allow others to pass, up to 25 feet from centerline of roads or up to 15 feet from centerline of trails.
- Limitations apply to all Class I (all-terrain vehicles), Class II (four-wheel drive vehicles), and Class III (motorcycles) vehicles and to all activity types (recreational, commercial, etc.) unless authorized by the BLM for administrative purposes.

Closed Area Management Guidelines: All motorized vehicles are prohibited from entering closed OHV areas unless authorized by the BLM for administrative purposes.

Process for ongoing public collaboration/outreach:

- The principal venue for public collaboration is through public outreach and scoping during future travel management planning efforts, special projects, and local partnership.
- The BLM will send press releases as needed informing the public of OHV opportunities and restrictions. The BLM will post signs where appropriate.
- Upon completion of the transportation management plan, maps and brochures shall be available to the public at the main office illustrating designations, and describing specific restrictions.

Process for selecting a final road and trail network: Route designations have been completed for the Upper Nestucca OHV Area. The BLM will accomplish final route designations for the rest of the district in a comprehensive, interdisciplinary travel and transportation management plan scheduled to be completed no later than five years after completion of the RMP revision.

BLM's geo-database will provide information for identifying roads and trails for both motorized and non-motorized activities. The BLM will conduct on-the-ground inventories if roads and trails cannot be identified using remote-sensing techniques. The BLM will evaluate proposed designations through public scoping and a NEPA analysis. The BLM will consider changes to the designated system during the transportation management planning process.

Road and trail construction and maintenance standards: The BLM will construct and maintain roads and trails in accordance with the standards in BLM Manual H-9114-1 (USDI BLM 1987) and other professional sources.

Upper Nestucca OHV Travel Management Area

Acres: 9,579

OHV Designation: Limited to designated roads and trails.

Niche: Located 20 miles northwest of McMinnville, Oregon, this area provides Class I (all-terrain vehicles), and Class III (motorcycles) OHV riding experience along a designated road and trail network.

Management Guidelines:

- Designated trails and maintained roadways are limited to Class I and Class III motor vehicle use within the boundaries of the OHV area.
- All Class I and Class III vehicles must be equipped with approved spark arresters, an Oregon all-terrain vehicles sticker for the appropriate vehicle class, and must meet posted noise requirements.
- Class II vehicle use is only authorized on Level 3 and Level 4 roadways.
- The BLM may restrict motorized use on the trail system during summer months due to fire hazard conditions.
- The BLM may be permanently or temporarily close areas or trails for administrative use, extreme wet conditions, construction/reconstruction requirements, or other environmental concerns.

Process for ongoing public collaboration/outreach: The principal venue for public collaboration on the trail system is through local partnership with the Applegate Rough Riders Motorcycle Club. A trail map is available to the public at the Salem District Office and Tillamook Field Office. The trail system is marked on the ground with regulatory and directional signage.

Process for selecting a final road and trail network: The BLM has completed route designations through the Upper Nestucca Motorcycle Trail System Environmental Assessment (EA OR 086-97-05). The BLM will use adaptive management to adjust the system for timber management, user needs, and resource protection.

Road and trail construction and maintenance standards: The BLM will construct and maintain roads and trails in accordance with the design features identified in the Monitoring and Maintenance Plan for the Upper Nestucca OHV Trail System. Trail maintenance will be a priority within this OHV area to ensure a quality riding experience for trail users and to conserve natural resource values.

References

USDI BLM. 2011. BLM Manual Handbook H-8342-1 – Travel and Transportation Management. 146 pp. http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/cdd/west_mojave_plan_updates.Par.33567.File.dat/Travel%20and%20Transportation%20Management%20Handbook.pdf.

USDI BLM. 1987. BLM Manual Handbook H-9114-1 – Trails. Available at BLM district offices.

Appendix Q – Tribal

Biographies and Maps

The BLM compiled data and text from five of the seven Tribes with Tribal lands and varying interests within the planning area, or portions of it. Each Tribe wrote and submitted their individual Tribal biography. The BLM did not alter or edit the text in any way. The BLM created the maps using data provided by each of the Tribes in order to show those lands of interest to each Tribe. The maps and biographies do not reflect a BLM endorsement of tribally stated territories or histories. In addition, the nomenclature used on each map came from the tribes as well. The BLM has included these biographies and maps as context for the Tribal Interests section as well as to allow the Tribes to state who they are and how they define their interest in the lands administered by the BLM in western Oregon. It also provides managers and others who implement this RMP with valuable information about the history and interests of Tribes within the planning area. All seven tribes listed below are federally recognized Tribes and interact with the BLM as sovereign Nations.

- The Confederated Tribes of Coos, Lower Umpqua, Siuslaw Indians
- The Confederated Tribes of the Grand Ronde Community of Oregon
- The Confederated Tribes of Siletz Indians
- The Confederated Tribes of the Warm Springs Indian Reservation
    - (The BLM did not receive Warm Springs documents in time for the draft.)
- The Coquille Indian Tribe
- The Cow Creek Band of Umpqua Tribe of Indians
- The Klamath Tribe
    - (The BLM did not receive Klamath documents in time for the draft.)

The Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians

We, the Coos, Lower Umpqua, and Siuslaw, are coastal people. We still live on lands that once were managed by our ancestors. We have always strived to live in balance with the land and waters, using their gracious bounties and sustaining them for future generations. We have always held sacred the land and the resources that rely on that land, water, and air. We have always lived using what the Creator has provided. We have endured many hardships to our land, people and culture over the last 150 years. Thousands of our ancestors lost their lives to relocation, sickness, and moral. Over the last century we have worked to sustain our people and culture by protecting the environment, natural resources and trying to find ways to balance our traditions and philosophy with the dynamic and developing viewpoints communities that share our coasts and lands.

A Historical Record

In 1855, members of the Coos, Lower Umpqua, and Siuslaw Tribes, along with members of the other coastal Oregon tribes, signed a treaty with the United States of America. This treaty would have ceded lands west of the summit of the Coast Range. This treaty was introduced in the United States Senate and read once, but whether through negligence or whether due to concerns arising from what is commonly known as the Rogue River War, it was never read a second time nor ratified by the Senate. Despite the lack of ratification, the Coos and Lower Umpqua Tribes were held captive beginning in 1856, the Coos were confined on the sand spit known as Ki:we'et (now commonly known as Sitka Dock) just south of Empire, the Lower Umpqua moved to Fort Umpqua on the north spit of the Umpqua River, then at the

Alsea Sub-Agency of the Coast Reservation and the Siuslaw were confined within the Coast Reservation, the boundary of which included most of the western portion of their Ancestral Territory.

In 1871, the federal Appropriations Act ended treaty making between the federal government and tribes. The relationship between sovereigns was continued by the United States through "agreements," statutes, and Executive Orders in lieu of treaties. The passage of this act ended the prospects of the Tribes' treaty being ratified.

In 1875, the Alsea Sub-Agency of the Coast Reservation was opened to Euro-American settlement. This occurred against the will and heartfelt testimony of the Coos and Lower Umpqua confined at the sub-agency. These Tribal Members were ordered to relocate to the remaining portion of the Coast Reservation centered around the Siletz Agency. Most if not all of the Coos and Lower Umpqua refused and relocated around the remnant Siuslaw population centered around the traditional village of Qa'ich (now commonly known as the area around the Hatch Tract, the site of the Confederated Tribes Three Rivers Casino and Hotel); centered around the area of Gardner and the confluence of the Smith and Umpqua Rivers, or centered around South Slough and other areas around Coos Bay.

In 1887, the General Allotment (Dawes) Act authorized allotments to Indian People. Most of these passed out of Indian tenure due to financial hardship, lack of familiarity of the applicable land tenure laws and regulations, and/or due to scheming by non-Indian land investors. Some allotments remain in Tribal Member ownership in fee status or have been sold to the Confederated Tribes government.

In 1917, the Coos, Lower Umpqua and Siuslaw Indians, in reflection of millennia of shared cultural and political ties, and in response to sixty years of common adversity, formally confederated to form the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians. The primary purpose of this confederation was to pursue land claims. Since according to United States Law in order to take lands a ratified treaty agreement had to take place and there was no such ratified treaty.

In 1929, the United States government waived its sovereign immunity (45 Stat.1256, as amended by 47 Stat. 307) and allowed the Confederated Tribes to sue the federal government in the United States Court of Claims for settlement of land claims. Testimony from several Tribal Members and members of the broader community was taken over the next several years. In 1935, the testimony of George Bundy Wasson (of Coos and Coquille descent) in the Court of Claims described the boundary of Ancestral Territory as extending from Fivemile Point (Coos County) north to Tenmile Creek (Lane County) thence east to the crest of the Coast Range, including the Coos, Umpqua (to the head of tide), Smith, and Siuslaw Watersheds. (This description has been carried forward and appears on the enrollment cards of members of the Confederated Tribes and was adopted in Tribal Council Resolution No. 90-010.) In 1938, the United States Court of Claims ruled against the Confederated Tribes, describing Indian testimony as hearsay and self-interested. Later in1938 the United States Supreme Court refused to hear Confederated Tribes appeal of this Court of Claims ruling. In 1947, the Confederated Tribes filed claim to the reorganized Indian Claims Commission, which in 1952 rejected the Confederated Tribes claim, ruling that the matter was *res judicata*, or a case already decided by the Court of Claims.

Following World War II, the United States government pursued the goal of Indian assimilation into the "melting pot" and promoted the termination of federal recognition of several tribes. In 1951, the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians refused to endorse termination of federal recognition. In 1954, Public Law 588 terminated federal recognition of forty-three bands and tribes in Oregon effective 13 August 1956, including, without consent, the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians.

In 1956, the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians petitioned the United Nations for membership "to the end that truth and justice may be raised up and accorded their proper place." The petition was ignored.

The period of termination was a dismal time. Tribal Members continued to know who they were, continued to remember their Ancestors, continued to honor their Elders, continued to meet among themselves as a Tribe, continued to raise their children to be Coos, Lower Umpqua, and Siuslaw, and continued to fight for their rights. Despite the dismissal of their Tribal identity by the United States government, the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians maintained continuous government of, by, and for the Tribes, and exercised the rights and fulfilled the responsibilities of any government to its People.

From 1954 through 1984, the Confederated Tribes expended three decades of human energy, money, and political capital working to have federal recognition restored. Through the sacrifices of many who lived to see the day, and through the sacrifices of many others who did not, federal recognition was restored to the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians through the enactment of Public Law 98-481which was signed into law on 17 October 1984.

Future Directions

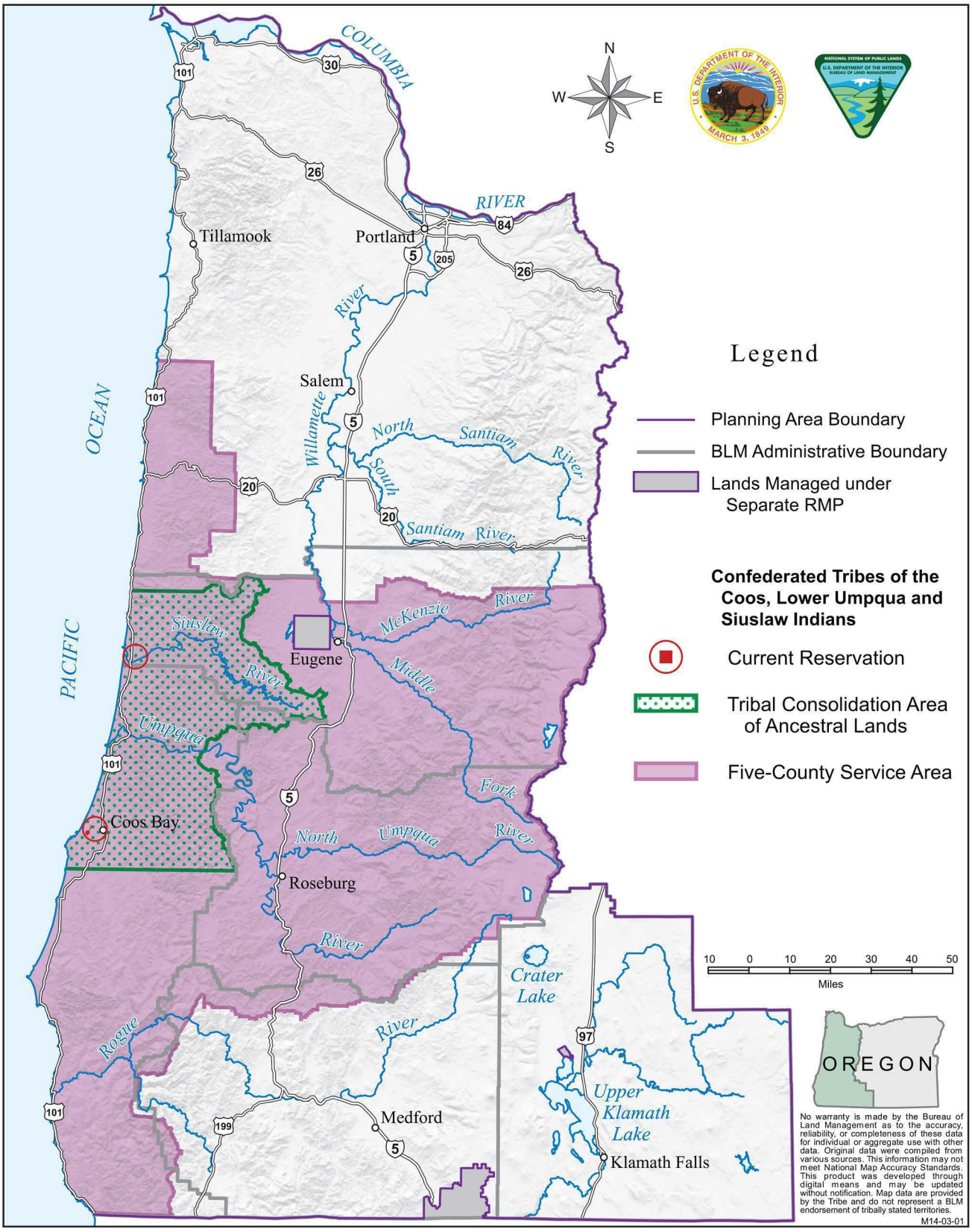
We of the Coos, Lower Umpqua, and Siuslaw have lived here since time immemorial. Our culture and stories are reminders to show our appreciation for all that we have. We have always taken only what we need, and we have always given back. For hundreds of generations we lived in balance with nature. We bring back the bones of the first caught Salmon to the ocean to show respect to the Salmon. It is our way of celebrating and communicating our appreciation to the Salmon, in recognition of their sacrifice. It is also a time to refrain from fishing and give reprieve to the first Salmon as they run upriver. We consider ourselves responsible for the survival and health of the fish, forest, waters and all the resources of our lands.

We understand that People are part of the Natural World. We understand that for us to live other parts of creation must give us their lives. We understand that our lives depend on the lives of others. We must take care of them, as they take care of us. We all must take care of each other. For ten thousand years, for five hundred generations, we have returned our Ancestors to the earth. Our Ancestors' bones are all around us – in the earth, in the trees, in the water, in the air. We feel the spirits of our Ancestors accompanying us every day as the Tribe continues on.

Over 150 years ago, we signed a treaty would have exchanged our land for some promises. That treaty was never ratified; we were removed from our lands and the promises were not kept. Where once millions of salmon returned to our streams, today only thousands return.

BLM-managed lands are culturally significant to the Tribes. Tribal cultural resources include archaeological sites and traditional cultural properties; living cultural resources such as cedar and salmon; and spiritually-significant sites including certain promontories and viewsheds. These cultural resources contribute to the health of tribal cultures and the persistence of tribal identities.

Today, we are Tribal members and we are neighbors. Today we sit around the same table. Today we face the same issues, and today we work together and create common solutions. We are proud to be members of the communities in our Ancestral Watersheds. We greatly respect the accomplishments of our partnerships, and we look forward to the continued healing that our partnerships can achieve.



Map 1: Tribal Lands of the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians

The Confederated Tribes of the Grand Ronde Community of Oregon

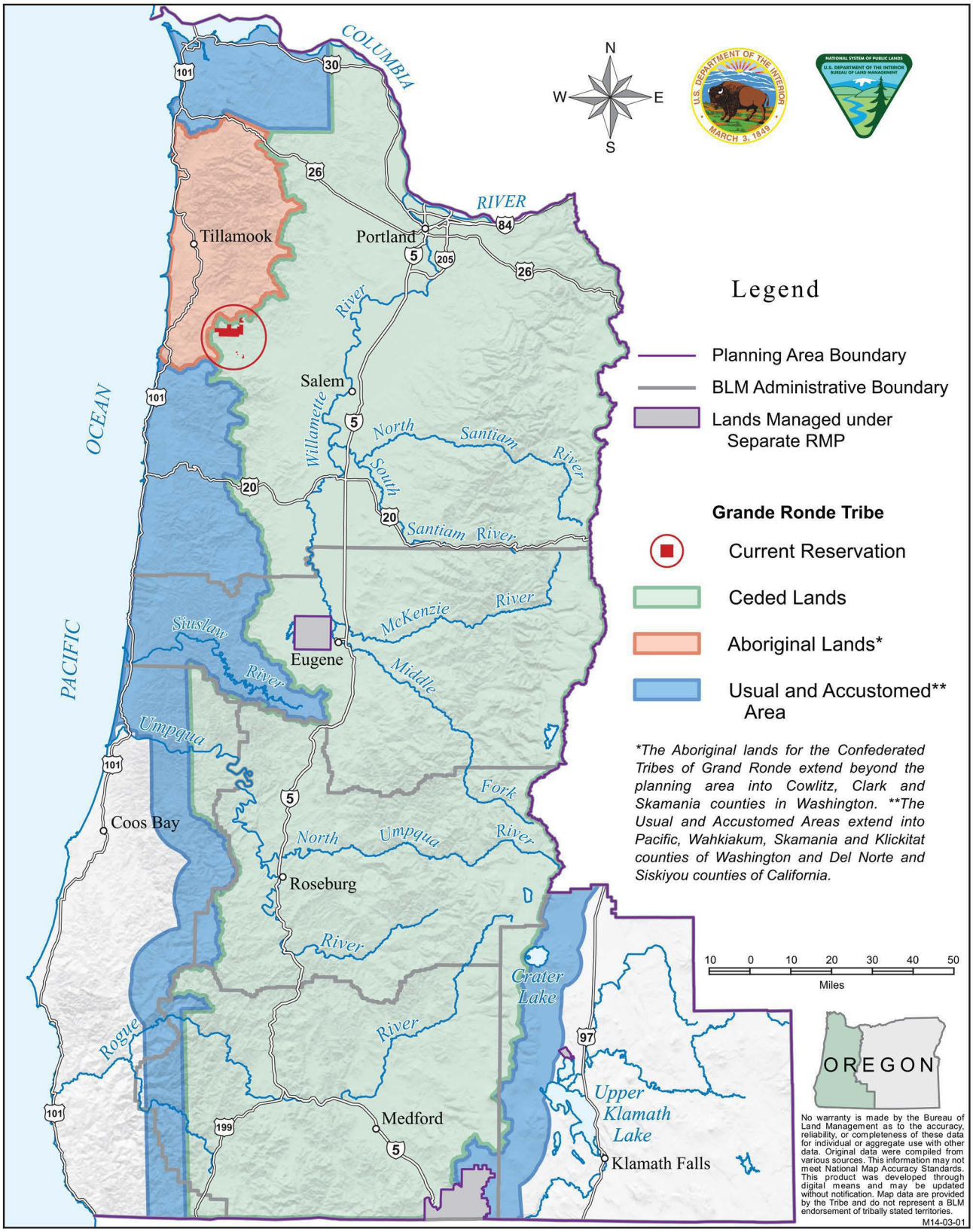
More than 30 Tribes and Bands were relocated to the Grand Ronde Reservation from western Oregon, southwestern Washington, and northern California and removed to the Reservation after signing seven treaties from 1853-1855. These include the Rogue River, Umpqua, Chasta, Kalapuya, Chinookan, Molalla and Tillamook Indians who had lived in their traditional homelands since time immemorial. Prior to removal they lived off the land – fish, game and plant foods were plentiful, and they traded with other Tribes and later, with non-Indians.

The Grand Ronde Reservation was begun by treaty arrangements in 1854 and 1855 and firmly established by Executive Order on June 30th, 1857. The original reservation contained more than 60,000 acres and was located on the eastern side of the coast range on the headwaters' of the South Yamhill River, about 60 miles southwest of Portland and about 25 miles from the ocean.

In 1887, the General Allotment Act became law. Under the law, 270 allotments totaling more than 33,000 acres were made to the Tribal members of the reservation. These allotments came with the understanding that they would pass from federal trust status into private ownership after 25 years. The purpose of the Act was to encourage Tribal people to become farmers and eliminate common ownership of land, traditional activities and practices. In 1901 U.S. Inspector James McLaughlin declared 25,791 acres of the reservation "surplus" and the U.S. sold it for $1.10 per acre to non-tribal businesses and citizens.

In 1936 under the Indian Reorganization Act (also known as the Howard-Wheeler Act), the Tribe was able to purchase 536.99 acres to provide homes and land for tribal people. The attempt at recovery of land was halted on August 13th, 1954, when the Congress passed Public Law 588, the Western Oregon Termination Act, which terminated the Tribe's federal recognition and abolished the treaties that had been negotiated in good faith. This act of legislation was aggressively pursued by then Secretary of Interior James Douglas McKay. McKay was Oregon's 25th Governor prior to accepting the position of Secretary of Interior. McKay oversaw the implementation of the Western Oregon Termination Act, which went into effect on August 13, 1956. For nearly 30 years, the members of the Tribe were landless with the exception of the Tribal cemetery and without the Tribe to provide a focal point of community. Irreparable damage was done to the Tribal community's health, education, languages and cultures. In the early 1970s efforts began to reverse the Termination Act and to reestablish the Tribe. Tribal leaders worked together with no financial backing, only a cemetery, and their desire for the Tribe to restore its federal recognition.

On November 22nd, 1983, Public Law 98-165, also known as the Grand Ronde Restoration Act, was signed into law. After a great deal of negotiations with the local community, local landowners, as well as state and federal agencies, the Tribe developed a Reservation Plan. Following this on September 9th, 1988, Public Law 100-425, also known as the Grand Ronde Reservation Act, was passed, restoring 9,811 acres of the original reservation. On October 4, 1994, Public law 103-435, added 240 acres to the Reservation to compensate the Tribe for a surveying error that was never corrected prior. Today the 10,052-acre reservation lies just north of the community of Grand Ronde. With Restoration of the Tribal government and the re-establishment of the Reservation, the Tribe has focused on rebuilding Tribal programs, developing Tribal services and servicing the greater community. The Tribe has provided a viable community that contributes to the local economy and provides for the achievement of the Tribal members.



Map 2: Tribal Lands of the Confederated Tribes of Grande Ronde

The Confederated Tribes of Siletz Indians

The Confederated Tribes of Siletz Indians (CTSI) consists of the many Tribes and Bands who were removed to or came to reside on the Siletz/Coast Reservation beginning in 1856 or after. Almost exclusively, ancestral Tribal residents resided there by Aboriginal Right and/or Treaty Right (it being their designated permanent home under treaty stipulations/approved federal policy).

Prior to Treaties being signed, the Reservation being established, and the U.S policy that all Western Oregon Indians were to confederate and live within its borders, Siletz ancestral peoples maintained about 20 million acres of ancestral territories, approximately 19 million of those acres were the area of Oregon west of the summit of the Cascades. As treaties were signed, our people generally ceded large territories to the U.S., while maintaining certain rights. Those rights included: (1) the right to a permanent reservation (and adequate land, water, fish wildlife and other resources for the CTSI to sustain itself into the future); (2) payment for cession of aboriginal title to those vast territories; and (3) right to a temporary reservation or ability to stay within the ceded area until the President of the U.S. selected the permanent reservation.

November 9, 1855, President Pierce signed an Executive Order establishing our permanent reservation at about 1.1 million acres. It included approximately 1/3 of what is now the State of Oregon's coastline. Removal of our ancestors to the new reservation began soon after. An encampment was established just off the eastern border of the reservation as a staging area for bringing tribes to the reservation. Just after most of the tribes had moved from the encampment/staging area to the Siletz Reservation, President Buchanan saw fit to re-designate the temporary encampment as the Grand Ronde Reservation. All Tribes and individuals who came to reside within the Siletz Reservation became members of the Confederated Tribes of Siletz. Those who remained at the encampment became members of the Confederated Tribes of Grand Ronde. All Western Oregon Indians were considered to belong to one or the other of the confederations. There were individuals, and small family groups who had stayed off-reservation, or returned from one or other of the reservation to live in old homelands.

Many hardships were endured, including starvation, neglect, abuse, forced labor, and violent assaults and punishments, sometimes resulting in deaths. Tribes were still being brought onto our Reservation from temporary encampments at Fort Umpqua and other places into the early 1860s. At about this time, the Coos, Lower Umpqua people who had not previously resided within the reservation were brought to a new Sub-Agency of our reservation established at Yachats, referred to as the Alsea Sub-Agency or Yachats Sub-Agency.

Quickly the brutal implementation of federal policy turned our Reservation's atmosphere into one of a harsh prison camp, rather than the Tribal Homeland that had been promised. That perception of our population suffering to bend to the will and whims of the U.S. and shifting policy decisions led U.S. Administrative and Legislative officials to take actions which grabbed large portions of our permanent reservation through illegal means – which did not take into account our peoples' treaty rights, or their own legal responsibilities/lack of authority.

In 1865, about 200,000 acres of our permanent reservation, around Yaquina Bay were taken by order signed by President Johnson. That action left our remaining reservation lands in two detached parcels. In 1875, another 700,000 acres were ripped from our possession through an Act of Congress. Our people were forced to move, instead of being informed that they had to give informed consent in order for the Act to legally take effect.

From 1875-1892 our remaining reservation consisted of about 225,000 acres. In 1892 the General Allotment Act took effect both on reservation and for our off-reservation families. Five hundred fifty-one

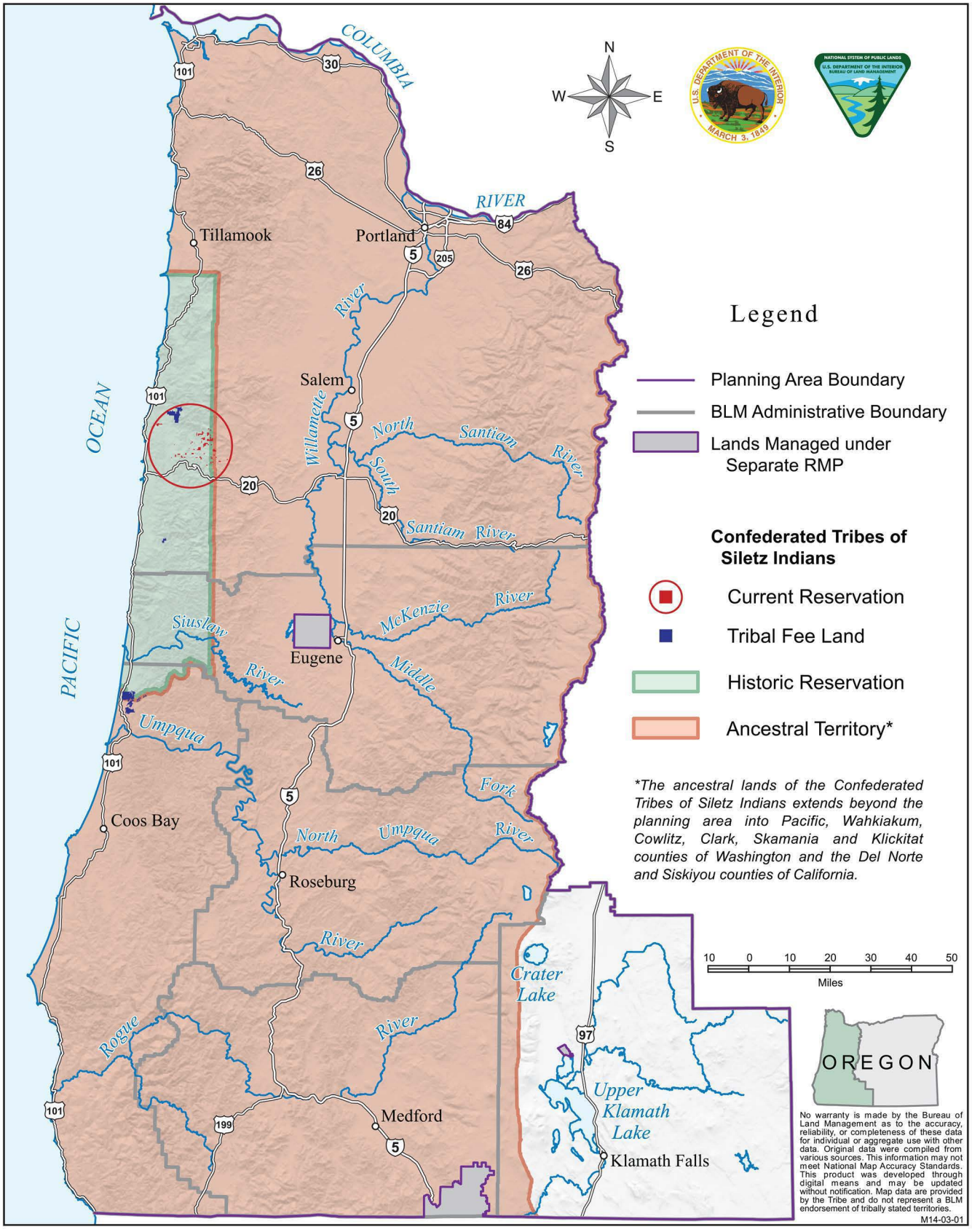
(551) Siletz Reservation Allotments of approximately 80 acres each were assigned to the tribal members then present, and before some families could even return to claim an allotment, the allotment rolls were closed and the remaining reservation lands declared "surplus". Our Tribe was forced to agree to cede those lands for 74 cents an acre, or they "could be taken just like the 1865 and 1875 reductions – without compensation". Promises that future tribal members could apply for and receive allotments from the open and unclaimed areas of the ceded areas remain unfulfilled.

Quickly, U.S. law and policy began to restrict our ability to hang onto even our allotments. By 1912, over half of the Siletz Allotments were non-Indian owned. All of these actions, from treaties, removal, reservation reductions, to loss of family allotments were experienced as a constant onslaught, and continued as U.S. Court of Claims and Indian Claims Commission cases were brought forward by our people. The U.S. Courts generally denied or minimized the U.S.'s responsibilities to our pay for lands ceded to the U.S., or maintain the reservation boundaries that had been set according to treaty stipulations. A combination of individuals who were of Coos, Lower Umpqua and Siuslaw descent brought suit for taking of aboriginal title without a title. Many enrolled Siletz members participated in the suit, but the effort was initiated by off-reservation families not enrolled, so the Court found in part that the group did not have standing to bring the suit – because the Confederated Tribes of Siletz, the legal successors in interest to those ancestral tribes, had not brought the action. Our Tillamook, Yaquina, Alsea, Tututni, Chetco and Coquille people brought suit through the Confederated Tribes of Siletz Indians, and seemed to be on the verge of a major victory, when the U.S. appealed that claims case to the U.S. Supreme Court. The Supreme Court decided that descendants of those tribes were only entitled to value at the time of taking, no interest accrued, because the U.S had failed to ratify their own treaty. A mere pittance was recovered for all of the generations of suffering since removal from those lands.

Simultaneous with land claims actions proceeding, was Siletz and Grand Ronde being targeted for the U.S. Policy of terminating tribal governments in the 1950s. The Western Oregon Termination Act was passed in 1954, and named the Confederated Tribes of Siletz Indians and Confederated Tribes of Grand Ronde, but no other Tribal governments were really recognized at that time. To ensure that no individuals living off-reservation, separate from Siletz or Grand Ronde, or that constituent groups who were members of those confederations could step forward later, and claim that they had survived the intended termination by not being named in the act – Congress named every western Oregon aboriginal group who had ever been named in a federal document, to be sure no chance of any tribal groups asserting status in Western Oregon would be possible. In 1956, the Western Oregon Termination Act took full effect.

Termination was meant to be the final blow to the CTSI and its members. The judgment funds from claims decisions were even held-up as insurance that no concerted resistance to the implementation of Termination would arise. About 1970, Siletz Indians began calling meetings and asking our people to come together and support an effort to get Congress to address our situation. Many of our people were living in poverty. Sub-standard housing was too common, healthcare and education access was low. In 1973, the Menominee Tribe of Wisconsin successfully petitioned Congress to reverse their Termination Act. The CTSI began working toward the same goal, but as the first landless tribe to regain federal recognition after being terminated. In November 1977, Congress passed, and President Jimmy Carter signed into law The Siletz Restoration Act. The Restoration Act called for an initial Reservation Plan to be submitted to Congress for consideration. The Siletz Tribe was advised to submit a modest request for return of lands, which could alter be expanded. The 1980, Siletz Reservation Act included about 3,660 acres of small scattered BLM administered parcels, primarily east of the town of Siletz. Today the CTSI owns about 15,000 acres, mostly timberlands added to our holdings after 1980, through purchase, donation, wildlife mitigation agreements, etc. Those lands are held in a variety of status' (Reservation, non-Reservation Trust, and fee) and managed for a combination of resource use/protection/enhancement values and revenue generation for member services.

Many places of intense historical, cultural and spiritual significance to our Confederated Tribes of Siletz Indians are now owned/managed by the BLM. Among these are ancestral villages such as Umpqua Eden, prayer places, treaty signing, and temporary Reservation sites such as Table Rocks in the Rogue Valley, battle sites such as Hungry Hill, numerous plant and other resource gathering places tended by our ancestors, both within and outside of our 1855 Siletz Reservation boundaries, including Yaquina Head Outstanding Natural Area. Because our people do not hold title or control of these places currently does not release us from our obligations to maintain our connections to them and recognize them for their importance to all generations in the past, present and future.



Map 3: Tribal Lands of the Confederated Tribes of Siletz Indians

The Coquille Indian Tribe

The Coquille Indian Tribe is a people that have always shared a strong connection with the land. This relationship is evident in the tribe's name which comes from the Native name for a lamprey eel, or "Scoquel," of which the river it abounded in took its name as well, and was later shortened to, "Coquell." Thus, "Coquille", pronounced, Ko-kwel, derived from a Chinook jargon word, became the name of a place and a people.

Coquille ancestors lived at South Slough on lower Coos Bay, in all the watersheds of the Coquille River system from the ocean to its headwaters, and along the coast as far as Cape Blanco and Port Orford. They spoke three distinct local languages; Miluk, Hanis, and Athapaskan, intermixed with Chinook jargon, the trade language for Northwest Native Americans. Along the coast, estuary shorelines and sheltered coastal bays offered food of all sorts, and canoe travel was easy. In the interior, streams and rivers full of fish and valleys where deer and elk wintered, determined where villages were located. Seasonal places in the uplands and interior valleys away from the estuaries and coast were often hunting and food gathering areas used by many different Native groups. Typically, when Coquille and other groups gathered for berry and nut harvesting, root digging, or at hunting and fishing sites, it was also a time of celebration, and for renewing old relationships and making new ones. These places were returned to year after year. Today, annual events like the Mid-Winter Gathering, Restoration Day Celebration, and Solstice Dances all respond to those ancient Coquille practices.

The Coquille people's Ancestral Homelands encompassed more than one million acres, all of it ceded to the U.S. government in treaties signed by, "Coquille chiefs and head-men," first in 1851 and again in 1855. Those treaties were never ratified by the U.S. Senate, thus reservation lands and other considerations promised in the treaties never materialized, so the Coquille people and the generations that followed were denied permanent Tribal homelands.

On June 28, 1989, Congress passed public Law 101-42, which re-established the Coquilles as a federally recognized Indian Tribe. The Coquille Restoration Act restored the Tribe's eligibility to participate in federal Indian programs and to receive funding to provide health, education, housing assistance, and pursue economic development for its members. The Act also reaffirmed the Tribe as a sovereign government, and validated the Tribe's authority to manage and administer political and legal jurisdiction over its lands and resources, its businesses, and its Tribal community members. Today, the Tribe, made up of over a thousand members, provides services to tribal members throughout the world and especially concentrated within the five-county service area of Coos, Curry, Douglas, Lane, and Jackson counties in Oregon.

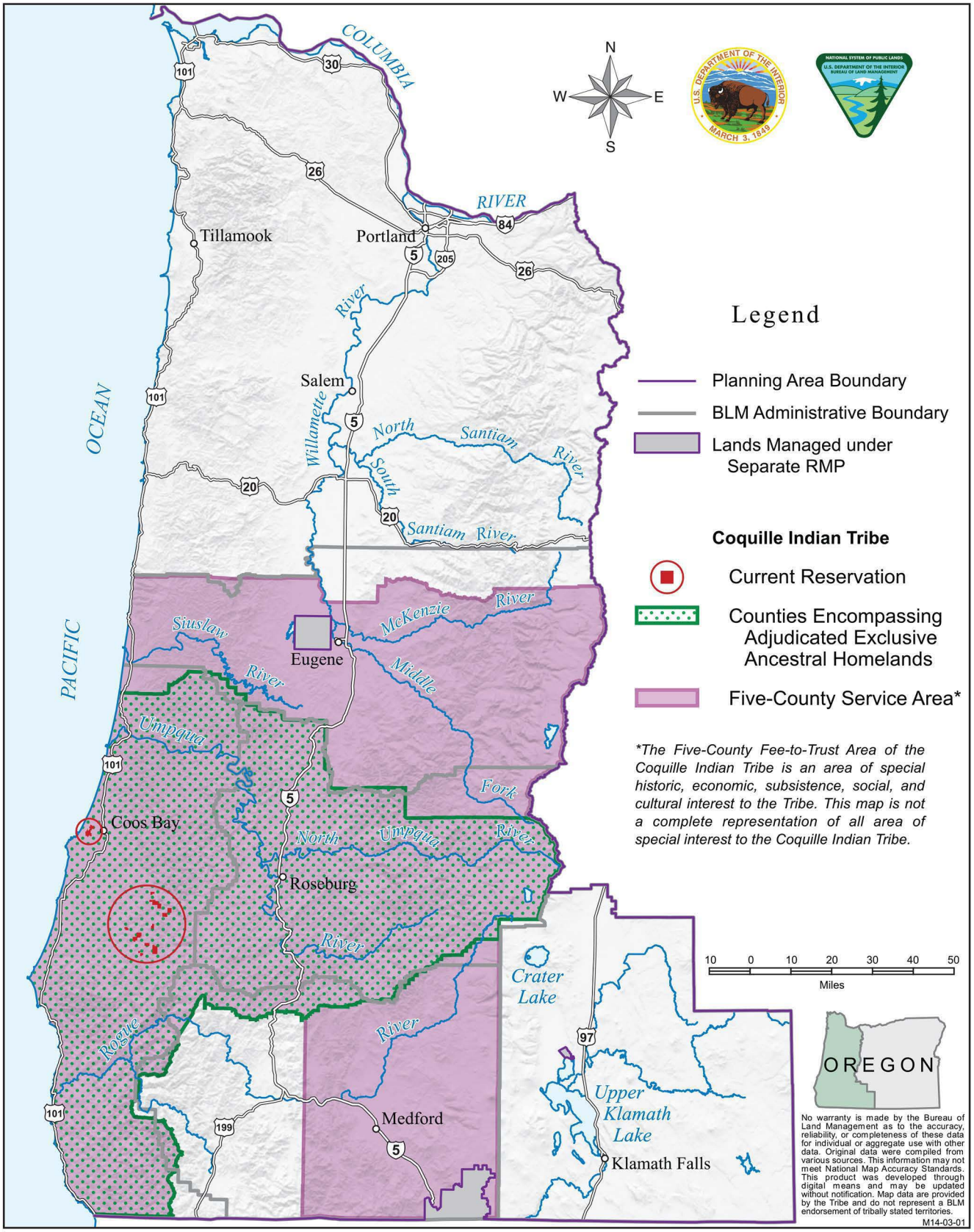
The Coquille Forest was created by enactment of P.L. 104-208, Division B, and Title V on September 30 1996. This Public Law, passed by the U.S. Congress and signed by President Clinton, restored 5,410 acres (5,397 according to GIS) of ancestral homelands to the Coquille Indian Tribe and designated the restored lands as the Coquille Forest.

The Coquille Forest Act allows the Coquille Tribe an opportunity to reaffirm Tribal stewardship over a small portion of its ancestral homelands, and to reestablish many of the Tribal cultural traditions that were once practiced on these landscapes.

The purpose for creation of the Coquille Forest was described by Senator Hatfield in his statement before the U.S. Senate concerning Amendment No. 5150 to the Oregon Resources Conservation Act of 1996 [S. 1662]: "It is intended to establish a Coquille Forest for the Coquille Tribe that will mesh into the broader forest management of Coos County. Within this context, the Coquille Forest is to provide a basis for

restoring the Tribe's culture as well as providing economic benefits [Congressional Record- Senate, pg. S9656, August 2, 1996].

The respect the Coquille people have always had for their Ancestral Homelands, much of which is now administered by the Bureau of Land Management, is carried on in legacy through the practices of the Coquille Indian Tribe today. Annual trips are still made to harvest traditional foods, gather grasses for weaving baskets and enjoy celebrations on the land their ancestors had stewardship over for thousands of years. The land is, and always will be, an integral part of their identity and heritage as a people.



Map 4: Ancestral Homelands and Areas of Special Interest to the Coquille Indian Tribe

The Cow Creek Band of Umpqua Tribe of Indians

The Cow Creek Band of Umpqua Tribe of Indians, located in Douglas County, Oregon, signed a treaty with the United States of America on September 19, 1853 which was one of the first treaty's from the Pacific Northwest to be ratified by the Senate on April 12, 1854. By that agreement, the Cow Creeks became a landless tribe, ceding more than 800 square miles of the Umpqua watershed in Southwestern Oregon to the United States. Unfortunately, the Treaty was ignored by the Federal Government for nearly a century until the Termination Act in 1956 which terminated federal relations with the Cow Creeks, along with 60 other tribes and bands in western Oregon.

The Cow Creeks received no prior notification of the Termination Act, and because of that were able to obtain presidential action in 1980 to take a land claims case to the U.S. Court of Claims. On December 29, 1982, nearly 125 years after the Treaty was signed, P.L. 97-391 was passed by Congress and the Tribe regained federal recognition.

With federal recognition, the tribe was able to negotiate federal contracts with the Bureau of Indian Affairs and the Indian Health Service to administer such programs as Housing, Education, and others related to health for the enrolled membership of the Tribe within the tribal service area.

Current enrollment for the Tribe is over 1600 members. Nearly one half of all tribal members reside in the tribe's seven county service area consisting of Coos, Deschutes, Douglas, Jackson, Josephine, Klamath and Lane Counties. These counties were determined by the Bureau of Indian Affairs and Indian Health Service as required by the CFR to define "on or near the reservation" for the tribe.

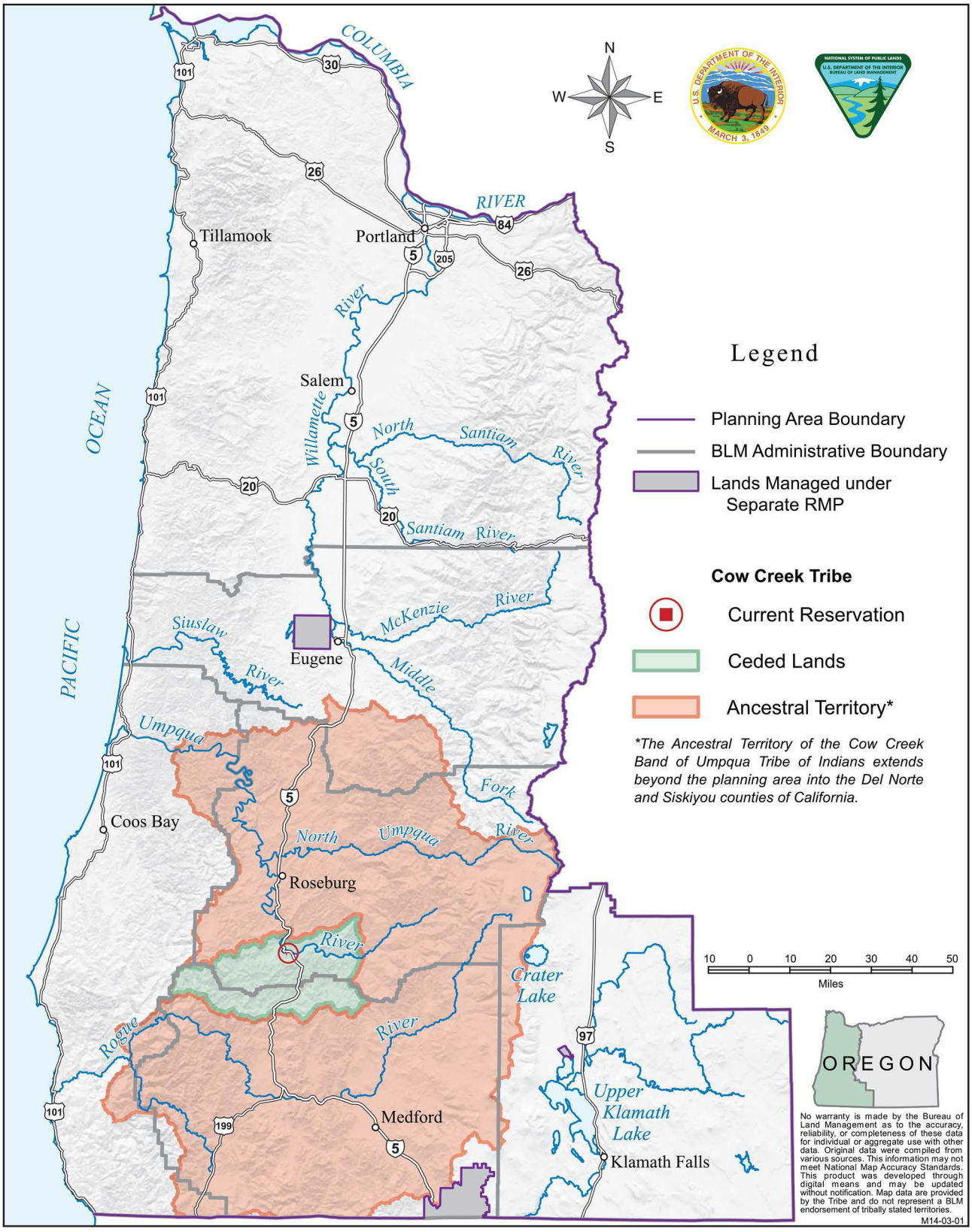
In 1985 the Tribe purchased 29 acres in Canyonville, Oregon which was eventually taken into "trust" by the federal government and became the Tribal Reservation. This property is only 6 miles from where the Treaty was signed in 1853.

The tribe has maintained strong cultural ties to the area. The traditional Cow Creek Pow-wow is held annually at South Umpqua Falls, an area that has tremendous importance to the tribe's culture and tradition.

Another area of great historical, cultural, and traditional use is an area known as the Huckleberry Patch on the Rogue-Umpqua Divide. This area was a traditional use area for the tribe and has great historic importance.

The Tribe has remained steadfast in the realization of tribal economic self-sufficiency. After years of planning and financial packaging, the Tribe opened the Cow Creek Bingo Center on April 30, 1992. Through careful management of tribal assets, the tribe was able to initiate a series of expansions that resulted in the Seven Feather Hotel and Casino Resort.

With proceeds from the resort, the tribe has developed an aggressive economic development program that includes land acquisition and business diversification and development.



Map 5: Tribal Lands of the Cow Creek Band of Umpqua Tribe of Indians

Tribal Listening Sessions

Overview

As part of the outreach process for the RMP, the BLM reached out to all nine Federally Recognized Tribes located within or holding interests within the planning area, inviting them to participate in listening sessions. These invitations initiated coordination and communication with the Tribes in this RMP planning process. Several Tribes also have representatives in CAAG, which has been and will continue to collaborate with the BLM throughout the duration of the planning process. In addition to these efforts, and formal government-to-government consultation, the BLM will continue to be available for meetings throughout the planning process with interested and affected Tribes.

BLM managers and RMP team members conducted listening sessions with five Tribes at local Tribal Headquarters (**Table Q-1**). Cogan Owens Cogan facilitated four of the five meetings with assistance from DS Consulting; BLM staff facilitated one meeting. Their notes, combined with BLM staff notes, comprise the content of this summary.

Table Q-1. Alphabetical listing of Tribal listening sessions.[1]

Tribe	Schedule
The Confederated Tribes of Grand Ronde Community of Oregon*	May 22, 2013
The Confederated Tribes of Siletz Indians*	June 7, 2013
The Coquille Indian Tribe*	May 14, 2013
The Cow Creek Band of Umpqua Tribe of Indians*	December 18, 2013
The Klamath Tribes*	July 15, 2013

[1]The Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians; The Confederated Tribes of Warm Springs; Karuk Tribe; and The Quartz Valley Indian Community elected not to have listening sessions.
* Denotes the Tribal representative serves as a member of the CAAG. In addition to these Tribes, the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians also serve on the CAAG.

These listening sessions initiated efforts to ensure that Tribes were involved early in the RMP process and that the BLM understands Tribal interests. The listening sessions:

- Provided Tribal Councils and staff with an update on the planning process and external initiatives;
- Sought input on Tribal issues and concerns and what analytical questions need to be addressed in developing Planning Criteria;
- Identified how Tribes can provide input during future phases of the planning process; and
- Sought input on the level and mechanisms for participation desired by each Tribe.

The BLM had not publically released the Purpose and Need at the time the first three listening sessions were held. These notes reflect only the listening sessions, and not subsequent discussions that the BLM held with the Tribes who expressed interest in follow up discussions on the Purpose and Need. These follow up sessions with the Tribes occurred through conversations with Tribal representatives through the CAAG.

At each listening session, materials presented included:

- Maps of BLM-administered lands in western Oregon (e.g., planning area and administrative land designations)

- Draft analytical questions developed with input from the Cooperating Agency Advisory Group's Tribal Work Group
- A fact sheet on the process and timeline

Listening sessions ranged from 1.5 to 3 hours in length and covered several common discussion items (**Table Q-2**).

Table Q-2. Listening session agenda and format.

Meeting Agenda Items	Participants
Introductions and Background	District Manager and Tribal Council
Update on Planning Process and Schedule	State Office staff
Questions/Discussion	Tribal Council and staff
Listening Session • What are the areas of Tribal interest? • What are Tribal values and concerns to address in the RMP? • What are analytical questions that BLM should address?	Facilitator
Summary/Closing	District Manager

To help frame the discussion of Planning Criteria for Tribal interests, Heather Ulrich, RMP Tribal Liaison, provided a preliminary list of issues and concerns that generally addressed how BLM-administered land management actions would affect the following:

- Tribal plant collection, management, and use
- Tribal resource collection of obsidian and other non-biological resources
- Tribal fishing and hunting resources and practices
- Tribal access to areas of interest including areas of plant collection, fishing, hunting, sacred sites, or places of traditional religious and cultural importance
- Sacred sites and places of traditional religious and cultural importance
- Neighboring tribally managed lands

Because of these listening sessions, the BLM expanded and refined this initial list to address the diverse number topics and resources of interest to Tribes more accurately. The Planning Criteria contains a section on Tribal Interests that outlines the refined list of analytical questions as gathered from Tribal outreach.

Tribal Listening Session Highlights

The following section summarizes the participants and highlights of each of the listening sessions.

Confederated Tribes of Grand Ronde

May 22, 2013
Tribal Headquarters, Grand Ronde, Oregon

Tribal council participants: Toby McClary, Secretary; Jon George, Council Member; June Sherer, Council Member; Kathleen Tom, Council Member; Chris Mercier, Council Member
Tribal staff participants: David Harrelson, Cultural Protection Manager; Eirik Thorsgard, Tribal Historic Preservation Officer; Michael Karnosh, Ceded Lands Program Manager; Michael Wilson, Natural Resources Director

BLM attendees: Kim Titus, Salem District Manager; Ginnie Grilley, Eugene District Manager; Heather Ulrich, RMP Tribal Liaison; Mark Brown, RMP Project Manager; Trish Hogervorst, Salem District Public Affairs Officer
Facilitator: Jim Owens, Cogan Owens Cogan

General comments and highlights of main Tribal interest topics

- The Grand Ronde has just signed (2013) a Natural Resources Management Plan that they feel may serve as a model for other Tribes. Their timber land is managed for sustained yield. In writing their Natural Resources Management Plan, the Tribe met with environmental groups to educate them on the plan. The Tribe is very proud of the fact that environmental groups had previously predicted the Grand Ronde timber would be gone in 20 years; at 30 years, there is still plenty of timber on Tribal lands due to good management.
- The Tribe asked about gated BLM roads. Could tribes get passes through gated areas to access cultural sites? Could BLM let the Tribe know the conditions of the roads? Tribal members could serve as eyes/ears for the BLM on BLM-administered lands during their Tribal gathering of cedar, huckleberries, etc. Tribal access and public access are not the same. The Tribe expressed a need for Tribal access to BLM-administered lands for religious reasons.
- Private companies are harvesting and punching in roads interrupting fish passage and providing no maintenance on the roads for many years. The Tribe is concerned about this happening on BLM-administered lands.
- There is a lot of available timber and our communities and counties are in need; consider increased timber production based upon sustainable management principles.
- Can the BLM add language at the plan level that establishes Tribes as partners for cultural resource work such as surveys?
- Develop a partnership for managing plants of interest, including "take" and the preparation for harvest and harvest methods.
- Could the Grand Ronde be included in all Tribal consultations since all lands on the BLM map are Ceded lands with treaty rights?
- The Tribe is contracting with National Park Service (NPS) and National Oceanic and Atmospheric Administration (NOAA) to conduct traditional cultural landscape studies on indigenous landscapes. Could the BLM hire Tribes to work on this on BLM-administered land?
- There are concerns regarding management of BLM-administered lands bordering the eastside of Grand Ronde lands.
- Could BLM meet regularly with Tribes on new rules coming down and create an memorandum of understanding on annual meeting to discuss mutual issues/projects? The Tribe would like to finish Tribal memorandum of understanding as cooperating agency on the planning process.
- Interested in discussion of Purpose and Need at a future date.
- The Tribe offered a tour of Grand Ronde lands to see work (i.e., fish passages) they are doing in natural resources. The Tribe has opened 60+ miles of fish passage.

Planning considerations

- Restoration and long-term maintenance of fish passage. Old roads left unmaintained block fish passage.
- Indigenous landscapes and landscape level analysis.
- Quantifying non-commercial items is not the way to approach it. Cannot compare value of timber products versus non-commercial timber products (e.g., items for making baskets and other Tribal cultural needs).
- How BLM manages collection of special forest product to prevent degradation.
- Tribe would like to provide information to the BLM on restoration efforts (e.g., hazelnut sticks for basketry). The Tribe would like to see more lands managed for Tribal cultural resources.

Confederated Tribes of Siletz Indians

June 7, 2013
Tribal Headquarters, Siletz, Oregon

Tribal Council participants: Delores Pigsley, Chairman; Lillie Butler, Council Member; Loraine Butler, Council Member; Reggie Butler, Sr. , Council Member; Robert Kentta, Council Member
Tribal staff participants: Mike Kennedy, Natural Resources Manager
BLM attendees: Kim Titus, Salem District Manager; Ginnie Grilley, Eugene District Manager; Mark Brown, RMP Project Manager; Heather Ulrich RMP Tribal Liaison; Richard Hatfield, Mary's Peak Resource Area Field Manager
Facilitator: Jim Owens, Cogan Owens Cogan

General comments and highlights of main Tribal interest topics

- How does the RMP fit into the Wyden Plan?
- The Tribe expressed concern for air, water, and climate change.
- The Tribe expressed concern for timber receipts and Secure Rural Schools.
- The Tribe stated it would like an memorandum of understanding for collecting basketry materials.
- Tribe has past and ongoing interest in public domain lands in Lincoln County.
- Look into Tribes' "right of first refusal" for excess federal lands within original reservation boundaries that are designated for disposal.
    - Can Tribes provide input to what lands the BLM can put in Land Tenure Zone 3 (suitable for disposal)?
- First level of interest in BLM-administered lands are those within the original reservation boundary. Some interests include:
    - Hazel management
    - Hunting access
    - Spruce root collection
- The Tribe expressed concern regarding destruction and looting of archaeological sites and artifacts as well as public use impacts in certain key areas of interest to the Tribe within the planning area.
- Concern regarding BLM ability to coordinate consultation with other/all Tribes concerned.
- Plant collection: Where resources are on BLM-administered land, can the Tribe help manage them, increase them, and collect them? Specific collection interests include:
    - Beargrass collection
    - Ferns and peeled chittum
    - Sugar pine and ancient oaks; digger pine in Applegate and Rogue valleys
    - Willamette Valley oak savannah, angelica (Lomatium species), scrub oak, and rocky outcrops
    - Acorns and pileated woodpeckers for feathers; want to ensure that the Tribe can obtain forage permits for these resources
- The Tribe identified a need for improved coordination on memoranda of understanding with other Tribes when Tribal territory is impacted.

Planning considerations

- Protection of historic trail systems.
- Preserve some type of visible boundary between the historic reservation lands and BLM-administered land, e.g. leave large trees.
- Management of public domain lands in Lincoln County by the Tribes.

- Management for traditionally collected plants (e.g., beargrass, hazel nuts, angelica) on all BLM-administered lands; stand diversity that encourages spruce, other species important for collection; adverse effects of overly dense timber stands on sugar pine, ancient oaks. Management should include heavy thinning or clearcuts to reopen areas for beargrass collection.
- Identification/interpretation of battle sites.
- Management for marbled murrelet.
- Protection of cemetery sites and other archaeological sites and artifacts impacted by inadvertent public use or intentional damage and looting.

Coquille Indian Tribe

May 14, 2013
Tribal Headquarters, North Bend, Oregon

Tribal participants: Brenda Meade, Chair; Toni Ann Brend, Vice-Chair; Ken Tanner, Chief; George Smith, Executive Director; Joan Metcalf, Secretary/Treasurer; Sharon Parrish, Representative; Kippy Robbins, Representative; Jason Robison, Natural Resources Director
BLM attendees: Mark Johnson, Coos Bay District Manager; Ralph Thomas, Coos Bay Associate District Manager; Heather Ulrich, RMP Tribal Liaison; Mark Brown, RMP Project Manager; Megan Harper, Coos Bay District Public Affairs Officer
Facilitator: Jim Owens, Cogan Owens Cogan

General comments and highlights of main Tribal interest topics

- The Coquille Indian Tribe regained Tribal status in 1989. A 1950's Court of Claims case provided exclusive ancestral territory on BLM-administered lands within the Coos Bay District. Other geographic areas outside of this exclusive ancestral territory are of shared interest with other Tribes. The Coquille Forest Act of 1996 put 5,400 acres of BLM-administered land into trust for the Tribe to manage. They have a huge stake in BLM plan revisions because of statutory direction that requires the Coquille Forest to be managed per the standards and guidelines of Federal forest plans "on adjacent or nearby Federal lands".
- The Tribe expressed concern regarding the economic health of the communities that the Coquille and other Tribes work in, and how Tribes influence and contribute to the communities they live and work in (e.g., Coquille is the second largest employer in Coos County).
- Tribal approach is to maintain healthy communities that rely upon timber harvest but still only take what is needed and managing for the needs of the earth rather than the needs of humans. Living in balance; sustainability from a cultural perspective.
- In regards to the Tribal Cooperative Management Area, consider Adaptive Management Area framework with site-specific management prescriptions and intensive monitoring.
- Tribe desires greater direct involvement in management of Coos Bay Wagon Road lands. Tribe has proposed a cooperative management agreement with Coos County; developing a concept paper to share with the Congressional delegation.
- Tribe wants to ensure an ongoing relationship with the BLM beyond this planning process.
- Interested in discussion of Purpose and Need at a future date.

Planning considerations

- Economic values that lead to a sustainable and economically healthy Tribal community.
- Approach for and addressing management of the Coos Bay Wagon Road and cooperative management.
- Consideration of TCMA in all alternatives based upon Direction from the Secretary of the Interior.

- Concerns regarding climate change and impacts on Tribal resources and natural resources.
- Adjacency issues in the context of the Tribe's exclusive ancestral territory.
- Management of natural/cultural resources within riparian areas.
- The Tribe wants to ensure that the planning effort considers provisions of existing agreements with the BLM (memoranda of understanding , memoranda of agreement, etc.). If proposed planning considerations are in opposition to, or not fully consistent with agreement provisions, further discussions with the Tribe should occur prior to moving forward with such considerations.

Cow Creek Band of Umpqua Tribe of Indians

December 18, 2013
Tribal Headquarters, Roseburg, Oregon

Tribal participants: Robert Van Norman, Treasurer; Lonnie Rainville, Operations Officer; Tim Vredenburg, Director of Forest Management; Amy Amoroso, Director of Natural Resources; Jessie Plueard, Archaeologist; Rhonda Malone, Cultural Development Coordinator; Kelly Coates, Fisheries Biologist; Heather Bartlett, Environmental Specialist; Scott Van Norman, Wildlife Technician
BLM attendees: Mark Brown, RMP Project Manager; Abbie Jossie, Roseburg District Manager; Heather Ulrich, RMP Tribal Liaison; Molly Casperson, Roseburg District Archaeologist
Facilitator: Cheyne Rossbach, Roseburg District Public Affairs Officer

General comments and highlights of main Tribal interest topics

- Purpose and Need Statement seems too broad and that it will be challenging to develop alternatives.
- The Tribe is very aware of the politics surrounding the BLM, specifically proposed legislation directed toward BLM-administered lands. Specifically, Congressman DeFazio's O&C Trust, Conservation, and Jobs Act and Senator Wyden's O&C Act of 2013 and Canyon Mountain Land Conveyance Act of 2013.
- There was interest in knowing how the RMP planning process was taking into consideration proposed legislation.
- Interest in clarification of the differences between the RMP Purpose and Need statement, current practices, and what is in the Northwest Forest Plan.
- There was interest in the definition of "old growth."
- The public perception of old growth as natural is not true. The character of historic forests was a direct result of Tribal management. Recognize historic human involvement in "old growth" development in the new definition of old growth – that past humans "created" what is old growth today. The idea that pristine or untouched are characteristic of old growth is incorrect.
- How will the BLM balance the needs of the county, who says they need a set amount of money, versus the other needs (like northern spotted owl recovery, etc.)? Do the perceived needs of the counties direct the plan?
- The way the BLM draws lines around resources conflicts with how the Tribe would delineate resources and, at times, the BLM and Tribe are not even looking at the same kinds of resources. Tribal staffs at the table do not adhere to the silo approach of isolated old growth stands or owls. One example where Tribal values and BLM values are in conflict is that old growth is not fire resilient like it was 100 years ago because the Tribe is not managing them the way they did traditionally (i.e., annual fire cycles).
- It is problematic that the structural complexity of forests related to fires cannot be mapped. The forests are not as they should be because management is not as it was historically (Tribal management). Another example of the incongruous nature of federal and Tribal land management

strategies is diminishing meadows that are important foraging locales for game. Definitions and alternatives should be adaptive enough to protect Tribal resources.
- Early seral habitat is important for foraging and hunting, which has little to do with meeting timber targets. The Tribe needs to be able to hunt and regular fire cycles are important to create habitat.
- The Tribe expressed interest in the differences in the proposed riparian buffer zones. Two important issues to the Tribe are clean water and fish.
- There have been Tribal efforts working on lamprey conservation and the Tribe encouraged the BLM to raise the bar on conservation efforts as well. Conservation methods for lamprey are also good for salmon.
- Water issues include more than quality. There are more stems than in the past, with less water in tributaries. Changes like these create systems that are more compatible for invasive or exotic species, which directly harm lamprey. Management of upland systems directly affects lamprey. The BLM riparian zones may not align with Tribal values. An example of this from the BLM's pilot project includes finding beargrass in no-touch riparian zones. The presence of beargrass in these zones suggests it was open at one time, so a no-touch area conflicts with the way the Tribe would manage the beargrass.
- Think of Tribal concerns when you consult with the National Marines Fisheries Service (NMFS) or whoever. Your decisions affect how the Tribe can consult for the next year, which ultimately affects how the Tribe can manage its own lands. Think of the federal government's trust responsibility to the Tribe.
- Recreation is important in the new RMP, but off-highway vehicle (OHV) recreation creates issues for the Tribe's cultural sites. As this plan develops, the public will put pressure on the BLM to open OHV areas that will directly affect cultural sites.
- This area is the ancestral territory of the Tribe. We have been here for thousands of years and intend to stay.
- Beyond archaeological sites, recognize that the Tribe has spiritual sites that have visual and auditory sensitivity. Address this with future Visual Resource Inventory efforts.

Planning considerations
- How would land management actions affect resident deer and elk populations?
- Interest in BLM's approach to water, fish, and lamprey conservation.
- Concerns for effects to archaeological and other cultural resources.
- Consider Tribal views of management and resources, which are typically different from BLM perspectives. Tribal perspectives are particularly important in respect to land management, fire, water, and riparian area management.

Klamath Tribes

July 15, 2013
Tribal Government Office, Chiloquin, Oregon

Tribal participants: Perry Chocktoot, Jr., Director of Culture and Heritage; Kathleen Mitchell, General Manager
BLM attendees: Mark Brown, RMP Project Manager; Heather Ulrich, RMP Tribal Liaison; Donald Holmstrom, Klamath Falls Field Manager; Brooke Brown, Klamath Falls Resource Area Archaeologist
Facilitator: Robin Gumpert, DS Consulting

General comments and highlights of main Tribal interest topics
- The Tribe's interest area begins at the top of the Cascade Range.

- The Tribe expressed concern about splitting the Lakeview District into separate RMPs, requiring the Tribe to consult with two offices on two different plans. All of the Lakeview District is part of the Klamath Tribes' aboriginal territory.
- Will the RMP result in more or less timber harvested?
- Grazing allotments affect cultural resources, mostly near fences and water sources and rock features. Desire 100 percent survey on all allotments so that the BLM can say for sure what the impacts are to sites.
- Concern over archaeological contracting firms surveying on BLM-administered lands when they have no experience in the area and may not have the background to identify and subsequently document sites.
- Desire for the BLM to listen to what the Tribes have to say at all levels of management and engage in meaningful consultation. The Tribe and the BLM need to be allies on projects, and this occurs with meaningful consultation.
- The Tribe identified concern that the Purpose and Need includes no Section 106 responsibilities .
- Meaningful consultation as part of the planning process needs to be captured in the Purpose and Need. Tribes are interested in what is going on elsewhere, even if not on their aboriginal lands.
- Trees have importance to the Tribe, particularly culturally modified tress (cambium peeled trees and bow stave trees). Section 106 needs to protect these important areas of cultural interest. Spiritual integrity is first and foremost of importance to the Tribe. Tribal Resolution 92-047 states that all sites are sacred.
- Clean water in the Klamath watershed is of great concern.
- The Tribe has 22 million acres of aboriginal lands, and they are concerned about grazing, timber harvest activities, and protecting their sacred sites. The Tribes would like to see preservation of their sacred sites.
- It is frustrating when Tribes feel like they are sharing information and not heard.
- BLM has come a long way on meaningful consultation, and needs to do this on all projects. Face time (face-to-face meetings) means a lot to the Tribe.
- All of the BLM-administered lands in Klamath County are of interest to the Tribe. There are numerous and diverse archaeological, cultural, and spiritual locations within the BLM-administered lands that are of great importance and interest to the Tribe.
- Primary impacts to Tribal interests are grazing, timber, OHV, and low water exposing sites.
- The BLM needs to recognize federal trust responsibilities and talk to the Tribe about closures to areas affecting sites. The Tribe expressed a need for a memorandum of understanding for government-to-government consultation.

Planning considerations

- Grazing allotments that affect cultural resources, mostly near fences and water sources, and rock features.
- Protection of culturally modified trees (cambium peeled trees and bow stave trees).
- Primary impacts to Tribal interests are grazing, timber, OHV use, water levels in reservoirs.

Tribal Listening Session Summary

These five listening sessions provided BLM managers and RMP staff with a greater understanding of Tribal histories and their interests in the lands and resources that the BLM manages. As part of the RMP, these topics of interest are included as analytical questions in the Planning Criteria and the effects analyzed by alternative (Chapter 3). The analysis will inform decision makers on how land management actions affect those resources of concern to the Tribes.

Some of the recurring themes identified during these listening sessions included:

- hunting, fishing and plant gathering access
- plant collection, management and use
- multiple Tribes with interests (sometimes competing) on the same BLM-administered lands;
- fish and lamprey
- archaeological sites and impacts due to land management actions as well as public use and vandalism
- cooperative opportunities
- climate change
- air and water quality
- balancing healthy forests and the need for economic stability for the counties and Tribes
- land acquisition into Tribal ownership or Tribal management
- indigenous landscape studies
- management of BLM-administered lands adjacent to Tribal land
- land management activities that benefit multiple resources of cultural value
- memoranda of understanding
- impacts from recreation and OHV use to cultural sites
- effects of proposed legislation on the planning process

Detailed notes captured during these sessions will aid managers as they continue managing the lands that hold importance to the Tribes. The BLM collected valuable information from these listening sessions that will inform land managers beyond the scope of this RMP in carrying out the BLM mission.

Appendix R – Other Wildlife- Not Northern Spotted Owl

Bald Eagle

Table R-1. Bald eagle nesting habitat development under the alternatives in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	247,608	247,608	247,608	247,608	247,608	247,608
Alternatives						
2023	239,162	245,926	240,541	237,713	246,257	251,623
2033	241,217	250,307	248,623	234,618	254,734	260,791
2043	269,083	284,349	284,691	259,979	290,664	301,812
2053	283,700	300,363	302,859	273,581	312,466	320,636
2063	300,862	322,298	325,246	288,660	338,378	345,936

Table R-2. Bald eagle nesting habitat development under the alternatives in the planning area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	1,146,747	1,146,747	1,146,747	1,146,747	1,146,747	1,146,747
Alternatives						
2023	1,138,301	1,145,065	1,139,680	1,136,852	1,145,396	1,150,762
2033	1,140,356	1,149,446	1,147,762	1,133,757	1,153,873	1,159,930
2043	1,168,222	1,183,488	1,183,830	1,159,118	1,189,803	1,200,951
2053	1,182,839	1,199,502	1,201,998	1,172,720	1,211,605	1,219,775
2063	1,697,743	1,719,179	1,722,127	1,685,541	1,735,259	1,742,817

Columbian White-tailed Deer

Table R-3. Higher-quality forage habitat development for the Columbian white-tailed deer within the range of the Lower Columbia River population in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	295	295	295	295	295	295
Alternatives						
2023	350	2,436	2,109	3,514	1,600	295
2033	394	3,030	2,184	4,341	1,365	-
2043	1,672	1,715	3,278	2,055	441	-
2053	2,500	1,910	4,000	3,222	1,137	-
2063	1,400	1,502	3,761	3,228	1,455	-

Table R-4. Higher-quality forage habitat development for the Columbian white-tailed deer within the range of the Lower Columbia River population in the planning area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	87,711	87,711	87,711	87,711	87,711	87,711
Alternatives						
2023	87,766	89,852	89,525	90,930	89,016	87,711
2033	86,453	89,089	88,243	90,400	87,424	86,059
2043	87,731	87,774	89,337	88,114	86,500	86,059
2053	88,559	87,969	90,059	89,281	87,196	86,059
2063	87,459	87,561	89,820	89,287	87,514	86,059

Table R-5. Higher-quality forage habitat development for the Columbian white-tailed deer within the range of the Douglas County population in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	9,834	9,834	9,834	9,834	9,834	9,834
Alternatives						
2023	23,745	15,813	15,467	29,767	10,257	6,827
2033	32,878	17,932	19,068	44,504	10,539	3,332
2043	27,122	18,307	26,312	36,163	10,810	3,248
2053	22,616	19,254	31,151	34,474	9,557	3,230
2063	18,854	21,192	26,802	35,587	8,554	2,964

Table R-6. Higher-quality forage habitat development for the Columbian white-tailed deer within the range of the Douglas County population in the planning area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	133,197	133,197	133,197	133,197	133,197	133,197
Alternatives						
2023	147,108	139,176	138,830	153,130	133,620	130,190
2033	148,302	133,356	134,492	159,928	125,963	118,756
2043	142,546	133,731	141,736	151,587	126,234	118,672
2053	138,040	134,678	146,575	149,898	124,981	118,654
2063	134,278	136,616	142,226	151,011	123,978	118,388

Black-tailed Deer and Roosevelk Elk

Table R-7. Higher-quality forage habitat development for black-tailed deer and Roosevelt elk in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	46,249	46,249	46,249	46,249	46,249	46,249
Alternatives						
2023	92,216	91,012	81,747	138,088	69,273	43,016
2033	101,496	97,831	73,281	180,450	51,793	9,667
2043	100,324	86,622	105,364	145,343	44,531	12,233
2053	111,095	79,930	132,251	127,038	47,977	14,105
2063	110,566	80,089	118,311	131,001	46,001	14,418

Table R-8. Higher-quality forage habitat development for black-tailed deer and Roosevelt elk in the planning area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	1,112,694	1,112,694	1,112,694	1,112,694	1,112,694	1,112,694
Alternatives						
2023	1,158,661	1,157,457	1,148,192	1,204,533	1,135,718	1,109,463
2033	1,088,405	1,084,740	1,060,190	1,167,359	1,038,702	996,579
2043	1,087,233	1,073,531	1,092,273	1,132,252	1,031,440	999,145
2053	1,098,004	1,066,839	1,119,160	1,113,947	1,034,886	1,001,017
2063	1,097,475	1,066,998	1,105,220	1,117,910	1,032,910	1,001,331

Fisher

Table R-9. Total fisher habitat (denning, resting, foraging combined) in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	574,219	574,219	574,219	574,219	574,219	574,219
Alternatives						
2023	540,312	562,929	566,950	556,936	566,614	571,406
2033	508,448	557,325	564,704	544,409	564,162	570,339
2043	506,615	579,756	593,507	567,035	591,213	593,899
2053	514,442	609,830	633,093	600,094	626,542	623,829
2063	527,502	632,336	662,866	620,639	653,341	644,357

Table R-10. Fisher denning habitat in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	324,478	324,478	324,478	324,478	324,478	324,478
Alternatives						
2023	298,161	320,609	317,328	308,951	315,449	326,958
2033	288,378	333,386	331,912	320,253	332,599	345,024
2043	277,816	343,220	343,245	329,545	344,426	353,797
2053	286,468	364,269	360,761	346,072	366,379	376,841
2063	292,012	387,886	376,867	365,611	389,533	398,633

Table R-11. Fisher resting habitat in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	153,657	153,657	153,657	153,657	153,657	153,657
Alternatives						
2023	148,819	148,504	149,972	149,670	154,827	151,470
2033	125,316	132,781	135,607	130,593	137,631	132,291
2043	150,131	157,106	163,113	153,280	161,670	164,213
2053	153,310	168,252	188,158	172,182	178,813	172,239
2063	143,410	162,066	193,001	167,697	172,961	160,996

Table R-12. Fisher foraging habitat in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	96,084	96,084	96,084	96,084	96,084	96,084
Alternatives						
2023	93,332	93,816	99,650	98,315	96,338	92,977
2033	94,755	91,157	97,184	93,563	93,932	93,024
2043	78,668	79,430	87,149	84,210	85,117	75,889
2053	74,664	77,310	84,173	81,840	81,350	74,748
2063	92,080	82,384	92,998	87,331	90,847	84,728

Table R-13. Total fisher habitat (denning, resting, foraging combined) in the planning area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	4,484,755	4,484,755	4,484,755	4,484,755	4,484,755	4,484,755
Alternatives						
2023	4,450,848	4,473,465	4,477,486	4,467,472	4,477,150	4,481,942
2033	4,519,548	4,568,425	4,575,804	4,555,509	4,575,262	4,581,440
2043	4,554,018	4,627,160	4,640,911	4,614,438	4,638,616	4,641,302
2053	4,561,846	4,657,234	4,680,496	4,647,498	4,673,945	4,671,232
2063	4,574,905	4,679,739	4,710,269	4,668,042	4,700,745	4,691,760

Table R-14. Fisher denning habitat in the planning area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	639,570	639,570	639,570	639,570	639,570	639,570
Alternatives						
2023	613,253	635,701	632,420	624,044	630,541	642,051
2033	603,470	648,479	647,005	635,345	647,691	660,117
2043	592,908	658,313	658,338	644,638	659,518	668,889
2053	892,611	970,411	966,903	952,215	972,521	982,983
2063	898,154	994,028	983,009	971,753	995,675	1,004,775

Table R-15. Fisher resting habitat in the planning area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	825,681	825,681	825,681	825,681	825,681	825,681
Alternatives						
2023	820,843	820,527	821,996	821,693	826,851	823,494
2033	797,339	804,805	807,630	802,617	809,654	804,315
2043	822,155	829,129	835,136	825,303	833,693	836,236
2053	534,284	549,226	569,132	553,156	559,787	553,213
2063	1,241,308	1,259,963	1,290,899	1,265,595	1,270,859	1,258,894

Table R-16. Fisher foraging habitat in the planning area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	3,019,504	3,019,504	3,019,504	3,019,504	3,019,504	3,019,504
Alternatives						
2023	3,016,752	3,017,236	3,023,070	3,021,735	3,019,758	3,016,397
2033	3,118,739	3,115,142	3,121,169	3,117,548	3,117,916	3,117,008
2043	3,138,956	3,139,718	3,147,436	3,144,497	3,145,405	3,136,177
2053	3,134,951	3,137,597	3,144,461	3,142,127	3,141,637	3,135,035
2063	2,435,443	2,425,748	2,436,361	2,430,694	2,434,211	2,428,091

Golden Eagle

Table R-17. Golden eagle nesting habitat development under the alternatives in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	789,751	789,751	789,751	789,751	789,751	789,751
Alternatives						
2023	750,166	779,767	770,310	757,922	786,414	797,483
2033	729,066	782,249	782,891	737,013	802,040	812,293
2043	787,103	860,962	866,826	796,427	893,766	909,511
2053	821,344	911,220	930,695	843,357	964,908	967,010
2063	848,128	957,588	982,160	878,459	1,026,264	1,018,234

Table R-18. Golden eagle nesting habitat development under the alternatives in the planning area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	3,225,904	3,225,904	3,225,904	3,225,904	3,225,904	3,225,904
Alternatives						
2023	3,186,319	3,215,920	3,206,463	3,194,075	3,222,567	3,233,636
2033	3,165,219	3,218,402	3,219,044	3,173,166	3,238,193	3,248,446
2043	3,223,256	3,297,115	3,302,979	3,232,580	3,329,919	3,345,664
2053	3,257,497	3,347,373	3,366,848	3,279,510	3,401,061	3,403,163
2063	4,612,466	4,721,926	4,746,498	4,642,797	4,790,602	4,782,572

Marbled Murrelet

Table R-19. Marbled murrelet nesting habitat development under the alternatives in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	493,968	493,968	493,968	493,968	493,968	493,968
Alternatives						
2023	502,168	507,622	501,865	477,023	518,431	528,310
2033	565,762	579,509	569,953	515,784	602,023	621,274
2043	648,814	660,588	647,416	580,062	691,494	716,909
2053	733,369	739,298	725,624	648,471	779,791	811,704
2063	773,852	756,794	771,558	654,988	813,721	840,024

Table R-20. Marbled murrelet high-quality nesting habitat development under the alternatives in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	233,219	233,219	233,219	233,219	233,219	233,219
Alternatives						
2023	226,102	231,247	230,737	222,942	232,005	233,448
2033	252,025	259,411	258,532	244,219	260,620	263,781
2043	260,610	271,627	271,282	251,518	274,686	277,291
2053	275,825	286,819	287,764	265,232	290,827	294,382
2063	294,666	305,620	308,023	276,789	310,055	319,070

Table R-21. Marbled murrelet nesting habitat development under the alternatives in the planning area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	5,301,635	5,301,635	5,301,635	5,301,635	5,301,635	5,301,635
Alternatives						
2023	5,309,835	5,315,289	5,309,532	5,284,690	5,326,098	5,335,977
2033	5,414,289	5,428,036	5,418,481	5,364,311	5,450,550	5,469,801
2043	5,515,882	5,527,656	5,514,484	5,447,131	5,558,562	5,583,977
2053	5,600,437	5,606,367	5,592,692	5,515,539	5,646,859	5,678,772
2063	5,640,921	5,623,862	5,638,627	5,522,056	5,680,789	5,707,093

Table R-22. Marbled murrelet high-quality nesting habitat development under the alternatives in the planning area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	573,150	573,150	573,150	573,150	573,150	573,150
Alternatives						
2023	566,033	571,178	570,669	562,874	571,936	573,380
2033	591,956	599,342	598,464	584,150	600,551	603,712
2043	600,542	611,559	611,214	591,449	614,617	617,222
2053	781,686	792,680	793,625	771,094	796,688	800,243
2063	800,527	811,481	813,884	782,651	815,916	824,931

Table R-23. Marbled murrelet nesting habitat development in designated critical habitat under the alternatives in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	273,174	273,174	273,174	273,174	273,174	273,174
Alternatives						
2023	279,663	287,274	277,165	269,436	286,747	287,761
2033	316,887	331,494	309,895	288,580	328,915	332,689
2043	362,224	379,380	354,011	328,535	376,676	381,421
2053	413,282	428,841	398,366	371,044	427,385	433,432
2063	434,896	442,991	419,668	380,736	440,396	446,137

Table R-24. Marbled murrelet high-quality nesting habitat development in designated critical habitat under the alternatives in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	154,331	154,331	154,331	154,331	154,331	154,331
Alternatives						
2023	154,266	154,515	153,559	149,579	154,097	154,522
2033	173,468	173,730	172,153	164,803	172,237	174,105
2043	180,766	181,190	179,316	169,448	180,709	181,438
2053	190,381	190,596	188,469	177,754	189,304	191,014
2063	197,017	197,646	194,091	180,763	193,961	198,051

Table R-25. Marbled murrelet high-quality nesting habitat development in designated critical habitat under the alternatives in the planning area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	344,345	344,345	344,345	344,345	344,345	344,345
Alternatives						
2023	344,280	344,529	343,573	339,593	344,111	344,536
2033	363,482	363,744	362,167	354,817	362,251	364,119
2043	370,780	371,204	369,330	359,462	370,723	371,452
2053	516,380	516,595	514,468	503,753	515,303	517,013
2063	523,016	523,645	520,090	506,762	519,960	524,050

Table R-26. Marbled murrelet nesting habitat in the Harvest Land Base under the alternatives.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)
Current Condition					
2013	140,848	44,347	39,241	127,550	114,874
Habitat Capable	292,633	115,374	99,751	307,165	308,078
Alternatives					
2023	145,174	32,139	36,323	95,992	123,440
2033	164,573	29,690	43,046	92,166	160,852
2043	193,032	31,952	47,800	102,398	201,815
2053	219,139	34,457	58,187	121,136	244,201
2063	232,374	26,705	65,850	107,051	263,673

Non-forest Habitat and Non-BLM Forest Habitat

For the analyses of non-forest habitat types on both BLM-administered lands and on all other ownerships, the BLM used the ecological systems data (ESLF Codes and ESLF Names) available in the 2012 Gradient Nearest Neighbor (GNN) (LEMMA 2014). There are 64 different ecological systems that are present in the planning area.

For simplicity, the BLM grouped and re-classified these 64 categories into 12 similar non-forest habitat groups. Refer to **Table R-27** (Re-classification of non-forest habitats from GNN) for a complete list of the 64 ecological systems in the planning area and the BLM re-classification used in this analysis.

The BLM assumes that the non-forest habitats remain static throughout the analysis period (2013-2063).

Table R-27. Re-classification of non-forest habitats from GNN.

GNN		BLM-reclassification	
ESLF Code	**ESLF Name**	**Code**	**Name**
21	Developed, Open Space	1	Urban/Developed
22	Developed, Low Intensity		
23	Developed, Medium Intensity		
24	Developed, High Intensity		
61	Orchards Vineyards and Other High Structure Agriculture	2	Agriculture
81	Pasture/Hay		
82	Cultivated Cropland		
3118	North Pacific Alpine and Subalpine Bedrock and Scree	3	Rock
3128	Inter-Mountain Basins Volcanic Rock and Cinder Land		
3129	Rocky Mountain Cliff, Canyon and Massive Bedrock		
3140	North Pacific Volcanic Rock and Cinder Land		
3155	North Pacific Montane Massive Bedrock, Cliff and Talus		
3158	North Pacific Coastal Cliff and Bluff		
3167	Mediterranean California Serpentine Barrens		
3169	Central California Coast Ranges Cliff and Canyon		
3170	Klamath-Siskiyou Cliff and Outcrop		
7162	North Pacific Herbaceous Bald and Bluff		
9297	Inter-Mountain Basins Alkaline Closed Depression		
5258	Inter-Mountain Basins Mixed Salt Desert Scrub	4	Desert
5456	Inter-Mountain Basins Semi-Desert Shrub Steppe		
3165	Mediterranean California Northern Coastal Dune	5	Dunes
3177	North Pacific Maritime Coastal Sand Dune and Strand		
5205	North Pacific Dry and Mesic Alpine Dwarf-Shrubland, Fell-field and Meadow	6	Grassland/Prairie
5409	Willamette Valley Upland Prairie and Savanna		
5452	Columbia Plateau Steppe and Grassland		
7102	California Mesic Serpentine Grassland		
7103	California Northern Coastal Grassland		
7108	Mediterranean California Alpine Dry Tundra		
7109	Mediterranean California Subalpine Meadow		
7110	North Pacific Montane Grassland		

GNN		BLM-reclassification	
ESLF Code	**ESLF Name**	**Code**	**Name**
7112	Northern Rocky Mountain Lower Montane, Foothill and Valley Grassland		
7157	North Pacific Alpine and Subalpine Dry Grassland		
8404	Introduced Upland Vegetation - Annual Grassland		
8502	Recently burned grassland		
9221	Willamette Valley Wet Prairie		
9265	Temperate Pacific Montane Wet Meadow		
3179	Inter-Mountain Basins Playa	7	Shrubland
5202	Columbia Plateau Scabland Shrubland		
5260	North Pacific Avalanche Chute Shrubland		
5261	North Pacific Montane Shrubland		
5305	California Xeric Serpentine Chaparral		
5311	Northern and Central California Dry-Mesic Chaparral		
5457	Northern California Coastal Scrub		
7161	North Pacific Hypermaritime Shrub and Herbaceous Headland		
9103	Inter-Mountain Basins Greasewood Flat		
5256	Great Basin Xeric Mixed Sagebrush Shrubland	8	Sagebrush
5257	Inter-Mountain Basins Big Sagebrush Shrubland		
5453	Columbia Plateau Low Sagebrush Steppe		
5454	Inter-Mountain Basins Big Sagebrush Steppe		
5455	Inter-Mountain Basins Montane Sagebrush Steppe		
9321	Columbia Plateau Silver Sagebrush Seasonally Flooded Shrub-Steppe		
2201	Open Water (Fresh)	9	Freshwater/Riparian
3122	Temperate Pacific Freshwater Mudflat		
9166	North Pacific Bog and Fen		
9173	North Pacific Shrub Swamp		
9219	Temperate Pacific Freshwater Aquatic Bed		
9220	North Pacific Intertidal Freshwater Wetland		
9222	North American Arid West Emergent Marsh		
9248	Mediterranean California Subalpine-Montane Fen		
9260	Temperate Pacific Freshwater Emergent Marsh		
9251	Northern California Claypan Vernal Pool	10	Vernal Pool
2202	Open Water (Brackish/Salt)	11	Marine
9281	Temperate Pacific Tidal Salt and Brackish Marsh		
3130	North American Alpine Ice Field	12	Ice

Table R-28. Non-forest habitat within the decision and planning areas.

Structural Stage	Decision Area		Planning Area	
	(Acres)	(%)	(Acres)	(%)
Urban/Developed	11,434	12%	1,061,331	24%
Agricultural	1,951	2%	2,193,206	51%
Rock	1,710	2%	76,278	2%
Desert	9	0%	32	0%
Dunes	1,300	1%	37,611	1%
Grassland	3,795	4%	290,284	7%
Shrubland	2,936	3%	59,616	1%
Sagebrush	63,884	70%	246,644	6%
Freshwater Riparian	4,164	5%	348,773	8%
Vernal Pools	307	0%	7,668	0%
Marine/Tidal	236	0%	16,464	0%
Ice	27	0%	3,335	0%
Totals	**91,752**	**100%**	**4,341,241**	**100%**

Non-BLM Forest Habitat

The BLM modeled forest habitat on non-BLM-administered lands within the planning area using the 2012 GNN structural condition (STRUCCOND) (LEMMA 2014).

So that the GNN-derived habitat on non-BLM lands could be readily compared with the WoodStock-derived forest habitat on BLM-administered lands, the BLM cross-walked the GNN STRUCCOND to the WoodStock structural stage categories (**Table R-29**).

Table R-29. Cross-walk of GNN STRUCCOND to Woodstock structural stages.

GNN STRUCCOND		WoodStock Structural Stage	
Code	**Description***	**Code**	**Structural Stage**
0	Non-forest	-	Non-forest
1	Sparse (CANCOV < 10%)	1.1	Early-successional: with Structural Legacies
		1.2	Early-successional: without Structural Legacies
2	Open (CANCOV 10-40%)	2.1	Stand Establishment: with Structural Legacies
		2.2	Stand Establishment: without Structural Legacies
3 and 4	Sapling/pole - moderate/closed (CANCOV>40, QMD_DOM <25cm) Small/medium tree - moderate/closed (CANCOV >= 40, QMD_DOM 25-50)	3.1	Young: High Density with Structural Legacies
		3.2	Young: High Density without Structural Legacies
		3.3	Young: Low Density with Structural Legacies
		3.4	Young: Low Density without Structural Legacies
5	Large tree - moderate/closed (CANCOV >= 40, QMD_DOM 50-75)	4.1	Mature: Single-layered Canopy
		4.2	Mature: Multi-layered Canopy
6	Large/giant tree - moderate/closed (CANCOV >= 40, QMD_DOM >= 75)	5.1	Structurally-complex: Developed Structurally-complex
		5.2	Structurally-complex: Existing Old Forest
		5.3	Structurally-complex: Existing Very Old Forest

* STRUCCOND Descriptions from LEMMA 2014.

The BLM modeled the structural conditions on non-BLM lands as continuing to provide the same distribution of habitat through time as the current condition, except in U.S. Forest Service reserves (i.e., Late-Successional Reserves and Congressionally Reserved lands).

The BLM modeled structural conditions continuing to develop on U.S. Forest Service reserve lands through time based on the mean ages of the WoodStock structural stages on the BLM-administered forest lands (**Table R-30**).

Table R-30. Assumptions for development of structural stages on non-BLM administered lands.

Code	Structural Stage	Mean Age* (Years)	BLM assumption for forest habitat development on Non-BLM lands
1.1	Early-successional: with Structural Legacies	10.3	Pixel stays in Early-successional group for 1 decade
1.2	Early-successional: without Structural Legacies		
2.1	Stand Establishment: with Structural Legacies	24.7	Pixel stays in Stand Establishment group for 1 decade
2.2	Stand Establishment: without Structural Legacies		
3.1	Young: High Density with Structural Legacies	66.5	Pixel stays in Young group for 4 decades
3.2	Young: High Density without Structural Legacies		
3.3	Young: Low Density with Structural Legacies		
3.4	Young: Low Density without Structural Legacies		
4.1	Mature: Single-layered Canopy	95.6	Pixel stays in Mature group for 3 decades
4.2	Mature: Multi-layered Canopy		
5.1	Structurally-complex: Developed Structurally-complex	160.4	Once a pixel enters Structurally-complex group, it remains there
5.2	Structurally-complex: Existing Old Forest		
5.3	Structurally-complex: Existing Very Old Forest		

* Mean age calculated using age on BLM-administered lands.

This modeling of U.S. Forest Service reserve lands assumed that habitat would not develop on U.S. Forest Service reserve lands that experience wildfire in the modeling (see the vegetation modeling section in Chapter 3).

For the purpose of this analysis, the BLM assumed that the future distribution of habitat conditions on non-BLM lands and burned, U.S. Forest Service reserves would continue to reflect the current distribution of habitat conditions.

On private lands, the assumption that the future distribution of habitat conditions would remain the same as current conditions is likely to be a reasonable approximation. On State and Forest Service non-reserve lands, this assumption is likely to be an underestimate of the future development of habitat. The BLM acknowledges that the spatial arrangement of structural conditions would change in the future, but lacks information to make more specific projections of how structural conditions would change over time on non-BLM-administered lands. This assumption is consistent with the assumption used in the analysis of forest structure and spatial pattern in the 2008 RMP/EIS, which describes the limitations on analyzing future changes on non-BLM lands and is incorporated here by reference (USDI BLM 2008, pp. 532-536).

North Oregon Coast Distinct Population Segment of the Red Tree Vole

Table R-31. North Oregon Coast DPS of the red tree vole habitat development under the alternatives in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	174,495	174,495	174,495	174,495	174,495	174,495
Alternatives						
2023	178,193	180,881	176,827	167,096	183,914	189,994
2033	214,128	218,570	212,751	189,394	225,827	235,607
2043	246,181	245,961	241,608	211,800	256,326	268,416
2053	281,094	278,632	274,507	236,514	293,181	309,872
2063	289,971	279,899	279,489	236,047	294,208	313,820

Table R-32. North Oregon Coast DPS of the red tree vole habitat development under the alternatives in the planning area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	741,263	741,263	741,263	741,263	741,263	741,263
Alternatives						
2023	744,961	747,649	743,595	733,864	750,682	756,762
2033	780,896	785,337	779,518	756,161	792,595	802,375
2043	812,948	812,729	808,376	778,568	823,094	835,184
2053	847,862	845,400	841,275	803,282	859,949	876,640
2063	978,930	968,859	968,448	925,006	983,168	1,002,779

Table R-33. North Oregon Coast DPS of the red tree vole habitat in the Harvest Land Base under the alternatives.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)
Current Condition					
2013	33,810	21,715	37,846	61,284	58,847
Habitat Capable	69,758	47,155	83,381	133,847	133,396
Alternatives					
2023	36,316	17,779	35,739	49,993	62,055
2033	46,492	18,466	44,670	52,673	79,939
2043	52,777	17,616	48,865	55,996	93,221
2053	55,195	15,703	51,687	58,015	109,727
2063	55,478	12,862	49,519	51,496	108,764

Snags and Down Woody Material

Table R-34. Snag density (trees per acre) in the decision area by structural group.

Structural Group	Diameter Class (Inches DBH)											Sub-Plots
	<6	6-12	12-18	18-24	24-30	30-36	>36	<10	10-20	>20	All	
Early-successional	4.1	6.5	2.2	1.4	0.7	0.6	0.3	9.4	3.7	2.6	15.7	127
Stand Establishment	1.5	3.4	1.2	0.7	0.5	0.2	0.3	4.4	2.0	1.4	7.8	1,313
Young	5.0	9.2	2.0	0.8	0.4	0.3	0.4	12.9	3.6	1.6	18.1	1,666
Mature	5.6	15.9	3.1	1.4	0.8	0.5	0.7	18.9	6.3	2.9	28.1	1,527
Structurally-complex	3.3	8.4	2.7	1.9	1.3	0.9	1.2	10.2	4.8	4.7	19.8	1,617
Weighted Average	**3.9**	**9.4**	**2.3**	**1.2**	**0.8**	**0.5**	**0.7**	**11.8**	**4.2**	**2.7**	**18.7**	**6,250**

Table R-35. Snag density (trees per acre) in the decision area by structural stage.

Structural Stage	Diameter Class (Inches DBH)											Sub-Plots
	<6	6-12	12-18	18-24	24-30	30-36	>36	<10	10-20	>20	All	
Early-successional with Structural Legacies	-	0.8	1.2	0.9	0.3	0.9	0.1	0.8	1.2	2.1	4.1	31
Early-successional without Structural Legacies	5.4	8.3	2.5	1.6	0.8	0.6	0.4	12.2	4.5	2.7	19.4	96
Stand Establishment with Structural Legacies	4.3	6.1	1.0	0.6	0.3	0.3	0.1	9.9	1.9	1.1	12.8	211
Stand Establishment without Structural Legacies	0.9	2.9	1.2	0.7	0.5	0.2	0.3	3.4	2.0	1.4	6.8	1,102
Young – High Density, with Structural Legacies	3.1	6.6	2.2	1.2	0.5	0.5	0.6	8.3	4.0	2.2	14.6	417
Young – High Density, without Structural Legacies	5.7	10.1	1.9	0.7	0.4	0.3	0.3	14.5	3.5	1.3	19.3	1,144
Young – Low Density, with Structural Legacies	5.4	10.9	0.7	0.2	0.9	0.5	0.1	16.3	0.9	1.4	18.6	31
Young – Low Density, without Structural Legacies	4.4	9.5	2.3	1.2	0.7	0.2	0.3	11.8	5.0	1.9	18.6	74
Mature, Single-layered Canopy	6.2	19.9	3.6	1.7	1.0	0.5	0.8	22.9	7.6	3.2	33.7	677
Mature, Multi-layered Canopy	5.2	12.7	2.7	1.3	0.6	0.5	0.7	15.7	5.3	2.6	23.6	850
Structurally-complex, Developed Structurally-complex	3.3	9.5	2.9	1.9	1.0	0.8	1.0	11.4	5.0	4.0	20.4	649
Structurally-complex, Existing Old Forest	3.3	7.8	2.5	1.9	1.6	1.0	1.3	9.6	4.7	5.1	19.3	925
Structurally-complex, Existing Very Old Forest	3.9	5.0	1.7	2.6	1.6	1.2	3.3	7.3	4.2	7.8	19.4	43
Weighted Average	**3.9**	**9.4**	**2.3**	**1.2**	**0.8**	**0.5**	**0.7**	**11.8**	**4.2**	**2.7**	**18.7**	**6,250**

Table R-36. Snag density (trees per acre) in the northern districts (Salem, Eugene, and Coos Bay) by structural group.

Structural Group	Diameter Class (Inches DBH)											Sub-Plots
	<6	6-12	12-18	18-24	24-30	30-36	>36	<10	10-20	>20	All	
Early-successional	-	-	0.9	0.3	-	1.2	-	-	0.9	1.6	2.5	17
Stand Establishment	0.9	2.3	1.9	1.0	0.8	0.3	0.4	2.8	2.9	2.0	7.7	500
Young	5.7	10.1	2.1	0.9	0.5	0.3	0.5	14.5	3.6	1.9	20.0	847
Mature	5.8	19.8	3.7	1.8	1.0	0.6	1.1	22.2	7.8	3.8	33.8	849
Structurally-complex	2.3	7.5	3.2	2.6	1.7	1.3	2.0	8.5	5.4	6.7	20.6	622
Weighted Average	**4.1**	**11.0**	**2.8**	**1.5**	**1.0**	**0.6**	**1.0**	**13.3**	**5.1**	**3.5**	**22.0**	**2,835**

Table R-37. Snag density (trees per acre) in the northern districts (Salem, Eugene, and Coos Bay) by structural stage.

Structural Stage	Diameter Class (Inches DBH)											Sub-Plots
	<6	6-12	12-18	18-24	24-30	30-36	>36	<10	10-20	>20	All	
Early-successional with Structural Legacies	-	-	1.3	0.4	-	1.8	-	-	1.3	2.2	3.5	12
Early-successional without Structural Legacies	-	-	-	-	-	-	-	-	-	-	-	5
Stand Establishment with Structural Legacies	4.0	6.0	1.1	1.5	1.2	-	-	10.0	1.6	2.2	13.9	24
Stand Establishment without Structural Legacies	0.7	2.1	1.9	1.0	0.8	0.4	0.5	2.4	3.0	2.0	7.4	476
Young – High Density, with Structural Legacies	2.9	4.5	2.5	1.6	0.5	0.7	1.3	6.5	4.0	3.6	14.1	156
Young – High Density, without Structural Legacies	6.4	11.4	2.0	0.7	0.5	0.2	0.4	16.5	3.5	1.5	21.5	677
Young – Low Density, with Structural Legacies	-	24.1	5.3	-	5.3	-	-	24.1	5.3	5.3	34.7	2
Young – Low Density, without Structural Legacies	-	6.0	0.9	1.3	-	0.4	1.3	2.0	5.3	2.7	10.0	12
Mature, Single-layered Canopy	6.7	22.3	4.0	1.8	1.2	0.6	0.9	25.3	8.6	3.7	37.6	531
Mature, Multi-layered Canopy	4.3	15.6	3.1	1.7	0.7	0.7	1.4	17.1	6.5	3.8	27.5	318
Structurally-complex, Developed Structurally Complex	2.0	8.8	3.9	2.5	1.6	1.3	1.8	9.1	6.5	6.2	21.8	272
Structurally-complex, Existing Old Forest	2.5	6.7	2.6	2.7	1.8	1.2	2.1	8.2	4.6	6.9	19.7	317
Structurally-complex, Existing Very Old Forest	3.7	4.4	1.9	2.3	1.1	1.6	3.9	6.6	4.3	8.0	18.8	33
Weighted Average	**4.1**	**11.0**	**2.8**	**1.5**	**1.0**	**0.6**	**1.0**	**13.3**	**5.1**	**3.5**	**22.0**	**2,835**

Table R-38. Snag density (trees per acre) in the southern districts (Roseburg, Medford, and Klamath Falls) by structural group.

Structural Group	Diameter Class (Inches DBH)											Sub-Plots
	<6	6-12	12-18	18-24	24-30	30-36	>36	<10	10-20	>20	All	
Early-successional	4.7	7.4	2.4	1.5	0.8	0.5	0.3	10.8	4.1	2.7	17.7	110
Stand Establishment	1.8	4.1	0.7	0.5	0.3	0.2	0.2	5.4	1.4	0.9	7.8	813
Young	4.2	8.4	1.9	0.7	0.4	0.3	0.2	11.3	3.6	1.3	16.1	819
Mature	5.4	11.0	2.4	1.0	0.5	0.3	0.3	14.8	4.4	1.7	20.9	678
Structurally-complex	3.9	8.9	2.3	1.4	1.1	0.7	0.7	11.3	4.4	3.5	19.2	995
Weighted Average	**3.8**	**8.0**	**1.9**	**1.0**	**0.6**	**0.4**	**0.4**	**10.6**	**3.5**	**2.0**	**16.1**	**3,415**

Table R-39. Snag density (trees per acre) in the southern districts (Roseburg, Medford, and Klamath Falls) by structural stage.

Structural Group	Diameter Class (Inches DBH)											Sub-Plots
	<6	6-12	12-18	18-24	24-30	30-36	>36	<10	10-20	>20	All	
Early-successional with Structural Legacies	-	1.3	1.1	1.1	0.6	0.3	0.1	1.3	1.1	2.1	4.5	19
Early-successional without Structural Legacies	5.7	8.7	2.6	1.6	0.8	0.6	0.4	12.8	4.7	2.9	20.5	91
Stand Establishment with Structural Legacies	4.4	6.1	1.0	0.5	0.2	0.3	0.1	9.8	1.9	0.9	12.7	187
Stand Establishment without Structural Legacies	1.1	3.5	0.6	0.5	0.3	0.1	0.3	4.1	1.3	1.0	6.3	626
Young – High Density, with Structural Legacies	3.1	7.8	2.0	0.9	0.4	0.3	0.2	9.4	4.0	1.4	14.9	261
Young – High Density, without Structural Legacies	4.6	8.4	1.8	0.6	0.2	0.3	0.2	11.7	3.4	1.1	16.2	467
Young – Low Density, with Structural Legacies	5.8	10.0	0.4	0.2	0.5	0.5	0.1	15.8	0.5	1.2	17.5	29
Young – Low Density, without Structural Legacies	5.2	10.2	2.5	1.2	0.9	0.2	0.1	13.7	4.9	1.7	20.3	62
Mature, Single-layered Canopy	4.3	11.2	2.4	1.1	0.4	0.2	0.2	14.4	3.9	1.4	19.7	146
Mature, Multi-layered Canopy	5.7	10.9	2.4	1.0	0.6	0.3	0.3	14.9	4.6	1.8	21.3	532
Structurally-complex, Developed Structurally-complex	4.3	9.9	2.2	1.4	0.6	0.4	0.5	13.0	4.0	2.3	19.3	377
Structurally-complex, Existing Old Forest	3.7	8.4	2.5	1.4	1.4	0.9	0.8	10.3	4.7	4.1	19.2	608
Structurally-complex, Existing Very Old Forest	4.8	7.2	1.1	3.7	3.2	-	1.1	9.6	4.0	7.4	21.1	10
Weighted Average	**3.8**	**8.0**	**1.9**	**1.0**	**0.6**	**0.4**	**0.4**	**10.6**	**3.5**	**2.0**	**16.1**	**3,415**

Table R-40. Down woody material cover in the decision area by structural group.

Structural Group	Decay Class (Percent Cover)						Number of Transects
	1	2	3	4	5	All	
Early-successional	0.2%	0.9%	1.5%	0.9%	0.3%	3.8%	254
Stand Establishment	0.2%	0.4%	1.4%	1.6%	0.4%	4.1%	2,626
Young	0.2%	0.4%	1.0%	1.4%	0.6%	3.6%	3,332
Mature	0.3%	0.7%	1.4%	1.8%	0.9%	5.0%	3,054
Structurally-complex	0.3%	0.7%	1.8%	1.5%	0.6%	4.9%	3,234
Weighted Average	**0.2%**	**0.6%**	**1.4%**	**1.5%**	**0.6%**	**4.4%**	**12,500**

Table R-41. Down woody material cover in the decision area by structural stage.

Structural Stage	Decay Class (Percent Cover)						Transects
	1	2	3	4	5	All	
Early-successional with Structural Legacies	0.2%	1.5%	2.4%	1.3%	0.3%	5.6%	62
Early-successional without Structural Legacies	0.1%	0.7%	1.3%	0.8%	0.3%	3.1%	192
Stand Establishment with Structural Legacies	0.2%	0.3%	0.7%	1.1%	0.8%	3.1%	422
Stand Establishment without Structural Legacies	0.2%	0.4%	1.6%	1.7%	0.4%	4.3%	2,204
Young – High Density, with Structural Legacies	0.2%	0.3%	1.1%	1.2%	0.4%	3.2%	834
Young – High Density, without Structural Legacies	0.3%	0.4%	1.0%	1.5%	0.6%	3.8%	2,288
Young – Low Density, with Structural Legacies	0.1%	0.2%	0.3%	0.2%	0.1%	0.9%	62
Young – Low Density, without Structural Legacies	0.1%	0.9%	1.3%	0.9%	0.3%	3.3%	148
Mature, Single-layered Canopy	0.3%	0.9%	1.5%	1.9%	0.9%	5.5%	1,354
Mature, Multi-layered Canopy	0.2%	0.6%	1.3%	1.7%	0.8%	4.6%	1,700
Structurally-complex, Developed Structurally-complex	0.2%	0.5%	1.5%	1.5%	0.6%	4.3%	1,298
Structurally-complex, Existing Old Forest	0.3%	0.8%	1.9%	1.5%	0.6%	5.2%	1,850
Structurally-complex, Existing Very Old Forest	0.4%	1.2%	5.2%	2.3%	0.9%	10.0%	86
Weighted Average	**0.2%**	**0.6%**	**1.4%**	**1.5%**	**0.6%**	**4.4%**	**12,500**

Table R-42. Down woody material cover in the northern districts (Salem, Eugene, and Coos Bay) by structural group.

Structural Group	Decay Class (Percent Cover)						Number of Transects
	1	2	3	4	5	All	
Early-successional	0.1%	1.6%	2.1%	1.0%	0.4%	5.3%	34
Stand Establishment	0.3%	0.4%	1.5%	1.5%	0.5%	4.1%	1,000
Young	0.3%	0.5%	1.2%	1.7%	0.7%	4.4%	1,694
Mature	0.4%	0.8%	1.6%	1.7%	0.9%	5.4%	1,698
Structurally-complex	0.3%	1.0%	2.7%	1.9%	0.8%	6.8%	1,244
Weighted Average	**0.3%**	**0.7%**	**1.7%**	**1.7%**	**0.8%**	**5.2%**	**5,670**

Table R-43. Down woody material cover in the northern districts (Salem, Eugene, and Coos Bay) by structural stage.

Structural Stage	Decay Class (Percent Cover)						Transects
	1	2	3	4	5	All	
Early-successional with Structural Legacies	0.2%	2.3%	3.0%	1.4%	0.6%	7.5%	24
Early-successional without Structural Legacies	-	-	-	-	-	-	10
Stand Establishment with Structural Legacies	-	0.2%	0.5%	1.3%	0.8%	2.8%	48
Stand Establishment without Structural Legacies	0.3%	0.4%	1.5%	1.5%	0.5%	4.2%	952
Young – High Density, with Structural Legacies	0.3%	0.4%	1.4%	1.7%	0.5%	4.3%	312
Young – High Density, without Structural Legacies	0.3%	0.5%	1.1%	1.7%	0.8%	4.4%	1,354
Young – Low Density, with Structural Legacies	0.8%	2.1%	-	1.4%	-	4.4%	4
Young – Low Density, without Structural Legacies	-	3.2%	2.3%	1.6%	1.0%	8.1%	24
Mature, Single-layered Canopy	0.4%	0.8%	1.6%	1.9%	1.0%	5.6%	1,062
Mature, Multi-layered Canopy	0.3%	0.7%	1.5%	1.5%	0.8%	5.0%	636
Structurally-complex, Developed Structurally-complex	0.2%	0.7%	1.9%	1.6%	0.7%	5.1%	544
Structurally-complex, Existing Old Forest	0.3%	1.3%	3.1%	2.1%	0.9%	7.7%	634
Structurally-complex, Existing Very Old Forest	0.4%	1.5%	6.5%	2.7%	1.0%	12.2%	66
Weighted Average	**0.3%**	**0.7%**	**1.7%**	**1.7%**	**0.8%**	**5.2%**	**5,670**

Table R-44. Down woody material cover in the southern districts (Roseburg, Medford, and Klamath Falls) by structural group.

Structural Group	Decay Class (Percent Cover)						Number of Transects
	1	2	3	4	5	All	
Early-successional	0.2%	0.8%	1.4%	0.9%	0.3%	3.5%	220
Stand Establishment	0.1%	0.5%	1.4%	1.6%	0.4%	4.0%	1,626
Young	0.1%	0.3%	0.8%	1.0%	0.4%	2.7%	1,638
Mature	0.1%	0.7%	1.1%	1.8%	0.8%	4.5%	1,356
Structurally-complex	0.2%	0.5%	1.3%	1.3%	0.5%	3.8%	1,990
Weighted Average	**0.2%**	**0.5%**	**1.2%**	**1.4%**	**0.5%**	**3.7%**	**6,830**

Table R-45. Down woody material cover in the southern districts (Roseburg, Medford, and Klamath Falls) by structural stage.

Structural Stage	Decay Class (Percent Cover)						Transects
	1	2	3	4	5	All	
Early-successional with Structural Legacies	0.2%	0.9%	2.0%	1.2%	-	4.5%	38
Early-successional without Structural Legacies	0.1%	0.7%	1.3%	0.8%	0.3%	3.3%	182
Stand Establishment with Structural Legacies	0.2%	0.3%	0.8%	1.1%	0.8%	3.2%	374
Stand Establishment without Structural Legacies	0.1%	0.5%	1.6%	1.8%	0.3%	4.3%	1,252
Young – High Density, with Structural Legacies	0.1%	0.3%	0.9%	0.9%	0.4%	2.6%	522
Young – High Density, without Structural Legacies	0.2%	0.3%	0.8%	1.1%	0.5%	2.9%	934
Young – Low Density, with Structural Legacies	-	-	0.3%	0.1%	0.1%	0.7%	58
Young – Low Density, without Structural Legacies	0.1%	0.4%	1.1%	0.7%	0.1%	2.4%	124
Mature, Single-layered Canopy	0.2%	1.1%	1.2%	1.9%	0.5%	4.9%	292
Mature, Multi-layered Canopy	0.1%	0.5%	1.1%	1.8%	0.8%	4.4%	1,064
Structurally-complex, Developed Structurally-complex	0.2%	0.4%	1.2%	1.4%	0.5%	3.7%	754
Structurally-complex, Existing Old Forest	0.2%	0.6%	1.3%	1.3%	0.4%	3.9%	1,216
Structurally-complex, Existing Very Old Forest	0.1%	0.3%	1.0%	0.8%	0.5%	2.7%	20
Weighted Average	**0.2%**	**0.5%**	**1.2%**	**1.4%**	**0.5%**	**3.7%**	**6,830**

Bureau Sensitive, Bureau Strategic, Survey & Manage Species

Table R-46. Early-successional habitat development for Bureau Sensitive, Bureau Strategic, Survey & Manage wildlife species and landbird focal species.

Taxonomic Group	Species		SSS Status*	S&M (Y/N)	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres) (%)							Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (By County)	Source for Species Range
						in 2013	*in 2063*								
	Common Name	Scientific Name				Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	No Timber Harvest			
Birds: Landbird Focal Species	Black-throated Gray Warbler	*Setophaga nigrescens*	-	N	Y[1]	388,976	139,443 (36%)	107,772 (28%)	24,419 (6%)	170,143 (44%)	64,049 (16%)	22,334 (6%)	Stand Establishment (2.1, 2.2)	All	NatureServe 2014
Birds: Landbird Focal Species	Blue (Sooty) Grouse	*Dendragapus fuliginosus sierra*	-	N	Y[1]	485,109	284,485 (59%)	225,647 (47%)	188,073 (39%)	339,836 (70%)	152,395 (31%)	74,967 (15%)	Early-successional (1.1, 1.2), Stand Establishment (2.1, 2.2), or Young Low Density (3.3, 3.4)	All	NatureServe 2014
Birds: Landbird Focal Species	Chipping Sparrow	*Spicella passerine*	-	N	Y[3]	46,258	110,566 (239%)	80,089 (173%)	118,312 (256%)	131,002 (283%)	46,001 (99%)	14,418 (31%)	Early-successional (1.1, 1.2)	All	NatureServe 2014
Birds: Landbird Focal Species	Common Nighthawk	*Chordeiles minor*	-	N	Y[2]	54,940	119,248 (217%)	88,771 (162%)	126,994 (231%)	139,684 (254%)	54,683 (100%)	23,100 (42%)	Early-successional (1.1, 1.2) or GNN Non-Forest Agricultural, Grassland, Shrub land (2, 6, 7)	All	NatureServe 2014
Birds: Landbird Focal Species	Fox Sparrow	*Passerlla iliaca*	-	N	Y[1]	46,258	110,566 (239%)	80,089 (173%)	118,312 (256%)	131,002 (283%)	46,001 (99%)	14,418 (31%)	Early-successional (1.1, 1.2)	All	NatureServe 2014
Birds: Landbird Focal Species	Grasshopper Sparrow	*Ammodramus savannarum*	BS	N	Y[2]	25,487	55,477 (218%)	35,188 (138%)	53,134 (208%)	57,469 (225%)	23,533 (92%)	11,938 (47%)	Early-successional (1.1, 1.2) or GNN Non-Forest Agricultural, Grassland, Shrub land (2, 6, 7)	Jackson, Lane, Linn, Polk	NatureServe 2014
Birds: Landbird Focal Species	Lark Sparrow	*Chondestes grammacus*	-	N	Y[2]	38,921	82,557 (212%)	46,993 (121%)	61,264 (157%)	67,724 (174%)	32,339 (83%)	17,938 (46%)	Early-successional (1.1, 1.2) or GNN Non-Forest Agricultural, Grassland, Shrub land (2, 6, 7)	Benton, Jackson, Josephine, Klamath, Lane, Linn, Multnomah, Tillamook	Avian Knowledge Northwest 2014

Taxonomic Group	Species		SSS Status*	S&M (Y/N)	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres) (%)							Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (By County)	Source for Species Range
						in 2013	*in 2063*								
	Common Name	Scientific Name				Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	No Timber Harvest			
Birds: Landbird Focal Species	Lazuli Bunting	*Passerina amoena*	-	N	Y[1]	54,940	119,248 (217%)	88,771 (162%)	126,993 (231%)	139,684 (254%)	54,683 (100%)	23,100 (42%)	Early-successional (1.1, 1.2) or GNN Non-Forest Agricultural, Grassland, Shrub land (2, 6, 7)	All – except Clatsop	Avian Knowledge Northwest 2014
Birds: Landbird Focal Species	Nashville Warbler	*Oreothlypis ruficapilla*	-	N	Y[1,3]	479,672	284,381 (59%)	117,859 (29%)	187,919 (39%)	339,513 (71%)	152,196 (32%)	74,890 (16%)	Early-successional (1.1, 1.2), Stand Establishment (2.1, 2.2), or Young Low Density (3.3, 3.4) within the Klamath Province	All – except Lincoln	Avian Knowledge Northwest 2014
Birds: Landbird Focal Species	Olive-sided Flycatcher	*Contopus cooperi*	-	N	Y[3]	402,947	249,722 (62%)	117,859 (29%)	141,484 (35%)	179,698 (45%)	108,880 (27%)	36,629 (10%)	Early-successional with Structural Legacies (1.1) or Stand Establishment (2.1, 2.2)	All	NatureServe 2014
Birds: Landbird Focal Species	Orange Crowned Warbler	*Oreothlypis celata*	-	N	Y[1]	46,258	110,566 (239%)	80,089 (173%)	118,312 (256%)	131,002 (283%)	46,001 (99%)	14,418 (31%)	Early-successional (1.1, 1.2)	All	NatureServe 2014
Birds: Landbird Focal Species	Oregon Vesper Sparrow	*Pooecetus gramineus affinis*	BS	N	Y[2]	5,726	28,774 (503%)	26,868 (469%)	58,696 (1025%)	48,788 (852%)	18,086 (316%)	1,798 (31%)	Early-successional (1.1, 1.2) or GNN Non-Forest Agricultural, Grassland, Shrub land (2, 6, 7)	Benton, Clackamas, Lane, Linn, Marion, Polk	NatureServe 2014
Birds: Landbird Focal Species	Rufous Hummingbird	*Selasphorous rufus*	-	N	Y[1]	485,109	284,485 (59%)	225,647 (47%)	188,073 (39%)	339,836 (70%)	152,395 (31%)	74,967 (15%)	Early-successional (1.1, 1.2), Stand Establishment (2.1, 2.2), or Young Low Density (3.3, 3.4)	All	NatureServe 2014
Birds: Landbird Focal Species	Streaked Horned Lark	*Eremophila alpestris strigata*	FT	N	Y[2]	2,671	20,421 (765%)	17,796 (666%)	36,245 (1357%)	29,977 (1122%)	13,939 (522%)	1,092 (41%)	Early-successional (1.1, 1.2) or GNN Non-Forest Agricultural, Grassland, Shrub land (2, 6, 7).	Benton, Clackamas, Linn, Marion, Polk, Yamhill	NatureServe 2014
Birds: Landbird Focal Species	Western Meadowlark	*Sturnella neglecta*	-	N	Y[2]	54,940	284,485 (518%)	88,771 (162%)	126,994 (231%)	139,684 (254%)	54,683 (100%)	23,100 (42%)	Early-successional (1.1, 1.2) or GNN Non-Forest Agricultural, Grassland, Shrub land (2, 6, 7)	All	NatureServe 2014

Taxonomic Group	Species		SSS Status*	S&M (Y/N)	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres) (%)							Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (By County)	Source for Species Range
						in 2013	*in 2063*								
	Common Name	Scientific Name				Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	No Timber Harvest			
Birds: Landbird Focal Species	Western Tanager	*Piranga ludoviciana*	-	N	Y[1]	438,851	173,919 (40%)	145,558 (33%)	69,761 (16%)	208,834 (48%)	106,394 (24%)	60,549 (14%)	Stand Establishment (2.1, 2.2) or Young Low Density (3.3, 3.4)	All	NatureServe 2014
Insects: Terrestrial	Siskiyou Short-horned Grasshopper	*Chloealtis aspasma*	BS	N	N	23,336	44,302 (190%)	19,290 (83%)	10,357 (44%)	21,021 (90%)	11,604 (50%)	10,130 (43%)	Early-successional (1.1, 1.2)	Jackson, Josephine	NatureServe 2014

*SSS Status (Special Status Species status): BS = Bureau Sensitive, BStr = Bureau Strategic, FP = Federal Proposed (also Bureau Sensitive), FC = Federal Candidate (also Bureau Sensitive).

[1] Altman and Alexander (2012).

[2] Altman (2000a).

[3] Altman (2000b).

Table R-47. Young or mature forest habitat development for Bureau Sensitive, Bureau Strategic, Survey & Manage wildlife species and landbird focal species.

Taxonomic Group	Species		SSS Status*	S&M (Y/N)	Land-bird Focal Species (Y/N)	Amount of Habitat (acres)							Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
						in 2013	*in 2063*								
	Common Name	Scientific Name				Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	No Timber Harvest			
Birds: Landbird Focal Species	Hammond's Flycatcher	*Empidonax hammondii*	-	N	Y[1]	1,088,340	1,234,282 (113%)	1,187,686 (109%)	1,239,055 (114%)	1,147,394 (105%)	1,251,205 (101%)	1,302,043 (120%)	Young High Density (3.1, 3.2) or Mature (4.1, 4.2)	All	NatureServe 2014
Birds: Landbird Focal Species	Hermit Thrush	*Catharus guttatus*	-	N	Y[1]	1,088,340	1,234,282 (113%)	1,187,686 (109%)	1,239,055 (114%)	1,147,394 (105%)	1,251,205 (101%)	1,302,043 (120%)	Young High Density (3.1, 3.2) or Mature (4.1, 4.2)	All	NatureServe 2014
Birds: Landbird Focal Species	Hermit Warbler	*Setophaga occidentalis*	-	N	Y[1]	1,088,340	1,234,282 (113%)	1,187,686 (109%)	1,239,055 (114%)	1,147,394 (105%)	1,251,205 (101%)	1,302,043 (120%)	Young High Density (3.1, 3.2) or Mature (4.1, 4.2)	All	Avian Knowledge Northwest 2014
Birds: Landbird Focal Species	Townsend's Warbler	*Setophaga townsedi*	-	N	Y[1]	1,088,340	1,234,282 (113%)	1,187,686 (109%)	1,239,055 (114%)	1,147,394 (105%)	1,251,205 (101%)	1,302,043 (120%)	Young High Density (3.1, 3.2) or Mature (4.1, 4.2)	All	Avian Knowledge Northwest 2014
Birds: Landbird Focal Species	Purple Finch	*Haemorphus purpureus*	-	N	Y[1]	1,435,511	1,289,215 (90%)	1,356,356 (94%)	1,409,909 (98%)	1,316,798 (92%)	1,423,674 (99%)	1,392,683 (97%)	Young High Density (3.1, 3.2), Mature Multi-layered Canopy (4.2), or Structurally-complex (5.1, 5.2, 5.3)	All	NatureServe 2014
Birds: Landbird Focal Species	Wilson's Warbler	*Cardellina pusilla*	-	N	Y[1]	1,138,215	1,268,758 (111%)	1,225,473 (108%)	1,284,396 (113%)	1,186,085 (104%)	1,293,550 (114%)	1,340,257 (118%)	Young (3.1, 3.2, 3.3, 3.4) or Mature (4.1, 4.2)	All	NatureServe 2014

Taxonomic Group	Species		SSS Status*	S&M (Y/N)	Land-bird Focal Species (Y/N)	Amount of Habitat (acres)							Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
						in 2013	*in 2063*								
	Common Name	Scientific Name				Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	No Timber Harvest			
Great Gray Owl	Great Gray Owl	*Strix nebulosa*	-	Y	N	45,157	116,913 (259%)	77,909 (172%)	91,599 (203%)	88,930 (197%)	42,922 (95%)	17,354 (38%)	Young High Density with Structural Legacies (3.1), Mature (4.1, 4.2), or Structurally-complex (5.1, 5.2, 5.3) or GNN Non-Forest Grassland, Shrub land, Sagebrush (6, 7, 8) that is < 650 feet from meadows or openings(1.1, 1.2) ≥ 10 acres in size	Douglas, Jackson, Josephine, Klamath, Lane, Linn	GeoBOB 2013

* SSS Status (Special Status Species status): BS = Bureau Sensitive, BStr = Bureau Strategic, FP = Federal Proposed (also Bureau Sensitive), FC = Federal Candidate (also Bureau Sensitive).

[1] Altman and Alexander (2012).

Table R-48. Mature or structurally-complex forest habitat development for Bureau Sensitive, Bureau Strategic, Survey & Manage wildlife species and landbird focal species.

Taxonomic Group	Species		SSS Status*	S&M (Y/N)	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres)							Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties in the Planning Area)	Source for Species Range
						in 2013	*in 2063*								
	Common Name	Scientific Name				Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	No Timber Harvest			
Birds: Landbird Focal Species	Brown Creeper	*Certhia Americana*	-	N	Y[1,3]	1,104,899	1,549,987 (140%)	1,638,115 (148%)	1,651,075 (149%)	1,467,275 (133%)	1,726,938 (156%)	1,831,210 (166%)	Mature (4.1, 4.2), or Structurally-complex (5.1, 5.2, 5.3)	All	NatureServe 2014
Birds: Landbird Focal Species	Hermit Thrush	*Catharus guttatus*	-	N	Y[3]	863,291	961,980 (111%)	1,058,410 (123%)	1,087,349 (126%)	962,201 (111%)	1,141,298 (132%)	1,136,633 (132%)	Mature Multi-layered Canopy (4.2) or Structurally-complex (5.1, 5.2, 5.3)	All	NatureServe 2014
Birds: Landbird Focal Species	Pacific-slope Flycatcher	*Empidonax difficilis*	-	N	Y[1]	1,104,899	1,549,987 (140%)	1,638,115 (148%)	1,651,075 (149%)	1,467,275 (133%)	1,726,938 (156%)	1,831,210 (166%)	Mature (4.1, 4.2), or Structurally-complex (5.1, 5.2, 5.3)	All	Avian Knowledge Northwest 2014
Birds: Landbird Focal Species	Pileated Woodpecker	*Dryocarpus pileatus*	-	N	Y[1]	863,291	961,980 (111%)	1,058,410 (123%)	1,087,349 (126%)	962,201 (111%)	1,141,298 (132%)	1,136,633 (132%)	Mature Multi-layered Canopy (4.2) or Structurally-complex (5.1, 5.2, 5.3)	All	Avian Knowledge Northwest 2014
Birds: Landbird Focal Species	Pygmy Nuthatch	*Sitta pygmaea*	-	N	Y[3]	9,991	9,439 (94%)	20,835 (209%)	20,054 (201%)	15,014 (150%)	16,935 (170%)	17,195 (172%)	Mature Multi-layered Canopy (4.2) or Structurally-complex (5.1, 5.2, 5.3)	Klamath	Avian Knowledge Northwest 2014
Birds: Landbird Focal Species	Varied Thrush	*Ixoreus naevius*	-	N	Y[1]	863,291	961,980 (111%)	1,058,410 (123%)	1,087,349 (126%)	962,201 (111%)	1,141,298 (132%)	1,136,633 (132%)	Mature Multi-layered Canopy (4.2) or Structurally-complex (5.1, 5.2, 5.3)	All	NatureServe 2014
Insects: Terrestrial	Johnson's Hairstreak	*Callophrys johnsoni*	BS	N	N	1,104,899	1,549,987 (140%)	1,638,115 (148%)	1,651,075 (149%)	1,467,275 (133%)	1,726,938 (156%)	1,831,210 (166%)	Mature (4.1, 4.2) or Structurally-complex (5.1, 5.2, 5.3)	All	NatureServe 2014

Taxonomic Group	Species		SSS Status*	S&M (Y/N)	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres)							Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties in the Planning Area)	Source for Species Range
						in 2013	*in 2063*								
	Common Name	Scientific Name				Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	No Timber Harvest			
Red Tree Vole	Red Tree Vole	*Arborimus longicaudus*	-	Y	N	930,404	1,260,016 (135%)	1,358,216 (146%)	1,371,586 (147%)	1,231,228 (132%)	1,432,730 (154%)	1,517,390 (163%)	Mature (4.1, 4.2) or Structurally-complex (5.1, 5.2, 5.3)	All - outside defined polygon for North Oregon Coast DPS	USFWS 2011
Red Tree Vole	North Oregon Coast DPS of the Red Tree Vole	*Arborimus longicaudus*	BS	Y	N	174,495	289,971 (166%)	279,899 (160%)	279,489 (160%)	236,047 (135%)	294,208 (169%)	313,820 (180%)	Mature (4.1, 4.2) or Structurally-complex (5.1, 5.2, 5.3)	Defined DPS Polygon	USFWS 2011

* SSSp Status (Special Status Species status): BS = Bureau Sensitive, BStr = Bureau Strategic, FP = Federal Proposed (also Bureau Sensitive), FC = Federal Candidate (also Bureau Sensitive).

[1] Altman and Alexander (2012).

[3] Altman (2000b).

Table R-49. Forest floor habitat development for Bureau Sensitive, Bureau Strategic, Survey & Manage wildlife species and landbird focal species.

Taxonomic Group	Species		SSS Status*	S&M (Y/N)	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres)							Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties in the Planning Area)	Source for Species Range
						in 2013	*in 2063*								
	Common Name	Scientific Name				Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	No Timber Harvest			
Amphibians: Terrestrial	Black Salamander	*Aneides ferreus*	BS	N	N	389,409	422,485 (108%)	488,842 (126%)	508,151 (130%)	484,370 (124%)	505,687 (130%)	514,176 (132%)	Young High Density with Structural Legacies (3.1), Mature (4.1, 4.2), or Structurally-complex (5.1, 5.2, 5.3)	Jackson, Josephine	NatureServe 2014
Amphibians: Terrestrial	California Slender Salamander	*Batrachoseps attenuates*	BS	N	N	225,416	251,435 (112%)	271,227 (120%)	283,379 (126%)	276,870 (123%)	287,792 (128%)	288,795 (128%)	Young High Density with Structural Legacies (3.1), Mature (4.1, 4.2), or Structurally-complex (5.1, 5.2, 5.3)	Curry, Josephine	NatureServe 2014
Amphibians: Terrestrial	Larch Mountain Salamander	*Plethodon larselli*	-	Y	N	3,181	2,573 (81%)	3,329 (105%)	2,802 (88%)	2,111 (66%)	3,707 (117%)	3,902 (123%)	Young High Density with Structural Legacies (3.1), Mature (4.1, 4.2), or Structurally-complex (5.1, 5.2, 5.3)	Multnomah	NatureServe 2014
Amphibians: Terrestrial	Van Dyke's Salamander	*Plethodon vandykei*	-	Y	N								Young High Density with Structural Legacies (3.1), Mature (4.1, 4.2), or Structurally-complex (5.1, 5.2, 5.3)	Out of Known Range	GeoBOB 2013
Insects: Terrestrial	Obrien's Seed Bug	*Malezonotus obrieni*	BStr	N	N	1,104,899	1,549,987 (140%)	1,638,115 (148%)	1,651,075 (149%)	1,467,275 (133%)	1,726,938 (156%)	1,831,210 (166%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	All	NatureServe 2014

Taxonomic Group	Species		SSS Status*	S&M (Y/N)	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres)							Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties in the Planning Area)	Source for Species Range
						in 2013	*in 2063*								
	Common Name	Scientific Name				Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	No Timber Harvest			
Insects: Terrestrial	Roth's Blind Ground Beetle	*Pterostichus rothi*	BS	N	N	1,104,899	1,549,987 (140%)	1,638,115 (148%)	1,651,075 (149%)	1,467,275 (133%)	1,726,938 (156%)	1,831,210 (166%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	All	Assumed to be all of Planning Area
Mollusks: Terrestrial	Cascades Axetail Slug	*Carinacauda stormi*	BS	N	N	237,164	366,778 (155%)	353,113 (149%)	353,116 (149%)	299,286 (126%)	382,037 (161%)	422,835 (178%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Clackamas, Lane, Linn, Marion	GeoBOB 2013; NatureServe 2014
Mollusks: Terrestrial	Puget Oregonian	*Cryptomastix devia*	BS	Y	N	23,838	40,523 (170%)	29,928 (126%)	33,579 (141%)	24,453 (103%)	34,842 (146%)	43,841 (184%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Multnomah, Washington, Yamhill	GeoBOB 2013
Mollusks: Terrestrial	Warty Jumping-slug	*Hemphillia glandulosa*	-	Y	N	80,547	130,929 (163%)	119,271 (148%)	124,794 (155%)	109,028 (135%)	131,954 (164%)	138,430 (172%)	Young High Density with Structural Legacies (3.1), Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Benton, Clatsop, Tillamook, Washington, Yamhill	GeoBOB 2013
Mollusks: Terrestrial	Malone Jumping-slug	*Hemphillia malonei*	-	Y	N	54,812	78,403 (143%)	73,743 (135%)	74,781 (136%)	62,213 (114%)	77,271 (141%)	89,747 (164%)	Young High Density with Structural Legacies (3.1), Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Clackamas, Marion, Multnomah	GeoBOB 2013

Taxonomic Group	Species		SSS Status*	S&M (Y/N)	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres)							Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties in the Planning Area)	Source for Species Range
						in 2013	*in 2063*								
	Common Name	Scientific Name				Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	No Timber Harvest			
Mollusks: Terrestrial	Oregon Megomphix	*Megomphix hemphilli*	-	Y	N	705,040	1,079,159 (153%)	1,085,261 (154%)	1,089,808 (155%)	946,713 (134%)	1,162,501 (165%)	1,246,290 (177%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Benton, Clackamas, Clatsop, Columbia, Coos, Douglas, Lane, Linn, Marion, Multnomah, Tillamook, Washington, Yamhill	GeoBOB 2013
Mollusks: Terrestrial	Klamath Sideband	*Monadenia churchi*	-	Y	N	163,314	177,638 (109%)	224,268 (137%)	231,326 (142%)	209,040 (128%)	229,231 (140%)	238,101 (146%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Jackson	GeoBOB 2013
Mollusks: Terrestrial	Green Sideband	*Monadenia fidelis beryllica*	BS	N	N	32,579	39,971 (123%)	39,578 (121%)	41,972 (129%)	35,767 (110%)	36,032 (111%)	45,292 (139%)	Young High Density with Structural Legacies (3.1), Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Curry	GeoBOB 2013
Mollusks: Terrestrial	Broadwhorl Tightcoil	*Pristiloma johnsoni*	BStr	N	N	473,900	714,295 (151%)	746,446 (158%)	738,105 (156%)	641,727 (135%)	791,217 (167%)	833,514 (176%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Curry, Douglas, Lane	GeoBOB 2013
Mollusks: Terrestrial	Crowned Tightcoil	*Pristiloma pilsbryi*	BS	N	N	21,451	40,295 (188%)	41,433 (193%)	40,519 (189%)	41,541 (194%)	41,529 (194%)	42,009 (196%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Tillamook	GeoBOB 2013

Taxonomic Group	Species		SSS Status*	S&M (Y/N)	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres)							Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties in the Planning Area)	Source for Species Range
						in 2013	*in 2063*								
	Common Name	Scientific Name				Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	No Timber Harvest			
Mollusks: Terrestrial	Blue-grey Taildropper	*Prophysaon coeruleum*	-	Y	N	1,144,280	1,532,767 (134%)	1,603,056 (140%)	1,647,285 (144%)	1,453,163 (127%)	1,707,753 (149%)	1,779,791 (156%)	Young High Density with Structural Legacies (3.1), Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Benton, Clackamas, Coos, Curry, Douglas, Jackson, Josephine, Klamath, Lane, Linn, Marion	GeoBOB 2013
Mollusks: Terrestrial	Klamath Taildropper	*Prophysaon sp. nov.*	BStr	N	N	220,822	234,750 (106%)	293,885 (133%)	300,640 (136%)	268,344 (122%)	294,427 (133%)	308,387 (140%)	Young High Density with Structural Legacies (3.1), Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Jackson, Klamath	GeoBOB 2013
Mollusks: Terrestrial	Hoko Vertigo	*Vertigo sp. nov.*	-	Y	N								Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Out of Known Range	GeoBOB 2013

*SSS Status (Special Status Species status): BS = Bureau Sensitive, BStr = Bureau Strategic, FP = Federal Proposed (also Bureau Sensitive), FC = Federal Candidate (also Bureau Sensitive).

Table R-50. Legacy features in "younger" habitat development for Bureau Sensitive, Bureau Strategic, Survey & Manage wildlife species and landbird focal species.

Taxonomic Group	Species		SSS Status*	S&M (Y/N)	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres)							Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties in the Planning Area)	Source for Species Range
						in 2013	*in 2063*								
	Common Name	Scientific Name				Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	No Timber Harvest			
Birds: Landbird Focal Species	Lewis' Woodpecker	*Melanerpes lewis*	BS	N	Y[2, 3]	12,896	89,420 (693%)	12,249 (95%)	70,832 (549%)	8,716 (68%)	31,361 (243%)	16,361 (127%)	Early-successional with Structural Legacies (1.1) or GNN Non-Forest Shrub land (7)	Columbia, Douglas, Jackson, Josephine, Klamath, Lane, Multnomah	GeoBOB 2013,N
Birds: Landbird Focal Species	Northern Flicker	*Colaptes auratus*	-	N	Y[1]	82,477	228,649 (277%)	14,382 (17%)	121,639 (147%)	13,940 (17%)	89,418 (108%)	15,589 (19%)	Early-successional with Structural Legacies (1.1) or Stand Establishment with Structural Legacies (2.1)	All	NatureServe 2014
Birds: Landbird Focal Species	Olive-sided Flycatcher	*Contopus cooperi*	-	N	Y[1]	402,947	249,722 (62%)	117,859 (29%)	141,484 (35%)	179,698 (45%)	108,880 (27%)	36,629 (9%)	Early-successional with Structural Legacies (1.1) or Stand Establishment (2.1, 2.2)	All	NatureServe 2014
Birds: Landbird Focal Species	White-Headed Woodpecker	*Picoides albolarvatus*	BS	N	Y[3]	10,313	72,725 (705%)	11,882 (115%)	40,209 (390%)	8,567 (83%)	24,085 (234%)	15,923 (154%)	Early-successional with Structural Legacies (1.1) or GNN Non-Forest Shrub land (7)	Douglas, Jackson, Josephine, Klamath	GeoBOB 2013; NatureServe 2014
Birds: Landbird Focal Species	Williamson's Sapsucker	*Sphyrapicus thyroideus*	-	N	Y[3]	84,441	215,195 (255%)	23,098 (27%)	101,787 (121%)	22,457 (27%)	84,237 (100%)	24,061 (28%)	Early-successional with Structural Legacies (1.1), Stand Establishment with Structural Legacies (2.1), or Young Low Density with Structural Legacies (3.3)	Benton, Clackamas, Douglas, Jackson, Josephine, Klamath, Lane, Linn	Avian Knowledge Northwest 2014; GeoBOB 2013

* SSS Status (Special Status Species status): BS = Bureau Sensitive, BStr = Bureau Strategic, FP = Federal Proposed (also Bureau Sensitive), FC = Federal Candidate (also Bureau Sensitive).

[1] Altman and Alexander (2012).

[2] Altman (2000a).

[3] Altman (2000b).

Table R-51. Legacy features in "older" habitat development for Bureau Sensitive, Bureau Strategic, Survey & Manage wildlife species and landbird focal species.

Taxonomic Group	Species		SSS Status*	S&M (Y/N)	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres)							Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties in the Planning Area)	Source for Species Range
						in 2013	*in 2063*								
	Common Name	Scientific Name				Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	No Timber Harvest			
Bats	Fringed Myotis	*Myotis thysanodes*	BS	N	N	1,162,574	1,555,190 (134%)	1,624,141 (140%)	1,672,762 (144%)	1,479,554 (127%)	1,730,345 (149%)	1,801,630 (155%)	Young with Structural Legacies (3.1, 3.3), Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Clackamas, Clatsop, Columbia, Coos, Curry, Douglas, Jackson, Josephine, Klamath, Lane, Lincoln, Linn, Tillamook, Washington	GeoBOB 2013; NatureServe 2014
Bats	Pallid Bat	*Antrozous pallidus*	BS	N	N	1,026,908	1,348,033 (131%)	1,435,273 (140%)	1,471,780 (143%)	1,305,381 (127%)	1,522,475 (148%)	1,571,763 (153%)	Young with Structural Legacies (3.1, 3.3), Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Coos, Curry, Douglas, Jackson, Josephine, Klamath, Lane	NatureServe 2014
Bats	Spotted Bat	*Euderma maculatum*	BS	N	N								Young with Structural Legacies (3.1, 3.3), Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Out of Known Range	NatureServe 2014
Birds: Landbird Focal Species	Vaux's Swift	*Chaetura vauxi*	-	N	Y[1]	992,340	1,090,906 (110%)	1,156,869 (117%)	1,219,648 (123%)	1,062,341 (107%)	1,267,362 (128%)	1,239,197 (125%)	Young High Density with Structural Legacy (3.1), Mature Multi-layered Canopy (4.2), or Structurally-complex (5.1, 5.2, 5.3)	All	NatureServe 2014

Taxonomic Group	Species		SSS Status*	S&M (Y/N)	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres)							Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties in the Planning Area)	Source for Species Range
						in 2013	*in 2063*								
	Common Name	Scientific Name				Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	No Timber Harvest			
Birds: Landbird Focal Species	Winter Wren	*Troglodytes hiemalus*	-	N	Y[1]	1,234,785	1,670,659 (135%)	1,432,214 (116%)	1,776,612 (144%)	1,559,493 (126%)	1,845,313 (149%)	1,925,362 (156%)	Young with Structural Legacies (3.1, 3.3), Mature (4.1, 4.2), or Structurally-complex (5.1, 5.2, 5.3)	All – except Lincoln	Avian Knowledge Northwest 2014

* SSS Status (Special Status Species status): BS = Bureau Sensitive, BStr = Bureau Strategic, FP = Federal Proposed (also Bureau Sensitive), FC = Federal Candidate (also Bureau Sensitive).

[1] Altman and Alexander (2012).

Structural Stage Development

Table R-52. Early-successional forest habitat development under the alternatives in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	46,249	46,249	46,249	46,249	46,249	46,249
Alternatives						
2023	92,216	91,012	81,747	138,088	69,273	43,016
2033	101,496	97,831	73,282	180,450	51,793	9,667
2043	100,324	86,622	105,364	145,343	44,531	12,233
2053	111,095	79,930	132,251	127,038	47,977	14,105
2063	110,566	80,089	118,311	131,001	46,001	14,418

Table R-53. Early-successional forest habitat development under the alternatives in the planning area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	1,112,694	1,112,694	1,112,694	1,112,694	1,112,694	1,112,694
Alternatives						
2023	1,158,661	1,157,457	1,148,192	1,204,533	1,135,718	1,109,463
2033	1,088,405	1,084,740	1,060,190	1,167,359	1,038,702	996,579
2043	1,087,233	1,073,531	1,092,273	1,132,252	1,031,440	999,145
2053	1,098,004	1,066,839	1,119,160	1,113,947	1,034,886	1,001,017
2063	1,097,475	1,066,998	1,105,220	1,117,910	1,032,910	1,001,331

Table R-54. Stand establishment forest habitat development under the alternatives in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	388,767	388,767	388,767	388,767	388,767	388,767
Alternatives						
2023	393,078	393,271	392,762	392,609	392,885	393,698
2033	261,528	259,790	261,142	260,643	261,162	263,693
2043	193,516	189,545	142,827	236,987	169,905	144,688
2053	169,130	158,823	77,038	243,421	118,027	75,210
2063	139,442	107,771	24,419	170,143	64,048	22,334

Table R-55. Stand establishment forest habitat development under the alternatives in the planning area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	2,473,304	2,473,304	2,473,304	2,473,304	2,473,304	2,473,304
Alternatives						
2023	2,477,615	2,477,808	2,477,299	2,477,146	2,477,422	2,478,235
2033	2,277,548	2,275,810	2,277,162	2,276,663	2,277,182	2,279,713
2043	2,130,000	2,126,029	2,079,311	2,173,471	2,106,389	2,081,173
2053	2,105,614	2,095,307	2,013,522	2,179,905	2,054,511	2,011,695
2063	2,075,926	2,044,255	1,960,903	2,106,627	2,000,532	1,958,819

Table R-56. Young forest habitat development under the alternatives in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	622,916	622,916	622,916	622,916	622,916	622,916
Alternatives						
2023	593,429	559,361	582,353	559,043	565,137	563,863
2033	621,154	553,647	588,635	563,582	560,568	550,334
2043	542,593	475,991	516,096	502,575	478,273	464,112
2053	410,984	347,098	395,704	369,961	347,204	331,876
2063	361,710	335,731	367,900	393,286	324,719	294,265

Table R-57. Young forest habitat development under the alternatives in the planning area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	9,807,038	9,807,038	9,807,038	9,807,038	9,807,038	9,807,038
Alternatives						
2023	9,777,551	9,743,483	9,766,475	9,743,165	9,749,259	9,747,986
2033	9,953,329	9,885,822	9,920,810	9,895,757	9,892,743	9,882,509
2043	9,954,304	9,887,702	9,927,807	9,914,286	9,889,984	9,875,822
2053	9,822,695	9,758,809	9,807,415	9,781,672	9,758,915	9,743,586
2063	8,295,651	8,269,672	8,301,841	8,327,227	8,258,660	8,228,205

Table R-58. Mature forest habitat development under the alternatives in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	515,324	515,324	515,324	515,324	515,324	515,324
Alternatives						
2023	530,495	535,495	528,263	510,523	555,899	570,286
2033	604,423	623,388	617,535	566,186	659,078	692,423
2043	748,405	753,999	746,035	671,321	807,110	864,305
2053	862,653	876,970	864,974	781,688	941,998	1,015,653
2063	907,043	889,737	916,491	792,794	968,826	1,045,993

Table R-59. Mature forest habitat development under the alternatives in the planning area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	2,431,709	2,431,709	2,431,709	2,431,709	2,431,709	2,431,709
Alternatives						
2023	2,446,880	2,451,880	2,444,648	2,426,908	2,472,284	2,486,671
2033	2,520,808	2,539,773	2,533,920	2,482,571	2,575,463	2,608,808
2043	2,664,790	2,670,384	2,662,420	2,587,706	2,723,495	2,780,690
2053	2,062,366	2,076,683	2,064,687	1,981,401	2,141,711	2,215,365
2063	3,584,526	3,567,220	3,593,974	3,470,277	3,646,309	3,723,475

Table R-60. Structurally-complex forest habitat development under the alternatives in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	588,435	588,435	588,435	588,435	588,435	588,435
Alternatives						
2023	552,481	582,560	576,573	561,435	578,505	591,365
2033	573,098	627,043	621,105	590,837	629,097	646,110
2043	576,860	655,541	651,378	605,473	661,880	676,889
2053	607,836	698,878	691,732	639,592	706,493	725,384
2063	642,938	748,371	734,577	674,474	758,105	785,217

Table R-61. Structurally-complex forest habitat development under the alternatives in the planning area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	1,578,370	1,578,370	1,578,370	1,578,370	1,578,370	1,578,370
Alternatives						
2023	1,542,416	1,572,495	1,566,508	1,551,370	1,568,440	1,581,271
2033	1,563,033	1,616,978	1,611,040	1,580,772	1,619,032	1,636,016
2043	1,566,795	1,645,476	1,641,313	1,595,408	1,651,815	1,666,795
2053	2,314,443	2,405,485	2,398,339	2,346,199	2,413,100	2,431,962
2063	2,349,545	2,454,978	2,441,184	2,381,081	2,464,712	2,491,796

Table R-62. Early-successional, stand establishment, and young stands with structural legacies (1.1, 2.1, 3.1, 3.3) in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	223,475	223,475	223,475	223,475	223,475	223,475
Alternatives						
2023	284,566	225,728	268,316	223,556	253,306	228,516
2033	301,306	199,160	267,575	196,131	244,514	204,698
2043	320,868	174,503	277,134	176,150	242,589	175,062
2053	344,989	149,389	278,851	149,441	235,643	151,473
2063	367,349	123,248	265,647	124,348	226,262	128,372

Table R-63. Mature and structurally-complex stands with structural legacies (4.2, 5.1, 5.2, 5.3) in the decision area.

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	No Timber Harvest (Acres)
Current Condition						
2013	862,411	862,411	862,411	862,411	862,411	862,411
Alternatives						
2023	822,156	850,413	840,454	824,563	859,206	871,438
2033	808,459	858,389	859,842	806,909	882,385	893,801
2043	884,185	952,884	962,440	879,988	993,084	1,011,663
2053	923,935	1,005,188	1,026,964	926,363	1,070,004	1,074,271
2063	961,980	1,058,410	1,087,349	962,201	1,141,298	1,136,633

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Appendix S – Northern Spotted Owl

Section S-A

Forecasting Habitat Change, and Northern Spotted Owl Population Responses, in Washington, Oregon and California

The U.S. Fish and Wildlife Service (USFWS) used HexSim (Schumaker 2011)—a spatially-explicit, individual-based, population model—to help inform its decisions on northern spotted owl recovery and the delineation of northern spotted owl critical habitat (USDI FWS 2011 and 2012). The Service's HexSim model was a powerful tool the BLM potentially could adapt to its planning needs.

The USFWS calibrated its HexSim model to run with northern spotted owl relative habitat suitability surfaces (i.e., digitized geospatial datasets used for computer analyses), which it derived using 1996 and 2006 Gradient Nearest Neighbor (GNN) data developed by the U.S. Forest Service (USFS) (Ohmann and Gregory 2002). Relative habitat suitability values range from 0 to 100, with higher numbers signifying better habitat value. The values themselves are derived from a variety of biotic and abiotic variables, such as the amount of forest canopy cover, mean tree diameter, and degree and direction of terrain slope. To create its relative habitat suitability surfaces, the USFWS used MaxEnt (Phillips *et al*. 2006) to compare variables present on broad landscapes with those associated with known northern spotted owls nest sites. The Service described its process in USDI FWS 2011 (Appendix C) and USDI FWS 2012.

Concurrent with the USFWS process, the USFS created a separate set of northern spotted owl relative habitat suitability surfaces to evaluate implementation of the Northwest Forest Plan (Davis *et al*. 2011). The USFS based its surfaces on a unique set of MaxEnt models that it also derived using 1996 and 2006 GNN data[143] (Davis *et al*. 2011, pp. 27 and 28). Differences between the two processes included:

- The two agencies used different variable scales to create their MaxEnt models. The USFS variables were specific to 30 × 30-m pixels (Davis *et al*. 2011, p. 28) whereas the USFWS variables were at the scale of 200 ha (USDI FWS 2012, p. 84).
- The two agencies trained their MaxEnt models to geographically-different modeling regions (Davis *et al*. 2011, p. 35 and USDI FWS 2011, p. C-13).
- Whereas the USFS trained its MaxEnt models primarily on discrete variable values, which could change independently (Davis *et al*. 2011, p. 99), the USFWS trained its MaxEnt models on a combination of discrete and compositional variables. Compositional variables are combinations of discrete variables, all of which must be present (USDI FWS 2012, p. C-38).

[143] Both the USFWS and USFS trained their MaxEnt models using 1996 GNN data because the intent was to develop models that predicted the relative habitat suitability for northern spotted owls when competitive interactions with barred owl still were relatively uncommon. For this purpose, 1996 GNN data are better than 2006 GNN data because, when associated with northern spotted owl nesting-roosting location data, they better represent the association between habitat conditions and northern spotted owl occupancy before later displacements of northern spotted owls by barred owls. Once the models were trained, both agencies projected their models to 2006 GNN data, the most recent data available. Hence, throughout the remainder of this document, when the BLM refers to USFWS 2006 GNN MaxEnt models or USFS 2006 GNN MaxEnt models it always means models developed with 1996 GNN data and applied to 2006 data.

- The USFS used LandTrendr to examine changes in forest stand conditions during 1996 – 2006 from timber harvest, insects and disease, and wildfire (Davis *et al*. 2011, p. 28, 29, 121-125).

Before the BLM northern spotted owl modeling process began, the BLM decided—for its planning process—to use Woodstock to forecast changes in forest stand growth and timber yield variables on its administered lands in the planning area (see the Vegetation Modeling Section in Chapter 3). Therefore, for the northern spotted owl modeling, the BLM created relative habitat suitability surfaces for its administered lands in the planning area, that changed each decade for five decades (see Chapter 3, Northern Spotted Owl), using Woodstock variable outputs. In addition, to generate credible range-wide simulations of northern spotted owl demographic responses to the BLM alternatives using HexSim, the BLM:

- Created relative habitat suitability surfaces for all "other lands" (i.e., lands other than BLM-administered lands in the planning area) within the northern spotted owl's range so simulated northern spotted owls could move across planning area boundaries and respond to habitat conditions on all land ownerships inside and outside the planning area, and;
- Forecasted changes to those surfaces from forest ingrowth, timber harvest and wildfire at the same decadal increments as its Woodstock model, something not done by either the USFS or USFWS.

Thus, to simulate habitat conditions on BLM-administered lands in the planning area, the BLM could not use the USFS or USFWS relative habitat suitability surfaces because the BLM needed to vary the relative habitat suitability surfaces according to each of its alternatives and over time, using variables derived from Woodstock.

To simulate habitat conditions on other lands within the northern spotted owl's range, the BLM originally hoped to build upon the relative habitat suitability surfaces developed by the USFS because:

- The similarity of scale between the BLM Woodstock variables and the USFS GNN variables potentially made it easier for the BLM to merge its relative habitat suitability surfaces for BLM-administered lands with those generated by the USFS for other lands;
- Since Woodstock generates individual variable values, instead of compositional variable values, the BLM could more-directly compare its MaxEnt models to those created by the USFS, and;
- Woodstock could generate the same variable values used by the USFS to create its relative habitat suitability surfaces, which potentially made the BLM and USFS surfaces more compatible.

In addition, the BLM determined that unpublished USFS LandTrendr results could help it forecast habitat changes on other lands.

Therefore, the BLM programmed Woodstock to generate the same variables used by the USFS GNN MaxEnt models (see Davis *et al*. 2011, p. 99) and, using those variables, planned to apply the USFS's MaxEnt models to BLM-administered lands in the planning area. The BLM initially hoped that there would be sufficient compatibility between the relative habitat suitability surfaces generated from the Woodstock and GNN datasets so that the BLM could use the Woodstock variable outputs for BLM-administered lands in the planning area and the GNN variable outputs for all other lands. If the two sets of variable outputs were insufficiently compatible, the BLM could add a stand age variable to the Woodstock outputs to correlate the two relative habitat suitability surfaces.

Unfortunately, as described below under Model 1, the BLM found that the USFS MaxEnt models would not work in this way. Subsequently, the BLM went through an iterative process to identify and account

for design differences between the USFS and USFWS GNN MaxEnt models so that the BLM could use the HexSim model developed by the USFWS—with little or no recalibration—with relative habitat suitability surfaces that utilized both Woodstock data for BLM-administered lands in the planning area and GNN data for other lands.

Developing MaxEnt Models for BLM-Administered Lands in the Planning Area

Objectives and Selection Criteria

Since the BLM initially sought to use the USFS's GNN MaxEnt models, it first evaluated whether doing so was reasonable for its planning purposes. The BLM used three model assessment criteria to evaluate the utility of the USFS, and subsequently other, MaxEnt models:

1) Whether the current–year relative habitat suitability surface generated by the MaxEnt models had a strong correlation[144] with that generated by the USFWS's MaxEnt models. The USFWS calibrated its northern spotted owl HexSim model to its own relative habitat suitability surface. If the new relative habitat suitability surfaces were strongly correlated to the USFWS's surface, the BLM could use the USFWS's HexSim model with the new surfaces with relatively little recalibration of the HexSim model. However, if they were not strongly correlated, a long and detailed recalibration of the HexSim model would be needed. The BLM preferred to avoid a lengthy recalibration.
2) Whether the relative habitat suitability models applied to BLM-administered lands performed similarly[145] to those applied to non-BLM lands. The spatial scale for evaluating the effects of various BLM alternatives on the northern spotted owl population was to occur over the entire geographic range of the northern spotted owl, within modeling regions, and at smaller scales. Hence, the BLM needed the models to perform similarly on BLM-administered lands in the planning area and all other lands within the northern spotted owl's range.
3) Relative habitat suitability surfaces developed for BLM-administered lands in the planning area had to be derived from the forest growth and timber yield variables generated by Woodstock, the most accurate data for those lands.

To determine if criterion 2 were met, the BLM evaluated how its models worked under the No Timber Harvest scenario by evaluating the portions of BLM-administered lands in the planning area that occurred in various relative habitat suitability value bins and strength-of-selection bins (see Model 8, below, the first model so evaluated, for more information). This was a heuristic evaluation of the "reasonableness" of the model(s) applied to decadal changes according to the No Timber Harvest. The BLM forecasted changes at decadal intervals for 50 years. If the model(s) worked well, there would be a steady decrease in the portion of BLM-administered land in low relative habitat suitability value bins and increases in the proportion of that land in higher relative habitat suitability value bins. This evaluation was heuristic

[144] Strong correlation: The BLM, knowing the substantive differences between the origins of the Woodstock and GNN datasets, did not choose an *a priori* minimum correlation coefficient. Instead, the BLM sought for the highest correlation coefficient it could achieve with the available datasets, and then determined if the coefficient were sufficiently strong to allow the BLM to proceed with its analyses.

[145] Performed similarly in terms of their relative progressions, over time, through relative habitat suitability bins and strength-of-selection bins. See Model 8, below, the first model so evaluated, for descriptions of these analyses.

because the BLM knew the general trajectory that would be seen if the model(s) worked reasonably well, even though it did not know the specific extent of that change.

Here, the BLM describes its process to develop relative habitat suitability surfaces that met its three assessment criteria. **Figure S-1** outlines the process.

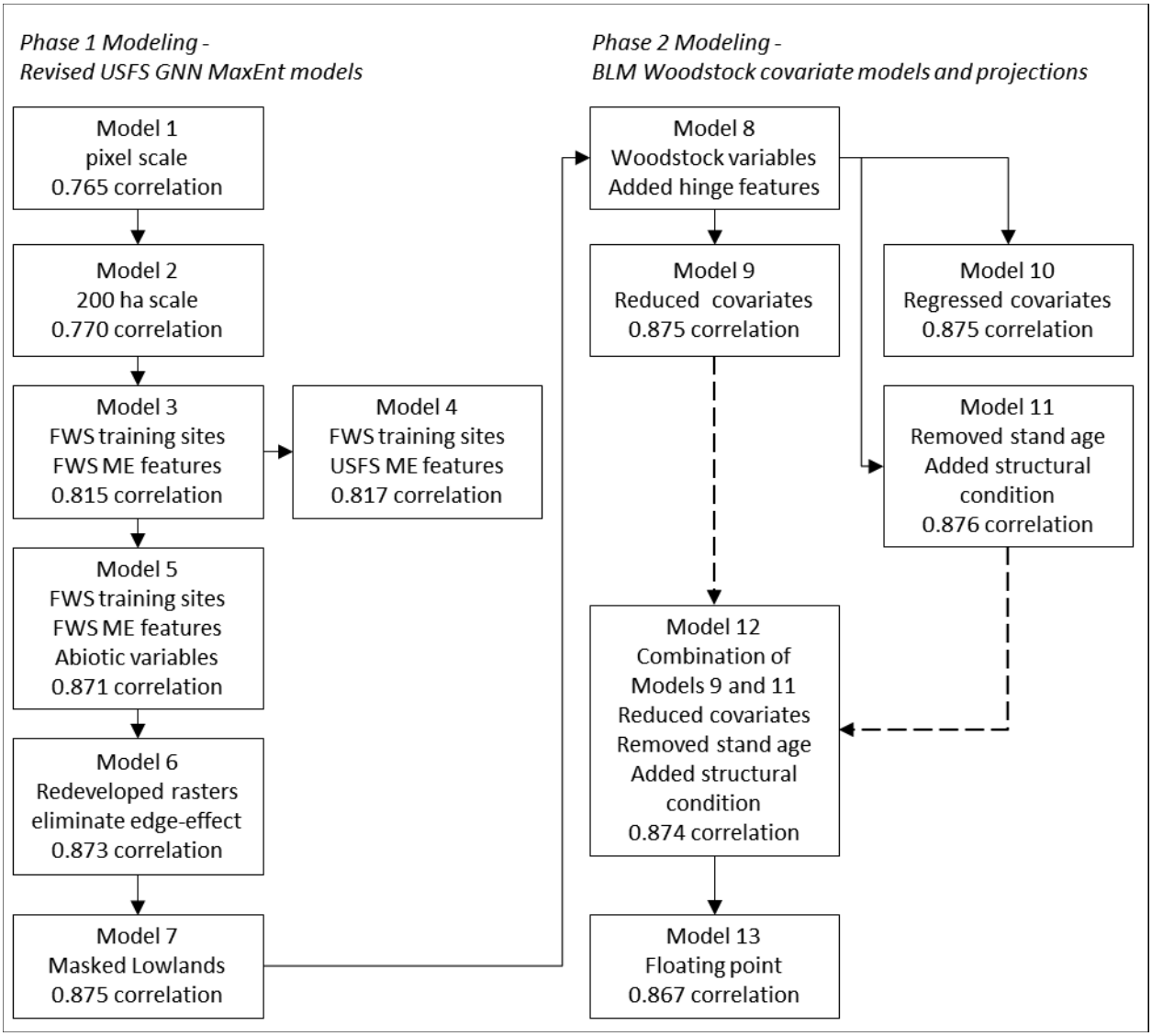

Figure S-1. Flowchart of the BLM MaxEnt modeling sequence. FWS refers to the U.S. Fish and Wildlife Service; ME refers to MaxEnt; USFS refers to the U.S. Forest Service.

Model 1

The BLM first conducted range-wide comparisons of the USFS (Davis *et al*. 2011) and USFWS (USDI FWS 2011, Appendix C) relative habitat suitability surfaces. The BLM overlaid the geographic range of the northern spotted owl with a grid of 86.6-ha hexagons—the grid used by the USFWS's HexSim model (USDI FWS 2012, p. 24)—and compared the relative habitat suitability values of both sets of models in each hexagon. As shown in **Figure S-2**, the two sets of models produced dissimilar results; the USDI FWS 2006 GNN MaxEnt models estimated more of the landscape to be in the lowest (relative habitat suitability values 0 to 10) and highest (values greater than 40) bins, whereas the USDA FS 2006 GNN

MaxEnt models estimated more of the landscape to be in the middle (values 11 to 40) bins. These results were not unexpected because, as described above, the USFS and USFWS calculated relative habitat suitability values at different scales.

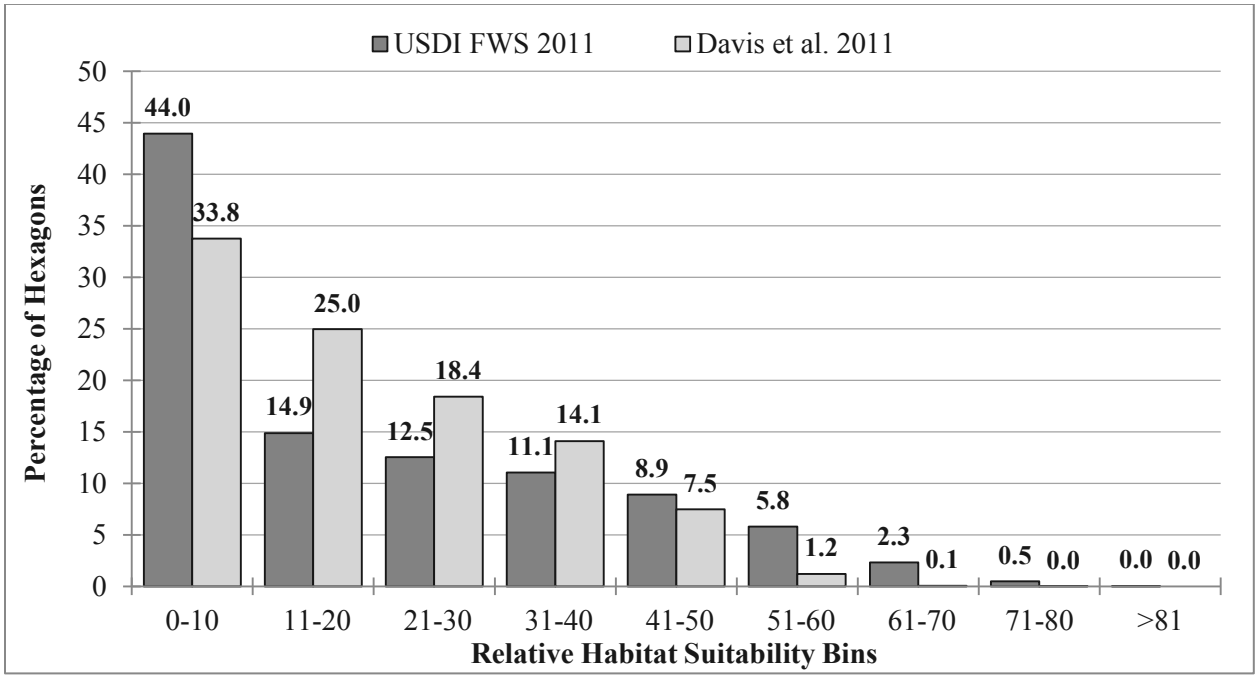

Figure S-2. Distribution of hexagons relative habitat suitability scores among various bins from 2006 GNN MaxEnt models developed by the U.S. Fish and Wildlife Service (USDI FWS 2011, Appendix C) and the U.S. Forest Service (Davis *et al*. 2011).

The correlation between hexagon relative habitat suitability values for the two sets of models was 0.765. The BLM sought a stronger relationship as well as greater similarity in the distribution of relative habitat suitability scores. The BLM determined that the USFS 2006 GNN MaxEnt models failed assessment criterion 1.

Model 2

The Model 1 results suggested the influence of an artifact-of-scale; i.e., the correlation would have been stronger if the two sets of MaxEnt models had been calculated at the same scale. So, the BLM ran the comparison again at the 200-ha scale used by the USFWS because the GNN data in part were derived from satellite imagery, the spatial accuracy of which increases with scale. Stated another way, although the GNN variable data reasonably describe forest conditions on a landscape, they are less accurate at the 30 × 30-m pixel-scale used by the USFS (see Ohman and Gregory 2002 and http://www.fs.fed.us/wwetac/projects/ohmann.html). Since the BLM intended to use its relative habitat suitability surfaces with the USFWS's HexSim model, in which simulated northern spotted owls "select" habitat from a relative habitat suitability surface, and the scale at which northern spotted owls are known to strongly select habitat is the 200-ha (i.e., ~ 500 ac) core use area (see Chapter 3, Northern Spotted Owl), the BLM chose that scale.

MaxEnt examines a variety of variables associated with known northern spotted owl nest locations and identifies those variables and combinations of variables, and the relative importance of each variable/combination, that best discriminate between occupied and available locations. The USFS (Davis *et al*. 2011) divided the northern spotted owl range into six modeling regions and used MaxEnt to identify

and weigh the best variables/combinations in each region, creating a unique MaxEnt model for each region. To alter the scale of the USFS relative habitat suitability surface, the BLM ran MaxEnt on the same modeling regions defined by the USFS, using the USFS 1996 GNN MaxEnt model for each region, but at the 200-ha scale. In other words, the BLM created a new set of MaxEnt models (Model 2) by running MaxEnt, with the region-specific models developed by the USFS, to calculate new relative habitat suitability values for each 30 × 30-m pixel based on the mean of the values of each variable within the 200-ha circle around each pixel.

The correlation between the USFWS 2006 GNN MaxEnt model and the Model 2 estimated relative habitat suitability for hexagons was 0.770. To meet assessment criterion 1, the BLM sought a stronger relationship.

Model 3

Keeping in mind that the USFS (Davis *et al*. 2011) and the USFWS (USDI FWS 2011) developed their MaxEnt models for different purposes, the BLM addressed another difference between the two model sets. The USFS MaxEnt models used northern spotted owl nest and pair roost sites from the demographic study areas supplemented by a random subset of northern spotted owl pair sites from the 10-year monitoring report training data set (Davis and Lint 2005) that were outside of the study area boundaries and spaced no nearer to each other than the mean nearest neighbor distance for that modeling region (Ray Davis, USFS, personal communication via e-mail to Eric Greenquist, October 21, 2014). In contrast, the USFWS MaxEnt models considered a subset of all known sites (USDI FWS 2011, p. C-21). Because northern spotted owl *known* nest sites tend to occur at greater densities in better habitat, and in areas that received more survey, when MaxEnt considers all sites, it calculates formulas that can be biased by the similarity of the variables around proximal sites. To help control for this, the USFS and USFWS used different approaches to limit the number of known sites MaxEnt could consider (i.e., aware of biased datasets, the agencies took different steps to reduce the bias). For Model 3, and all subsequent models, the BLM used the same northern spotted owl locations used by the USFWS.

The BLM also used the same MaxEnt feature sets used by the USFWS. Features, in MaxEnt, refer to the functional forms or shapes of relationships evaluated in MaxEnt. The BLM did this to determine if it could use variables used by the USFS (albeit, at the different scale) and that the BLM could estimate with Woodstock, while, at the same time, minimizing other differences between the USFS and the USFWS models so that the differences in the respective relative habitat suitability surfaces would not be a function of the differences in either training location or MaxEnt specifications (e.g., the features used).

The correlation between the USFWS 2006 GNN MaxEnt models and the Model 3 estimated relative habitat suitability for hexagons was 0.815, an improvement from previous models. Although the BLM determined that this correlation coefficient was sufficiently strong to meet assessment criterion 1, it sought a stronger relationship.

Model 4

Model 4 was identical to Model 3 except that the BLM returned to the MaxEnt features used by the USFS (Davis *et al*. 2011). The correlation between the USFWS 2006 GNN MaxEnt models and the Model 4 estimated relative habitat suitability for hexagons was 0.817, nearly identical to that of Model 3, indicating that models 3 and 4 were nearly identical in their predictive capabilities.

Model 5

Model 5 was identical to Model 3 except that the BLM added the abiotic variables elevation, curvature, and relative slope position index (USDI FWS 2011, p. C-25 and Table C9). The correlation between the USFWS 2006 GNN MaxEnt models and the Model 5 estimated relative habitat suitability for hexagons increased to 0.871. The BLM determined that this correlation coefficient met criterion 1, but it evaluated whether a stronger relationship was possible.

Model 6

Model 6 was identical to Model 5 except that the BLM redeveloped the variable rasters to match the methods used by the USFWS (USDI FWS 2011, p. C-60). The BLM generated GNN variable rasters using buffered USFS modeling regions to eliminate edge effect. Because variable values reflect the mean of all values within a 200-ha circle, the MaxEnt model for a modeling region can be influenced by the lack of data beyond the regional boundary (i.e., up to 800 m beyond the boundary, the area potentially within the radius of a 200-ha circle). Buffering the modeling region caused MaxEnt to clip data at the regional boundary and calculate mean values from only variable values within the region.

The correlation between the USFWS 2006 GNN MaxEnt models and the Model 6 estimated relative habitat suitability for hexagons was 0.873. The BLM evaluated whether a stronger relationship was possible.

Model 7

Model 7 was identical to Model 6 except that the BLM masked those portions of western Oregon, such as the Willamette Valley and Puget Lowlands that, due to limited habitat, support few, if any, northern spotted owls. This forced MaxEnt to consider more subtle associations between northern spotted owl sites and the habitat variables associated with those sites. In the BLM MaxEnt analyses, masked areas became unavailable to be included in the random subset of available locations to which MaxEnt compared locations occupied by northern spotted owls. Masking these areas resulted in MaxEnt formulas based on forests in which northern spotted owls occurred compared to other, available, forested areas rather than to the broader array of habitat types, some of which were unoccupied by northern spotted owls. This eliminated major areas of non-potential habitat from the models.

The correlation between the USFWS 2006 GNN MaxEnt models and the Model 7 estimated relative habitat suitability for hexagons was 0.875.

Through the development of Model 7, the BLM had worked to refine the compatibility of the BLM regional MaxEnt models with those used by the USFWS in its HexSim model. As stated earlier, the BLM saw the opportunity to use the unpublished USFS (Davis *et al*. 2011) LandTrendr data to help it forecast changes in relative habitat suitability values on other lands within the northern spotted owl range (lands other than BLM-administered lands in the planning area), and the BLM saw the opportunity to use the USFWS's HexSim model to forecast northern spotted owl population responses. With a 0.875 correlation between the Model 7 relative habitat suitability surfaces and those developed by the USFWS (both of which used 2006 GNN data), the BLM was confident of its reconciliation.

Model 8

Beginning with Model 8, the BLM replaced the 2006 GNN variable values for BLM-administered lands in the planning area with those produced by Woodstock for 2013. Because the BLM, at this stage, was developing relative habitat suitability surfaces for its administered lands within the planning area, the BLM also begin limiting this, and subsequent models, to the three western Oregon modeling regions

defined by the USFS: the Oregon Coast Range, Oregon and California Cascades, and Oregon and California Klamath modeling regions (Davis *et al*. 2011, p. 35). Finally, the BLM added the hinge feature to MaxEnt, adding this feature to the threshold, quadratic and linear features the BLM had added to Model 3. Adding the hinge feature allowed MaxEnt to consider more subtle associations between variables, an attempt to improve its predictive capability.

With these changes, the BLM began an iterative modeling process to—

1. Project the current MaxEnt model for each of the three western Oregon modeling regions to the Woodstock variables (i.e., beginning with Model 8, apply the Model 8 MaxEnt formulas to the 2013 Woodstock-generated variable values for BLM-administered lands in the planning area) by using the MaxEnt .lamdas files from the model developed with the 1996 GNN data[146];
2. Evaluate the projected MaxEnt outputs by (a) relative habitat suitability bins and (b) strength-of-selection habitat class distributions147 through the decadal time-series (2013-2063);
3. Refine the model variables (i.e., generate new models, beginning with Model 9), and;
4. Repeat steps 1 through 3 with each set of new and refined MaxEnt models until all three assessment criteria were met.

As further explanation: MaxEnt is a multivariate model; i.e., its predictions are influenced by both the state of individual variables and how each variable co-varies with the other model variables. The USFWS (USDI FWS 2011) and USFS (Davis *et al*. 2011) MaxEnt models were projected to 2006 GNN data. In contrast, for BLM-administered lands in the planning area, the BLM would use the variable values

[146] To clarify: The BLM developed all of its Maxent models using 1996 GNN data, then projected those models to 2006 GNN, 2012 GNN and 2013 Woodstock data.

[147] Based on its modeling needs (see Chapter 3, Northern Spotted Owl), the BLM divided northern spotted owl habitat into categories based on strength-of-selection. This was similar to the process used by the USFWS (USDI FWS 2011, pp. C-31 – C-39) but, in the BLM's case, the BLM used four categories: (1) "strongly selected against," (2) "selected against," (3) "selected for," and (4) "strongly selected for." The "strongly selected against" and "strongly selected for" categories were those areas with strength-of-selection values of less than -2.75 and greater than 2.75, respectively. "Selected against" areas were those with strength-of-selection values from -2.75 to 0, and "selected for" areas had strength-of-selection values of greater than 0 and less than or equal to 2.75. Strength-of-selection values represent the degree to which northern spotted owls disproportionately select for or against particular relative habitat suitability categories. Thus, "strongly selected for" areas (strength-of-selection greater than 2.75) means that the proportion of northern spotted owl nest locations in that category was at least 2.75 times greater than expected based on the proportion of the area with that relative habitat suitability value in the landscape. Similarly, "strongly selected against" areas (strength-of-selection less than 2.75) means that northern spotted owls nested in such relative habitat suitability areas at least 2.75 times less than would be expected based on their extent in the landscape. As an example: If the relative habitat suitability values greater than 45 represented 10 percent of a modeling region and 50 percent of the northern spotted owl nests in that region were in areas with relative habitat suitability greater than 45, the strength-of-selection value would be 5.0 (50 percent of the nests divided by 10 percent of the area), and categorized as "strongly selected for." Similarly, if 50 percent of the landscape were in areas with relative habitat suitability less than 15 and 10 percent of the nests in that region were in areas with relative habitat suitability less than 15, the strength-of-selection would be -5.0 (10 percent of the nest sites divided by 50 percent of the area, which means the area was used five times less than would be expected based on its availability), and categorized as "strongly selected against." The BLM created strength-of-selection curves separately for each of the three western Oregon modeling regions, and separately for each of the models. These strength-of-selection-defined categories provided a relatively simple and consistent way to track changes in the amount of area containing habitats of differing value to northern spotted owls; with value being defined by the owls' relative attraction or avoidance.

derived from Woodstock. Thus, the BLM began evaluating how the 2006 GNN- and 2013 Woodstock-derived variables co-varied.

Figure S-3 shows scatterplots of the relationship between each pair of the biotic variables from 2006 GNN data (left) and 2013 Woodstock data (right) for BLM-administered lands in the planning area. The BLM did not evaluate abiotic variables because the sources of those variables are the same for both models. For the initial comparisons, the BLM evaluated 2006 GNN data (the most recent dataset available at the time) and Woodstock's estimates for 2013 conditions on BLM-administered lands in the planning area. It is important to note that the GNN and Woodstock datasets were derived through substantively different processes, so the BLM anticipated substantive, albeit undefined, differences between the two datasets.

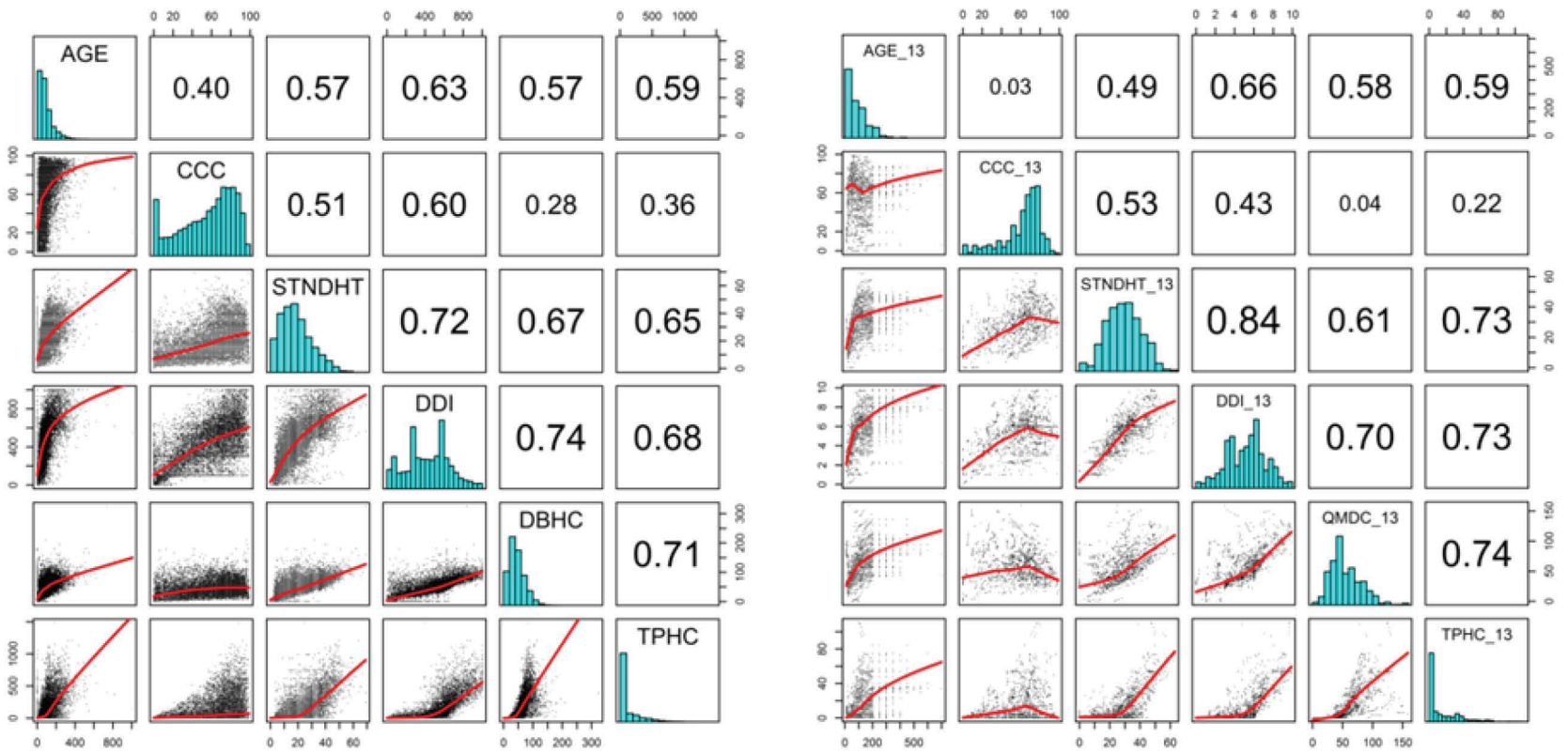

Figure S-3. Bivariate scatterplots for select 2006 GNN variables for the three western Oregon modeling regions (left) and 2013 Woodstock variables for BLM-administered lands in the planning area (right). Both matrices display the XY scatter plots for each pair of variables, using a non-linear LOWESS smoother (locally-weighted scatterplot smoothing, a type of non-parametric regression) for the fitted line, in the lower left, the covariate histogram for each pair of variables across the diagonal, and the Pearson's correlation coefficient for each pair of variables in the upper right. Variable abbreviations are defined in the text, below, except DBHC which refers to the mean trunk diameter of conifers, similar to quadratic mean trunk diameter of dominate and co-dominate conifers (QMDC_13).

The comparisons revealed very different relationships between: stand age (AGE in **Figure S-3**) and canopy cover of all conifers (CCC), stand age and stand height (STNDHT), stand age and the number of large conifer trees per hectare (TPHC), canopy cover of all conifers and stand height, canopy cover of all conifers and stand diameter diversity index (DDI), canopy cover of all conifers and quadratic mean trunk diameter of conifers (QMDC), and canopy cover of all conifers and the number large conifer trees per hectare. Most disconcerting were the differences in the relationships of conifer canopy cover to stand height, diameter diversity index, mean conifer trunk diameter, and the number of large conifer trees per hectare. In all cases, Woodstock estimated that, as canopy cover increased beyond approximately 70 percent, each of these variables would decrease. In contrast, GNN represented these same relationships as increasing in all cases, though the rate of increase varied from slight (number of large conifer trees per hectare) to rapid (stand height and stand diameter diversity index).

In accordance with assessment criterion 2 the BLM also compared the models in terms of decadal progressions of relative habitat suitability. To this point, the correlations the BLM had calculated were between the USFWS's 2006 GNN MaxEnt models and the BLM 2006 GNN MaxEnt models at both modeling region and range-wide scales. For the BLM Woodstock models, the focus of the evaluation was the temporal trend in relative habitat suitability and habitat distributions. Given that the first projection of habitat change in the BLM's Woodstock model was the No Timber Harvest scenario, the BLM expected that the percentage of BLM-administered land with low relative habitat suitability would decrease while the percentage in intermediate and higher relative habitat suitability would increase. The BLM based this expectation on its knowledge that northern spotted owls preferentially select areas with larger trees and more structural complexity and, as trees get older, they get larger and such forests acquire more structural diversity. The BLM did not have a specific expectation on the exact quantity or percentage of BLM-administered land in lower, intermediate, and high relative habitat suitability bins, only of the trends over time in each of those bins. The BLM's evaluations were meant to check on the trends.

However, as shown in **Figure S-4**, although the temporal trends in relative habitat suitability showed a reduction over time in the percentage of the landscape in the lowest relative habitat suitability categories and an increase in the highest relative habitat suitability category, the trend in the intermediate categories (40-50, 50-60, 60-70) were in the opposite direction than what was expected, particularity in the Oregon and California Cascades Modeling Region (**Figure S-4 B**).

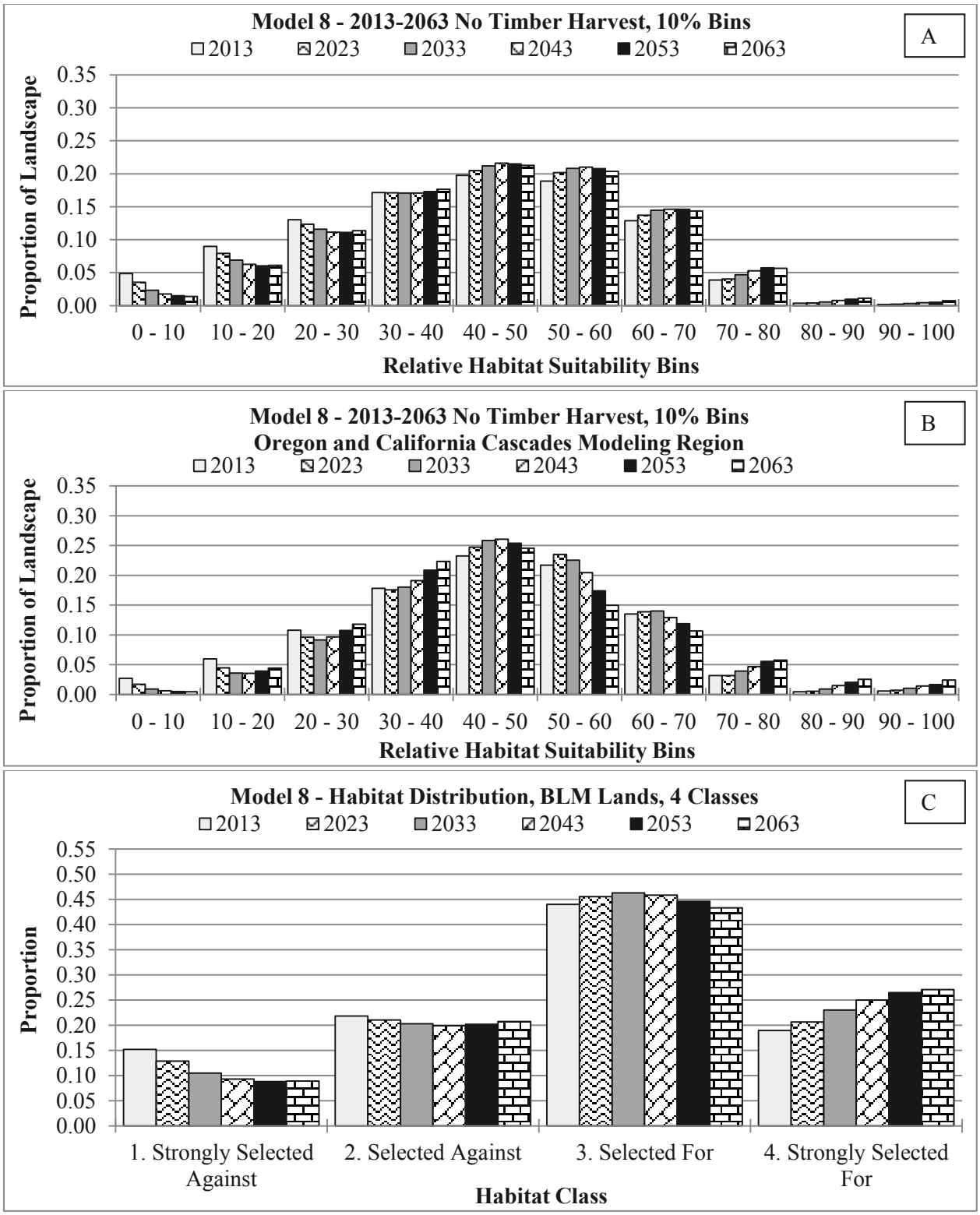

Figure S-4. No Timber Harvest: distribution of relative habitat suitability by decade for Model 8, on BLM-administered lands in the planning area (A and C), and on BLM-administered lands in the Oregon and California Cascades Modeling Region (B). Histograms A and B show the portion of BLM-administered lands in each relative habitat suitability bin at the start of each of six decades. Histogram C

shows the portion of BLM-administered lands in each strength-of-selection bin at the start of each of six decades.

In part, these trends in variable value with age and relative habitat suitability progression arose because the models generated from Woodstock variable data were not always indicative of how forests on BLM-administered lands develop. For example, an existing 140-year-old stand on BLM-administered land does not exhibit the structural characteristics that an existing 40-year-old stand would be expected to exhibit in one-hundred years. The 40-year old stand might have received commercial thinning and other silvicultural practices that would result in different stand metrics when it eventually becomes 140 years old. Timber harvests before 1960 tended to be more extensive and intensive than later harvests, and subsequent regeneration commonly occurred through natural seeding. In contrast, timber harvests after 1960 more likely left legacy trees and riparian buffers, and the subsequent regeneration more commonly was the result of planting, fertilization, and thinning. Thus, younger stands on BLM-administered lands commonly exhibit some structural characteristics, such as canopy cover, that are greater than those of some older stands.

This analysis revealed that the BLM could not simply use Model 8 with the Woodstock-derived variable values. For example, as shown in **Figure S-3**, in the BLM 2013 Woodstock MaxEnt model, stand height was very influential. In the 2006 GNN data, stand height increased nearly linearly with stand age (**Figure S-3**, left matrix, STNDHT/AGE). In contrast, according to the 2013 Woodstock data, stand height increased rapidly with increasing age for young stands, but then the rate of increase decreased dramatically (**Figure S-3**, right matrix, STNDHT_13/AGE_13). The effect of these many differences was that, when the BLM used the Model 8 MaxEnt formulas (which were derived from 1996 GNN data) with the 2013 Woodstock variable values, relative habitat suitability decreased as stands got older, or, at least, their rate of increase was less than represented by the GNN data. Therefore, the BLM had to further modify its MaxEnt model to better reconcile how the 2013 Woodstock and 2006 GNN variables co-varied.

The BLM dealt with the appreciably different forms of relationships between the 2006 GNN and 2013 Woodstock variables by removing some of those variables, as described below. At this point, the BLM questioned whether it could meet model assessment criteria 2 and 3, especially given that age was an influential variable in the models. Additionally, similar to previous models, the BLM evaluated whether it could find stronger relationships between its newly-developed models and the model developed by the USDI FWS (2011).

Model 9

Model 9 was identical to Model 8 except that the BLM reduced the variable set of each modeling region based on its evaluation of differences in 2006 GNN and 2013 Woodstock variable distributions observed in the scatterplots and histograms generated by Model 8. The BLM removed those variables that strongly influenced a model's predictions and co-varied with other variables substantially differently within the 2006 GNN and 2013 Woodstock data. For the Oregon and California Klamath Region the BLM removed canopy cover of all conifers (CCC in **Figure S-3**) and the number of large conifer trees per hectare (TPHC); for the Oregon and California Cascades Region the BLM removed stand height (STNDHT) and the number of large conifer trees per hectare; and for the Oregon Coast Range Region the BLM removed stand height. Removing these variables allowed other variables to become more influential in the models. The reduced sets of variables produced what the BLM interpreted as a more reasonable distribution of changes in relative habitat suitability by decade, given the No Timber Harvest habitat change scenario.

Figures S-5 and **S-6** compare the results of Models 9 and 8; Model 9 demonstrated a more-expected distribution of relative habitat suitability by decade.

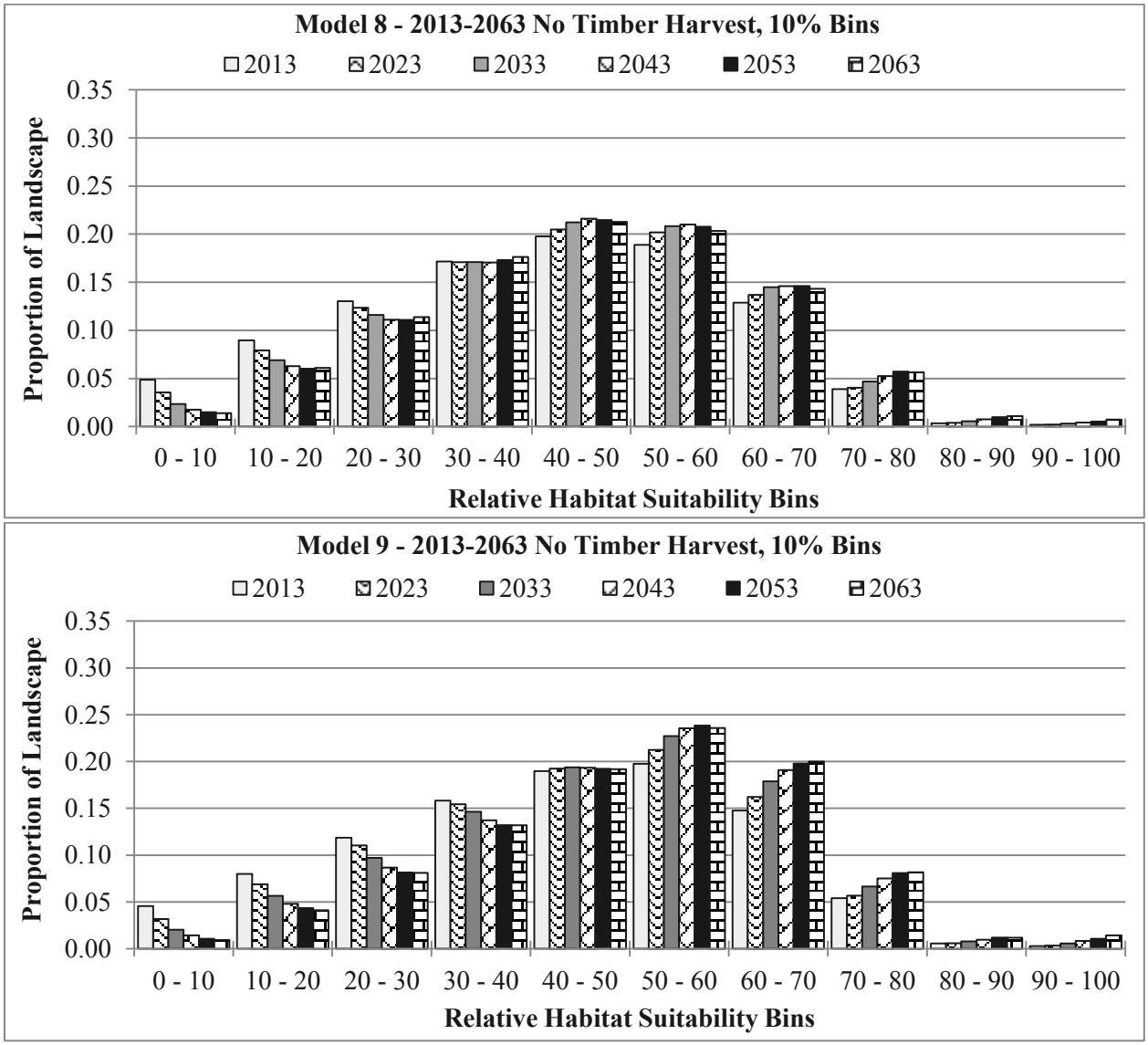

Figure S-5. No Timber Harvest: distributions of relative habitat suitability by decade for Model 8 and Model 9 on BLM-administered lands in the planning area. The histograms show the portion of BLM-administered lands in each relative habitat suitability bin at the beginning of each of six decades.

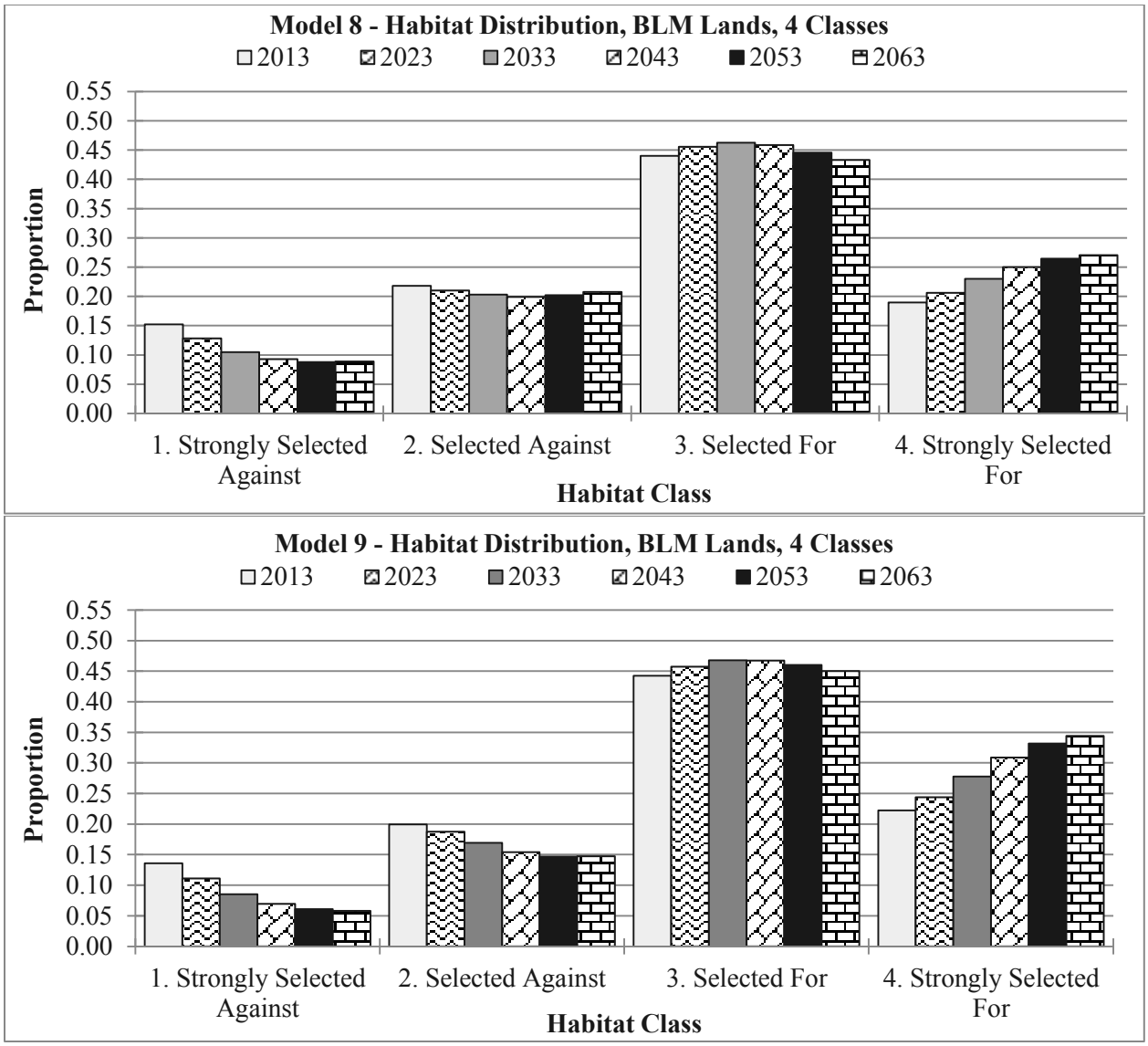

Figure S-6. No Timber Harvest: distribution of relative habitat suitability by decade for Model 8 and Model 9, on BLM-administered lands in the planning area. The histograms show the portion of BLM-administered lands in each strength-of-selection bin at the beginning of each of six decades.

The correlation between the USFWS 2006 GNN MaxEnt models and the Model 9 estimated relative habitat suitability for hexagons was 0.875, identical to that of Model 7. Nonetheless, the lack of the expected increase in the selected-for habitat class in **Figure S-6** indicated the need for further refinement. The BLM still questioned whether it could meet model assessment criteria 2 and 3, given that age was an influential variable in the models.

Model 10

Model 10 was identical to Model 8 except that, for those modeling regions and for those variables that showed declines with age, the BLM created regression equations to predict each of those variables as a function of age. The regression equations that best fit the data always were logarithmic (threshold) relationships and had the effect of smoothing the associations. The BLM did this because these variables

appeared in the original 2006 GNN MaxEnt models, but, for the 2013 Woodstock representation of BLM-administered lands, they sometimes showed counter-intuitive relationships—such as mean tree diameter and stand height declining as stands aged—only to sometimes increase at older ages. In part, these relationships probably were an artifact of limited data; relatively few BLM inventory plots exist in forest stands with very old trees. The BLM developed these regression equations within each of the three western Oregon modeling regions. The BLM also removed canopy cover of all conifers from the set of modeling covariates because the distribution relative to age, even when regressed, was highly inconsistent with GNN canopy cover distributions.

As shown in **Figure S-7**, when compared to Model 9, Model 10 generated a more-expected and logical trend in relative habitat suitability change over time. The correlation between the USFWS 2006 GNN MaxEnt models and the Model 10 estimated relative habitat suitability for hexagons again was 0.875. However, the BLM subsequently determined that Model 10 was not viable due to issues with the stand age variable.

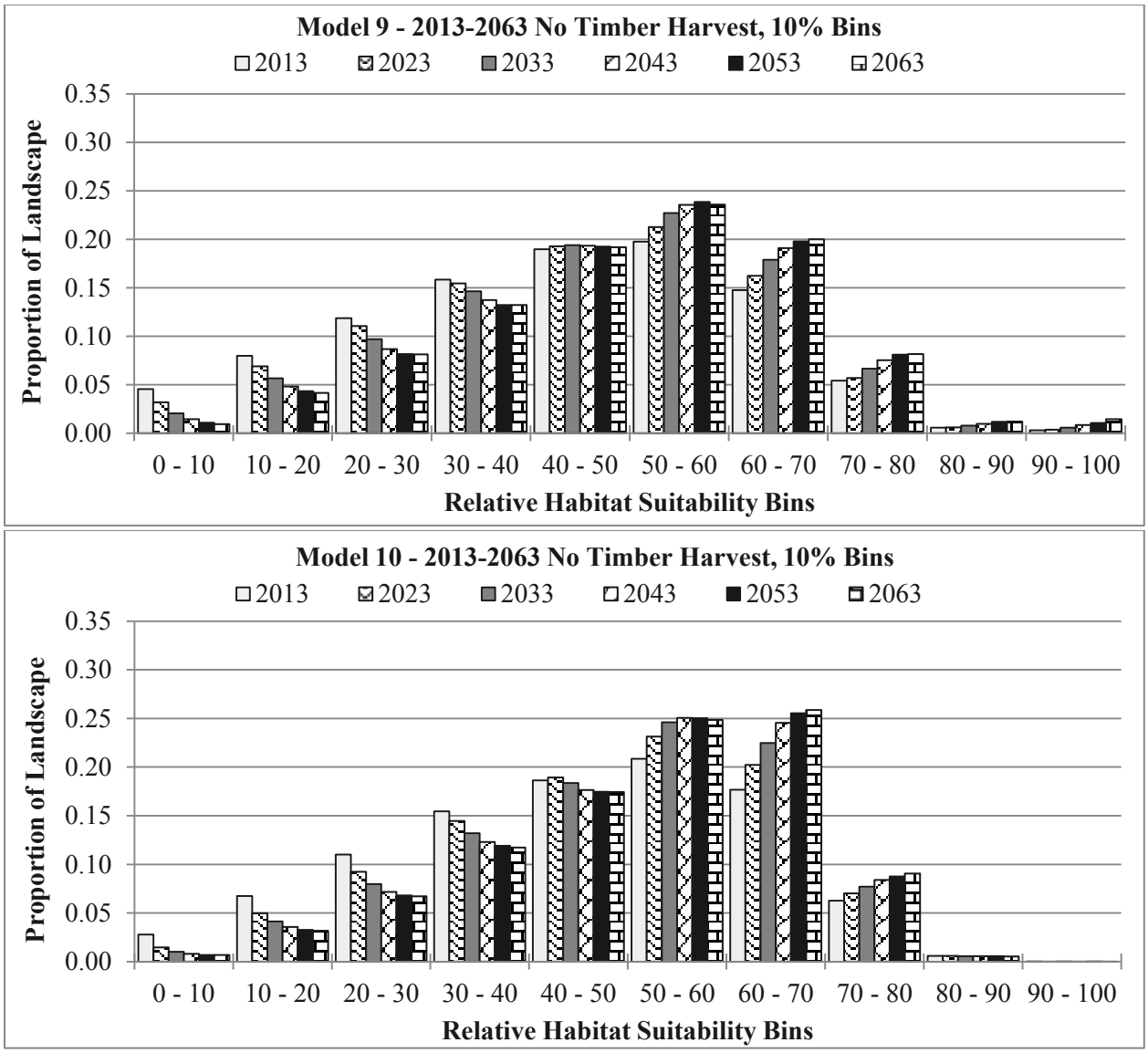

Figure S-7. No Timber Harvest: distributions of relative habitat suitability by decade for Model 9 and Model 10 on BLM-administered lands in the planning area. The histograms show the portion of BLM-administered lands in each relative habitat suitability bin at the beginning of each of six decades.

Woodstock, when it forecasts the treatment of a stand, does not threat stand age consistently. Instead, when Woodstock forecasts a treatment, it retains the original stand age or resets the stand age to 0 depending on the nature of the treatment (e.g., light thinning versus regeneration harvest). Thus, over time, forest stands of the same age value could have substantially different values for other variables. Since the BLM was creating relative habitat suitability surfaces for different decadal time steps, it could not rely on stand age as a variable. For this reason, Model 10 was not viable.

Model 11

Model 11 was identical to Model 8 (using non-regressed covariates) except that the BLM removed age as a variable for the reason described under Model 10. Instead, the BLM added the Woodstock "structural condition" variable because structural condition is a GNN-defined categorical variable that also can be

derived from Woodstock data. The GNN structural condition classes included: sparse, open, sapling/pole, small/medium tree, large tree, and large/giant tree.

The correlation between the USFWS 2006 GNN MaxEnt models and the Model 11 estimated relative habitat suitability for hexagons was 0.876, almost identical to that of Model 9. Nonetheless, as shown in **Figure S-8**, regarding model assessment criterion 2, the modified set of variables resulted in relative habitat suitability progressions that the BLM interpreted as less-logical than expected.

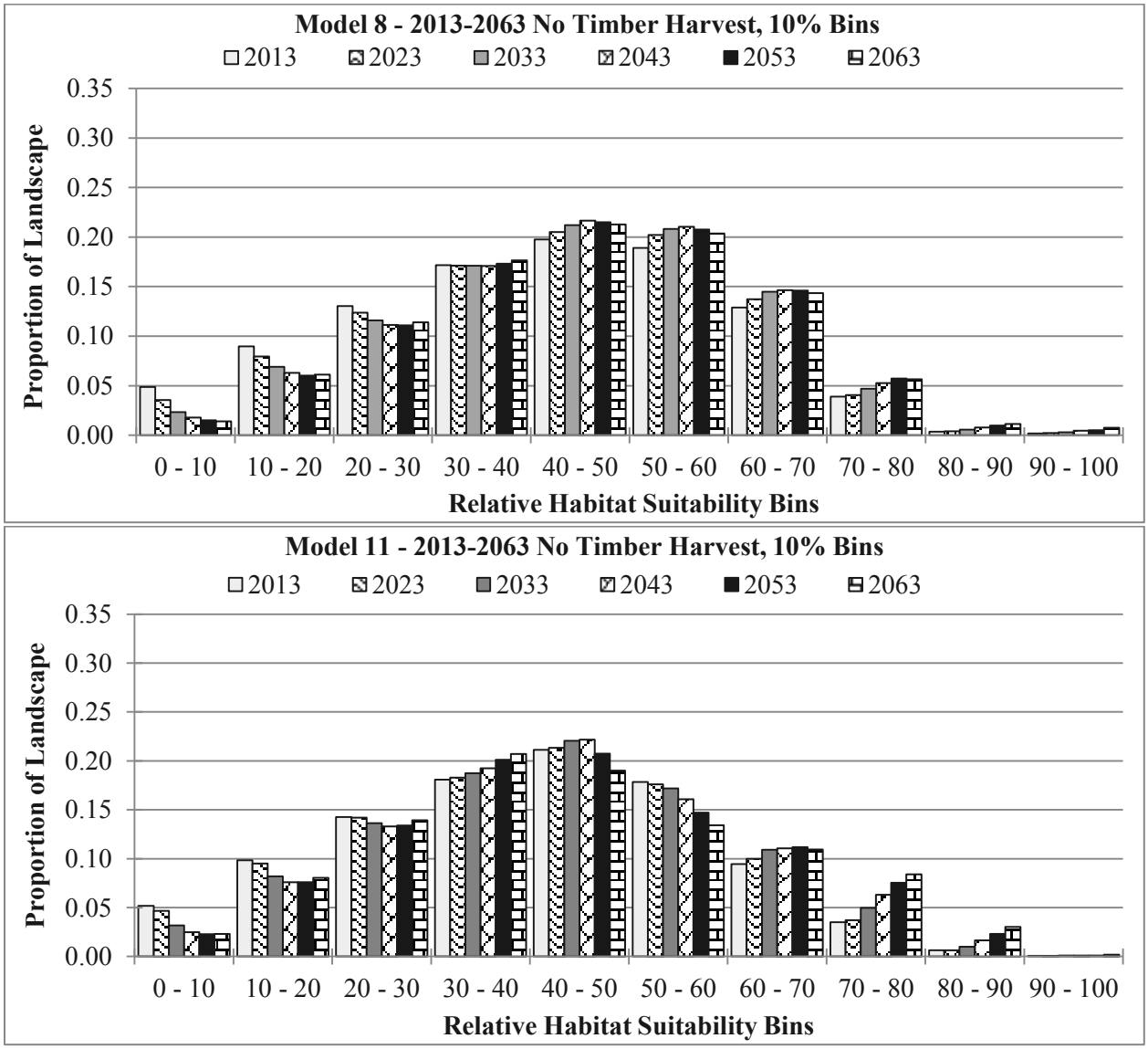

Figure S-8. No Timber Harvest: distributions of relative habitat suitability by decade for Model 8 and Model 11 on BLM-administered lands in the planning area. The histograms show the portion of BLM-administered lands in each relative habitat suitability bin at the beginning of each of six decades.

Model 12

Model 12 was a combination of the refinements implemented in models 9 and 11. The BLM used the same reduced set of variables used in Model 9, and removed age (because of the age-related issues described under Model 10) and added structural condition as it had in Model 11.

Figures S-9 and **S-10** compare the decadal relative habitat suitability progressions under Models 9 and 12. Although Model 9 had generated the best previous distribution, it also included stand age as a variable, which Woodstock did not treat in a consistent manner. Model 12 was the best set of revised variables the BLM was able to develop. The Model 12 relative habitat suitability progressions were very similar to those for Model 9 in terms of showing the expected progression of relative habitat suitability by decade, but also showed slightly lower relative habitat suitability values overall (as seen in the higher suitability bins).

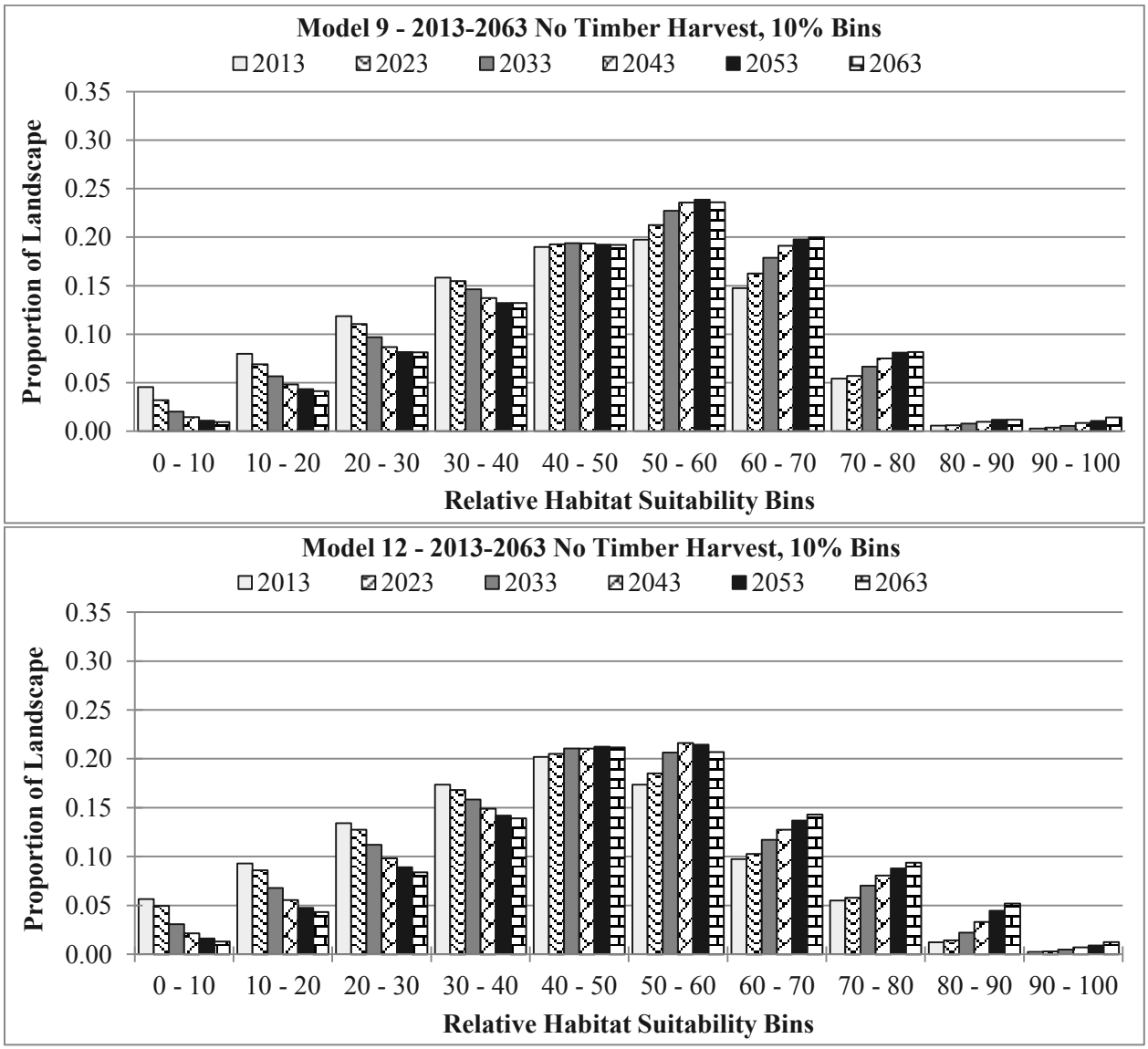

Figure S-9. No Timber Harvest: distributions of relative habitat suitability by decade for Model 9 and Model 12 on BLM-administered lands in the planning area. The histograms show the portion of BLM-administered lands in each relative habitat suitability bin at the beginning of each of six decades.

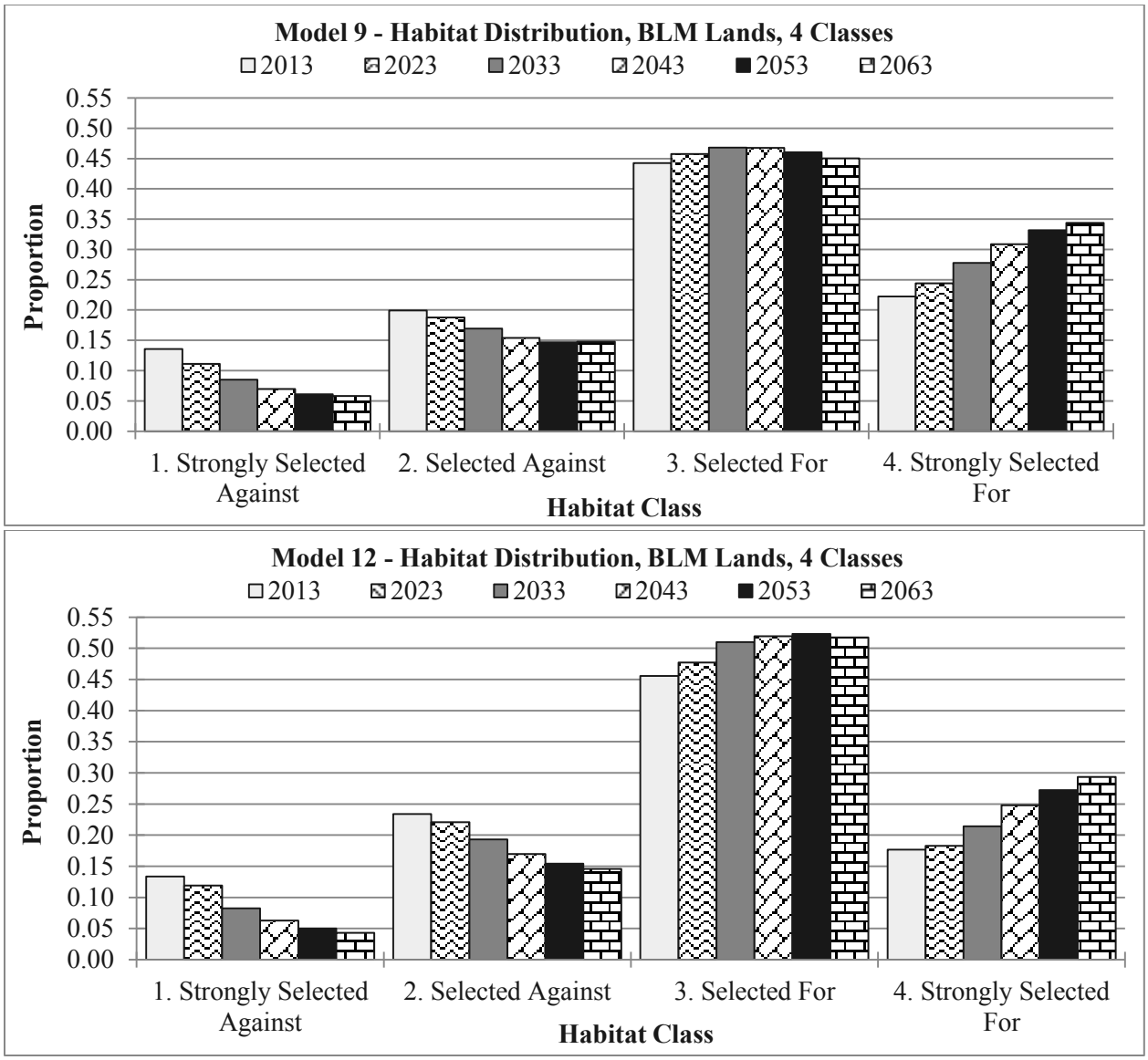

Figure S-10. No Timber Harvest: distribution of relative habitat suitability by decade for Model 9 and Model 12 on BLM-administered lands in the planning area. The histograms show the portion of BLM-administered lands in each strength-of-selection bin at the beginning of each of six decades.

The correlation between the USFWS 2006 GNN MaxEnt models and the Model 12 estimated relative habitat suitability for hexagons was 0.874. Based on this correlation coefficient and the progressions shown in **Figures S-9** and **S-10**, the BLM determined that Model 12 fulfilled its three model assessment criteria.

Model 13

Model 13 became the final BLM model. It was identical to Model 12 except that the BLM used floating point values, rather than integer values, to conform GNN covariate values to Woodstock output precision; i.e., to better reconcile the data going into the 2006 GNN and 2013 Woodstock models. Floating point values include decimals; integers are whole numbers.

The correlation between the USFWS 2006 GNN MaxEnt models and the Model 13 estimated relative habitat suitability for hexagons was 0.867. For the three western Oregon modeling regions, this set of models included eleven variables for each of the modeling regions. **Table S-1** shows the variables and their relative contributions. As described below, the BLM determined that Model 13 fulfilled its three model assessment criteria. The BLM's earlier attempts to fine-tune models so as to increase the correlation between its newly-developed models and those of the USDI FWS (2011) were reasonable but, by this point, the BLM recognized that hexagon correlations of 0.860 to 0.870 were as strong as it likely would get given inherent differences in the sources of the 2006 GNN and 2013 Woodstock variables[148].

Table S-1. Model 13 variables and percent contributions by modeling region. Missing values indicate that the BLM did not use the variable for the modeling region. The modeling regions are the Oregon and California Klamath (KLAMT), the Oregon and California Cascades (ORCAS), and Oregon Coast Range (ORCOA), described by Davis *et al*. (2011).

Covariate	Covariate Description	KLAMT	ORCAS	ORCOA
ccc	Canopy cover of all conifers		0.45	1.0213
curv	Topographic curvature	5.0242	3.122	2.3622
dbhc	Basal-area weighted mean diameter of all live conifers	1.0851	11.3159	0.2664
ddi	Diameter diversity index	5.5428	40.1345	12.9418
elev	Elevation	1.1043	4.1592	2.6962
evghwd	Evergreen hardwood composition type	2.4068	4.1657	7.8237
oak	Oak composition type	6.6165	0.8094	
pine	Pine composition type	2.0507	13.552	6.4613
rpi	Relative position index (% slope position in 200 ha window)	29.631	12.8439	9.5835
stndht	Stand height, computed as average of heights of all dominant and codominant trees	44.6563		
struccond	Structural condition (lumping of Johnson and O'Neil's (2001) SIZECL and COVCL	0.3544	4.4098	0.2031
subalp	Sub-alpine composition type	1.528	5.0377	1.6429
tphc	Density of all live conifers ≥ 75 cm DBH			54.9975

Before accepting Model 13, the BLM compared the Model 13 distribution of hexagons among relative habitat suitability bins with that of the USFWS (USDI FWS 2011) 2006 GNN MaxEnt model for: 1) BLM-administered lands in the planning area within the three western Oregon modeling regions and 2) all lands within those regions. To do this, the BLM "updated" the USFWS relative habitat suitability surfaces by projecting the Service's MaxEnt models, which the Service had trained on 1996 GNN data (see footnote on page 1), to newly-available 2012 GNN data (http://lemma.forestry.oregonstate.edu/data/structure-maps). (For brevity, these new models hereafter are referred to as the USFWS 2012 GNN MaxEnt models, even though the BLM created them.) The BLM did this to reduce the temporal differences between the 2006 GNN and the 2013 Woodstock datasets.

[148] GNN variables are derived from vegetation measurements from regional networks of field plots and Landsat imagery data to characterize forest vegetation across a region; see Ohmann and Gregory (2002). Woodstock variables are derived from BLM Forest Operations Inventory (forest stand exam) data and USFS/BLM Current Vegetation Survey (https://www.fbo.gov/index?s=opportunity&mode=form&id=bed33e38414e6986bc3dbada90bde22a&tab=core&_cview=1) data.

The BLM evaluated relative habitat suitability distributions among eight relative habitat suitability bins (the largest bin being greater than 70 because so little of the landscape existed above that value). Thus, for the three modeling regions and eight bins there were 24 modeling region by bin comparisons for the two sets of models. As shown in **Figure S-11**, the largest absolute value of difference was 5 percentage points and the smallest difference was 0 percentage points. Of the 24 comparisons, the most frequent difference was an absolute value of 1 percentage point (nine times), followed by 5 percentage points and 4 percentage points (four times each), 2 percentage points and 0 percentage points (three times each), and 3 percentage points (one time). Thus, the two sets of models predicted similar amounts of the landscape (all lands within each modeling region or only BLM-administered lands within each modeling region) within each of the relative habitat suitability bins.

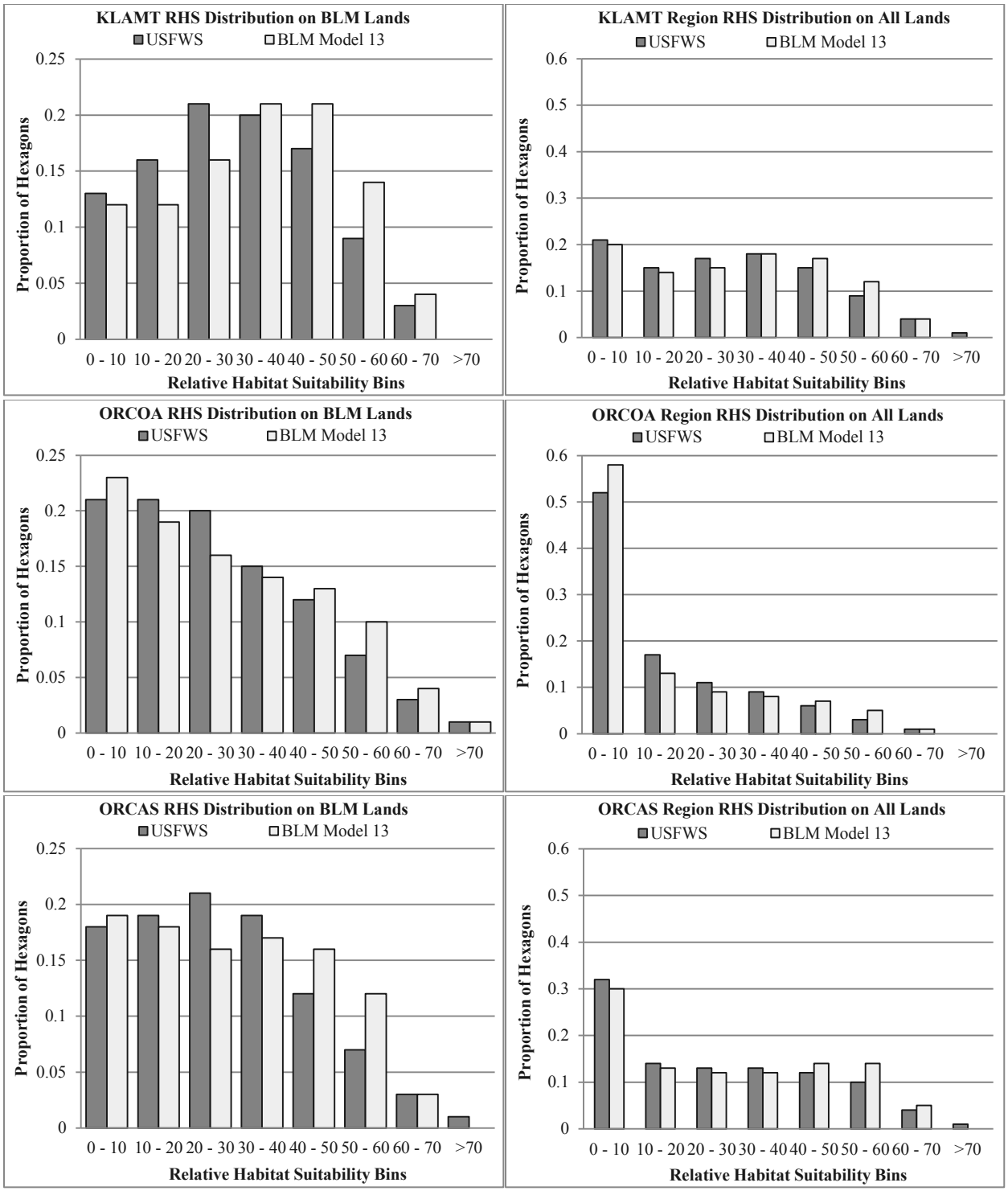

Figure S-11. Comparisons of the distribution of relative habitat suitability at the hexagon scale, on BLM-administered lands (left column), and all lands (right column), in the Oregon and California Klamaths, Oregon Coast Range and the Oregon and California Cascades modeling regions (described by Davis *et al*. 2011). The USFWS relative habitat suitability surfaces are based on the Service's 2012 GNN MaxEnt model. The BLM surfaces are based on the BLM 2013 Woodstock Model 13.

As shown in **Figure S-12**, the BLM also found, when mapped, a strong similarity in the spatial distribution of relative habitat suitability values between the two sets of models. Most differences were minor and represented a shade of green or red rather than one model predicting very high suitability for an area while the other model predicted very low suitability for that area.

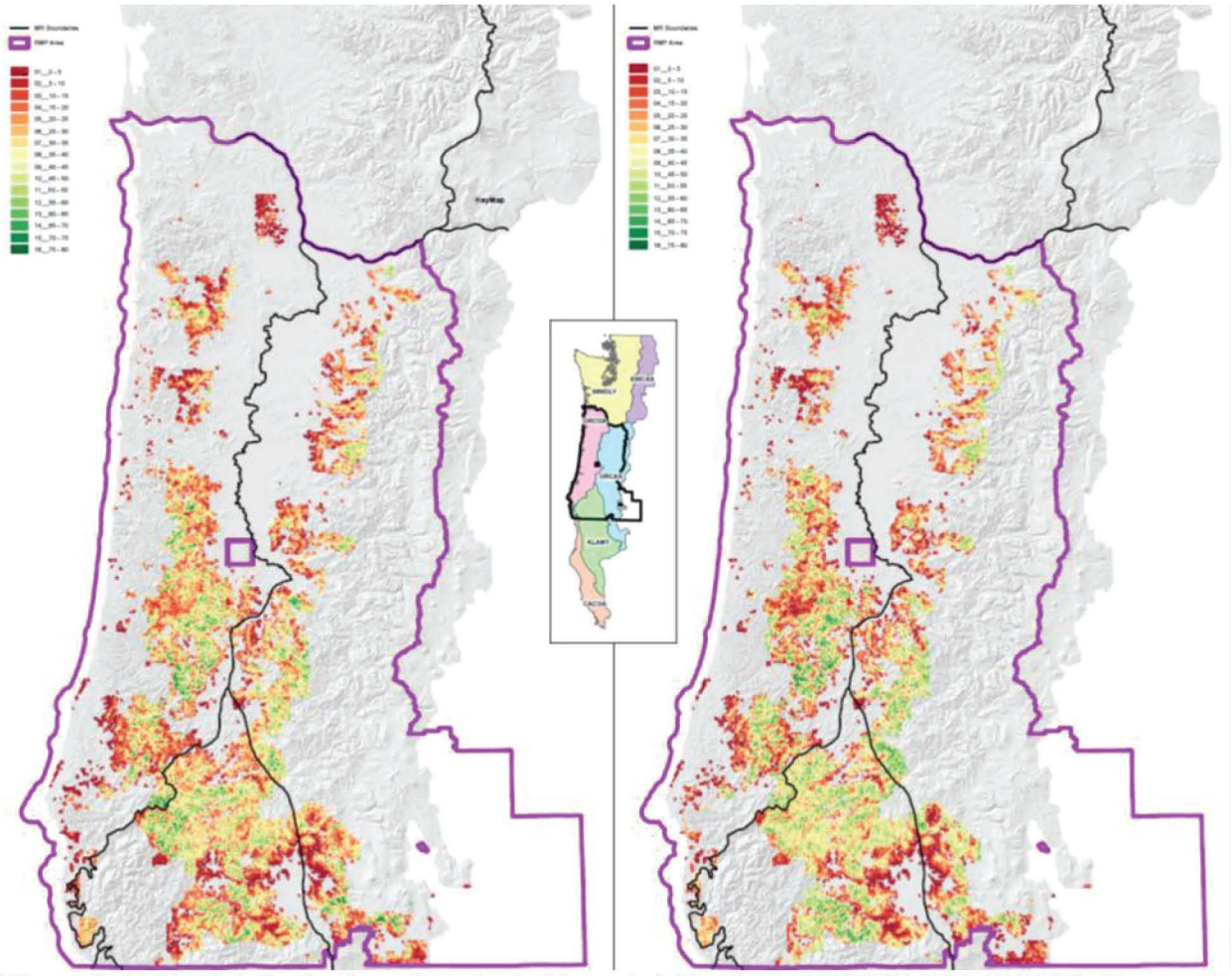

Figure S-12. Spatial distribution of relative habitat suitability for the USFWS 2012 GNN MaxEnt model (left) and the BLM 2013 Woodstock Model 13 (right). Greener areas represent higher relative habitat suitability whereas redder colors represent lower relative habitat suitability

Also, before accepting Model 13, the BLM examined the distribution of the northern spotted owl known sites used to train Model 13 (training sites) with those known sites withheld from model development (test sites) as described in the description of Model 3. There were 2,865 training sites in the northern spotted owl range of which 490 occurred on BLM-administered lands in the planning area, and 925 test sites in the range of which 164 occurred on BLM-administered lands.

Figure S-13 compares the range-wide distributions of training sites among relative habitat suitability bins for the USFWS 1996 GNN MaxEnt models and the BLM 1996 GNN Model 13[149]. The distributions are

[149] As explained in the footnote on page 1, the USFWS used 1996 GNN data to train its MaxEnt models. The BLM developed Model 13 using the same data for the comparison.

similar. **Figure S-14** makes the same comparison of the test sites. The distributions are not as similar as for the training sites, which are expected because the models were trained on the training sites. Nonetheless, the two distributions in **Figure S-14** follow similar trends.

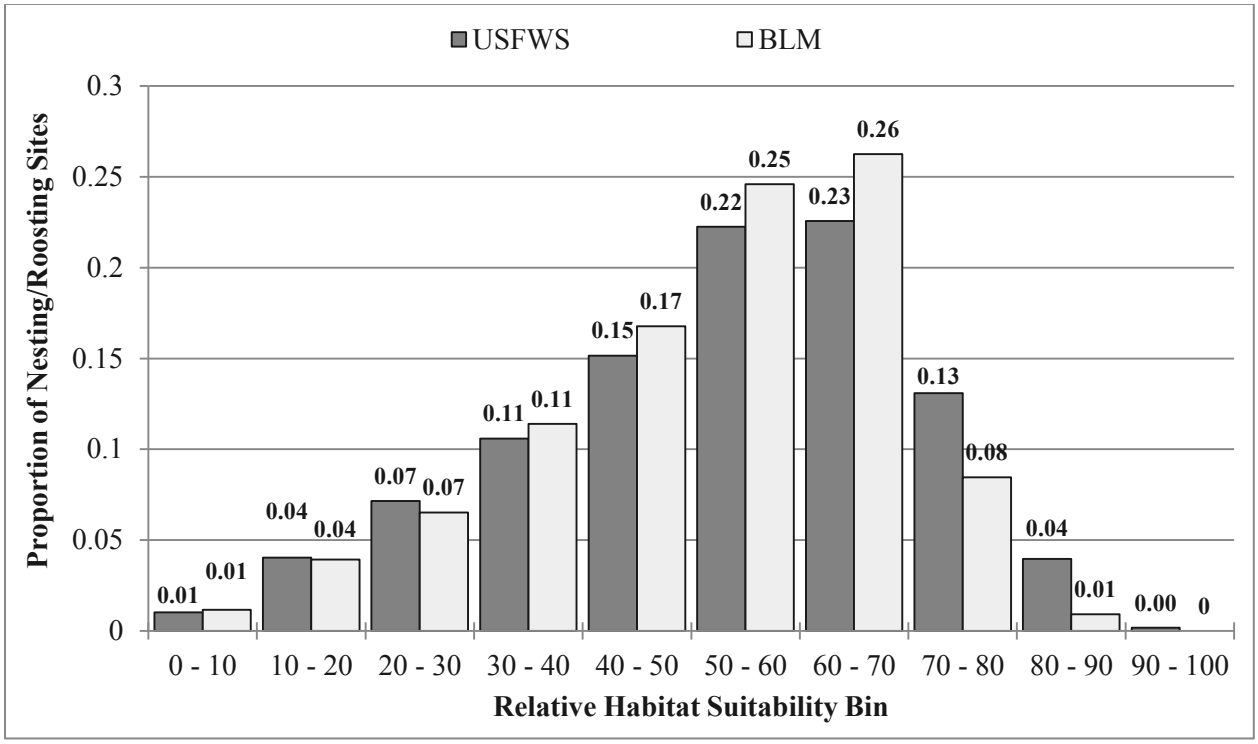

Figure S-13. Range-wide distribution of relative habitat suitability values among training northern spotted owl sites for the USFWS's 1996 GNN MaxEnt model and BLM's 1996 GNN Model 13.

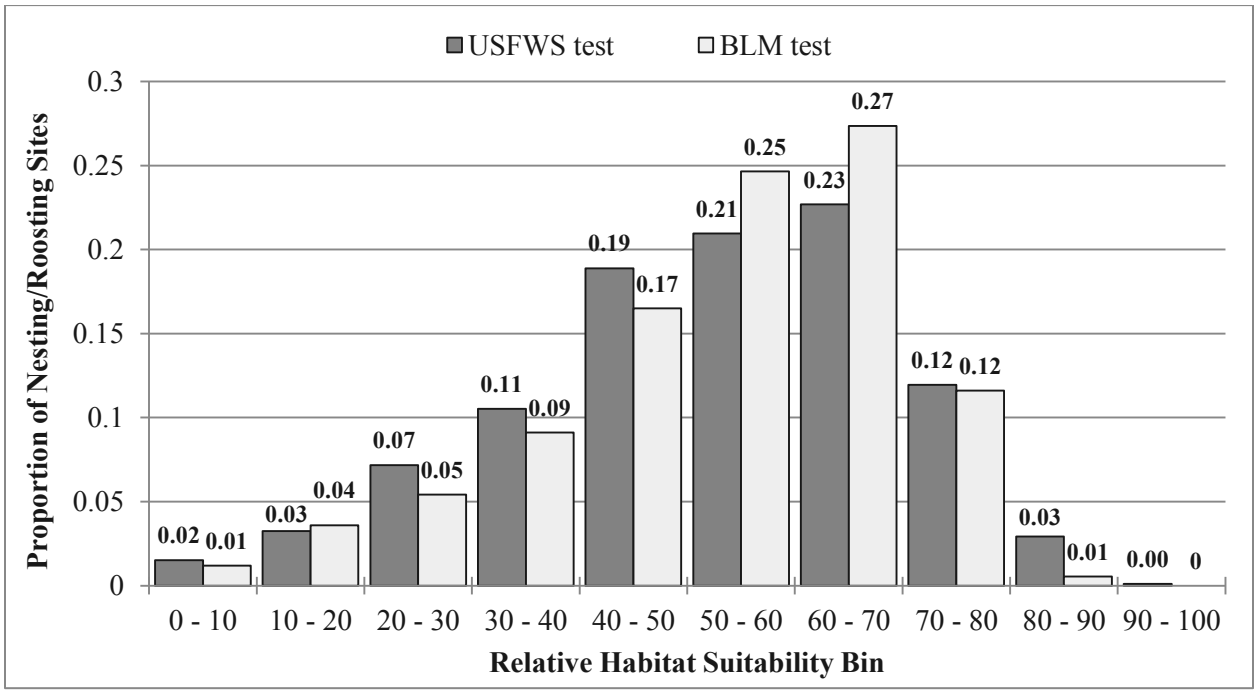

Figure S-14. Range-wide distribution of relative habitat suitability values among test northern spotted owl sites for the USFWS's 1996 GNN MaxEnt model and BLM's 1996 GNN Model 13.

The BLM made similar comparisons for BLM-administered lands in the planning area, this time using the USFWS 2012 GNN MaxEnt models and the BLM 2013 Woodstock Model 13. **Figure S-15** shows the distributions for training sites on BLM-administered lands in the planning area; Figure 16 shows the distributions for test sites on the same lands. As expected, the distributions are less similar than the range-wide distributions shown in **Figures S-13** and **S-14** because of the smaller numbers of sites associated with BLM-administered lands in the planning area and because of substantive differences in the origins of the 2012 GNN and 2013 Woodstock data. Because the Woodstock variables were derived from forest stand exam and Current Vegetation Survey plot data (i.e., on-the-ground examination and measurement), the BLM is confident of the accuracy of the Woodstock variables for BLM-administered lands in the planning area. Nonetheless, **Figures S-13** to **S-16** suggest that Model 13, as used by the BLM, inflates relative habitat suitability values. As explained below, this almost certainly is an artifact of truncating Model 13 to BLM-administered lands.

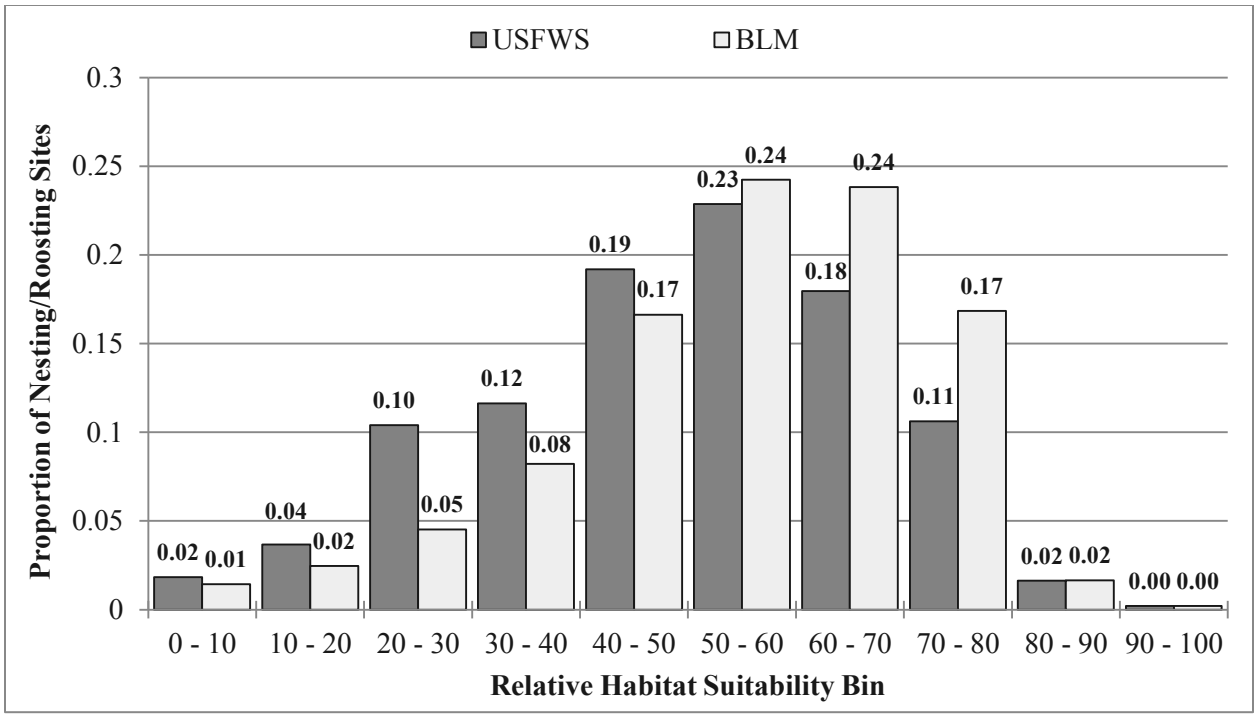

Figure S-15. Distribution of relative habitat suitability values among training northern spotted owl sites on BLM-administered lands in the planning area for the USFWS's 2012 GNN MaxEnt model and BLM's 2013 Woodstock Model 13.

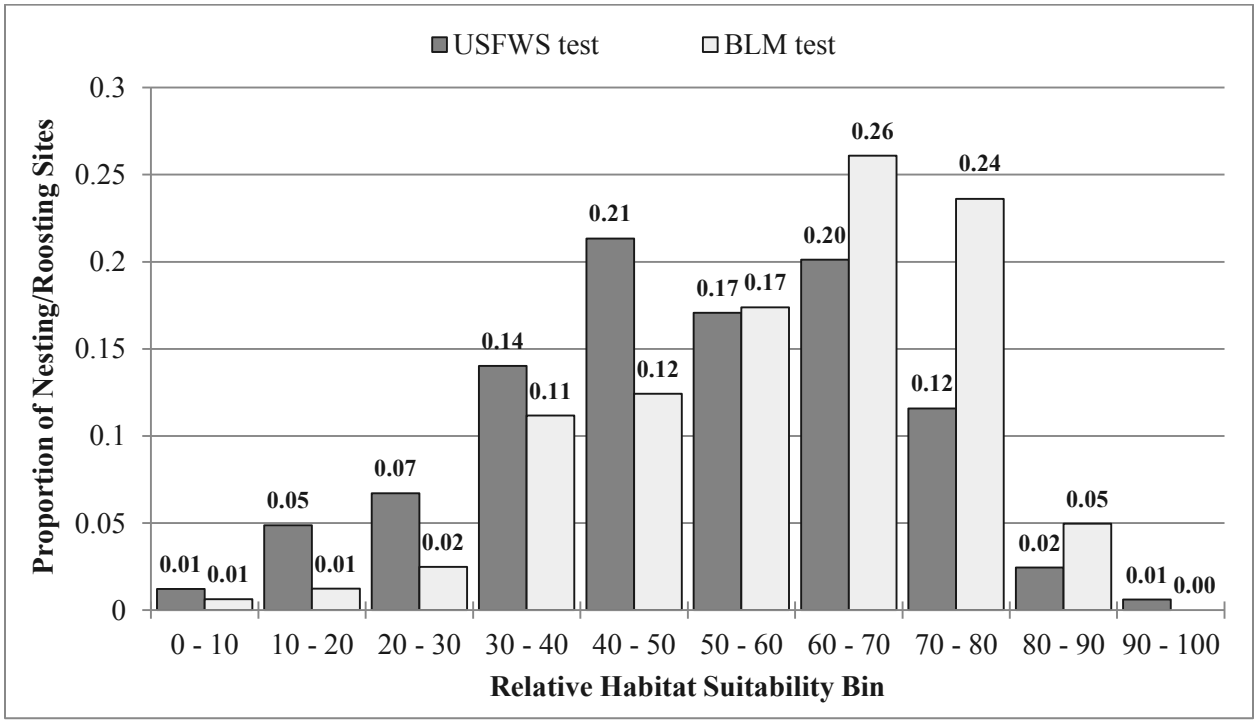

Figure S-16. Distribution of relative habitat suitability values among test northern spotted owl sites on BLM-administered lands in the planning area for the USFWS's 2012 GNN MaxEnt model and BLM's 2013 Woodstock Model 13.

As described above, MaxEnt calculates relative habitat suitability based on variable values within a 200-ha circle. GNN data, used in the USFWS MaxEnt models, were available for all lands within the northern spotted owl's range. However, the BLM developed Woodstock data only for BLM-administered lands in the planning area. The BLM uses Woodstock data because it is the most accurate data for BLM-administered lands. However, an artifact arises when the BLM applies Model 13 to BLM-administered lands that abut other lands (i.e., lands within 800 m of BLM-administered lands, the radius of a 200-ha circle). In this case, the BLM could use Model 13 to calculate relative habitat suitability values for 2013 based on 2013 Woodstock data for BLM-administered lands and 2012 GNN data for other lands. However, the BLM cannot do this for subsequent decades because there are no reliable data on how individual GNN values vary and co-vary over time. As described below, the BLM simulated changes in relative habitat suitability values on other lands by developing a 2012 relative habitat suitability surface for each modeling region, and then changing relative habitat suitability values according to the calculated effects of ingrowth, wildfire, and timber harvest on those values at decadal increments. But the BLM could not do the same for the underlying GNN variable values used to calculate relative habitat suitability. Stated another way, Woodstock generates new variable values for BLM-administered lands at decadal increments. But, after 2012, there are no comparable GNN values available for other lands abutting BLM-administered lands. Thus, after 2013, Model 13 must calculate relative habitat suitability values for BLM-administered land using only Woodstock data. Since forest conditions on BLM-administered lands commonly support northern spotted owls better than those on adjacent lands, which frequently are industrial timber lands, the BLM method appears to inflate relative habitat suitability values on its-administered lands.

This is not a weakness of Model 13. Instead, it is an artifact of data limitations for other lands within 800 m of BLM-administered lands in the planning area. Although the BLM is exploring options to evaluate and, if necessary, adjust its modeling to mitigate any inflation before preparing its Final EIS, preliminary evaluation by the BLM indicates that the current relative habitat suitability surfaces are valid for the Draft EIS because the inflation appears to be minor and consistent among all alternatives and No Timber Harvest reference analyses. Thus, inflation would not prejudice the analytical results, and it would be less of a factor in areas of BLM-administered land that are blocked up or adjacent to USFS reserves or Congressional Withdrawals, which are more important to BLM contributions to the conservation needs of the northern spotted owl.

Forecasting Change in Relative Habitat Suitability on Other Lands in Washington, Oregon and California

The BLM forecasted changes in relative habitat suitability from ingrowth, wildfire, and timber harvests for all lands within the U.S.-portion of the northern spotted owl range. Modifications in forest structure and composition at decadal increments on BLM-administered lands in the planning area were incorporated in the Woodstock models and reflected in the BLM's Model 13 relative habitat suitability surfaces. The BLM based its forecasted magnitudes of change on all other lands on differences between the USFWS's 1996 and 2006 GNN-based relative habitat suitability surfaces. That is, BLM assumed that the decadal change in relative habitat suitability from 1996 to 2006 would be realized during subsequent decades.

To estimate rates-of-change from forest ingrowth in decadal increments, the BLM calculated the mean difference between 1996 and 2006 for each integer relative habitat suitability value (i.e., the analysis determined the mean value in 2006 for all pixels with the same value in 1996). The BLM generated rates-of-change statistics separately for each physiographic province and, within each province, further stratified by congressionally withdrawn lands (e.g., wilderness areas), federal reserved lands (e.g., Late-successional Reserves), federal non-reserved lands (e.g., general forest management areas), and non-

federal lands. The BLM excluded pixels from the analysis within Monitoring Trends in Burn Severity (http://www.mtbs.gov/) fire perimeters and unpublished USFS LandTrendr harvest patches (see Davis *et al*. 2011) to minimize the influence of other agents of change on the ingrowth rates.

Initially, the BLM included only pixels showing positive or no change between 1996 and 2006 in the calculations. The BLM did this because negative change does not reflect forest ingrowth. The BLM used those derived rates-of-change to generate projected decadal relative habitat suitability surfaces for other lands, combined with the decadal Woodstock projections for BLM-administered lands. However, after examining the results, the BLM determined that the rate of ingrowth for forests in the drier portion of the northern spotted owl's range (i.e., most of California, and the eastern Cascades of Washington and Oregon) appeared to exceed observed rates. After additional consideration and testing, the BLM truncated all negative changes to 0 and all positive changes to 10 because negative changes in relative habitat suitability were not indicative of ingrowth and, knowing how habitat develops, rates higher than 10 were unrealistic. Although relatively few values exceeded 10, they were sufficiently high to affect mean rates-of-change. The final results were sets of range-wide ingrowth forecasts for strata within each physiographic province[150].

The BLM used results from Davis *et al*. (2014) to forecast changes in relative habitat suitability values following wildfires. The BLM applied changes only for moderate and high severity fires by habitat class because Davis *et al*. (2014) determined that low severity fires have a negligible effect on northern spotted owl habitat. These findings are supported by Manley's (2014) descriptions of the effects of fire on northern spotted owls. The BLM modeled the spatial locations, extents, and severity of future wildfires using the same predicted wildfire dataset included in the Woodstock models, which extends over the non-BLM portions of the northern spotted owl's range (see Appendix D).

Expanding on the methods described by Davis *et al*. (2011, pp. 28-30), the BLM used the unpublished USFS LandTrendr change detection data to develop range-wide forecasts of decadal rates of negative change in relative habitat suitability values following timber harvests. To create potential timber harvest patches on other lands, the BLM segmented the USFS 2006 GNN-based relative habitat suitability model using eCognition Developer 8 (Trimble Navigation Ltd., Westminster, CO). The BLM parameterized the software's segmentation routine to iteratively group neighboring pixels with similar relative habitat suitability values into discrete patches until the mean patch size ± 1 SD within each physiographic province and strata most closely approximated those observed in the LandTrendr dataset between 1996 and 2006 (**Tables S-2** and **S-3**). Segmenting the USFS 2006 GNN-based surface resulted in more realistic representations of harvest treatment patch shapes and dimensions than those created using the smoother, 200-ha-scale USFWS relative habitat suitability surfaces.

[150] The BLM is testing methods to refine its forecasts. Because the USFS LandTrendr analysis was based on a 200-ha scale relative habitat suitability surface—i.e., relative habitat suitability values are based on the means of variable values within 800 m of each pixel, the radius of a 200-ha circle—any negative change in burn and timber harvest areas would affect the relative habitat suitability values within 800 m, and not just within the treatment or burn area. The BLM tested masking areas within 800 m of burn and treatment areas, and recalculating relative habitat suitability change, and found that this eliminated much of the negative change the BLM had detected outside burn and harvest areas. However, the degree of change did not cause the BLM to replace its analyses for the Draft EIS. The BLM will test additional methods to refine its relative habitat suitability surfaces during its preparation of the Final EIS.

Table S-2. Metrics, calculated from data developed by Davis *et al*. (2011), used to forecast decadal (1996 – 2006) losses of northern spotted owl dispersal and nesting-roosting habitat from timber harvest on lands other than BLM-administered lands in the planning area.

Physiographic Province	Dispersal Habitat in 1996 (Acres)	Dispersal Habitat Harvested (Acres)	Dispersal Habitat Harvested (Percent)	Nesting-Roosting Habitat in 1996 (Acres)	Nesting-Roosting Habitat Harvested (Acres)	Nesting-Roosting Habitat Harvested (Percent)	Habitat Harvested that was Nesting-Roosting (Percent)	10-Year Mean Loss of Habitat to Harvest	Mean Harvest Patch Size (Acres)	Stand Harvest Patch Size (Acres)
Federal Non-Reserved Lands										
Washington										
Eastern Cascades	128,810	1,208	1%	207,310	1,819	1%	60%	1.0%	20	10
Olympic Peninsula	39,038	128	0%	37,275	47	0%	27%	0.2%	19	9
Western Cascades	143,116	404	0%	288,691	1,025	0%	72%	0.3%	19	8
Western Lowlands	11	-	0%	-	-	-	-	0.0%	-	-
Oregon										
Coast Range	34,732	265	1%	34,722	135	0%	34%	0.6%	21	11
Eastern Cascades	109,494	1,725	2%	145,704	1,756	1%	50%	1.4%	23	13
Klamath	111,577	628	1%	135,992	737	1%	54%	0.6%	18	7
Western Cascades	478,515	3,972	1%	844,548	6,669	1%	63%	0.9%	19	9
Willamette Valley	4	-	0%	-	-	-	-	0.0%	-	-
California										
Cascades	110,507	1,386	1%	63,151	1,858	3%	57%	2.1%	33	23
Coast Range	25,543	12	0%	11,191	-	0%	0%	0.0%	12	-
Klamath	576,849	2,482	0%	657,433	1,845	0%	43%	0.4%	17	7
Federal Reserved Lands										
Washington										
Eastern Cascades	139,270	606	0%	268,674	1,618	1%	73%	0.8%	17	8
Olympic Peninsula	89,086	73	0%	277,151	308	0%	81%	0.1%	16	5
Western Cascades	182,939	234	0%	486,969	443	0%	65%	0.1%	18	7
Oregon										
Coast Range	118,696	598	1%	266,301	1,103	0%	65%	0.5%	20	9
Eastern Cascades	73,898	397	1%	159,868	347	0%	47%	0.4%	19	8
Klamath	218,679	103	0%	210,418	232	0%	69%	0.1%	20	10
Western Cascades	264,104	328	0%	740,398	487	0%	60%	0.1%	18	7
California										
Cascades	67,741	267	0%	85,839	239	0%	47%	0.3%	22	15
Coast Range	30,071	31	0%	25,486	22	0%	42%	0.1%	13	3
Klamath	335,682	536	0%	579,128	526	0%	50%	0.1%	16	5
Non-Federal Lands										

Physiographic Province	Dispersal Habitat in 1996 (Acres)	Dispersal Habitat Harvested (Acres)	Dispersal Habitat Harvested (Percent)	Nesting-Roosting Habitat in 1996 (Acres)	Nesting-Roosting Habitat Harvested (Acres)	Nesting-Roosting Habitat Harvested (Percent)	Habitat Harvested that was Nesting-Roosting (Percent)	10-Year Mean Loss of Habitat to Harvest	Mean Harvest Patch Size (Acres)	Stand Harvest Patch Size (Acres)
Washington										
Eastern Cascades	319,729	18,536	6%	362,291	24,540	7%	57%	6.3%	30	20
Olympic Peninsula	275,885	33,068	12%	192,741	23,153	12%	41%	12.0%	41	27
Western Cascades	212,118	23,573	11%	120,707	11,207	9%	32%	10.2%	39	27
Western Lowlands	524,668	73,413	14%	149,848	19,729	13%	21%	13.6%	40	27
Oregon										
Coast Range	659,641	104,393	16%	483,985	106,584	22%	51%	18.9%	44	30
Eastern Cascades	132,149	15,728	12%	114,531	11,061	10%	41%	10.8%	37	25
Klamath	300,416	26,920	9%	244,411	23,492	10%	47%	9.3%	33	22
Western Cascades	411,318	63,999	16%	260,687	45,250	17%	41%	16.5%	46	33
Willamette Valley	50,477	3,220	6%	37,962	3,553	9%	52%	7.9%	22	12
California										
Cascades	184,094	9,049	5%	109,434	6,310	6%	41%	5.3%	20	9
Coast Range	1,189,363	41,598	3%	967,484	36,891	4%	47%	3.7%	20	9
Klamath	382,099	10,094	3%	353,724	10,157	3%	50%	2.8%	19	8
Non-Federal Land Totals by State†††										
Washington	1,332,399	148,590	11%	825,587	78,629	10%	35%	10.3%	38	26
Oregon	1,554,001	214,260	14%	1,141,576	189,940	17%	47%	15.2%	42	30
California	1,755,556	60,741	3%	1,430,642	53,358	4%	47%	3.6%	20	9

† Congressional reserved and BLM-administered lands in the planning area not included.
†† BLM-administered lands in the planning area not included.
††† Mean harvest patch sizes on non-federal lands by state are NOT averages of the above physiographic province averages.

Table S-3. Changes, calculated from data developed by Davis *et al*. (2011), in relative habitat suitability values from timber harvests occurring in northern spotted owl habitat between 1996 and 2006 by physiographic province and Northwest Forest Plan land-use allocation.

Physiographic Province	Federal Reserved Lands†			Federal Non-Reserved Lands††			Non-Federal Lands		
	Selected Against	Selected For	Strongly Selected For	Selected Against	Selected For	Strongly Selected For	Selected Against	Selected For	Strongly Selected For
Washington									
Eastern Cascades	-2	-2	-	-2	-4	-2	-3	-6	-10
Olympic Peninsula	4	3	-	5	-8	4	-7	-12	-13
Western Cascades	4	2	4	3	-1	-1	-9	-15	-19
Western Lowlands	-	-	-	-	-	-	-7	-12	-16
Oregon									
Coast Range	2	-2	-	-3	1	1	-5	-10	-13
Eastern Cascades	1	1	-4	-	-1	-2	-3	-7	-16
Klamath	-1	1	-10	-	-1	-	-3	-5	-4
Western Cascades	-	-2	-5	1	-	-1	-7	-9	-6
Willamette Valley	-	-	-	-	-	-	-6	-7	-27
California									
Cascades	4	-6	-4	-5	-13	-13	-3	-7	-13
Coast Range	-2	-3	-	-2	-	-	1	1	-1
Klamath	0	1	-1	-1	-	1	-1	-1	-3

† Congressionally reserved and BLM-administered lands in the planning area not included
†† BLM-administered lands in the planning area not included

Starting with the 2012 relative habitat suitability surface (i.e., the surface the BLM created using 2012 GNN data with the USFWS 1996 GNN MaxEnt models), the BLM forecasted changes on other lands from ingrowth, wildfire, and timber treatments before advancing in decadal increments for five decades (2013-2063). Modeling each decade in sequence was necessary because estimating change in future decadal intervals depended on adjusted values from the previous decade.

At the beginning of each decade, the BLM applied the rates-of-change in relative habitat suitability value from ingrowth and categorized the results into the four habitat suitability classes using the previously derived strength-of-selection class breaks: strongly-selected-against, selected-against, selected-for, and strongly-selected-for. Next, the BLM adjusted pixel values within the wildfire perimeters predicted to occur within the decade depending on the fire severity and corresponding relative habitat suitability class. The BLM categorized the resulting continuous surface into habitat classes a second time before adding the effects of timber harvests. Finally, the BLM calculated the median habitat class within each candidate harvest treatment patch (i.e., the results of the image segmentations described above), and randomly selected treatment patches in each province and strata until the area harvested approached, but did not exceed, the total decadal treatment area calculated from the LandTrendr data. The BLM then repeated the process for the next and subsequent decades.

The BLM applied four selection criteria when selecting timber harvest patches.

- All modeled harvest patches had to exceed 10 acres in size because the BLM anticipated smaller timber harvests would be commercially inviable.
- The BLM did not allow the selection of patches that were more than 500 m from a road because of anticipated limitations to commercial access.
- Patches classified as "strongly-selected-against" were not considered because such stands generally would be too young for commercial timber harvest.

- The BLM did not allow a patch to be selected for treatment twice during the 50-year forecast period. Once selected, the rates of change from harvest were applied to the relative habitat suitability values within each patch. After harvesting a patch, ingrowth within modeled harvests was allowed to progress, uninterrupted for the remainder of the planning horizon.

The BLM applied changes in relative habitat suitability to all lands before updating the pixel values on BLM-administered lands in the planning area with the results from Model 13 for the same decade.

The BLM created only one set of decadal relative habitat suitability surfaces for non-BLM lands across the northern spotted owl's range. The BLM used this single set of surfaces for all evaluations of the alternatives and the No Timber Harvest reference analyses (i.e., only the relative habitat surfaces for BLM-administered lands in the planning area changed by alternative). The BLM used this final set of relative habitat suitability surfaces, one for each decade between 2013 and 2063, for the HexSim population dynamics models.

Developing and Calibrating the BLM HexSim Model

As described above, the BLM determined that the HexSim model developed by the USFWS to inform its decisions on northern spotted owl recovery and critical habitat (USDI FWS 2011, Appendix C; and USDI FWS 2012), with specific changes, could help the BLM meet its planning needs. Therefore, the BLM took the Service's northern spotted owl HexSim model, fully parameterized, and modified it as necessary. The BLM made the following changes:

- As described above, the BLM developed different range-wide relative habitat suitability surfaces that reflected spatially-explicit estimates of how forest stands would respond over time to forest ingrowth, timber harvest and wildfire on all lands, and also to forest restoration treatments on BLM-administered lands in the planning area.
- Although the BLM altered relative habitat suitability values by decade on all lands, as described above, the BLM did not otherwise augment or suppress those values. In effect, unlike some USFWS simulations that limited northern spotted owl nesting to potential critical habitat units, the BLM always allowed simulated northern spotted owls to move, forage and establish nest territories on all lands according to local relative habitat suitability values.
- Because the BLM required both stochastic and non-stochastic simulations of northern spotted owl response for the reasons described in Chapter 3 (Northern Spotted Owl, Issue 4), the BLM completed 500 replicate simulations of each alternative. In contrast, after its Phase 1 modeling, the USFWS used only stochastic simulations, with 100 replicates per alternative (USDI FWS 2012, p. 29).
- Although the BLM calibrated the BLM model using the same method used by the USFWS (USDI FWS 2011, pp. C-71 – C-74), the BLM calibration, described below, yielded unique numbers and locations of female northern spotted owls to begin each of the replicate simulations.
- The BLM used observed barred owl encounter rates (Forsman *et al*. 2011, Appendix B; and USDI FWS 2011, p. C-66 and Table C-25) for reasons described in Chapter 3 (Northern Spotted Owl Issue 4).
- Also for reasons described in Chapter 3 (Northern Spotted Owl Issue 4), the BLM simulated 50 years (2013-2063) with relative habitat suitability values changing every 10 years according to the BLM forecasts, and then held habitat values constant for an additional 50 years.

The northern spotted owl HexSim model developed by the USFWS (see USDI FWS 2011 and Schumaker *et al*. 2014) is an individual-based, spatially-explicit, population simulation model. The Service parameterized the model based on empirically-derived estimates of age-specific survival, fecundity, territory and home-range size, and dispersal (USDI FWS 2011 and Schumaker *et al*. 2014). The Service

used its relative habitat suitability surface in HexSim to represent resource quality (higher values were of greater quality than lower values). Each of the eleven modeling regions (USDI FWS 2011, p. C-13) had different resource targets for northern spotted owls, and resource targets varied in relation to home range size (larger targets in areas with larger home ranges). For home range size variation, many empirical studies existed and the Service used them to guide its decisions in the development of HexSim (USDI FWS 2011, Appendix C and Schumaker *et al*. 2014). However, other than variation in home range size, no empirical information existed to guide specific decisions on resource targets. Because resource targets—as represented by relative habitat suitability—are not real, on-the-ground, quantities, they can have no empirical basis; they only can be associated with on-the-ground resources. Thus, the authors of the Service's northern spotted owl HexSim models varied resource targets until resulting simulated population sizes were similar to empirically-estimated populations of northern spotted owls (USDI FWS 2011, Appendix C and Schumaker *et al*. 2014). This model calibration happened by "tuning" (i.e., varying) resource targets by modeling region. The Service (USDI FWS 2011, Appendix C) also calibrated its HexSim model for dispersal such that simulated northern spotted owls that dispersed did so in a way that resulted in similar dispersal distance profiles to those estimated from empirical studies. For this portion of the calibration, the Service tuned the model by varying the attraction/repulsion of various habitats (relative habitat suitability values) as well as the maximum number of 86.6-ha hexagons a dispersing owl could move through while attempting to find a territory (see USDI FWS 2011 and Schumaker *et al*. 2014).

The BLM initially intended to use the 2012 GNN version of Model 13 for other lands within the northern spotted owl's range. However, as the BLM evaluated how Model 13 would be use for HexSim population dynamics modeling, it evaluated a range of factors that, instead, suggested using the USFWS MaxEnt model projected to newly-available 2012 GNN variables for other lands:

- The USFWS HexSim model had been developed to work with and calibrated to the USFWS 2006 GNN MaxEnt relative habitat suitability model, and had been demonstrated to be well-calibrated to those data (USDI FWS 2011, Appendix C).
- The BLM's 2006 GNN version of Model 13 demonstrated a high degree of correlation to the Service's 2006 GNN model (correlation coefficient of 0.867).
- BLM-administered lands in the planning area account for about 4 percent of lands in the northern spotted owl's range. As such, relative habitat suitability values on BLM-administered lands would likely have a proportionally small effect on overall population response.
- The USFWS initially calibrated its HexSim model by adjusting model parameters (i.e., resource targets) separately for each of its eleven modeling regions. BLM-administered lands in the planning area are constrained to four of those regions. This meant that, by using the Service's 2006 GNN MaxEnt relative habitat suitability surface, five of the eleven modeling regions would require no recalibration at all. And, because of the high degree of correlation between the Service's model and Model 13, the other modeling regions probably would require only minor recalibration.

Given these conditions, BLM determined that using the USFWS's 2012 GNN model for other lands was reasonable and would require less calibration and re-development of HexSim than would be required using the BLM 2012 GNN Model 13 relative habitat suitability surfaces for those lands.

The USFS released its 2012 GNN data at about the same time the BLM reached this phase in the project; up to this point, the latest release of these data was for 2006. To create the new 2012 version of the USFWS MaxEnt model, the BLM generated a full set of model variable surfaces from the 2012 GNN data, using the same GNN attributes and methods used by USFWS to generate the original 1996 and 2006 covariate rasters (USDI FWS 2011, Appendix C). The BLM then projected the original USFWS 1996

MaxEnt model to the 2012 covariate rasters separately for each of the eleven USFWS modeling regions, and merged them into a single, seamless range-wide relative habitat suitability surface.

To derive the relative habitat suitability surface needed to calibrate HexSim, the BLM then replaced the pixels in the USFWS 2012 GNN model for BLM-administered lands in the planning area with data from the final BLM 2013 Woodstock Model 13 raster.

Because the BLM created new MaxEnt surfaces for its-administered lands in the planning area, before running population simulations it sought to evaluate whether the "default settings" of HexSim, as used by USFWS, would work well for the BLM, or whether further calibration (fine tuning) were needed. In their calibration/tuning of the spotted owl HexSim model, the Service (USDI FWS 2011, Appendix C) found that time-step 50 represented a reasonable approximation of the present (at the time the Service did its work). The only differences between the data feeding into the northern spotted owl HexSim models between the Service and this effort by the BLM are that:

- The USFWS and the BLM used different MaxEnt relative habitat suitability surfaces for BLM-administered lands in the planning area, and;
- For BLM-administered lands in the planning area the relative habitat suitability surface was estimated for 2013, and for other lands the BLM projected the USFWS 1996 GNN MaxEnt models using GNN data from 2012 (as opposed to 2006, as used by the Service).

Thus, this new "base" relative habitat suitability surfaces used by the BLM used the identical MaxEnt models for all lands except BLM-administered lands in the planning area and, for those lands, the BLM developed a new MaxEnt model (Model 13). Since the correlation between the relative habitat suitability surfaces developed by the USFWS and Model 13 was so high, the BLM anticipated that its HexSim model would require minor, or no, recalibration.

The BLM began recalibration by using the USFWS default HexSim settings, and evaluated population estimates for the same eight demographic study areas for which the Service had data (USDI FWS 2011, pp. C-71 – C-75). The BLM ran 20 replicates of HexSim (without environmental stochasticity; see Northern Spotted Owl Chapter 3) for 70 time-steps. Replicates refer to the number of distinct simulations that are run. Because HexSim is not a deterministic model, several replicates are needed to get an estimate of mean responses (different replicates will almost always vary in their specific population responses). The BLM chose 70 time-steps because it initially wanted to evaluate whether, using default settings, simulated demographic study area population sizes were more/less similar to empirically-estimated populations before, during, or after time-step 50, the time-step that USFWS (USDI FWS 2011, pp. C-71 – C-75) found to be a good approximation of "now." The BLM used the mean population among the 20 replicates to estimate simulated population size. For the eight demographic study areas, the BLM used the mean of the three years with the largest population to estimate population size (see USDI FWS 2011, pp. C-71 – C-75).

Using default parameters in the northern spotted owl HexSim model, the BLM found that mean population size of territorial owls on the eight demographic study areas at time-step 59 corresponded most closely with the empirical population estimates. For the demographic study areas, empirical estimates of populations ranged from 30 to 130, with the total population on the eight study areas being 756. At time-step 59, mean simulated estimates of populations ranged from 32 to 145, with a total population of 763. The pairwise percent differences between empirical and simulated populations on each of the study areas varied from 0.54 percent to 41.75 percent, with a mean percentage difference of 4.7 percent. Time-step 55 had the smallest mean percent difference (-2.3 percent) but the estimate of total population size on the eight study areas was 6 percent higher than the empirical estimates. In contrast, the time-step 59 estimated

total population size on the eight study areas was 0.95 percent larger than the empirical estimate. **Figure S-17** compares empirical and time-step 59 population estimates in each of the study areas.

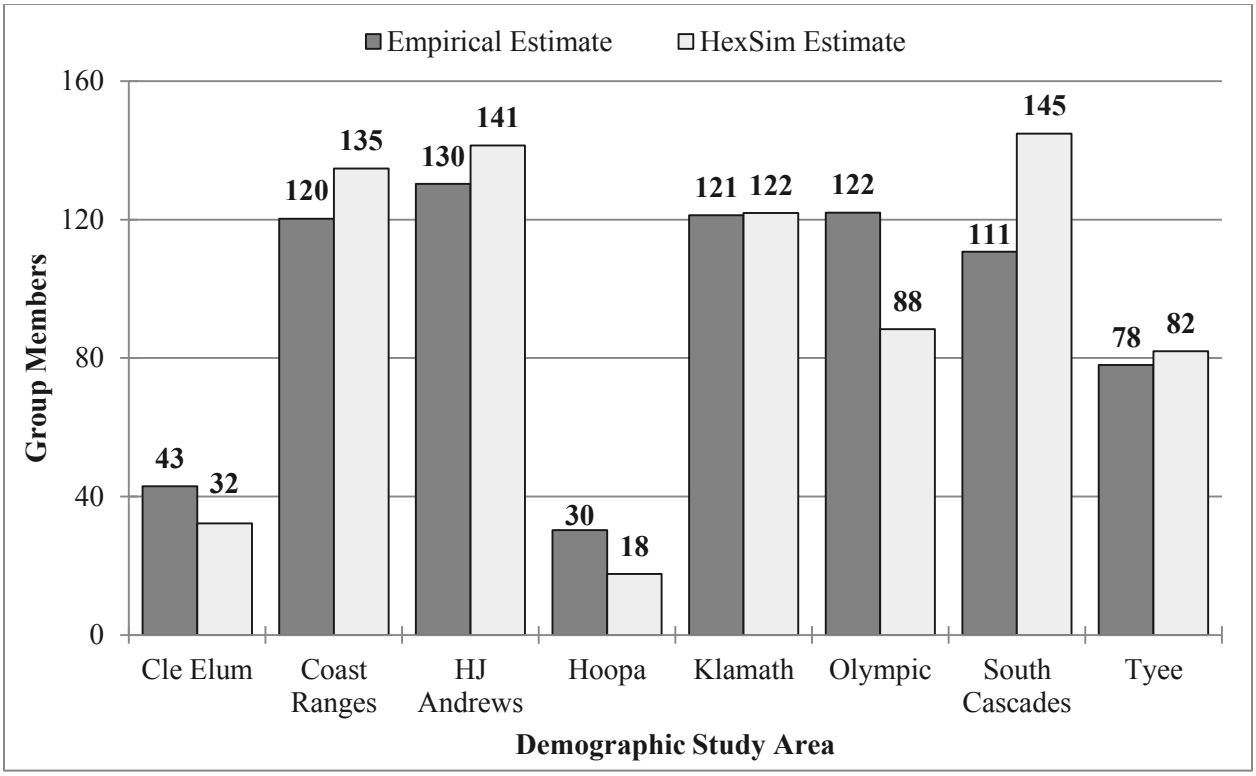

Figure S-17. Comparison of the mean of estimates of territorial northern spotted owls on eight demographic study areas estimated in the field (empirical estimates, n = mean of three highest years between 1996 and 2006) and estimated using the BLM northern spotted owl HexSim model (mean from 20 replicates of HexSim at time-step 59).

Because the default parameters worked well, the BLM did not further attempt to fine-tune any parameter settings and used the default settings. The only difference between the USFWS's (2011) and BLM's current use of the spotted owl HexSim model is that the e Service used time-step 50 to represent the current year and the BLM used time-step 59.

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---. 2012. Modeling and analysis procedures used to identify and evaluate potential critical habitat networks for the northern spotted owl, submitted to the Federal Register November 21, 2012. Unpublished manuscript http://www.fws.gov/oregonfwo/species/data/northernspottedowl/Documents/MODEL_SUPP_Dunk2012AppC.pdf. U.S Fish and Wildlife Service, Region 1, Portland, OR. 48 pp.

Section S-B

Simulated Northern Spotted Owl Dispersal Flux During 2053-2063 Under Each Alternative and According to the No Timber Harvest Reference Analyses

Shown are simulated northern spotted owl dispersal flux during 2053 – 2063, based on 100 replicate, non-stochastic simulations, under each alternative and according to the No Timber Harvest. When compared to dispersal flux under current habitat conditions (Northern Spotted Owl **Figure 3-191**), each image shows a decrease due to the decline in the northern spotted owl population. All of the alternatives yield results that are comparable to those for the No Timber Harvest, indicating that none of the alternatives would appreciably limit northern spotted owl movement and survival in any part of western Oregon. However, there are subtle differences among the alternatives, many of which appear to conflict with the projections of the dispersal-capable landscape in 50 years, shown in Northern Spotted Owl **Figure S-18**.

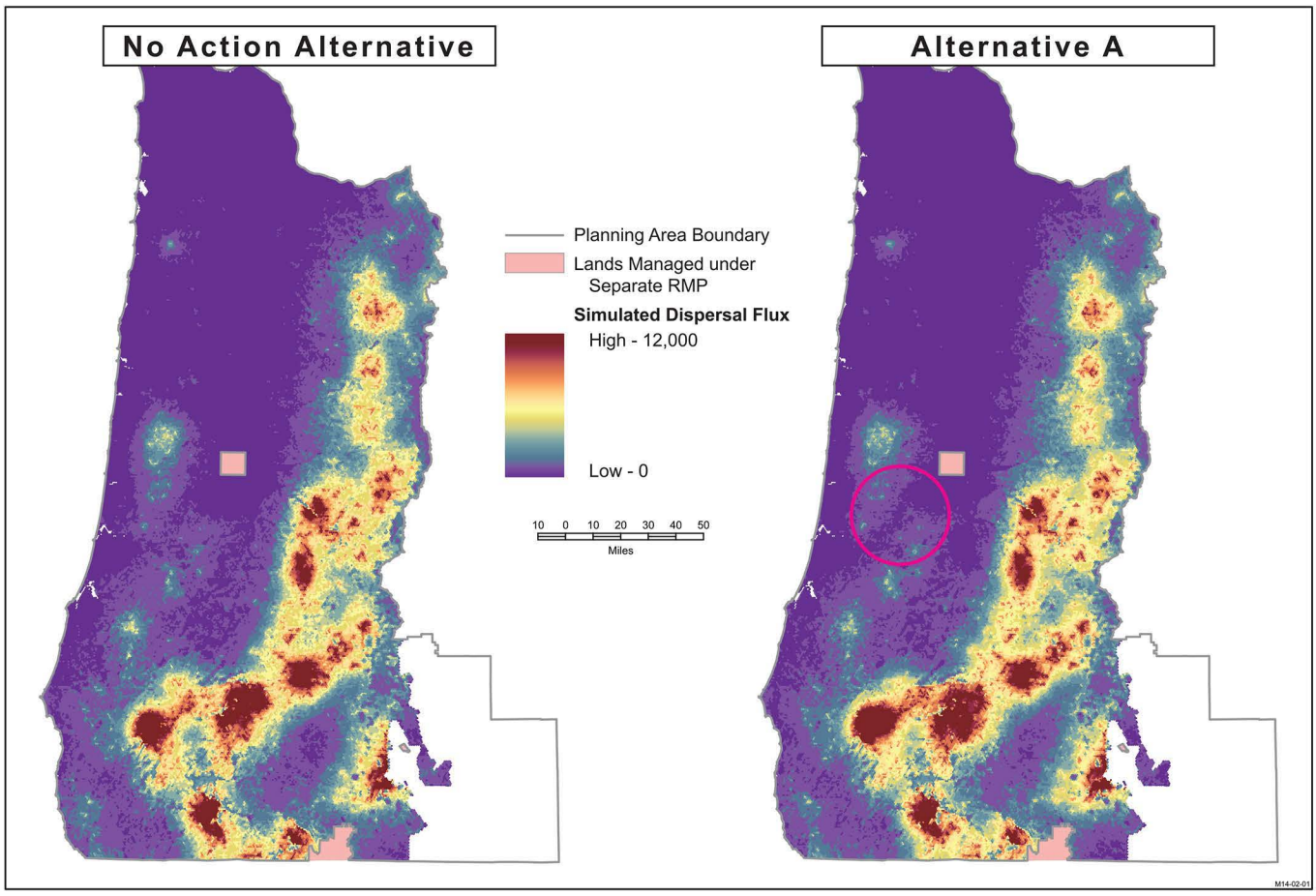
The circled areas in northern spotted owl **Figure S-18** suggest that, among the alternatives, the No Action alternative, Sub-alternative B and Alternative D best would support northern spotted owl east-west movement between the Coast Range and the western Cascades through the area south of the Willamette Valley. However, these simulations of dispersal flux indicate that the other alternatives support northern spotted owl movement and survival through this area better than the No Action Alternative, Sub-alternative B and Alternative D, and support movement and survival at levels comparable to that of the No Timber Harvest. Other curious results:

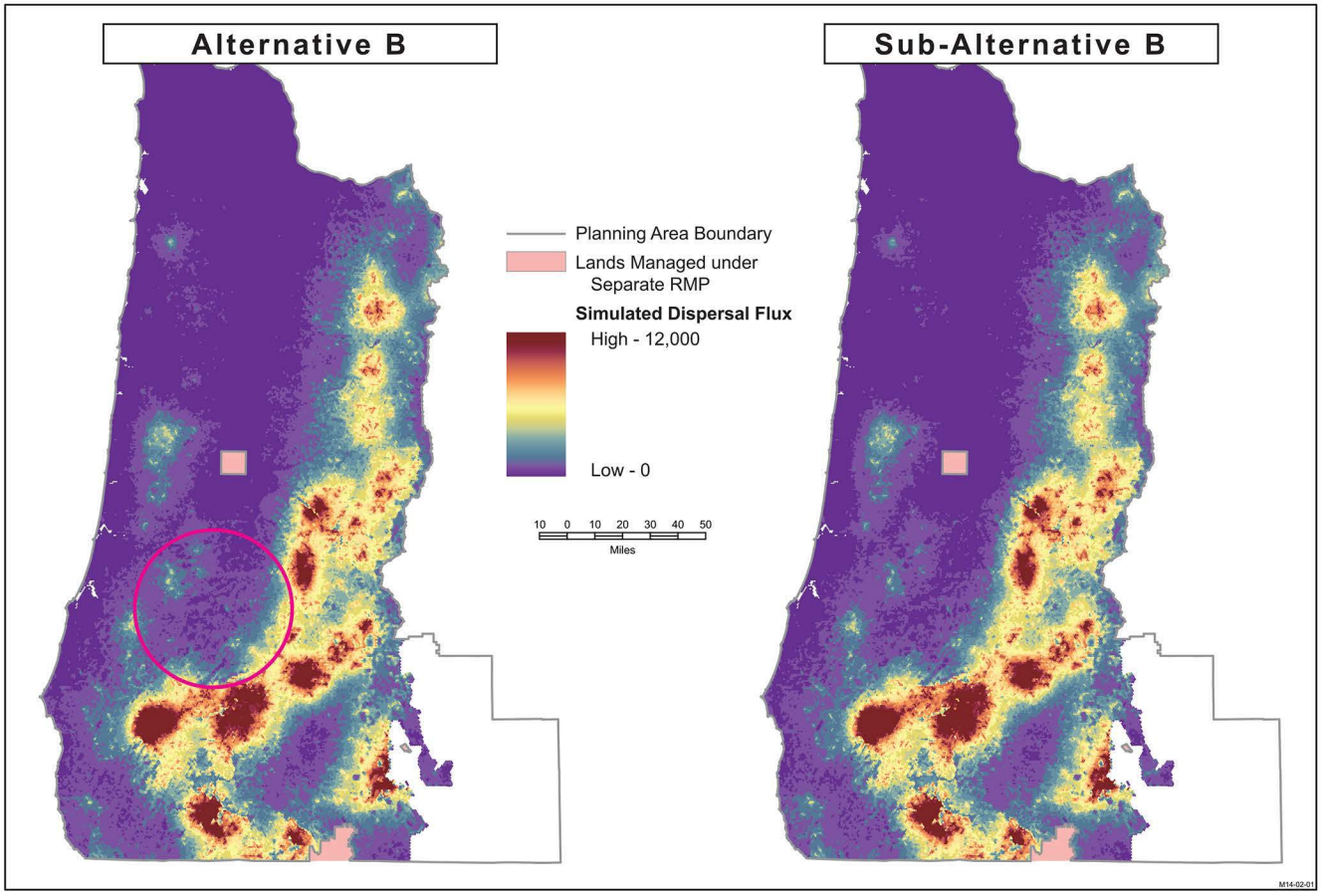
- Under Alternative A (yellow circle), which has the largest network of Late-Successional Reserves, simulated dispersal flux in the southern Coast Range is more limited than under the other alternatives.
- The only difference between Alternative B and Sub-alternative B is that Sub-alterative B reserves more forest stands associated with northern spotted owl known sites. Yet, simulated dispersal flux

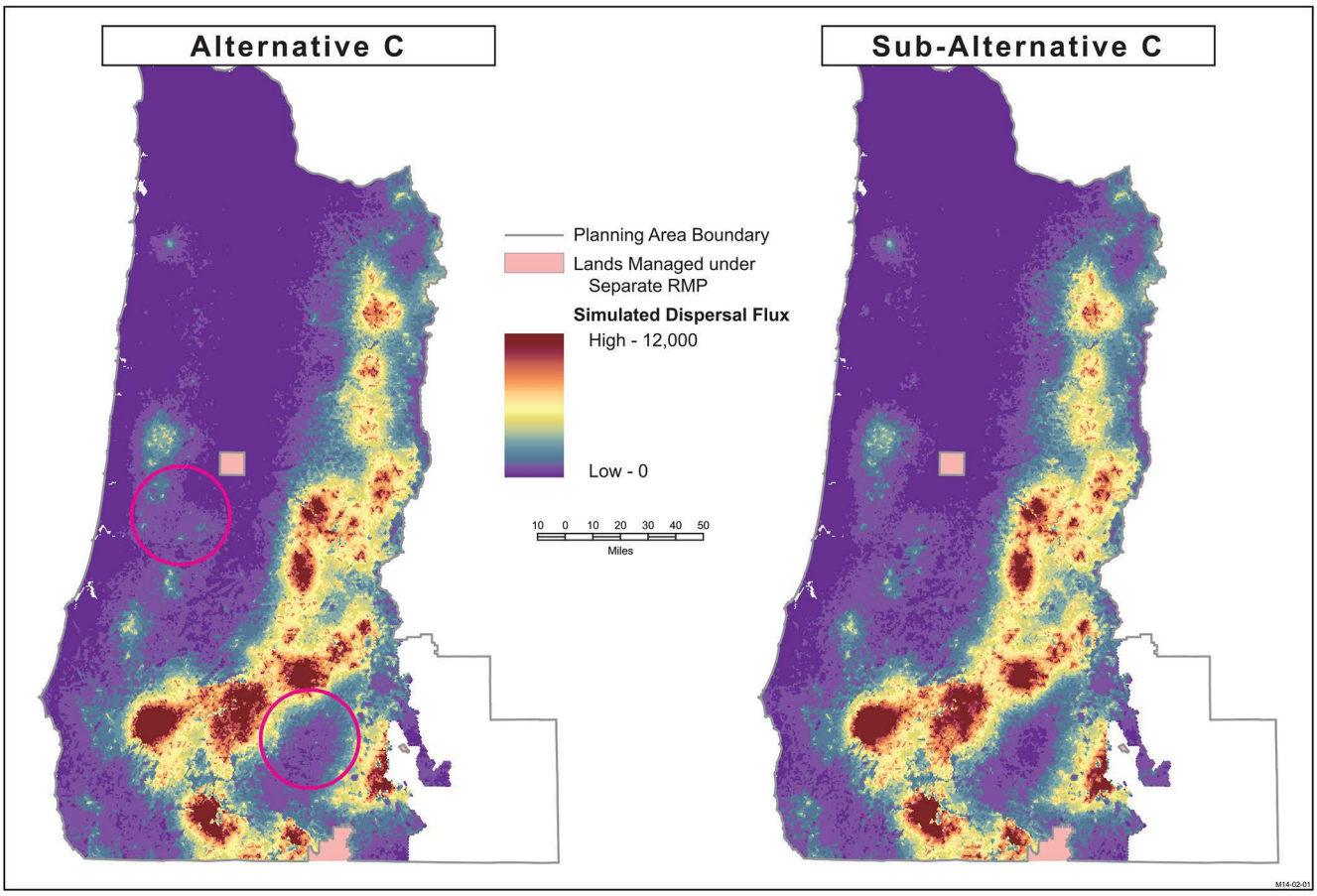
through the area south of the Willamette Valley is slightly higher under Alternative B (green circle) than under Sub-alternative B.

- The only difference between Alternative C and Sub-alternative C is that all forest stands 80 years old and older are reserved under Sub-alternative C. But, simulated dispersal flux is slightly higher under Alternative C in the southern Coast Range and a portion of the Rogue River Valley (Alternative C, red circles).

These differences, although subtle, reflect simulations of how northern spotted owls would move through habitat under each alternative. Whereas the dispersal-capable landscape, shown in northern spotted owl **Figure S-18**, reflects a forecast of habitat condition under each alternative, independent of northern spotted owl use or occupancy, dispersal flux, shown here, reflects habitat condition and how northern spotted owl might occupancy such habitat. Thus, dispersal flux is more dynamic than dispersal-capability, and less able to define slight differences between alternatives, suggesting that these differences might not be real. That said, dispersal flux is valuable for evaluating the ability of a landscape to support northern spotted owl movement and survival. Taken collectively, the analyses of dispersal flux and the dispersal-capable landscape indicate that all alternatives would support northern spotted owl movement and survival at comparable levels, but that the No Action alternative, Sub-alternative B and Alternative D best would support northern spotted owl movement between the Coast Range and the western Cascades.


No Action Alternative
Alternative A
Planning Area Boundary
Lands Managed under Separate RMP
Simulated Dispersal Flux
High - 12,000
Low - 0
10 0 10 20 30 40 50
Miles
M14-02-01


Alternative B
Sub-Alternative B
Planning Area Boundary
Lands Managed under Separate RMP
Simulated Dispersal Flux
High - 12,000
Low - 0
10 0 10 20 30 40 50
Miles
M14-02-01


Alternative C
Sub-Alternative C
Planning Area Boundary
Lands Managed under Separate RMP
Simulated Dispersal Flux
High - 12,000
Low - 0
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Miles
M14-02-01

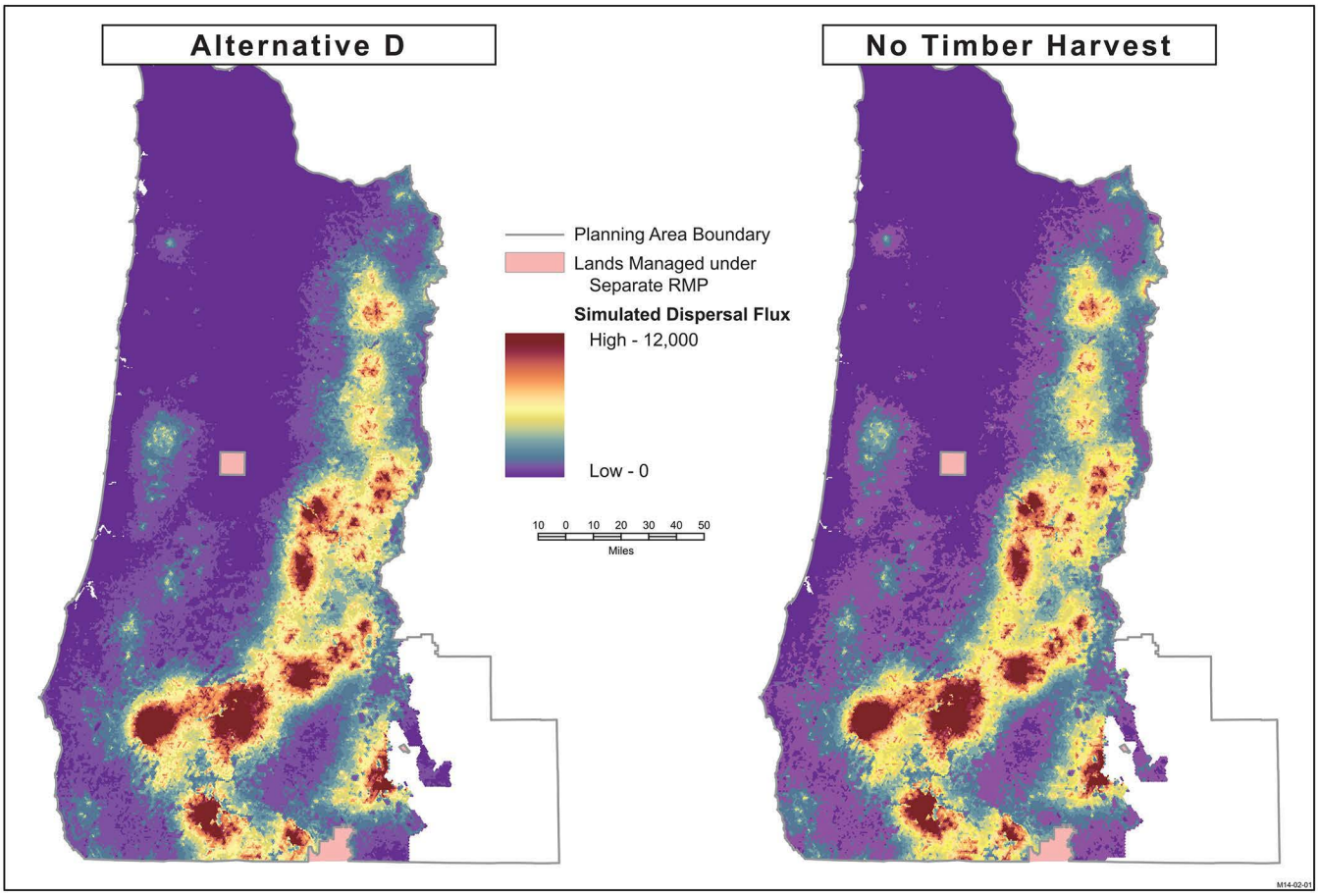


Figure S-18. Simulated northern spotted owl dispersal flux during 2053 – 2063 under each alternative and according to the No Timber Harvest reference analyses.

Section S-C

Summary of Population Risks under the Alternatives and According to the No Timber Harvest Reference Analyses

North Coast and Olympic Modeling Region

Under all alternatives, the mean probability—based on 500 replicate stochastic simulations—that the northern spotted owl population will decline to 250 or fewer females is above 90 percent in 2013, reaches 100 percent within 30 years, and remains at 100 percent. There are no discernable differences among the alternatives.

Under the No Timber Harvest reference analyses using both current and modified barred owl encounter rates, the mean probability—based on 500 replicate stochastic simulations—that the northern spotted owl population will decline to 250 or fewer females is above 90 percent in 2013, reaches 100 percent within 30 years, and remains at 100 percent. There are no discernable differences between the reference analyses or between the reference analyses and the alternatives.

Figures S-19 and **S-20** show mean probabilities over time, by alternative and for the No Timber Harvest reference analyses, of the northern spotted owl population declining to 100 females.

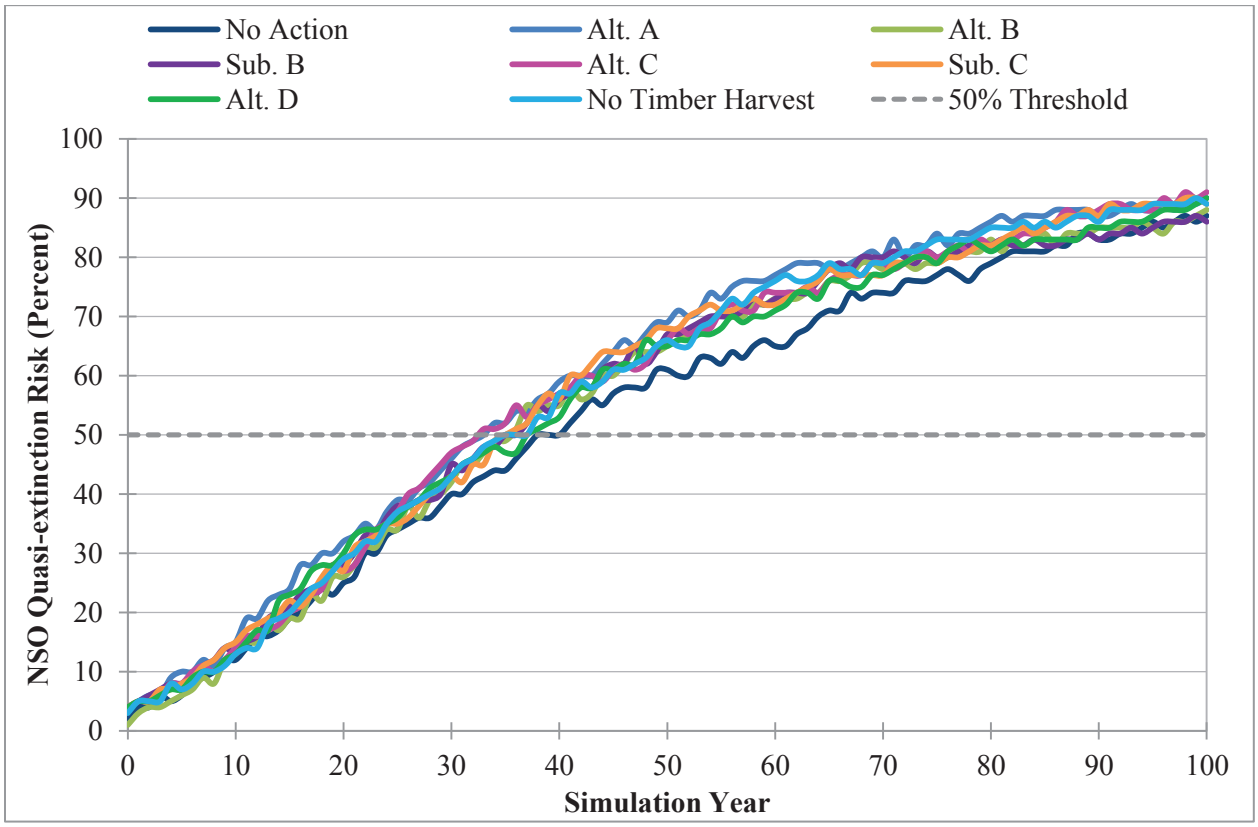


Figure S-19. Extinction risk as a function of time, by alternative, using a quasi-extinction level of 100 females. This graph shows the mean probability, by year (0 = 2013), that 500 simulated stochastic populations declined to 100 females.

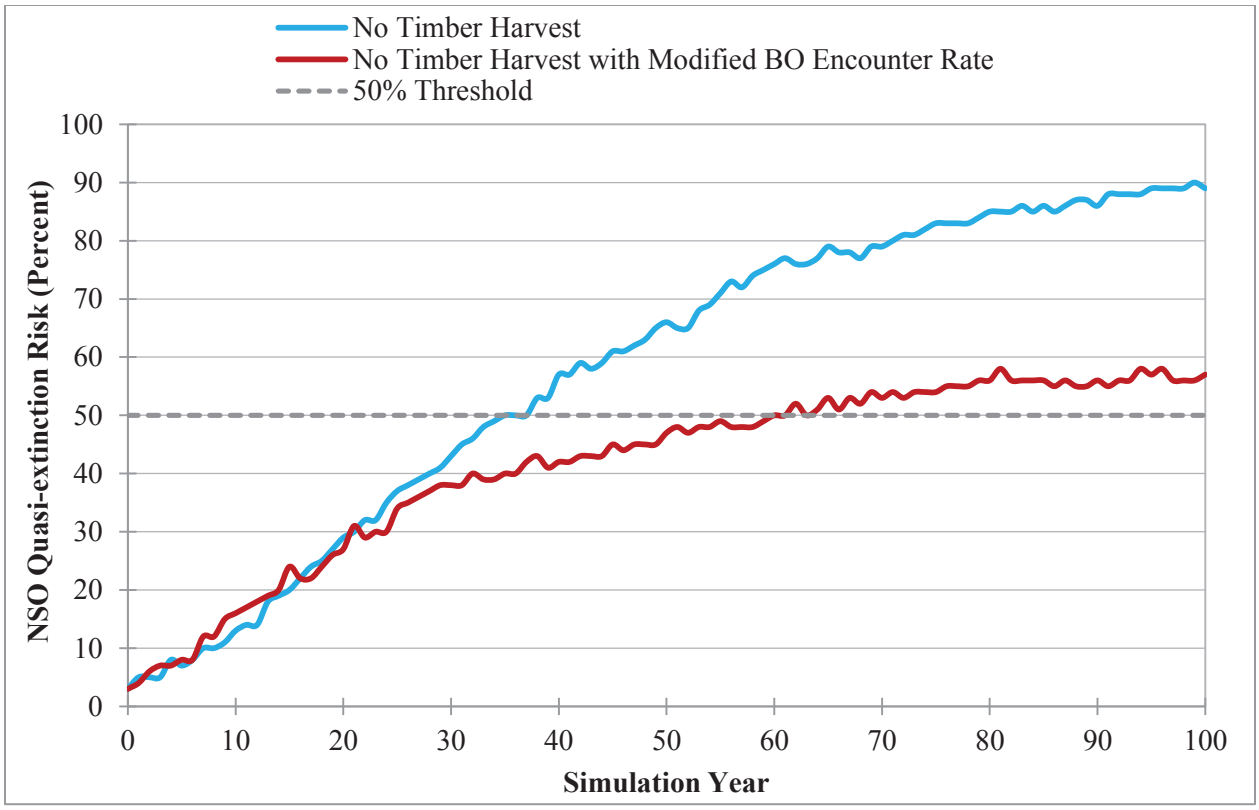


Figure S-20. A comparison of extinction risk as a function of time, under the No Timber Harvest reference analyses—using both current (blue) and modified (red) barred owl encounter rates—based on a quasi-extinction level of 100 females. This graph shows the mean probability, by year (0 = 2013), that 500 simulated stochastic populations declined to 100 females.

Table S-4. Year (after 2013) that the northern spotted owl population reached a 50-percent probability of declining to 100 females, based on 500 stochastic simulations.

Alternative	Simulation Year
No Action	38
Alt. A	33
Alt. B	36
Sub. B	35
Alt. C	33
Sub. C	35
Alt. D	37
No Timber Harvest (with Current Barred Owl Encounter Rate)	35
No Timber Harvest with Modified Barred Owl Encounter Rate	60

Oregon Coast Modeling Region

Figures S-21 and **S-22** show mean probabilities over time, by alternative and for the No Timber Harvest reference analyses, of the northern spotted owl population declining to 250 females.

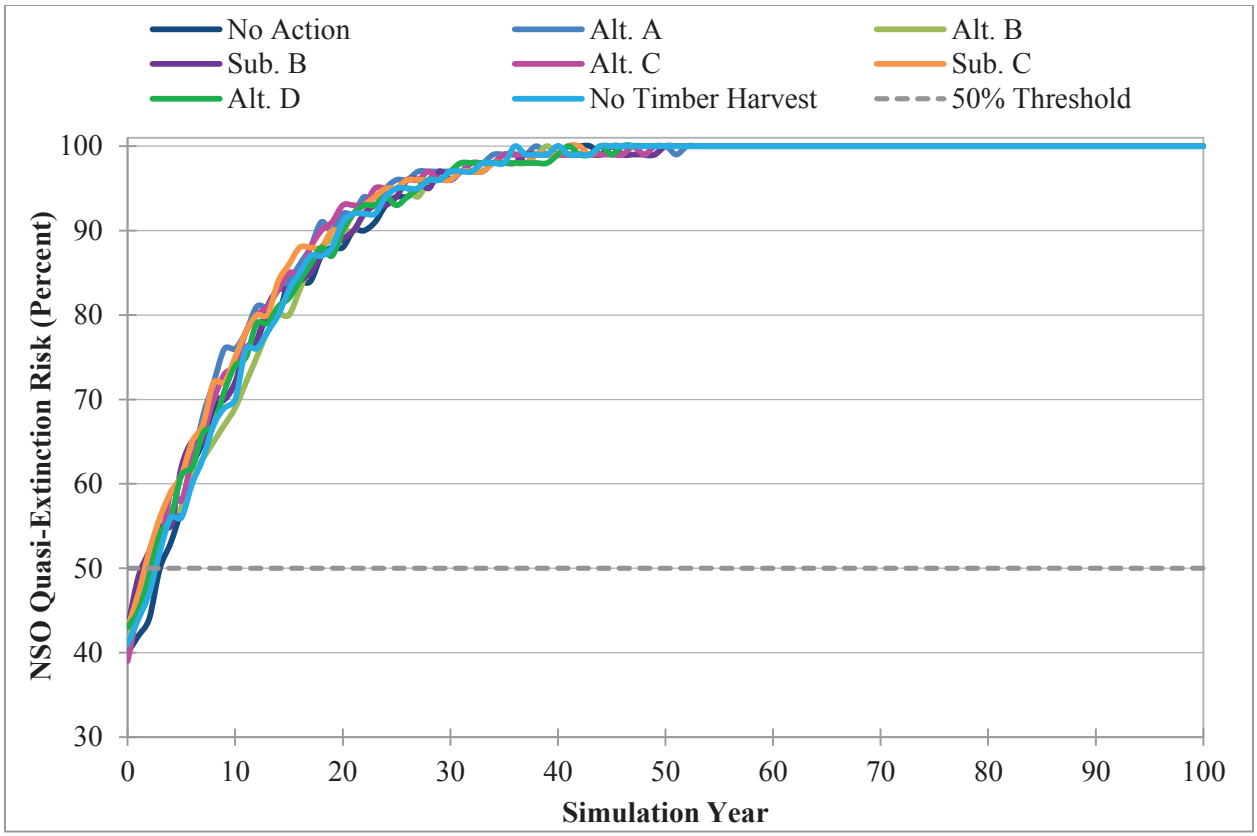


Figure S-21. Extinction risk as a function of time, by alternative, using a quasi-extinction level of 250 females. This graph shows the mean probability, by year (0 = 2013), that 500 simulated stochastic populations declined to 250 females.

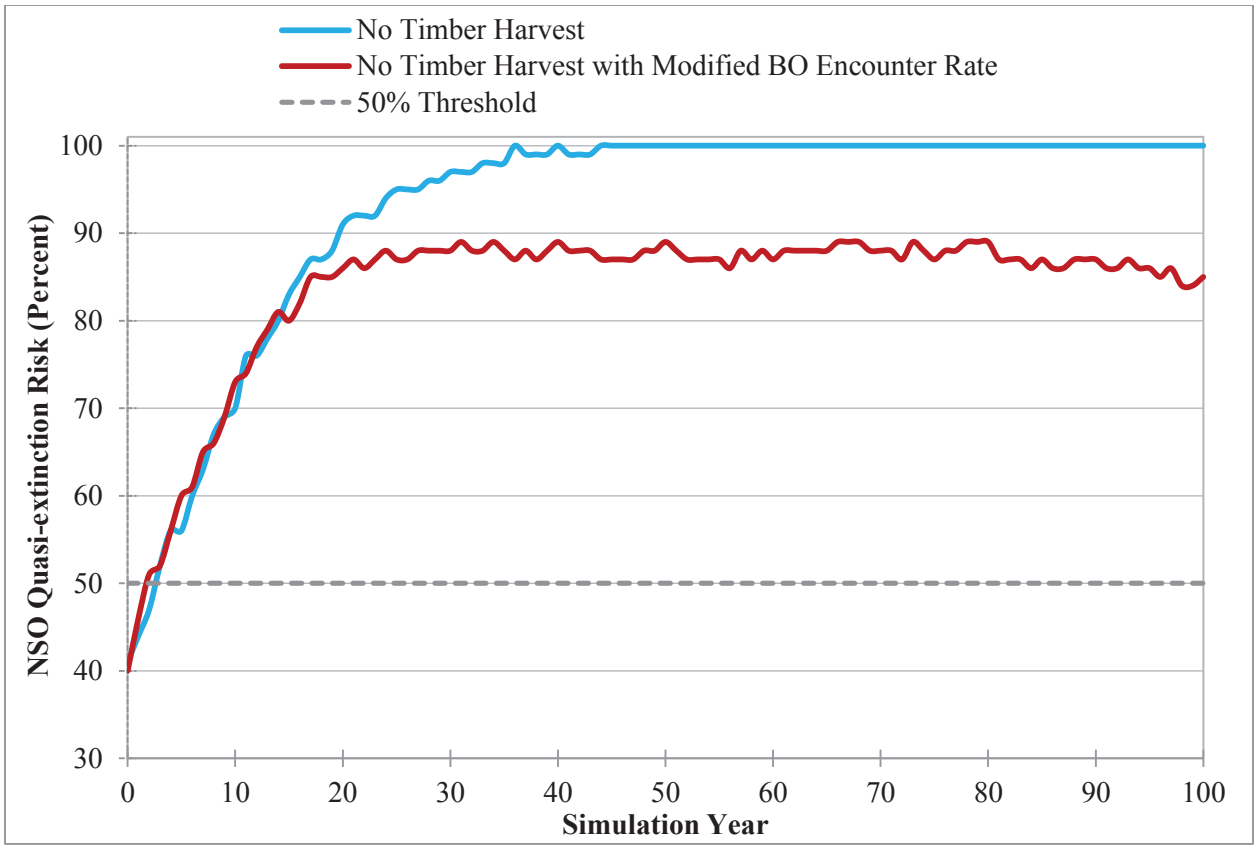


Figure S-22. A comparison of extinction risk as a function of time, under the No Timber Harvest reference analyses—using both current (blue) and modified (red) barred owl encounter rates—based on a quasi-extinction level of 250 females. This graph shows the mean probability, by year (0 = 2013), that 500 simulated stochastic populations declined to 250 females.

Table S-5. Year that the northern spotted owl population reached a 50-percent probability of declining to 250 females, based on 500 stochastic simulations.

Alternative	Simulation Year
No Action	3
Alt. A	2
Alt. B	3
Sub. B	2
Alt. C	3
Sub. C	2
Alt. D	3
No Timber Harvest (with Current Barred Owl Encounter Rate)	3
No Timber Harvest with Modified Barred Owl Encounter Rate	2

Figures S-23 and **S-24** show mean probabilities over time, by alternative and for the No Timber Harvest reference analyses, of the northern spotted owl population declining to 100 females.

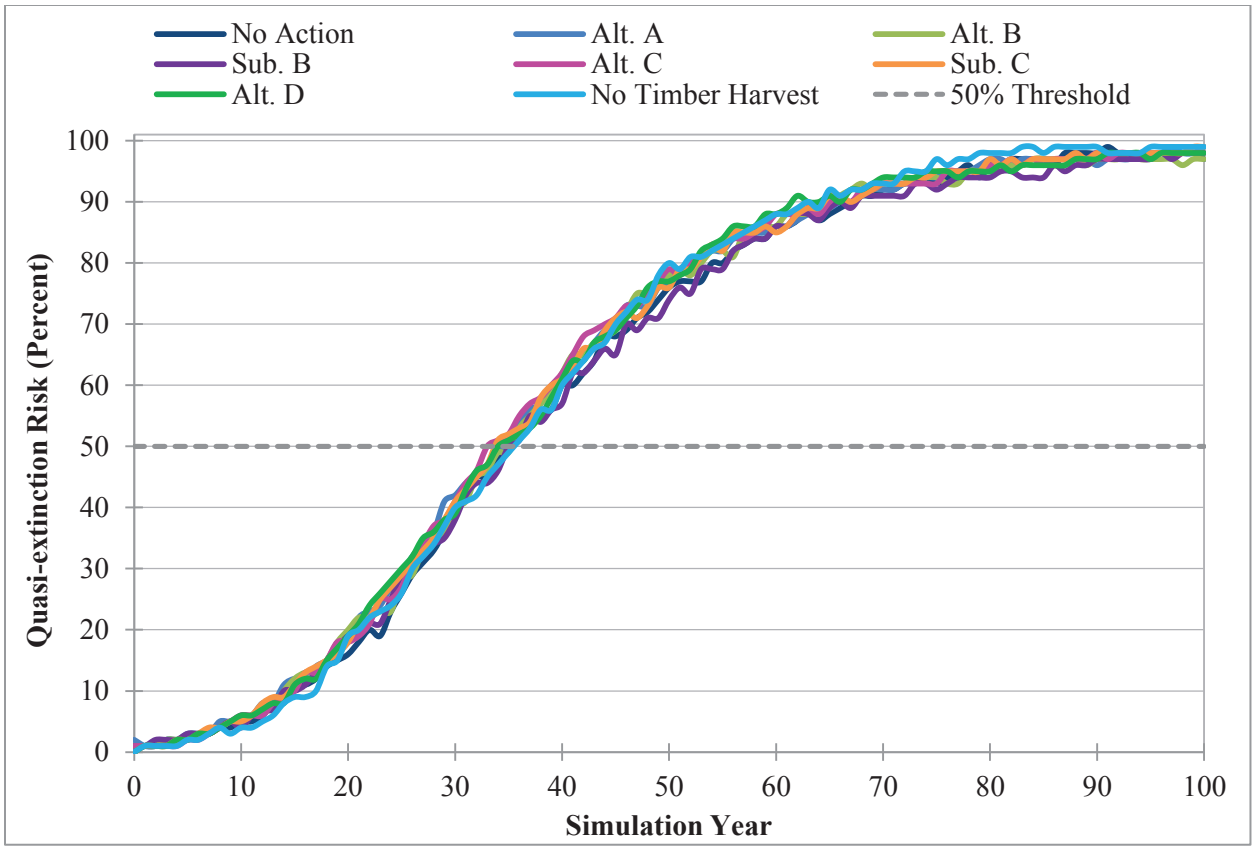


Figure S-23. Extinction risk as a function of time, by alternative, using a quasi-extinction level of 100 females. This graph shows the mean probability, by year (0 = 2013), that 500 simulated stochastic populations declined to 100 females.

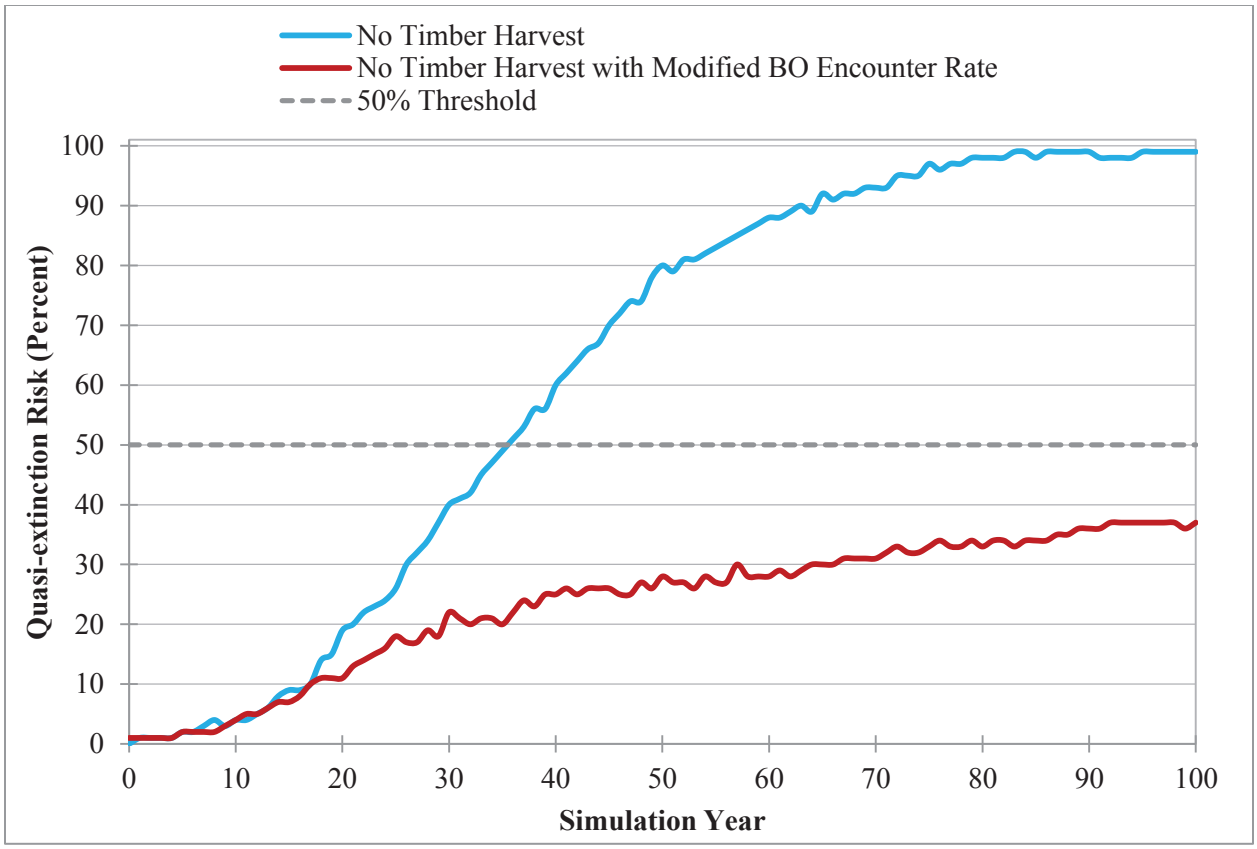


Figure S-24. A comparison of extinction risk as a function of time, under the No Timber Harvest reference analyses—using both current (blue) and modified (red) barred owl encounter rates—based on a quasi-extinction level of 100 females. This graph shows the mean probability, by year (0 = 2013), that 500 simulated stochastic populations declined to 100 females.

Table S-6. Year that the northern spotted owl population reached a 50-percent probability of declining to 100 females, based on 500 stochastic simulations.

Alternative	Simulation Year
No Action	35
Alt. A	35
Alt. B	36
Sub. B	35
Alt. C	33
Sub. C	34
Alt. D	34
No Timber Harvest (with Current Barred Owl Encounter Rate)	36
No Timber Harvest with Modified Barred Owl Encounter Rate	-

West Cascades-South Modeling Region

Under all alternatives, the mean probability—based on 500 replicate stochastic simulations—that the northern spotted owl population will decline to 250 or fewer females begins at 0 percent in 2013 and remains below 5 percent for 50 years. There are no discernable differences among the alternatives.

Under the No Timber Harvest reference analyses using both current and modified barred owl encounter rates, the mean probability—based on 500 replicate stochastic simulations—that the northern spotted owl population will decline to 250 or fewer females is 0 percent in 2013 and remains below 5 percent for 50 years. There are no discernable differences between the reference analyses or between the reference analyses and the alternatives.

Under all alternatives and reference analyses, the mean probability—based on 500 replicate stochastic simulations—that the northern spotted owl population will decline to 100 or fewer females begins at 0 percent in 2013 and remains at 0 percent for 50 years. There are no discernable differences among the alternatives.

East Cascades-South Modeling Region

Under all alternatives, the mean probability—based on 500 replicate stochastic simulations—that the northern spotted owl population will decline to 250 or fewer females is above 85 percent in 2013 and reaches 90 percent within 20 years. There are no discernable differences among the alternatives.

Under the No Timber Harvest reference analyses using both current and modified barred owl encounter rates, the mean probability—based on 500 replicate stochastic simulations—that the northern spotted owl population will decline to 250 or fewer females is above 85 percent in 2013 and reached 90 percent within 20 years. There is slight differentiation between the reference analyses using the current and modified rates, with the current rate performing 4 percent better over 100 years. There are no discernable differences between the reference analysis using the current rate and the alternatives.

Under all alternatives and reference analyses, the mean probability—based on 500 replicate stochastic simulations—that the northern spotted owl population will decline to 100 or fewer females is below 5 percent in 2013 and remains at or below 5 percent for 50 years. There are no discernable differences among the alternatives.

Klamath-Siskiyou-West Modeling Region

Under all alternatives, the mean probability—based on 500 replicate stochastic simulations—that the northern spotted owl population will decline to 250 or fewer females begins at 0 percent in 2013 and remains below 2 percent for 50 years. There are no discernable differences among the alternatives.

Under the No Timber Harvest reference analyses using both current and modified barred owl encounter rates, the mean probability—based on 500 replicate stochastic simulations—that the northern spotted owl population will decline to 250 or fewer females is 0 percent in 2013 and remains below 2 percent for 50 years. There are no discernable differences between the reference analyses or between the reference analyses and the alternatives.

Under all alternatives and reference analyses, the mean probability—based on 500 replicate stochastic simulations—that the northern spotted owl population will decline to 100 or fewer females begins at 0 percent in 2013 and remains at 0 percent for 50 years. There are no discernable differences among the alternatives.

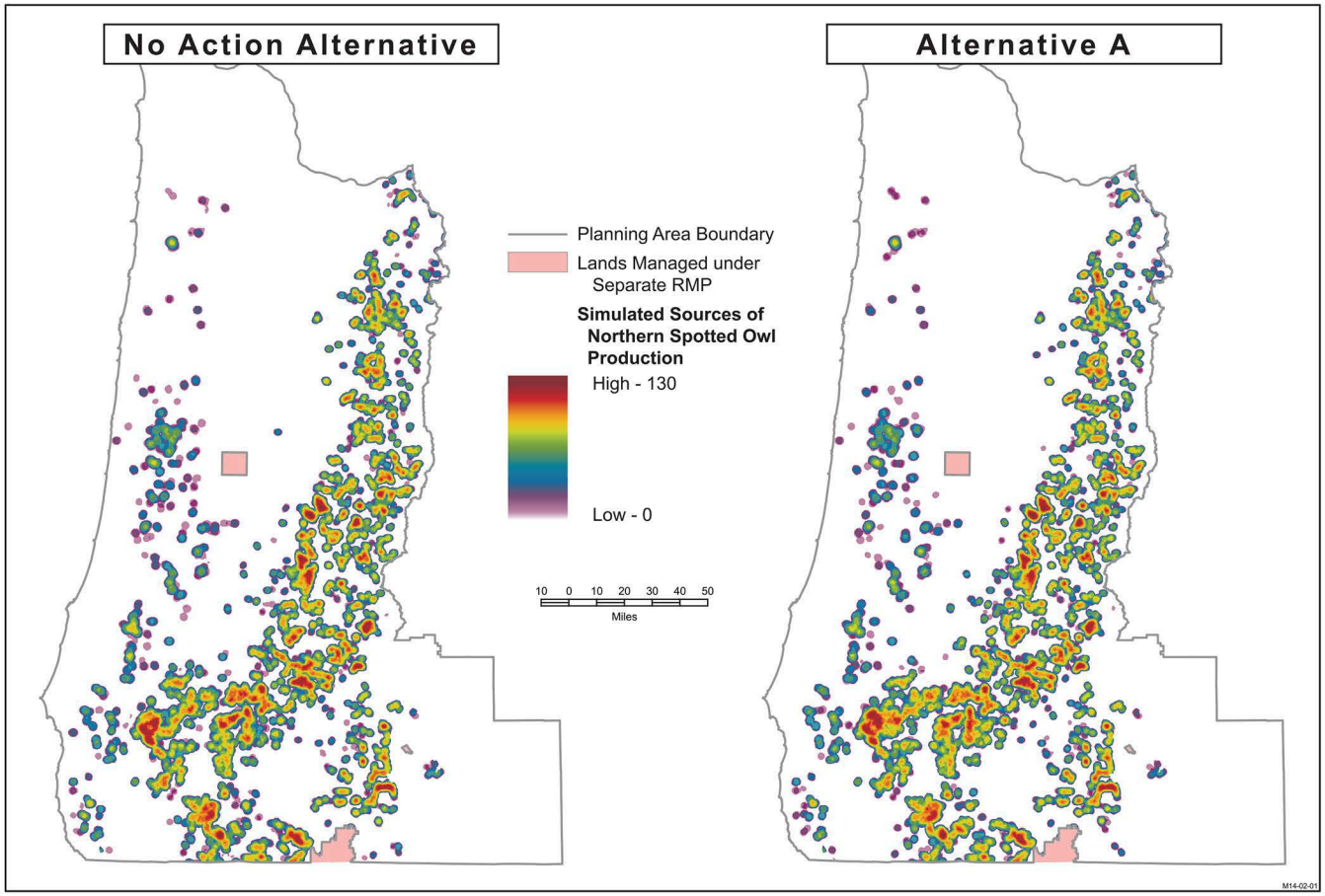
Klamath-Siskiyou-East Modeling Region

Under all alternatives, the mean probability—based on 500 replicate stochastic simulations—that the northern spotted owl population will decline to 250 or fewer females begins at 0 percent in 2013 and remains below 2 percent for 50 years. There are no discernable differences among the alternatives.

Under the No Timber Harvest reference analyses using both current and modified barred owl encounter rates, the mean probability—based on 500 replicate stochastic simulations—that the northern spotted owl population will decline to 250 or fewer females is 0 percent in 2013 and remains below 2 percent for 50 years. There are no discernable differences between the reference analyses or between the reference analyses and the alternatives.

Under all alternatives and reference analyses, the mean probability—based on 500 replicate stochastic simulations—that the northern spotted owl population will decline to 100 or fewer females begins at 0 percent in 2013 and remains at 0 percent for 50 years. There are no discernable differences among the alternatives.

Section S-D


No Action Alternative
Alternative A
Planning Area Boundary
Lands Managed under Separate RMP
Simulated Sources of Northern Spotted Owl Production
High - 130
Low - 0
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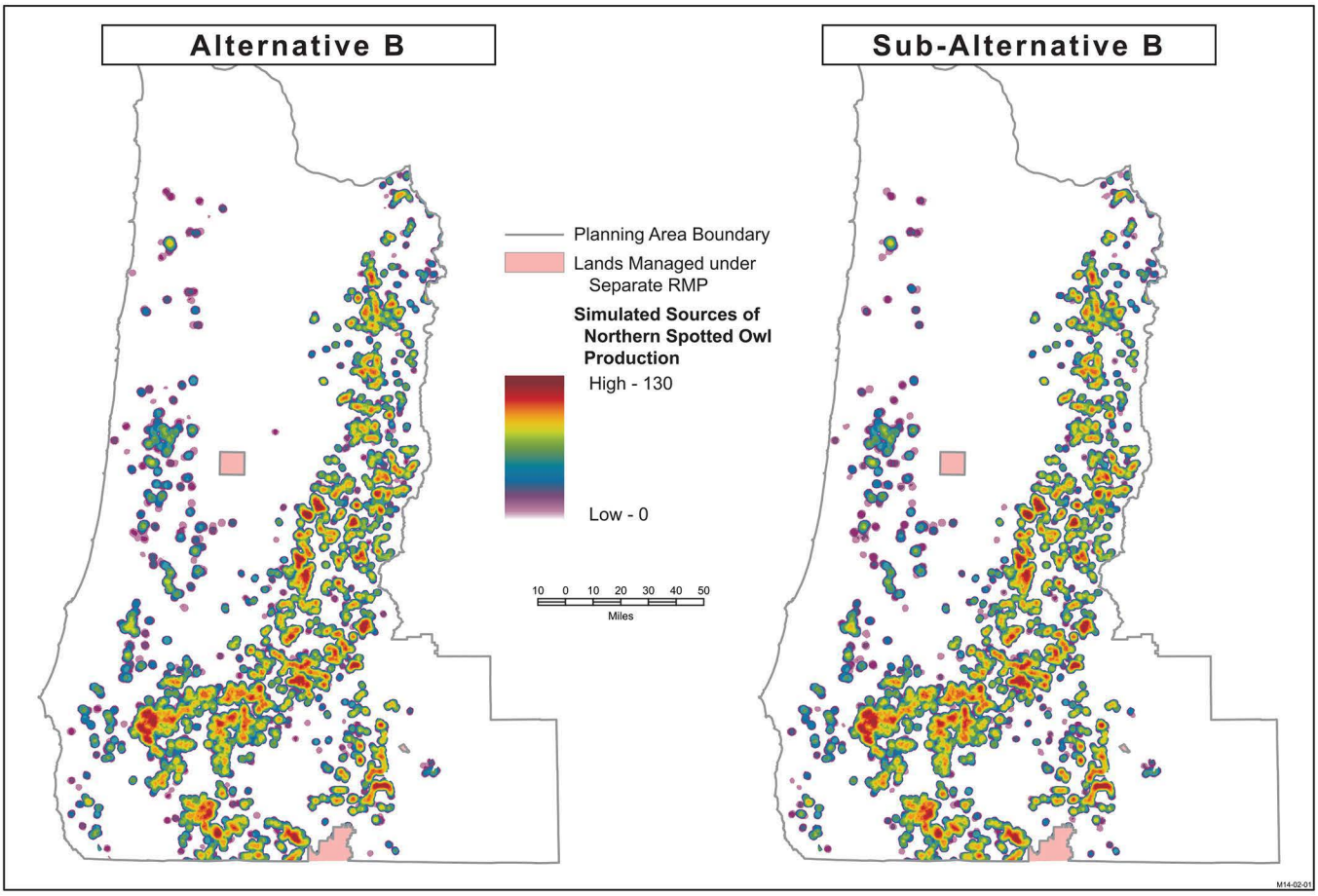
Miles
M14-02-01


Alternative B
Sub-Alternative B
Planning Area Boundary
Lands Managed under Separate RMP
Simulated Sources of Northern Spotted Owl Production
High - 130
Low - 0
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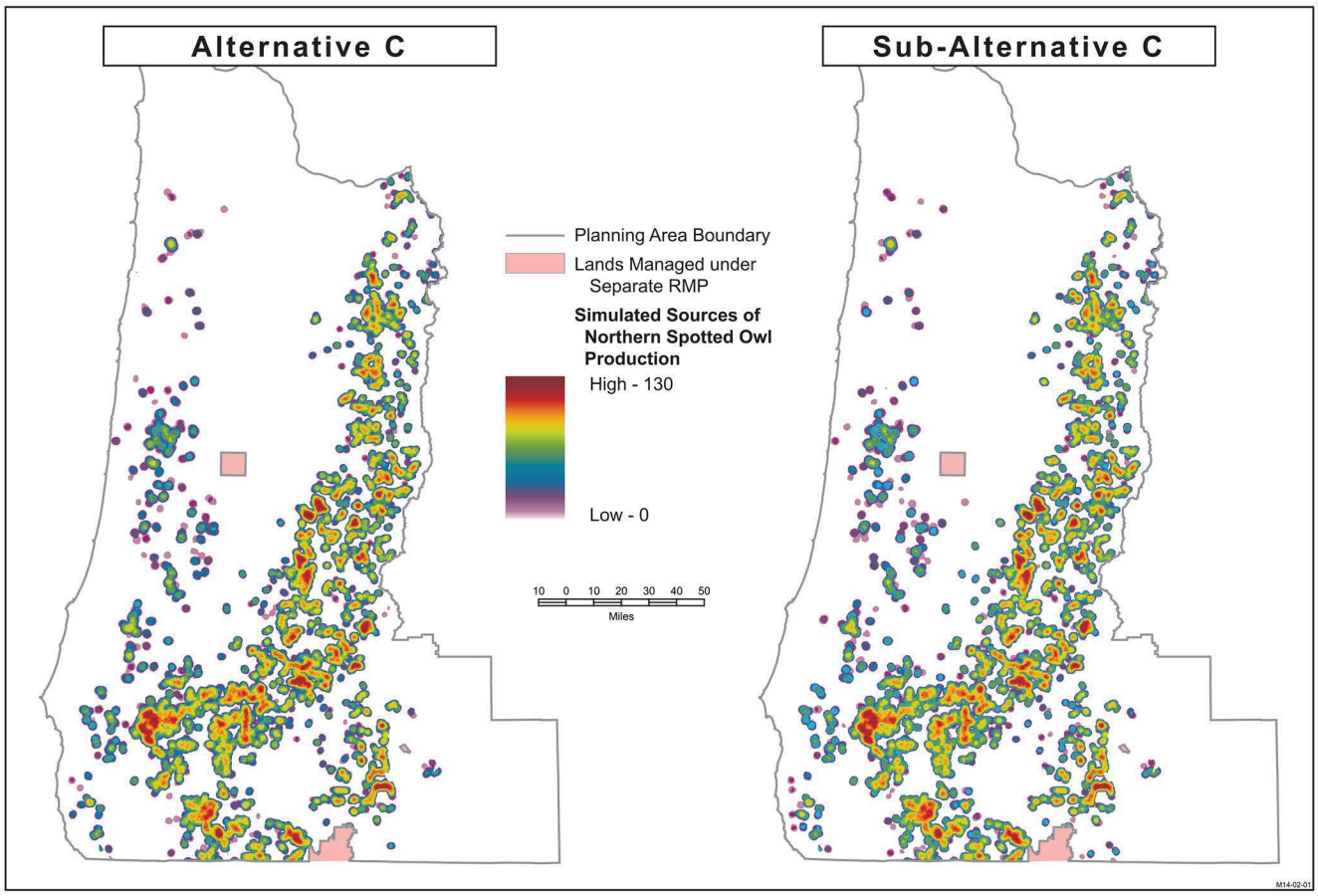
Miles
M14-02-01


Alternative C
Sub-Alternative C
Planning Area Boundary
Lands Managed under Separate RMP
Simulated Sources of Northern Spotted Owl Production
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Low - 0
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Miles
M14-02-01

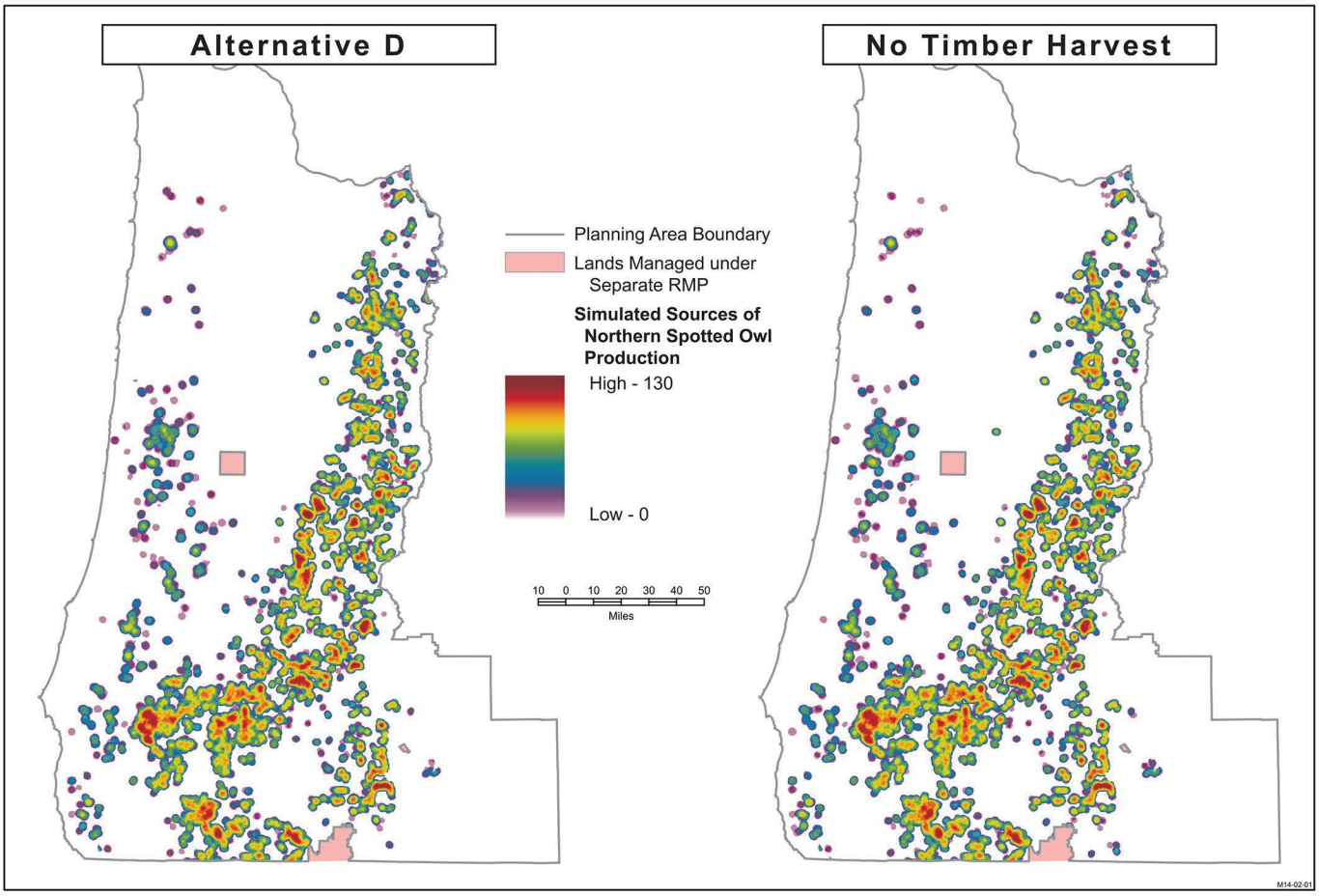

Figure S-25. Simulated sources of northern spotted owl production during 2053 – 2063 under each alternative and according to the No Timber Harvest with Modified Barred Owl Encounter Rate.
Colors reflect 1 – 130 births per hexagon (mean source value) during 100 replicate, non-stochastic simulations.

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