



November 1, 2012



Pilot Thompson Project Proposal

The intent of this document is to provide an updated version of the Pilot Thompson project proposal to members of the public, including community members, interested organizations, and our collaborative partners. In April 2012, a scoping notice was sent to interested citizens that summarized BLM's preliminary proposal, presented potential alternative themes, described the development process to date, and requested input on potential alternatives to meet the project objectives. A Scoping Report summarizing the comments received was issued in August 2012 and those comments have been used to develop the alternatives described in Section A.

Because collaboration and community participation is important in developing and implementing the Pilot project, I am sharing the progress the interdisciplinary team has made in crafting the alternatives to be analyzed in detail in the upcoming environmental assessment. Take a look at the alternatives described and let us know if there are other alternatives we should have crafted and why. Alternatives must meet the Purpose and Need of the pilot project, and every possible combination of units, treatments and roads do not have to be in a separate alternative. I will be able to take portions of alternatives as a final decision, so it is important that the range of potential actions are captured in the alternatives analyzed in detail. Also, if you have comments about the specific details of the alternatives, please let us know that, too. Please respond to Stephanie Kelleher via email at skellehe@blm.gov or by phone at 541-618-2205.

Some of you have also expressed concerns about the implementation of Pilot Joe, and would like to suggest changes to improve the design and implementation of Pilot Thompson. By design, we organized a multi-party monitoring group to evaluate the implementation of the Pilot projects. I am currently working with that group, which includes community and collaborative partners, to address what we have learned from the Pilot Joe Demonstration Project to date and address how we can better improve implementation, including but not limited to marking individual trees and laying out the sale units. You may address suggested improvements through the multi-party monitoring effort, or provide your concerns directly to Stephanie at the above contact information.

A. ALTERNATIVES TO BE ANALYZED

1. Alternative 1 – No-Action

The No-Action Alternative describes a baseline against which the environmental effects of the action alternatives can be compared. The No-Action alternative discusses the consequences of not taking the proposed action. No-Action assumes the current resource trends will continue into the future. Under the No-Action Alternative, no vegetation management would be implemented; there would be no commercial cutting of trees and there would be no density management or fuels reduction treatments. Normal programmed road maintenance would be performed. Other activities authorized by separate NEPA analyses could happen. The analysis of the No-Action Alternative answers the question: What would occur to the resources of concern, if the Proposed Action does not take place?

Selection of the No-Action Alternative would not constitute a decision to reallocate these lands to non-commodity uses. The decision maker does not need to make a specific decision to select the "No-Action" Alternative. If that is the choice, the Proposed Action would simply be dropped and the NEPA process ended. Future harvesting, young stand forest development work, fuels reduction treatments, other connected actions and road management in this area would not be precluded and could be analyzed under a subsequent NEPA document.

2. The Action Alternatives

This section describes the two action alternatives to be considered in detail. The narrative summary of each alternative is followed by tables listing the commercial and non-commercial harvest units, a road use table, and a

table detailing proposed new road construction and/or road decommissioning (where applicable). Components that are common to both action alternatives, including project design features (PDFs), commercial harvest methods, and post-harvest fuels reduction work, are described in further detail under Section B (Components Common to the Action Alternatives).

a. Alternative 2

Alternative 2 was developed to achieve the objectives described in Chapter 1, the Purpose and Need for the Pilot Thompson Project. Alternative 2 was designed to address the need for road building to access stands that show a need for restoration and would otherwise be accessed by helicopter only.

Under this alternative, 2,356 acres of vegetation would be treated using various commercial and non-commercial silvicultural prescriptions as described under Section B (Components Common to the Action Alternatives). About 1,226 acres are proposed for commercial treatments. Approximately 2,216 acres are proposed for non-commercial treatments, of which 1,086 acres are within commercial harvest units and 1,130 acres are strictly non-commercial stands (Table 2-1).

The cutting and removal of trees is accomplished in commercial conifer forest by a timber sale contract which sells material over eight (8) inches DBH (diameter at breast height). Trees to be retained or removed are designated in accordance with the marking guidelines outlined in Section C. Depending on stand conditions, individual trees are marked for retention (leave tree marking) or for harvest (cut tree marking). Non-commercial vegetation (material less than eight (8) inches DBH) would be removed through contracts that hire out cutting, and piling of material. Tops and limbs of trees cut would be treated to reduce fire risk by piling and burning the material in a controlled manner. BLM will burn the piles during wet weather conditions. Some material could be made available for firewood, pulp or woody biomass depending on market conditions and demand.

Table 2-1 summarizes the project by silvicultural treatment prescriptions and timber harvest methods. Unit specific information is displayed in Table 2-2 and 2-3, and Map 2-1.

Table 2-1. Alternative 2: Summary of Acres by Silvicultural Prescription and Harvest Method

Commercial Prescriptions	Est. Acres
Variable Density Thinning	824
Density Management – Intermediate Treatment	319
Riparian Reserve Thinning	83
Total	1226
Non-commercial Prescriptions	Est. Acres
Understory Reduction (in commercial harvest stands)	1086
Density Management – Non Plantation	959
Density Management – Plantation	171
Total	2216
Timber Harvest Method	Est. Acres
Cable Yarding	1031
Tractor Yarding	195
Helicopter Yarding	0
Total	1226

Table 2-2. Alternative 2: Non-Commercial Units by Prescription and Plant Series

Unit	T - R	Section	Plant Series	Non-Commercial Prescription	Acres
3-3	38S-4W 39S-4W	34 3	Pine	DM/Non Plantation	34
4-1	39S-4W	3,4	Pine	DM/Non Plantation	33
5-2	39S-4W	5,8,9	White Oak	DM/Non Plantation	14
5-3	39S-4W	5	Pine	DM/Non Plantation	20
5-4	39S-4W	5	Pine	DM/Plantation	10
6-2	39S-4W	6	Douglas-fir	DM/Non Plantation	9
8-3	39S-4W	8	Douglas-fir	DM/Plantation	12
9-3	39S-4W	9	White Oak	DM/Non Plantation	16
19-3	39S-4W	19	White Oak and Pine	DM/Non Plantation	97
19-7	39S-4W	19	Douglas-fir	DM/Non Plantation	8
19-8	39S-4W	19	Pine	DM/Plantation	22
19-9	39S-4W	19	Pine	DM/Non Plantation	36
19-10	39S-4W	19	Douglas-fir	DM/Non Plantation	18
19-11	39S-4W	19	Pine	DM/Non Plantation	7
19-12	39S-4W	19	Douglas-fir	DM/Plantation	14
19-13	39S-4W	19	Pine	DM/Plantation	8
20-2	38S-4W	20,29,30	White Oak and Pine	DM/Non Plantation	164
20-3	38S-4W	20	Pine	DM/Plantation	23
25-5	39S-5W	25	Douglas-fir	DM/Non Plantation	108
25-6	39S-5W 39S-4W	25 30	Douglas-fir	DM/Non Plantation	67
25-7	39S-5W	25	Douglas-fir	DM/Non Plantation	7
28-3	38S-4W	28	Pine	DM/Non Plantation	6
28-4	38S-4W	28	Douglas-fir	DM/Non Plantation	7
28-5	38S-4W	28	White Oak	DM/Non Plantation	1
28-6	38S-4W	28	White Oak	DM/Non Plantation	1
29-3	38S-4W	29	Douglas-fir	DM/Plantation	15
29-4	38S-4W	29,30	Douglas-fir	DM/Non Plantation	25
29-5	38S-4W	29	Douglas-fir	DM/Non Plantation	12
29-6	38S-4W	29	Pine	DM/Non Plantation	12
30-1	38S-4W	30	White Oak	DM/Non Plantation	1
31-3	38S-4W	31	Douglas-fir	DM/Plantation	11
31-4	38S-4W	31	Douglas-fir	DM/Non Plantation	4
31-5	38S-4W 39S-4W	31 6	Douglas-fir	DM/Non Plantation	15
31-6	38S-4W 39S-4W	31 6	Pine	DM/Plantation	29
33-5	38S-4W 39S-4W	33 4	Douglas-fir, White Oak, Pine	DM/Non Plantation	133
33-6	38S-4W	33	Douglas-fir	DM/Plantation	18

Unit	T - R	Section	Plant Series	Non-Commercial Prescription	Acres
33-7	38S-4W	33	Douglas-fir	DM/Non Plantation	19
33-8	38S-4W	33	Douglas-fir	DM/Non Plantation	2
33-9	38S-4W	33	Pine	DM/Non Plantation	8
33-10	38S-4W	33	Pine	DM/Non Plantation	4
34-4	38S-4W	34	Douglas-fir	DM/Non Plantation	2
34-5	38S-4W	33,34	Douglas-fir	DM/Non Plantation	20
34-6	38S-4W	27,34	Douglas-fir	DM/Non Plantation	29
34-7	38S-4W	34	Douglas-fir	DM/Non Plantation	20
34-8	38S-4W	34	Douglas-fir	DM/Plantation	9
				Total Acres	1130
DM = Density Management					

Table 2-3. Alternative 2: Commercial Harvest Units by Silvicultural Prescription and Harvest Method

Unit	T - R	Section	Harvest Method	Silvicultural Prescription	Associated Non-Commercial Prescription	Acres	Riparian Acres
3-1	39S-4W	3	Tractor	VDT, RRT	Activity, UR	4	10
3-2	39S-4W	3	Tractor	VDT	Activity, UR	19	N/A
3-4	38S-4W	34	Cable	VDT, RRT	Activity, UR	3	2
3-5	39S-4W	3	Cable	VDT, RRT	Activity, UR	6	7
5-1	39S-4W	5	Cable	VDT	Activity	21	N/A
6-1	39S-4W 38S-4W	5,6 31	Cable	VDT	Activity, UR	52	N/A
8-1	39S-4W	8	Cable	VDT	Activity, UR	20	N/A
9-1	39S-4W	9	Tractor	VDT, RRT	Activity, UR	18	9
9-2	39S-4W	8,9	Cable	DMI	Activity, UR	4	N/A
9-4	39S-4W	9	Tractor	DMI	Activity, UR	3	N/A
12-1	39S-5W	12	Cable	VDT	Activity, UR	42	N/A
19-1	39S-4W	19	Cable	VDT	Activity, UR	46	N/A
19-2	39S-4W	19	Cable	VDT, RRT	Activity, UR	2	5
19-4	39S-4W	19	Cable	VDT	Activity	36	N/A
19-5	39S-4W	19	Tractor	DMI	Activity, UR	10	N/A
19-6	39S-4W	19	Tractor	VDT	Activity, UR	18	N/A
20-1	38S-4W	20	Cable	VDT	Activity, UR	37	N/A
25-1	39S-5W 39S-4W	25 19,30	Cable	DMI, RRT	Activity, UR	164	25
25-2	39S-5W	25	Tractor	DMI	Activity, UR	8	N/A
25-3	39S-5W	25	Tractor	VDT, RRT	Activity, UR	18	4
25-4	39S-5W	25	Tractor	DMI	Activity, UR	38	N/A
25-8	39S-5W	25	Tractor	DMI, RRT	Activity, UR	10	2
25-9	39S-5W	25	Tractor	DMI, RRT	Activity, UR	19	5
25-10	39S-5W	25	Cable	DMI	Activity, UR	14	N/A

Unit	T- R	Section	Harvest Method	Silvicultural Prescription	Associated Non-Commercial Prescription	Acres	Riparian Acres
28-1	38S-4W	28	Cable	DMI	Activity, UR	29	N/A
28-2	38S-4W	28	Cable	VDT	Activity, UR	19	N/A
29-1	38S-4W	20,29	Cable	VDT	Activity, UR	41	N/A
30-2	38S-4W	29,30,31	Cable	VDT, RRT	Activity, UR	149	11
31-1	38S-4W	31	Cable	DMI	Activity, UR	20	N/A
31-2	38S-4W 39S-4W	31 6	Cable	VDT	Activity, UR	60	N/A
33-1	38S-4W	33	Cable	VDT	Activity, UR	6	N/A
33-2	38S-4W	33	Cable	VDT	Activity, UR	3	N/A
33-3	38S-4W	33,34	Cable	VDT	Activity, UR	55	N/A
33-4	38S-4W	33	Cable	VDT, RRT	Activity, UR	23	3
34-1	38S-4W	27,34	Cable	VDT	Activity, UR	88	N/A
34-2	38S-4W	34	Cable	VDT	Activity, UR	19	N/A
34-3	38S-4W 39S-4W	34 3	Cable	VDT	Activity, UR	19	N/A
Total Acres						1143	83
VDT = Variable Density Thin UR = Understory Reduction DM = Density Management RRT = Riparian Reserve Thin DMI= Density Management/Intermediate Treatment Activity = pile & burn tree tops and limbs to reduce fuels as needed							

Under Alternative 2, an estimated 45 miles of existing roads would be used as haul routes and improved as needed to meet BLM standards (Table 2-4). Road improvements could include such items as spot rocking, cleaning road drainage ditches and culvert basins, repairing and installing water dips, grading and shaping roads.

Renovation of approximately 3.30 miles of road would occur on existing BLM roads to access commercial harvest units (Table 2-4). Renovation of roads would include reshaping the road with a blade, brushing, and restoring water drainage.

Alternative 2 would construct approximately 0.62 miles of new road to provide access to proposed harvest units. About 0.37 miles of road constructed would be permanently added to the road system and approximately 0.25 miles of temporary road construction is proposed (Table 2-5). Under Alternative 2, approximately 2.55 miles of road would be fully decommissioned (Table 2-6). All road treatment activities would adhere to associated project design features identified in Section B.

Following use, all newly constructed and renovated permanent roads and would be effectively blocked to preclude use. Blockage would consist of placing logs, slash, boulders, berms, and other material both at the entrance so that it is camouflaged, and at sufficient intervals along the roads length. Temporary roads used or constructed would be fully decommissioned or obliterated at the completion of timber harvest activities.

Fully decommissioning would include decompacting the surface to a depth of 12 inches and slash and other debris would be placed along the roads length to provide ground cover and discourage OHV use. Blockage at the entrance would consist of placing earthen berms, logs, slash, boulders, and other material so the entrance is camouflaged and vehicle use is precluded. Obliterated roads would be treated similar to fully decommissioning, however where fill occurs recontouring, and outsloping the travelway to disperse runoff would occur. Both methods would include the removal of all drainage structures. Treatments described may be modified by the authorized officer with consultation with appropriate earth scientists or aquatic specialists.

Two new landings would be constructed; one on road 39-4-19.5 and one on a non-system road in T39S-R4W-S25 SE ¼ (Map 2-1) to avoid blocking roads used to access adjacent private land. Landings would be located outside of riparian reserves, would not exceed ½ an acre, and would adhere to associated project design features (p. 26, 28).

Table 2-4. Alternative 2: Proposed Haul Routes on Existing Roads in the Project Area

Road Number	Approximate Length (miles)	Existing Surface:	Control	Possible Road Stabilization or Drainage improvements	Seasonal Restriction
		Depth (inches) and Type			(for log hauling)
38-4W-17.00A	0.47	BST	BLM	3	0
38-4W-17.00B	0.76	BST	BLM	3	0
38-4W-17.00C	2.35	BST	BLM	3	0
38-4W-17.00D1	0.51	ASC	BLM	3	1
38-4W-17.00D2	0.07	ASC	BLM	3	1
38-4W-20.0A	0.16	GRR	BLM	3	1
38-4W-20.0B	0.71	GRR	BLM	3	1
38-4W-20.01	0.79	NAT	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	1
38-4W-20.02	0.07	NAT	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	2
38-4W-28.00A1	0.15	ASC	BLM	3	1
38-4W-28.00A2	1.72	ASC	BLM	3	1
38-4W-28.00A3	1.03	ASC	BLM	3	1
38-4W-28.00B1	1.16	ASC	BLM	3	1
38-4W-28.00B2	0.34	ASC	BLM	3	1
38-4W-28.00B3	1.89	GRR	BLM	3	1
38-4W-28.00B4	2.16	GRR	BLM	3	1
38-4W-28.01A1	0.10	PRR	BLM	3	1
38-4W-28.01A2	0.30	PRR	BLM	3	1
38-4W-28.01B	0.56	ASC	BLM	3	1
38-4W-28.01C	0.29	NAT	BLM	3	1
38-4W-28.02	0.48	GRR	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	1
38-4W-29.00A	1.11	ASC	BLM	3	1
38-4W-29.00B	1.43	GRR	BLM	3	1
38-4W-31.00	0.56	NAT	BLM	3	1
38-4W-31.01	0.64	NAT	BLM	3	1
38-4W-33.00	1.19	PRR	BLM	3	1
38-4W-33.01	1.00	ASC	BLM	3	1
38-4W-33.03	0.17	NAT	BLM	Open closed road, Brush and Blade, Improve Drainage,	1

Road Number	Approximate Length (miles)	Existing Surface:	Control	Possible Road Stabilization or Drainage improvements	Seasonal Restriction
		Depth (inches) and Type			(for log hauling)
				Close after use	
38-4W-34.00	0.26	ASC	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	1
38-4W-34.01	0.11	NAT	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	1
38-4W-34.02	0.26	NAT	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	1
38-4W-35.03C1	0.17	NAT	BLM	3	1
38-4W-35.03C2	1.27	NAT	BLM	3	1
38-4W-35.03D	0.03	NAT	BLM	3	1
38-4W-35.03E	0.60	NAT	BLM	3	1
39-4W-03.02	0.40	NAT	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	1
39-4W-06.00	1.25	ASC	BLM	3	1
39-4W-09.00A	0.27	ASC	BLM	3	1
39-4W-09.01A	0.26	ASC	BLM	3	1
39-4W-09.01B	0.21	NAT	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	1
39-4W-09.03	0.62	NAT	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	1
39-4W-17.00	0.37	NAT	BLM	3	1
39-4W-19.01A	1.35	ASC	BLM	3	1
39-4W-19.01B1	0.13	ASC	BLM	3	1
39-4W-19.01B2	1.28	ASC	BLM	3	1
39-4W-19.01C	2.40	NAT	BLM	3	1
39-4W-19.02	0.57	ASC	BLM	3	1
39-4W-19.03	0.18	NAT	BLM	3	1
39-4W-19.04	0.13	NAT	BLM	3	1
39-4W-19.05	0.18	NAT	BLM	3	1
39-4W-20.00	0.28	NAT	BLM	3	1
39-5W-01.00A1	0.52	ASC	BLM	3	1
39-5W-01.00A2	0.76	ASC	BLM	3	1
39-5W-01.00B	0.65	ASC	BLM	3	1
39-5W-01.01A	0.26	ASC	BLM	3	1
39-5W-01.01B	0.80	ASC	BLM	3	1
39-5W-01.01C	0.30	ASC	BLM	3	1

Road Number	Approximate Length (miles)	Existing Surface:	Control	Possible Road Stabilization or Drainage improvements	Seasonal Restriction
		Depth (inches) and Type			(for log hauling)
39-5W-02.00A	0.87	ASC	BLM	3	1
39-5W-24.00A1	0.02	ASC	BLM	3	1
39-5W-24.00A2	0.63	ASC	BLM	3	1
39-5W-24.00A3	0.10	ASC	BLM	3	1
39-5W-24.00B1	0.18	ASC	BLM	3	1
39-5W-25.00A	1.53	PRR	BLM	3	1
39-5W-25.00B	0.66	PRR	BLM	3	1
39-5W-25.01A	0.13	PRR	BLM	3	1
39-5W-25.01B	0.98	PRR	BLM	3	1
39-5W-25.02A	1.14	ASC	BLM	3	1
39-5W-25.02B	0.51	ASC	BLM	3	1
39-5W-25.03	0.43	ASC	BLM	3	1
Total mileage	45.22				

Abbreviations:

Existing Surface: NAT=natural; ASC=Aggregate Surface Course; BST=Bituminous Surface Treatment; GRR=Grid Rolled Rock; PRR=Pit Run Rock

Control: BLM=Bureau of Land Management; PVT=Private

Possible Improvements: 3=no road stabilization/drainage improvements. All BLM roads proposed for haul routes would be maintained to BLM-Standards

Seasonal Restrictions: 0=no restrictions

(for log hauling) 1=hauling restricted between 10/15 and 6/1

2=hauling restricted between 11/15 and 5/15

Note: If Purchaser furnishes and places additional rock, seasonal restrictions could be modified as approved by the Authorized Officer.

Table 2-5. Alternative 2: Proposed New Road Construction.

Road Number	Approximate Length (miles)	Existing Surface:	Control	Comments
		Depth (inches) and Type		
39-4-20.00	0.12	NAT	BLM	Extend Existing Road
39-4-06.01	0.25	NAT	BLM	Barricade After Use
Total mileage:	0.37			
39-5-25.05	0.13	NAT	BLM	Temporary Road, Fully Decommission After Use
38-4-34.01	0.12	NAT	BLM	Temporary Road, Fully Decommission After Use
Total mileage:	0.25			

Abbreviations:

Existing Surface: NAT=Natural

Control: BLM=Bureau of Land Management

Table 2-6. Alternative 2: Proposed Road Decommissioning.

Road Number	Approximate Length (miles)	Existing Surface:	Control	Comments
		Depth (inches) and Type		
38-4-34.00 Spur A	0.46	NAT	BLM	Fully Decommission After Harvest
39-4-03.02 Spur A	0.2	NAT	BLM	Fully Decommission
39-4-06.00 Spur A	0.57	NAT	BLM	Fully Decommission
39-4-06.00 Spur B	0.11	NAT	BLM	Fully Decommission
38-4-28.02	0.46	NAT	BLM	Closed, convert to Fully Decommission
39-4-19.00	0.4	NAT	BLM	Closed, convert to Fully Decommission
39-4-3.1	0.35	NAT	BLM	Closed, convert to Fully Decommission
Total mileage:	2.55			

Abbreviations:

Existing Surface: NAT=Natural

Control: BLM=Bureau of Land Management

b. Alternative 3

Alternative 3 was developed to achieve the objectives described in Chapter 1, the Purpose and Need for the Pilot Thompson Project. Alternative 3 addresses the desire for no road building and provides a comparison of the environmental effects of building roads versus not building roads. It also provides a comparison of the differences in the cost for completing forest thinning, including helicopter logging opportunities.

Under this alternative, 2,723 acres of vegetation would be treated using various commercial and non-commercial silvicultural prescriptions as described as described under Section C (Components Common to the Action Alternatives). About 1,593 acres are proposed for commercial treatments. Approximately 2,322 acres are proposed for non-commercial treatments, of which 1,192 acres are within commercial harvest units and 1,130 acres are strictly non-commercial stands (Table 2-8).

The cutting and removal of trees is accomplished in commercial conifer forest by a timber sale contract which sells material over eight (8) inches DBH (diameter at breast height). Trees to be retained or removed are designated in accordance with the marking guidelines outlined in Section C. Depending on stand conditions, individual trees are marked for retention (leave tree marking) or for harvest (cut tree marking). Non-commercial vegetation (material less than eight (8) inches DBH) would be removed through contracts that hire out cutting, and piling of material. Tops and limbs of trees cut would be treated to reduce fire risk by piling and burning the material in a controlled manner. BLM will burn the piles during wet weather conditions. Some material could be made available for firewood, pulp or woody biomass depending on market conditions and demand.

Table 2-8 summarizes the project by silvicultural treatment prescriptions and timber harvest methods. Unit specific information is displayed in Table 2-9 and 2-10, and Map 2-2.

Table 2-8. Alternative 3: Summary of Acres by Silvicultural Prescription and Harvest Method

Commercial Prescriptions	Est. Acres
Variable Density Thinning	1190
Density Management – Intermediate Treatment	319
Riparian Reserve Thinning	84

	Total	1593
Non-commercial Prescriptions		Est. Acres
Understory Reduction (in commercial harvest stands)		1192
Density Management – Non Plantation		959
Density Management – Plantation		171
	Total	2322
Timber Harvest Method		Est. Acres
Cable Yarding		960
Tractor Yarding		196
Helicopter Yarding		437
	Total	1593

Table 2-9. Alternative 3: Non-Commercial Units by Prescription and Plant Series

Unit	T_R	Section	Plant Series	Non-Commercial Rx	Acres
3-3	38S-4W 39S-4W	34 3	Pine	DM/Non Plantation	34
4-1	39S-4W	3,4	Pine	DM/Non Plantation	33
5-2	39S-4W	5,8,9	White Oak	DM/Non Plantation	14
5-3	39S-4W	5	Pine	DM/Non Plantation	20
5-4	39S-4W	5	Pine	DM/Plantation	10
6-2	39S-4W	6	Douglas-fir	DM/Non Plantation	9
8-3	39S-4W	8	Douglas-fir	DM/Plantation	12
9-3	39S-4W	9	White Oak	DM/Non Plantation	16
19-3	39S-4W	19	White Oak and Pine	DM/Non Plantation	97
19-7	39S-4W	19	Douglas-fir	DM/Non Plantation	8
19-8	39S-4W	19	Pine	DM/Plantation	22
19-9	39S-4W	19	Pine	DM/Non Plantation	36
19-10	39S-4W	19	Douglas-fir	DM/Non Plantation	18
19-11	39S-4W	19	Pine	DM/Non Plantation	7
19-12	39S-4W	19	Douglas-fir	DM/Plantation	14
19-13	39S-4W	19	Pine	DM/Plantation	8
20-2	38S-4W	20,29,30	White Oak and Pine	DM/Non Plantation	164
20-3	38S-4W	20	Pine	DM/Plantation	23
25-5	39S-5W	25	Douglas-fir	DM/Non Plantation	108
25-6	39S-5W 39S-4W	25 30	Douglas-fir	DM/Non Plantation	67
25-7	39S-5W	25	Douglas-fir	DM/Non Plantation	7
28-3	38S-4W	28	Pine	DM/Non Plantation	6
28-4	38S-4W	28	Douglas-fir	DM/Non Plantation	7
28-5	38S-4W	28	White Oak	DM/Non Plantation	1
28-6	38S-4W	28	White Oak	DM/Non Plantation	1
29-3	38S-4W	29	Douglas-fir	DM/Plantation	15
29-4	38S-4W	29,30	Douglas-fir	DM/Non Plantation	25
29-5	38S-4W	29	Douglas-fir	DM/Non Plantation	12

Unit	T_R	Section	Plant Series	Non-Commercial Rx	Acres
29-6	38S-4W	29	Pine	DM/Non Plantation	12
30-1	38S-4W	30	White Oak	DM/Non Plantation	1
31-3	38S-4W	31	Douglas-fir	DM/Plantation	11
31-4	38S-4W	31	Douglas-fir	DM/Non Plantation	4
31-5	38S-4W 39S-4W	31 6	Douglas-fir	DM/Non Plantation	15
31-6	38S-4W 39S-4W	31 6	Pine	DM/Plantation	29
33-5	38S-4W 39S-4W	33 4	Douglas-fir, White Oak, Pine	DM/Non Plantation	133
33-6	38S-4W	33	Douglas-fir	DM/Plantation	18
33-7	38S-4W	33	Douglas-fir	DM/Non Plantation	19
33-8	38S-4W	33	Douglas-fir	DM/Non Plantation	2
33-9	38S-4W	33	Pine	DM/Non Plantation	8
33-10	38S-4W	33	Pine	DM/Non Plantation	4
34-4	38S-4W	34	Douglas-fir	DM/Non Plantation	2
34-5	38S-4W	33,34	Douglas-fir	DM/Non Plantation	20
34-6	38S-4W	27,34	Douglas-fir	DM/Non Plantation	29
34-7	38S-4W	34	Douglas-fir	DM/Non Plantation	20
34-8	38S-4W	34	Douglas-fir	DM/Plantation	9
				Total Acres	1130

Table 2-10. Alternative 3: Commercial Harvest Units by Silvicultural Prescription and Harvest Method

Unit	T_R	Section	Logging System	Silviculture Rx	Non-Commercial Rx	Acres	Riparian Acres
3-1	39S-4W	3	Tractor	VDT, RRT	Activity, UR	4	10
3-2	39S-4W	3	Tractor	VDT	Activity, UR	19	N/A
3-4	38S-4W	34	Cable	VDT, RRT	Activity, UR	3	2
3-5	39S-4W	3	Cable	VDT, RRT	Activity, UR	6	7
5-1	39S-4W	5	Cable	VDT	Activity	21	N/A
6-1	39S-4W 38S-4W	5,6 31	Heli	VDT	Activity, UR	52	N/A
8-1	39S-4W	8	Cable	VDT	Activity, UR	20	N/A
8-2	39S-4W	8	Heli	VDT	Activity, UR	71	N/A
9-1	39S-4W	9	Tractor	VDT, RRT	Activity, UR	18	9
9-2	39S-4W	8,9	Cable	DMI	Activity, UR	4	N/A
9-4	39S-4W	9	Tractor	DMI	Activity, UR	3	N/A
12-1	39S-5W	12	Cable	VDT	Activity, UR	42	N/A
12-2	39S-5W 39S-4W	12 7	Heli	VDT	Activity	13	N/A
12-3	39S-5W 39S-4W	13 7,18	Heli	VDT	Activity	40	N/A
13-1	39S-5W	13	Heli	VDT	Activity	26	N/A
17-1	39S-4W	7,17,18	Heli	VDT	Activity	154	N/A
19-1	39S-4W	19	Cable	VDT	Activity, UR	46	N/A

Unit	T_R	Section	Logging System	Silviculture Rx	Non-Commercial Rx	Acres	Riparian Acres
19-2	39S-4W	19	Cable	VDT, RRT	Activity, UR	2	5
19-4	39S-4W	19	Cable	VDT	Activity	36	N/A
19-5	39S-4W	19	Tractor	DMI	Activity, UR	10	N/A
19-6	39S-4W	19	Tractor	VDT	Activity, UR	18	N/A
20-1	38S-4W	20	Cable	VDT	Activity, UR	37	N/A
25-1	39S-5W 39S-4W	25 19,30	Cable	DMI, RRT	Activity, UR	164	25
25-2	39S-5W	25	Tractor	DMI	Activity, UR	8	N/A
25-3	39S-5W	25	Tractor	VDT, RRT	Activity, UR	18	5
25-4	39S-5W	25	Tractor	DMI	Activity, UR	38	N/A
25-8	39S-5W	25	Tractor	DMI, RRT	Activity, UR	10	2
25-9	39S-5W	25	Tractor	DMI, RRT	Activity, UR	19	5
25-10	39S-5W	25	Cable	DMI	Activity, UR	14	N/A
28-1	38S-4W	28	Cable	DMI	Activity, UR	29	N/A
28-2	38S-4W	28	Cable	VDT	Activity, UR	19	N/A
29-1	38S-4W	20,29	Cable	VDT	Activity, UR	41	N/A
29-2	38S-4W	29	Heli	VDT	Activity, UR	35	N/A
29-7	38S-4W	29	Heli	VDT	Activity	27	N/A
30-2	38S-4W	29,30,31	Cable	VDT, RRT	Activity, UR	149	11
31-1	38S-4W	31	Cable	DMI	Activity, UR	20	N/A
31-2	38S-4W 39S-4W	31 6	Cable	VDT	Activity, UR	60	N/A
33-1	38S-4W	33	Cable	VDT	Activity, UR	6	N/A
33-2	38S-4W	33	Cable	VDT	Activity, UR	3	N/A
33-3	38S-4W	33,34	Cable	VDT	Activity, UR	55	N/A
33-4	38S-4W	33	Cable	VDT, RRT	Activity, UR	23	3
34-1	38S-4W	27,34	Cable	VDT	Activity, UR	88	N/A
34-2	38S-4W	34	Cable	VDT	Activity, UR	19	N/A
34-3	38S-4W 39S-4W	34 3	Heli	VDT	Activity, UR	19	N/A
Total Acres						1509	84

Abbreviations:

VDT = Variable Density Thin UR = Understory Reduction DM = Density Management
RRT = Riparian Reserve Thin DMI= Density Management/Intermediate Treatment
Activity = pile & burn tree tops and limbs to reduce fuels as needed

Under Alternative 3, an estimated 46.7 miles of existing roads would be used as haul routes and improved as needed to meet BLM standards (Table 2-11). Road improvements could include such items as spot rocking, cleaning road drainage ditches and culvert basins, repairing and installing water dips, grading and shaping roads.

Renovation of approximately 3.37 miles of road would occur on existing BLM roads to access commercial harvest units (Table 2-11). Renovation of roads would include reshaping the road with a blade, brushing, and restoring water drainage. At the end of project activities, all roads would be closed and barricades would be constructed to block vehicular traffic.

Approximately 2.55 miles of road would be fully decommissioned (Table 2-12). Fully decommissioning would include decompacting the surface to a depth of 12 inches and slash and other debris would be placed along the roads length to provide ground cover and discourage OHV use. Blockage at the entrance would consist of placing earthen berms, logs, slash, boulders, and other material so the entrance is camouflaged and vehicle use is precluded. All drainage structures would be removed. Treatments described may be modified by the authorized officer with consultation with appropriate earth scientists or aquatic specialists. All road treatment activities would adhere to associated project design features identified in Section B (Components Common to the Action Alternatives).

Two new landings would be constructed; one on road 39-4-19.5 and one on a non-system road in T39S-R4W-S25 SE ¼ (Map2-2) to avoid blocking roads used to access adjacent private land. Landings would be located outside of riparian reserves, would not exceed ½ an acre, and would adhere to associated project design features (p. 26, 28).

Table 2-11. Alternative 3: Proposed Haul Routes on Existing Roads in the Project Area

Road Number	Approximate Length (miles)	Existing Surface:	Control	Possible Road Stabilization or Drainage improvements	Seasonal Restriction
		Depth (inches) and Type			(for log hauling)
38-4W-17.00A	0.47	BST	BLM	3	0
38-4W-17.00B	0.76	BST	BLM	3	0
38-4W-17.00C	2.35	BST	BLM	3	0
38-4W-17.00D1	0.51	ASC	BLM	3	1
38-4W-17.00D2	0.07	ASC	BLM	3	1
38-4W-20.0A	0.16	GRR	BLM	3	1
38-4W-20.0B	0.71	GRR	BLM	3	1
38-4W-20.01	0.79	NAT	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	1
38-4W-20.02	0.07	NAT	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	2
38-4W-28.00A1	0.15	ASC	BLM	3	1
38-4W-28.00A2	1.72	ASC	BLM	3	1
38-4W-28.00A3	1.03	ASC	BLM	3	1
38-4W-28.00B1	1.16	ASC	BLM	3	1
38-4W-28.00B2	0.34	ASC	BLM	3	1
38-4W-28.00B3	1.89	GRR	BLM	3	1
38-4W-28.00B4	2.16	GRR	BLM	3	1
38-4W-28.01A1	0.10	PRR	BLM	3	1
38-4W-28.01A2	0.30	PRR	BLM	3	1
38-4W-28.01B	0.56	ASC	BLM	3	1
38-4W-28.01C	0.29	NAT	BLM	3	1
38-4W-28.02	0.48	GRR	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	1

Road Number	Approximate Length (miles)	Existing Surface:	Control	Possible Road Stabilization or Drainage improvements	Seasonal Restriction
		Depth (inches) and Type			(for log hauling)
38-4W-29.00A	1.11	ASC	BLM	3	1
38-4W-29.00B	1.43	GRR	BLM	3	1
38-4W-31.00	0.56	NAT	BLM	3	1
38-4W-31.01	0.64	NAT	BLM	3	1
38-4W-33.00	1.19	PRR	BLM	3	1
38-4W-33.01	1.00	ASC	BLM	3	1
38-4W-33.03	0.17	NAT	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	1
38-4W-34.00	0.26	ASC	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	1
38-4W-34.01	0.11	NAT	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	1
38-4W-34.02	0.26	NAT	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	1
38-4W-35.03C1	0.17	NAT	BLM	3	1
38-4W-35.03C2	1.27	NAT	BLM	3	1
38-4W-35.03D	0.03	NAT	BLM	3	1
38-4W-35.03E	0.60	NAT	BLM	3	1
39-4W-03.02	0.40	NAT	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	1
39-4W-06.00	1.25	ASC	BLM	3	1
39-4W-09.00A	0.27	ASC	BLM	3	1
39-4W-09.01A	0.26	ASC	BLM	3	1
39-4W-09.01B	0.21	NAT	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	1
39-4W-09.02	0.72	ASC	BLM	3	1
39-4W-09.03	0.62	NAT	BLM	Open closed road, Brush and Blade, Improve Drainage, Close after use	1
39-4W-17.00	0.37	NAT	BLM	3	1
39-4W-17.01	0.35	ASC	BLM	3	1
39-4W-19.01A	1.35	ASC	BLM	3	1

Road Number	Approximate Length (miles)	Existing Surface:	Control	Possible Road Stabilization or Drainage improvements	Seasonal Restriction
		Depth (inches) and Type			(for log hauling)
39-4W-19.01B1	0.13	ASC	BLM	3	1
39-4W-19.01B2	1.28	ASC	BLM	3	1
39-4W-19.01C	2.40	NAT	BLM	3	1
39-4W-19.03	0.18	NAT	BLM	3	1
39-4W-19.04	0.13	NAT	BLM	3	1
39-4W-19.05	0.18	NAT	BLM	3	1
39-4W-20.00	0.28	NAT	BLM	3	1
39-5W-01.00A1	0.52	ASC	BLM	3	1
39-5W-01.00A2	0.76	ASC	BLM	3	1
39-5W-01.00B	0.65	ASC	BLM	3	1
39-5W-01.01A	0.26	ASC	BLM	3	1
39-5W-01.01B	0.80	ASC	BLM	3	1
39-5W-01.01C	1.27	ASC	BLM	3	1
39-5W-02.00A	0.87	ASC	BLM	3	1
39-5W-24.00A1	0.02	ASC	BLM	3	1
39-5W-24.00A2	0.63	ASC	BLM	3	1
39-5W-24.00A3	0.10	ASC	BLM	3	1
39-5W-24.00B1	0.18	ASC	BLM	3	1
39-5W-25.00A	1.53	PRR	BLM	3	1
39-5W-25.00B	0.66	PRR	BLM	3	1
39-5W-25.01A	0.13	PRR	BLM	3	1
39-5W-25.01B	0.98	PRR	BLM	3	1
39-5W-25.02A	1.14	ASC	BLM	3	1
39-5W-25.02B	0.51	ASC	BLM	3	1
39-5W-25.03	0.43	ASC	BLM	3	1
Total mileage	46.69				

Abbreviations:

Existing Surface:

NAT=natural; ASC=Aggregate Surface Course; BST=Bituminous Surface Treatment

Control:

BLM=Bureau of Land Management; PVT=Private

Possible Improvements:

3=no road stabilization/drainage improvements. All BLM roads proposed for haul routes would be maintained to BLM-Standards

Seasonal Restrictions:

0=no restrictions

(for log hauling)

1=hauling restricted between 10/15 and 6/1

2= hauling restricted between 11/15 and 5/15

Note: If Purchaser furnishes and places additional rock, seasonal restrictions could be modified as approved by the Authorized Officer.

Table 2-12. Alternative 3. Proposed Road Decommissioning

Road Number	Approximate Length (miles)	Existing Surface:	Control	Comments
		Depth (inches) and Type		
38-4-34.00 Spur A	0.46	NAT	BLM	Fully Decommission After Harvest
39-4-03.02 Spur A	0.2	NAT	BLM	Fully Decommission

Road Number	Approximate Length (miles)	Existing Surface:	Control	Comments
		Depth (inches) and Type		
39-4-06.00 Spur A	0.57	NAT	BLM	Fully Decommission
39-4-06.00 Spur B	0.11	NAT	BLM	Fully Decommission
38-4-28.02	0.46	NAT	BLM	Closed, convert to Fully Decommission
39-4-19.00	0.4	NAT	BLM	Closed, convert to Fully Decommission
39-4-3.1	0.35	NAT	BLM	Closed, convert to Fully Decommission
Total mileage:	2.55			-

Abbreviations:

Existing Surface: NAT=Natural

Control: BLM=Bureau of Land Management

B. COMPONENTS COMMON TO THE ACTION ALTERNATIVES

1. Silvicultural Objectives and Dry Forest Prescriptions

All of the prescriptions included under the Pilot Thompson Project were designed to achieve the following overarching objectives:

- Conserve and improve survivability of older trees (trees >150 years of age) by reducing nearby fuels and competing vegetation.
- Increase resistance/resilience of forest stands and landscape to wildfire, drought, insects, etc. by reducing stand densities, ladder fuels, and shifting tree species diversity.
- Restore more sustainable structure and composition by reducing stand densities and enhancing tree diversity, including retention of hardwoods and desirable understory species.
- Accelerate development of structural complexity such as larger tree structures and decadence.
- Develop spatial heterogeneity within stands (e.g. fine-scale structural mosaic).
- Create conditions that are favorable for the initiation, creation, and retention of snags, down wood, large vigorous hardwoods, and understory vegetation diversity in areas where these are lacking
- Contribute to fulfilling the intent of the Endangered Species Act by conserving ecosystems upon which species depend and incorporating elements of active management proposed by the US Fish and Wildlife Service in the draft revised Recovery Plan for the Northern Spotted Owl.

The vegetation treatments proposed under the Pilot Thompson Project are divided into two categories: commercial and non-commercial treatments. Commercial refers to treatment areas where the trees to be removed are of sufficient size to be sold as saw logs to produce dimensional lumber or plywood veneer. Non-commercial refers to treatment stands where the material to be removed is smaller than eight inches diameter breast height (DBH).

The vegetation treatments proposed use a variety of silvicultural techniques based on the existing and potential vegetation at each site. A group of silvicultural prescriptions have been developed that match the potential and existing characteristics of each site with the forest vegetation goals. These prescriptions take into account changes in the potential vegetation based on factors such as aspect, slope, available moisture and soil type. The

prescriptions guide which trees are to be left and which trees are to be cut. The target density for trees left on each site is based on the individual site's ability to sustain healthy trees long term.

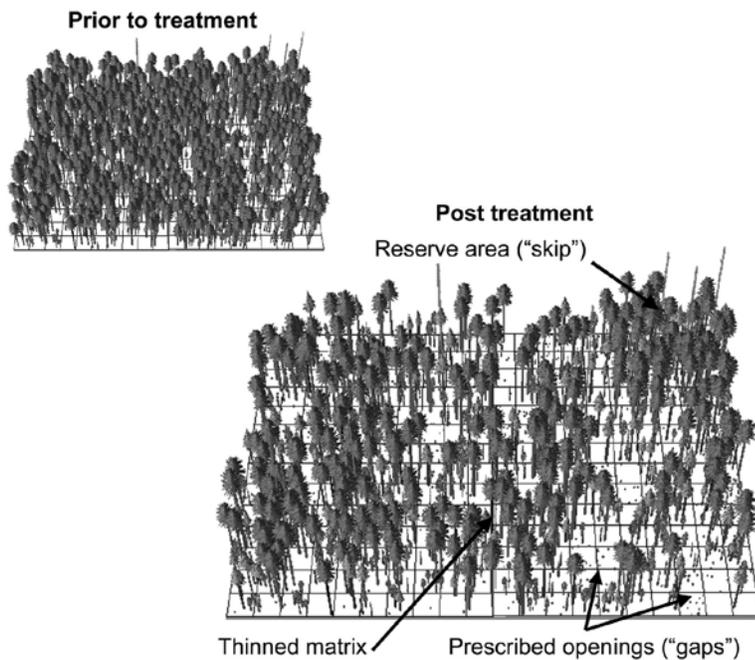
The silvicultural prescriptions are as follows:

Commercial Prescriptions

Variable Density Thinning:

The silvicultural prescriptions for this project are designed to move the current condition of crowded, uniform forest stands to site conditions that are more open and spatially heterogeneous (clumpy) in nature. The silvicultural strategies that will be applied to achieve the desired dry forest restoration goals include the use of variable-density management. This uneven-aged management approach encourages the creation of spatial heterogeneity and structural mosaics characteristic of historic dry forest stands. This prescription is used to accomplish dry forest restoration goals in stands >80 years old that have reached a mid seral condition. Variable-density thinning is designed to move the current condition of crowded and/or uniform forest stands to site conditions that are more open and spatially heterogeneous (clumpy) in nature. Stands would be thinned to an acceptable density level based on site conditions or plant community. Stand level features that are desired include a diversity of age class and species within the forest canopy. Variable-density thinning (VDT) for this project will combine thinning with gaps (small openings) and skips (untreated patches) to replicate historical patterns commonly found in mixed species and mixed-age stands. The thinned matrix or the area between skips and gaps will be thinned proportionally or from below (figure 2-1).

Figure 2-1. Graphic of a stand before and after thinning with skips and gaps.



Elements of the Variable Density Thinning prescription call for (see Appendix A for general marking guide):

- Retaining the older trees (conifer and hardwood) and improving their survival potential by eliminating nearby competing vegetation and ground/ladder fuels.
- Retaining other key structural/compositional elements in the stand.
- Leaving areas in the stand untreated (“skips”) to provide:

- ✓ diversity in structural conditions (e.g. heavily shaded areas);
 - ✓ desirable snag and down wood features;
 - ✓ hiding cover and break up visuals (e.g., for wildlife); and
 - ✓ Protection of sensitive areas (e.g., seeps, rock outcrops, special status species sites)
- Thinning the remainder of stand (after old tree protection and skips) to:
 - ✓ Favor more drought-and fire-tolerant tree species;
 - ✓ Protect hardwood species with high wildlife value (many require removal of some dominant/co-dominant conifers);
 - ✓ Increase the average diameter of the residual stand; and
 - ✓ Reduce overall stocking levels to a target basal area or density.
 - Creating some small openings for shade intolerant tree regeneration (e.g. pines) and plant if seed sources are limited or absent.
 - Treating activity fuels, such as by broadcast burning or pile-and-burn.
 - Enhancing heterogeneity and avoid creating homogeneity within a stand.

Variable Density Thinning/Douglas-fir Series:

Dry Douglas-fir stands are typically found on west, southwest, east, and southeast aspects in Douglas-fir plant associations. Douglas-fir is the predominant conifer species and ponderosa pine is often present in these stands. On dry ridges and westerly aspects in the Douglas-fir plant association, especially where manzanita is found, trees would be thinned to retain no more than 80 ft² basal area per acre. Treatment of activity fuels following completion of thinning activity is an essential component of this prescription. Specifically, the VDT prescription on dry Douglas-fir sites aims to achieve the following goals:

- Leave 60-120 ft² basal area per acre at the stand level. Low basal areas (e.g., 60-80 sq. ft.) are acceptable in the “driest” Douglas-fir plant associations where the goal is to restore a pine and oak component within the stand.
- Protect exceptional hardwoods. (See Appendix A)
- Leave all codominant and dominant pine, cedar, and oak; suppressed individuals can be cut.
- Leave SKIPS (+/-15% of the treatment area) to provide dense/shaded forest patches as habitat, hiding cover, and visual barriers; and ecologically significant patches, such as seeps, rock outcrops, and hardwood groves.
- Provide GAPS (+/-15% of the treatment area) to create some larger (1/2 to 2 acre) open areas to the extent of about 1 acre opening every 6 or 7 acres (or ~ +/-15% of the treatment area) for establishing pine regeneration and other understory components. Complete removal of overstory is not encouraged; i.e., generally leave some scattered trees remaining. Low density planting of fire resilient or drought tolerant species may be utilized in such gaps, where seed sources are limited or absent. The objective is to maintain a multi-aged and multi-species mix of drought tolerant and fire resilient species in dry forest stands. If no pines or cedars are available for retention, planting would increase species and structural diversity. Following initial treatment (variable-density thinning) units would be assessed for planting needs based on the available planting space and lack of species diversity in the stand. Tree planting spacing would be clumped and random, rather than evenly spaced. Seedlings would be planted no more than 100 trees per acre and planting sites would be dictated by microsite conditions.

Density Management /Intermediate Treatment:

This prescription is used to accomplish dry forest restoration goals in young to mid seral stands (40-80 years old) with high stem densities that are experiencing intense competition from conifer and hardwoods. These stands are heterogeneous in stand structure, while others are less patchy with high densities in the mid and lower tree layers. Treatment consists of cutting trees and shrubs (generally less than 20 inches diameter for conifer and less than 6 inches diameter for hardwoods) with chainsaws and disposing excess material by burning or biomass removal. In rare cases Pacific madrone up to 12 inch DBH may be cut under drip lines of ponderosa pine, sugar pine, white oak, and black oak greater than 16 inch DBH. Density management of these stands would remove fuel accumulations in patches while thinning lower and middle tree layers to accelerate development of a mature multi-layered stand structure. Treatment of activity fuels following completion of thinning activity is an essential component of this prescription.

- Leave 60-100 ft² basal area per acre at the stand level. Low basal areas (e.g., 60-80 sq. ft.) are acceptable in the “driest” Douglas-fir plant associations where the goal is to restore a pine and oak component within the stand.
- Protect exceptional hardwoods. (See Section C)
- Leave all codominant and dominant pine, cedar, and oak; suppressed individuals can be cut.
- Leave SKIPS (+/-15% of the treatment area) to provide dense/shaded forest patches as habitat, hiding cover, and visual barriers; and ecologically significant patches, such as seeps, rock outcrops, and hardwood groves. GAPS will not be prescribed for these stand types or units.

Riparian Reserve Thinning

This prescription is used to implement management within specified Riparian Reserves consistent with Aquatic Conservation Strategy (ACS) objectives, while meeting site specific restoration objectives for dry forest stands. Treatments would be limited to non-perennial streams and based on site specific stand/vegetation conditions. Treatments would be designed to maintain or improve aquatic systems, achieving consistency with short and long term ACS objectives. Vegetation treatments would be limited to thinning in young to mid seral stands to reduce stand density and acquire desired vegetation characteristics. These vegetation treatments will increase species diversity and tree vigor within dry Douglas-fir stands that exhibit uncharacteristic stand structure and species composition. Treatment consists of cutting small diameter conifers (generally less than 12 inches), non-riparian hardwoods, and shrubs. Stands would be thinned to a canopy cover range of 50-60 percent. This will remove fuel accumulations in patches while thinning lower and middle tree layers to accelerate development of a mature multi-layered stand structure. Vegetation would be treated in designated Riparian Reserves outside of a no treatment buffer (50 ft.). Designated no treatment buffers would be maintained to provide for additional SKIPS, thus filtering runoff, protecting habitat for riparian-dependent species, and maintaining large wood for distribution to downstream fish-bearing waters. GAPS will not be prescribed in Riparian Reserves. Riparian Reserve widths would conform to the interim widths prescribed in the Northwest Forest Plan (pg. C-30). Riparian Reserve thinning will occur between the no treatment buffer (50 ft. slope distance) from a non-perennial channel and a site potential tree height distance (155 ft. slope distance) from a non-perennial channel. Riparian Reserve thinning will occur within specified commercial treatment areas and be treated according to Riparian Reserve Thinning guidelines only (refer to Section C).

Non-Commercial Prescriptions

Understory Reduction - Non-commercial Removal within Commercial Stands:

Non-commercial understory vegetation reduction would occur in some stands that also receive commercial variable-density thinning. These areas would be treated using manual techniques (cutting with saws) to achieve desired tree densities. The objective is to maintain a multi-layered mix of conifer, hardwood and shrub species appropriate to the plant series. Conifer, hardwood, and shrub spacing widths and retention will vary depending on site conditions and plant community.

Understory vegetation density would be reduced by cutting and spacing Douglas-fir <8" DBH, Pacific madrone <6" DBH, and canyon-live oak <4" DBH. Spacing widths may vary from 15 to 25 feet for Douglas-fir and 25 to 35 feet for Pacific madrone and canyon-live oak. Within this range, the wider spacing would be used for species such as pine or oak, which thrive in open, sunny conditions. These species will be spaced off trees ≥ 8 " DBH and within the dripline of ponderosa pine and sugar pine ≥ 8 " DBH. The spacing of conifers will be independently spaced from hardwoods.

Vegetation diversity would be obtained by maintaining species occurring at low frequencies in the stand (i.e. incense cedar, sugar pine, white oak, black oak). All shrub species other than whiteleaf manzanita, buckbrush and deerbrush ceanothus will be reserved from cutting. All conifer and hardwood species other than Douglas-fir, Pacific madrone, and canyon-live oak are reserved from cutting. If competition to pine trees exists, black oak <6" DBH and unhealthy pine <8" DBH will be cut. Canyon-live oak and black oak will generally not be cut unless appropriate for the plant community. In some stands all hardwoods will be reserved. Refer to the density management prescription below for the required reserve (no cut) vegetation for understory reduction. The slash created from the understory reduction treatment, including harvest activity slash, would be hand-piled and burned (HP/B) or underburned (UB). In some cases, material would be removed from the unit and yarded to the road and used as woody biomass. Activity slash will be treated within 12-18 months of creation.

Density Management (Plantation and Non-Plantation):

Density management is used to accomplish forest health thinning and fuels reduction treatments in conifer forests, hardwood woodlands, and shrublands. Density management consists of cutting small trees (generally less than 8 inches diameter) and vegetation with chainsaws and disposing of the material by hand-piling and burning or use of a lop and scatter method in lighter fuels. Density management increases tree growth rates and promotes horizontal and vertical structural diversity in stands and capitalizes on existing stand diversity to promote further stand diversity over time. Density management is also used in stands where pines and shade intolerant hardwood species are diminishing in vigor and numbers because of overcrowded stand density conditions.

Conifer, hardwood, and shrub spacing widths will vary depending on site conditions and plant community. Spacing widths may vary from 15 to 25 feet for conifers and 25 to 45 feet for hardwoods and shrubs. Within this range, the wider spacing would be used for larger leaf trees or for species such as pine or oak which thrive in less dense conditions. Hardwoods ≥ 6 " DBH and conifers ≥ 8 " DBH are reserve vegetation and shall not be cut. These trees shall be included in spacing requirements. A minimum of one-quarter to one-half acre "skips" or no-treatment areas (15% +/- at the stand level) would be untreated to further facilitate diversity. Plant buffers, hardwood areas, rock out-crops, wet areas, and areas with large woodrat nests would contribute to or serve as these leave areas. Pre-existing small openings experiencing encroachment would be targeted first to restore open patches.

Thinning treatment should maintain species composition similar to the potential vegetation or dominant plant association for the site. Retained stems per acre will vary widely, ranging from 70-200 trees per acre. When considering a group of conifer trees for thinning, select leave trees by the following order of species preference, sugar pine, ponderosa pine, incense cedar, Douglas-fir, and white fir. When considering a group of hardwood trees for thinning, select leave trees by the following order of species preference, black oak, canyon live oak, and Pacific madrone. Depending on plant community one or more species may be reserved from cutting (see below). Vegetation reserved from cutting will always be maple species, dogwood, pacific yew, silk tassel, hazel, willow, and ocean spray, regardless of spacing (i.e., not included in spacing or considered leave trees). No removal of white oak, mountain mahogany and manzanita >12" single stem at one foot above ground. Any species of conifer, hardwood or shrubs considered as rare (less than 5% coverage) within the entire unit shall be left. The slash created from the density management treatment would be hand piled and burned or if markets exist removed and used as woody biomass fuel. In dry forest stands (conifer dominated) tree planting of drought tolerant and fire resilient species would be programed if planting space is available and lack of species diversity is observed

following treatment. Tree planting spacing would be clumped and random, rather than evenly spaced. Seedlings would be planted no more than 100 trees per acre and planting sites would be dictated by microsite conditions

Douglas-fir Series

Target Plant Association:

Douglas-fir – Ponderosa Pine/Poison Oak

Douglas-fir – Canyon Live Oak/Dwarf Oregongrape

Douglas-fir – Canyon Live Oak/Poison Oak

Douglas-fir – Incense-Cedar/Piper’s Oregongrape

Douglas-fir – Creambush Ocean-Spray/Whipplevine-Sword-fern

Goals:

1. Reduce fuels and fire hazard adjacent to conifer stands.
2. Promote a mix of more mature hardwoods and conifers (black oaks and ponderosa pine).
3. Maintain Historic Hardwood and Conifer Species

Prescription Description and Objectives:

Non-commercial - Douglas-fir (Non-Plantations):

Heterogeneous Douglas-fir stands >40 years old (pole 5-11” DBH through mid seral size 11-21” DBH) experiencing intense competition from conifer and hardwoods need to be managed to reduce stand densities, promote species diversity, and maintain vigorous crowns. Densities in these stands are heterogeneous in stand structure, while others are less patchy with high densities in the mid and lower tree layers. Density management of these stands would remove fuel accumulations in patches while thinning lower and middle tree layers to accelerate development of a mature multi-layered stand structure. Thinning would benefit species of shade intolerance and provide adequate growing space for large hardwoods and conifers alike. Vegetation would be cut to accelerate growth, promote stand differentiation, and maintain the hardwood component for future stand diversity. Spacing widths may vary from 15 to 25 feet for conifers and 25 to 45 feet for hardwoods and shrubs. The largest and healthiest best formed trees shall be selected as leave trees. Acceptable leave tree standards apply (i.e. greater than 3 feet tall, no broken tops, 30% crown or more). The spacing of conifer trees is independent of hardwood trees. Sprout clumps would be thinned to the largest stem and spaced within the 25-45 feet range. Select trees for leave with good form and vigor (non-chlorotic) that are free of disease and fire damaged. When acceptable leave trees are not available, shrub clumps at least one foot high and 3 to 10 feet in crown diameter shall be selected as leave vegetation.

Non-commercial - Douglas-fir (Plantations):

Homogeneous Douglas-fir stands 15-40 years old that are sapling through pole size (0-11” DBH) are experiencing intense competition from shrubs and hardwoods and need to be managed to reduce stand densities, promote species diversity, and maintain vigorous crowns. Densities in these younger seral stands are highly homogenous in stand structure, while others are more patchy with high densities in the mid and lower tree layers. Density management of these stands would retain the most vigorous large trees in patches while thinning lower and middle tree layers to accelerate development of a multi-layered structure.

Thinning activity would speed the natural processes of stand development toward an uneven-age and would benefit species of shade intolerance. Vegetation would be cut to accelerate growth, promote stand differentiation, and maintain the hardwood component for future stand diversity. Thinning and brushing would release residual conifers and hardwoods. Spacing widths may vary from 18 to 20 feet for conifers and 30 to 40 feet for hardwoods and shrubs. Leave trees shall be selected based upon tree species preference and quality. When

considering a group of trees for thinning, species preference and individual tree quality has precedence over tree DBH or height. For example, a healthy 4 foot tall sugar pine should be left instead of an 8 foot tall Douglas-fir tree. Spacing is to be independent of trees >8" DBH (e.g. acceptable to have a 4" DBH tree next to 15" DBH tree). Acceptable leave tree standards apply (i.e. greater than 3 feet tall, no broken tops, 30% crown or more). The spacing of leave trees <8" DBH is independent of hardwood and conifer trees ≥8" DBH. Retained stems per acre will vary widely, ranging from 100-150 trees per acre. Hardwood stems not selected as leave trees and all surplus trees up to 8" DBH would be cut. Sprout clumps or shrub-form hardwoods would be thinned to the largest stem and spaced within the 30-40 feet range. The straightest stems with the largest diameter at 2' above ground level and the best formed crowns with origins closest to the base of the stump would be selected for leave within sprout clumps.

Ponderosa Pine Series

Target Plant Association:

Ponderosa Pine – Black Oak

Ponderosa Pine – Douglas-fir

Goals:

1. Reduce fuels and hence fire hazard adjacent to conifer stands.
2. Promote a mix of more mature hardwoods and conifers (black oaks and ponderosa pine).
3. Maintain Historic Hardwood and Conifer Species

Prescription Description and Objectives:

Non-Commercial – Ponderosa Pine (Plantations and Non-Plantations):

These units now have a mix of conifers, hardwoods, (Pacific madrone and black oak) and shrub species such as deerbrush ceanothus, buckbrush and manzanita. High densities are evident and due to post fire sprouting. This prescription is intended to reduce fuel hazard and promote growth of hardwoods and conifers by thinning hardwood stems in clumps and singly and by thinning the conifers where found. Shrub species will be reduced primarily when competing with tree species and/or pose as a ladder fuel hazard. Conifers <8" DBH will be spaced 20-25 feet in overly dense patches of natural regeneration. Pacific madrone less than 6 inches DBH and canyon live oak less than 4 inches DBH and non-reserve shrub species should be spaced 25-45 feet apart. Slash multiple stem hardwoods less than 6 inches DBH, leaving one or two of the healthiest stems per clump. Black Oak will generally not be cut unless competing with itself at high densities. Trees selected for removal will usually be small and suppressed. Leave trees shall include primarily singles, however, clumps and groups shall also be considered as leave trees for spacing. Thin clumps to the most vigorous one or two stems. Spacing of conifer leave trees will be variable depending on size. Favor pine and oaks to leave in spacing selection. Pacific madrone will be retained when oak and pine are not present.

White Oak Series

Target Plant Association:

White Oak – Hedgehog Dogtail Grass

White Oak – Douglas-fir/Poison Oak

Goals:

1. Reduce fuels and fire hazard adjacent to private residences.
2. Promote a species mix that includes ponderosa pine, white oak, and native grasses.
3. Restore woodland/shrubland communities to sustainable density levels.

4. Create more open mosaic of historic vegetation.
5. Remove decadent shrubs and use prescribed fire, where appropriate, to stimulate re-growth and new sprouting of a mixture of shrub species to provide improved wildlife forage.
6. Improve native plant communities in the herb/forb/grass layer.

Prescription Description and Objectives:

Non-Commercial – White Oak:

This prescription is aimed at reducing fire-hazard within the full range of woodlands with oak and other hardwood components. Depending on initial conditions, the resultant stands may show a large reduction in shrubs and small trees. Underburning will be required for maintaining these sites in a low-fuel condition. Plant communities typically consist of open grown ponderosa pine and white oak with dominant ground cover of buck brush, the full range of woodlands with oak and other hardwood components. A mosaic of white oaks, deerbrush, buckbrush, and manzanita are found.

Due to fire suppression and stand dynamics, Douglas-fir has encroached in these communities and growth is seriously affected from moisture/competition stress. Slash all Douglas-fir trees less than 7 inches DBH. Encourage pine and oak longevity by thinning around these species. Pacific madrone less than 6 inches DBH and canyon live oak less than 4 inches DBH and non-reserve shrub species should be spaced 25-45 feet apart. Hardwoods shall be favored over shrub species to encourage grasses and forbs. Black Oak will not be cut unless competing with itself at high densities. Trees selected for removal will be small and suppressed. Leave trees shall include primarily singles, however, clumps and groups shall also be considered as leave trees. Absolutely no removal of white oak, mountain mahogany and manzanita >12" single stem at one foot above ground. Conifer, hardwood and shrub snags less than 6 inches DBH shall be felled. In areas where white oak or other reserve vegetation do not exist, leave clumps of shrubs with a 15 to 25 foot diameter spaced 45 feet apart. Suppressed or low vigor ponderosa pines can be cut. Leave chaparral shall include primarily single shrubs; however, clumps and groups shall also be considered as leave shrubs. Leave chaparral shall be left as 15 to 25-foot diameter singles or groups spaced 45 feet apart. Leave no large clumps within 50 feet of private property line.

2. Commercial Harvest Methods:

Trees designated for removal as a result of application of the forest stand prescriptions described above would be moved from forest stands to landing areas using a combination of cable and tractor yarding methods.

Cable (skyline) Yarding: This harvest method drags trees with one end suspended, and one end on the ground, up the slope to a landing area on or near a road. This requires narrow skyline corridors about every 150 to 200 feet, and parallel to each other, through the treatment unit to operate the skyline cable. Corridors are about 9 to 15 feet wide, depending on the size of trees to be removed and the terrain, and are pre-located and approved by the BLM. Trees removed are end-lined (dragged) to the corridor.

Tractor Yarding: utilizes tractors to drag trees to landing locations. Tractor yarding only occurs on lands with less than 35 percent slopes. This method requires narrow skid trails (about 9 to 12 feet wide). Skid trail locations are approximately 150 feet apart, but vary depending on the site-specific terrain, and are pre-located and approved by the BLM Contract Administrator. Pre-located skid trails minimize the area of ground a tractor operates on, thus, minimizing soil disturbance.

Tractor Swing Route – refers to a logging system in which harvested logs are moved from one landing to another. Under both action alternatives, logs would be harvested using a skyline system from a yarding position determined to be optimal. From the optimal yarding position, logs would then be moved via a skid trail to a roadside landing using ground-based equipment.

Helicopter Yarding: lifts trees bunched together by a cable, moving the trees from the treatment unit to a landing area near a road. Helicopter yarding allows for full suspension of the trees from the treatment unit to

the landing area and does not create skid trails or corridors. Trees posing safety hazards would be removed when operationally required.

3. Post-Harvest Fuels Reduction Treatments

Small diameter slash (generally 3 inches diameter and less) created from commercial forest thinning (activity slash) would be cut, handpiled, and covered with plastic following completion of timber harvest operations. Pile burning is usually completed within 1 month to 1 year of timber harvesting depending on the time of year the harvest occurred; slash needs a period of time to cure before burning can take place.

Follow-up maintenance underburning may take place within 5 years following initial treatments. Underburning involves the controlled application of fire to understory vegetation and downed woody material when fuel moisture, soil moisture, and weather and atmospheric conditions allow for the fire to be confined to a predetermined area at a prescribed intensity to achieve the planned resource objectives. Prescribed underburning usually occurs during late winter to spring when soil and duff moisture conditions are sufficient to retain the required amounts of duff, large woody material, and to reduce soil heating. Occasionally, these conditions can be met during the fall season.

Each of the foregoing fuels reduction treatments may be used as stand-alone treatments or in combination. Post-harvest evaluations would determine the extent and method of treatments needed (hand pile and burning, and/or underburning).

4. Project Design Features

Project Design Features (PDFs) are an integral part of the Action Alternatives (Alternatives 2 & 3). PDFs include seasonal restrictions on many activities in order to minimize erosion and reduce disturbance to wildlife. PDFs also outline protective buffers for sensitive species, mandate the retention of snags, and delineate many measures for protecting Riparian Reserves throughout the project. Most PDFs reflect Best Management Practices and standard operating procedures.

The PDFs with an asterisk (*) are Best Management Practices (BMPs) to reduce nonpoint source pollution to the maximum extent practicable. Best management practices (BMPs) are required by the Federal Clean Water Act (as amended by the Water Quality Act of 1987) to reduce nonpoint source pollution to the maximum extent practicable. BMPs are considered the primary mechanisms to achieve Oregon water quality standards. Implementation of PDFs in addition to establishment of Riparian Reserves would equal or exceed Oregon State Forest Practice Rules. A review of forest management impacts on water quality concluded that the use of BMPs in forest operations was generally effective in avoiding significant water quality problems, however the report noted that proper implementation of BMPs was essential to minimizing non-point source pollution (Kattelman 1996). BMPs would be monitored and, where necessary, modified to ensure compliance with Oregon Water Quality Standards. The PDFs listed below apply to the both action alternatives, Alternative 2 and 3.

Riparian Reserves

Northwest Forest Plan (NWFP) Riparian Reserves, as incorporated by the Medford District RMP, are located on federal lands throughout the planning area. A BLM stream survey crew conducted surveys within the Pilot Thompson project area in order to ensure that all areas needing Riparian Reserve protection were identified. The survey crew assessed stream conditions, documented the location of wetland and unstable areas, and determined whether stream channels were perennial, intermittent, or dry draws (USDA and USDI 1994:C30-C31). Stream maps were updated with the new information.

Site specific widths for each Riparian Reserve have been mapped in GIS and would be implemented under the action alternatives. Riparian Reserve widths were established based on a site potential tree height of 155 feet for the Middle Applegate Watershed. Therefore, Riparian Reserves for the Pilot Thompson project area are as follows:

- (1) Fish-bearing streams: 310 feet slope distance on each side of the stream.
- (2) Perennial nonfish-bearing streams: 155 feet slope distance on each side of the stream.
- (3) Intermittent nonfish-bearing streams: 155 feet slope distance on each side of the stream. Intermittent streams have a defined channel, annual scour and deposition, and are further described as short duration or long duration:
 - a. **Short Duration Intermittent:** A stream that flows only during storm or heavy precipitation events. These streams can also be described as ephemeral streams.
 - b. **Long-duration intermittent stream:** A stream that flows seasonally, usually drying up during the summer.
- (4) Unstable and potentially unstable ground: the extent of the unstable and potentially unstable ground.
- (5) Springs, seeps and other non-stream wetlands less than one acre in size, the wetland and the area from the edges of the wetland to the outer edges of the riparian vegetation. For this project, a buffer of 100 feet is being implemented to meet this requirement.
- (6) Constructed ponds and reservoirs, wetlands greater than one acre in size – Riparian Reserves consist of the body of water or wetland and: the area to the outer edges of the riparian vegetation, or the extent of the seasonally saturated soil, or the extent of unstable or potentially unstable areas, or to 155 feet slope distance from the edge of the wetland greater than 1 acre or the maximum pool elevation of constructed ponds and reservoirs, whichever is the greatest. For this project, a buffer of 155 feet, the height of one site potential tree, is being implemented to meet this requirement.

Harvest and Yarding

Objective 1: Protect Off-site Soil Erosion and Soil Productivity Loss

- When operationally feasible, all units would be yarded in such a way that the coarse woody debris remaining after logging would be maintained at or greater than current levels in order to protect the surface soil and maintain productivity.*
- Wherever trees are cut to be removed, directional felling away from Riparian Reserves, dry draws and irrigation ditches would be practiced. Maximum operational suspension would be practiced to alleviate gouging and other disturbance on draw side slopes and headwalls. Trees would be felled to the lead in relation to the skid trails. *
- All skid trail locations would be approved by BLM. Maximum area per unit in skid trails would be 12%. Existing skid trails would be utilized when possible. Tractors would be equipped with integral arches to obtain one end log suspension during log skidding. Skid trail locations would avoid ground with slopes over 35 percent and areas with high water tables. The intent is to minimize areas affected by tractors and other mechanical equipment (disturbance, particle displacement, deflection, and compaction) and thus minimize soil productivity loss. *
- Skid trails would be water barred according to BLM standards. Main tractor skid trails would be blocked with an approved barricade and camouflaged with slash and other debris where they intersect haul roads. The intent is to minimize erosion and routing of overland flow to streams by decreasing disturbance (e.g. unauthorized use by OHVs).*
- Tractor yarding would occur between May 15 to October 15 or on approval by the Authorized Officer. Some variations in these dates (early or later) would be permitted dependent upon weather and soil moisture conditions (<30% moisture at 3" depth). The intent is to minimize off-site erosion and sedimentation to local waterways. The authorized officer can approve operations outside of the above

dates based on input from BLM's staff watershed specialist's (hydrologist, fisheries biologist, or soil scientist).*

- For all cable yarding, maximum operational suspension would be maintained on slopes greater than 50 percent. Minimum corridor widths (generally less than 15 feet in width) would be utilized to assure silvicultural prescriptions and objectives are met. Corridors will be preapproved by the BLM; consider not using pre-existing corridors where impacts to established oak and pine species would occur.
- Skyline and tractor yarding would be avoided up and down dry draws. The intent is to minimize the occurrence of erosion and compaction in existing areas of concentrated surface or substrate flow.
- Helicopter landings would be constructed during the dry season (May 15th to October 15th).
- Helicopter landings would be treated to reduce soil erosion. Treatment of the running surface would be dependent on site conditions and would include one of the following: subsoil, till, or rip, effectively block access, then mulch and seed with native grasses or other approved seed.
- Fill slopes of helicopter landings would be seeded with native grasses or other approved seed mixes and mulched, except where rock occurs.
- No hauling would occur during the wet season (October 15th to May 15). This would protect the road from damage and decrease the potential for off-site sediment movement. An extension of these dates may be permitted by the Authorized Officer with a conditional waiver dependent upon weather, soil moisture, and surface condition of the roads.
- Dust abatement required by timber sale contracts would use water or lignin.
- On tractor swing trails, where determined necessary, any berms or ruts would be leveled to match the existing topography and slash and other debris scattered to discourage use and protect the surface from erosion after use.
- All landings would be treated to reduce soil erosion. Treatment of the surface would be dependent on site conditions and would include one or more of the following: subsoil, till, or rip, effectively block access, disperse runoff or other drainage improvements, and seeding and mulching with native grasses or other species.

Objective 2: Protect Riparian Reserves

- Minimize yarding corridors within Riparian Reserves. Full suspension of logs is required across all stream channels.
- No harvest would be allowed within Riparian Reserves of perennial channels. Where harvest occurs adjacent to other types of streams, no trees would be cut within 50 feet of either side of the channel.
- No ground based equipment would be permitted off of roads within Riparian Reserves. An exception is a designated skid trail in unit 25-3 that would cross a short duration intermittent and is necessary to treat the western portion of this unit. Prior to harvest, bump logs would be placed in the channel to minimize disturbance. Following harvest any berms or ruts would be leveled to match the existing topography and slash and other debris scattered so that 80 percent ground cover is achieved. The bump logs would be removed and any loose soil removed from within the channel.

- Trees would be directionally felled away from the stream channel and endlined from outside the Riparian Reserve. Where excess ground disturbance has been identified as a potential source of sediment, slash and other approved material would be scattered to maintain a minimum of 80 percent ground cover.
- No construction of new landings or expansion of old landings would be allowed in Riparian Reserves.
- No logging slash would be piled within Riparian Reserves.

Non-Commercial Treatments (Uplands Only)

Objective 1: Protect Off-site Soil Erosion and Soil Productivity Loss

- Vegetation would be thinned using manual techniques of cutting material by hand crews with chainsaws. Slash created by the project would be hand piled and burned if cut by hand crews. No piling in dry draws would be allowed.
- Old skid trails would not be opened or driven on without the approval of the authorized officer.
- Old skid roads would not be treated near the intersections with system roads in order to provide a visual screen and discourage vehicular access.

Non-commercial Treatments (Riparian Reserves)

Objective 1: Protect Function and Character of Riparian Reserves

- *Manual* vegetation treatments would *not occur* in the following portion of Riparian Reserves: within 50 feet of fish-bearing and perennial streams; within 50 feet from the edge of springs, seeps, and wetlands; within Riparian Reserves for unstable and potentially unstable areas; and within 30 feet of long-duration intermittent streams (Table 2-13). *
- Riparian hardwood species such as willow, ash, maple, alder, and black oak would not be thinned.
- Down large woody debris over 16" diameter would not be damaged, driven over, or used for fire wood.

Table 2-13. Riparian Reserve Buffer Distances – Non-Commercial Treatment Areas

	Manual treatments	Pile burning
Fish-bearing	50' buffer	50' buffer
Perennial	50' buffer	50' buffer
Long-duration intermittent	30' buffer	30' buffer
Short-duration intermittent	Where necessary (treating through is OK, as prescribed)	No piles in the channel or draw bottoms
Springs/seeps/wetlands	50' buffer	50' buffer
Unstable areas	Not allowed in RR	50' buffer

Objective 2: Protect Off-site Soil Erosion and Soil Productivity Loss

- Thinned material may be lopped and scattered in specific areas where pile burning is not desirable. This would occur if material is near stream channels or other wet or potentially wet areas.

- Crossing channels with vehicles or equipment, including ATVs and pickups, would be limited to existing system roads shown on EA maps. *
- Piles would not be placed in channel bottoms.

Prescribed Fire

Objective 1: Protect Riparian Reserves

- With underburns, no ignition would occur within Riparian Reserves.
- No pile burning would occur in the bottom of dry draws.

Objective 2: Reduce Soil Erosion and Soil Productivity Loss

- Underburns would be conducted only when a light to moderate burn can be achieved (spring-like conditions when soil and duff are moist), with the objective of maintaining on-site coarse woody material.
- Firelines for underburns would be constructed manually.
- Water bars and firelines would be constructed according to District guidelines (USDI 1995, p. 167).
- Piles would be dispersed across treatment areas.
- Piles would be burned when soil and duff moisture are high.
- No mechanical piling allowed off of roads or landing areas.
- Any containment lines constructed for fuels projects shall be sufficiently blocked along their entire length to preclude use by OHVs. This would include such measures as placing logs and slash, falling trees less than 8" dbh (excluding riparian reserves) or other actions as necessary.
- Where existing trails intersect treatment areas, avoid placement of slash piles on existing trails to prevent trail braiding and widening.

Objective 3: Prevent Chemical Water Pollution

- Foam retardant would not be used in Riparian Reserves.*

Roads

Objective 1: Protect Riparian Reserves

- No construction of new landings or expansion of old landings would be allowed in Riparian Reserves. *
- Landings within Riparian Reserves used during project implementation would be treated to reduce soil erosion. Treatment of the running surface would be dependent on site conditions and would include subsoiling to lift and fracture the compacted surface in place to a depth of 18 inches. Mulching and seeding with native grasses or other approved material would be required. Where feasible, the landings shall then be blocked sufficiently to preclude vehicles.

Objective 2: Prevent Off-site Soil Erosion

- Landing construction and renovation would not occur during the winter months (October 15 to May 15) when the potential for soil erosion and water quality degradation exists. An extension (earlier or later) of these dates may be considered under dry conditions and a specific erosion control plan is prepared and accepted (e.g. rocking, water barring, seeding, mulching, barricading). All construction activities would be stopped during a rain event of 0.2 inches or more within a 24-hour period or if determined by the administrative officer that resource damage would occur if construction is not halted. If on-site information is inadequate, measurements from the nearest Remote Automated Weather Station would be used. Construction activities would not occur for at least 48 hours after rainfall has stopped and on approval by the Authorized Officer. *
- Following use, all newly constructed and renovated permanent roads would be effectively blocked to preclude use. Blockage would consist of placing logs, slash, boulders, berms, and other material both at the entrance so that it is camouflaged, and at sufficient intervals along the roads length.
- Temporary roads used or constructed would be either fully decommissioned or obliterated at the completion of log haul and site preparation. Full decommissioning would include decompacting the surface to a depth of 12 inches and slash and other debris would be placed along the roads length to provide ground cover and discourage OHV use. Blockage at the entrance would consist of placing earthen berms, logs, slash, boulders, and other material so the entrance is camouflaged and vehicle use is precluded. Obliterated roads would be treated similar to full decommissioning, however where fill occurs recontouring, and outsloping the travelway to disperse runoff would occur. Both methods would include the removal of all drainage structures. Treatments described may be modified by the authorized officer with consultation with appropriate earth scientists or aquatic specialists.
- Newly constructed roads would be outsloped where possible.
- Bare soil due to road renovation would be protected and stabilized prior to fall rains.*
- In order to reduce the amount of road-related soil disturbance, decommissioning would occur during the dry season (usually May 15 to October 15).
- Preservation of Existing Vegetation - Some road sections proposed for decommissioning have large amounts of naturally generated trees, brush and debris on them that is beneficial for long-term erosion control. This material would be preserved as much as possible but the priority would still be to convert all existing man-made drainage structures such as ditches, culverts and dips to a long-term no maintenance drainage configuration such as large dips, outsloping road surface, and well drained, high-capacity waterbars. Barricades, additional planting, seeding, and mulching would be done as needed to reduce erosion. Open areas would be ripped where feasible.*
- Obliteration or fully decommissioning roads may include decompacting the surface, outsloping or recontouring the travelway, removing drainage structures, seeding and/or planting, mulching, placing logs, slash and other debris, and constructing water bars, barricades, and other drainage features.
- Areas of disturbed ground on all decommissioned roads within Riparian Reserves would be seeded with native or approved seed and mulched. No fertilizer would be spread within Riparian Reserves.
- Excavated material from (removing) stream crossings would be removed to at least bankfull width. Stream side slopes would be reestablished to natural contour then seeded (with native or approved seed) and mulched.

- Decommissioned roads would be water barred on each side of stream crossings in order to adequately filter road surface runoff and minimize sediment transport to streams.
- OHV use on decommissioned roads would be discouraged by placement of debris or other appropriate barriers.
- Treatment would depend upon the existing vegetation on the particular road segment.*

Objective 3: Protect Natural Discharge Patterns

- Where possible, rolling grades and out sloping would be used on road grades that are less than 8%. These design features would be used to reduce concentration of flows and minimize accumulation of water from road drainage.

Objective 4: Protect Stream Banks and Stream Channel Integrity

- Stream crossings would be re-established to the natural stream gradient. This would be accomplished by removing the culvert and the road fill within the stream crossing areas.

Hauling

Objective 1: Prevent Off-site Soil Erosion

- No hauling would occur on natural surfaced roads during the wet season (October 15th to June 15th). This would protect the roads from damage and decrease the potential for off-site sediment movement. Some variations in these dates would be permitted dependent upon weather and soil moisture conditions of the roads.
- Hauling would be allowed between May 15th and November 15th on roads surfaced with at least 6 inches of pit-run rock or 8 inches of crushed rock. Some variations in these dates would be permitted dependent upon weather and soil moisture conditions of the roads.
- Dust abatement would include water or lignin.

Quarries

Objective 1: Protect Riparian Reserves

- No quarry development or expansion would occur within Riparian Reserves.

Objective 2: Prevent Off-Site Soil Erosion

- Rock used to stabilize selected roads and landings and minimize erosion would be obtained from existing quarries or purchased.

Oil and Hazardous Materials Emergency Response

- During operations described in the Proposed Action, the operator would be required to have a BLM-approved spill plan or other applicable contingency plan. In the event of any release of oil or hazardous substance, as defined in Oregon Administrative Rules (OAR) 340-142-0005 (9)(d) and (15), into the soil, water, or air, the operator would immediately implement the site's plan. As part of the plan, the operator would be required to have spill containment kits present on the site during operations. The operator

would be required to be in compliance with OAR 629-605-0130 of the Forest Practices Act, Compliance with the Rules and Regulations of the Department of Environmental Quality.

- Notification, removal, transport, and disposal of oil, hazardous substances, and hazardous wastes would be accomplished in accordance with OAR 340-142, Oil and Hazardous Materials Emergency Response Requirements, contained in Oregon Department of Environmental Quality regulations.

Silviculture

Objective 1: Protect Residual Leave Trees

- In forest stands with a pine component, logging slash should be handpiled outside of the driplines of individual pine trees and burned.
- Prescribed burns should be performed when moisture conditions are high enough and prescription windows are at a level so that no more than 50% of the mound depth/duff layer around pine trees is consumed during burning.
- No more than 25% of the pine tree live crown should be scorched for trees 8 inches DBH and larger.
- Implement prescribed underburning when soil and duff moisture and weather conditions allow for low intensity burning in order to minimize tree stress and adverse effects on tree roots and foliage.

Objective 2: Create growing sites and reduce competing vegetation for natural seedlings

- In forest stands with a pine component, treat logging slash and fuel loading to prepare suitable seedbeds for reproduction.

Objective 3: Protect unique features during stand treatment

- During timber harvest, hardwood trees marked in yellow paint need to be carefully treated around to prevent damage to limbs, tops, and stems. Logging corridors should be designed to avoid or minimize damage to yellow marked trees of both conifer and hardwood species.
- Snags (standing dead trees) not considered as a safety hazard shall be protected and remain standing.
- Fuels treatment activities such as handpiling and burning are not allowed within “Skips”. Skips are designated areas within a stand that are not to be treated, manipulated, or managed.

Terrestrial Wildlife

Objective 1: Protect Northern Spotted Owl Nest Reserves

- Reserve from harvest designated 100-acre core areas for northern spotted owl sites designated as known sites on January 1, 1994.
- Seasonally restrict habitat modifying activities from March 1 to September 30 within 0.25 miles of known northern spotted owl sites. The seasonal restriction could be waived if the BLM determines the site is not occupied or owls are not nesting.

Table 2-14. Commercial Units with Seasonal Restrictions for the Northern Spotted Owl.

Unit	TRS	Restriction Dates
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3-1	39S-4W-3	March 1 – September 30
3-5	39S-4W-3	March 1 – September 30
8-1	39S-4W-8	March 1 – September 30
31-1	38S-4W-31	March 1 – September 30
31-4	38S-4W-31	March 1 – September 30

Objective 2: Reduce Disturbance (noise and habitat) Impacts to Northern Spotted Owl

- Work activities that produce noise above ambient levels will **not** occur within specified distances (Table 2-15) of any nest site or activity center of known pairs and resident single between March 1st and June 30th (or until two weeks after the fledgling period) unless protocol surveys have determined the activity center is not occupied, the NSO pair is not nesting or failed in their nesting attempt. The wildlife biologist has the authority to extend the seasonal restriction beyond June 30th if surveys indicate the NSO young have not developed sufficient mobility by June 30th.

Table 2-15. Noise Disturbance Distance Buffers for the Northern Spotted Owl

Type of Activity	Zone of Restricted Operation
Blast of more than 2 pounds of explosive	1 mile
Blast of 2 pounds or less of explosive	360 feet
Impact pile driver, jackhammer, or rock drill	180 feet
Helicopter or single-engine airplane	360 feet
Chainsaws	195 feet
Heavy Equipment	105 feet

- Prescribed burning during the nesting season within 0.25 miles of occupied habitat would be dependent upon area biologist review and concurrence. The Service will be notified of all such occurrences.

Objective 3: Provide Wildlife Trees & Habitat for Cavity Dependent Species

- All non-hazardous snags would be retained in all harvest units. If it is necessary to fall snags for safety reasons, they would remain on site as coarse woody debris (CWD).
- Do not mark large, green broken-top trees and large snags with loose bark. Retain and protect these structures where possible.
- All trees damaged during felling operations that were not originally marked for treatment will be retained for future snag and cavity recruitment.

Objective 4: Protect Special Status Wildlife Species

- Seasonally restrict disturbance activities from March 1 to July 15 within 0.25 miles of known and occupied nest sites of other raptors (e.g., goshawk, red-tailed hawk, Coopers hawk, flammulated owl). No known nests exist within 0.25 miles of treatment units. This restriction would be implemented in the event of the discovery of such a nest prior to treatment activities.
- Seasonally restrict harvest activities up to 0.25 miles no line of sight and 0.5 miles line of sight around active bald or golden eagle nest sites from February 1 to August 15. No known nests exist within 0.5 miles of treatment units. This restriction would be implemented in the event of the discovery of such a nest prior to treatment activities.

Objective 5: Protect Townsends Big-eared Bat

- Protect occupied sites (mine adits) from disturbance and management activities that may alter micro-site conditions with a 250 foot no treatment buffer (RMP, p.57). This is anticipated to effect units 4-1 and 9-1.

Objective 6: Protect Survey and Manage Wildlife Species and Habitat

- Known great gray owl nests would be protected with a 30 acre management area and a ¼ mile protection zone (approx. 100 acres).
 - a. Within the 30 acre management area, management treatments are limited to protection or improvement of nesting habitat.
 - b. Within the ¼ mile protection zone,
 - i. Provide a 300 foot buffer around natural openings greater than 10 acres that have nesting habitat associated with them. Within this 300 foot buffer, treatments are limited to protection or improvement of nesting habitat.
 - ii. Prohibit disturbance from management activities within 300 feet of nesting habitat (1 mile radius for blasting) from March 1st-July 31st, or until fledging, whichever is later, unless surveys of the nesting habitat indicate no presence or no nesting.

Table 2-16. Commercial Units with Seasonal Restrictions for Great Gray Owls.

Unit	TRS	Restriction Dates
20-1	T38S-4W-20	March 1 st – July 31 st
3-1	T39S-4W-3	March 1 st – July 31 st
4-1	T39S-4W-4	March 1 st – July 31 st
5-1	T39S-4W-5	March 1 st – July 31 st
8-1	T39S-4W-8	March 1 st – July 31 st
9-2	T39S-4W-9	March 1 st – July 31 st

- Known locations of Survey and Manage and Bureau Sensitive snails, *Monadenia chaceana*, *Helminthoglypta hertleini*, *Monadenia fidelis celeuthia*, *Vespericola sierranus* and *Deroceras hersperium* (a slug) would be protected through the application of a no treatment buffer.

Objective 7: Protect General Wildlife Habitat

- All snags greater than 16” DBH would be reserved from cutting unless they pose a safety hazard, in which case they would be left on the ground in the unit and a replacement standing tree would be identified for retention.
- Coarse woody debris (CWD) would be retained and protected from disturbance to the greatest extent possible during logging, burning and other project activities.
- Limit to the extent possible ground disturbing activities in areas with rock accumulations / talus. This includes designating skid roads and yarding corridors away from rock accumulations / talus wherever feasible.
- Leave approximately 10% of the hand-piles created from hazardous fuels reduction treatments unburned across treatment areas to provide refugia for small mammals and other species.

Botanical Resources

Objective 1: Protection of Bureau Special Status and Survey and Manage Plant Species

- Ground-disturbing activities outside proposed unit boundaries shall require Field Manager approval in consultation with the Resource Area botanist.
- Directionally fall harvest trees away from plant buffers.

Table 2-17. Bureau Special Status and Survey and Manage Plant Protection

Species name	# of sites ¹	Protection ²
<i>Chaenotheca ferruginea</i>	2	25 ft. no treatment buffer
<i>Chaenotheca subroscida</i>	1	25 ft. no treatment buffer
<i>Cypripedium fasciculatum</i>	8	50-100 ft. no treatment buffer
<i>Cypripedium montanum</i>	4	25-100 ft. no treatment buffer
<i>Eucephalis vialis</i>	2	25 ft. no treatment buffer
<i>Fritillaria spp. leaves</i>	2	100 ft. no treatment buffer
<i>Leptogium teretiusculum</i>	5	25-50 ft. no treatment buffer
<i>Zigadenus fontanus</i>	1	25 ft. no treatment buffer

¹ number of plant sites per species in the project area
² no treatment buffers = no cutting, slashing, logging activity, nor equipment entry

Objective 2: To Minimize the Spread of Noxious Weeds

- Vehicle and equipment use off existing roads in the project area would be limited to the dry season.
- Pressure wash vehicles and equipment that will travel off system roads prior to entry onto BLM-managed lands. Equipment moving from a weed infested work site to or through a non-infested area shall be field washed before moving. Field washing station shall include a high pressure pump, containment mat, filter system, and a holding tank.
- Seed or plant highly disturbed areas during project implementation with native plant materials.
- Mulch highly disturbed areas after treatment with weed-free straw or hay, per 63 FR 124:51102. Straw or hay must be obtained from the BLM or purchased from growers certified by Oregon Department of Agriculture's Weed-Free Forage Program. If hay is used, it must be from native grasses only.
- Treat noxious weed infestations as resources allow using the most effective methods to promote healthy native plant communities.

Cultural Resources

Objective 1: Avoid Impacts and Protect Cultural Resources

- There are recorded cultural sites in the project area which would be buffered prior to project implementation. Flagging would be placed 25 feet from the site boundary. No treatments will occur within this buffer.
- No fire line construction, prescribed burning, or hand piling/burning would occur within the flagged boundaries of the recorded cultural resources.

- Trees will be directionally felled away from cultural resource site buffers for one tree length (average 160 feet).
- If during project implementation the contractor encounters or becomes aware of any objects or sites of cultural value on federal lands, such as historical or pre-historical ruins, graves, grave markers, or artifacts, the contractor shall immediately suspend all operations in the vicinity of the cultural value and notify the COR. The project may be redesigned to protect the cultural resource values present, or evaluation and mitigation procedures would be implemented based on recommendations from the Resource Area Archaeologist with concurrence by the Ashland Field Manager and State Historic Preservation Office.
- Sites which have been determined **not** eligible, and having received State Historic Preservation Office concurrence, will be managed according to BLM Manual 8100.
- Sites that are within treatment units may be hand-treated to reduce fuel loading, and to lessen their visibility on the landscape. These sites will be identified prior to project implementation by district archaeological staff. All materials cut from sites will be piled off-site for burning purposes. The District archaeological staff will work with other Resource Area staff to identify suitable areas for pile burning.
- If new areas of ground disturbance are identified (such as helicopter or other landings, skid trails, etc. located outside of treatment units) these areas may need to be surveyed for cultural resources prior to their construction.
- Sites that are located within units that are scheduled to be treated by prescribed fire will have hand lines constructed around them as necessary to protect the resource from fire.
- Only existing breaches or areas along ditch systems designated by District archaeological staff shall be used during project implementation. If new crossings are needed to facilitate access, these areas will be developed with the archaeological staff and in consultation with SHPO if necessary.
- Brush and tree removal within ditch systems will be discussed with archaeological staff prior to removal. Any wooden features within ditches must remain in place and will be protected. All brush and other woody materials will be piled away from the ditches for burning.
- Prior to any underburning activities, all ditches or ditch segments will be examined by the District archaeologists to identify any wooden features. Appropriate mitigation for such features will be developed by District archaeologists.

Recreation

Objective 1. Ensure Public Safety

- On all major haul routes, signs will be posted to alert the public of logging operations, including the presence of trucks on roadways and recommended slow speeds (i.e. to proceed with caution).

Objective 2. Maintain public safety for recreationists using trails

- Place signs on haul routes where trail crossing exists on the route; 1) to alert drivers to the presence of the recreation trail crossing and, 2) to alert equestrian riders and hikers to the presence of logging operations and logging truck travel. The following roads are to be signed during logging operations; Hinkle Gulch Road (38S-4W-28.0), Misty C Spur (38S-4W-28.01), Section 33 Spur (38S-4W-33.01), Keeler Creek Spur (38S-4W-35.03) Ninemile Rd (39S-5W-24.0) Thompson Divide Rd (39S- 5W- 25.2_East Fork

County Road, Panther Gulch Rd.(39W-5S-2.0), Lower Ferris Rd (38S-4W-20) and Ferris Gulch Road (38S-4W-20).

C. GENERAL GUIDANCE APPLICABLE FOR ALL DRY FOREST SILVICULTURAL PRESCRIPTIONS

Strive to create diverse vertical and horizontal stand structure by leaving trees of all crown classes with crown ratios of ≥ 30 percent. Strive for stand diversity in regard to diameter classes, species composition, tree heights (crown classes), trees per acre, and the vigor of individual trees. Some diseased, forked-top, and dying and dead trees should remain.

The following trees with these legacy characteristics should be favored for retention over other trees when marking dry forest stands. Pay particular close attention to trees greater than 30" DBH, because these tree sizes may have the greatest likelihood of being >150 years of age than most trees below this diameter.

- Larger and older than the second growth trees in the current stand; an indication that the tree maybe one of the seed trees of the present day stand. These trees have a bottle-brush shape (non-symmetrical crown).
- Large diameter limbs indicating that the tree was once open grown and had a large crown. Limbs (live or dead) are usually heavy and gnarled, are covered with mosses and lichens, and are close to the ground.
- Douglas-fir will have thick bark with deep fissures and have a chocolate brown color. Second growth trees have more gray color in the bark. Ponderosa pines will have thick bark, plate-like and yellow orange in color.

Do NOT try to create uniformity/evenness in stand conditions in marking; DO try to encourage creation of spatial heterogeneity. Structural mosaics are characteristic of Dry Forest stands.

Retain clusters of trees, where appropriate, to thin clustered tree stems. Such clusters of 2, 3, 4, or more stems are characteristic structural features of all natural forest stands.

To encourage the maintenance and establishment of fire resilient species, retain conifers in the following order of species preference: sugar pine, ponderosa pine, incense cedar, Douglas-fir, and white fir. All commercial sized hardwoods are reserved from cutting.

Retain snags of various size and decay classes. Favor large deformed or unique green trees in the stand for future snag recruitment. When available, leave green trees (any diameter) immediately adjacent to snags that are greater than 16 inches DBH. These trees will provide additional structural and habitat diversity.

When practical protect green trees (any diameter) immediately surrounding large (greater than 16 inches DBH and 16 feet in length) pieces of coarse woody debris. Retention of green trees would minimize coarse woody debris disturbance and maintain the functional integrity of the coarse woody debris.

Protect large or exceptional hardwoods, particularly larger cavity-bearing trees for stand diversity and wildlife benefit. Leave conifers that have their crown entangled in a hardwood tree or pose a threat from potential damage from timber falling. Save large diameter and unique hardwoods for stand diversity, structure and wildlife.

Thin around large (>18" DBH) and/or old (>150 years) pine, oak and cedar trees. Protect these tree species by increasing growing space and decreasing competition around these trees. Mark all competing conifers around the leave or center tree twice the distance of the trees dripline (distance from tree bole to dripline). Leave all trees in a group if they exhibit these legacy characteristics. Trees that exhibit legacy characteristics should be preferred over tree size when selecting an individual or group to protect. Trees that are associated with legacy trees or create a unique type of stand structure or wildlife habitat shall not be marked.

Leave trees that are associated with old trees (i.e. root grafts, shared crowns) or create a unique type of stand structure for wildlife habitat. Reserve trees with bird nests, wildlife cavities, wide forks with flat nesting spots, or loose bark (bat roosts).

Watch for natural openings (windthrow, fire, etc.) in the timber stands. These can be expanded in size if necessary for gap creation.

In draws which are not designated as Riparian Reserves, leave trees in the center of the draw bottoms for soil stability (10-feet on each side is recommended).

Do not mark seed trees. Do not mark any tree, that if felled, would endanger a seed tree.

Riparian Marking Guide for Dry Forest Stands Using Canopy Cover

Overall Objectives:

- Increase resistance/resilience of forest stands and landscape to wildfire, drought, insects, etc. (e.g., by reducing stand densities, ladder fuels, and increasing tree species diversity);
- Restore more characteristic structure and composition (e.g., reducing stand densities and enhancing tree diversity, including hardwoods, and desirable understory species);
- Accelerate development of structural complexity (e.g., development of larger tree structures and decadence);
- Contribute to development of spatial heterogeneity in stand (e.g, fine-scale structural mosaic); and,
- Reduce risk of wildfire reaching areas where late successional forest conditions are emphasized.
- Meet Aquatic Conservation Strategy objectives

Prescription:

Stands would be selected on a site specific basis and marked for thinning by BLM personnel, with oversight from the Ashland Resource Area’s silviculturist, hydrologist, and fish biologist, to ensure that treatment units are marked to meet the objectives of Riparian Reserve Thinning. Thinning would be prescribed in Riparian Reserves that exhibit high density, poor crown ratios, and poor conifer seedling regeneration. Vegetation treatments would be limited to thinning and fuels reduction in young to mid seral stands to control stand density and acquire desired vegetation characteristics. Stands would be thinned to a canopy cover range of 50-60 percent. Suppressed trees with low vigor and poor crown ratio would be removed while leaving the largest, healthiest trees. These stands would be thinned predominately *from below*. Thinning would generally target trees in the intermediate and suppressed layers in order to maintain a relatively high canopy cover in the overstory.

Marking is based on maintaining 50% and 60% canopy derived from relative crown size. It enables the marker to vary leave tree spacing within a Riparian Reserve, maintain an average of 50% and 60% canopy for the Riparian Reserve area, and reduce stand densities. Use table A for 50% and 60% canopy cover.

Priority for retention trees: 1) Healthy pine with $\geq 30\%$ live crown ratio. 2) Healthy conifers that are in the dominant and co-dominant stand layer. 3) Healthy conifers that are in the intermediate stand layer.

Table A: Marking guidelines for leave tree spacing - using crown radius for 50% and 60% canopy cover.		
Average crown radius of the conifer tree selected for retention in feet	Maximum spacing between boles of the retention trees to obtain 50% Canopy Cover target in feet	Maximum spacing between boles of the retention trees to obtain 60% Canopy Cover target in feet
8 or less	20	18

Table A: Marking guidelines for leave tree spacing - using crown radius for 50% and 60% canopy cover.		
Average crown radius of the conifer tree selected for retention in feet	Maximum spacing between boles of the retention trees to obtain 50% Canopy Cover target in feet	Maximum spacing between boles of the retention trees to obtain 60% Canopy Cover target in feet
9	22	21
10	25	23
11	28	25
12	30	27
13	33	30
14	35	32
15 or more	37	34