Chapter 2

Alternatives

2.1 Formulation of Alternatives

This chapter is intended to provide a clear explanation of the activities proposed in the action alternative. It describes an alternative meeting the purpose and need outlined in Chapter 1. The Ninemile Interdisciplinary Team (IDT) followed the alternative analysis procedure found under Section 104 of the HFRA. Subsection (d) (2) states that one action alternative is sufficient for authorized hazardous fuel reduction projects located within the WUI, such as Ninemile. The Ninemile IDT used the issues identified through the scoping process and the standards and guidelines in the Forest Plan as amended as the basis for developing the proposed action, Alternative 2. The No-Action Alternative is analyzed and contrasted with the action alternative.

2.2 Alternatives Dropped from Further Consideration

The IDT initially worked on a second action alternative that retained more hiding and thermal cover for mule deer in the Management Area 10 portion of the Project Area. This alternative was dropped from final consideration as it was not greatly different from Alternative 2 in the areas proposed for treatment and was less effective in meeting the fuel reduction needs compared to Alternative 2.

The Oregon Natural Resources Council (ONRC) and the Klamath-Siskiyou Wildlands Center, in their combined response to the 1/27/04 HFRA scoping letter (ONRC/KSWC 2004), requested that a second action alternative be included and analyzed in the Ninemile EA. Klamath Forest Alliance made a similar request in their response. The requested alternative was one similar to the selected alternative in the Chiloquin Community Fuels Reduction Project, i.e. an alternative that does not include commercial harvest of trees larger than 8" DBH (diameter at breast height) as one of the proposed activities. About half of the units in the proposed action include timber harvest as part of the overall fuel reduction treatments. The remainder of the units in the proposed action do not have the stand structure and tree stocking where commercial harvest is needed to achieve the needed fuel reduction.

In support of their claim that commercial thinning is not needed to reduce fuels, and their request for a non-commercial alternative, ONRC quoted a September 26, 2003 summary of the study *Rural Technology Initiative - Investigation of Alternative Strategies for Design, Layout, and Administration of Fuel Removal Projects* (Mason et al. 2003). The quote submitted by ONRC reads:

"On the Okanogan National Forest in Washington and the Fremont National Forest in Oregon, where some of the region's worst fires have occurred in recent years, the most effective treatment tested using the computer software preserved ponderosa pine and western larch, while taking the smallest trees of other species until a targeted density was achieved. This approach typically left between 40 and 100 of the largest trees per

acre. The trees removed rarely included any larger than 12 inches in diameter." (Emphasis added by ONRC)

The Mason et al. (2003) study modeled fire hazard reduction, economic cost, habitat protection and carbon sequestration for wildfires and for fuel reduction treatments. Forest inventory plot data from the Fremont and Okanogan National Forests were used in the study simulations.

Four thinning regimes were modeled: 1) Removal of all trees 9 inches DBH and smaller **(9 & Under)**; 2) Thin from below removing 50% of the existing basal area per acre **(Half BA)**; 3) Thin from below with a residual BA of 45 square feet per acre favoring ponderosa pine and western larch **(BA 45)**; 4) Removal of all trees 12 inches DBH and larger **(12 & Over)**. In addition, a control was modeled **(No Action)**, as was a crown fire representative of each forest **(Wildfire)**. The study simulated treatments in the year 2000 and modeled stand vegetation and fuel recovery through 2030. The simulations were modeled with periodic maintenance underburning or other treatments to remove ingrowth and fuels **(Without Regeneration)** and without further treatments **(With Regeneration)**.

The most effective thinning treatment modeled for fire hazard reduction in the study was the BA 45 without regeneration treatment, a thinning followed by periodic underburning to maintain the fuel reduction. The next best was Half BA without regeneration, followed by 9 & Under without regeneration. The 12 & Over regime, which simulates an overstory removal or economic harvest, did little to reduce fire hazard. The results may be viewed on pages 23 through 32 of the Mason et al. study, and more extensively in the Appendices.

The reason that few trees were removed that were larger than 12 inches in diameter in the most effective BA 45 thinning regime appears to be an artifact of the data set. Few plots used in the study had substantial numbers of trees larger than 12 to 14 inches in diameter. Generally, if a treatment retains the largest and best quality trees in this thinning regime, the trees in the upper diameter classes would be kept, not harvested, unless they were not the favored species. This is true both of the BA 45 treatment and those proposed for Ninemile. In the Fremont data, of the 154 "high risk" (hazard) plots, only 2% of the trees were larger than 12" DBH. In the "moderate risk" category (236 plots) only 1% of the trees exceeded 12" DBH. In the "low risk" category (112 plots) 13% of the trees were larger than 12" DBH. Overall in the Fremont plots only an estimated 5% of the trees were larger than 12 inches. The quadratic mean diameter distributions may be seen in Appendix B of the study, pages B-1 to B-11.

A similar diameter distribution exists in the Okanogan data. Of the 117 "high risk" plots, none of the trees were larger than 12" DBH. The largest quadratic mean diameter group in this category was 10 inches. In the moderate risk category (200 plots) again, no trees exceeded 12" DBH, as this was the largest diameter group represented. In the low risk category (117 plots) 15% of the trees were larger than 12" DBH. Overall in the Okanogan plots only an estimated 4% of the trees were larger than 12 inches. The diameter distributions may be seen in Appendix C of the study, pages C-1 to C-11.

Some of the findings in the study were applicable to the Ninemile Project. One unit that does not require harvest does include whipfalling of trees less than 8 inches in diameter

(Unit 32, Table 2-2). The other non-harvest units did not require any stocking reduction, either because the units had previously been thinned, had little conifer stocking, or were primarily brushfields. In Ninemile, the units with harvest as part of the proposed fuel reduction treatment will receive approximately the same thinning regime as the BA 45 thinning modeled in the Mason et al. (2003) study, at least in the portions of the study that contained a full range of diameter classes. The authors summarized their findings in a cover letter accompanying the publication, stating *"Computer generated thinning simulations show that harvests of smaller trees with retention of larger trees can substantively reduce risk of catastrophic wildfire."* The target basal area in Ninemile is 50 square feet per acre; the largest and best quality trees will be retained as the stands are thinned from below; all trees 21" DBH and larger will be retained, even if that results in areas with basal areas greater than 50; and ponderosa pine will be favored over other species. The effectiveness of these treatments is discussed in Chapter 3 under Key Issue #1, Fire Hazard Reduction. The estimated reduction in fuel hazard and the time period in which it remains effective are similar to those modeled for BA 45. Under Key Issue #2, Treaty Resources and Other Concerns of the Klamath Tribes, several stands with varying size classes and structures are displayed, both before and after the proposed treatments. The numbers of trees retained are similar to results modeled in Mason et al. (2003) for the BA 45 treatment.

A second study submitted by ONRC/KSWC as supporting a non-harvest alternative is *Modifying Wildfire Behavior-The Effectiveness of Fuel Treatments-The Status of Our Knowledge* by Carey and Schumann (2003) of the organization The Forest Trust. The portions of the executive summary quoted:

"Although the assertion is frequently made that simply reducing tree density can reduce wildfire hazard, the scientific literature provides tenuous support for this hypothesis."

and

"The proposal that commercial logging can reduce the incidence of canopy fire was untested in the scientific literature. Commercial logging focuses on large diameter trees and does not address crown base height – the branches, seedlings, and saplings which contribute so significantly to the "ladder effect" in wildfire behavior."
(Emphasis added by ONRC)

The review by Carey and Schumann listed literature that explored the reduction in fire behavior accomplished by prescribed burning alone, mechanical thinning, combined thinning and burning, and commercial timber harvest alone. Relevant articles are quoted for each type of treatment, demonstrating the effectiveness of lack of effectiveness for each type of treatment. All studies were from the ponderosa pine type.

Carey and Schumann (2003) state that *"A combination of strategies may be the most effective fuel treatment* based on studies from Agee (1996), Covington et al. (1997), and van Wagtendonk (1996). The treatments proposed in Ninemile do not simply reduce tree density. The fuel reductions are comprehensive in nature, addressing all portions of the fuel loading and fuel ladders, as appropriate. This includes treating ground fuels, brush, seedlings, saplings, and trees up to 21 inch in diameter for effective, long lasting fuel reduction that also provides improved forage for big game and other wildlife. This "combination of strategies" in Ninemile appears to be what the authors are

recommending. About half of the units proposed in Ninemile will need commercial thinning as part of the prescribed fuel reduction strategy. The other half of the proposed units do not have the conifer stocking structure where commercial harvest is needed, i.e. the trees are already adequately spaced apart. In this second group the fuel reduction treatments concentrate on ground fuels, brush, and in some cases trees less than 8 inches in diameter.

The authors appear uncomfortable with the degree of scientific support for the reduction of fire hazard afforded by tree stocking reduction, which is a part of the Ninemile proposal. This may be more of an organizational bias by The Forest Trust, as numerous examples are given in the paper supporting of tree thinning as one of the effective tools for fire hazard reduction. On The Forest Trust website Director Henry Carey, primary author of the above paper, states "*This Act (HFRA), in tandem with the other recent regulatory changes, represents the biggest set back for forest conservation in 30 years... Although it includes several constructive programs, the Healthy Forests Initiative is essentially a reversal in this climate of improved forest management. The Initiative curtails the power of citizens, rural communities and even state governments and puts full control of public forest back in the hands of the federal government. Although federal authority, in itself, might not be a bad thing, unchecked discretion invites the kinds of behaviors that resulted in the debates over clearcutting in the 1970's. Examples of thoughtless or irresponsible fuel reduction projects are already rolling in."* Message from the Director (http://www.theforesttrust.org/foresters.html).

The study reviewed several papers that supported the fuel reduction effectiveness of thinning, as proposed in Ninemile, to remove trees from below and reduce crown density, reduce fuel ladders, and raise crown base height. All thinning residues will be treated in Ninemile, while many of the papers reviewed as negative toward thinning were on studies that left thinning slash in place. Supporting papers include observations by Agee (1996) and Fule' and Covington (1996). Both described wildfires that dropped from the crowns to the ground and causing less mortality in thinned stands than in unthinned areas. Scott (1998) modeled fire behavior in thinned ponderosa stands, using thinning levels that thinned less (retaining 75 square feet of basal area or higher) than that proposed in Ninemile (50 square feet). All treatments in this study reduced the potential for crown fire spread by reducing crown bulk density. Pollet and Omi (2002) studied a site where whole tree thinning, like that proposed in Ninemile, was conducted, leaving no thinning slash on site. A wildfire later burned through the area, resulting in lower fire severity and less crown scorch than in adjacent untreated areas.

Combined mechanical thinning and burning provided several examples relevant to Ninemile. Barbouletos et al. (1998) recounted a crown fire transforming to a surface fire in a thinned and underburned area of the Boise National Forest. Weaver (1957) described a reduction in fire hazard following thinning, pruning, slash reduction, and periodic underburning. This paper studied a site on the former Klamath Indian Reservation, which is now the Chiloquin Ranger District, location of the Ninemile Project. Johnson et al. (1998) simulated prescribed fire and timber harvest reducing high severity fire better than harvest alone. Simulations by van Wagtendonk (1996) leaving slash on site caused crown fires and higher fire severity than removing and treating slash when thinning. Pollet and Omi (2002) found a high correlation between tree densities and the current fire severity rating.

Carey and Schumann found few studies relating fire reduction strictly to commercial timber harvest. Most concerned the effects of treating vs. not treating created logging slash, with lower fire severity when slash is treated. In Ninemile the commercial harvest covers the thinning of conifers from 4" to 21" diameter. All slash from the thinned trees will be removed to the landings and disposed of. This should result in decreased fire behavior in the treated stands.

The Klamath Forest Alliance (2004) also requested an additional alternative that did not include commercial harvest. On page 2 of their HFRA scoping response they requested an alternative similar to the one selected in the Chiloquin Community Fuels Reduction Project, where thinning was done on trees 8 inches in diameter and smaller. On page 7 KFA recommended only removing trees 12 inches in diameter and smaller, except in dense stands near homes and businesses. On page 8 they recommend that commercial harvest should keep the largest trees on any site and should not harvest trees larger than 20 inches in diameter.

KFA offered a publication titled *Restoring California's Forests: An Ecologically Based Strategy for Reducing Severe Fires, Protecting Communities, and Restoring the National Forests of California* from the California Wilderness Coalition (2002). This is a general paper on forest restoration and the reintroduction of low intensity fire into western forests. The Ninemile Proposed Action generally meets the 'Key Elements" from the paper that were presented by KFA in their response. Elements applicable to Ninemile include:

- *Focus aggressive thinning only in the wildland-urban interface and previously logged stands.* Ninemile units are entirely within the WUI as defined in HFRA, and all areas have been previously logged.
- *Thinning programs should include some prescribed fire.* Ninemile includes underburning on the majority of the acres in the proposed action.
- *Thinning should be site specific.* Specific silvicultural prescriptions will be done for each unit.
- *Remove only the amount necessary to make prescribed burning effective.* Ninemile is implementing a level of treatment that will be effective for up to thirty years before re-thinning is needed, and allows for periodic reuse of prescribed fire.
- *Retain all large trees, live and dead.* Ninemile does not thin trees larger than 21" DBH.
- *Retain all old growth.* Ninemile treats a portion of the old growth stands to return the structure to the historic open park-like condition with low fire intensities.
- *Retain diversity of tree species, sizes, and treatment patterns.* Ninemile will retain portions or each unit in untreated patches. Ponderosa pine will increase in representation with treatment, but other species will be retained.
- *No new roads.* Ninemile will not construct any new permanent roads.
- *Conserve habitat for imperiled species.* Ninemile TES species effects are shown in Chapter 3. USFWS concurred with the effects.
- *Conserve soils.* Ninemile treatments will keep effects within LRMP standards.

Other recommendations from KFA were beyond the scope of the Ninemile Project. These include de-linking restoration from timber sales, awarding contracts on a 'best value' rather than low bid basis, and emphasizing local contractors and workers.

The non-harvest alternative does not meet the purpose and need of the project (Chapter 1, page 13) as required by HFRA under Section 104 (c) CONSIDERATION OF ALTERNATIVES (1) (C) (ii). In particular, thinning of all sizes of trees allowable under the Eastside Screen direction (up to 21" DBH) is needed to fully treat the existing fuel conditions, to provide adequate growing space to improve stand health and vigor, decrease mortality due to insects, disease, and wildfire, and to reduce conifer dominance and provide adequate growing room for new mule deer forage.

A non-harvest alternative does not meet the need for commercial timber production from the Ninemile Area. The HFRA, in Section 102(b) RELATION TO AGENCY PLANS, states that an authorized fuel reduction project like Ninemile "*shall be conducted consistent with the resource management plan and other relevant administrative policies or decisions applicable to the Federal land covered by the project.*" Most of the Ninemile Project Area is programmed for commercial timber harvest in the Winema LRMP. All units that include harvest are located in Management Areas (Table 1-2) that program or permit timber harvest. Commercial thinning is one of the "allowable tools" from the *Implementation Plan* (2002) and referenced by HFRA in Section 101 (2).

Commercial thinning has been found to be an important part of overall fuel reduction treatments in reducing the severity of wildfire. In *The Effects of Thinning and Similar Stand Treatments on Fire Behavior* (Graham et al. 1999) reviewed numerous studies and concluded that thinning could have positive or negative effects on fire potential, depending on the timber type, stand condition, and treatment of fuels following thinning. The best general approach for lowering wildfire intensities, damage, and mortality was combining managing tree density (thinning from below), surface fuel treatment, and use of prescribed fire in areas at high risk to wildfire. This is the strategy followed in the Ninemile project.

In *Science Basis for Changing Forest Structure to Modify Wildfire Behavior and Severity* (USDA Forest Service 2004), thinning is noted as an important element of a forest fuel reduction strategy. The editors state on page 27 that *"The most appropriate fuel treatment strategy is often thinning (removing ladder fuels and decreasing tree crown density) followed by prescribed fire, piling and burning of fuels, or other mechanical treatments that reduce surface fuel amounts. This approach reduces canopy, ladder, and surface fuels, thereby reducing both the intensity and severity of potential wildfires."* The Ninemile combination of treatments, including thinning, is designed to achieve this result.

The study *Final Report: Effect of Fuels Treatment on Wildfire Severi*ty (Omi and Martinson 2002) investigated the severity of wildfires that burned into existing fuel treatments areas. Treatments included repeated use of prescribed fire, single prescribed fires, debris/slash removal, and mechanical thinning with and without slash removal. All of the reduction treatments had been conducted less than ten year prior to being burned in wildfires. The authors concluded that treated stands burned less severely than untreated areas, and that it was important to treat the entire fuel profile,

including thinning of the canopy. Crown density, which is reduced through thinning, significantly affected the stand damage rating in the study. The authors state that *"fuel treatment practitioners have gambled that a reduction in crown fuels* (thinning) *outweighs any increase in surface fire hazard. Our research demonstrates that their bets have been well placed."*

2.3 Alternatives Considered in Detail

Alternative 1 No-Action

The No-Action Alternative assumes that conifer thinning, brush treatment, underburning, and all other activities associated with the Ninemile Fuel Reduction Project would not be implemented. In the analysis of effects in Chapter 3 of this document, the No-Action Alternative discussion provides baseline information on the affected resources, including expected trends given that no activities from this analysis would take place.

Alternative 2 Proposed Action

In Chapter 1, the proposed action is described in general terms. In Chapter 2, the proposed action has become more specific as alternatives were developed. Alternative 2 has been identified as the proposed action.

In addition to describing the alternative considered and analyzed in Chapter 3 of this document, this section provides a summary of elements, mitigation measures, and opportunities common to the action alternative.

Alternative 2, the proposed action, was developed by the Interdisciplinary Team, the Klamath Tribes, and the Chiloquin-Agency Lake Fire District to address the underlying needs of the Project and the issues of fire hazard reduction and Klamath Tribal Treaty resources and other Tribal concerns. It addresses Key Issue #1, Fire Hazard Reduction by proposing extensive fuels reduction treatments throughout the WUI. This alternative also addresses Key Issue #2, Treaty Resources and Other Concerns of the Klamath Tribes, by leaving an arrangement of cover areas untreated, by retaining bitterbrush seed sources, screening cover, and untreated patches within units, by improving mule deer forage, and by softening the visual character of the treated areas.

Alternative 2 reduces conifer overstocking across all allowable size classes, which will reduce ladder fuels, increase individual tree health and stand vigor, and reduce future mortality from insects, disease and fire. It treats brush mechanically and through the use of prescribed fire, which also reduces the accumulated fuels present in the area. Alternative 2 has a total of 83 units of fuels reduction on 6961 acres of the federal lands in the project area. Approximately 46 units totaling 3461 acres include timber harvest as part of the treatment regime needed to restore sustainable conditions. About 27581 cunits (hundred cubic feet) or 14.3 million board feet (MMBF) of commercial timber, from 4 to 21 inch DBH, is predicted to come from the commercial thinning operations. This addresses the need for commercially valuable timber from the Project Area. Approximately 37 units totaling 3500 acres are on areas where the existing vegetative structure does not need harvest as part of the prescribed treatments. Overall, Alternative 2 will perform two or more fuel reduction activities within each proposed unit

to move the existing conditions closer to more sustainable conditions on about 37% of the total project area.

Tables 2-1 and 2-2 summarize fuels treatments proposed by unit for Alternative 2 for units with harvest and without harvest. Figures 2-1 and 2-2 display the units summarized in Tables 2-1 and 2-2 respectively. Table 2-3 summarizes the activities proposed in Alternative 2.

Proposed Treatments

Treatment prescriptions are designed to move the treated stands toward structural conditions that were once common but are now under-represented in the Ninemile Project Area. In the case of ponderosa pine stands, moving stand structures towards an open, park like condition with less of a continuous fuel ladder, less ground fuels, and a younger brush component is the objective. Existing stocking, fuel, and fuel ladders will be treated by conifer thinning, brush mowing, piling, and underburning. The treatments will be used to reduce the fuel loadings and modify the fuel profiles of the unit.

Conifer thinning will be done by thinning trees between 0 and 21 inches in diameter in the harvest units of Alternative 2 and between 0 and 8 inches in some of the fuels-only units in the alternative. Approximately 50 square feet of basal area per acre of conifer stocking will be retained in ponderosa stands, and slightly more retained in pine-associated stands. In general dominant and codominant trees (the largest and healthiest trees in the stand) and all trees larger than 21 inches in diameter would be retained. Ponderosa pine would be favored for retention over white fir and lodgepole. Junipers will be removed. Ground based harvesting will be done in all units with a commercial harvest, and slash will be removed to the landings using a Yard Tops Attached provision. Existing landings and skid trails will be used where feasible. Temporary roads will be constructed to access some units and to locate landings off of main roads. The proposed temporary roads are shown in Figure 1-3. All temporary roads will be obliterated following harvest activities. Logging will be done over frozen ground or when soil conditions allow. Harvesting will reduce fire hazard retaining trees at a wider spacing, reducing the ladder fuels, and by increasing the average distance from the ground to the crown.

Whipfalling or precommercial thinning may be done by chainsaw or in combination with brush mowing. In some units machine piling or hand piling of the precommercial slash will be done and the piles will be burned. Whipfalling will reduce ladder fuels, and improve forest health.

Brush mowing or shredding consists of mowing understory brush, small trees, and other vegetation. A mowing attachment is towed behind a dozer or tractor, or is attached to the head of an excavator or harvester (slashbuster). The vegetation is chopped into small pieces and left on the surface. Fuel ladders would be effectively treated. In most units, this treatment is needed so that underburning can be applied safely and effectively, especially near the private land boundaries. A mosaic of unshredded bitterbrush would be retained as a seed source for new plants on up to 30% of a unit.

Underburning consists of burning the surface fuels to consume the dead woody material such as needle litter and shredded or dead brush. The majority of the units in the Ninemile Project Area will require thinning and/or mowing before underburning can be done safely and effectively. In most units needing underburning, the burning would be completed one to four years after the original piling or mowing. Most brush and some young trees are consumed or killed during this treatment. A mosaic of unburned brush will be retained for seed sources and diversity within units. The underburning is conducted in the spring and fall seasons. Total fuel amounts, especially fine ground fuels and needle litter, will be reduced.

The activities proposed in Ninemile are consistent with the recommendations in the South of Sprague (SOS) Watershed Assessment (1995) for reducing stocking in both trees and shrubs, reducing surface fuels, and reintroduction of fire to the ecosystem. The SOS recommendations are incorporated into the Ninemile proposed activities, and are designed to return treated areas to a fire regime that includes little stand replacement fire or insect and disease mortality.

Further details about the proposed treatments may be found in the Fuels and Silviculture Specialist Reports in the project record.

Table 2-4 at the end of Chapter 2 provides a comparison of the No Action Alternative and the Proposed Action for the Purpose and Need, Key Issues, and Other Issues. A page number is referenced for Chapter 3 (Affected Environment and Environmental Consequences) for each of the issues to assist in locating more complete information on these summarized results.

Table 2-1. Estimated Acres of Proposed Treatments, Units with Harvest

Unit #	Total Harvest Acres	Whipfall Acres (WF) Acres	Machine Piling (MP) Acres	Slash-buster (SB) Acres	Underburn (UB) Acres
1	19	19	19	0	19
3	123	0	0	0	123
7	93	93	93	0	93
8	71	71	71	0	71
11	36	36	36	0	36
15	105	105	105	0	105
16	47	47	47	0	47
19	67	0	0	0	67
20	15	15	15	0	0
21	171	171	0	171	171
22	11	11	0	11	11
23	36	36	0	36	36
24	45	45	0	45	45
25	25	25	0	25	25
27	112	0	0	0	112
28	228	0	0	0	228
30	44	0	0	0	44
31	34	34	0	34	34
33	33	33	0	33	33
34	61	61	0	61	61
35	45	45	0	45	45
36	10	10	10	0	10
37	67	67	67	0	67
38	47	0	0	47	47
39	48	0	0	48	48
40	71	0	0	71	71
41	176	0	0	176	176
42	29	0	0	29	29
43	63	0	0	63	63
44	27	0	0	0	27
45	8	0	0	0	8
46	59	0	0	0	59
47	25	25	25	0	25
48	19	19	19	0	19
49	55	0	0	0	55
50	139	139	139	0	139
51	52	0	0	0	52
52	101	101	101	0	25
53	110	110	110	0	110
54	157	157	0	157	0
55	9	0	0	0	9
56	238	35	0	238	238
57	82	82	82	0	82
58	61	61	61	61	0
59	61	0	0	61	61
60	132	132	132	66	132
61	194	194	194	0	194
Totals	**3461**	**1979**	**1326**	**1478**	**3152**

Table 2-2. Estimated Acres of Proposed Treatments, Units without Harvest

Unit #	Total Unit Acres	Whipfall (WF) Acres	Machine Pile (MP) Acres	Hand Piling (HP) Acres	Slash Busting (SB) Acres	Under Burning (UB) Acres	Jackpot Burning (JPB) Acres
1	74	0	0	0	74	74	0
2	40	0	0	0	40	40	0
3	40	0	0	0	40	40	0
4	167	0	0	0	167	167	0
6	70	0	0	0	70	70	0
7	71	0	0	0	71	71	0
8	31	0	0	0	31	31	0
9	53	0	0	0	53	53	0
11	17	0	0	0	17	17	0
12	33	0	0	0	33	33	0
13	30	0	0	0	30	30	0
18	35	0	0	0	0	20	15
19	99	0	0	0	99	99	0
20	67	0	0	0	67	67	0
21	49	0	0	0	49	49	0
22	187	0	0	0	187	187	0
24	106	0	0	0	106	106	0
25	50	0	0	0	50	50	0
26	69	0	0	0	69	69	0
30	63	0	0	0	63	0	63
31	29	0	0	0	29	0	29
32	114	114	114	0	0	0	114
33	117	0	0	0	117	117	0
34	84	0	0	0	84	84	0
35	106	0	0	0	106	106	0
36	294	0	0	0	294	294	0
37	47	0	0	0	47	47	0
38	212	0	0	0	212	212	0
39	66	0	0	0	66	66	0
40	114	0	0	0	114	114	0
41	159	0	0	0	159	159	0
42	173	0	0	0	173	173	0
43	99	0	0	0	99	99	0
44	36	0	0	0	36	36	0
45	51	0	0	26	25	0	0
46	11	0	0	0	11	0	0
47	15	0	0	0	0	15	0
Totals	**3500**	**114**	**114**	**26**	**3315**	**3222**	**221**

Table 2-3. Summary of Proposed Action (Alternative 2)

Activities and Treatments	Alternative 2 Proposed Action
Commercial Timber Harvest Acres (Estimated Volume) **Sawlog Volume** (hundred cubic feet and million board feet) **Fiber Volume** (hundred cubic feet and million board feet) **Total Volume** (hundred cubic feet and million board feet)	**3461 Acres** **25841 CCF /13.4 MMBF** **1740 CCF / .9 MMBF** **27581 CCF/ 14.3 MMBF**
Approximate acres of skid trails and landings needed. Landing size is based on a landing every 20 acres and .33 acres in size. Skid trails make up 12 percent of each unit **Skid Trails** **Landings**	 **415 Acres** **57 Acres**
Miles of temporary road construction (estimate)	**12.8 Miles**
Miles of permanent road construction	**0 Miles**
Types of fuels treatment in units with harvest: **Harvest, Yard Tops Attached** **Burn YTA Landings** **Whipfalling/Thin (<8" DBH)** **Machine pile/burn** **Slashbusting/Mowing** **Underburning**	 **3461 Acres** **173 Landings** **1979 Acres** **1326 Acres** **1478 Acres** **3152 Acres**
Total acres in units that will receive a combination of fuels treatments including harvest	**3461 Acres**
Types of fuels treatment in units without harvest: **Whipfalling/Thin (<8" DBH)** **Machine pile/burn** **Slashbusting/Mowing** **Underburning** **Jackpot Burning** **Hand Piling**	 **114 Acres** **114 Acres** **3315 Acres** **3222 Acres** **221 Acres** **26 Acres**
Total acres in Natural Fuels Units that will receive a combination of fuel treatments	**3500 Acres**
Total acres of Fuels treatments Within Ninemile **Harvest, Yard Tops Attached** **Burn YTA Landings** **Whipfalling/Thin (<8"DBH)** **Machine pile/burn** **Slashbusting/Mowing** **Underburning** **Jackpot Burning** **Hand Piling**	 **3461 Acres** **173 Landings** **2093 Acres** **1440 Acres** **4793 Acres** **6374 Acres** **221 Acres** **26 Acres**
Total acres in both Harvest and Natural Fuels Units that will receive a combination of fuel treatments	**6961 Acres**

Figure 2-1. Alternative 2 Proposed Units with Harvest Activity

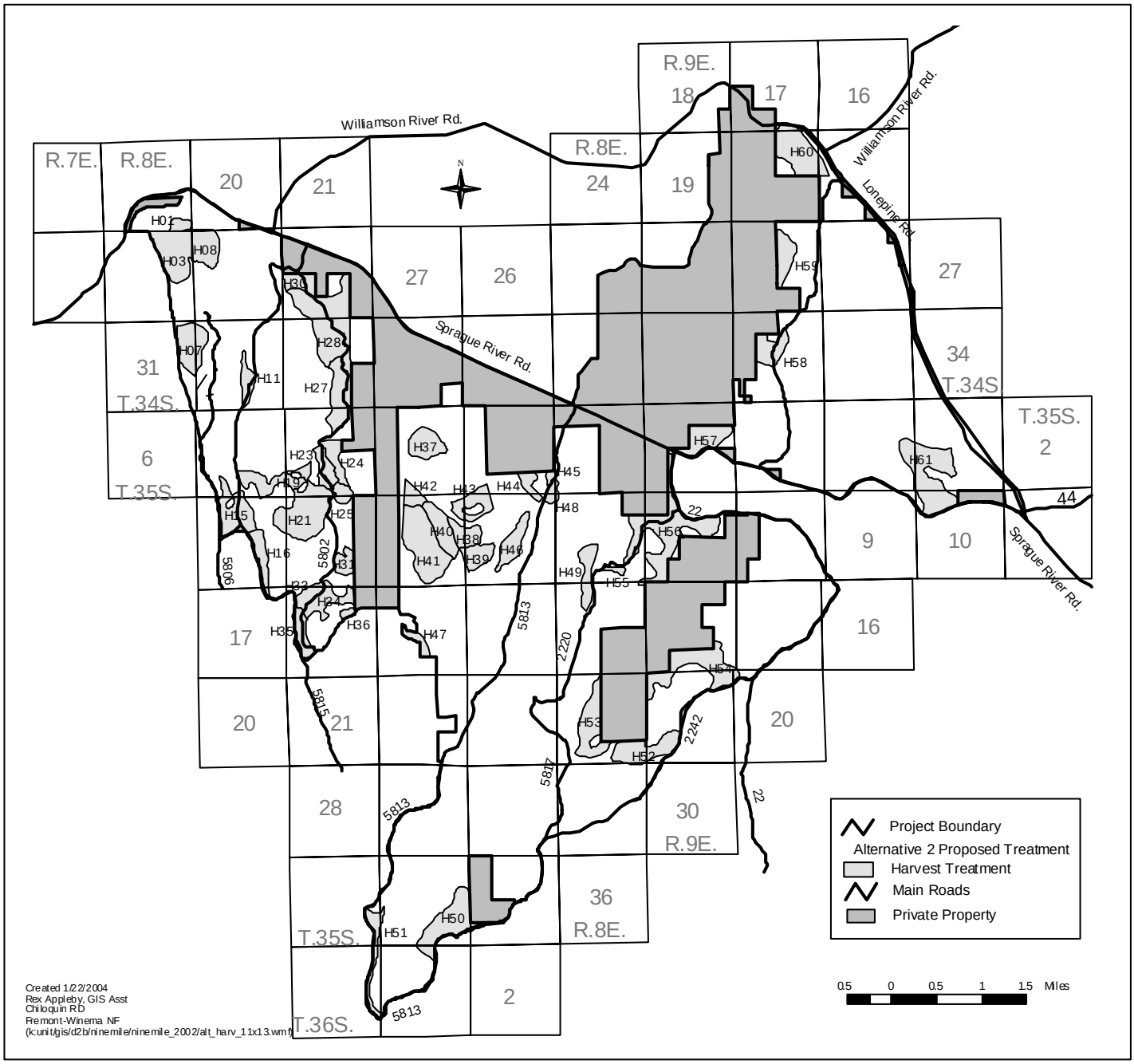
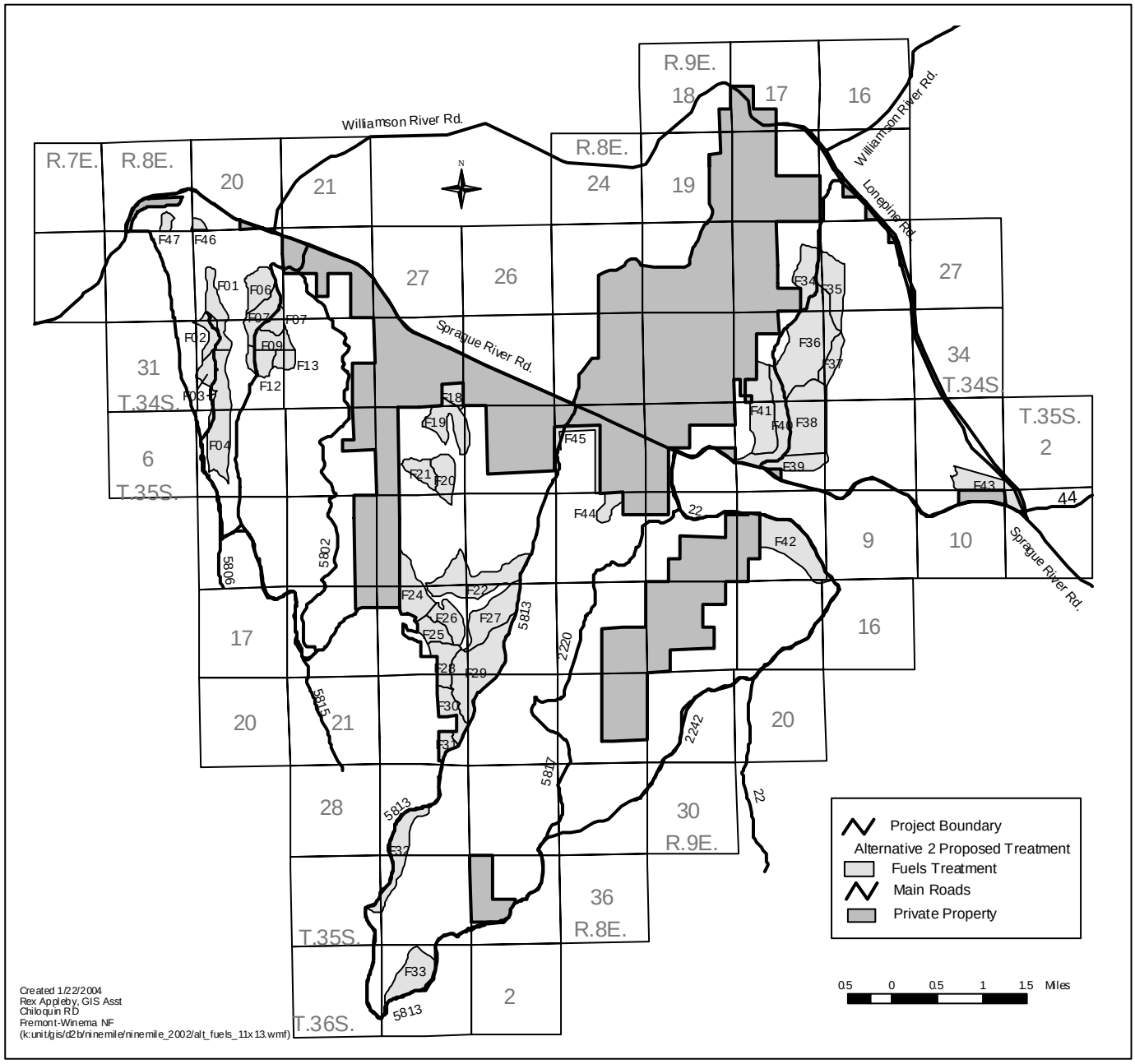


Figure 2-2. Alternative 2 Proposed Units without Harvest Activity



Resource Protection and Mitigation Measures for the Action Alternative

Resource protection measures would be applied to minimize or prevent effects of the proposed action on scenery, soils, wildlife, air quality, fire hazard, noxious weeds, TES plants and animals, and watershed and riparian resources. Specific measures are listed in Appendix B.

The Ninemile Fuel Reduction Project will meet the Interim Riparian Habitat Conservation Area (RHCA) buffer widths, as designated by INFISH (1995). Treatment units, through unit design and layout, will avoid impacts to areas within the riparian buffers.

Unit layout will be done with the assistance and input of the Tribal Forester, Tribal Biologist, and other Natural Resource Department staff to meet concerns over retention of screening and cover patches and bitterbrush seed sources.

The Ninemile Project will utilize avoidance as the primary means of cultural resource site protection. Cultural resource technicians from the Forest Service will assist in treatment unit layout and in monitoring the treatment activities throughout the life of the Project. Tribal Culture & Heritage personnel will be kept fully apprised of unit layout and activities near known sites. If previously undiscovered sites are found in the course of project activities, all activities in the vicinity of the site will cease and the site area will be protected until the site is recorded and evaluated by qualified personnel. All heritage resource sites will be actively protected under the protection clause of service contracts.

2.4 Improvement Opportunities & Recommendations

Road Maintenance

The Ninemile Interdisciplinary Team identified roads that need specific maintenance to be used in the project and to reduce potential hydrological problems. The road number and the specific maintenance needed are shown in Chapter 3. Further details may be found in the Roads Report and the Fisheries Specialist Report in the Project Record.

Noxious Weeds and Invasive Species

Noxious weed identification and removal may be needed along roads and within units in the Project Area. Known noxious weed populations exist at this time within the Ninemile Area. Protection measures will be used (Appendix B) to limit the spread of undesirable species. If discovered, additional noxious weeds needing treatment will be added to existing treatment agreements with Klamath County, or may be covered in a separate analysis.

Access

Temporary road construction will be needed to access some harvest units and to locate landings away from main road systems. These temporary roads are constructed to the lowest standard needed from native materials, and are removed following harvest by ripping and obliteration. These temporary roads will not become part of the permanent

road system. Figure 1-3 displays the approximate location of proposed temporary roads.

Additional Fuel Reductions

Approximately 130 acres of fuel reduction needs were identified in Ninemile that were outside of the Wildland Urban Interface boundary, and therefore not eligible for inclusion in an HFRA decision. These non-WUI acres are located in T34S R8E, Sections 31 and 32, and in T35S R8E, Section 5. These units will be covered in a separate decision document. A map showing the extent of WUI in Ninemile may be seen in Figure 1-6.

Additional Restoration Treatments

There were twenty-seven units covering approximately 1900 acres identified by the ID Team during the Ninemile analysis that need various types of vegetative restoration treatments. The treatments do not materially reduce fuels, but do treat vegetative conditions that are different from sustainable historical conditions. Treatments include juniper reduction, conifer removal within aspen stands, and meadow burning to release sensitive species. These proposed treatments will be covered in a separate decision document.

Table 2-4. Summary Comparison of Alternatives

Purpose and Need	Alternative 1 No Action	Alternative 2 Proposed Action
Lower fuel loadings, less ladder fuels, and reduction in fire hazard	Does not address Purpose and Need. Does not reduce fuels on any acres.	Addresses Purpose and Need. Reduces fuel on 6961 acres
Improve vigor and growth rates in timber stands	Does not address Purpose and Need. No improvement in overstocking and competition in any stand.	Addresses Purpose and Need. Improves growth rates on 3461 acres of harvest/fuels units, maintains or improves growth on 3500 acres of natural fuels only units
Improve the quality of mule deer habitat	Does not address Purpose and Need. Habitat remains with excessive cover and poor quality forage	Addresses Purpose and Need. Reduces conifer dominance and stimulated new forage on 6961 acres. Reduces excess cover.
Produce commercially valuable timber	Does not address Purpose and Need. Harvests no timber.	Addresses Purpose and Need. Harvests est. 27581 CCF on 3461 acres

Table 2-4. Summary Comparison of Alternatives, continued

Issues		Alternative 1 No Action	Alternative 2 Proposed Action
Key Issue #1 Fire Hazard Reduction (pages 41-68)	The area on which the fire hazard is effectively lowered	No fuel treatments, no fire hazard reduction. Fuels continue to accumulate. 79% high hazard rating	6961 total acres of fuel reduction treatment, 47% of area changed from high to low hazard
	The degree that the total fuel loadings are reduced on treated areas	Condition Class 3 is maintained through lack of treatment, increases over time	Total of 6961 acres of Condition Class 3 treated, 39% of area changed to Condition Class 1
	The length of time that fuel treatments are effective	Fuel conditions continue to worsen as vegetation accumulates	Treated areas will stay CC 1 for at least 10-15 years, can be treated with maintenance underburn to return to CC 1, or wait longer to maintain forage
	The increase in individual tree vigor and overall stand health to reduce mortality	Continued decline in growth rates and forest health as stands increase basal area, leading to competition related mortality over time	Improved forest health and growing space for increased growth rates, increase in vigor for 25-30 years until intertree competition slows growth again
Key Issue #2 Treaty Resources and other concerns of the Klamath Tribes (pages 69-86)	Effects on mule deer habitat, a primary Treaty Resource concern of many Tribal members	Current cover % is high, and forage is old, decadent, and providing low quality and quantity of forage. Forage will decline over time, cover will increase	Reduces overall cover from 60% to 44%, returns to 50% optimum winter range cover in 10 years, improves forage on 6961 acres of treatment by rejuvenation and shift of site resources from trees to forage
	The visual effects of treatment on a natural appearing landscape	Dense stand appearance and structure will not change through treatment. Gradual loss of larger trees due to stress, insects, competition	Treated areas will be more open, longer site distances, taller trees, less brush and understory trees. Fire effects will be evident. Large trees will be more visible
	Effectiveness of cultural site protection	No actions would be implemented that could disturb known sites. Risk of wildfire damage to sites remains unchanged	Avoidance used to prevent disturbance to sites with monitoring. Lower risk following treatment from wildfire damage to sites
	Effects of treatments on wildlife species of interest to the Tribes and on traditional use plants	Plants and wildlife that rely on dense forest conditions favored, those needing disturbance and openings not favored	Plants and animals that benefit from openings and disturbance favored. Less dense, conifer dominated habitat retained
Threatened and Endangered Species, Other Wildlife, and Sensitive Plants (pages 87-114)		No effect from actions, risk to animals and habitat from the high fuel hazard and potential for uncharacteristically severe wildfire that remains untreated	NLAA effect on Bald Eagle No Effect or No Impact on all others. Lowers chance of large scale wildfire. Improves habitat for sensitive plant

Table 2-4. Summary Comparison of Alternatives, continued

Issues	Alternative 1 No Action	Alternative 2 Proposed Action
Noxious Weeds and Invasive Plants (pages 101-102)	No potential for spread or introduction of unwanted species as there are no treatments implemented	Potential for introduction of unwanted species, ground disturbance produces seedbed. Measures such as equipment washing will be used to lessen potential
Soils (pages 115-117)	Soils could be damaged by catastrophic wildfire. Without wildfire, little chance of soil damage	Potential for excessive soil compaction and displacement through equipment use. Improvement in soil processes through treatment, vegetation establishment. BMPs applied to limit soil impacts below guidelines
Old Growth (pages 117-121)	Old growth remains same, multi-storied and dense, high competition levels unchanged, subject to stand-level fire mortality	609 acres of old growth treated, moved toward historic open condition where fire can function as stand tending mechanism
Air Quality and Smoke Management (pages 121-123)	No production of smoke or particulates from activity created fuels. Higher possibility of wildfire smoke	175 landings and other machine, hand piles, and underburning will produce an estimated 1186 tons of particulate emissions
Roads and Transportation System (pages 123-125)	No road maintenance or improvements beyond regular blading and other activities dependant on yearly budget levels	Improve several miles of roads needed for harvest access, replace culverts, improve surfacing and drainage. Close one portion of road, re-route and improve more logical replacement segment. No permanent road construction.
Economic Analysis (pages 125-128)	No revenues or costs No commercial timber produced or jobs created	Revenue from timber harvest partly offsets the cost of other fuel reduction activities. 355 jobs created