Appendix A - Project Compliance with Federal and State Laws

All project alternatives were designed using the appropriate direction and guidelines found in the Willamette National Forest Land and Resource Management Plan (LRMP), the Northwest Forest Plan, the Aquatic Conservation Strategy, and Best Management Practices. These alternatives are also consistent with other guidance or direction such as the Endangered Species Act of 1973, the Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 1996, the Clean Water Act, Wild and Scenic Rivers Act, and Executive Orders 12962, 11988, and 11990. Specific guidance components applicable to this project and a discussion of compliance with this direction are presented below, by each category.

A-1: The Willamette National Forest Land and Resource Management Plan (LRMP) (1990), as amended[1]

These commercial thinning treatments are directed by the standards and guidelines in the Forest Plan according to commercial thinning (MA-14a-13) and the land allocations (General Forest, Special wildlife Habitat, Matrix, and Riparian Reserves). All thinning treatments would take place on land classified as suitable for timber production. Areas determined to be unsuitable have been avoided and dropped from the units. Thinning maintains or enhances species diversity through the development of understory vegetation, and all tree species would be retained as part of the residual stand. These stands have not reach culmination of mean annual increment, and no regeneration harvest is planned. The gaps that would be created are considered a part of the natural stand structure of older Douglas-fir, and not a regeneration method.

No regeneration harvest is proposed with this project. Gaps created are considered to be a part of the natural stand structure of older Douglas-fir, and would not be reforested. If desired in the future, reforestation (e.g. understory planting or group selections) on these sites would be feasible and have a high potential for success, as evidenced by the current high stocking levels and productivity of these stands.

The principle policy document relevant to wildlife management on the Forest is the 1990 Willamette National Forest Land and Resource Management Plan, referred to as the Forest Plan for the remainder of this section. The Forest Plan provides standards and guidelines for management of wildlife species and habitats. Standards and guidelines are presented at the Forest level (LRMP, FW-121 to FW-174) or Management Area level. Management Areas included in this project area are General Forest (MA-14a), Northern Spotted Owl Habitat Area (MA-9a), Pileated Woodpecker Habitat Area (MA-9b), Marten Habitat Area (MA-9c), Special Habitat Area (MA-9d), Riparian Areas (MA-15).

- Management objectives for deer and elk habitat apply to specific mapped “Big Game Emphasis Areas” (BGEA) within the Willamette National Forest. Effects to these species will be discussed in this section.

[1] This document was amended by the NW Forest Plan in 1994, however, the management direction within must still be applied where they are more restrictive or provide greater benefits to late-successional and old-growth forest related species than other provisions of the NW Forest Plan standards and guidelines.

Management Area 9d: Saddleblanket Mountain Special Wildlife Habitat Area: This allocation protects special or unique habitats for wildlife and botanical resources such as dry meadows, cliffs, caves, talus mineral springs, mineral licks, wet meadows, marshes, and bogs.

Of the special wildlife habitat area, 723 acres exist within the project area along the northeast perimeter and along both the North and South Fork Winberry Creek. Units 1538 (13ac), 1512 (40ac), 1456 (12.5ac), 1581 (3.5 ac) and 1575 (10ac), totaling 79 acres are proposed for moderate thinning. No special habitat features will be affected by this project. The goal of the forest plan is to protect and enhance unique wildlife habitats and botanical sites.

Specific forestwide goals, standards and guidelines were established in the LRMP (Chapter IV, 3-4, 45-95) to provide direction on project design with a goal of minimizing negative effects to soil, water, and fish.

Amendment 37 (July 1997) to the Willamette Land and Resource Management Plan (USDA, 1990) adds four Conservation Strategies as amendments to the Forest Plan. The Conservation Strategies are for: *Aster gormanii, Ophioglossum pusillum, Cimicifuga elata* and *Frasera umpquaensis*.

Determination of Project Consistency

The project is consistent with the competing vegetation direction. In the thinning units, competing and unwanted vegetation is not a concern due the age of the stands, seral stage condition of the stands, and the proposed treatment type. These stands are 35 to 60 years old and are dominant in size and height to any competing vegetation. Competing vegetation may come into the created gaps. In these areas, the potential major future competitors to coniferous seedlings are big leaf maple, vine maple, and rhododendron. All three species are currently present in portions of these units in varying concentrations. The prevention strategy was selected, after consideration of previous experience with these vegetation types. Over the long term, the canopy cover will expand back to the point where the shading will control the levels of most potential competing vegetation, except in larger gaps. Since these types of gaps are a desired stand structural element, their continued presence would not be a concern during the next rotation.

Proposed actions associated with this project comply with current Forestwide and management area (MA) standards and guidelines pertaining to general wildlife and MIS management - including those MIS species also listed as threatened, endangered, or sensitive.

All goals and standards/guidelines from the LRMP were reviewed prior to project development and integrated into the project design for all alternatives. All alternatives are consistent with this direction. The MIS fish groups identified in the LRMP will continue to persist as viable populations under all alternatives.

A-2: The Northwest Forest Plan (1994) as amended

Current standards and guidelines governing management of this area provide direction that promotes long-term maintenance of amount and distribution of suitable habitat for cavity nesters and cavity excavator species.

The Northwest Forest Plan established specific standards and guidelines for management within riparian reserves and key watersheds.

The LRMP was amended by the Northwest Forest Plan, however administratively withdrawn areas and all other LRMP standards and guidelines apply where they are more restrictive or provide greater benefits to late-successional and old-growth-forest-related species than other provisions of the Northwest Forest Plan standards and guidelines.

As a general rule, standards and guidelines for Riparian Reserves prohibit or regulate activities in Riparian Reserves that retard or prevent attainment of the Aquatic Conservation Strategy objectives.

Determination of Project Consistency

This proposal also complies with other standards and guidelines established for affected allocations in the Willamette National Forest Land and Resource Management Plan (1990) as amended by the Northwest Forest Plan Records of Decision (ROD; 1994, 2001).

All standards and guidelines for management within riparian reserves and key watersheds were reviewed prior to project development and integrated into the project design for all alternatives. All alternatives are consistent with this direction.

A-3: Aquatic Conservation Strategy (ACS) as amended in 2003

An integral part of the Northwest Forest Plan, the goal of the ACS is: to maintain and restore the ecological health of watersheds and the aquatic ecosystems within them. The four major components of the ACS (as noted below) provide the basis for protection of watershed health.

1) Riparian Reserves were established to buffer streams and other water bodies. Riparian Reserves are portions of watersheds where riparian-dependent resources receive primary emphasis and where special standards and guidelines apply. Standards and guidelines prohibit and regulate activities in Riparian Reserves that retard or prevent attainment of the Aquatic Conservation Strategy objectives. Riparian Reserves include those portions of a watershed directly coupled to streams and rivers, that is, the portions of a watershed required for maintaining hydrologic, geomorphic, and ecologic processes that directly affect standing and flowing waterbodies such as lakes and ponds, wetlands, streams, stream processes, and fish habitats. Under the Aquatic Conservation Strategy, Riparian Reserves are used to maintain and restore riparian structures and functions of intermittent streams, confer benefits to riparian-dependent and associated species other than fish, enhance habitat conservation for organisms that are dependent on the transition zone between upslope and riparian areas, improve travel and dispersal corridors for many terrestrial animals and plants, and provide for greater connectivity of the watershed.

2) Key Watersheds were identified across the Northwest Forest Plan area to serve as the cornerstones of aquatic species recovery.

3) Watershed Analysis: Procedures for conducting analysis that evaluates geomorphic and ecologic processes operating in specific watersheds. This analysis should enable watershed planning that achieves Aquatic Conservation Strategy objectives. Watershed Analysis provides the basis for monitoring and restoration programs and the foundation from which Riparian Reserves can be delineated. Watershed Analysis must be completed prior to management in Key Watersheds, and Riparian Reserves.

4) Watershed Restoration. A comprehensive, long-term program of watershed restoration to restore watershed health and aquatic ecosystems, including the habitats supporting fish and other aquatic and riparian-dependent organisms.

Projects that will include management within a Riparian Reserve must:

1) Describe the existing condition, including the important physical and biological components of the fifth-level watershed(s) in which the project area lies,

2) Describe the effect of the project on the existing condition; and

3) Demonstrate that in designing and assessing the project the decision maker considered and used, as appropriate, any relevant information from applicable watershed analysis.

This work will address these items at a level of detail in proportion to the risk associated with the project.

The project is deemed consistent with the ACS objectives if it is designed to contribute to maintaining or restoring the fifth-level watershed condition over the long term, even if short-term effects may be adverse.

Determination of Project Consistency

ACS Components: All action alternatives prescribe management within the riparian reserves. This management was designed to improve the long-term function of the reserves in regard to providing high quality water and fish habitat conditions. This may involve some short-term negative effects that will be offset by long-term improvements. The project area is not in a key watershed. Watershed analysis was completed for the Winberry 6th-level watershed in 1996. General recommendations from that analysis regarding riparian management were incorporated into project design. Other watershed restoration is planned, with the addition of woody material into streams, road decommissioning, and road drainage improvements.

ACS Consistency: The existing condition of the Winberry 6th-level watershed is described in the Winberry and Lower Fall Creek watershed analysis (USDA Forest Service and USDI Bureau of Land Management 1996). Additionally, watershed disturbance levels for the Winberry 6th-level watershed are described in section 2.2.1.of the Integrated Aquatics Team Specialist Report, which can be found in the project record. More explicit detail and project effects on existing condition are disclosed for the watershed in section 2 of that document. Negative short-term effects were identified, with numerous longer term beneficial effects. Watershed analysis recommendations were incorporated into the project design for all alternatives.

This project is consistent with the ACS because it is designed to contribute to maintaining or restoring the watershed condition over the long term, with only minor short-term negative effects.

A-4: Best Management Practices (BMPs)

The Pacific Northwest Region entered into an agreement with the State of Oregon adopting "General Water Quality Best Management Practices" in November 1988. These BMPs were integrated into the LRMP as management direction. Specific information on how to correctly integrate BMPs into the NEPA process is found in Appendix H of the LRMP FEIS.

Determination of Project Consistency

Applicable BMPs are included in the Mitigations Common to all Action Alternatives section of this report. Implementation of the identified BMPs will limit the potential negative effect to water quality, and fish habitat, and therefore to the aquatic resource. All alternatives are consistent with this direction.

A-5: The Endangered Species Act (ESA) of 1973 (as amended)

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities in furtherance of the purposes of the Act by carrying out programs for the conservation of species listed pursuant to the Act. Section 7(a)(2) states that each Federal agency shall… "insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat."

Determination of Project Consistency

This project has been designed to be consistent with the existing programmatic BA, which covers thinning timber sales on the Mt. Hood and Willamette National Forests and portions of the Eugene and Salem Bureau of Land Management Districts. Consultation with National Marine Fisheries Service regarding project consistency with the programmatic decision is ongoing. The project consistency worksheet currently being prepared for this project will show how the project was designed to meet specific project design criteria set out in the programmatic BA. One site-specific variance to the project design criteria is proposed in this project and an analysis to describe how the effects associated with the planned exception still fall within the expected range of effects as described in the programmatic biological assessment will be included in consultation.

This project has been designed to promote the conservation of ESA-listed UWR Chinook salmon. It is highly probable that all alternatives for this project will not jeopardize the continued existence of UWR Chinook salmon, or result in the destruction or adverse modification of designated critical habitat. All alternatives are therefore consistent with ESA direction.

Because no surveys were completed to determine effects on fungi, all action alternatives were given a May Impact Individuals or Habitat (MIIH), But Will Not Likely Contribute to a Trend Towards Federal Listing or Loss of Viability for the Population or Species rating.

Usnea longissima was given a No Impact (NI) determination because the documented populations and associated habitat are sufficiently buffered through mitigation measures or located away from the impacts of project activities.

Peltigera pacifica was given a MIIH determination and will be partly or fully buffered depending on location of known populations in relation to project activities.

A-6: 1918 Migratory Bird Treaty Act (MBTA) and the Migratory Bird Executive Order 13186

Migratory Bird Treaty Act (MBTA) of 1918 established an international framework for the protection and conservation of migratory birds. This Act makes it illegal, unless permitted by regulations, to "pursue, hunt, take, capture, purchase, deliver for shipment, ship, cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird . . ."

Executive Order (E.O. 13186) entitled "Responsibilities of Federal Agencies to Protect Migratory Birds." requires the "environmental analysis of Federal actions, required by NEPA or other established environmental review processes, evaluates the effects of actions and agency plans on migratory birds, with emphasis on species of concern."

Determination of Project Consistency

All alternatives are consistent with the 1918 Migratory Bird Treaty Act (MBTA) and the Migratory Bird Executive Order 13186. Alternatives were designed under current Forest Service policy for landbirds. Vegetation management cannot completely avoid unintentional take of birds, no matter what mitigations are imposed on the activities. Mitigation, such as retention of snags and down logs, retention of live trees, and avoidance of riparian areas proposed in this project will minimize take of migratory birds.

A-7: The Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 1996 as amended

Section 305(b)(2) of the MSA directs that “Each Federal agency shall consult with the Secretary with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat identified under this Act.” The MSA implementing regulations (50CFR part 600), specifically §600.920(a) states that “Federal agencies must consult with NMFS regarding any of their actions authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken that may adversely affect EFH.

Chinook salmon are the only MSA fish species on the Willamette National Forest. Essential fish habitat has been delineated in the Willamette River Basin based on the process described in MSA §303(a)(7). Federal agencies are to minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat (MSA §303(a)(7)).

Determination of Project Consistency

All streams currently or historically occupied by spring Chinook salmon in the project area have been designated as essential fish habitat by the NMFS. Designated EFH is synonymous with designated critical habitat. Minor negative effects to occupied and critical habitat are predicted to occur with all action alternatives, as described earlier in this document. These effects will be short term in nature, and are not expected to result in biologically measurable changes in EFH condition. Consultation has been initiated with NMFS(refer to discussion of ESA consistency). This project is consistent with the MSA.

A-8: Clean Water Act (PL92-500, as amended in 1977 and 1982)

The Oregon Department of Environmental Quality is the agency responsible for implementation of the Clean Water Act within the State. Oregon Administrative Rules (Chapter 340, Division 41) identifies beneficial uses, which may include: potential anadromous fish passage, salmonid rearing, salmonid spawning, resident fish and aquatic life.

The ODEQ provides temperature and turbidity concern thresholds, with limits on allowable increases.

Additionally in 2005, the State of Oregon agreed with the FS and BLM that implementation of the "Northwest Forest Plan Temperature TMDL Implementation Strategies" would meet our requirements for protection of water temperature.

Determination of Project Consistency

Winberry Creek is listed as water quality limited for temperature because it exceeds the temperature criterion of 17.0ºC for salmonids. Planned harvest will not occur within the primary shade zone and harvest will not remove more than 50 percent canopy closure in the secondary shade zone, as described in the TMDL implementation strategy. All of the alternatives for this project will have a neutral short-term effect on stream water temperature, and will potentially reduce stream water temperature in the long-term due to improved tree health, height, and canopy size with the proposed silvicultural treatment.

All alternatives will increase turbidity levels in streams within the project area, primarily due to road improvements and road decommissioning. These effects are not expected to exceed the point-source turbidity thresholds established by ODEQ. All action alternatives will result in short-term negative effects that will be offset by short-term and long term reductions in chronic sediment sources, and reduced risk of episodic large-scale sediment delivery to streams, thereby resulting in reduced turbidity levels in the future.

All alternatives are consistent with this direction.

A-9: Wild and Scenic Rivers Act

None of the streams potentially affected by this project are designated or proposed to be Wild or Scenic.

Determination of Project Consistency

This Act is not applicable to this project.

A-10: National Historic Preservation Act of 1966, as amended

This Act requires Federal agencies to consult with American Indian Tribes, and various State and local groups before nonrenewable cultural resources, such as archaeological and historic structures, are damaged or destroyed. Section 106 of this Act requires Federal agencies to review the effects project proposals may have on the cultural resources in the Analysis Area.

Determination of Project Consistency

The alternatives were either designed to avoid or exclude these areas from any management activities, have mitigated the effects by protecting the sites with down logs, and or minimized the site disturbances with yarding log suspension requirements.

A-11: Executive Order 12962, Recreational Fisheries (1995)

Federal agencies shall, to the extent permitted by law and where practicable, and in cooperation with States and Tribes, improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities by:

a) developing and encouraging partnerships between governments and the private sector to advance aquatic resource conservation and enhance recreational fishing opportunities;

b) identifying recreational fishing opportunities that are limited by water quality and habitat degradation and promoting restoration to support viable, healthy, and, where feasible, self-sustaining recreational fisheries;

c) fostering sound aquatic conservation and restoration endeavors to benefit recreational fisheries;

d) providing access to and promoting awareness of opportunities for public participation and enjoyment of U.S. recreational fishery resources;

e) supporting outreach programs designed to stimulate angler participation in the conservation and restoration of aquatic systems;

f) implementing laws under their purview in a manner that will conserve, restore, and enhance aquatic systems that support recreational fisheries;

g) establishing cost-share programs, under existing authorities, that match or exceed Federal funds with nonfederal contributions;

h) evaluating the effects of Federally funded, permitted, or authorized actions on aquatic systems and recreational fisheries and document those effects relative to the purpose of this order; and

i) assisting private landowners to conserve and enhance aquatic resources on their lands.

Determination of Project Consistency

Recreational fishing is an identified use in the analysis area, primarily on Fall Creek. This project will not result in any appreciable reduction in the fish population numbers or otherwise negatively affect the fishing opportunity. All alternatives are consistent with this Order.

A-12: Executive Order 11988, Floodplains

This Order requires government agencies to take actions that reduce the risk of loss due to floods, to minimize the impact of floods on human health and welfare, and to restore and preserve the natural and beneficial values served by floodplains.

Determination of Project Consistency

All alternatives are consistent with this direction.

A-13: Executive Order 11990, Wetlands

This order requires government agencies to take actions that minimize destruction, loss or degradation of wetlands. Streamside Riparian Reserves, seeps and other wet habitats are to be assessed.

Determination of Project Consistency

All alternatives are consistent with this direction.

A-14: Laws and Regulations for Soils

In 36 C.F.R. 219.14(a), there is direction to the Forest Service to classify lands under their jurisdiction as not suited for timber production if they fall into any of four categories 1) Non-forest, 2) Irreversible soil or watershed damage (from NFMA 6(g)(3)(E)(i), 3) No assurance of reforestation within five years, and 4) Legislatively or administratively withdrawn.

Determination of Project Consistency

The direction was reviewed and areas with irreversible soil damage were identified and avoided during project design under all alternatives. All alternatives are consistent with this direction.

A-15: Regional Guidelines for Soils

The Forest Service has developed regional guidelines (Forest Service Manual R-6 Supplement No. 2500.98-1 (Title 2520 – Watershed Protection and Management)) which clarifies direction for planning and implementing activities in areas where soil quality standards are exceeded from prior activities; redefines soil displacement; and provides guidance for managing soil organic matter and moisture regimes.

Determination of Project Consistency

These regional guidelines were reviewed and it was determined that all project alternatives are consistent with these guidelines.

Appendix B – Past, Present and Foreseeable Activities Relevant to Cumulative Effects

For the majority of the cumulative effects analyses, the analysis area was defined by the boundary used in the Interagency Winberry and Lower Fall Creek Watershed Analysis (1996). This analysis area was used in order to remain consistent and comparable with the Watershed Analysis. The cumulative effects analysis includes the history of harvest and other stand management activities beginning in the 1940s and the effects of timber harvest and road systems on vegetation, wildlife habitat, air quality, recreation, water quality, fisheries, and hydrology of the watershed. The analysis includes future harvest projects for which the NEPA process has begun. The table below names the recent past, ongoing and future projects for which NEPA is complete.

Project Timeframe	Winberry Creek Drainage	Fall Creek Drainage
Recent Past	Grin Thin Pencil Thin Windy Thin	Clark Fire Roadside Salvage Bedrock Campground Restoration fall Creek SIA Salvage Boundary Thin Borderline Thin Fringe Thin
Ongoing	Windy Cabin Thin Cabin Thin	Edge Thin - ongoing Periphery Thin - ongoing Margin Thin - ongoing Portland Thin - ongoing Fall Thin -ongoing
Future (all part of the Hehe LSR Project)		Zog Thin - future Sunshine Thin - future Tiller Thin - future Symbol Thin - future Pernot Thin - future Hehe Thin - future

A possible fish habitat improvement project in the Winberry Creek drainage is being considered. Such a project would be done under a separate NEPA analysis and has not yet begun.

The table below presents a summary of activities that have occurred in the past and are ongoing within the Fall Creek Watershed. Note that there are no foreseeable future activities. The listing includes the small amount (18.5 percent) of private lands within the lower part of the watershed. Vegetation conditions for the private lands were estimated from aerial photography. The various resource analyses may have used a subset of these activities, depending on the size of the appropriate analysis area, for instance, either single or multiple 6th-level subwatersheds.

Table 33. Summary by decade of past, present, and future activities in Fall Creek Watershed

Decade	Acres by Activity Category					
	Regeneration Harvest	Fuels Treatment	Commercial Thinning	Precomm. Thinning	Fertilization	Pruning
1940s	5,844	2,960	0	0	0	0
1950s	5,915	5,630	0	0	0	0
1960s	9,203	8,763	0	0	0	0
1970s	6,152	5,969	26	3,298	1,801	0
1980s	6,979	6,205	254	8,626	12,338	20
1990s	1,113	904	711	2,815	2,380	1,065
2000-2004	39	39	962	1,818	191	12
2004-2010	29	29	5,902	1,790		400
Foreseeable Activities	0	0	0	0	0	0

Road Systems in the Winberry Creek Watershed

The first primitive “truck trail” roads built in the watershed began in the early 1900s for the primary purpose of administrative access for fire protection. In the 1920s few roads constructed. The emphasis was still to develop a road system for effective fire protection. In the late 1940s demand for timber products increased significantly and lower use project roads, such as roads within a timber sale area, were constructed. In the early 1960s the road design standards were improved and many of the main access roads were constructed. The vast majority of the roads in the watershed were constructed from the 1960s through the 1980s when demand for timber and recreation access to public lands dramatically increased. Road construction was minimal in the 1990s with the decline in timber targets and emphasis shifted toward decommissioning and closure of roads given limited road maintenance budgets. The Winberry Creek watershed has approximately 139 miles of road. The current system consist of about 9.38 miles of paved roads, 111 miles of aggregate surface roads, 19 miles of improved surface or pit run roads and 7 miles of native surface roads.

Appendix C - Sale Area Improvements - Funded Project Priority List

No essential projects were identified.

Mitigating Measures

1. Road Closure and Rehabilitation (roads and temporary spurs not closed with timber sale contract).
2. Invasive Weed Control and Surveys.
3. Erosion Control Seeding and Fertilization.
4. Coarse Wood Debris - Snag and Down Wood Creation and Monitoring

Resource Opportunity Projects

These projects are not considered connected actions to the proposed action nor reasonably foreseeable future actions for the cumulative effects analyses because there are no specific plans or information about these activities at this time. Separate environmental analysis would be completed for these projects prior to implementation.

The following projects would be eligible for sale area improvement funding should money be available from timber stumpage payments after implementation of an action alternative or from other sources not connected with the proposed timber sale. The projects are listed in order of descending priority;

1. In-stream structure placement of large woody debris on North Winberry Creek
2. Wildlife Forage Enhancement projects
3. Timber stand improvement projects
4. Firewood inventory and removal
5. Repair or maintenance of Timber Butte Cabin, Saddleblanket Lookout, Little Blanket Shelter
6. Trail maintenance

Appendix D – Detrimental Soils Condition Predictions by Treatment Unit

Table 34. Detrimental soil condition by unit

		Percentage Detrimental Soil Conditions by Category									
Unit	**Acres**	**Existing (Excluding Roads)**	**Classified Roads**	**Total Existing**	**Landings**	**Temporary Roads**	**Helicopter**	**Skyline**	**Ground-Based**	**Total from Proposed Activities**	**Total After Activities**
1160	**3**	**8***	**5.3**	**13**	**7.5**	**0.0**	**0.0**	**0.0**	**10.0**	**17**	**31***
1200	48	8*	2.4	**10**	3.1	0.5	0.2	0.8	4.0	9	19*
1242**	**73**	**34**	**2.1**	**36**	**1.7**	**0.0**	**0.1**	**0.0**	**9.3**	**11**	**47**
1257**	**41**	**25***	**2.5**	**28**	**3.1**	**0.8**	**1.0**	**0.0**	**0.0**	**5**	**32***
1278	34	5*	0.4	**5**	3.0	0.7	0.0	1.8	0.0	5	11*
1296	62	10*	1.7	**12**	3.2	0.6	0.0	0.9	1.7	6	16*
1310	**20**	**5***	**4.4**	**9**	**6.3**	**0.4**	**0.0**	**1.3**	**3.0**	**11**	**20***
1323**	**60**	**8**	**2.6**	**11**	**2.5**	**0.0**	**0.0**	**0.0**	**10.0**	**12**	**23**
1364**	5	7	0.0	**7**	0.0	0.0	0.0	0.0	10.0	10	17
1370	**49**	**8**	**1.8**	**10**	**6.1**	**0.3**	**0.0**	**1.4**	**2.4**	**10**	**20**
1378**	28	3	2.1	**5**	7.2	1.1	0.0	1.0	4.6	14	19
1387	**63**	**8**	**2.3**	**10**	**2.8**	**0.5**	**0.0**	**0.8**	**5.4**	**10**	**20**
1388	**35**	**7**	**3.8**	**11**	**7.2**	**1.2**	**0.0**	**0.3**	**8.4**	**17**	**28**
1394	32	5*	2.6	**8**	8.5	0.0	0.0	1.8	0.0	10	18*
1395	41	7*	1.0	**8**	1.8	1.6	0.0	1.3	3.0	8	16*
1402	33	5*	0.9	**6**	6.8	0.7	0.0	1.8	0.0	9	15*
1408	**18**	**5***	**1.2**	**6**	**4.2**	**2.8**	**0.0**	**1.0**	**5.5**	**14**	**20***
1411	22	5*	1.6	**7**	6.7	0.3	0.0	1.8	0.0	9	15*
1412	**7**	**7**	**5.1**	**12**	**0.0**	**0.0**	**0.0**	**0.0**	**10.0**	**10**	**22**
1421**	**36**	**7***	**2.5**	**10**	**7.0**	**0.0**	**0.0**	**1.2**	**3.1**	**11**	**21***
1426	34	5*	1.7	**7**	6.0	0.0	0.0	1.8	0.0	8	14*
1430	41	8*	2.1	**10**	3.1	0.0	0.0	1.8	0.0	5	15*
1432	**47**	**8**	**3.3**	**11**	**2.7**	**0.0**	**0.0**	**0.5**	**7.4**	**11**	**22**
1435	26	8	1.6	**10**	6.7	0.0	0.0	1.8	0.0	9	18
1440	41	7	0.5	**7**	3.6	0.3	0.0	1.0	4.3	9	17

		Percentage Detrimental Soil Conditions by Category									
Unit	**Acres**	**Existing (Excluding Roads)**	**Classified Roads**	**Total Existing**	**Landings**	**Temporary Roads**	**Helicopter**	**Skyline**	**Ground-Based**	**Total from Proposed Activities**	**Total After Activities**
1443	**33**	**7***	**0.5**	**7**	**3.7**	**1.5**	**0.0**	**0.7**	**6.1**	**12**	**20***
1446**	44	5	3.6	**9**	5.1	0.0	0.2	1.0	3.1	9	18
1451	40	5*	1.0	**6**	3.8	0.3	0.0	1.8	0.0	6	12*
1456	43	5	1.9	**7**	2.3	0.0	0.0	1.3	3.1	7	14
1470	19	8*	0.6	**9**	1.3	0.0	0.0	1.8	0.0	3	12*
1476	**12**	**8***	**5.5**	**14**	**10.5**	**0.0**	**0.0**	**1.8**	**0.0**	**12**	**26***
1477	45	1	2.0	**3**	1.7	0.0	0.0	0.0	10.0	12	15
1490	27	8*	2.5	**11**	3.7	0.0	0.0	1.1	3.9	9	19*
1493	39	3	1.8	**5**	5.2	0.0	0.0	1.4	2.2	9	14
1495	**19**	**8***	**0.0**	**8**	**9.4**	**2.4**	**0.0**	**0.8**	**5.6**	**18**	**26***
1511	**62**	**6***	**1.7**	**8**	**2.4**	**0.0**	**0.0**	**0.0**	**10.0**	**12**	**20***
1512	51	8*	0.5	**8**	1.5	0.0	0.0	0.3	8.5	10	19*
1514	**19**	**10***	**2.4**	**12**	**6.7**	**0.0**	**0.0**	**1.8**	**0.0**	**8**	**21***
1516	50	1	1.4	**2**	2.0	0.0	0.0	0.0	10.0	12	14
1523**	30	3	2.4	**5**	1.7	0.0	0.0	0.0	10.0	12	17
1533	26	3	2.8	**6**	2.0	0.0	0.0	0.0	10.0	12	18
1534	10	15	2.1	**17**	0.0	0.0	0.4	1.1	0.0	2	19
1537	44	8	2.5	**10**	1.1	0.0	0.4	0.3	3.8	6	16
1538**	50	3	2.8	**6**	1.5	0.0	0.0	0.0	10.0	12	17
1539**	**17**	**15**	**2.9**	**18**	**3.0**	**0.0**	**0.0**	**1.0**	**4.4**	**8**	**26**
1546	20	5	3.0	**8**	1.3	0.0	0.0	0.0	10.0	10	19
1552	53	8	1.5	**10**	1.9	0.0	0.0	1.1	4.0	7	17
1566**	68	3	1.6	**5**	3.3	0.0	0.3	1.2	0.8	6	10
1574	31	7*	1.9	**9**	4.0	0.0	0.0	0.9	5.1	10	19*
1575	34	7*	0.9	**8**	5.2	0.0	0.0	1.8	0.0	7	15*
1576	36	8*	0.5	**9**	3.5	0.0	0.0	1.8	0.0	5	14*
1577	48	9*	1.0	**10**	4.2	1.0	0.0	1.5	1.7	9	18*
1579	60	10*	2.9	**13**	3.8	0.0	0.2	1.4	0.0	5	18*
1581	13	6*	0.8	**7**	3.8	1.5	0.0	1.8	0.0	7	14*
1592	30	8	1.2	**9**	2.5	0.0	0.4	1.0	1.1	5	14

		Percentage Detrimental Soil Conditions by Category									
Unit	**Acres**	**Existing (Excluding Roads)**	**Classified Roads**	**Total Existing**	**Landings**	**Temporary Roads**	**Helicopter**	**Skyline**	**Ground-Based**	**Total from Proposed Activities**	**Total After Activities**
1594	17	8*	1.8	**10**	1.4	0.0	0.0	1.8	0.0	2	13*
1596	42	7*	0.4	**7**	2.9	0.6	0.0	1.2	2.8	7	15*
1601	34	7*	2.0	**9**	2.9	0.0	0.5	0.0	4.9	8	17*
1605	14	9*	0.4	**9**	5.4	0.5	0.0	1.8	0.0	8	17*
1611	31	3	1.5	**5**	5.6	0.0	0.0	1.2	3.6	10	15
1618	27	4	1.6	**6**	10.2	0.0	0.0	1.8	0.0	12	18
1619	37	7	2.7	**10**	1.4	0.0	0.7	0.0	2.8	5	15
1633	32	4	1.6	**6**	6.2	0.3	0.3	0.5	4.5	12	17
1638	9	4	0.8	**5**	2.7	0.0	0.0	1.8	0.0	5	9
1639	**16**	**7***	**3.7**	**11**	**9.2**	**0.0**	**0.0**	**1.8**	**0.0**	**11**	**22***
1647	**8**	**3**	**3.4**	**6**	**6.6**	**0.0**	**0.0**	**0.0**	**10.0**	**17**	**23**
1649	32	3	3.1	**6**	2.4	0.6	0.0	1.1	4.2	8	14
1658**	58	4	3.1	**7**	2.6	0.2	0.0	0.7	6.1	10	17
1679**	34	5	1.4	**6**	2.9	0.0	0.0	1.5	1.9	6	13
1701	**10**	**6**	**3.4**	**9**	**5.0**	**0.0**	**0.0**	**0.5**	**7.0**	**13**	**22**
1714	44	5*	1.5	**6**	2.9	0.0	0.2	0.6	4.8	8	15*
1732	33	6*	0.5	**6**	5.2	0.4	0.3	1.3	0.0	7	14*
3262**	30	4	2.7	**7**	4.2	0.0	0.0	0.8	5.8	11	17
3434	**6**	**7***	**7.4**	**14**	**3.9**	**0.0**	**0.0**	**0.0**	**10.0**	**14**	**28***
3648	19	4	1.4	**5**	4.0	0.0	0.0	1.8	0.0	6	11
4971	16	8*	1.3	**9**	0.0	0.0	0.2	0.0	8.1	8	18*
4972	**33**	**8**	**2.4**	**10**	**1.5**	**0.0**	**0.0**	**0.0**	**10.0**	**12**	**22**
10228	**7**	**5***	**4.4**	**9**	**6.7**	**0.0**	**0.0**	**0.0**	**10.0**	**17**	**26***
10290	2	8*	0.0	**8**	0.0	0.0	0.0	0.0	10.0	10	18*
10307	**7**	**8***	**2.8**	**11**	**7.4**	**0.0**	**0.0**	**1.8**	**0.0**	**9**	**20***

* = Units that have estimated detrimental soil condition but not field verified.
** = Units where additional mitigation measures are recommended due to site-specific variations (see next page).

Units with additional mitigations due to soils concerns following field surveys:

1242 - springs in the unit; heavily impacted areas at the top of the unit and in headwaters of the stream to the south; subsoiling recommended for area in the north of the unit; springs in headwaters of southern stream; 34% DSC; trees visibly effected (see map)

Recommendations: subsoil top of unit. Either convert all to skyline harvests or subsoil and seed landings, temporary roads, and major skid trails after operations.

1257 - Very severe erosion hazard soils with springs throughout ground-based portion (see map)

Recommendations: convert ground-based to skyline

1323 - 7-8% DSC

Recommendations: subsoil and seed landings.

1364 - Old collapsing Humbolt bridge needs removed; 7-8% DSC

Recommendations: remove Humbolt bridge

1378 - Thin, rocky soils with heavy compaction along upper (northern) portion (see map); stunted tree growth

Recommendations: remove area with soil concerns, to flat to skyline

1421 - All of the proposed tractor harvests are too steep for equipment (40% +)

Recommendations: convert to skyline harvests

1446 - Area highlighted on map is heavily dissected with small streams (see map)

Recommendations: skyline with 50 foot buffers on all streams

1523 - Very steep access off of 1802000 road, >45%, too steep for mechanical access

Recommendations: drop or convert to skyline section of tractor harvest between 1802000 road and lower (northern) stream

1538 - Severe erosion hazard and springs throughout unit; highlighted areas have high concentration of residual disturbance (see map)

Recommendations: convert highlighted areas to skyline or remove from harvest consideration.

1539 - 15-20% DSC

Recommendations: drop or convert ground-based portion to skyline or subsoil all landings, temporary roads, and main skid trails after harvest

1566 - Ground-based portion of this unit has several springs with wetland species

Recommendations: removing unit from harvest consideration.

1658 - Steep (>40%) in sections that are accessed by 1824000 road (see map)

Recommendations: convert to skyline

1679 - Steep (>40%) in sections that are accessed by 1824000 road (see map)

Recommendations: convert to skyline

3262 - Steep (>40%) in sections that are accessed by 1824000 road (see map)

Recommendations: convert to skyline

Appendix E – Proposed Treatment Table

Table 35 displays for each unit and alternative the proposed logging system, thinning intensity, timber volume, and prescribed fuel treatment. Not displayed in the table is the concept of proposed gaps. Therefore, it is important to note that:

- Alternative 3 includes additional volume for 5 percent additional gaps.
- Alternative 2 has 15 percent or 385 acres in gaps, which equates to one 1-acre dominant tree release (117-foot radius) per 6.7 acres
- Alternative 3 has 16 percent or 410 acres in 1-acre gaps, and 4 percent or 103 acres in 3-acre gaps, which equates to one 1-acre dominant tree release per 6.3 acres, and one 3-acre dominant tree release (203-foot radius) per 25 acres.

In addition, the following notes help interpret elements of the table:

Thinning Intensity: Light = approx. 100 residual trees/acre, Moderate = approx. 75 residual trees/acre, Heavy = approx. 50 residual trees/acre

Fuels Treatment: LTA = leave tops attached (yarding tops), GP = grapple piling within unit along roads

Table 35. Proposed treatment units, acres, logging system, thinning intensity, timber volume and prescribed fuel treatment for Alternatives 2 and 3.

Unit Number	Acres	Logging System	Thinning Intensity	Total Timber Volume Alt. 2 (MBF)	Total Timber Volume Alt. 3 (MBF)	Fuel Treatment Alt. 2	Fuel Treatment Alt. 3
1160	4	Ground-based	Moderate	60	68	LTA/GP	LTA/GP
1200	20	Ground-based	Moderate	302	340	LTA/GP	LTA/GP
1200	31	Skyline	Moderate	468	527	LTA/GP	LTA/GP
1242	39	Ground-based	Moderate	608	684	LTA/GP	LTA/GP
1242	19	Helicopter	Moderate	296	333	GP	GP
1242	14	Skyline	Moderate	218	246	LTA/GP	LTA/GP
1257	13	Ground-based	Moderate	160	180	LTA/GP	LTA/GP
1257	36	Skyline	Moderate	443	498	LTA/GP	LTA/GP
1278	34	Skyline	Light	377	424	LTA/GP	LTA/GP
1296	11	Ground-based	Moderate	187	210	LTA/GP	LTA/GP
1296	51	Skyline	Moderate	867	975	LTA/GP	LTA/GP
1310	7	Ground-based	Moderate	119	134	LTA/GP	LTA
1310	12	Skyline	Moderate	204	230	LTA/GP	NT
1323	17	Ground-based	Moderate	272	306	LTA/GP	LTA/GP
1323	42	Skyline	Moderate	672	756	LTA/GP	LTA/GP

Unit Number	Acres	Logging System	Thinning Intensity	Total Timber Volume Alt. 2 (MBF)	Total Timber Volume Alt. 3 (MBF)	Fuel Treatment Alt. 2	Fuel Treatment Alt. 3
1364	5	Ground-based	Light	80	90	LTA/GP	LTA
1370	12	Ground-based	Moderate	194	218	LTA/GP	LTA/GP
1370	37	Skyline	Moderate	630	708	LTA/GP	LTA/GP
1378	13	Ground-based	Moderate	192	216	LTA/GP	LTA
1378	15	Skyline	Moderate	223	251	LTA/GP	LTA
1387	34	Ground-based	Moderate	540	608	LTA/GP	LTA
1387	29	Skyline	Moderate	463	521	LTA/GP	NT
1388	14	Ground-based	Light	238	268	LTA/GP	LTA/GP
1388	21	Skyline	Moderate	357	402	LTA/GP	LTA/GP
1394	32	Skyline	Moderate	483	543	LTA/GP	LTA/GP
1395	6	Ground-based	Moderate	98	110	LTA/GP	LTA
1395	6	Ground-based	Moderate	110	124	LTA/GP	LTA
1395	29	Skyline	Moderate	496	558	LTA/GP	NT
1402	33	Skyline	Moderate	562	632	LTA/GP	LTA/GP
1408	10	Ground-based	Moderate	170	191	LTA/GP	LTA/GP
1408	8	Skyline	Moderate	136	153	LTA/GP	LTA/GP
1411	22	Skyline	Moderate	380	427	LTA/GP	LTA
1412	6	Ground-based	Moderate	102	115	LTA/GP	LTA
1421	12	Ground-based	Moderate	200	225	LTA/GP	LTA/GP
1421	24	Skyline	Moderate	401	451	LTA/GP	LTA/GP
1426	34	Skyline	Moderate	503	566	LTA/GP	LTA/GP
1430	41	Skyline	Light	410	462	LTA/GP	NT
1432	35	Ground-based	Heavy	560	629	LTA/GP	LTA/GP
1432	13	Skyline	Moderate	208	234	LTA/GP	LTA
1435	26	Skyline	Moderate	359	404	LTA/GP	LTA/GP
1440	17	Ground-based	Moderate	333	375	LTA/GP	LTA/GP
1440	24	Skyline	Moderate	461	519	LTA/GP	LTA/GP
1443	21	Ground-based	Moderate	366	412	LTA/GP	LTA/GP
1443	13	Skyline	Moderate	194	218	LTA/GP	LTA/GP
1446	14	Ground-based	Moderate	224	252	LTA/GP	LTA/GP
1446	31	Skyline	Moderate	496	558	LTA/GP	LTA/GP

Unit Number	Acres	Logging System	Thinning Intensity	Total Timber Volume Alt. 2 (MBF)	Total Timber Volume Alt. 3 (MBF)	Fuel Treatment Alt. 2	Fuel Treatment Alt. 3
1451	39	Skyline	Moderate	585	658	LTA/GP	NT
1456	13	Ground-based	Moderate	237	266	LTA/GP	LTA
1456	30	Skyline	Moderate	535	602	LTA/GP	LTA
1470	19	Skyline	Moderate	325	365	LTA/GP	NT
1476	12	Skyline	Moderate	203	229	LTA/GP	NT
1477	45	Ground-based	Heavy	899	1011	LTA/GP	LTA/GP
1490	11	Ground-based	Light	160	180	LTA/GP	LTA/GP
1490	17	Skyline	Light	251	283	LTA/GP	LTA/GP
1493	9	Ground-based	Moderate	163	183	LTA/GP	LTA/GP
1493	30	Skyline	Moderate	451	508	LTA/GP	LTA/GP
1495	10	Ground-based	Moderate	178	200	LTA/GP	LTA
1495	8	Skyline	Moderate	140	157	NT	NT
1511	62	Ground-based	Moderate	938	1055	LTA/GP	LTA
1512	42	Ground-based	Moderate	580	652	LTA/GP	LTA
1512	8	Skyline	Moderate	108	122	LTA/GP	LTA
1514	18	Skyline	Moderate	290	326	LTA/GP	NT
1516	49	Ground-based	Moderate	809	910	LTA/GP	LTA/GP
1523	31	Ground-based	Moderate	608	684	LTA/GP	LTA/GP
1533	25	Ground-based	Moderate	375	422	LTA/GP	LTA/GP
1534	4	Ground-based	Heavy	59	66	LTA/GP	LTA/GP
1534	6	Skyline	Heavy	97	109	LTA/GP	LTA/GP
1537	17	Ground-based	Moderate	226	254	LTA/GP	LTA/GP
1537	18	Helicopter	Moderate	233	262	GP	GP
1537	9	Skyline	Moderate	120	135	LTA/GP	LTA/GP
1538	50	Ground-based	Moderate	706	794	LTA/GP	LTA/GP
1539	7	Ground-based	Light	124	140	LTA/GP	LTA/GP
1539	9	Skyline	Light	159	178	LTA/GP	LTA/GP
1546	20	Ground-based	Moderate	285	321	LTA/GP	LTA
1552	21	Ground-based	Moderate	288	324	LTA/GP	LTA/GP
1552	31	Skyline	Moderate	425	478	LTA/GP	LTA/GP
1566	6	Ground-based	Moderate	65	74	LTA/GP	LTA/GP

Unit Number	Acres	Logging System	Thinning Intensity	Total Timber Volume Alt. 2 (MBF)	Total Timber Volume Alt. 3 (MBF)	Fuel Treatment Alt. 2	Fuel Treatment Alt. 3
1566	17	Helicopter	Moderate	192	216	GP	GP
1566	46	Skyline	Moderate	685	771	LTA/GP	LTA/GP
1574	16	Ground-based	Moderate	255	287	LTA/GP	LTA/GP
1574	15	Skyline	Moderate	247	278	LTA/GP	LTA/GP
1575	28	Skyline	Moderate	92	104	LTA/GP	LTA
1576	36	Skyline	Heavy	605	680	LTA/GP	LTA
1577	8	Ground-based	Moderate	135	152	LTA/GP	LTA
1577	40	Skyline	Moderate	676	761	LTA/GP	LTA
1579	13	Helicopter	Heavy	250	281	GP	GP
1579	47	Skyline	Heavy	902	1015	LTA/GP	LTA/GP
1581	10	Skyline	Moderate	150	169	LTA/GP	LTA
1592	3	Ground-based	Moderate	48	54	LTA/GP	LTA
1592	11	Helicopter	Moderate	159	179	NT	NT
1592	16	Skyline	Moderate	246	277	LTA/GP	LTA
1594	16	Skyline	Moderate	240	270	LTA/GP	LTA
1596	12	Ground-based	Moderate	180	203	LTA/GP	LTA
1596	30	Skyline	Moderate	450	506	LTA/GP	NT
1601	17	Ground-based	Moderate	284	320	LTA/GP	LTA
1601	18	Helicopter	Moderate	301	338	NT	NT
1605	14	Skyline	Moderate	234	264	LTA/GP	LTA
1611	16	Ground-based	Heavy	355	400	LTA/GP	LTA
1611	16	Skyline	Heavy	355	400	LTA/GP	NT
1618	28	Skyline	Heavy	459	517	LTA/GP	NT
1619	10	Ground-based	Light	156	175	LTA/GP	LTA
1619	26	Helicopter	Moderate	393	442	GP	GP
1633	14	Ground-based	Moderate	211	238	LTA/GP	LTA
1633	9	Helicopter	Moderate	136	153	GP	NT
1633	8	Skyline	Moderate	121	136	LTA/GP	NT
1638	9	Skyline	Moderate	168	189	LTA/GP	NT
1639	17	Skyline	Heavy	289	325	LTA/GP	LTA/GP
1647	8	Ground-based	Moderate	113	127	LTA/GP	LTA

Unit Number	Acres	Logging System	Thinning Intensity	Total Timber Volume Alt. 2 (MBF)	Total Timber Volume Alt. 3 (MBF)	Fuel Treatment Alt. 2	Fuel Treatment Alt. 3
1649	13	Ground-based	Moderate	200	225	LTA/GP	LTA/GP
1649	7	Skyline	Moderate	102	115	LTA/GP	LTA/GP
1649	12	Skyline	Moderate	177	199	LTA/GP	LTA/GP
1658	35	Ground-based	Moderate	623	701	LTA/GP	LTA/GP
1658	23	Skyline	Moderate	409	461	LTA/GP	LTA/GP
1679	6	Ground-based	Moderate	98	110	LTA/GP	LTA/GP
1679	28	Skyline	Moderate	453	510	LTA/GP	LTA/GP
1701	7	Ground-based	Moderate	106	119	LTA/GP	LTA/GP
1701	3	Skyline	Moderate	45	51	LTA/GP	LTA/GP
1714	21	Ground-based	Moderate	336	378	LTA/GP	LTA/GP
1714	9	Helicopter	Moderate	141	159	NT	NT
1714	13	Skyline	Moderate	215	242	LTA/GP	LTA/GP
1732	9	Helicopter	Moderate	153	172	GP	NT
1732	24	Skyline	Moderate	416	468	LTA/GP	LTA
3262	5	Ground-based	Moderate	80	90	LTA/GP	LTA/GP
3262	12	Ground-based	Moderate	176	198	LTA/GP	LTA/GP
3262	12	Skyline	Moderate	187	211	LTA/GP	LTA/GP
3434	6	Ground-based	Moderate	109	123	LTA/GP	LTA
3648	19	Skyline	Moderate	323	363	LTA/GP	NT
4971	16	Ground-based	Moderate	240	270	LTA/GP	LTA
4972	33	Ground-based	Moderate	557	626	LTA/GP	LTA
10228	7	Ground-based	Light	112	125	LTA/GP	LTA
10290	2	Ground-based	Light	25	28	LTA/GP	LTA
10307	7	Skyline	Moderate	115	129	LTA/GP	NT
	2,564	Totals		40,529	45,596		