

## Chapter 2 - Alternatives, including the Proposed Action

This chapter describes and compares the alternatives considered for the Niner Project. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the decision maker. Some of the information used to compare the alternatives is based upon the design of the alternative (i.e., acres of ground-based tractor logging versus helicopter logging, miles of temporary roads construction) and some of the information is based upon the environmental, social and economic effects of implementing each alternative (i.e., percentage of treatment units in detrimental soils classes, big game habitat variables, number of log truck loads, logging cost per mbf, and present net values).

### Alternatives

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#### Alternative A – Proposed Action

Alternative A is designed to implement the Forest Plan direction and meet S&Gs for the various forest resources. Specifically, the alternative presents an approach to meeting S&Gs and addressing the significant issue of detrimental soil conditions. The alternative uses a combination of log yarding systems with an emphasis towards low cost ground-based yarding systems.

This alternative would commercially thin about **3,328** acres of 60-80 year old stands and would yield about 50 MMBF to meet the purpose and need of maintaining the growth and health of the stands and producing a sustainable, commercial yield of wood products.

The stands would be thinned to a variety of densities ranging from about 60-100 trees per acre, maintaining canopy cover greater than 35 percent, and managing the relative densities down to about 30-45. Various prescriptive elements of variable density thinning would be employed such as leaving un-thinned patches, maintaining no thin areas to buffer and protect riparian and special habitats, creating small openings with dominant tree release and landing areas, and varying the tree spacing among the units.

Log removal would be accomplished with a combination of yarding systems. Alternative A would use a ground-based yarding system on about **1,652** (50 percent) acres, cable skyline yarding system about **1,233** (37 percent) acres, and helicopter yarding on about **443** (13 percent) acres.

The proposed yarding systems would require the construction of about **6.3** miles of temporary roads to access the thinning units, reconstruction on about 3.95 miles of existing roads, and maintenance on about **17.5** miles of existing haul route roads, and. Three perennial fish bearing stream crossing culverts under the main haul route Road 1928 would be replaced along with numerous ditch relief culverts scattered throughout the project area roads. This alternative would close about **19.5** miles of road to passenger vehicles after timber harvest activities by berming and/or gating. The roads would be rehabilitated and stored in a hydrologically stable condition. These road closures would meet the purpose and need to reduce open road densities and trend toward meeting S&Gs

for big game habitat. A temporary bridge would be installed to access Unit #209 (94 acres). The rest of the temporary roads would be closed after harvest activities.

The alternative would mitigate post-thinning fuels by yarding tops and branches and grapple piling at landing for all **3,328** treated acres. The alternative would also prescribe approximately **496** acres of grapple piling within 40 feet of most of roads in or adjacent to thinning units, and about **104** acres of under-burning. These proposed fuel treatments meet the purpose and need to manage fuel loadings within Forest Plans S&Gs.

The alternative includes North Fork and OHV trail maintenance and trail interpretative signing, firewood inventory and administration, timber stand improvement treatments, cleaning of garbage dumps and abandon vehicles within the project area. The alternative would potentially support the funding for in-stream placement of large woody debris in the NFMFR, and installation of fish passage culverts should money be available from the timber stumpage payments. These last two projects are not connected actions and separate environmental analyses would be completed for these projects.

Table 3 – Alternative A Unit Summary

Units	Acres	Silvicultural Prescription	Logging System	Fuels Prescription
11A	6.2	Thin to 75 TPA, No cut DBH limit 22” to protect OG in Wild & Scenic corridor	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
11B	7.4	Thin to 75 TPA, No cut DBH limit 22” to protect OG in Wild & Scenic corridor	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
11C	2.9	Thin to 75 TPA, No cut DBH limit 22” to protect OG in Wild & Scenic corridor	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
11D	1.8	Thin to 75 TPA, No cut DBH limit 22” to protect OG in Wild & Scenic corridor	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
12	98.9	Thin to 67 TPA, No cut DBH limit 22” to protect OG in Wild & Scenic corridor	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
12A	7.7	Thin to 67 TPA, No cut DBH limit 22” to protect OG in Wild & Scenic corridor	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
13	52.2	Thin to 67 TPA, No cut DBH limit 22” to protect OG in Wild & Scenic corridor	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
13A	31.0	Thin to 67 TPA, No cut DBH limit 22” to protect OG in Wild & Scenic corridor	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
14	82.4	Thin to 67 TPA, No cut DBH limit 22” to protect OG in Wild & Scenic corridor	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
15	29.4	Thin to 56 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn

<b>Units</b>	<b>Acres</b>	<b>Silvicultural Prescription</b>	<b>Logging System</b>	<b>Fuels Prescription</b>
<b>15A</b>	11.4	Thin to 56 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>15C</b>	5.2	Thin to 56 TPA	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>16</b>	59.4	Thin to 56 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>18</b>	41.7	Thin to 75 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>19</b>	35.4	Thin to 75 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>120</b>	37.2	Thin to 67 TPA	Helicopter	Yard Tops Pile & Burn Under Burn
<b>121</b>	29.9	Thin to 67 TPA	Helicopter	Yard Tops Pile & Burn Under Burn
<b>201</b>	582.5	Thin to 67 TPA	Tractor and Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>202</b>	468.5	Thin to 67 TPA	Tractor and Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>203</b>	43.0	Thin to 56 TPA	Tractor and Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>204</b>	465.5	Thin to 56 TPA	Tractor and Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>205</b>	220.4	Thin to 56 TPA	Tractor and Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>206</b>	28.5	Thin to 56 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>207</b>	45.7	Thin to 56 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>208</b>	172.1	Thin to 75 TPA	Tractor and Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>209</b>	94.3	Thin to 75 TPA	Tractor, Skyline, and Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>210</b>	2.6	Thin to 67 TPA	Tractor	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>211</b>	25.0	Thin to 56 TPA	Tractor	Yard Tops Pile & Burn

Units	Acres	Silvicultural Prescription	Logging System	Fuels Prescription
				Roadside grapple Pile & Burn
<b>212</b>	83.4	Thin to 56 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>214</b>	15.1	Thin to 67 TPA	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>215</b>	172.7	Thin to 56 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>216</b>	57.9	Thin to 67 TPA	Tractor	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>217</b>	31.5	Thin to 56 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>218</b>	26.1	Thin to 56 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>219</b>	106.6	Thin to 56 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn Hand Pile and Burn
<b>220</b>	36.9	Thin to 56 TPA	Helicopter	Yard Tops Pile & Burn Under Burn
<b>221</b>	13.8	Thin to 67 TPA	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>222</b>	32.1	Thin to 67 TPA	Tractor	Yard Tops Pile & Burn Roadside grapple Pile & Burn Hand Pile and Burn
<b>223</b>	61.9	Thin to 67 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn

TPA = Trees per acre, DBH=Diameter Breast height, OG=Old-growth

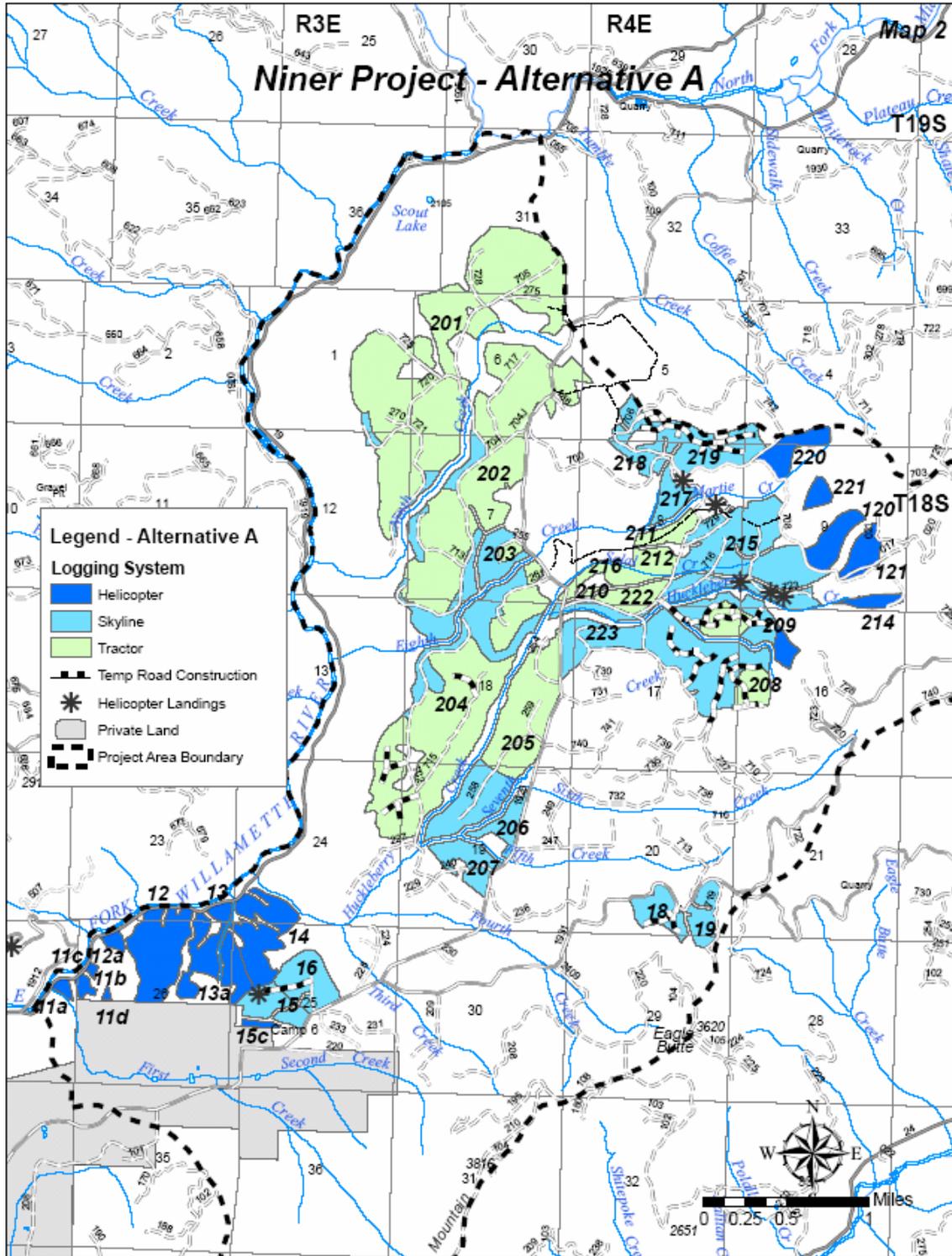


Figure 2 - Map of Alternative A

## Alternative B

Alternative B is also designed to respond to the significant issue of detrimental soil conditions with an emphasis toward restoration. The alternative would use a combination of log yarding methods with an emphasis towards achieving one-end or full log suspension which minimizes the impact of soil compaction and displacement. The alternative includes 13 small group selection patch cuts (about **60** acres) that will undergo restoration of compacted soil by soil tillage treatments.

This alternative would also commercially thin about **3,268** acres of 60-80 year old stand. This alternative would yield about 50 MMBF to meet the purpose and need of maintaining the growth and health of the stands and produce a sustainable and commercial yield of wood products.

The stands would be thinned to a variety of densities ranging from about 60-100 trees per acre, maintaining canopy cover greater than 35 percent, and managing the relative densities down to about 30-45. Various prescriptive elements of variable density thinning would be employed such as leaving un-thinned patches, maintaining no thin areas to buffer and protect riparian and special habitats, creating small openings created by dominant tree release and landing areas, and varying the tree spacing among the units.

Log removal would be accomplished with a combination of yarding systems. This alternative shifts the majority of ground-based yarding acreage to a cable skyline yarding systems. Alternative B would only tractor yard about **60** (2 percent) acres, skyline yard about **2,734** (83 percent) acres, and helicopter yard about **534** (15 percent) acres.

The proposed yarding systems would require the construction of about **5.0** miles of temporary roads to access the thinning units, reconstruction on about 3.95 miles of existing roads, and maintenance on about **17.5** miles of haul route roads. Three perennial fish bearing stream crossing culverts under the main haul route Road 1928 would be replaced along with numerous ditch relief culverts. This alternative would close about **19.5** miles of road to passenger after timber harvest activities by berming and/or gating. These roads would be rehabilitated and stored in a hydrologically stable condition. These road closures would meet the purpose and need to reduce open road densities and trend toward S&Gs for big game habitat. In this alternative, the temporary bridge would not be installed to access Unit #209 and the unit would be helicopter yarded. The temporary roads would be closed after harvest activities.

The alternative would mitigate the post-thinning fuels by yarding tops and grapple piling at landings for all **3,328** treated acres. The alternative would also prescribe approximately **496** acres of grapple piling within 40 feet of most of the roads in or adjacent to thinning units, **524** acres of supplemental hand pile and burning, and about **104** acres of underburning. These proposed fuel treatments meet the purpose and need to manage fuel loadings within Forest Plans S&Gs.

The alternative includes North Fork and OHV trail maintenance and trail interpretative signing, firewood inventory and administration, timber stand improvement treatments, cleaning of garbage dumps and abandon vehicles within the project area. The alternative would potentially support the funding for in-stream placement of large woody debris in the NFMFR, and installation of fish passage culverts should money be available from the timber stumpage payments. These last two projects are not connected actions and separate environmental analyses would be completed for these projects.

**Table 4 – Alternative B Unit Summary**

<b>Units</b>	<b>Acres</b>	<b>Silvicultural Prescription</b>	<b>Logging System</b>	<b>Fuels Prescription</b>
<b>11A</b>	6.2	Thin to 75 TPA, No cut DBH limit 22” to protect OG in Wild & Scenic corridor	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>11B</b>	7.4	Thin to 75 TPA, No cut DBH limit 22” to protect OG in Wild & Scenic corridor	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>11C</b>	2.9	Thin to 75 TPA, No cut DBH limit 22” to protect OG in Wild & Scenic corridor	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>11D</b>	1.8	Thin to 75 TPA, No cut DBH limit 22” to protect OG in Wild & Scenic corridor	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>12</b>	98.9	Thin to 67 TPA, No cut DBH limit 22” to protect OG in Wild & Scenic corridor	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>12A</b>	7.7	Thin to 67 TPA, No cut DBH limit 22” to protect OG in Wild & Scenic corridor	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>13</b>	52.2	Thin to 67 TPA, No cut DBH limit 22” to protect OG in Wild & Scenic corridor	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
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<b>Units</b>	<b>Acres</b>	<b>Silvicultural Prescription</b>	<b>Logging System</b>	<b>Fuels Prescription</b>
<b>14</b>	82.4	Thin to 67 TPA, No cut DBH limit 22" to protect OG in Wild & Scenic corridor	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>15</b>	29.4	Thin to 56 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>15A</b>	11.4	Thin to 56 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>15C</b>	5.2	Thin to 56 TPA	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn
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<b>18</b>	41.7	Thin to 75 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>19</b>	35.4	Thin to 75 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>29</b>	4.5	Group Selection	Tractor	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>30</b>	5.5	Group Selection	Tractor	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>31</b>	2.3	Group Selection	Tractor	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>32</b>	3.2	Group Selection	Tractor	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>33</b>	3.5	Group Selection	Tractor	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>34</b>	5.1	Group Selection	Tractor	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>35</b>	6.5	Group Selection	Tractor	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>36</b>	3.5	Group Selection	Tractor	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>37</b>	5.6	Group Selection	Tractor	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>38</b>	3.3	Group Selection	Tractor	Yard Tops Pile & Burn

<b>Units</b>	<b>Acres</b>	<b>Silvicultural Prescription</b>	<b>Logging System</b>	<b>Fuels Prescription</b>
				Roadside grapple Pile & Burn
<b>39</b>	4.5	Group Selection	Tractor	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>40</b>	4.9	Group Selection	Tractor	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>41</b>	7.0	Group Selection	Tractor	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>120</b>	37.2	Thin to 67 TPA	Helicopter	Yard Tops Pile & Burn Under Burn
<b>121</b>	29.9	Thin to 67 TPA	Helicopter	Yard Tops Pile & Burn Under Burn
<b>201</b>	582.5	Thin to 67 TPA	Tractor and Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>202</b>	468.5	Thin to 67 TPA	Tractor and Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>203</b>	43.0	Thin to 56 TPA	Tractor and Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>204</b>	465.5	Thin to 56 TPA	Tractor and Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
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<b>210</b>	2.6	Thin to 67 TPA	Tractor	Yard Tops Pile & Burn Roadside grapple Pile & Burn
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<b>Units</b>	<b>Acres</b>	<b>Silvicultural Prescription</b>	<b>Logging System</b>	<b>Fuels Prescription</b>
<b>212</b>	83.4	Thin to 56 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>214</b>	15.1	Thin to 67 TPA	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn Hand Pile and Burn
<b>215</b>	172.7	Thin to 56 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>216</b>	57.9	Thin to 67 TPA	Tractor	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>217</b>	31.5	Thin to 56 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>218</b>	26.1	Thin to 56 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn
<b>219</b>	106.6	Thin to 56 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn Hand Pile and Burn
<b>220</b>	36.9	Thin to 56 TPA	Helicopter	Yard Tops Pile & Burn Under Burn
<b>221</b>	13.8	Thin to 67 TPA	Helicopter	Yard Tops Pile & Burn Roadside grapple Pile & Burn Hand Pile and Burn
<b>222</b>	32.1	Thin to 67 TPA	Tractor	Yard Tops Pile & Burn Roadside grapple Pile & Burn Hand Pile and Burn
<b>223</b>	61.9	Thin to 67 TPA	Skyline	Yard Tops Pile & Burn Roadside grapple Pile & Burn

TPA = Trees per acre, DBH=Diameter Breast height, OG=Old-growth

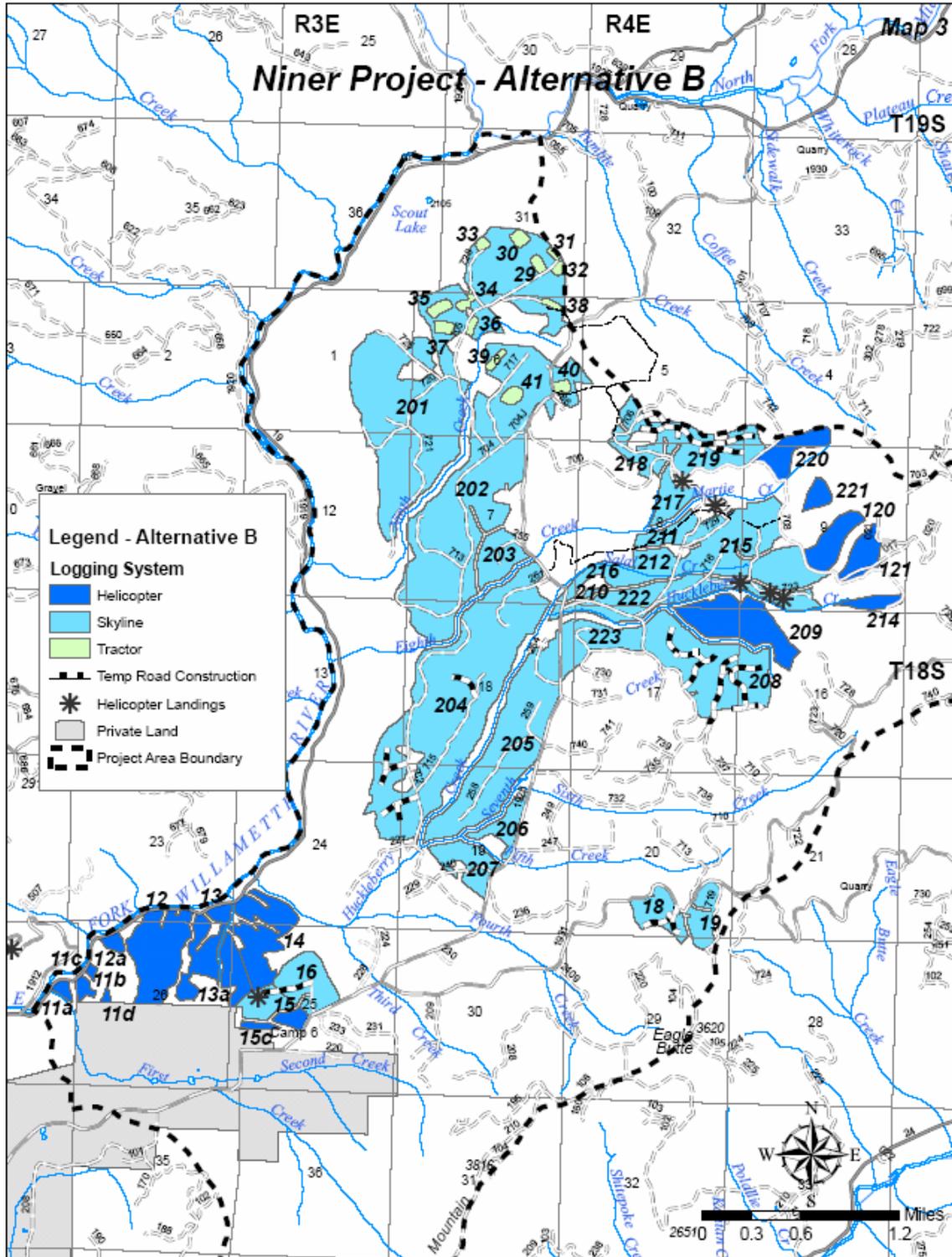


Figure 3 - Map of Alternative B

## Summary of Road Work Associated with Action Alternatives A and B

**Table 5 – Road Construction / Reconstruction and Road Closures**

Surface Type	New Road Construction <sup>1</sup>		Roads Reconstruction <sup>4</sup>	Road Closed <sup>5</sup>
	Permanent <sup>2</sup>	Temporary <sup>3</sup> Alt A/Alt B		
<b>Natural</b>	0	6.3/5.0	0	16.34 miles
<b>Aggregate</b>	0	0	3.75 miles	3.13 miles
<b>Paved</b>	0	0	0.2 miles	0
<b>Totals</b>	0	6.3/5.0	3.95 miles	19.47 miles

<sup>1</sup> Construction – builds new road,

<sup>2</sup> Permanent – road would remain available for use after the sale ends

<sup>3</sup> Temporary – road would be closed by berming, scarifying, waterbarring, seeding, and fertilizing after harvest activities (about 1 mile would be closed with a modified low level closure –see Table 8 footnote).

<sup>4</sup> Reconstruction – improves existing roads

<sup>5</sup> Closing – May include: berming the entrance, removal of culverts, out-sloping the road surface, pulling-back side slope fill material onto the cut slope, installation of water-bars removal of placed rock, and re-vegetation of the road prism.

**Table 6 – Road Reconstruction and Maintenance Summary –Alternatives A and B**

Road number	Surface Type	Miles	Maintenance Level or Reconstruction
<b>1928</b>	Aggregate	5.3	High, 3.75 miles of aggregate rock and 0.1 mile paved
<b>1931</b>	Aggregate	2.6	Low
<b>1912</b>	Aggregate	1.5	Low
<b>1928705</b>	Aggregate	2.2	Low
<b>1928700</b>	Aggregate	1.8	Low
<b>1928710</b>	Aggregate	1.4	Low
<b>1928702</b>	Aggregate	2.4	Low
<b>1928225</b>	Native Surface	0.3	Low
<b>Totals</b>		17.5	

Maintenance – includes blading, brushing, spot rocking, ditch cleaning

Low level maintenance may consist of brushing roadside vegetation, falling of snags and danger trees, blading of road bed, cleaning of ditches and culvert inlets and out lets, removing slough and slide material and placing crushed aggregate or asphalt surfacing and removing and replacing or installing new ditch relief culverts. These are standard maintenance and /or reconstruction activities that occur on all roads when commercial activity occurs or on a rotating basis determined by use and need.

Moderate level maintenance includes the same items of work as the low level with the addition of replacing culverts in intermittent and not-fish bearing perennial streams.

High level maintenance could involve all the work items in low and moderate levels with the addition of replacing culverts in fish bearing perennial streams and repairing major road failures within riparian areas.

**Table 7 – Major Culvert Replacement Summary – Alternative A and B**

Road Number	MP	New Culvert Diameter	Streamflow <sup>1</sup>
		Inches	Class
<b>1928</b>	0.12	24"	Intermittent
	0.67	24"	Intermittent
	1.43	84" countersunk or similar	Perennial
	1.85	84" countersunk or similar	Perennial
	2.34	60" countersunk or similar	Perennial
<b>1928700</b>	1.37	48"	Perennial
<b>1931</b>	0.79	24"	Intermittent
<b>Total #</b>			7

**Table 8 – Road Closures Summary – Alternatives A and B**

<b>Road Number</b>	<b>Miles</b>	<b>Closure Level</b>
1928240	0.41	Modified Low
1928254	0.30	Modified Low
1928255	0.28	Modified Low
1928258	0.78	Modified Low
1928261	0.15	Modified Low
1928275	0.25	Modified Low
1928290	0.28	Modified Low
1928712	0.96	Modified Low
1928713	0.52	Modified Low
1928715	0.86	Modified Low
1928716	0.28	Modified Low
1928717	0.67	Modified Low
1928721	0.94	Modified Low
1928723	0.44	Modified Low
1928729	0.35	Modified Low
1928730	0.66	Modified Low
1928731	0.36	Modified Low
1928735	0.44	Modified Low
1928739	0.57	Modified Low
1928740	0.57	Modified Low
1928741	0.25	Modified Low
<b>Subtotal</b>	<b>10.32</b>	
1928220	0.09	Low

<b>Road Number</b>	<b>Miles</b>	<b>Closure Level</b>
1928224	0.18	Low
1928225	0.22	Low
1928228	0.62	Low
1928229	0.19	Low
1928231	0.25	Low
1928246	0.08	Low
1928247	0.76	Low
1928249	0.33	Low
1928259	0.23	Low
1928261	0.53	Low
1928270	0.13	Low
1928301	0.14	Low
1928707	0.38	Low
1928709	0.36	Low
1928710	1.0	Low
1928737	0.45	Low
1928738	0.35	Low
1928742	0.54	Low
1928773	0.11	Low
1931101	0.20	Low
1931209	0.62	Moderate
1931710	0.90	Low
1931713	0.50	Moderate
<b>Subtotal</b>	<b>9.15</b>	
<b>Total</b>	<b>19.47</b>	

Low level closure: Barrier will be a berm with water bars to be constructed as needed. Water bars could be drivable or not. Administrative closures would fall in this category.

Modified Low level closure – Barrier will be a berm with waterbars to be constructed as needed. The road surface would be narrowed down to about one half the road width with soil tillage treatments. The restored area would be seeded with forage and native seed mixes. Woody debris would be pull back into the restored area and scattered.

Moderate level closure: Barrier would be a berm with water bars to be constructed as needed, possible removal of culverts in stream channel that are not in high fills. There could side cast pull back if needed. Water bars would not be drivable.

**Table 9 – Haul Route Summary – Alternative A and B**

<b>Haul Route by road #</b>	<b>Miles of Haul</b>	<b>Road Surface Type</b>	<b>Season of Use</b>
<b>1900</b>	4.	Paved	Year Round
<b>1912</b>	1.55	Aggregate Rock	Year Round
<b>1928</b>	5.3	Aggregate Rock	Year Round after rocking
<b>1931</b>	2.6	Aggregate Rock	Year Round
<b>1931719</b>	0.4	Aggregate Rock	Dry Haul
<b>1928225</b>	.22	Native Surface	Year Round after rocking
<b>1928702</b>	2.35	Aggregate Rock	Year Round after rocking
<b>1928715</b>	0.82	Aggregate Rock	Dry Haul
<b>1928258</b>	0.91	Native Surface	Dry Haul
<b>1928259</b>	0.23	Native Surface	Dry Haul
<b>1928254</b>	0.64	Native Surface	Dry Haul
<b>1928261</b>	0.55	Native Surface	Dry Haul
<b>1928255</b>	0.18	Native Surface	Dry Haul
<b>1928704</b>	1.95	Aggregate Rock	Year Round

<b>Haul Route by road #</b>	<b>Miles of Haul</b>	<b>Road Surface Type</b>	<b>Season of Use</b>
1928713	0.51	Native Surface	Dry Haul
1928717	0.68	Native Surface	Dry Haul
1928705	2.20	Native Surface	Dry Haul
1928720	0.80	Aggregate Rock	Dry Haul
1928721	0.94	Aggregate Rock	Dry Haul
1928725	0.61	Aggregate Rock	Dry Haul
1928728	0.39	Native Surface - Dirt	Dry Haul
1928700	1.75	Aggregate Rock	Year Round
1928730	0.31	Aggregate Rock	Year Round
1928290	0.25	Native Surface - Dirt	Dry Haul
1928710	1.40	Aggregate Rock	Year Round
1928716	0.82	Native Surface	Dry Haul
1928712	1.0	Native Surface	Dry Haul
1928729	0.52	Native Surface	Dry Haul
1928723	0.22	Native Surface	Dry Haul
1928706	0.5	Aggregate Rock	Dry Haul
1928708	2.0	Native Surface - Dirt	Dry Haul
<b>Totals</b>	36.6		

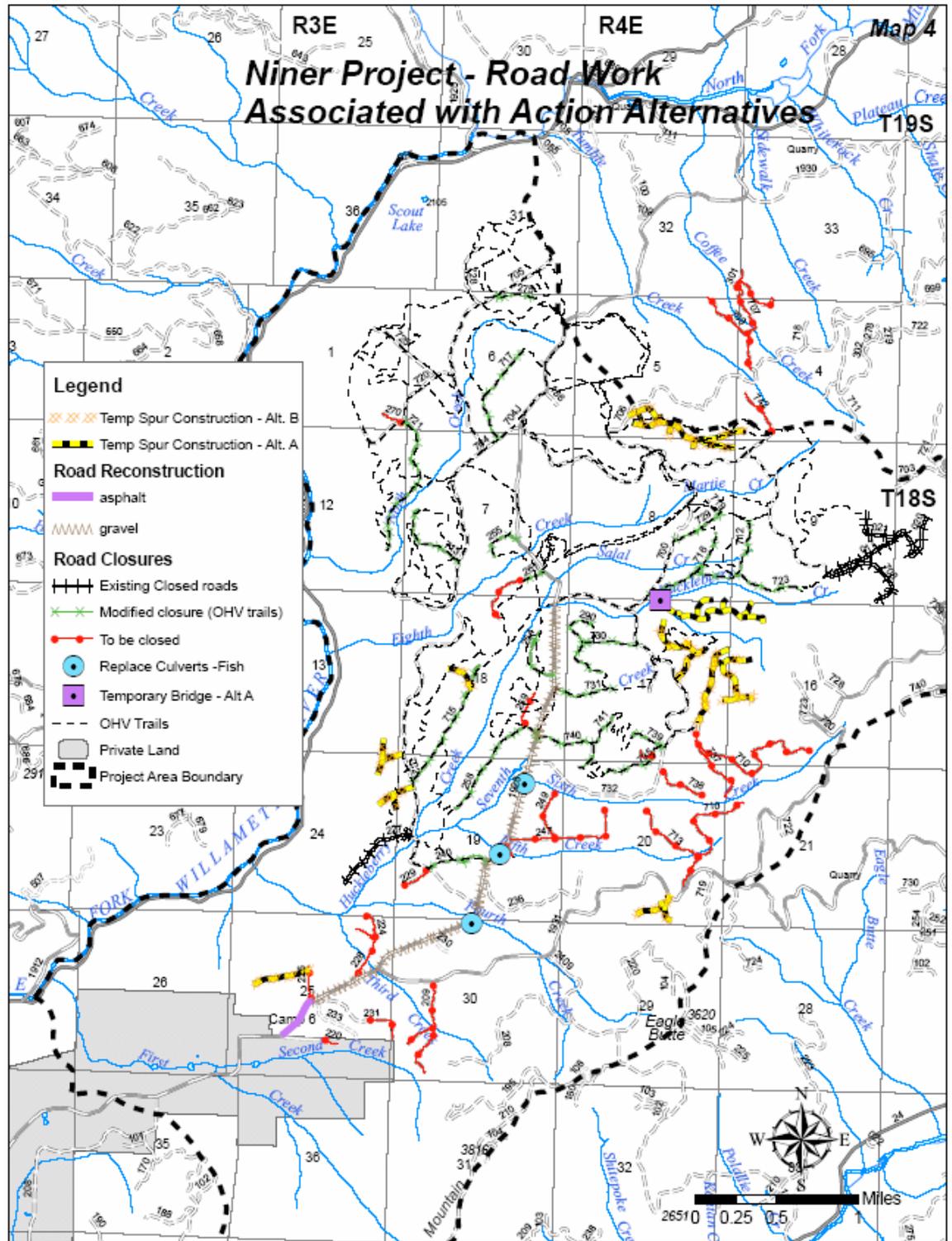


Figure 4 - Map of Road Work Associated with Action Alternatives

### **Alternative C – No Action**

Alternative C is the No Action alternative where the proposed project does not take place. No further activities would take place to manage the stands by thinning. The No Action alternative provides a benchmark, or a point of reference for describing the environmental effects between Alternative A (proposed action) and Alternative B

### **Alternative Considered But Eliminated from Detailed Analysis**

**Big Game Emphasis Alternatives** – An alternative were considered that would change the moderately rated Huckleberry Big Game Emphasis Area (BGEA) to low rated BGEA. This change would have been incorporated with a non-significant amendment to the Forest Plan S&Gs for deer and elk management. The Huckleberry OHV Trail Expansion Project Environmental Assessment is concurrently being completed in this area. The decision was made to assess the proposed Huckleberry BGEA change with the Huckleberry OHV Trail Expansion Project Environmental Assessment. The decision on the Huckleberry Trail Expansion Project EA is pending. Even though the current proposed action alternatives have elements associated with improving big game habitat (i.e. road closures, improving forage), the proposed change to the Huckleberry BGEA was eliminated from further detailed analysis in this project.

**No Commercial Harvest in Riparian Reserves Alternative** – As discussed under the issue on riparian management, the purpose and need for riparian management is established in the Forest Plans, Watershed Analysis, and Wild and Scenic River Plan. A scoping comment was received that suggested no commercial harvest in Riparian Reserves. Thinning and not extracting the excess trees would have created an unacceptable fuel loading condition which would increase risk of fire, fire intensities and rates of fire spread, suppression costs, and potential for resource damage. An alternative with absolutely no thinning in riparian reserves would not have met the purpose and need for the project to restore riparian conditions. The No Action alternative gives the Responsible Official the option to select no harvest in the Riparian Reserves. The option to have no commercial harvest in riparian reserves was not considered in other action alternatives and eliminated from further detailed analysis in this project.

**Restoration Alternative** – A restoration alternative was considered based on public comments. A “restoration only” alternative would not have met the purpose and need for this project. Therefore, a restoration alternative was not within the range of reasonable alternative choices which meet the purpose and need and not considered in the analysis.

## Mitigation Common to the Action Alternatives

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In response to Forest Plan S&Gs, laws and regulations, and public comments on the proposal, mitigation measures were developed to ease some of the potential adverse impacts the various alternatives may cause. The mitigation measures applied to both of the action alternatives.

### Soils/Water/Fish

#### *Riparian Reserves*

The riparian reserves would be treated with three slightly different prescriptions depending on the class of stream. The North Fork of the Middle Fork of the Willamette River (Class I) would retain a 170 foot wide no-harvest stream influence zone adjacent to the river because it is a ESA listed fish habitat. Adjacent trees would be felled away from the no-harvest zone, no cable yarding would occur across the river, and no burning would occur within the Riparian Reserve of any units adjacent to ESA listed fish habitat. On a segment of Huckleberry Creek, the no-harvest zone would be a variable width (about 200 to 600 feet) to retain all of the floodplain as defined by riparian indicator plants for streams lacking a clearly defined inner gorge. On the rest of the fish-bearing (Class II) streams, a minimum of 100 foot wide no-harvest zone would be retained. The non fish-bearing (Class III and IV) permanently flowing and intermittent flowing streams, ponds and small wetlands less than 1 acre would retain 50 ft wide no harvest zones on each side of the banks or surrounding the feature. These no-harvest zones would include all of inner gorge and the entire primary shade zone. Adjacent trees would be felled away from the no-harvest buffer. No cable yarding would occur across the stream. Under burning would be discouraged from entering the no-harvest zone on the smaller Class III and IV streams, but some low intensity backing fires would be permitted.

The upper portion of the riparian reserves from about 170-340 feet (NFMFWR), 100-340 feet (fish-bearing Class I and II) and 50-170 feet (non fish-bearing, permanent and intermittent flowing streams, ponds, and wetlands) from the channel or wetland edge would be thinned to a specified number of trees per acre to meet riparian and terrestrial objectives. The thinning would maintain and restore species composition and structural diversity and provide for habitat to support well-distributed populations of native plants, and invertebrate and vertebrate riparian-dependent species.

#### *Coarse Woody Debris*

No yarding of existing coarse woody debris shall occur in these stands. Protecting the existing coarse woody debris ensures adequate nutrient cycling for maintenance of long-term site potential and provides valuable habitat structure for a diversity of species. The majority of the coarse woody debris is remnant debris from the previous harvest entry.

For most of the unit's stand conditions, there is an opportunity to begin creating large woody debris where it is deficit and meet minimum standards for diameters of pieces and linear feet established in the Northwest Forest Plan. Approximately 2 trees per acre greater than 20 inches would be felled to create large down woody debris.

### ***Logging Operations***

Log suspension requirements and fuel reduction operations are prescribed to minimize soil disturbance within FW-081 and FW-084 (from Forest Plan) limits. In the case where mineral soil is exposed in specific locations beyond the level of maximum allowable disturbance, the site would be waterbarred, seeded, and fertilized immediately following harvest.

Ground-based yarding would be restricted to slopes less than 30 percent. The operating season for tractor yarding would be from July 15th to September 15th to minimize reduction of soil productivity (minimize additional soil compaction and puddling).

No timber yarding would be allowed through the no harvest zones of the Riparian Reserves. No ground based machines would be permitted to cross any streams, nor would skid trails be used within the no-harvest zones of the Riparian Reserves. Skyline yarding equipment would not be permitted within the no-harvest zones adjacent to any streams nor would skyline corridors cross any streams.

Trees to be harvested would be directional felled away from the no harvest zones of the Riparian Reserves.

### ***Compacted Soils***

Soil tillage treatments would occur on skid trails, temporary spur roads, landings, (Alternatives A and B) and in soil restoration units (Alternative B only). Alternative A would restore soil compaction areas on landings (206 acres), temporary roads (6.3 miles), and a portion of the modified low level closed roads (10 miles). Alternative B would restore soil compaction areas on landings (126 acres), temporary roads (5.0 miles), compacted soil harvest units (60 acres), and a portion of the modified low level closed roads (10 miles).

### ***Best Management Practices***

Best Management Practices (BMP) would be used during the construction of temporary spurs, maintenance and reconstruction of haul route roads, and during road closure to prevent and control soil erosion (see the Niner Watershed Specialist Report in the Analysis File for a complete listing of the BMP's applicable to this project).

Erosion control booms or straw mulch would be installed near road and stream crossings when sediment is generated from winter haul road.

Erosion prevention and control measure would implement during timber sale operation. Areas disturbed by harvest operations and road maintenance or reconstruction would be re-vegetated where needed and completed in a timely manner.

All logger constructed temporary spur roads used on the project would be closed by berming, scarifying, waterbarring, seeding, and fertilizing.

Water-bars would be install where needed to minimize water runoff on tractor skid trails, landings, the modified low level closed roads, and closed temporary roads.

Dry season operating restriction would be applied to all native surface temporary spur roads. If the purchaser request to operate outside the dry season period, then the purchaser would rock/gravel the spur upon approval of the FS official. Logging settings

that are accessed from existing graveled roads in portions of Units #16-19, #202-207, #211, #212, #217, #218, #222 and #223 are not constrained by the dry season restrictions.

Culvert replacement in live streams would be done during the ODFW in-stream work period for the North Fork of the Middle Fork Willamette River watershed (approximately July 1st to October 15<sup>th</sup>) with exceptions outside of dry season approved by Fish Biologist or Hydrologist.

## **Wildlife**

### ***Coarse woody debris***

As mentioned previously, all existing coarse woody debris would be protected. Coarse woody debris provides valuable habitat structure for a diversity of species. Current snags, defective trees, and down wood habitat would be protected to the greatest extent feasible during proposed activities.

Birds and small animals using standing snags for habitat would benefit by creating wildlife trees in all thinning units. Wildlife trees would be retained at levels sufficient to support species of cavity-nesting birds at 40 percent of potential populations (ROD, C-42). This equates to about 2 trees per acre on the thinning units. Wildlife trees would be clumped in small groups or individually distributed over the harvest units. After harvest activities are completed, yarding damage to the residual stand would be assessed and damaged trees would be incorporated into the snag creation prescription. Monitoring surveys would be established to determine the effectiveness and usage of the wildlife trees.

### ***Road closure***

Approximately 19.5 miles of classified roads would be closed by blocking the entrance to the road to reduce the density of open road miles. These blocked roads are primarily to reduce disturbance to big game habitat, to rehabilitate roads for long term storage to minimize sediment contribution to streams, and to reduce the cost of road maintenance. The road block devices would be maintained over time to ensure the effectiveness of the closure. About 10 miles of classified roads would be closed with a modified low level closure. All temporary roads would be closed after harvest activities.

## **Threatened, Endangered, and Sensitive Species**

### ***Northern Spotted Owls***

Impose seasonal restriction on all helicopter activity and other noise-generating activities associated with project activities during the spotted owl critical nesting period between March 1 and July 15. This restriction does not apply to ground based activities such as falling, yarding, or hauling that are beyond 0.25 mile of suitable spotted owl habitat.

Seasonal restriction for noise producing activities would be implemented for a number of activities to avoid disturbance of breeding pairs of northern spotted owl. This restriction would be implemented for any noise producing activity (falling, yarding, and hauling of timber (with exceptions), road construction) which might occur within one quarter mile of known spotted owl activity centers or un-surveyed suitable habitat from March 1 through July 15 (critical nesting period) unless non-nesting is determined. Units that are

helicopter logged outside the .25 mile area may also need to be restricted depending on the flight path and helicopter landing locations.

The thinning prescription using elements of variable density thinning is designed to speed the attainment of late-successional characteristics.

Riparian Reserves retained for protection of water quality, and described above under Soils/Water, also serve as foraging, nesting, and dispersal habitat for northern spotted owls, as well as travel corridors for many wildlife species.

### ***Bald Eagle***

Potential bald eagle nest, roost, and perch trees (remnant overstory live trees and snags) are protected to the greatest extent feasible. The overstory remnant old-growth in units #11-14 would be protected for bald eagle habitat.

Conduct periodic habitat surveys during the breeding season to document occupancy status does not change while thinning activities are underway. In the event bald eagles are detected using habitat in the area that may be subject to disturbance during the breeding season, incorporate measures to ensure disturbance is mitigated.

### ***Peregrine Falcon***

In order to ensure that helicopter activity does not disturb peregrine behavior at a nearby nest site during the breeding season (January 15 – July 31), restrict flight path between project area(s) and the Oakridge airport to an area east of the North Fork of the Middle Fork Willamette River.

### ***Harlequin Ducks***

Resources opportunity projects proposed in the NFMFWR channel such as stream placement of large woody debris to improve fish habitat would be conducted outside the critical portion of the breeding season (March 15 – July 15) for harlequin ducks.

### ***Baird's Shrew and Pacific Shrew***

Riparian reserve buffers and variable density thinning would provide refugia throughout areas affected by proposed activities and would mitigate negative effects to individuals that may be present and disturbed by such activities. All existing coarse woody debris would be protected to provide habitat for the Baird's shrew and Pacific shrew.

### ***Pacific Fringe-tailed Bat***

When it is feasible to do so, consider “high stumping” trees or snags  $\geq 24$ ” diameter that must be felled for safety reasons. Creating stumps 1 – 2 meters in height would mitigate the loss of some existing roosting habitat more quickly than the delayed snag creation called for in this project's silvicultural prescription.

In the event a significant bat roost is located within the project area, the ID Team biologist, District wildlife biologist and Regional bat taxa specialist should be contacted to inspect the site, assess any project activities for their potential to impact bats, and formulate site specific management guidelines to ensure protection of the site.

### ***Oregon Slender Salamander***

Current snag, defective tree, and down wood habitat is protected to the greatest extent feasible during proposed activities.

If TES species are found in the proposed units or road locations during project layout or implementation, appropriate action would be taken. During harvest, contract provisions would be used if listed species are found at that time.

### ***Spring Chinook Salmon and Bull Trout***

The mitigation measures for soil and water such as the no harvest zone of the riparian reserves, log suspension requirements, seasonal restrictions, soil tillage treatments, and BMPs applied during the maintenance and reconstruction of existing roads, construction of temporary roads, road closures, and other erosion prevention and control measures would mitigate adverse effects to these ESA listed fish species

## **Survey and Manage Species**

### ***Crater Lake Tightcoil***

Riparian reserve buffers and variable density thinning would provide refugia throughout areas affected by proposed activities and would mitigate negative effects to individuals that may be present and disturbed by such activities.

### ***Red Tree Vole***

No harvest buffers of the Riparian Reserves and elements of variable density thinning such as un-thinned areas would maintain microclimate conditions in suitable habitat and guard against any negative effects that would influence the potential for persistence of this species at a known site, or elsewhere throughout the project area.

## **Management Indicator Species**

For cavity excavators (including pileated woodpecker and marten): The existing snags would be retained and down logs protected to the greatest extent feasible. In addition, green trees having crown abnormalities and/or obvious indicators of wildlife use such as pileated woodpecker foraging trees would be retained.

Deer and Elk: Openings associated with proposed activities such as landings, burn piles, soil treatment areas, and road closure would be seeded approved forage seed mix and fertilizer.

Closure of about 9 miles of open classified road would reduce open road densities and forage habitat improvement (seeding and fertilization) would increase forage quality and quantity.

## **Invasive Weeds**

All timber harvest and culvert replacement machinery would be required to be cleaned before entering the work area, especially those that would be working off-road.

All road maintenance equipment would be required to be cleaned prior to entering the project area. Road maintenance activities would be encouraged to be performed during July or later so that weed seed would not be moved around on equipment.

Weed-free aggregate material would be used if available for road restoration, reconstruction and helicopter landing construction.

The project area would be re-vegetated with native species following soil disturbance. Grass mixture would include California brome, California fescue and blue wildrye in openings and the forested understory. Desired herbaceous species would include big deervetch (*Lotus crassifolius*) in openings; blue wildrye around culvert replacements, on closed road beds.

Project area roadsides would be pre-treated using manual or mechanical control to remove sources of weed seed prior to harvest activities.

Road work would be encouraged during the dry season when mud and seed would be less likely to be transported on vehicle undercarriages.

Weed infested helicopter landings would be clean up prior to use. The top six inches of soil would be scalped off and deposited in an area where weed infestations can be monitored and or treated via manual methods.

An equipment cleaning site would be identified by the District Botanist. Invasive weed infestation sites would be monitored for three years following treatment to ensure weeds are eradicated and do not spread from this site.

The existing slender false brome site would be pre-treated prior to harvest operations. Because the seed bank remain in the soil and it is unknown how long the seed is viable, the sites would be re-survey prior to project implementation to document and treat any new sites.

Documentation of pre-treatment of weed sites prior to project activities would be filed in the Niner Project Analysis File and delineated on the timber sale area contract maps.

### **Silviculture**

Logging operations (falling and yarding) are restricted to the time period outside of sap flow (approximately April 1 to June 30) to minimize potential for stem damage during active cambium growth.

### **Fuels**

Fuel treatments are prescribed to mitigated the fine fuel loadings created from the commercial thinning. Fuel treatments include yarding tops and branches and grapple piling and burning at landings, grapple piling within 40 feet of most roads left open, hand piling and burning, and underburning. The underburning would occur during spring-like conditions to minimize impacts to the soils, existing coarse woody debris, and mortality to green leave trees.

### **Air Quality**

Air quality would be maintained by adhering to the Oregon Smoke Management Plan and additional monitoring of low level winds to insure that burning occurs when the risk of smoke intrusions into designated areas and Class I airsheds is low. Various fuel treatments methods such as yarding top, grapple piling along roads, and hand piling and burning, and underburning during spring-like conditions would be used. The slash piles would be covered and dry when burned which reduces the amount of smoke produced.

Only units and fuel concentrations which exceed FW-212 and FW-252 would be piled and burned.

### **Cultural**

Proposed harvest units were surveyed for cultural resources. Several old railroad grades used during the historic logging operations would be protected from soil disturbance. No yarding corridors would be allowed to cross these railroad grades to protect them from disturbance. Other existing cultural resource sites were either protected with a 100 foot no cut buffer or avoided in the unit boundaries. If any cultural sites are found during any proposed activity, the activity would be discontinued, and contract provisions would be invoked until the site is evaluated for significance and appropriate mitigation measures are performed.

### **Recreation**

Roadside damage along Road 1928 near Camp 6 from un-regulated off road vehicle trails would be blocked off to controlling access and the trails would be closed and rehabilitated to reduce sediment from entering the streams.

All logging operations around the OHV trails would be restricted to the weekdays to reduce impacts OHV users during the weekends.

All logging operations which involve helicopter yarding over the main FS Road 1900 to the landing off of Road 1912 would require traffic flaggers for public safety and would be restricted to weekdays.

All logging operation in Units 15, 15a, 15c, and 16 near Camp Six would be restricted to weekdays from 0800-1900.

## Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives. The table should be used in conjunction with the discussion of issues in Chapter 3 – Environmental Consequences in order to fully understand the implications and differences of the alternatives

**Table 10 -Comparison of Alternatives**

	<b>Alternative A Proposed Action</b>	<b>Alternative B</b>	<b>Alternative C No Action</b>
<b>Silviculture Treatmt.</b>			
<b>Commercial Thin</b>	3328 acres	3268 acres	0
<b>Group Selection Patch Cuts</b>	0	60 acres	0
<b>Total Treatment</b>	3328 acres	3328 acres	0
<b>Timber Volume</b>	50 mmbf	50 mmbf	0
<b>Logging Systems</b>			
<b>Tractor</b>	1652 (50%) acres	60 (2%) acres	0
<b>Skyline</b>	1233 (37%) acres	2734 (83%) acres	0
<b>Helicopter</b>	443 (13%) acres	534 (15%) acres	0
<b>Road Work</b>			
<b>Road Maintenance</b>	17.5 miles	17.5 miles	0
<b>Road Reconstruction</b>	3.95 miles	3.95 miles	0
<b>Construction of Temporary Roads</b>	6.3 miles	5.0 miles	0
<b>Construction Temporary Bridge</b>	1 bridge	NA	0
<b>Perennial Streams (Fish Bearing) Culverts Replaced</b>	3 culverts	3 culverts	0

	<b>Alternative A Proposed Action</b>	<b>Alternative B</b>	<b>Alternative C No Action</b>
<b>Ditch relief culverts Replaced</b>	Numerous	Numerous	0
<b>Close Roads</b>	19.5 miles	19.5 miles	0
<b>Closed to Passenger vehicles</b>	9 miles	9 miles	0
<b>Partially Closed and Restored Roads</b>	11 miles	11 miles	0
<b>Soils</b>			
<b>Soil Tillage Treatments</b>			
<b>Restoration of compacted soil area</b>	0	60 acres	0
<b>Landings &amp; Skid Trails</b>	206 acres	126 acres	0
<b>Temp Roads</b>	11 acres	8 acres	0
<b>Closed Roads</b>	14 acres	14 acres	0
<b>Partially Closed and Restored Roads</b>	7 acres	7 acres	0
<b>Detrimental Soils – Significant Issue</b>			
<b>Detrimental Soil Classes</b>			
<b>0-10%</b>	964 ac. (29%)	959 ac. (29%)	898 ac (27%)
<b>11-15%</b>	2186 ac. (66%)	1062 ac. (32%)	349 ac. (11%)
<b>16-20%</b>	104 ac. (3%)	1204 ac. (36%)	1832 ac. (55%)
<b>20+%</b>	74 ac. (2%)	103 ac. (3%)	2490 ac. (7%)

	<b>Alternative A Proposed Action</b>	<b>Alternative B</b>	<b>Alternative C No Action</b>
<b>Wildlife</b>			
<b>Big Game</b>			
<b>“Huckleberry” BGEA Habitat Effectiveness Indices - Moderate</b>			
<b>Forage quality</b>	0.25	0.25	0.18
<b>Cover quality</b>	0.54	0.54	0.53
<b>Open roads</b>	0.23	0.23	0.15
<b>Size and spacing of cover and forage</b>	0.80	0.80	0.76
<b>Overall Habitat Effectiveness index</b>	0.39	0.39	0.32
<b>“First” BGEA Habitat Effectiveness Indices -Low</b>			
<b>Forage quality</b>	0.28	0.28	0.29
<b>Cover quality</b>	0.59	0.59	0.58
<b>Open roads</b>	0.32	0.32	0.31
<b>Size and spacing of cover and forage</b>	0.77	0.77	0.76
<b>Overall Habitat Effectiveness index</b>	0.45	0.45	0.44
<b>Percent increase in forage acres</b>	21% Huckleberry 10% First	21% Huckleberry 10% First	0 Huckleberry 0 First
<b>Quality Forage Created/Enhanced</b>	163 ac.	233 ac.	0

	<b>Alternative A Proposed Action</b>	<b>Alternative B</b>	<b>Alternative C No Action</b>
<b>TE&amp;S Species</b>			
<b>Effects determination</b>			
<b>Wildlife Species</b>			
<b>Northern Spotted Owl</b>	MA, LAA	MA, LAA	NE
<b>Acres of short term (vs. long term) downgraded suitable owl habitat</b>	488 acres	488 acres	0
<b>Northern Bald Eagle</b>	NE	NE	NI
<b>Harlequin Duck</b>	NI	NI	NI
<b>American Peregrine Falcon</b>	NI	NI	NI
<b>Baird's Shrew</b>	MIH,NLCT	MIH,NLCT	NI
<b>Pacific Shrew</b>	MIH,NLCT	MIH,NLCT	NI
<b>Fisher</b>	NI	NI	NI
<b>Pacific Fringe-tailed Bat</b>	MIH,NLCT	MIH,NLCT	NI
<b>Oregon Slender Salamander</b>	MIH,NLCT	MIH,NLCT	NI
<b>Cascade Torrent Salamander</b>	NI	NI	NI
<b>Crater Lake Tightcoil</b>	NI	NI	NE
<b>Fish Species</b>			
<b>Spring Chinook Salmon</b>	MA, NLAA	MA, NLAA	NI
<b>Bull trout</b>	MA, NLAA	MA, NLAA	NI

	<b>Alternative A Proposed Action</b>	<b>Alternative B</b>	<b>Alternative C No Action</b>
<b>Sensitive and Survey and Manage Plant Species</b>			
<i>Botrychium minganense</i>	NI	NI	NI
<i>Botrychium montanum</i>	NI	NI	NI
<i>Bridgeoporus nobillissimus</i>	NI	NI	NI
<i>Carex livida</i>	NI	NI	NI
<i>Cimicifuga elata</i>	NI	NI	NI
<i>Corydalis aqua- gelidae</i>	NI	NI	NI
<i>Eucephalis(Aster) vialis</i>	NI	NI	NI
<i>Iliamna latibracteata</i>	NI	NI	NI
<i>Hypogymnia duplicata</i>	NI	NI	NI
<i>Leptogium burnetiae var. hirsutum</i>	NI	NI	NI
<i>Leptogium cyanescens</i>	NI	NI	NI
<i>Lycopodium complanatum</i>	NI	NI	NI
<i>Mycorrhizal Fungi</i>	<b>MIH,NLCT</b>	<b>MIH,NLCT</b>	<b>NI</b>
<i>Nephroma occultum</i>	NI	NI	NI
<i>Pannaria rubiginosa</i>	NI	NI	NI
<i>Peltigera neckeri</i>	NI	NI	NI
<i>Peltigera pacifica</i>	NI	NI	NI

	<b>Alternative A Proposed Action</b>	<b>Alternative B</b>	<b>Alternative C No Action</b>
<i>Pseudocyphellaria rainierensis</i>	NI	NI	NI
<i>Saprophytic on Litter fungi</i>	MIH,NLCT	MIH, NLCT	NI
<i>Saprophytic on wood</i>	MIH,NCLT	MIH,NLCT	NI
<i>Scouleria marginata</i>	NI	NI	NI
<i>Tetraphis geniculata</i>	NI	NI	NI
<b>Survey and Manage Wildlife Species</b>			
<b>Great Gray Owl</b>	No Habitat, No Surveys Required	No Habitat, No Surveys Required	NA
<b>Red Tree Vole</b>	Habitat Present, No Surveys Required	Habitat Present, No Surveys Required	NA
<b>Crater Lake Tightcoil</b>	Habitat Present, Surveyed, Negative result	Habitat Present, No Habitat Disturbed, No Surveyed Required	NA
<b>Fire and Fuels</b>			
<b>Fuel Treatments</b>			
<b>Yard Tops &amp; Machine Pile &amp; Burn@ Landings</b>	3328 acres	3328 acres	0
<b>Grapple Pile and Burn along Roads</b>	496 acres	496 acres	0
<b>Hand Pile &amp; Burn Within Units</b>	0	524 acres	0
<b>Under burning</b>	104 acres	104 acres	0

	<b>Alternative A Proposed Action</b>	<b>Alternative B</b>	<b>Alternative C No Action</b>
<b>Post treatment fuel loading (0-3 inch) tons per acre</b>			
<b>Unit #</b>			
<b>18,19</b>	14.7	5.0	5-7
<b>11-14</b>	8.3	8.3	3-4
<b>15,16</b>	8.5	8.5	2-4
<b>120,121</b>	3.0	3.0	8-10
<b>201-207, 210-213, 216-218</b>	8.2	8.2	3-4
<b>208,209,</b>	14.9	5.0	10-13
<b>214,219, 221</b>	16.9	5.0	10-13
<b>215</b>	6.7	6.7	3-4
<b>222</b>	10.5	5.0	3-4
<b>220</b>	3.0	3.0	10-13
<b>Priority Acres Treated</b>	886 ac.	1,360 ac.	<b>0</b>
<b>Air Quality</b>			
<b>PM Totals</b>	449	586	0
<b>Economics</b>			
<b>Logging cost per thousand board feet (MBF)</b>	\$356/mbf	\$408/mbf	0
<b>Project Benefit Cost Ratio</b>	2.20	1.85	0
<b>Project Financial Present Net Value</b>	\$16,519,031	\$13,913,473	(-\$180,000)

	<b>Alternative A Proposed Action</b>	<b>Alternative B</b>	<b>Alternative C No Action</b>
<b>Water Quality</b>			
<b>Potential Soil Erosion Categories</b>			
<b>Category 5 Soils (Least Erosive)</b>	2792 ac. (84%)	2792 ac. (84%)	0
<b>Category 1 Soils</b>	15 ac. (0.5%)	15 ac. (0.5%)	0
<b>Category 2 Soils</b>	15 ac. (0.5%)	15 ac. (0.5%)	0
<b>Category 4 Soil</b>	357 ac. (11%)	357 ac. (11%)	0
<b>Category 3 Soils (Most Erosive)</b>	149 ac. (4%)	149 ac. (4%)	0
<b>Land Stability Rating</b>			
<b>Category 5 Soils (Most Stable)</b>	2792 ac. (84%)	2792 ac. (84%)	0
<b>Category 4 Soils</b>	357 ac. (11%)	357 ac. (11%)	0
<b>Category 1 Soils (Least Stable), Category 2 &amp; 3 Soils</b>	179 ac. (5%)	179 ac. (5%)	0
<b>Riparian Management</b>			
<b>Acres of riparian reserve thinned</b>	574	574	0
<b>Vegetation</b>			
<b>Change (% &amp; acres) in seral conditions</b>	0%, 0 acres	1%, 60 ac from stem exclusion to stand initiation	0%, 0 acres

	<b>Alternative A Proposed Action</b>	<b>Alternative B</b>	<b>Alternative C No Action</b>
<b>Invasive Weeds</b>			
<b>Acres of ground disturbance</b>	2,522 acres	907 acres	0
<b>Miles of road work</b>	47.2 miles	45.9 miles	0
<b>Wild &amp; Scenic River</b>			
<b>Acres treated in MA 6E – NFWFMR Wild and Scenic River</b>	291	291	0
<b>Recreation OHV</b>			
<b>Length of time in days of OHV trail closures</b>	Given segments of trails closed < 14 days	Given segments of trails closed < 14 days	NA
<b>Percentage of the OHV trail area affected by timber sales</b>	10% of trails closed at a time, 215 days of log truck traffic	10% of trails closed at a time, 215 days of log truck traffic	NA
<b>Public Safety</b>			
<b>Number of log trucks per day hauling down Road 1928</b>	10 loads per day	10 loads per days	0
<b>Total number of day of timber hauling</b>	1,250 days	1,250 days	
<b>Number of helicopter loads over Road 1900 and the river</b>	1100	1100	0

NA = Not Applicable

NE = No Effect

NI = No Impact.

MIIH, NLCT = May Impact Individuals or their Habitat, but the action will Not Likely Contribute to a Trend towards federal listing or loss of viability to the population or species.

MA, NLAA = May Affect, Not Likely to Adversely Affect

MA, LAA = May Affect, Likely to Adversely Affect