Lower West Fork Project

Record of Decision

Bitterroot National Forest
West Fork Ranger District
Ravalli County, MT

July 2010

Responsible Agency: USDA Forest Service

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Project Area Location: T2N R21W Sections 27-36, T1N R20W Sections 6-8, 17-20, 29-32, T1N R21W Sections 1-30, 34-36, T1N R22W Sections 1, 12-15, 23-26, and T1S R21W Sections 1-4, 10-12, 14-16, 21, 22 PMM, Ravalli County, Montana.

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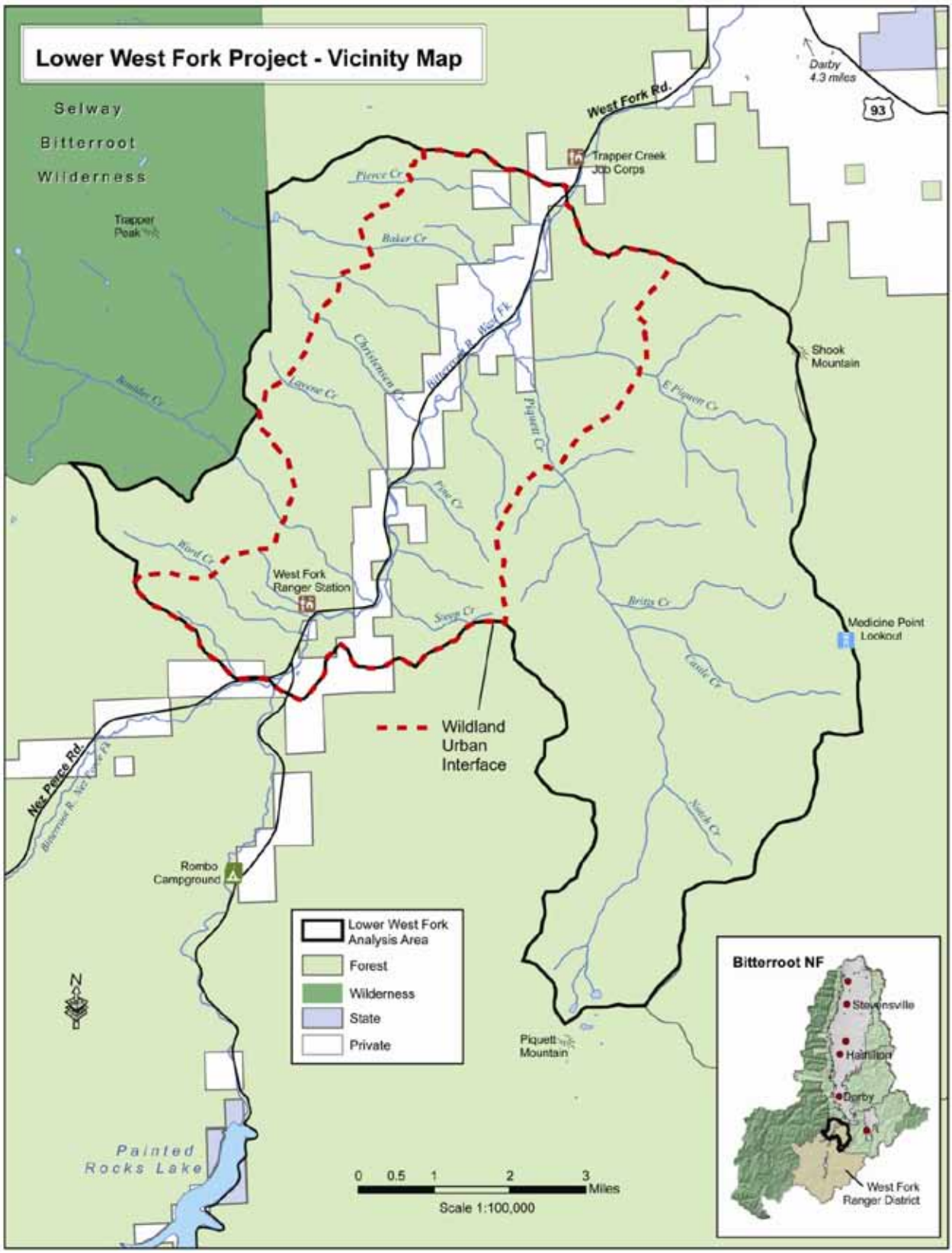

Figure 1: Lower West Fork Project Area and Vicinity Map showing the Wildland Urban Interface Boundary

RECORD OF DECISION
LOWER WEST FORK PROJECT

USDA Forest Service
West Fork Ranger District, Bitterroot National Forest
Ravalli County, Montana

1.1 DECISION OVERVIEW

After thorough review of the Lower West Fork Project Final Environmental Impact Statement (FEIS) and public comments received throughout the analysis process, I have decided to modify and select Alternative 3. I modified Alternative 3 by adding the following features from Alternative 2:

- commercially thin Unit 60 on the west side of the West Fork of the Bitterroot River (West Fork River)
- retain the option to treat potential noxious weed spread with herbicides
- treat the prescribed fire units in the Wildland Urban Interface (WUI) on the east side of the West Fork River
- decommission National Forest System Road (NFSR) 13841 from its junction with NFSR 74327 and decommission NFSR 13424 from its junction with NFSR 13425

I believe my decision is the best balance between enhancing forest conditions and reducing the potentially negative effects of forest management. My decision will reduce the risk of crown fire in the WUI, and stream sedimentation, and improve forest resiliency, fish population connectivity, and soil productivity. The potentially negative effects of the activities required to achieve these objectives will be eliminated or reduced through project design and the application of Best Management Practices (BMPs). This Record of Decision (ROD) explains the rationale for my decision.

The ROD is organized as follows:

- Background information about the proposal and the purpose and need for the project
- Description of the activities approved in the modified Alternative 3
- Criteria and rationale I considered in selecting this alternative
- Description of the public involvement process
- Consistency findings with applicable laws and policies
- Project implementation and contact information

This document and my decision are based on and reference the analysis in the Lower West Fork Project FEIS and Draft EIS (DEIS), and information in the project file.

2.1 BACKGROUND

The Lower West Fork analysis area is located about 15 air miles southwest of Darby, Montana (Fig. 1). National Forest System land makes up most of the analysis area though about 3,400 acres of private land exist along the West Fork River. The Selway-Bitterroot Wilderness borders the analysis area to the west and Shook Mountain and Medicine Point lookout mark the border to the east.

The goal of this project is to expand fire management options beyond suppression in the event of an ignition by decreasing stand density and fuel loads. The intent is to re-establish fire as a natural process at the intensities and frequencies that shaped this landscape. Managing fuel loads and stand density using timber harvest, non-commercial thinning, prescribed fire, and natural ignitions would reduce fire intensity at the Bitterroot National Forest boundary.

I have decided to treat this area because:

- The Forest Plan directs the use of prescribed fire to maintain healthy, dynamic ecosystems that meet land management objectives and to emphasize fire ecology implications in its application (Forest Plan Appendix M).
- Management Area direction requires fire planning be designed to
  - protect and enhance timber investments and values (Forest Plan pg. III-7)
  - protect and enhance winter range habitat (Forest Plan pg. III-13)
  - protect visual quality and minimize fire danger and insect and disease problems, and assure establishment and protection of stands (Forest Plan III-20, III-28, III-34, III-60)
  - perpetuate natural ecosystems (Forest Plan III-43)
- The Wildland Fire Risk Mitigation Plan identifies fuel reduction as a high priority (Community Wildfire Protection Plan; DNRC et al. 2006) (FEIS pg. 1-1).
  - Treating fuels in the WUI adjacent to the West Fork River moderates potential fire intensity adjacent to the private land boundary. Lower fire intensities will allow fire protection agencies more options to manage the fire, and protect the natural resources and private land developments.
- The ponderosa pine/Douglas-fir forests are densely stocked, declining in resilience to environmental stressors, and shifting composition from ponderosa pine to Douglas-fir (FEIS pgs. 1-6, 3.2-8).
  - The trees left after thinning will be predominantly large ponderosa pine mixed with large Douglas-fir. These trees will have adequate growing space to restore their defense mechanisms and resist insect and disease infections. The larger trees also have thicker bark that is more resistant to fire. The spacing between trees will inhibit fire from transitioning to the crown and reduce the potential burning time adjacent to the tree bole. These conditions will improve tree survival in a fire.
- High fuel loads and crown fire potential in the low elevation ponderosa pine/Douglas-fir forests limit fire management options (FEIS pgs.1-5, 3.3-11, 3.3-12).
  - Reducing fuels will allow more flexibility in the management of natural ignitions and promote the natural role of fire in the ecosystem.
- The fuel treatments augment the area of fuels reduction created by the Frasier Interface project and the School Point Ecoburn and improve the management of fire behavior on the landscape scale.
- The project analysis area provides opportunities to evaluate soil, watershed, and fisheries projects that would reduce sedimentation in the West Fork River, which is listed as impaired (Montana Department of Environmental Quality (MDEQ 2008)) (FEIS pgs. 1-7, 3.5-6, 3.5-6, 3.6-8, 3.6-9).
  - Storing and decommissioning roads no longer used for forest management, and rehabilitating disturbed soils will improve water infiltration to the soil and reduce runoff and sedimentation. Less sediment in the streams and more water stored in the soil will improve water quality and fish habitat.
  - Removing fish barriers will improve the genetic mixing of fish populations and improve their resilience to environmental stressors.
  - Rehabilitating soils in the terrace units and units with legacy soil compaction will augment the natural soil recovery process.

3.1 PURPOSE AND NEED

The purpose of the Lower West Fork project is to improve forest resilience to environmental stressors such as fire, insects, and disease and reduce fuel loads in and adjacent to the WUI. An additional purpose of this project is to reduce soil compaction on terrace units, and reduce sedimentation and fish barriers created by roads and road crossings.

The purpose of this project is not to prevent insects, disease, and fire from regulating forest conditions but to maintain forest conditions that support endemic populations and historic fire intervals and intensities.

Forest conditions following treatments would be open stands of large, predominantly ponderosa pine trees with fuel loads appropriate to the site and fire interval. These stands would have less competitive stress and better resistance to insect and disease occurrences. The lighter fuel loads and wider spacing between trees would:

1. Reduce crown fire hazard in low elevation ponderosa pine/Douglas-fir forests
2. Improve forest resilience to natural disturbances, particularly the resilience of large diameter ponderosa pine trees
3. Maintain or increase shade intolerant species, specifically ponderosa pine

Soil compaction would be reduced on terrace units, historic skid trails in Units 3 and 12, and in the portion of Unit 1 where detrimental soil disturbance exceeds Regional soil quality standards (FEIS pgs. 3.5-5). Sedimentation in tributaries to the West Fork River would be reduced by storing and decommissioning roads, and fish passage would be restored by replacing culverts that block fish migration. These projects would improve the overall soil, watershed, and fisheries conditions and enhance the biological resilience in the Lower West Fork analysis area.

The differences between current conditions and desired conditions and the effect of those conditions on ecosystem processes determined the need for the proposed actions in Lower West Fork analysis area.

- Ø Forest vegetation has shifted from open stands of primarily large ponderosa pine to more uniform and dense stands of Douglas-fir, especially in the understory, in the Lower West Fork area. These dense stands are more prone to intense wildland fires and insect or disease epidemics (Graham et al. 2004; USDA 2004, FEIS pgs.1-6, 3.2-10 to 3.2-17, 3.3-6 to 3.3-12).
- Ø Forests in the Lower West Fork analysis area have departed from historic fire frequency intervals causing changes in vegetation structures, fuel loads, and fire severity. This means that fires could burn at higher intensities than is typical for these types of forests. The potential loss of forest ecosystem and private property components is higher because of these conditions (FEIS pgs. 3.3-6 to 3.3-12).
- Ø The forest around the Lower West Fork WUI is a high priority treatment area based on values at risk and potential fire behavior (FEIS pg. 3.3-6). The Lower West Fork project would reduce fuel loads and modify areas of high-intensity, crown fire behavior to low or moderate intensity surface fire behavior (FEIS pg. 3.3-12).
- Ø The Bitterroot Community Wildfire Protection Plan recommends restoration of fire-adapted ecosystems by restoring healthy, diverse, and resilient ecological systems to minimize fire severity in the priority areas.
- Ø The Rombo Fire burned over 1,400 acres of old growth forest in the Lower West Fork analysis area, which reduced old growth habitat by 33 percent (FEIS pg. 3.8-4). Reducing fire intensity in the analysis area protects remaining old growth habitat.
- Ø Roads contribute sediment to tributaries of the West Fork River, which is listed as impaired by sediment (MDEQ 2005) (FEIS pg. 3.6-2). Reducing sediment by storing and decommissioning roads no longer used for forest management would decrease sediment in the West Fork River and its tributaries (FEIS pgs. 3.6-30 -3.6-32).

- Ø Seven culverts present barriers to westslope cutthroat trout migration (FEIS 3.7-29). Replacing or removing these barriers would reconnect westslope cutthroat trout access to about 3.4 miles of spawning and rearing habitat. The improved access would allow genetic mixing between strains of westslope cutthroat trout and improve their resilience to environmental stressors.
- Ø Terrace units developed in the late 1960s created high levels of ground disturbance. The units have regenerated and formed dense stands of commercial-sized trees. Thinning these stands provides an opportunity to augment soil rehabilitation on the terrace benches by actively decompacting the soil and covering them with 10-15 tons/acre of woody debris. Active decompaction will only be feasible on units with slopes less than 35 percent. On steeper slopes, 10 to 15 tons/acre of woody debris will be left on the terrace benches. The high levels of woody debris increase soil moisture, moderate soil temperatures, and increase soil microbe populations and functions.

Changing these resource conditions to maintain the ecological parameters under which they developed will allow more management flexibility of natural disturbances, specifically fire, when they occur. The proposed actions would change the existing resource conditions so they are closer to the desired conditions. They would also complement and extend the area of fuels reduction treatments in the Frasier Interface project (designed by the Forest Consensus Council), the School Point Ecoburn, and similar actions taken on private land. The objective is not to attain a specific desired condition and remain static, rather to create conditions where natural processes can occur without severe ecological consequences or large capital investments.

Soil, watershed, and fishery resources have residual effects from road system development and past harvest practices. This analysis provides an opportunity to evaluate these situations in the context of the planned activities and improve these resource conditions. The Water Quality Restoration Plan and Total Maximum Daily Loads for the Bitterroot Headwaters Planning Area (Restoration Plan) (MDEQ 2005) listed the West Fork River as impaired by sediment. Though the Restoration Plan did not identify any of the streams in the Lower West Fork analysis area as restoration priorities, it recommends that sediment from roads be reduced in the West Fork River Watershed (MDEQ 2005 pg. 182).

4.1 DECISION

I have decided to select Alternative 3-modified to include the following features of Alternative 2:

- Ø Include Unit 60 on the west side of the river as a commercial thin unit
- Ø Retain herbicide use as described in Alternative 2 as an option for treating new invasive plant populations
- Ø Treat prescribed fire units in the WUI on the east side of the river as proposed in Alternative 2
- Ø Decommission NFSR 13841 from its junction with NFSR 74327
- Ø Decommission NFSR 13424 from its junction with NFSR 13425

Unit 60 was not analyzed for treatment under Alternative 3 because the purpose of the alternative was to reduce fuels in the WUI on the west side of the West Fork River and Unit 60 is not within the WUI. However, Unit 60 abuts the Trapper-Bunkhouse analysis area and the Trapper-Bunkhouse unit adjacent to Unit 60 is scheduled for commercial thin. Thinning the unit in Trapper-Bunkhouse and not Unit 60 in Lower West Fork would create an unnatural visual and ecological division in the same vegetation type. There are no detrimental effects associated with treating Unit 60 and not treating it would diminish the landscape benefits of treatment in both project areas.

Herbicide use was not analyzed under Alternative 3 to display the difference between vegetation treatments with and without herbicide use to control the spread of invasive plants. The same parameters for herbicide use as described in Alternative 2 would be applied to Alternative 3. Since less area will be treated than in Alternative 2, the potential need to use herbicides will be less and therefore, the effects of herbicide use will be less than described in Alternative 2.

Though the headwaters of Piquett Creek and East Piquett Creek have burned in the past 10 years, there is still the potential for crown fire in the WUI on the east side of West Fork River. Prescribed fire in Units 64, 65, 69, 71, 72, and 73 would reduce fuels adjacent to private land and provide options when managing fires.

In Alternative 3, NFSR 13424 and 13841 were proposed for decommission from their junctions with NFSR 5723 and 5724, respectively. After closer inspection, it is apparent that this action would close access to other road systems without removing the drainage structures. Furthermore, closing the other road systems was not analyzed in this process. My decision is to decommission NFSRs 13424 and 13841 from their junctions as stated above, which would reduce the total road decommission project by about one mile (about 0.5 mile less decommissioning on each road). Current management direction would be followed on the road sections not decommissioned.

The above modifications were analyzed under Alternative 2 and their effects would not exceed the degree of effects analyzed in that Alternative.

My decision will reduce fuels on approximately 4,131 acres using commercial thinning, non-commercial thinning, and prescribed fire (Table 1). Approximately 88% of the treatments will occur in the WUI (Fig. 1, 2). About 1,741 acres will be commercially thinned using ground-based and skyline yarding systems (Table 1). Commercial thins occur on parts of the commercial thin units, however the entire unit understory will be thinned (non-commercial thin) and excess slash will be treated using prescribed fire. Fuels will be reduced on another 1,658 acres using prescribed fire only. Another 296 acres in existing plantations will be non-commercially thinned. Approximately 1.8 miles of temporary road and 1.6 miles of tracked line machine (TLM) trail will be constructed to access timber. Individual road lengths vary between 1,200 and 2,100 feet.

My decision includes the application of the design features and mitigation measures described in the FEIS and summarized in Chapter 2 (FEIS pgs. 2-18 – 2-25) and Appendix A of this Record of Decision. About 18 miles of road will be stored and 26 miles decommissioned (Table 2, FEIS pg. 3.6-31, Table 3.6-13). Thirty-three culverts will be removed from road-stream crossings, 23 of which contribute sediment to streams. Storing or decommissioning 11.3 miles of road are mandatory to off-set potential short-term timber sale effects (Table 3, FEIS Table 2-4). This mitigation would remove 18 culverts, 12 of which contribute sediment to streams. The remaining roads will be decommissioned or stored using appropriated or partnership funds. Table 4 provides a summary of the treatments in Alternative 3, modified.

Table 1: Unit Treatments under Alternative 3-modified

Unit No.	Treatment*	Area (acre)	WUI Area (acre)	Yarding Method (acre)			Temp. Roads[1] (ft)	TLM[2] Trail (ft^2)
				Ground	Skyline	TLM		
1	Commercial Thin with underburn	239	239	64	26	31	1,246	404
2	Commercial Thin with underburn	197	197	76	104	0	N/A[3]	N/A
3	Commercial Thin with underburn	163	163	98	58	7	N/A	873
4	Commercial Thin with underburn	142	142	52	0	0	N/A	N/A
5	Commercial Thin with underburn	35	35	12	21	0	N/A	N/A
6	Commercial Thin with underburn	35	35	35	0	0	N/A	N/A
7	Commercial Thin with underburn	25	25	0	19	10	N/A	N/A
8	Commercial Thin with underburn	130	130	43	62	25	1,454	1,035
9	Commercial Thin with underburn	109	109	16	62	15	1,284	N/A
10	Commercial Thin with underburn	55	55	11	40	0	N/A	N/A
11	Commercial Thin with underburn	33	33	30	3	0	N/A	N/A
12	Commercial Thin with underburn	125	125	93	13	19	1,863	598
14	Commercial Thin with underburn	19	0	3	16	0	N/A	N/A
21	Commercial Thin with underburn	18	0	0	18	0	N/A	N/A
25	Commercial Thin with underburn	7	0	2	5	0	N/A	N/A

Unit No.	Treatment*	Area (acre)	WUI Area (acre)	Yarding Method (acre)			Temp. Roads[1] (ft)	TLM[2] Trail (ft[2])
				Ground	Skyline	TLM		
27	Non-commercial Thin	4	0	0	N/A	N/A	N/A	N/A
32	Prescribed Fire	131	131	N/A	N/A	N/A	N/A	N/A
33	Prescribed Fire	282	237	NA	N/A	N/A	N/A	N/A
34	Commercial Thin with underburn	119	119	43	0	0	N/A	N/A
35	Commercial Thin with underburn	35	35	5	0	31	N/A	1,814
60	Commercial Thin with underburn	140	0	102	28	N/A	1,322	N/A
60A	Prescribed Fire	31	0	N/A	N/A	N/A	N/A	N/A
61	Commercial Thin with underburn	418	418	131	145	8	2,112	1,812
61A	Prescribed Fire	414	415	N/A	N/A	N/A	N/A	N/A
62	Commercial Thin with underburn	66	66	19	47	0	N/A	N/A
63	Prescribed Fire	20	20	N/A	N/A	N/A	N/A	N/A
63B	Prescribed Fire	32	32	N/A	N/A	N/A	N/A	N/A
64	Prescribed Fire	246	246	N/A	N/A	N/A	N/A	N/A
65	Prescribed Fire	40	28	N/A	N/A	N/A	N/A	N/A
69	Prescribed Fire	27	27	N/A	N/A	N/A	N/A	N/A
70	Prescribed Fire	199	199	N/A	N/A	N/A	N/A	N/A
71	Prescribed Fire	70	49	N/A	N/A	N/A	N/A	N/A
72	Prescribed Fire	4	4	N/A	N/A	N/A	N/A	N/A
73	Prescribed Fire	2	2	N/A	N/A	N/A	N/A	N/A
74	Prescribed Fire	4	4	N/A	N/A	N/A	N/A	N/A
75	Non-commercial thin	20	0	N/A	N/A	N/A	N/A	N/A
80	Non-commercial thin	24	0	N/A	N/A	N/A	N/A	N/A
81	Commercial Thin with underburn	25	25	0	25	0	N/A	N/A
82	Non-commercial thin	11	11	N/A	N/A	N/A	N/A	N/A
83	Non-commercial thin	14	14	N/A	N/A	N/A	N/A	N/A
84	Non-commercial thin	2	2	N/A	N/A	N/A	N/A	N/A
85	Non-commercial thin	15	15	N/A	N/A	N/A	N/A	N/A
86	Commercial thin	23	23	0	23	0	N/A	N/A
87	Non-commercial thin	38	38	N/A	N/A	N/A	N/A	N/A
88	Commercial Thin with underburn	30	29	7	24	0	N/A	N/A
89	Commercial Thin with underburn	61	0	0	51	10	N/A	1,046
90	Commercial Thin with underburn	38	0	3	36	0	N/A	N/A
91	Non-commercial thin	28	28	N/A	N/A	N/A	N/A	N/A
92	Non-commercial thin	27	0	N/A	N/A	N/A	N/A	N/A
93	Non-commercial thin	12	0	N/A	N/A	N/A	N/A	N/A
94	Non-commercial thin	7	7	N/A	N/A	N/A	N/A	N/A
95	Non-commercial thin	43	43	N/A	N/A	N/A	N/A	N/A
96	Non-commercial thin	23	23	N/A	N/A	N/A	N/A	N/A
97	Non-commercial thin	4	4	N/A	N/A	N/A	N/A	N/A
98	Non-commercial thin	11	0	N/A	N/A	N/A	N/A	N/A
99	Commercial Thin with underburn	16	16	0	0	16	N/A	927
100	Prescribed Fire	30	30	N/A	N/A	N/A	N/A	N/A
101	Non-commercial thin	9	9	N/A	N/A	N/A	N/A	N/A
102	Non-commercial thin	4	0	N/A	N/A	N/A	N/A	N/A
	TOTALS	4,131	3,637	743	826	172	9,281	8,509
	Percentage		85[1]	43[2]	49	8	(1.8 mi)	(1.6 mi)

[1]Percentage of area treated
[2]Percentage of harvest area

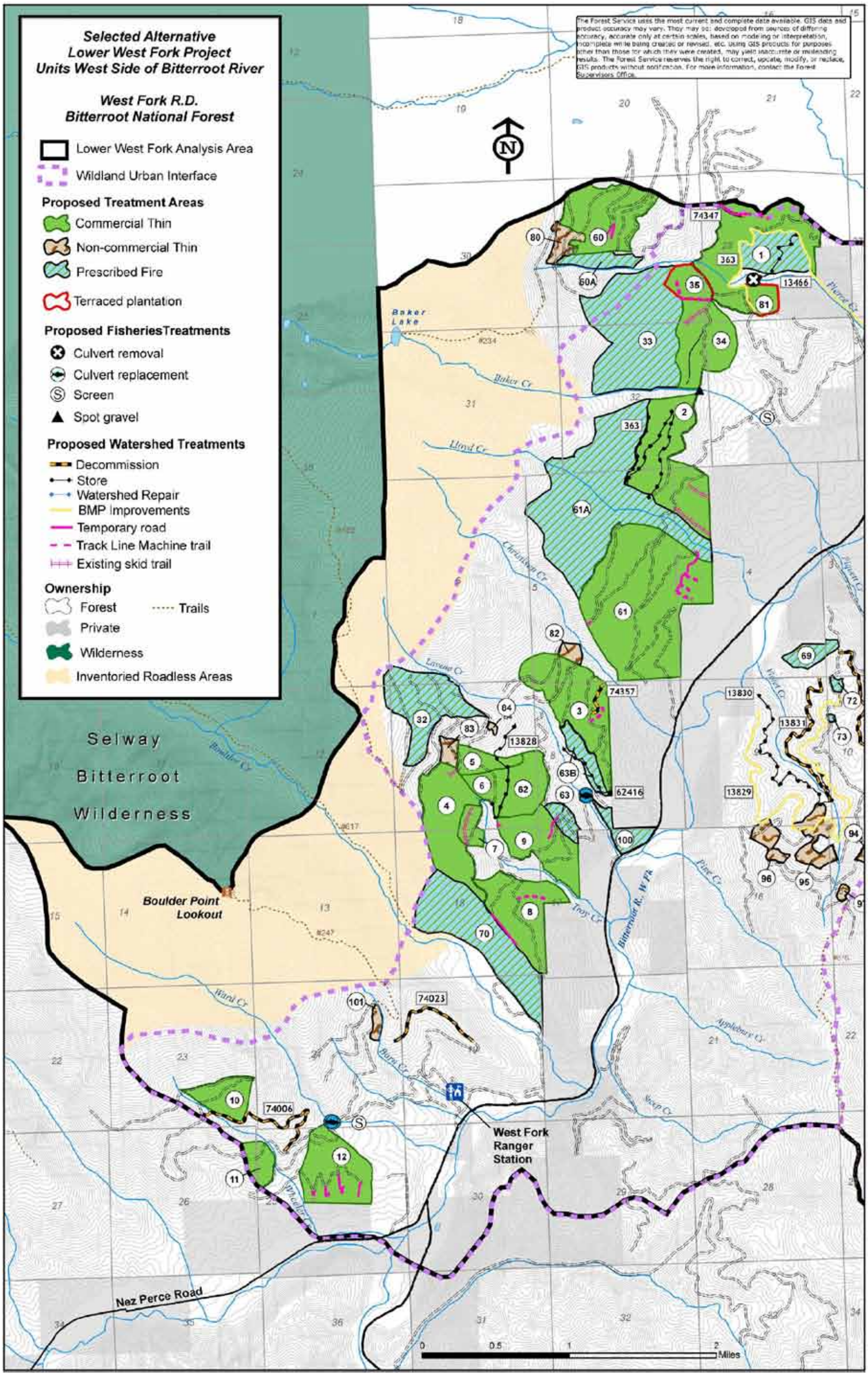

Figure 2: Lower West Fork Project Selected Alternative - Treatment Areas on the West Side of the West Fork River

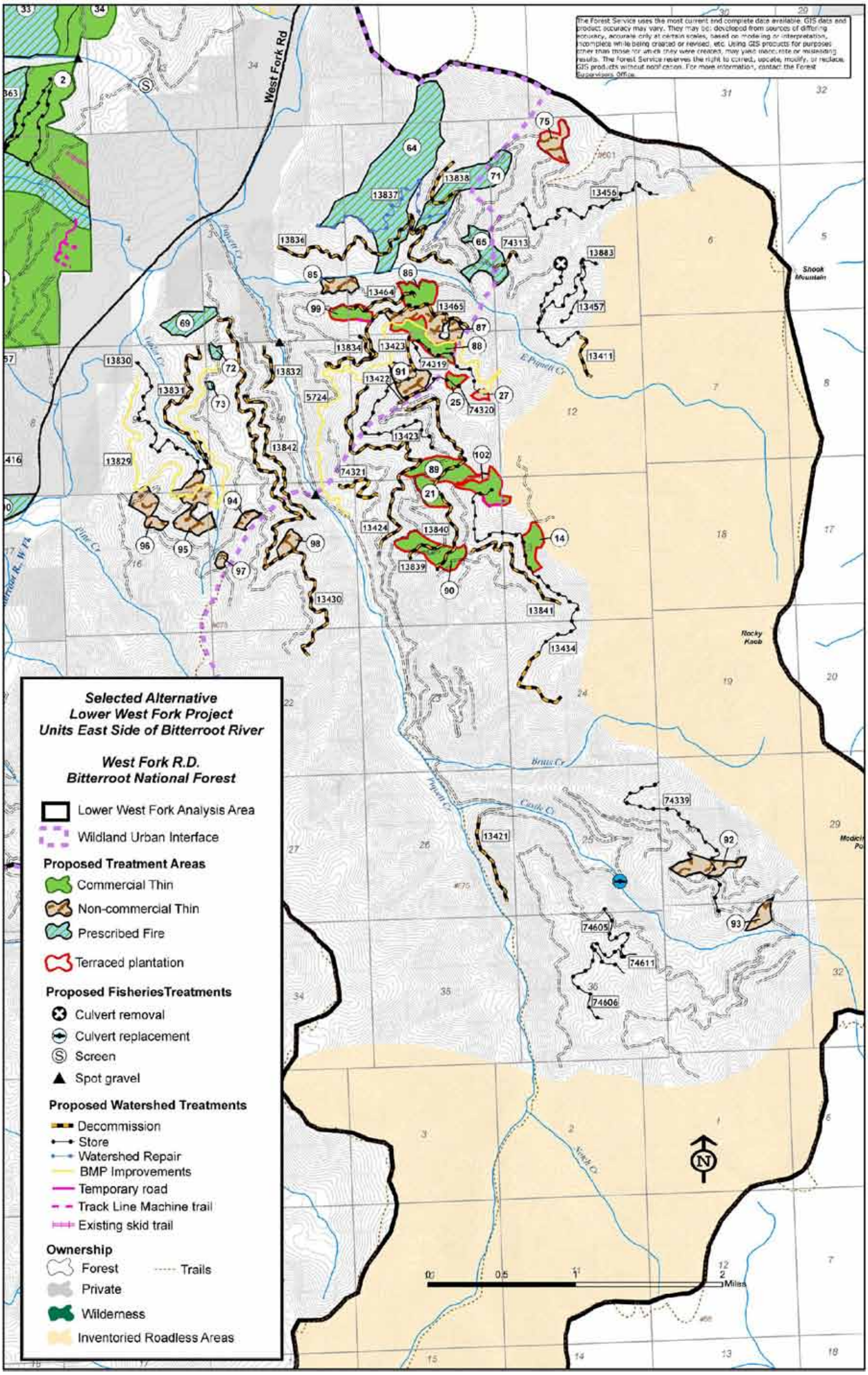

Figure 3: Lower West Fork Project Selected Alternative - Treatment Areas on the East Side of the West Fork River

Table 2: Stored or Decommissioned Roads under Alternative 3-modified

Road Number	Milepost	Description	Culverts Removed	Contributing Culverts Removed
363, Piquet Cr.	5.1-6.8	Storage	0	0
363, West Fork near Baker Cr.	0.0-3.0	BMP Improvements	0	0
5724, Piquett	0.0-3.7	BMP Improvements	0	0
13411, East Piquett[1]	1.6-2.4	Storage	4	2
13411, East Piquett[1]	2.4-2.8	Decommission	1	0
13421, Piquett	0.0-0.6	Decommission	0	0
All Haul Routes	Entire Length	Reshape and maintain drain dips; under contract and complete before contract closes		
13422, Piquett	0.0-0.2	Decommission	0	0
13423, Piquett	0.0-1.7	Storage	1	0
13423, Piquett	1.7-1.9	Decommission	0	0
13424, Piquett[1]	0.2-3.1	Decommission	4	2
13430, Piquett	0.0-4.2	Decommission	1	1
13434, Piquett	0.0-2.7	Storage	1	1
13434, Piquett	2.1-2.7	Decommission	1	1
13456, East Piquett	0.4-1.6	Storage	0	0
13457, Near Baker[1]	0.0-1.8	Storage	0	0
13464, East Piquett	1.7-2.3	Decommission	0	0
13465, East Piquett	0.0-1.6	Decommission	1	1
13466, Pierce[1]	0.0-0.6	Storage	3	2
13828, Troy, Lavene	0.0-0.9	Storage	1	1
13829, Violet	0.0-3.6	BMP Improvements	0	0
13830, Violet[1]	0.0-1.6	Storage	2	2
13831, Violet[1]	0.0-1.3	Decommission	2	2
13832, Piquett	0.6-0.9	Decommission	0	0
13834, Piquett	0.0-0.6	Decommission	1	0
13836, East Piquett[1]	0.0-2.4	Decommission	2	2
13837		Repair sediment sources		
13838, East Piquett	0.0-0.6	Decommission	1	1
13839, Piquett	0.6-0.8	Decommission	0	0
13840, Piquett	0.0-1.8	Decommission	1	0
13841, Piquett	0.0-1.2	Decommission	1	0
13842, Piquett	0.0-1.3	Decommission	1	1
13883, East Piquett	0.0-0.1	Storage	0	0
62416, Lavene	0.0-0.6	Storage	1	1
74006, Ward	0.0-1.2	Decommission	0	0
74023, Barn Draw	1.0-1.8	Decommission	1	1
74313, East Piquett	0.0-0.2	Decommission	1	1
74319, East Piquett	0.0-0.8	Storage	0	0
74320, East Piquett	0.0-0.2	Storage	0	0
74321, Piquett[1]	0.0-0.7	Decommission	1	1
74339, Castle	0.0-1.7	Storage	0	0
74347, Pierce	0.0-0.2	Decommission	0	0
74357, Christisen	0.0-0.3	Decommission	0	0
74605, Caste	0.0-1.4	Storage	0	0
74606, Castle	0.0-0.8	Storage	0	0
74611, Castle	0.0-0.1	Storage	0	0
Total culverts removed Estimated Sediment Reduction (1.7tons*23)			33	23[2] 39.1 ton less

[1] Included in stewardship contract and completed prior to the contract closure.

[2] BMP work assumed neutral

Table 3: Mandatory Stewardship Road Treatments under Alternative 3-modified.

Road Number	Watershed	Treatment	Length (miles)
13411	East Piquett	Storage	0.8
13411	East Piquett	Decommission	0.4
13421	Piquett	Decommission	0.7
13424	Piquett	Decommission	2.4
13457	East Piquett	Storage	1.8
13466	Pierce	Storage	0.6
13830	Violet	Storage	1.6
13831	Violet	Decommission	1.3
13836	East Piquett	Decommission	2.4
13837	Piquett	Repair sediment sources	N/A

The adaptive management protocol developed for the 65-acre portion of Unit 1 with detrimental soil disturbance will be applied. This protocol reduces ladder fuels, provides coarse woody debris, and increases crown spacing without the use of heavy equipment. Heavy equipment in this portion of Unit 1 might increase soil compaction above Region 1 soil standards. Initially, the area will be thinned from below and the slash will be lopped and scattered to prevent beetle infestation. The slash will be left on the ground at least one year to allow nutrients to leach into the soil. The slash will be burned and the area re-surveyed to assess residual coarse woody debris on the site. The coarse woody debris goal is 15-20 tons per acre. If residual coarse woody debris is below the required level, larger trees will be felled and left on site. The treatment emphasis will be to thin Douglas-fir and retain large ponderosa pine. Douglas-fir logs greater than 17 inches diameter and longer than six feet are preferred as coarse woody debris because Douglas-fir decays at a slower rate than ponderosa pine and stays on the soil surface longer.

Thinning larger trees from the overstory increases crown spacing and coarse woody debris in larger diameter classes. Limbs and treetops may needed to be piled and burned if the fine fuel load is too high following the last thinning entry.

Table 4: Summary of Activities for Alternative 3-modified

Activity	Acres (% of total area treated)
Total Number of Treatment Units	60
Treatments Area in WUI (acres)	3,639 (85%)
Proposed Treatments:	
Commercial Thin	2,303 (56%)
Prescribed Burn	1,532 (37%)
Small Tree Thin (Plantations)	296 (7%)
Research	199 (5%)
Total Acres Treated	4,131
Yarding Systems:	
Skyline	998 (57%)
Tractor	743 (43%)
Total Commercial Treatments	1,741
Temporary Road Construction (miles)	1.8
Tracked Line Machine (TLM) Trail (miles)	1.6
Roads to be decommissioned (miles)	26
Mandatory Roads to be decommissioned	11.3
Estimated Timber Harvest Volume (thousand cubic feet, CCF)	11,700 (5.4 mmbf[1])

[1] mmbf = million board feet

5.1 ALTERNATIVES CONSIDERED

Three alternatives were analyzed in detail in the FEIS. These are briefly described below. Table 5 shows a comparison of activities by alternative, including the chosen alternative.

Table 5: Comparison of Activities by Alternative

Activity	Alt. 1	Alt. 2	Alt. 3	Alt. 3 – modified
Total Number of Treatment Units	0	76	51	60
Acres of Treatments in Wildland Urban Interface (% of total acres treated)	0	4,290 (85%)	3,277 (91%)	3,639 (85%)
Proposed Treatments in acres (% of total acres treated)				
Commercial Thin with underburn	0	3,057 (60%)	2,163 (60%)	2,303 (56%)
Prescribed Burn only	0	1,703 (34%)	1,140 (32%)	1,532 (37%)
Small Tree Thin (Plantations)	0	296 (6%)	296(8%)	296 (7%)
Research (included in Prescribed burn)	0	199 (4%)	199 (6%)	199 (5%)
Total Acres Treated		5,056	3,599	4,131
Yarding Systems (acres) (% of harvest)				
Skyline	0	1,083 (43%)	798 (47%)	826 (47%)
TLM	0	366 (15%)	172 (10%)	172 (10%)
Tractor	0	1,044 (42%)	743 (43%)	743 (43%)
Roads Management				
Temporary Road Construction (miles)	0	2.2	1.5	1.8
TLM trail (miles)	0	1.7	1.6	1.6
Roads Decommissioned or stored with timber sale(miles)	0	11.6	11.8	11.8
Culvert removed/sediment contributors	0	15/11	18/12	18/12
Road Storage		19	18	18
Total Road decommission (miles)	0	10	27	26
Total Culverts removed/sediment contributors	0	22/16	33/23	33/23
Fish Passage Barriers removed/replaced	0	7	7	7
Fish screens installed	0	2	2	2
Soil Restoration	0	329	382	382
Estimated Timber Harvest Volume (thousand board feet, MBF)	0	7,500	5,100	5,500

5.1.1 ALTERNATIVE 1 – NO ACTION (FEIS PP. 2-5).

Under Alternative 1, current management would continue in the analysis area. No treatments are prescribed in Alternative 1 that would reduce potential crown fire, improve forest resiliency, or watershed condition. Though no management activities are proposed under this alternative, environmental changes will continue in the analysis area.

5.1.2 ALTERNATIVE 2 - PROPOSED ACTION (FEIS PP. 2-5 TO 2-12).

Alternative 2 was developed to meet the Purpose and Need of the project. It would have treated approximately 5,056 acres on National Forest System land. Eighty-five percent of the treatments would occur in the WUI. The proposed treatments would have been a combination of commercial thinning, small tree thinning, and prescribed burning. Approximately 49% of the treatment area would produce commercial timber volume estimated to be about 7.5 million board feet (MMBF). About 2.2 miles of temporary roads and 1.7 miles of TLM trail would have been constructed. This alternative would have stored almost 19 miles of road and decommissioned another 10 miles. Properly closing these roads would have removed 22 culverts of which 16 contribute sediment to streams. About 11.6 miles of road would

have been stored or decommissionied as part of the timber sale. The remaining work would be funded by appropriated or partnership funds.

Five culverts that block fish passage would also be replaced or removed. Soil restoration would be initiated in harvest units 1, 3, and 12 and on 297 acres of terraced plantations.

5.1.3 ALTERNATIVE 3 (FEIS PP. 2-12 TO 2-15).

Alternative 3 was designed to respond to the public concern that fires in 2000 and the Rombo fire have treated fuels on the east side of the West Fork River and that additional treatment is not necessary for community fire protection in the WUI. Alternative 3 would have treated approximately 3,599 acres of National Forest System land. Ninety one percent of the treatments would occur in the WUI. The proposed treatments would have been similar to those described for Alternative 2. Approximately 48% of the treatment area would produce commercial timber volume estimated to be about 5.1 MMBF. Approximately 1.5 miles of temporary roads and 1.6 miles of TLM trail would have been constructed. This alternative would have stored about 18 miles of road and decommissioned another 27 miles. Properly closing these roads would have removed 33 culverts of which 23 contribute sediment to streams. About 11.8 miles of road would have been stored or decommissionied as part of the timber sale. The remaining work would be funded by appropriated or partnership funds.

Treatments to benefit the fisheries would have been the same as in Alternative 2. Soil restoration strategies would also have been the same except in Unit 1. The portion of Unit 1 with high amounts of soil compaction would not be commercially thinned. Instead, the progressive strategy would achieve the fuel load reduction and stand enhancement objectives in the purpose and need. The strategy consists of:

- thinning from below
- lopping the slash to prevent beetle infestation
- letting nutrients leach from the slash for at least a year
- burn the slash
- assess coarse woody debris level with a goal of 15-20 tons/acre
- thin larger trees from the mid-story, if necessary

5.2 ALTERNATIVES CONSIDERED BUT ELIMINATED (FEIS PP. 2-17)

During project development, and in response to comments submitted on the DEIS, six other alternatives were considered but not analyzed in detail. These alternatives, and the reasons for not analyzing them in detail, are described below.

5.2.1 FOCUS FUEL TREATMENTS IN THE HOME IGNITION ZONE RATHER THAN EXTENSIVE WILDLAND FUEL MANAGEMENT

This alternative was not considered in detail because it would treat fuels on only a tiny fraction of the National Forest. The effects of this alternative would be indistinguishable from the No Action alternative. This alternative would not meet the purpose and need because it would not:

- Reduce fuel loads enough to lower crown fire hazard
- Improve ponderosa pine resilience
- Promote the representation of shade intolerant trees species in stands.

5.2.2 REMOVE OR FIX ALL ROADS THAT CAUSE SOIL AND WATER PROBLEMS, OR ARE NOT NEEDED FOR FUTURE MANAGEMENT

Alternatives 2 and 3 adequately address this issue. The ID Team used the Roads Analysis process to determine the roads not needed for future management. The FEIS discloses the cost of fixing all roads that cause soil and water problems. The arterial roads that encroach on streams in the analysis area (Roads 363

and 5630 along Pierce and Lavene creeks, for example) have been graveled to reduce sediment production. Little more can be done to reduce sediment production from these roads other than paving or relocation. Paving or relocation is infeasible due to topographic constraints and high costs.

5.2.3 DROP ALL UNITS WHERE TREATMENTS ARE PROPOSED FOR FOREST HEALTH REASONS, OR FOR GENERATING MONEY TO DO OTHER WORK

None of the treatment units were proposed exclusively for forest health reasons, or for generating money. All of the treatment units were designed to improve stand resiliency to fire and insect activity. Therefore, if all of the units proposed to improve stand resiliency were dropped, the alternative would be the same as the No Action alternative, which is analyzed.

5.2.4 DO NOT INCLUDE ANY COMMERCIAL LOGGING IN ROADLESS AREAS, BUT DO INCLUDE THE USE OF PRESCRIBED FIRE

Alternatives 2 and 3 adequately address this alternative. Both alternatives propose the use of prescribed fire in inventoried roadless areas, and neither alternative proposes commercial harvest in inventoried roadless areas.

5.2.5 DEVELOP A WATERSHED RESTORATION ALTERNATIVE, OR AT LEAST INCLUDE WATERSHED RESTORATION ELEMENTS IN ALL OF THE REASONABLE ALTERNATIVES.

Alternative 3 was developed in response to this recommendation. Watershed restoration elements are also included in Alternative 2.

5.2.6 REDUCE FUELS THROUGH TIMBER HARVEST AND SLASH DISPOSAL WITHOUT THE USE OF PRESCRIBED FIRE OR PILE BURNING.

This alternative would not treat the prescribed fire units or adequately reduce fuel loads. Not treating the prescribed fire units would decrease the fuels management effectiveness at the landscape-level (Arno and Fiedler 2005, Finney et al. 2005) by maintaining forest conditions that could carry fire and threaten resources in and adjacent to the WUI.

Thinning forests creates slash or woody material with little to no commercial value. Some of this material has value for replenishing soil nutrients and other soil characteristics, however too much can increase fuel loads and fire hazards. Slash can be ground into chips but this requires whole tree yarding, which is not feasible in some units. Also, chip vans typically have a wider turning radius than log trucks and may not be able to access some units. The nearest chip market is 100 miles from the analysis area but is not operating at this time. Under Alternatives 2, 3, and 3 – modified, chipping is an option if the market is available and the units are accessible (FEIS pg. 2-8, 2-14).

Stephens et al. (2009) found the effectiveness of mechanical thinning to reduce passive and active crown fire potential is dependent on the type of harvest system used, and the activity fuels remaining after harvest. Whole tree harvest systems cause little increase in 1-, 10-, and 100-hour fuels while cut-to-length systems greatly increase surface fuels in these classes. Stephens et al. (2009) found that mechanical treatments followed by prescribed burning or pile burning were the most effective treatment for reducing crown fire potential and predicted tree mortality. Post-wildfire studies indicate that mechanically treated stands without surface fuel treatments burned with higher intensity than those mechanically treated followed by prescribed fire (Skinner et al. 2004, Cram et al. 2006, Schmidt et al. 2008).

For these reasons, this alternative would not meet the purpose of reducing fuel loads and crown fire potential.

6.1 RATIONALE FOR MY DECISION

In selecting Alternative 3-modified, I determined that my decision is consistent with all laws, regulations, and policies. I considered the potential cumulative effects and reasonably foreseeable activities. I believe my decision provides the best balance of management activities to respond to the purpose and need, public comments, and environmental and social issues while complying with all applicable laws and regulations.

I base my conclusion on a review of the record that shows a thorough review of relevant scientific information, consideration of responsible opposing views, and the acknowledgement of incomplete or unavailable information, scientific uncertainty, and risk. For example, soil surveys in Unit 1 indicate that 42 acres of the Unit has 19% detrimental soil disturbance (DSD). The soil scientist recommended winter logging for the highly compacted soils in Unit 1. Forest monitoring supported by scientific literature indicates that winter ground-based harvest causes about 1% DSD (FEIS 3.5-18). Though mitigation measures require re-using skid trails and leaving 15-20 tons of coarse woody debris on the site, there is a risk that soil compaction would increase in the short-term. In response to a comment on the DEIS, I directed the ID Team to develop an alternative treatment that would meet the purpose and need for the project without increasing DSD. The alternative treatment analyzed in Alternative 3 of the FEIS does not increase DSD because heavy equipment is not used (FEIS 3.5-20). It achieves the purpose and need by thinning the understory and possibly the overstory, treating the smaller fuels after nutrients leach into the soil, and leaving the larger woody debris for long-term soil productivity. Throughout the FEIS, the scientific basis is referenced as it supports the purpose and need, the actions developed to respond to the purpose and need, and the effects analysis of the actions included in my decision.

The criteria I relied upon to make my decision on this project include:

- Achievement of the project purpose and need
- Relationship to environmental and social issues and public comments

My decision reduces the severity of fire on National Forest System lands adjacent to private property, and supports the Bitterroot Community Wildfire Protection Plan.

6.1.1 MEETING THE PURPOSE AND NEED

As noted in Section 3.1 of this document, the purposes for undertaking the Lower West Fork project are:

- Reduce fuel loads and lower crown fire hazard in low elevation ponderosa pine/Douglas-fir forests
- Improve forest resilience to natural disturbances (fire, insects, disease); particularly the resilience of large diameter ponderosa pine trees
- Maintain or increase shade intolerant species, specifically ponderosa pine
- Improve overall soil, watershed, and fisheries conditions by reducing road effects and rehabilitating degraded soils in historic harvest units and terraced lands.

Measurement indicators (Table 6) were developed for each of the purpose and need statements to indicate how each alternative responds to the statements (FEIS pg. 2-4, 2-16). The following section describes the purpose and need statements, lists the measurement indicators, and presents the results for each of the alternatives considered in detail. I believe the long-term benefits of improving forest conditions, reducing crown fire potential, and restoring the natural fire regime override the poor economics of this project. The currently poor market conditions may improve by the time the project is prepared for sale or the project may be delayed until market conditions improve. The analysis includes soil and watershed rehabilitation projects for which funds are available or that can better compete for funds since they are analyzed through the NEPA process. These projects will augment the natural soil rehabilitation and improve watershed conditions.

Table 6: Comparison of Measures to Meet the Purpose and Need of the Lower West Fork Project

Purpose and Need Measure	Alt. 1	Alt. 2	Alt.3	Alt.3 - modified
Area of reduced crown fire behavior (acres)	0	1,330	886	978
Area of reduced stocking (acres)	0	2,789	2,009	2,037
Area of reduced forest structure change[1] (acres)	0	2,493	1,713	1,741
Area of ponderosa pine treated	0	2,614	1,829	1,870
Area treated in the WUI	0	4,290	3,277	3,637
Part- and Full-time job contribution over the life of the project	0	170	121	121
Income contribution over life of the project) ($)	0	5.6 million	4.0 million	4.0 million
Revenue available for resource improvement ($)	0	140,000	100,400	100,400
Expected funding needed for implementation of mandatory activities ($)	0	581,100	492,800	492,800
Expected funding needed for implementation of mandatory activities and all optional stewardship activities ($)	0	1,656,600	1,441,900	1,441,900
Reduced long-term sedimentation (tons/year)	0	27	39	39
Decommissioned roads (miles)	0	10	27	26
Stored roads (miles)	0	19	18	18
Stream crossings removed	0	23	33	33
Fish barriers eliminated	0	7	7	7
Soil rehabilitation in terraced plantations (acres)	0	297	297	297
Soil rehabilitation in units with historic disturbance (acres)	0	32	85	85

[1] Represents area of commercial thin treatments. Though non-commercial thin treatments reduce stocking, they do not change the structure of the unit.

REDUCE FUEL LOADS AND LOWER CROWN FIRE HAZARD IN LOW ELEVATION PONDEROSA PINE/DOUGLAS-FIR FORESTS

The Bitterroot National Forest has been altered by 100 years of fire suppression, insect and disease outbreaks, and logging (Hessburg et al. 1994). The vegetation structure in most of the project area has shifted to dense, overstocked stands that are at increasing risk of stand-replacing fires. Large areas of unburned fuel exist in the project area that, in the event of a wildfire, could pose a considerable risk to firefighters, the public, and natural resources.

The fires of 2000 burned over 307,000 acres on the Bitterroot NF causing the loss of residences and property and the evacuation of over 1,000 homes. The fires of 2000 burned a portion of the Piquett Creek drainage, but most of the Lower West Fork analysis area did not burn in 2000. In 2007, the Rombo fire covered about 29,000 acres and burned 24,700 acres, including much of the upper half of the Piquett Creek drainage. The Rombo fire did not pose as great a threat to life and property as the fires in 2000 because it started in the higher elevations. However, the suppression cost of this fire was 7.2 million dollars. The Lower West Fork analysis area surrounds private land along the West Fork River. A large fire, or multiple ignitions in one day on the West Fork face has the potential to overwhelm suppression forces and travel unimpeded to the Forest Service/private property boundary.

Addressing this situation is a primary purpose of this project. Taking actions to reduce fuels in the project area would set the stage for fire to play a more natural role, which historically was non-stand replacing with short-to-moderately short fire free interval. To achieve this purpose, there is a need to reduce existing fuel loads, including live trees and dead and down woody material. Fire type was the measure chosen to evaluate the effects of the proposed treatments on fuels and fire behavior.

Alternative 2 reduces potential crown fire behavior the most (1,330 acres) followed by Alternatives 3 – modified (978 acres) and 3 (886 acres) (Table 6). The potential for crown fire to occur would continue to increase in Alternative 1.

The west side of the West Fork River is the highest priority for treatment because the terrain and vegetation are fairly uniform. Only one fire has occurred in the area since 1979. All of the action alternatives treat this area similarly. The difference between alternatives is the treatments on the east side of the West Fork River. The east side of the river has more broken terrain and more area previously harvested using the clearcut silvicultural system. The less uniform stands and topography create more barriers to fire spread. In addition the Rombo Fire and fires in 2000 burned most of the analysis area up to the WUI. Alternative 2 treats the most area using a combination of prescribed fire and commercial thin followed by an underburn. Alternative 3 treats only the terrace units. This treatment may interupt fire behavior but it but would not be as effective as Alternative 2. Alternative 3-modified allows for prescribed burning that would augment the treatment in the terrace units. The ID Team discovered through the analysis process that the Piquett drainage is vulnerable to channel changing events because of the amount of forest canopy lost during the Rombo Fire. In addition, the recent fires have reduced thermal cover and old growth habitat. Not harvesting timber in these units would offset the effects of the fires. Under these circumstances, I believe that Alternative 3-modified provides appropriate reductions in potential crown fire that will provide adequate fire management options in response to ignitions and protect vulnerable resource conditions and habitat components.

IMPROVE PONDEROSA PINE FOREST RESILIENCY TO NATURAL DISTURBANCE,

Stands in the Lower West Fork project area are a product of succession in the absence of disturbance. Stand densities have increased which has decreased tree vigor and increased fuel continuity. Declining tree vigor increases forest susceptibility to insects and disease, and higher tree mortality. Increasing stand density also increases the fuel continuity and provides structure for the development of crown fires. Ponderosa pine and ponderosa pine/Douglas-fir stands historically experienced frequent low-to-mixed intensity fires. This fire regime created landscapes resilient to fire, insects, and disease pathogens. Not only does the increase in tree density increase the flammability of the forest, but it increases water and nutrient competition among trees, shrubs, and other forest plants and predisposes the forest to disease and insect attacks. The area of reduced stand density, especially in the ponderosa pine and ponderosa pine/Douglas-fir forests was the indicator used to determine resiliency. Commercial thinning reduces stocking and favors disease-resistant trees, which improve tree vigor and resiliency. Alternative 2 reduces stocking the most (Table 6) followed by Alternative 3-modified and Alternative 3. Stocking is not reduced under Alternative 1 and stand density will continue to increase in the analysis area.

Again, the Alternatives treat the same units on the west side of the West Fork River, except Alternative 3 does not treat Unit 60. On the east side of the River, the terrace units are the only units commercially thinned in Alternative 3 or Alternative 3-modified. Not thinning the stands commercially thinned under Alternative 2 on this side of the river may off-set recent losses in thermal cover in the adjacent burned areas. The stands will become increasingly at risk for disease and insect attacks but treatments in the terrace units and prescribed fire units may buffer this risk.

As described in the Economics and Social Analysis section of the FEIS, the timber program on the Bitterroot National Forest has declined substantially over the last twenty years. However, even at the current level, timber from the Forest plays an important role in the wood products economy of Missoula and Ravalli Counties. The trees harvested to reduce stocking levels and, consequently, reduce the risk of stand-replacing wildfires, have commercial value, which will contribute to the local economy.

The ID Team selected two measurement indicators to compare the alternatives in terms of their effect on economic opportunities. They are total employment, expressed as jobs, and total labor income. It is important to note that these are not new jobs or income, but rather jobs and labor income attributed to the project.

With respect to total employment, Alternative 2 would contribute 170 part- and full-time jobs over the life of the project, followed by Alternative 3 with 121 jobs over the life of the project. Alternative 3-modified would be similar to Alternative 3 because timber harvest on the east side of the river is similar to Alternative 3 and the road decommissioning and storage is essentially the same.

With respect to total labor income, Alternative 2 would result in $5.6 million dollars spread over the life of the project**,** followed by Alternative 3 with $4.0 million dollars spread over the life of the project. Again, Alternative 3-modified would be similar to Alternative 3 because the treated areas are similar and the watershed, soils and fisheries projects are the same. Alternative 1 would not result in any total labor income. Under current market conditions, this project is unlikely to generate adequate funds to cover all the stewardship costs. However, allocated and partnership funds are available to pay for most watershed, soil, and fisheries projects not associated with the timber sale and having these projects analyzed in a NEPA document improves their potential to be funded.

MAINTAIN OR INCREASE SHADE INTOLERANT SPECIES

The dry, lower elevations are composed of mixed Douglas-fir and ponderosa pine in well-stocked or over-stocked stands with increasing levels of Douglas-fir regeneration in the understory. Fire was an important agent that controlled forest density and species composition. These moderately warm, dry grasslands and cool upland sites had high fire frequencies and low to mixed intensity fire regimes. Fire suppression initiated the species composition shift in most of the ponderosa pine forest type to forest dominated by more shade tolerant species such as Douglas-fir and grand fir. Fire suppression reduced fire frequency and created conditions for shade tolerant species to encroach and out-compete less shade tolerant species. Reducing the stand density to favor retention of the large ponderosa pine and to a lesser extent, the large Douglas-fir will allow fire to function at an intensity that will not damage the forest components. The measurement indicators selected to compare the alternatives are area of ponderosa pine habitat treated and area of reduced stand density. As with the previous measures, Alternative 2 treats the most area and reduces the density of the most stands. Alternative 3 treats the least area and the fewest stands. Alternative 3-modified is similar to Alternative 3, though this alternative treats slightly more area. Again, Alternative 1 does not treat any stands so ponderosa pine representation in stands would continue to decline.

The main difference between the action alternatives is the treatment of areas on the east side of the West Fork River. Only the terrace units are thinned on the east side of the River in Alternatives 3 and 3–modified though ponderosa pine stands will be maintained in the prescribed fire units under Alternative 3–modified.

IMPROVE OVERALL SOIL, WATERSHED, AND FISHERIES CONDITIONS BY REDUCING ROAD IMPACTS AND REHABILITATING SOILS ON TERRACED LANDS IN THE AREA.

Streams and Fish

Road sediments reduce water quality and channel conditions by increasing the amount of fine sediments in the stream, which settles into the stream substrate, reduces the volume of pools, and increases bank erosion. The Restoration Plan lists the West Fork River as impaired (MDEQ 2005) by sediment and thermal modification. The Restoration Plan recommends reductions in road sediment sources. The number of stream crossings removed and the miles of road decommissioned or stored are the two measurement indicators.

Alternatives 3 and 3 – modified decommission and store the most miles of road and remove the most culverts. Alternative 2 is similar to Alternatives 3 and 3–modified in the miles of road stored but decommissions 10 miles of road in contrast to the 27 and 26 miles of road decommissioned in Alternatives 3 and 3–modified, respectively. Similar amounts of road are stored or decommissioned as part of the timber sale (Table 6). Appropriations or partnerships will fund the roadwork not associated with the timber sale.

Rehabilitating Detrimental Soil Disturbance

Soil conditions in three proposed commercial thinning units are near or exceed Region 1 Soil Quality Standards. Rehabilitation by increasing the amount of fine and coarse wood on the soil for future soil development, decompacting soils degraded by past ground-based logging operations, or a combination of these treatments would improve soil quality.

The project area contains approximately 297 acres of terrace plantations created in the late 1960s to improve tree survival and growth. The construction of terraces created high levels of soil disturbance as dozers cut benches across the recently clearcut slopes. The soils cut from the benches were side cast down slope on risers between benches. Dozer operations created highly compacted soil conditions on the terrace benches. Soil monitoring of the terraces indicate these units have 50 to 60 percent detrimental soil disturbance, which exceeds Region 1 Soil Quality Standards. The two measures indicating differences between alternatives are the area of soil improvement in past harvest units and the area of soil improvement on terrace plantations. All the alternatives treat the same area of terrace plantations and Alternative 2 treats 32 acres of past harvest units while Alternatives 3 and 3–modified treat 85 acres. The difference between alternatives is not the absolute area treated but the method of treatment. My preference is in the methods used to treat the compacted soils in Unit 1 as described in Alternatives 3 and 3–modified. I believe this treatment would augment soil rehabilitation without the risk of incurring more compaction.

IMPROVE AQUATIC CONNECTIVITY

The fishery in the Lower West Fork analysis area does not meet desired conditions, primarily because several culvert barriers fragment bull trout and westslope cutthroat trout populations; and non-native trout competitors are present throughout the West Fork River and much of Piquett and East Piquett creeks.

The number of fish barriers replaced or removed is the measurement indicator selected to address this Purpose and Need item. Alternatives 2, 3, and 3–modified all remove or replace the same culvert on the same streams. No culverts are removed or replaced under Alternative 1.

6.1.2 Addressing Issues and Public Concerns

I considered the comments received on the DEIS, and directed the ID Team to incorporate changes to the FEIS as appropriate. Refer to the Summary of Changes between Draft and Final EIS in the FEIS. Chapter 4 of the FEIS provides more thorough responses to the comments on the DEIS and the comment letters are provided in Appendix G of the FEIS.

The following are the major concerns raised by the public in their responses to scoping the DEIS, and during public field trips and public meetings. I have summarized how the ID Team addressed them through the analysis process.

Fisheries and Watershed

The primary concerns raised by the public focused on the funding of proposed watershed improvement mitigations and opportunities.

The funding of watershed and fisheries improvements are discussed in alternative descriptions and the Chapter 3 watershed and fisheries sections of the FEIS. They are also considered in the Economics analysis (Section 3.13). Table 3.13-5 shows the revenues associated with the project and the mitigation activities, while Table 3.13-6 shows the improvement opportunities and possible funding sources.

Soils

Commenters raised concerns about the effectiveness of subsoiling, the Region 1 soil quality guidelines; failure to conduct field reviews; and guidelines pertaining to coarse woody debris.

Information concerning subsoiling is included in Chapter 4, Response to Comments of the FEIS and disclosed in the soils analysis, Section 3.5, as are the Region 1 soil quality guidelines and field reviews.

Concerns raised about the effectiveness of soil mitigations in the compacted portion of Unit 1 prompted additional ID Team discussions and an alternative method for treating the area. The alternative method was incorporated into Alternatives 3 and 3–modified and will be implemented as part of my decision.

WILDLIFE – ELK HABITAT EFFECTIVENESS AND THERMAL COVER

Concerns were raised about road management and how they were considered in the determination of elk habitat effectiveness. Also, concerns were raised about the proposed Bitterroot National Forest Plan (Forest Plan) amendments for elk habitat effectiveness and thermal cover.

Both amendments were modified to clarify the intent and their application in the Lower West Fork Analysis Area. The elk habitat effectiveness and thermal cover analyses are also expanded and clarified in the FEIS.

RECREATION AND ROADLESS

Concerns raised by commenters pertaining to unroaded and roadless areas dealt with the effects of the proposed treatments on unroaded areas.

The effects of the proposed activities on roadless and unroaded areas are clarified and disclosed in Section 3.12 of the FEIS.

7.1 PUBLIC INVOLVEMENT

The concept for the Lower West Fork Project was introduced on a public field trip to review the similar Frasier Interface project in October of 2006. The feedback from this field trip was used to refine the proposed action for the Lower West Fork Project. Two additional field trips were held as the project developed in May 2007 and January 2008.

A legal notice was published in the Ravalli Republic newspaper on March 7, 2007 (PF-Scoping-07-002). This notice provided details on the project and invited people to comment during the 30-day scoping period. News releases on the project proposal appeared in the Ravalli Republic on March 8, 2007. The Forest Service mailed a scoping letter, with four maps describing the proposed project and its background, to about 148 people, organizations, and agencies on March 7, 2007. They were invited to submit comments and questions on the project proposal by April 7, 2007. The Forest Service received 12 responses (PF-Scoping-001-009, 021, 023, 031). On March 10, 2007, the Forest Service established a Lower West Fork Project webpage providing public access to scoping letters, maps, and treatment examples used in the proposed action and alternatives. This website was updated as new information became available (www.fs.fed.us/r1/bitterroot).

Preliminary ID Team analysis indicated that larger areas needed treatment to better apply current research and meet the project's purpose and need of reducing crown fire risk on a landscape scale. In addition, the Rombo fire burned through several previously proposed units. Three of these units were proposed for prescribed fire, two for commercial harvest, and two for non-commercial thins. Only one of these units, a non-commercial thin unit would still benefit from treatment. The proposed action was expanded to treat additional areas within the analysis area boundary and a Notice of Intent was published on December 12, 2007. The Notice of Intent opened another comment period that closed January 22, 2008. The Forest Service received 10 comments during this period. These comments in addition to the comments received in the initial comment period were used to identify issues and develop alternatives to the proposed action.

The DEIS was completed and a Notice of Availability was published in the Federal Register on April 10, 2009. The Notice of Availability opened the 45-day comment period that ended May 26, 2009. The Forest Service sent letters to 154 individuals, organizations, and agencies informing them that the DEIS was available as a document, compact disc, or on the Bitterroot National Forest web site. They also placed a legal advertisement in the Ravalli Republic, the newspaper of record, and distributed articles to the Missoulian, Missoulian on line, the Ravalli Republic, and the Bitterroot Star. The Forest Service received

six letters in response to these notifications and the comments in the letters were used to correct mistakes or clarify or amend the analysis. The ID Team added another alternative to evaluate the effects of stand treatments without the use of fire but did not carry that alternative through the analysis. The responses to all comments the Forest Service received are in Chapter 4.

Public Meetings
Prior to the January 16, 2008 field trip, District Ranger Campbell briefed the Bitterroot Restoration Committee (BRC) on the project at a regularly scheduled meeting on December 18, 2007. The purpose and need for management and the BRC restoration principles were compared as part of the briefing. The BRC was also briefed on the project status at the regularly scheduled meeting on October 27, 2008.

7.1.1 HOW I CONSIDERED PUBLIC COMMENTS

Regardless of the source or form of the correspondence, or whether the comment was received during the official comment periods or afterwards, I considered each piece of correspondence. The public comment process provided many issues and concerns related to the project that were considered in the analysis (FEIS Chapter 4). I have reviewed these issues and concerns and I believe Alternative 3-Modified provides the best balance addressing public concerns and achieving the project purpose and need.

8.1 FINDINGS RELATED TO OTHER LAWS AND REGULATIONS

To the best of my knowledge, my decision is consistent with all laws, regulations, and agency policy relevant to this project. The following discussion is not an all-inclusive listing, but provides information on topics raised by the public or other agencies.

8.1.1 NATIONAL FOREST MANAGEMENT ACT

The selected alternative is consistent with the National Forest Management Act (NFMA) requirements under 16 USC 1604 (g) (3) (E), which concerns even-aged management and clearcutting. The cutting of live trees to create an even-aged system is not proposed.

1) No soil, slope, or other watershed conditions will be irreversibly damaged (FEIS pgs. 3.5-44, Appendix A). No system roads will be built during this project, so the project will not create any permanent impairment. Alternative 3-modified maintains organic matter, soil porosity, and topsoil through the use of Best Management Practices (BMPs), Soil and Water Conservation Practices (SWCPs), and mitigation measures (FEIS pg. 3.5-44). Localized and limited detrimental soil disturbance will occur on landings, skid trails, temporary roads, or where soils are intensely heated, for example under logs or around roots. Detrimental soil disturbances will be managed according to Region 1 Soil Quality Guidelines to ensure soil productivity is maintained in activity areas. Compacted soils from terracing, historic logging activities, and re-used skid trails will be rehabilitated and trend soil productivity towards a net improvement (FEIS pgs. 3.5-26 – 3.5-31)

2) The units will be fully stocked following the commercial thin and prescribed fire treatments. No regeneration harvest would occur therefore, there would is no need to restock stands withing 5 years (FEIS pg. 3.2-3).

3) Alternative 3-modified protects streams, stream banks, shorelines, lakes, wetlands, and other bodies of water from detrimental changes in water temperatures, blockages of water courses, and deposits of sediment through implementation of the Inland Native Fish Strategy standards and guidelines, programmatic agreements made with the U.S. Fish and Wildlife Service, BMPs, project design, and mitigations (FEIS pp. 3.7-8, 3.7-28, 3.7-34,2-20 – 2-21, Appendix A).

4) In Alternative 3-modified, the harvesting systems were selected based on site-specific resource requirements and not primarily to generate the greatest dollar return or the greatest unit output of timber (FEIS pg. 3.2-3).

SITE-SPECIFIC BITTERROOT NATIONAL FOREST PLAN AMENDMENT

Implementation of Alternative 3-modified will require a site-specific amendment to the Bitterroot Forest Plan (1987) (FEIS p. 1-11 to 1-13) Appendix F. Therefore, my decision includes an amendment that will modify the following Forest Plan standards specifically as they relate to the Lower West Fork decision:

- Ø Elk habitat effectiveness
- Ø Forest-wide thermal cover
- Ø Coarse woody debris

Please see Appendix F of the FEIS for more detailed information pertaining to this amendment. Section 1926.51 of the Forest Service Directives (www.fs.fed.us/emc/nfma/index5.html) gives guidance for determining what constitutes a "significant amendment" under NFMA. I have determined, based on this guidance, that this site-specific forest plan amendment is not significant because it will not significantly alter the long-term relationship between levels of multiple-use goods and services originally projected; and, it will not have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period. The amendment modifies standards and guidelines in the analysis area for the Lower West Fork project. Therefore, it is not a long term change in the plan. The public has been notified of this amendment throughout the NEPA process.

FOREST PLAN CONSISTENCY

The Bitterroot National Forest Plan (Forest Plan) provides general management direction for the Forest, and establishes Forest-wide and management area standards and guidelines (USDA Forest Service 1987, Chapter II). Management activities are to be consistent with the Forest Plan (16 USC 1604 (i)).

I have evaluated the consistency of the alternatives with Forest Plan standards. Alternative 3-modified is consistent with the Forest Plan, meets Forest Plan standards, as amended, and will contribute toward reaching Forest Plan goals and objectives. Consistency with these standards can be found throughout the FEIS (pgs. 3.2-3 to 3.2-5 3.3-3 – 3.3-5, 3.3-22, 3.4-13, 3.5-45 – 3.5-46, 3.6-41 - 3.6-45, 3.7-34, 3.8-65 – 3.8-67, 3.9-11, 3.10-14 to 3.10-15, 3.11-5, 3.12-19). The Biological Evaluations and Biological Assessments confirm that this project will not impact the viability of sensitive, or threatened and endangered species. (FEIS pgs. 3.7-32 – 3.7-33, 3.8-68, 3.10-13 - 3.10-14.

8.1.2 NATIONAL ENVIRONMENTAL POLICY ACT

NEPA requires Federal agencies to: (a) use a systematic interdisciplinary approach in planning and decision making; (b) consider the environmental impact of proposed actions; (c) identify adverse environmental effects which cannot be avoided should the proposal be implemented; (d) consider alternatives to the proposed action; (e) consider relationship between local short-term uses of the human environment and the maintenance and enhancement of long-term productivity; and (f) identify any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

I find that the Lower West Fork analysis process and documentation is consistent with NEPA. The CEQ provides NEPA guidance for government agencies, and interprets regulations on cumulative effects as; requiring analysis and a concise description of the identifiable present effects of past actions to the extent that they are relevant and useful in analyzing whether the reasonable foreseeable effects of agency proposal for action and its alternatives may have a continuing additive and significant relationship to those effects. The CEQ regulations do not require agencies to catalog and analyze all individual past actions. Information about past actions that may be available or obtained with reasonable effort does not mean that it is relevant and necessary to inform decisionmaking (CEQ 2005). However, I directed the Lower West Fork ID Team to catalog past harvest, road construction, and grazing activities and their effects, which is documented in Appendix B of the FEIS.

8.1.3 CLEAN WATER ACT

The Lower West Fork project complies with the Clean Water Act (FEIS pgs. 3.6-42 to 3.6-43). Soil and water resources are protected through the application of design features and mitigation measures (FEIS pgs. 2-17 to 2-24) and soil and water conservation practices listed in Appendix A of the FEIS. Though the West Fork of the Bitterroot River (West Fork River) is listed on the Montana 2008 impaired waters list, none of the tributaries in the Lower West Fork analysis area are listed. However, reducing sediment levels in these tributaries will decrease sediment levels in the West Fork River. The soil and water rehabilitation projects will reduce potential long-term sediment contributions to streams and contribute to the overall reduction of sediment in the West Fork River.

8.1.4 CLEAN AIR ACT

The basic framework for controlling air pollutants in the United States is the 1970 Clean Air Act, as amended in 1990 and 1999 (42 USC 7401 et seq.). The main air quality concern associated with this project is the amount and duration of particulate matter produced by prescribed burning. All prescribed burning will be implemented in full compliance with Montana Department of Environmental Quality air programs through cooperation with the Montana Idaho Airshed Group (FEIS p. 3.4-13). I have concluded that Alternative 3-modified meets the Clean Air Act and the Montana Clean Air Act (FEIS p. 3.4-8 to 3.4-10).

8.1.5 ENDANGERED SPECIES ACT

The Bitterroot National Forest Fisheries Biologist, Wildlife Biologist, and Botanist evaluated the effects of the alternatives on threatened and endangered fish, wildlife, and plant, species, respectively (FEIS pgs. 3.7-1 to 3.7-5, 3.7-10 to 3.7-15, 3.7-19 to 3.7-32, 3.8-42 to 3.8-44, 3.8-67, 3.10-1). The Fisheries Biologist prepared a Biological Assessment of bull trout (PF-FISH-002) and the U.S. Fish and Wildlife Service (USFWS) concurred with the Forest Service determination "that the proposed project is not likely to adversely affect bull trout, bull trout critical habitat, and proposed bull trout critical habitat." (PF-FISH-003). As there are no Threatened and Endangered wildlife or plant species known to occur on the Bitterroot National Forest, consultation with the USFWS was not required, and Biological Assessments were not prepared (FEIS pgs. 3.8-1, 3.10-1).

The USFWS no longer lists the Canada lynx as threatened or endangered on the Bitterroot NF (FEIS pgs. 3.8-42). However, the project effects on Canada lynx habitat were evaluated as described in the NRLMD ROD (FEIS pg. 3.8-42) and the analysis showed there would be "No Effect" (FEIS pg. 3.8-44). Consultation with the USFWS is not required because Canada lynx are not listed as threatened on the Bitterroot NF and the determination was "No Effect."

Forest Service resource specialists prepared Biological Evaluations or Biological Assessments for sensitive fish, wildlife, and plants and summarized the conclusions in the FEIS (FEIS pgs. 3.7-33, 3.8-67, 3.10-14, respectively). The conclusions were either "No Impact" or "May Impact Individuals or Habitat but not likely to contribute to a trend towards Federal listing or loss of viability to the population or species."

Alternative 3-modified would have effects similar to Alternative 3 because the soil and water rehabilitation projects would be the same and the timber harvest would be similar. The determinations of effect for threatened, endangered, and sensitive species were the same for Alternatives 2 and 3. Therefore, the determinations would be the same for Alternative 3-modified.

8.1.6 ENVIRONMENTAL JUSTICE ACT

Executive Order 12898, issued in 1994, orders federal agencies to identify and address any adverse human health and environmental effects that disproportionately impact minority and low-income populations. Based on the composition of the affected communities and the cultural and economic factors, Alternative 3-

modified will have no adverse effects on human health and safety or environmental effects on minority, low-income, or any other segments of the population (FEIS pg. 3.13-10).

Alternative 3-modified provides the option to treat potential new invasive plant populations with herbicides. The criteria for determining whether to use herbicides, which herbicides to use, and how to apply them will be the same as described in Alternative 2. The potential exposure to herbicides under Alternative 2 were determined to be very low (FEIS pg. 3.15-5) and would not disproportionately affect minorities or low income populations. Herbicide exposure would be less likely under Alternative 3-modified because soil disturbance would occur on 758 fewer acres. Though more roads would be decommissioned and stored under Alternative 3-modified, it would increase the area of potential disturbance to 1,791 acres, which is less than the 2,549 acres of potential disturbance in Alternative 2.

8.1.7 MIGRATORY BIRD TREATY ACT

The design features and mitigation measures in Alternative 3-modified provide adequate conservation measures for migratory birds. Overall, impacts on forest land birds are expected to be minimal and are not expected to affect species viability (FEIS pg. 3.8-66).

8.1.8 NATIONAL HISTORIC PRESERVATION ACT

Alternative 3-modified would not affect any cultural resources. Recognizing the potential exists to encounter and disturb unidentified sites during project activity, mitigation practices require halting activities and notifying the Forest Archaeologist, if cultural resources are encountered during project implementation. Formal consultation has been completed with the Confederated Salish and Kootenai Tribes and the State Historic Preservation Office in accordance with the Memorandum of Understanding (PF-HERT-002). Heritage and Tribal interests are regulated by federal laws that direct and guide the Forest Service in identifying, evaluating and protecting cultural resources. Alternative 3-modified will comply with these federal laws because both Alternative 2 and Alternative 3 comply (FEIS pg. 3.11-5) and Alternative 3-modified is within the parameters of these two alternatives.

8.1.9 ENVIRONMENTALLY PREFERRED ALTERNATIVE

The Council on Environmental Quality defines the environmentally preferred alternative as "the alternative that will promote the national environmental policy as expressed in NEPA's Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources." This definition could be generalized to mean the alternative that best balances negative impacts with benefits.

Alternative 1 (No Action) would impact the biological and physical environment the least in the short-term because no ground-disturbing activities would occur. However this alternative does little to improve stand growing conditions and forest density will increase. Over time, stand resilience to environmental stressors would decline and the forest will increasingly become susceptible insects, disease, and fire. In addition, no road decommissioning or storage and associated culvert removal would occur and current trends in sediment contributions to associated streams would continue. This alternative would not contribute to the sediment reduction target identified in the Water Quality Restoration Plan and Total Maximum Daily Loads for the Bitterroot Headwaters Planning Area (DEQ 2005). Fish habitat would continue to be fragmented at the seven fish barrier culverts. Soil rehabilitation would continue at the normal rate and would not be expedited through subsoiling or slash decomposition.

Alternative 3-modified offers the best balance between meeting the purpose and need for the project and minimizing long-term environmental effects. The units on the west side of the West Fork River are treated under Alternative 3-modified, which links fuel treatments in three previous decisions. These treatments provide a buffer across the landscape between the Selway-Bitterroot Wilderness and private land boundaries, which would likely increase fire management options. Alternative 3-modified retains the prescribed fire units on the east side of the River, which combined with past treatments and fires, will

provide some fire management options while not creating additional disturbance in drainages recovering from the effects of the Rombo fire. By not commercially thinning the units on the east side of the river at this time, log truck traffic will not be on roads next to streams that are prone to increased sedimentation from the Rombo fire. I conclude that the commercial thin treatments on the east side of the West Fork River are not as critical to enhancing fire management options. Past fire activity and harvest treatments and the proposed prescribed fire and terrace treatments provide adequate opportunities to manage fire and protect resources in the WUI.

Retaining the option to combat new weed infestations using herbicides is an important feature analyzed in Alternative 2 that needs to be retained in Alternative 3-modified. These drier ecotypes are prone to weed infestations and weed seed sources typically are adjacent to treatment areas. Though preventive and mechanical methods of eradication are preferable, not all weed species can be treated in this manner.

Alternative 3-modified also restores the most soil and watershed conditions. The treatment of the portion of Unit 1 with high levels of soil disturbance has the potential to accelerate the recovery of soil conditions. Terrace units will be treated to improve stand growing conditions and enhance soil rehabilitation rates. This Alternative also decommissions or stores the most roads and removes the most culverts from roads not needed for forest management, which in turn reduces the most sedimentation and restores fish habitat connectivity.

Considering these factors, I conclude that Alternative 3-modified is the environmentally preferred alternative.

8.1.10 PERMITS REQUIRED

Removing or replacing culverts within an active stream channel requires a 124 permit from the Montana Department of Fish, Wildlife, and Parks. In certain instances, a 404 permit from the Army Corps of Engineers or 318 permit from Montana Department of Environmental Quality, may also be required. The applicable permits must be obtained prior to conducting the work. The permits sometimes contain additional site-specific mitigations to minimize damage to the aquatic ecosystem. Appropriated dollars from the Forest Services annual budget is also required for implementation of the culvert work. No other permits, licenses, grants, or authorizations are needed to implement the decision.

9.1 APPEAL PROVISIONS

This decision is subject to appeal pursuant to 36 CFR 215.11. A written appeal must be submitted within 45 days following the publication date of the legal notice of this decision in the *Ravalli Republic*, the newspaper of record in Hamilton, Montana. It is the responsibility of the appellant to ensure their appeal is received in a timely manner. The publication date of the legal notice of the decision in the newspaper of record is the *exclusive* means for calculating the time to file an appeal. Appellants should not rely on date or timeframe information provided by any other source. Appeals must be submitted to:

USDA Forest Service, Northern Region ATTN: Appeal Deciding Officer P.O. Box 7669 Missoula, MT 59807	**Or**	USDA Forest Service, Northern Region ATTN: Appeal Deciding Officer 200 East Broadway Missoula, MT 59802

(Office hours are Monday through Friday from 7:30 a.m. to 4:00 p.m., except holidays.)

Electronic appeals must be submitted to: **appeals-northern-regional-office@fs.fed.us**

Faxed appeals must be submitted to: Fax: (406) 329-3411

In electronic appeals, the subject line should contain the name of the project being appealed. An automated response will confirm your electronic appeal has been received. Electronic appeals must be submitted in MS Word, Word Perfect, or Rich Text Format (RTF).

It is the appellant's responsibility to provide sufficient evidence and rationale to show why my decision should be reversed. The appeal must be filed with the Appeal Deciding Officer in writing. At a minimum, the appeal must meet the content requirements of 36 CFR 215.14, and include the following information:

- The appellant's name and address, with a telephone number, if available;
- A signature, or other verification of authorship upon request (a scanned signature for electronic mail may be filed with the appeal);
- When multiple names are listed on an appeal, identification of the lead appellant and verification of the identity of the lead appellant upon request;
- The name of the project for which the decision was made, the name and title of the Responsible Official, and the date of the decision;
- The regulation under which the appeal is being filed, when there is an option to appeal under either 36 CFR 215 or 36 CFR 251, subpart C;
- Any specific change(s) in the decision that the appellant seeks and rationale for those changes;
- Any portion(s) of the decision with which the appellant disagrees, and explanation for the disagreement;
- Why the appellant believes the Responsible Official's decision failed to consider the comments; and
- How the appellant believes the decision specifically violates law, regulation, or policy.

If an appeal is received on this project there may be informal resolution meetings and/or conference calls between the Responsible Official and the appellant. These discussions would take place within 15 days after the closing date for filing an appeal. All such meetings are open to the public. If you are interested in attending any informal resolution discussions, please contact the Responsible Official or monitor the following website for postings about current appeals in the Northern Region of the Forest Service: http://www.fs.fed.us/r1/projects/appeal_index.shtml."

10.1 IMPLEMENTATION

If no appeal is received, implementation of this decision may occur on, but not before, five business days from the close of the appeal filing period. If an appeal is received, implementation may not occur for 15 days following the date of appeal disposition.

11.1 FURTHER INFORMATION AND CONTACT PERSON

For additional information concerning this decision contact Dave Campbell, West Fork District Ranger, Bitterroot National Forest, 6735 West Fork Rd, Darby, MT 59829. (406) 821-1212. Information is also available at http://www.fs.fed.us/r1/bitterroot/planning/decisiondocs/decisiondocs.html

Julie K. King

Julie K. King

Forest Supervisor
Bitterroot National Forest

6-28-10

Date

LIST OF REFERENCES CITED IN THIS DECISION

The following references were cited in this Record of Decision. Additional literature is cited in the Final Environmental Impact Statement.

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APPENDIX A

BEST MANAGEMENT PRACTICES
BITTERROOT NATIONAL FOREST

2.3 MITIGATION MEASURES AND PROJECT DESIGN

The Forest Service designs projects and specifies practices that prevent or mitigate adverse effects of project activities. These design features and management practices come from direction in the Forest Plan, and Forest Service manuals and handbooks. The design features and mitigation practices specified in the alternatives are outlined in Tables A-1 and A-2.

Table A-1: Mitigation Practices and Design Features in Alternatives 2 and 3 of the Lower West Fork Project

Objective	Mitigation Practice or Design Feature
Soils	
Minimize soil erosion and compaction	Activities will comply with Best Management Practices (BMPs) to minimize effects to soil resources. BMPs are listed in Appendix A. Complete descriptions are available in the Project File.
Reduce soil erosion, prevent sedimentation into streams, and prevent the spread of noxious weeds	Disturbed sites will be evaluated by timber sale administrators (TSAs) and/or resource specialists to determine erosion control and revegetation needs. Soil disturbances associated with landings, roadside ditches, temporary roads, or other areas would be rehabilitated as soon as possible by re-contouring, shallow ripping (6-12 inches) as needed, seeding, fertilizing, planting of shrubs, and covering with mulch or slash.
Minimize soil compaction	Skid trails will be designated and historic skid trails will be used to the extent feasible in units yarded by ground-based systems.
	Winter ground-based yarding is required in Unit 1 below FS road 363 (approximately 65 acres) under Alternative 2. The winter yarding will be required to follow standard winter timber operating procedures. Commercial thinning operations will be required to limb and leave tops in this area. Woody debris levels should range from 15 to 20 tons/acre on the ground following thinning to enhance natural soil rehabilitation The woody debris will be a mix of fine and coarse wood.
	Summer ground-based yarding will occur when soils are dry (soil moisture is near or below the permanent wilting point).
	Winter ground-based yarding: The snow depth, distribution, and air temperature conditions must be such that ground-based operations maintain the following combination of snow depth and frozen soil conditions **under the wheels or tracks/treads** of equipment at all times. (***** see below). Depth of compacted (by equipment) snow under wheels or track/tread — Minimum thickness of solidly frozen soil needed below compacted snow layer 10 or more inches — 0 inches 7 to 10 inches — 1 inch 4 to 7 inches — 2 inches less than 4 inches — 4 inches *****Pre-trailing. Pre-trailing selected skid trails a day or so prior to skidding or other heavy trail use is a way to achieve this objective. If average, pre-compacted

Objective	Mitigation Practice or Design Feature
	snow depth along the proposed trail is more than 15 inches, pre-trailing can be done whether or not the soil is frozen. If pre-compacted snow depth is 8 to15 inches, pre-trailing should be done only if the soil is solidly frozen in the top one inch or more. Otherwise, pre-trailing should be delayed until more snow falls to accumulate another 8 inches or more. To further aid soil protection, pre-trailing should be done using an "easy-does-it" approach, including slow ground speeds and steady movements. Avoid spinning tires and bouncing equipment on trails as much as possible. Adequate pre-trailing air temperatures are generally in the low 20s ˚Fahrenheit or lower. For more information about pre-trailing conditions, consult with the Forest soil scientist.
	Subsoiling will occur on all skid trails used for yarding in the proposed summer ground-based units. If winter ground-based yarding is used in units 3 and 12, subsoiling of historic skid trails will be required in order to create a net improvement in soil productivity in these units. A SGR or excavator subsoiling implement that achieves desired results will be used; proper application of subsoiling does not mix soil horizons and will cause minimal disturbance to surface soil/litter layers. Subsoiling will also occur on all skid trails in skyline units where summer, tractor swing is required. When available, slash will be placed on the decompacted skid trails by the SGR.
Reduce detrimental soil disturbance (DSD)	Feller/buncher equipment may be used on skyline units pending the results of studies conducted in the Trapper Bunkhouse project area. If DSD exceeds 2%, then feller/bunchers will NOT be used on skyline units in the Lower West Fork Project area. These units will be harvested using conventional felling and skyline yarding methods. Rehabilitation activities on new temporary roads and Tracked line machine trails will include recontouring, slashing, and seeding. Historic roads used for hauling will be stabilized by removing drainage structures; ripping, seeding, and fertilizing the road bed; and closing the entrance to these roads.
Reduce DSD and prevent the spread of noxious weeds	Hand pile sizes inside units will average 6-8 feet in diameter so localized areas of soil disturbance will be less than about 50 square feet. This does not pertain to slash created on landings during yarding operations.
	Burning of piles should occur during wet conditions when the duff is moist. The entire duff profile should be moist to the touch in the pile locations.
Prevent the creation of new areas of DSD	Where feasible, pile and burn slash where detrimental soil disturbance already exists, such as on old log landings, skid trails, and roads associated with the past harvest units. This practice will prevent the creation of new areas of detrimental soil disturbance.
Maintain 70% ground cover	The soil scientist will be consulted prior to burning to ensure soil conditions are acceptable for burning. Prescribed burning in terrace and non-terraced non-commercial thin units will only be completed through piling and burning on a case by case basis, pending field review by the soil scientist.
	At least 70 percent ground cover is necessary to prevent detrimental accelerated erosion and loss in soil productivity after treatments are completed. Ground cover includes duff, organic soil horizons, vegetation basal area, fine woody debris, coarse woody debris (CWD), and surface coarse fragments. In those cases where ground cover is less than 70 percent prior to burning, fuel consumption and ground cover loss should not exceed 15 percent. Prescribe fire prescriptions will be designed to meet these soil protection requirements.

Objective	Mitigation Practice or Design Feature
Maintain soil productivity	CWD (material greater than 3 inches in diameter) left on site will include leave trees both standing and down, and broken limbs and tops created by timber harvest. Amounts will be within ranges identified in Section 1.7 D, with the exception of unit 1 and terraced units.
	In unit 1, fine and coarse woody debris from logging slash will be spread uniformly across the compacted portions of the ground-based unit (below FS road 363) at a rate of 15 to 20 tons/acre to increase organic matter for soil rehabilitation. Under burning will not be completed in this 65 acre area of unit 1.
	Mechanical thinning operations in terrace units will ensure adequate woody debris (fine and coarse wood) is left for soil rehabilitation on the terrace benches. This may require some limbing and leaving tops to ensure an adequate amount of woody debris is available for soil rehabilitation on the benches. An organic fertilizer, woody debris (rate of 10 to 15 tons/acre), or combination of both will be applied following subsoiling or ripping on the terrace benches to improve soil organic concentrations, nutrient cycling, and microbial populations. Risers in between benches should meet CWD standards described in Section 1.7 D. Under burning will not be completed on the terrace units. If fuel reduction is required after mechanical harvest and soil rehabilitation activities, piling and burning will be completed on a case by case basis pending field review by the soil scientist.
	Woody debris levels should be 10 to 15 tons/acre throughout the non-terraced plantations following all treatments including potential piling and burning.
	The silvicultural prescriptions will be designed to account for future large CWD (>15 inches diameter) recruitment that will meet acceptable levels in stands where CWD is less than minimum levels before treatment. CWD will be left in these stands to the extent feasible to meet minimum requirements that do not pose a fuels hazard. High amounts of small CWD (3-15 inches diameter) may present wildfire risks.
	CWD will generally be evenly distributed on each acre, unless otherwise agreed to by the Contracting Officer or their designee.
	Prescribed burning operations will maintain CWD levels where existing CWD is less than required minimum levels. Burning should attempt to increase CWD recruitment where possible.
	Wood larger than 15 inches in diameter will not be intentionally ignited during hand lighting. It is understood that once hand crews light the fire, fire may burn into and combust some large CWD. Coarse woody debris will meet standards stated in Section 1.7 D, with the exception of terrace units and unit 1.
Allow time for nutrients to leach from slash prior to burning	The slash will be left in all commercial thin units through one winter after cutting to allow for initial decomposition and nutrient leaching.
Watershed and Fisheries	
Ensure that water-related beneficial uses are protected and that State water quality standards are met	Trees will not be harvested from Riparian Habitat Conservation Areas (RHCAs). If trees felled outside of the RHCAs land or roll into the RHCAs, their boles may be removed, but the tops and limbs will be left behind. The RHCAs are: within 300 feet of fish-bearing streams within 150 feet of permanently flowing, non-fish bearing streams within 100 feet of seasonally flowing or intermittent streams within 150 feet of ponds, lakes or wetlands > 1 acre in area within 50 feet of ponds, lakes or wetlands < 1 acre in area within 50 feet of landslide prone areas (USDA Forest Service 1995).
	RHCA boundaries will be designated and marked on the ground in consultation with the Fisheries Biologist.

Objective	Mitigation Practice or Design Feature
Ensure that water-related beneficial uses are protected cont.	In RHCAs, trees can be felled when they pose a safety risk. Felled hazard trees will be left on-site (INFISH standard RA-2), unless their removal is deemed necessary for safety reasons by the TSA.
	Log landings, temporary roads, and tracked line machine trails will not be located in the RHCAs.
	Generally, no fuel storage, mixing of fuels, or refueling equipment will occur in the RHCAs. If there are no other alternative areas, refueling sites in RHCAs may be used, but they must be approved by the Fisheries Biologist and have an approved spill containment plan prior to their use. Small pumps (for example, Mark III) and chainsaws can be refueled within the RHCA as long as proper spill containment actions are implemented (USDA Forest Service1995).
Protect the streamside management zone (SMZ)	All activities will comply with the Montana Streamside Management Zone Act.
	Ground-based equipment will be prohibited from entering SMZs without the appropriate variance from Montana DNRC. Boundaries of RHCAs will be marked to exclude equipment operation.
	Best Management Practices will be applied and monitored during the administration of the contract. Applicable BMPs are in the Project File and summarized in Appendix A.
Protect Forest roads used during log hauling operations	The TSA and/or resource specialists will monitor road conditions to ensure they do not contribute sediment to streams. Road maintenance activities (including snowplowing and dust abatement) will follow the requirements specified in the USFSW[1] Programmatic Biological Assessment for road maintenance (1999).
Prevent sediment entering streams from encroached segments of haul roads	On the encroached haul road segments (Pierce Creek #363, Lavene Creek #5630, and Piquett Creek #49 Roads) – Straw bale check dams will be installed below the outlets of all ditch relief culverts, in the road ditches that empty into streams, and below road drainage features such as drive-thru dips that lack adequate riparian filter distance. The check dams will be installed prior to winter hauling, and maintained during all periods of winter hauling. Outlets of all ditch relief pipes will be kept free of snow blockage during winter haul. Snow berm drainage holes will be designated prior to winter haul, and kept open throughout the duration of winter hauling.
Roads proposed for long-term storage or culvert removal/restoration	Seed, fertilize and slash roads after decompaction and/or recontouring, mulch to the extent feasible. Seed mix will be as prescribed by the Forest Botanist. Mulch is required on sites located within sediment contributing distance of streams (about 300 feet). Where culverts with flowing water are removed, a strawbale check dam will be installed below the outlet prior to removing the culvert.
All units with manual thinning	Trees will not be manually thinned and slash piles will not be created within 50 feet of streams and wetlands.
Protect RHCAs during prescribed burning	Helicopter ignition will not occur in the RHCAs. Hand ignition can occur in all of the RHCAs except wetlands. Fire will be allowed to back into or burn through the RHCAs.
	In Units 32, 33, and 60A, no ignition (hand or helicopter) will occur within 300 feet of Pierce Creek and Lavene Creek.
	Generally, hand fireline will not be dug in the RHCAs. If needed, hand fireline can be dug in the RHCAs, but it must 1) avoid wetlands, 2) be constructed with proper drainage structures, and 3) be recontoured and covered with slash upon completion of the burn. Machine fireline is prohibited in all RHCAs.
	If drafting from streams occurs, intake hoses will be fitted with a screen mesh equal to or smaller than 3/32 inches. Intake hoses will be placed in low velocity portions of the stream channel (< 0.4 feet/second of flow).

Objective	Mitigation Practice or Design Feature
Protect aquatic resources and ground water during herbicide application High effectiveness Application standards.	(W1) Mixing and loading of tanks will occur more than 300 feet from live water where possible. No mixing will occur within 100 feet of live water.
	(A1) Herbicides will not be used to control weeds within a 100-foot radius of any potable water spring development or diversion within the project area.
Protect aquatic resources during herbicide applications High effectiveness. Avoids potentially harmful exposure	(A2) No ester formulations of herbicides will be used (i.e., 2,4-D ester, triclopyr-BEE), due to relatively high fish toxicity.
Protect aquatic resources and ground water during herbicide applications High effectiveness. Practical experience.	(A3) Use of herbicides and surfactants within 100 feet of surface water will adhere to distances and conditions outlined in Table 3.7-4, Herbicide Use Restrictions in RHCAs (Chapter 3 section 3.7 Fisheries)
	(A4) In areas adjacent to known stream reaches where bull trout spawn (Boulder Creek and Piquett Creek), no herbicides would be used within 15 feet of the stream, no picloram within 100 feet, and no application after July 15.
Timber Management	
Prevent pine engraver (*Ips spp*.) population increases	All thinning in units with ponderosa pine and lodgepole pine must be performed between the months of July 1 thru December 31. Slash must be properly disposed of, i.e., piled and burned or lopped and scattered. Where limbs and tops exceed three inches in diameter, they need to be bucked in four-foot lengths and scattered to allow time for larger boles to dry out and not become Ips beetle host sites the following year.
Prevent the spread of annosus root disease	Apply borate to freshly cut ponderosa pine stumps greater than 12 inches in diameter inside bark.
Protect TES Plant Populations and their Habitat/Promote Healthy Native Plant Communities	
Avoid dwarf onion populations during harvest operations in units 3, 18, 41, 64, 68, 69, 70, 73, 74	Dwarf onion (*Allium parvum*) populations will be located by GPS and marked on sale area maps for avoidance during skidding and slash piling.
Avoid Rocky Mountain paintbrush populations during harvest operations in units 6 and 70	Rocky Mountain paintbrush (*Castilleja covilleana*) populations will be located by GPS and marked on sale area maps for avoidance during skidding and slash piling.
Avoid Lemhi penstemon populations in units 22 and 66	Lemhi penstemon (*Penstemon lemhiensis*) populations will be located by GPS and marked on sale area maps for avoidance during skidding and slash piling.
To reduce the risk of weed spread All Units	Clean equipment prior to moving into the project area, minimize soil disturbance, and revegetate disturbed soil where native plant recovery may be delayed (consult Forest Botanist for specific recommendations) as outlined in FSM 2000, Zero Code 2080 – Noxious Weed Management (R1 Supplement No. 2000-2001-1).
Landings, Temp Roads, TLM paths	Botanist will evaluate temporary roads, TLM paths, and landing locations that have not previously been surveyed for sensitive plants. Sensitive plant locations would be avoided or an alternate site would be used.
Herbicide Treatments (Alternative 2)	Lemhi penstemon plants along NFS roads 13423 and 5723 will be avoided during roadside spraying. The Forest Botanist will be contacted prior to off-road herbicide applications to ensure that sensitive plants will be avoided. Sensitive plants are known to occur in units 3, 18, 22, 41, 64, 66, 68, 69, 70, 73, and 74. GPS locations will be made available to applicators so plants can be avoided.
Prevent weed spread along road corridors	Treat haul roads and access roads with herbicides prior to implementing harvest and/or burning activities.
Promote successful revegetation	Treat temporary roads, TLM trails and landings with herbicides after harvest activities are completed and prior to revegetating.

Objective	Mitigation Practice or Design Feature
Protect sensitive plants from herbicides Protect sensitive plants from herbicides (cont.) Moderate to High Effectiveness	(SP1) Consult with district/forest botanist each year for updates to species-specific protection measures, before any site applications begin.
	(SP2) All treatment sites will be evaluated for sensitive plant habitat suitability. Highly suitable habitat will be surveyed as necessary prior to treatment.
	(SP3) Provide the weed crew with maps of all known sensitive plant locations so that these sites can be identified and protected.
	(SP4) Train the weed crew to identify sensitive plants so that new sites can be identified and protected.
	(SP5) The Forest Botanist will provide site-specific treatment guidelines for weed infestations within or adjacent to known sensitive plant populations.
	(SP6) No spraying with vehicle-based spraying devices will be done within 50 feet of any known sensitive plant occurrence.
	(SP7) No chemical spraying will be done within 25 feet of any known sensitive plant occurrence, only mechanical treatment would be used.
Herbicide Use (Alternative 2)	
Control Application Rates; Moderate effectiveness Monitor –equipment for wear	(H1) Operators shall calibrate spray equipment at regular intervals (approximately after every 80 to 160 hours of use) to ensure proper rates of herbicide applications using standard methods.
Ensure responsible application of herbicide; Moderate effectiveness Monitor –Daily Pesticide Application Record or similar database.	(H2) Herbicides will be used in accordance with label instructions and restrictions. Application will be done or supervised by licensed applicators.
High effectiveness (Professional experience)	(H3) Herbicide applicators shall carry spill containment equipment, as described and in the Herbicide Emergency Spill Plan, and be familiar with and carry an Herbicide Emergency Spill Plan. A spill cleanup kit will be available at temporary storage sites and with all transportations (vehicles, raft, plane, mules) carrying herbicides.
Prevent spillage in rafts that may come into contact with humans or may directly enter surface waters. High Effectiveness, Practical experience.	(H4) Equipment used for transportation, storage, or application of herbicides shall be maintained in leak proof condition.
Prevent contact with open water. High effectiveness. Logic.	(H5) Chemicals will not be used over live water (streams, ponds, springs, etc.), including water standing or running in ditch lines. Dry roadside ditches that lead to intermittent and perennial streams will not be sprayed with any herbicide containing picloram.
Avoid impact to sensitive plants and non-target aquatic species. High effectiveness Professional experience.	(H6) Procedures for mixing, loading, and disposal of herbicides and a spill plan will be followed. All herbicide storage, mixing, and post-application equipment cleaning will be completed outside of RHCAs. If no other alternative is available, mixing and loading operations must take place in an area where an accidental spill would not contaminate a stream or body of water before it could be contained. Particular attention will be given to avoiding mixing, loading, or cleaning within 100 feet of live water. These procedures are referenced in Appendix A and B of the Draft Selway-Bitterroot Invasives EIS (2008). Drafting equipment used for filling herbicide spray tanks will be equipped with appropriate back-siphoning prevention devices.
Assure product safety. High effectiveness. EPA Studies.	(H8) Additional herbicides may be considered for use within the project area in the future. Only EPA registered herbicides having a completed Human Health and Ecological Risk Assessment Final Report will be considered for use. Additional consultation regarding ESA-listed species will occur for the use of any new herbicide not included in this Record of Decision.

Objective	Mitigation Practice or Design Feature
Inform public and reduce exposure; High effectiveness (Logical – prevent exposure)	(H9) Roads receiving treatment will be posted with the date of treatment and chemical applied.
Provide for annual, pre-application oversight. High effectiveness. Coordination.	(H10) The Annual Plan of Operations for herbicide application will be reviewed by an interdisciplinary team that includes, at a minimum, hydrology and or fisheries biology, botany, and wildlife biology skills. The review will take place prior to implementation to ensure the protection of native flora and fauna and to ensure that herbicide thresholds, as described in the Fisheries section of Chapter 3, are not exceeded
Prevent contact with open water. High effectiveness. Logic.	(H11) No herbicide spraying will occur during rain or when rain is imminent. Dry roadside ditches that lead to intermittent and perennial streams will not be sprayed with any herbicide containing picloram.
Protect Aquatic Resources; High effectiveness Prior testing.	(H12) Use of surfactants will occur as previously described, using only the surfactants listed and according to the allowable distances to live water displayed in Table 2-9 below.
Safe handling of herbicide; High effectiveness (Logical – visible)	(H13) Water-soluble colorants, such as Hi-Light® blue dye, will be used within 100 feet of water and in other situations as needed to enable applicators and inspectors to better see where herbicides have been applied.
General Safety; High Effectiveness; Logical – high visibility	Traffic control and signing during weed-treatment operations will be used as necessary to ensure safety of the public and workers.
Protect Cultural Resource sites; High effectiveness (Logical – avoids impact to area)	(C1) Mechanical/cultural treatments that disturb soil, will not be used on any known historical or archaeological site without proper clearances by a Forest Heritage Resource Specialist.
Wildlife	
Retain old growth habitat characteristics in units that contain old growth habitat (units 4, 8, 9, 15, 33, 60A, 61A, 70, 71)	The Silviculturist and Wildlife Biologist will monitor stand marking and timber harvest to ensure the stands meet Green et al. (1995, addednum 2005) old growth criteria.
Snags	Retain all snags unless designated “danger” trees (29CFR 1910.266(h)(1)(vi,vii).
Retain downed, woody debris	Fire Type Group — Coarse Woody Debris 2, 4 — 5-10 tons/acre 6 — 10-20 tons/acre 7, 8, 9 — 8-24 tons/acre
Protect amphibians and herptiles High effectiveness with training and diligence of applicator. Avoids potentially harmful exposure.	(W1) When ground application of authorized herbicides is necessary within 50 feet of a water body, wetland, or river beach, applicators will survey the treatment area at time of application to determine potential presence of amphibians and aquatic associated herptiles.
	The broadcast spray application method will not be used if adult amphibians or aquatic associated herptiles are identified.
	The extent of species population distribution in the treatment area will be reported to the district amphibian specialist (Fisheries or Wildlife Biologist) as soon as possible. Hand pulling or wick application will be used or treatment will be deferred on advice of the amphibian specialist if treatment is not possible without directly spraying individuals.
	If tadpoles or amphibian metamorphs are identified, the location will be reported to the amphibian specialist and weed coordinator as soon as possible, and application of herbicides will be delayed until metamorphs disperse.
Reduce potential for incidental contact of spray compounds with non-target species of concern.	(W2) Avoid directly spraying any terrestrial organism other than invasive plant species, including snakes, lizards, salamanders, small mammals, ground nesting birds, and insect concentrations such as ladybug swarms.

Objective	Mitigation Practice or Design Feature
Moderate effectiveness due to tendency for some species to hide under rocks and debris. Practical experience.	If treatment is not possible without directly spraying individuals, then hand pulling or wick application will be employed.
Minimize impact to nesting eagles; High effectiveness (MT Bald Eagle Working Group. 1994. page 24)	(W3) Activities associated with weed control will avoid areas within 400 meters of active bald eagle or peregrine falcon nest sites unless the Wildlife Biologist provides further direction.
Minimize human effects on wildlife. High effectiveness. Practical experience.	(W4) Food, garbage, and human waste associated with project implementation work crews will be properly managed so as not to attract or habituate wildlife.
	Crew camps will be located to avoid disturbance to wildlife in reproductive sites during active reproductive periods, including calving and lambing areas, raptor nesting and carnivore den sites.
Protect Bog Lemmings. Avoids potentially harmful exposure. High Effectiveness based on research	W5) Chemical application is prohibited within 300 feet of all sites where northern bog lemmings are known to occur, as well as peatland sites not yet surveyed for northern bog lemmings, pending review and approval by the Forest Wildlife Biologist.

Table A-2: Adjuvants (Surfactants) Proposed for Use and Allowable Distance to Live Water

Surfactant	Distance to Live Water Use Allowed			
	0 – 15’	>15 – 50’	>50 – 100’	> 100’
Agri-Dex, and Super Spread MSO	Yes	Yes	Yes	Yes
Cide Kick II	No	Yes	Yes	Yes
R-11, Activator 90, X-77, Latron AG-98, Pro-Spreader Activator, Cide-Kick, LI-700, Spreader 90, Syl-tac, Cygnet Plus, Sylgard 309, Freeway, Silwet L-77, Kinectic, and Inlet	No	No	Yes	Yes
R-900, R-56, Cohere, Dyne-Amic, Bond, Tacktic, and Latron Ag-98 (N)	No	No	No	Yes