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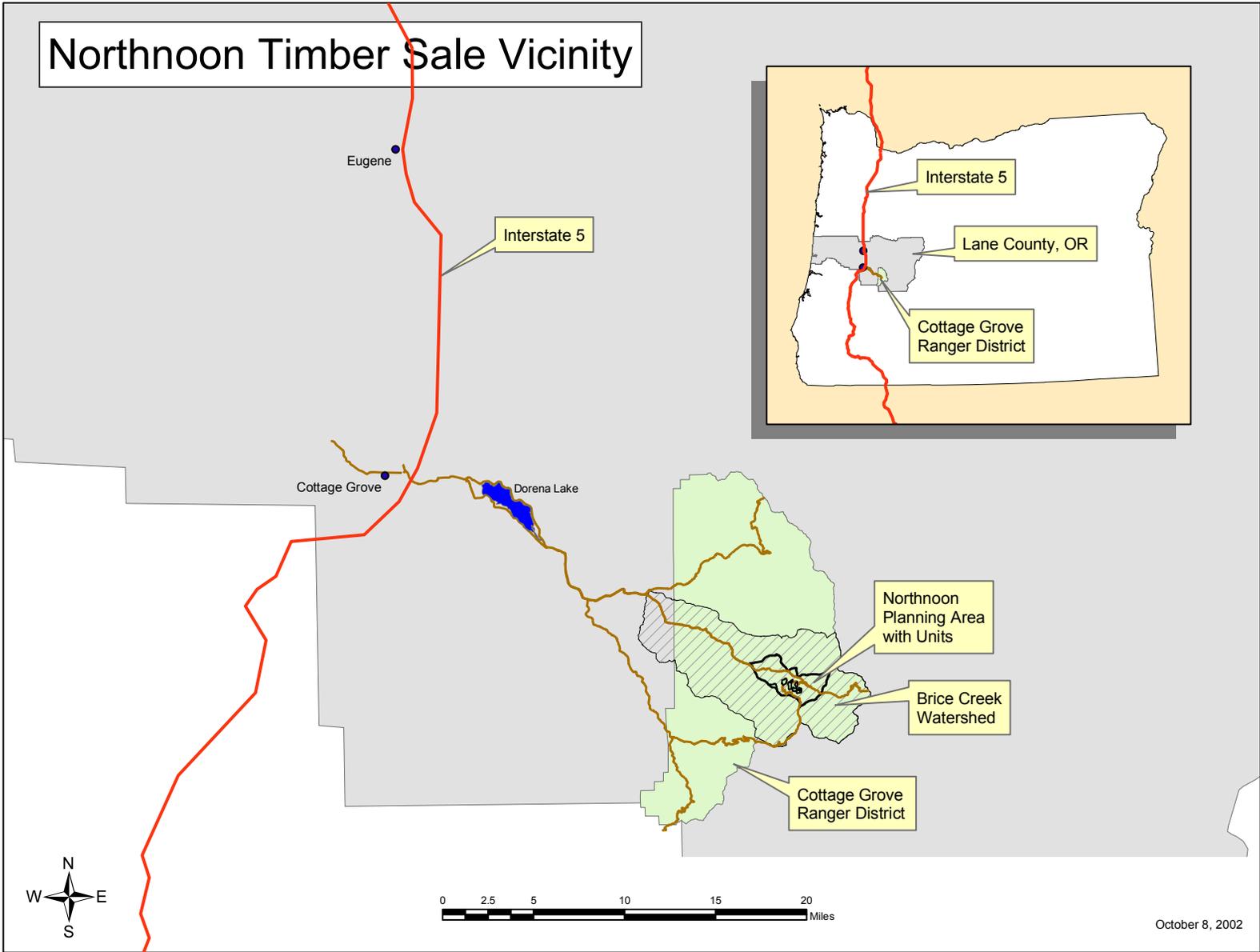


Figure 1. Vicinity Map

Chapter 1 Purpose and Need for Action

Introduction

This EA (Environmental Assessment) documents the analysis of a range of alternatives, including the proposed action for timber harvest and associated activities in the Brice Creek sub-watershed located on the Cottage Grove Ranger District of the Umpqua National Forest. This analysis tiers to the Final Environmental Impact Statement for the 1990 Umpqua National Forest LRMP (Land and Resource Management Plan), as amended by the 1994 Northwest Forest Plan, and incorporates recommendations and analysis completed in the Brice Creek Watershed Analysis (1997).

Project Location and Area Description

The project area is in Brice Creek sub-watershed, which is a tributary to Row River. The planning area is within MA (Management Area) 10 (produce timber on a cost-efficient sustainable basis consistent with other resource objectives); and is overlapped by MA 13 (provide additional emphasis for the orderly exploration, development, extraction and production of mineral resources on lands within the Fairview-Bohemia mineralized area) as described in the Umpqua LRMP.

Implementation of the 1994 Northwest Forest Plan overlaid additional direction for the area. A portion of the South Cascades LSR (Late-Successional Reserve) 222 covers the eastern portion of the planning area. The overall objective of Late-Successional Reserves is to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl. The Riparian Reserve allocation provides areas along all streams, wetlands, ponds, lakes and unstable and potentially unstable areas where riparian-dependent resources receive primary emphasis. The remainder of the planning area lies in Matrix allocation where the majority of timber harvest and silviculture treatments take place. Silviculture objectives for Matrix include: production of commercial yields of wood, including those species such as Pacific yew and western red cedar that require extended rotations, retention of moderate levels of ecologically valuable old-growth components such as snags, logs, and relatively large green trees, and increasing ecological diversity by providing early-successional habitat.

All alternatives for timber harvest projects proposed in this Environmental Assessment lie outside of the Late-Successional Reserve and outside Riparian Reserves. The legal description of this project area is T22S, R2E, Sections 29, 30, 31, 32, and 32 W.M., Lane County, Oregon.

Purpose and Need

The purpose of this project is to implement recommendations from the Brice Creek Watershed Analysis (1997) and to implement goals and objectives of the Umpqua National Forest LRMP as amended by the ROD (Record of Decision) for the Northwest Forest Plan. The Cottage Grove Ranger District has a need to restore and manage the vegetation and infrastructure such as roads, abandoned mining shafts and trails, in the Northnoon Planning Area. There is a need to apply silviculture treatments that retain the structural characteristics of late-successional forests based on historic disturbance patterns (ROD B-2) and to restore white and sugar pine species. Implementing partial thinning of the understory and creating small gaps will also meet timber harvest goals and objectives of the LRMP by providing wood products to the local economy.

This project will implement the six following recommendations from the BCWA (Brice Creek Watershed Analysis):

1. Minimize fragmentation in Matrix by deferring harvest in connected, late-successional vegetation (BCWA 177). Minimize harvest in habitat connectivity zone (BCWA 188).
2. Restore fire's role of maintenance (BCWA 174).
3. Restore rust resistant western white pine and sugar pine where it is ecologically sound (BCWA 178).
4. "Storm-proof" roads that will have minimal maintenance (BCWA 171).
5. Include appropriate geotechnical input during project planning (BCWA 171).
6. Implement riparian silviculture treatments such as planting and thinning in Brice Creek where appropriate (BCWA 184).

Proposed Action

To meet the need and purposes described above, the proposed action will:

- Partially harvest by thinning 163 acres of mature and transitional stands in Matrix allocations. Thinning will take place in the understory and in densely stocked stands while maintaining approximately 60 to 80 percent canopy cover. The intent is to design harvest activities that are consistent with historic disturbance patterns.
- Create small, 1- to 2-acre, openings within thinned stands, which are consistent with historic disturbance patterns.
- Treat ground and ladder fuels in harvest units such that future fire behavior would be characteristic of a low intensity ground fire.
- Plant native species in gaps, restoration sites and decommissioned roads.
- Precommercial thin 408 acres of existing harvest units in the planning area.
- Treat noxious weeds and nonnative plants along roads and at other disturbed sites.
- Improve the drainage and stability of approximately 9.4 miles of roads. Roads 2212-724, 2212-142, 2212-438, 2212-809, 2212-098 and 2212-099 will be maintained at Level I Maintenance standard. Roads 2216-732 and 2212-737 will be maintained as Level II roads.
- Reconstruct 3.7 miles of Road 2212 by re-surfacing with crushed aggregate.
- Inactivate, by pulling culverts and water barring, approximately 2.31 miles of Roads 2216-808, 2216-505, 2216-733, 2216-821, 2212-453, 2212-145, and 2212-144.
- Close an abandoned mining shaft on Road 2212 at milepost 3.0 by filling the hole with 20 cubic yards of rock and soil material.
- Maintain water sump at the junction of Road 2212 and Road 732.
- Improve wildlife habitat through snag creation and large wood replacement within the planning area.
- Thin small trees and plant conifers along 4 miles of Brice Creek from the Champion Creek confluence to the Grass Creek confluence.

Decisions to be made in this Analysis

Based on the analysis documented in this environmental assessment, District Ranger Deborah Schmidt of the Cottage Grove Ranger District will make the following decisions:

- Should timber be harvested in the Brice Creek sub-watershed at this time?
- If timber is harvested, how many acres are appropriate, where should the harvest units be located, and which trees should be harvested?
- Should there be prescribed fire applied to existing or remaining fuels?
- Are there roads that should be closed or storm-proofed?
- Should the roads identified in the proposed action be improved or reduced?
- What management requirements; mitigation measures; best management practices and monitoring are necessary?
- Is there a significant effect on the human environment that would require preparation of an Environmental Impact Statement?
- Can a finding be made that the project “attains” or “does not prevent attainment” of the Aquatic Conservation Strategy objectives as described in the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl?
- Where should noxious weed treatments be applied?
- Is there an effective way to close the open abandoned mineshaft located on Road 2212?

Environmental Setting

Overview

The Northnoon Planning Area encompasses approximately 3,612 acres in the middle to upper reaches of the Brice Creek watershed. Specifically, the area is described as the Upper Brice West 02H Drainage (7th field drainage). Elevation ranges from approximately 2,200 to 4,600 feet. Slopes are moderate to steep, and aspect is generally north to northwest. The planning area includes several small steep tributaries that enter Brice Creek from the south and some steep tributaries to the north. The larger streams (Trestle, Wyatt and Parker Creeks) are excluded since they make up their own 7th field drainages.

The major land allocations for this planning area, as detailed in the Umpqua LRMP, as amended, include Matrix, Riparian Reserves and Late-Successional Reserve (LSR). The BCWA (Brice Creek Watershed Analysis), completed in 1997 provides an analysis of the watershed conditions including the Northnoon Planning Area.

Vegetation

Cool, moist, western hemlock plant associations characterize the planning area. At the highest elevations there is a transition to silver fir plant associations. The dominant tree species in most stands is Douglas-fir, with western hemlock and western red cedar in the understory. A small number of stands are almost pure western hemlock. Common brush species found in the area include vine maple and rhododendron. Historically, fire has determined the pattern and structure of the forests in these plant associations.

Both western white pine and sugar pine were important minor species within the assessment area. White pine blister rust, caused by *Cronartium ribicola*, was introduced to the Northwest in Vancouver, BC, in 1910 (Neuenschwander, et al 1999), and probably reached the planning area in the 1930's. Rust hazard is moderate to high within the assessment area due to its elevation and the abundance of the high-risk alternate host, blood current (*Ribes sanguineum*).

Approximately 77 percent of the vegetation in the planning area can be characterized as late-successional. In this document, the phrase "late-successional" combines mature (81 to 150 years), transitional (151 to 299 years), and old-growth (300+) stands. The remaining vegetation is establishment (0 to 30 years) at 22 percent and thinning (31 to 79 years) at 0.4 percent. Most of the proposed units are two-aged stands with an overstory of transitional vegetation approximately 150 to 180 years old and an understory of mature trees approximately 80 to 120 years in age.

Historic Disturbance Patterns/Fire History

Based on a fire history study described in the Brice Creek Watershed Analysis (1997), historical fires in the Northnoon Planning Area generally burned at low- to moderately high-intensities. Canopy closure generally ranged from 60 to 80 percent with openings in the overstory occurring due to insect, disease, wind and fire events. Understory and partial stand replacement fires often produced small gaps. These gaps were usually less than 2 acres in size. Occasionally a more intense partial stand replacing fire occurred that created openings greater than 2 acres. Larger openings tended to occur on the upper portions of the slopes and were most often found at mid-elevation. Openings caused by relatively infrequent stand replacing fires can exceed 10 acres in size and usually leave some portion of the overstory intact.

The last significant fire activity in this area occurred on the lower portion of Noonday Ridge in 1917 (the Green Rock Mine Fire). It burned on the north slopes of Noonday Ridge and down to Brice Creek, across from Wyatt and Trestle Creeks. The written account indicates this fire was of moderate- to high-intensity.

The fire regime in Brice Creek watershed is best described as moderate. The moderate fire regime has the most complex mix of low-, moderate- and high-severity fires. Low- and moderate-severity fires occur at 25 to 100 year intervals and are partial stand replacement fires.

Stand replacing fires occurred in the watershed between the years 1561 and 1574 and are estimated to have covered almost 92 percent of the watershed based on the fire history study for Brice Creek. Fire episodes at the end of the 17th and during the late 18th century ranged from low- to high-intensity, affecting, to some extent, all watershed drainages in the planning area regardless of aspect or elevation (BCWA, 1997).

Roads

The road system in the analysis area was originally constructed to provide mining access in the watershed. Roads that are more recent were developed in support of the timber management program and other human uses in the area. Total road length in the Upper Brice West Drainage is 25 miles, with a road density of 3.8 mi./mi.².

Mining

The Northnoon Planning Area overlaps the Fairview-Bohemia Mineralized Area (MA13). Placer mining and lode mining for gold are historical activities within the Brice Creek watershed and the Northnoon Planning Area. Placer mining occurs in Brice Creek and there are several active lode claims in the Northnoon Planning Area, adjacent to Noonday Ridge. Historic mining has

left a legacy of access roads, old adits and tunnels, cabins, dumpsites and abandoned equipment. Mining is a historical human use in Brice Creek and a statutory right that needs to be accommodated while maintaining and restoring quality habitat (BCWA).

Recreation

Most recreation use in the watershed occurs along Brice Creek, west of the confluence of Brice and Champion Creeks. Primary recreation activities that occur within the Northnoon Planning Area include camping, picnicking, swimming, sunbathing, fishing and various activities on historic trails. Existing developed recreation facilities include the Noonday Wagon Road Trail #1405 and Sultana Way Trail #1405A; these trails are historic mining routes or wagon roads. Due to their average 8-foot road width, they also serve a variety of trail uses that include 4 x 4 vehicles, ATV's, mountain bikes, equestrians and hikers. The first portion of the Parker Creek Falls Trail #1415 and its associated trailhead are also within the Northnoon Planning Area. Recreation sites near but not in the planning area include Hobo Camp and Lund Park Campgrounds located on Brice Creek. These two semi-developed campgrounds indirectly serve the Brice Creek corridor and the Noonday Trail system. There are several dispersed camps within the Northnoon Planning Area; most are along Brice Creek and some are along the Noonday Ridge area. There are several access points to the Noonday Trail system that are utilized as dispersed campsites. Miners and campers for overnight use or day-use activities typically use the dispersed campsites along Brice Creek.

Aquatic Habitat

The Northnoon Planning Area is located within the Brice Creek 6th field sub-watershed. The Brice Creek Watershed is 36,329 acres. Approximately 88 percent of the watershed is within Forest Service administered lands. It is located in the northern portion of the Upper Row River 5th field watershed. The Row River flows into the Coast Fork Willamette Sub Basin. Dorena Dam, built in 1949, blocks all anadromous fish passage in the Upper Row River.

Brice Creek supports a population of resident cutthroat trout (*Oncorhynchus clarki*), speckled dace (*Rhinichthys osculus*), longnose dace (*Rhinichthys cataractae*), and at least one species of sculpin (*Cottus sp.*). Brice Creek is managed by Oregon Department of Fish and Wildlife for naturally reproducing cutthroat trout (Connolly et. al, 1992). Refer to the Brice Creek Watershed Analysis (USDA, 1997) for further information.

Table 1. Upper Brice West Drainage Aquatic Characteristics

Acres	Square Miles	Fish Bearing Miles	Non-Fish Miles	Stream Density	Road Density	% Riparian >80 Years
3,612	5.6	4.6	30.1	6.1	3.8	70%

The planning area encompasses the Upper Brice West 7th field drainage. The above table indicates some characteristics of the Upper Brice West Drainage

Terrestrial Habitat

The Northnoon Planning Area provides a mix of habitat types including late-successional, a small amount of old-growth (10 percent) and the remainder, except for a small patch of mature, in early-seral. The early-seral habitat created by clearcut harvesting is deficient in legacy old growth components such as live trees, snags or down wood that would naturally be present. The transitional-aged stands are deficient in the quantity of snags that historically would have been created by fires; and the roads and harvest units have fragmented the stand connectivity.

The northern spotted owl is the only known threatened or endangered species in the Brice Creek watershed. There is habitat for a variety of cavity nesters, bats and Neotropical migrants, but the effects of fire suppression, harvesting and road building have caused declines in the populations of these species (Finch, 1991; Barclay, 1996).

Big game use is generally black-tail deer and an occasional Roosevelt elk. Most use occurs during summer months because slopes are northerly with heavy snow loads. Road densities are high at 3.8 mi/sq. mile resulting in habitat fragmentation and greater opportunities for disturbance (Lee et. al, 1997).

Champion Creek provides for the best remaining riparian habitat within the Brice Creek Watershed. Other riparian habitats have been impacted by road locations and timber harvest resulting in increased stream temperatures, increased sediment and a loss of pool habitat. The Champion Creek drainage provides the only known viable population of tailed frogs on the District. This species requires cold clean water with boulder habitat.

Botany

The Northnoon Planning Area falls within the western hemlock vegetation zone, however, the highest elevations within the planning area are considered the Pacific silver fir zone. The plant communities in these stands vary with associated changes in slope, aspect and proximity to riparian systems. Douglas-fir (*psuedotsuga menziesii*) dominates most of the stands included in the project proposal, with western hemlock (*Tsuga heterophylla*) and western redcedar (*Thuja plicata*) in the developing understory. A few stands in the area also include Pacific silver fir (*Abies amabilis*).

The density of the understory varies with slope, aspect and natural openings. Typical understory shrubs include vine maple (*Acer circinatum*), rhododendron (*Rhododendron macrophyllum*), salal (*Gaultheria shallon*) and huckleberry (*Vaccinium parvifolium*). Forbs are diverse and include vanilla leaf (*Achlys triphylla*), queen's cup (*Clintonia uniflora*), and cutleaf goldthread (*Coptis laciniata*). Beargrass (*Xerophyllum tenax*) and pyrolas (*Pyrola spp.*) are occasional in dryer sites. These stands are also home to scattered populations of mycotrophs (obtaining nutrients through fungal associations) including candystick (*Allotropa virgata*), pinedrops (*Pterospora andromedea*), and pinesap (*Hypopitys monotropa*). Inventories for lichens and bryophytes revealed diverse assemblages of epiphytes and wood-inhabiting species, though no rare species were noted in the area. Lichen communities in these stands are typical for mid-elevation mature coniferous forests. The diversity of cyanolichens associated with late-successional forests is not well developed in these stands. Adjacent older stands have greater diversity and biomass of cyanolichens.

Issues and Concerns Associated with the Proposed Action

Scoping for the Northnoon Timber Sale Project began in January 1998, with a project initiation letter identifying preliminary issues and selecting an interdisciplinary team. This project has been included in the Umpqua National Forest SOPA (Schedule of Proposed Actions) since April 1, 1998. The Cottage Grove Ranger District publishes a list of proposed actions for the District in the *Cottage Grove Sentinel* on a quarterly basis. The Northnoon Timber Sale project was included with information provided in a District newsletter published in October 1998. In addition, the Ranger District conducted an Open House on April 23, 1998, March 18, 1999, December 7, 2000 and May 30, 2002 in which land and resource management projects were

presented to the public for input and comment. This project was included in those presentations.

The IDT (Interdisciplinary Team) meeting notes and public comments can be reviewed, and are included in the analysis file of this environmental assessment.

Significant issues associated with a proposed action are the focus of an environmental assessment because they provide the basis for formulating and comparing alternatives to the proposed action (40 CFR 1502.14). Significant issues are based on unresolved conflicts concerning alternative uses of available resources.

Scoping identified a number of issues and concerns related to the proposed timber sale project in the Brice Creek watershed. In particular, scoping focused on:

- Harvesting late-successional vegetation
- Water quality concerns
- Aquatic habitat concerns
- Soil suitability concerns
- Trail impacts
- Road access and impacts
- Forest health concerns
- Visuals
- Geology
- Late-Successional Reserves
- Abandoned mines and safety

Issue

Harvest would remove older trees and degrade late-successional habitat

Harvest activities in older stands may reduce habitat effectiveness for some species dependent on late-successional habitat by reducing the potential for snag and down wood recruitment and removing some of the large older trees. Typically, moderate- or low-intensity fires would clear out the undergrowth and create openings in a mosaic of stand and fuel conditions leaving abundant snags and down wood, an important component of late-successional habitat.

Harvest by thinning would remove some of the dense stems that historically provide snags and down wood through mortality by fire, insects or disease. Creating gaps by harvest would remove some of the older trees that in a low or moderate intensity fire would be available as snags or remnants. Increasing the size and the acreage in gaps would result in additional older trees harvested and a greater reduction in habitat for associated late-successional species.

Indicator:

- Acres of habitat thinned
- Acres of gaps

- Acres of retention

Concerns

Water Quality and Aquatic Habitat

Concern: Brice Creek is on the Oregon DEQ's (Department of Environmental Quality) Final 1998 Water Quality Limited Streams – 303(d) list for temperature concerns from the mouth up to the confluence with Parker Creek. There is a concern that timber sale activities may affect water temperatures. Specifically, harvesting riparian trees may increase stream temperatures by decreasing shade to the stream channel. Another concern is that created openings near streams may increase the temperature of the groundwater; thereby increasing stream temperature.

Concern: Timber harvest activities can affect aquatic habitat. Removal of trees may reduce the potential for large woody debris to enter the stream channel. A reduction in large woody debris can cause channel stability concerns and limit hiding cover and pool habitat. Fine sediment can enter the streams by being transported down ditches along roads. Use of roads and decreased maintenance of these roads increases these concerns. Fine sediment can impact aquatic habitat by decreasing spawning habitat and by reducing macro invertebrate habitat.

Indicator:

- Acres of riparian area harvested
- Miles of road inactivated and storm-proofed

Soils

Concern: Soils in portions of the planning area are characterized as unsuitable for regeneration because they are shallow, well drained and rocky. The concern is that harvested areas will not be successfully reforested.

Trail Impacts

Concern: Existing developed recreation facilities within the Northnoon Planning Area include the Noonday Wagon Road Trail #1405 and Sultana Way Trail #1405A. These trails are historic mining routes or wagon roads. The first portion of the Parker Creek Falls Trail #1415 and its associated trailhead are also within the Northnoon Planning Area. The concern is that harvest activity will alter the forest experience and the visual integrity of the trails.

Road Access and Impacts

Concern: The road density is high in the planning area and there are roads with potential failure concerns. Roads are needed for access for fire suppression, mining and timber harvest. The concern is that the need and potential to reduce the road density may be in conflict with the need for road access.

Indicator:

- Miles of road inactivated

Forest Health

Concern: The majority of the trees in the southern portion of the planning area are 120 to 250 years in age. The stands are dense in some areas and are at risk from a

high-intensity fire, insect or disease activity. White pine blister rust has killed the majority of white pine in the planning area. The concern is that left alone, the area will burn at high-intensity or be susceptible to insect or disease epidemics.

Indicator:

- Acres treated by thinning
- Acres of fuels treatment
- Acres planted with western white or sugar pine

Visual Impacts

Concern: The Brice Creek corridor is valued for its aesthetic attributes and for the recreational opportunities including hiking, camping, fishing, hunting and driving for pleasure. There are currently multiple, large clearcuts detracting from the visual quality of the area. There is a concern that harvest activities will impact the view-shed from Road 22 and the Noonday Trail #1405.

Geology

Concern: Could harvest accelerate landslide rates? The Northnoon Planning Area is located on steep rocky soils. There are several Debris Slide Basins within the planning area. Portions of most of the units are within mapped Debris Slide Basins. Stability of these areas is a concern.

Indicator:

- Acres harvested on high-risk landforms

Late-Successional Reserves

Concern: The 9,600-acre portion of LSR-222 in upper Brice Creek is mainly in the eastern portion of the Northnoon Planning Area. There is a concern that harvest and associated activities such as prescribed fire will impact late-successional habitat recovery in the LSR.

Mining Claims and Access

Concern: There is an open mineshaft on Road 2212 at milepost 3.01. There is a concern about the safety of this shaft.

Indicator:

- Number of mineshafts closed

Chapter 2 Alternatives Including the Proposed Action

Three alternatives for the Northnoon Timber Sale Project were considered in detail. The National Environmental Policy Act (NEPA) requires analysis of a proposed action and other reasonable alternatives including the No-Action Alternative. The No-Action Alternative provides a baseline for estimating environmental effects. The action alternatives were developed following field reconnaissance and in response to the issues and concerns identified through scoping.

The Northnoon Planning Area was identified for potential harvest activities based on recommendations in the Brice Creek Watershed Analysis and through implementation of the standards and guidelines in the Umpqua Forest Plan as amended. Recommendations in the Brice Creek Watershed Analysis prioritized areas for harvest based on maintaining connected late-successional habitat. The Northnoon Planning Area was in the highest priority area for harvest because it did not impact connected late-successional habitat. In addition, areas with unsuitable soils for reforestation were eliminated from evaluation for harvest as well as riparian reserves. The result is that the potential for a variety of alternative treatments and locations was considerably narrowed before this analysis began.

Alternatives Considered but Eliminated from Detailed Study

In response to scoping, an alternative was considered that implemented restoring fire to the landscape without timber harvest activity. This involved prescribed burning and the creation of snags and down wood. This alternative was eliminated for detailed study because it did not meet the purpose and need for action to contribute wood products to the local economy.

Another alternative was considered that harvested two old-growth stands at the higher elevation of the planning area. This alternative was eliminated for detailed study because the trees in the understory are not densely stocked and the proposed treatments would be marginally effective.

One other alternative that was considered proposed to thin from below without leaving gaps. This was eliminated from study because it was not representative of the moderate-severity fire regime that characterizes the planning area.

Alternative 1 – No Action

This alternative serves as the baseline for estimating environmental effects of the action alternatives. No timber harvest or road decommissioning, construction or reconstruction would occur; no fuels treatment, noxious weed treatment or removal of safety hazards would occur. There would be no site preparation, reforestation, noxious weed treatment, or wildlife structures implemented.

Roads would be maintained to appropriate standards. Fire prevention and control activities would continue.

Northnoon Timber Sale Alternatives 2 and 3

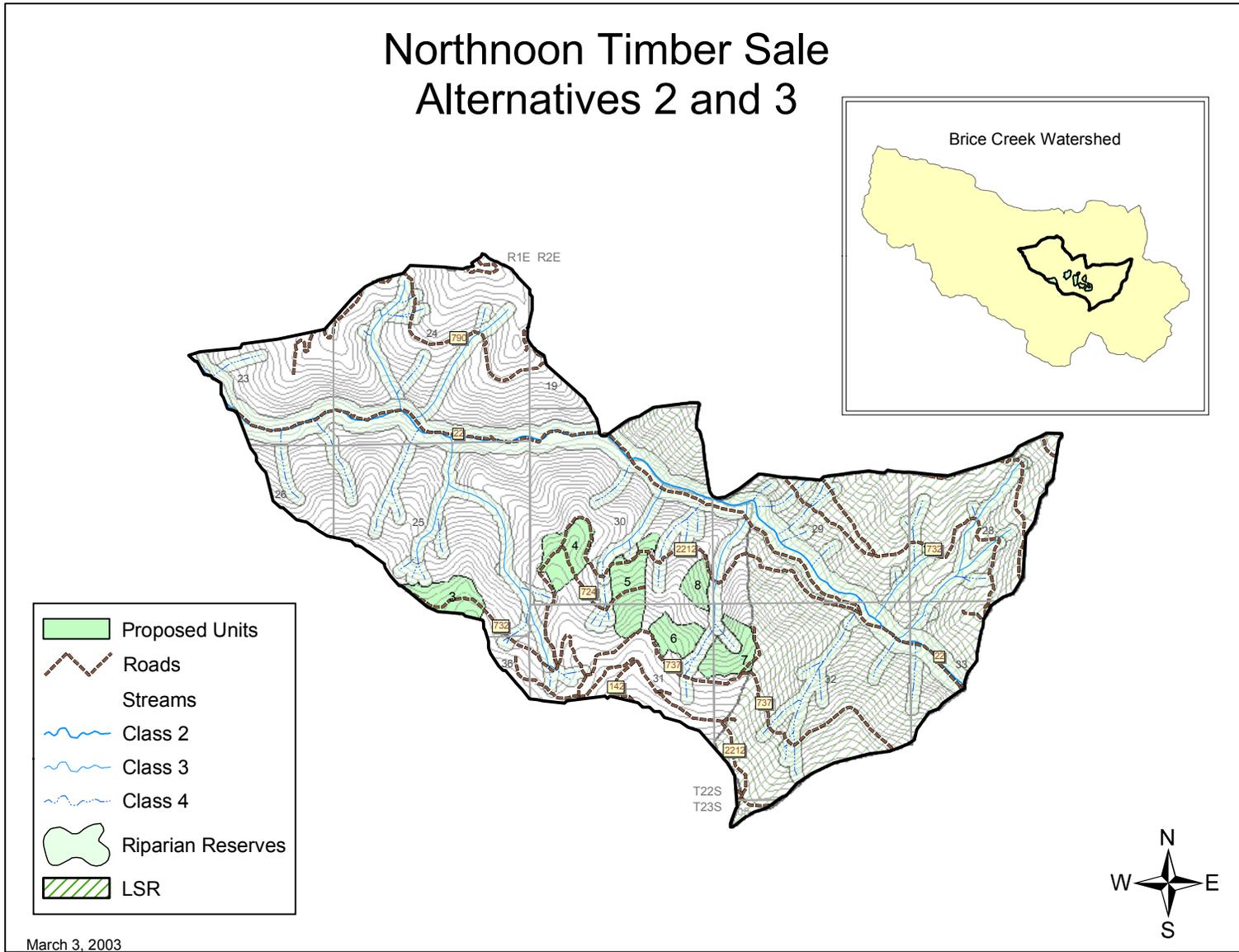


Figure 2. Map of Timber Harvest Units for Action Alternatives

Alternative 2 – Proposed Action

This alternative was developed to implement recommendations from the Brice Creek Watershed Analysis to concentrate harvest activity outside the Habitat Connectivity Zone and the Late Successional Reserve, and to design harvest activities consistent with historic disturbance patterns. Late-successional conditions would be maintained while thinning out the understory, creating gaps and reducing fine fuels. Forest Plan objectives to produce commercial yields of wood would be met. This alternative also examines reducing safety hazards and possible watershed restoration opportunities, including road decommissioning.

The silviculture prescription for this alternative would:

- In two-storied stands on 75 percent of the unit, thin approximately one-third of the basal area in understory trees; or in areas of single story young trees, thin approximately one-third of the basal area in intermediate and co-dominant trees
- Retain canopy closure of 60 to 80 percent in the thinned areas
- Create 1- to 2-acre gaps on 15 percent of each unit, retaining 15 percent of the basal area in large trees for structure
- Within the harvest units, approximately 10 percent of the area will be reserved as retention patches, and will not be thinned or regenerated
- There would be no harvesting in Riparian Reserves.

Table 2. Alternative 2 Harvest Unit Descriptions

Unit #	Acres	Basal Area/Acre	Vol./ acre (mbf)	Acres in Thinning (75%)	Basal Area /Acre Removed Thinning	Vol./ Acre Removed Thinning (mbf)	Acres in Gaps (15%)	Vol./ acre Removed from Gaps (mbf)	Total Volume (mbf) Harvested
3	25	275	49	18.75	60	10	3.75	41	341
4	40	267	45	30	68	10	6	38	528
5	46	235	44	34.5	60	8	7	37	535
6	23	182	33	17.25	22	5	3.45	28	183
7	30	257	56	22.5	74	14	4.5	47	531
8	17	186	38	12.75	63	5	2.5	32	144
Totals	181			136			27		2262

Alternative 3

This alternative was developed in response to a significant issue raised during scoping and the interdisciplinary team process; the issue of harvesting older trees and the subsequent reduction of late-successional habitat. This alternative mitigates the effect of habitat reduction by reducing the percentage of each unit in gaps to 5 percent and by reducing the size of each gap to ¼- to ½-acre in size.

The silviculture prescription for this alternative would:

- In two-storied stands on 85 percent of the unit, thin approximately one-third of the basal area in understory trees; or in areas of single story young trees, thin approximately one-third of the basal area in intermediate and co-dominant trees
- Retain canopy closure of 60 to 80 percent in the thinned areas
- To retain late-successional habitat, 5 percent of each unit would be in ¼- to ½-acre gaps
- Within the harvest units, approximately 10 percent of the area will be reserved as retention patches, and will not be thinned or regenerated
- No thinning would occur in Riparian Reserves

Table 3. Alternative 3 Harvest Unit Descriptions

Unit #	Acres	Basal Area/ Acre	Vol./ acre (mbf)	Acres in Thinning (85%)	Basal Area /Acre Removed Thinning	Vol./ Acre Removed Thinning (mbf)	Acres in Gaps (5%)	Volume Removed from Gaps (mbf)	Total Volume (mbf) Harvested
3	25	275	49	21.25	60	10	1.25	61	274
4	40	267	45	34	68	10	2	90	430
5	46	232	44	39.1	60	8	2.3	101	414
6	23	186	33	19.55	22	5	1.15	38	136
7	30	180	56	25.5	74	14	1.5	84	441
8	17	186	38	14.45	63	5	0.85	32	105
Totals	181			154			9	327	1800

Activities Common to All Action Alternatives

Activities Associated with Harvest

All 181 acres are designated as Matrix, are suitable for replanting, and can be reached with cable and tractor yarding systems.

The following recommendations from the Brice Creek Watershed Analysis for snags and down wood will be followed:

- Leave in each harvest unit a minimum of three snags greater than 20-inch diameter and three snags greater than 30-inch diameter per acre in Decay Classes I and II.
- Manage for a minimum of 12 pieces of down woody material greater than 20 inches x 10 feet and 12 pieces greater than 20 x 20 inches per acre in Decay Classes I and II.

The removal of logs under the action alternatives will be accomplished primarily using a cable (skyline) yarding system, with the exception of approximately 10 acres in Unit 4 that will be ground skidded to pre-designated skid trails.

The existing transportation system will be used for the majority of harvest activity. There will be a 200-foot temporary road built into Unit 8 that will be decommissioned and planted following

harvest activity. Unit 6 will require 230 feet of temporary road. The temporary road in Unit 6 will be located on, and require improvement of, an existing mining access road. The temporary road will be decommissioned and planted after use.

Reforestation and site preparation will occur in gaps.

Fuels treatment after harvest activities will be accomplished with low-intensity underburning or jackpot burning (burning concentrations of fuels).

Removal of noxious weeds and nonnative plants will occur along roads and at disturbed sites such as landings.

The action alternatives also include wildlife habitat enhancements such as snag creation, installation of bird boxes and placement of large woody material in the units.

Road Activities Within the Planning Area

Reconstruction will consist of re-surfacing 3.7 miles of Road 2212 with crushed aggregate. The rock source will be the Chanoos Material Source located on Road 2212-732.

Approximately 2.31 miles of roads in the planning area that are presently closed to vehicular traffic will be treated. These roads will be put into a self-maintained condition by removing all culverts, water barring and/or out-sloping. The roads that are or will be in a self-maintained condition include roads: 2216-808, 2216-505, 2216-733, 2216-821, 2212-453, 2212-145 and 2212-144. All of these roads except for the 2212-144 are in the LSR. These roads are not needed for timber, mining, recreation or potential fire activities. Road 2216-821 is 0.5-mile long and crosses stream channels. Having this road in a self-maintained condition will benefit the aquatic system.

Approximately 3.3 miles of road will be storm-proofed and be maintained at Level I Maintenance standard. Stormproofing work involves changing the drainage to be more self-maintaining by out-sloping surfaces, removing culverts and installing water bars, which will help stabilize the roads. This will occur on Roads 2212-724, 2212-142, 2212-438, 2212-809, 2212-098 and 2212-099.

Approximately 6.1 additional miles of road will be storm-proofed by water barring and improving the drainage on the 2216-732 and 2212-737 Roads. These roads will continue to be maintained as Level II roads. Access is needed on these roads for emergency fire vehicles. A gate can be installed on Road 2212-737 keeping it accessible to local miners.

Associated Activities within the Planning Area

- Precommercial thinning on 351 acres of plantations within the planning area is needed to reduce stand density and accelerate the growth on the remaining stems.
- Close an abandoned mining shaft on Road 2212 at milepost 3 by filling the hole with 20 cubic yards of rock and soil material.
- Implement riparian silviculture such as planting and thinning of small trees along 4 miles of Brice Creek from the Champion Creek confluence to the Grass Creek confluence. There are several areas between Brice Creek and the road where thinning of hardwoods would reduce competition in the conifer understory. Thinning would enhance the growth development of conifers, which provide shade year-round to the streams. In other areas, the density of small conifer trees is high and growth is declining. Thinning these

stands could improve conifer growth and vigor of these small trees. There are other areas where there are no trees growing that would benefit from planting. This will help establish a more desired condition of larger conifers between the stream and the road. The trees to be thinned are less than 7 inches diameter, the majority can be girdled, with some felled. No thinning activity will occur within 30-50 feet of the stream.

- Maintenance of Water Source #39 at the junction of FS Roads 2212 and 732.
- All roadless (inventoried, Forest Plan Appendix C) areas are avoided by this project. This project also avoids all known cultural resources, wetlands, floodplains and unique habitats.
- All activities must be consistent with the Umpqua Land and Resource Management Plan, as amended by the ROD (Record of Decision) for Amendments to Forest Service and Bureau of Land Management Documents within the Range of the Northern Spotted Owl.

Northnoon Timber Sale Projects Common to Action Alternatives

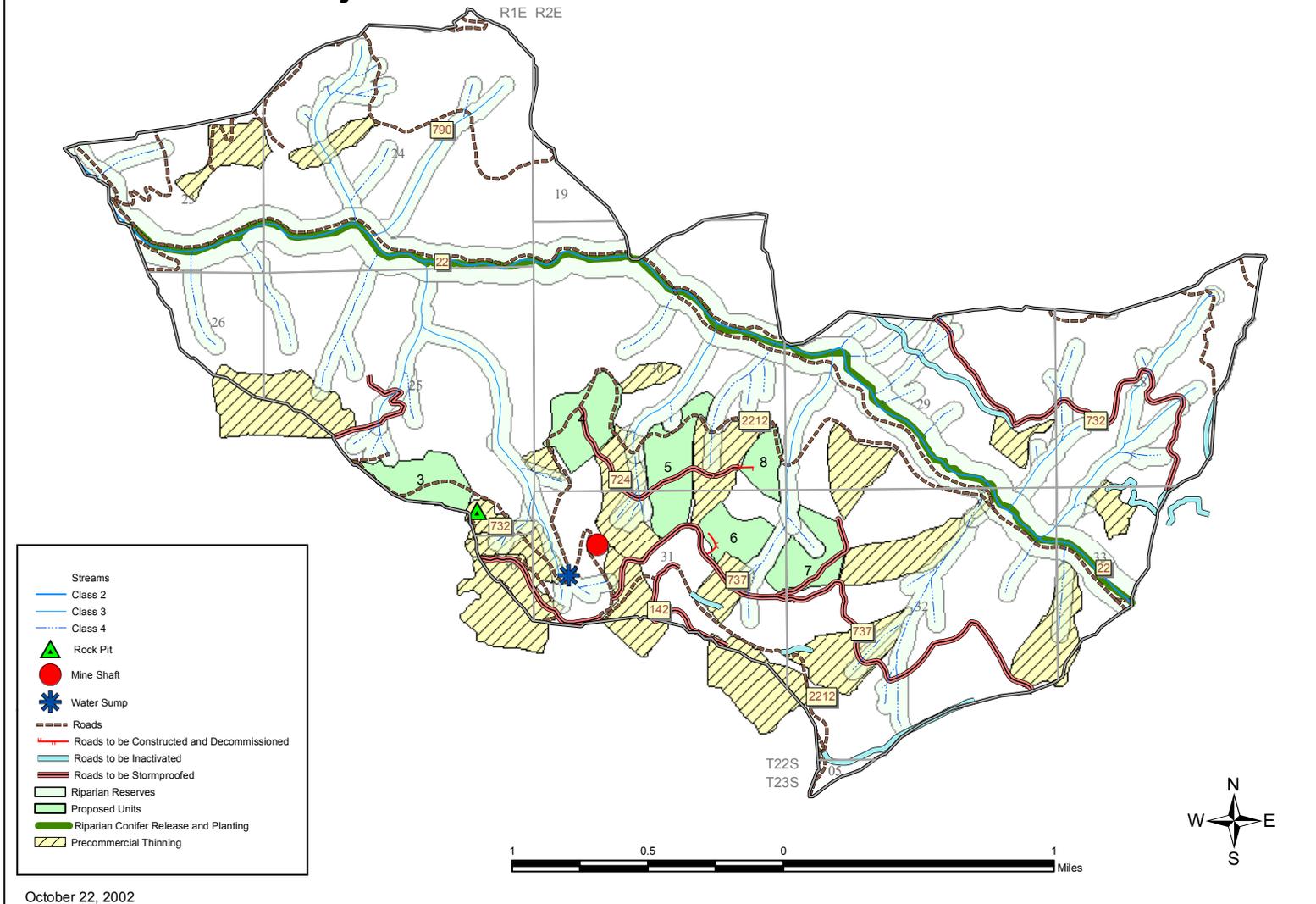


Figure 3. Projects Common to Action Alternatives

Comparison of Alternatives

Table 4. Northnoon Timber Sale – Summary of Action Alternatives

Comparison Factor	Alternative 1	Alternative 2	Alternative 3
Acres harvested – habitat altered	0	163	163
Volume removed	0	2.1 MMBF ¹	1.8 MMBF
Acres in gaps	0	27	9
Acres thinned	0	136	154
Acres in retention	181	18	18
Acres of riparian area harvested	0	0	0
Acres planted with white pine	0	27	9
Acres harvest on high risk landforms	0	0	0
Acres of fuel treatment	0	163	163
Temporary roads built and decommissioned after use	0	430 feet	430 feet
Miles of road inactivated	0	2.3	2.3
Miles of road storm-proofed	0	9.4	9.4
Miles of riparian silviculture restoration along Brice Creek	0	4	4
Acres harvested adjacent to trails	0	0	0
Abandoned mine shafts closed	0	1	1

¹ The acronym MMBF and MBF are Roman numeral expressions for million board feet and thousand board feet respectively.

Best Management Practices, Management Requirements, Mitigation Measures and Monitoring

The following measures apply to all action alternatives or as otherwise stated. These requirements will be implemented to meet laws, regulations, policies and recommendations. All are applied to reduce potential adverse environmental impacts that could result from implementing either action alternative. The practices listed have been implemented before on the Cottage Grove Ranger District and/or on other forests and ranger districts. To date, no information has surfaced which indicates that the practices listed cannot achieve the stated objectives.

General water quality BMP's (Best Management Practices) are prescribed to protect the beneficial uses of water, and to address water quality objectives, as required by the federal Clean Water Act and the 1990 Umpqua Forest Plan. Each BMP is listed by the code used in the Pacific Northwest Regional Guide called General Best Management Practices. See Appendix B for a chart showing the derivation of the actions.

Implementation and monitoring responsibilities accompanying each practice are listed in Appendix C.

The practices, management requirements and mitigation measures are organized by the following:

- **G 1-12 – General Provisions:** Applies to both the planning and implementation phases of all ground disturbing activities
- **PO 1-17 – Project Operations:** Applies to the operational phase of ground disturbing activities.
- **LP 1-12 – Logging Practices:** Applies to logging practices
- **RP 1-8 – Road Practices:** Applies to road management activities
- **FM 1-6 – Fire Management:** Applies to fuels and fire suppression activities

Table 5. Best Management Practices, Mitigations and Management Requirements

Number	Objective	Actions/Practice/Mitigation
G-1	Protect water quality and riparian resources, reduce erosion	Stream course protection (identification of Riparian Reserves) will be used on all stream classes and designated on Timber Sale Area maps.
G-2	Protect water quality and riparian resources, reduce erosion	Prohibit or regulate activities in Riparian Reserve that retard or prevent attainment of the Aquatic Conservation Strategy objectives.
G-3	Protect water quality and riparian resources, reduce erosion	Riparian Reserve widths will be equal to the height of one site-potential tree (190 feet) for all non-fish bearing perennial and intermittent streams and two site-potential trees for all fish bearing streams.
G-4	Protect water quality and riparian resources, reduce erosion	No timber harvest will be conducted within Riparian Reserves. Establish no-cut buffers on all streams and wet openings; the exception will be where skyline corridors will cross through Riparian Reserves in some units that will be skyline yarded. These corridors will be kept to a maximum of 10 feet in width. These areas will be protected with directional felling, and will have debris clean out waived.
G-5	Protect sensitive and threatened & endangered Species	Any management activity that will negatively affect species listed on the Regional Forester's Sensitive Species List, or their habitat, will be modified to either avoid or minimize the impact. Threatened or endangered species will be protected if found during sale operations.
G-6	Protect native vegetation	Native hardwood trees or tree-like shrubs will be maintained on at least 10 percent of the area in all harvest units. This standard applies in areas where hardwoods are a natural component of conifer timber stands and are intended to ensure that hardwoods will continue to be represented in the stand.
G-7	Protect native vegetation	Retain 10 percent of the area associated with each harvest unit to provide options for habitat diversity.
G-8	Protect unique habitats	Apply a 150-foot no activity buffer around all unique habitats to minimize potential impacts of harvest and post-sale fuels treatments. This mitigation applies to all unique habitats currently known or those located in subsequent fieldwork.
G-9	Erosion control	The application of Best Management Practices for the protection of water quality and beneficial uses will be monitored on ground-disturbing activities.
G-10	Identify erosion control needs	Erosion control needs will be identified where developed areas, including recreation sites, roads, trails, rock pits and others, produce erosion/sedimentation that may affect water quality and beneficial uses in surface waters.
G-11	Protect soil productivity	Existing surface organic material (litter, duff and wood) needed to maintain soil productivity will be protected to the greatest extent possible from all ground disturbing activities.

Number	Objective	Actions/Practice/Mitigation
G-12	Protect cultural resources	In the event that an unknown historic or prehistoric site is discovered in the course of the project, the activity will be stopped and the appropriate measures will be taken to stop any adverse effects to the site resulting from the activity. All known sites will be protected. No ground disturbance activities will occur on known sites.
PO-1	Maintain control of project operations through contract	Contract preparation and administration will include operating periods, modification language, and control and acceptance of purchaser work.
PO-2	Maintain control of project operations through contract	Modification of the Timber Sale Contract during the life of the contract will be accomplished through appropriate Timber Sale Contract provisions.
PO-3	Erosion control	Purchaser erosion control structures and maintenance work that will be inspected prior to acceptance by the Forest Service are to be specified in the Timber Sale Contract.
PO-4	Protect northern spotted owl	No harvest activities will occur from March 1 to July 15 unless approved by the District Wildlife Biologist.
PO-5	Prevent resource damage Protect wildlife	The operating period for the sale will be from May 1 to October 31 unless otherwise agreed to by the Forest Service Contracting Officer.
PO-6	Water Quality	The Umpqua National Forest Spill Prevention and Response Plan will be followed for the transportation of hazardous materials. If the volume of fuel exceeds 660 gallons in a single container or a total on site storage of 1,320 gallons, a SPCC (Spill Prevention Control and Countermeasures) Plan is required.
PO-7	Noxious Weed Control	Require that all off-road equipment be seed free prior to entering the Ranger District.
PO-8	Erosion control	Maintain effective ground cover in ground-disturbed areas of 45 to 65 percent. Re-vegetate landings, skid roads and other disturbed ground according to Umpqua Native Species policy.
PO-9	Erosion control	Landings are located so that designated timber can be yarded with minimal disturbance to riparian reserves. Locate landings in such a way as to minimize creation of hazardous watershed conditions. Landing size shall not exceed that needed for safe and efficient yarding and loading operations.
PO-10	Erosion control	All landing locations will be approved by the Forest Service prior to landing construction and agreed upon plans for the landing shall insure water quality protection.
PO-11	Erosion control	Provisions are made in the Timber Sale Contract for landings to be rehabilitated by providing proper drainage and by planting with native vegetation if necessary.
PO-12	Protect Soil Productivity	The combined total amount of unacceptable soil condition (compaction) within an activity area should not exceed 20 percent.
PO-13	Maintain snag habitat	To the extent practicable, leave and protect from disturbance all large diameter snags that were present prior to harvest activity. If snags must be felled for safety concerns, leave the snags on site.

Number	Objective	Actions/Practice/Mitigation
PO-14	Maintain snag habitat	Retain or create a minimum of three snags greater than 20 inches diameter and three snags greater than 30 inches diameter per acre in Decay Classes I and II. Manage for a minimum density of 9 snags per acre in Decay Classes I, II, III and IV throughout the drainage. Priority is to retain the existing snags within the units.
PO-15	Maintain down wood habitat and site productivity	To the extent practicable, leave and protect from disturbance all large down logs that were present prior to harvest activity.
PO-16	Maintain down wood habitat	Follow recommendations in the BCWA to achieve down woody material objectives within the Matrix allocation. Manage for a minimum of 12 pieces greater than 20 inches in diameter and 20 feet long and 12 pieces greater than 20 inches in diameter and 10 feet long at a density of 24 pieces per acre of Decay Classes I and II across the harvest units. Additional material will be left when logs have little or no commercial value and do not produce an unacceptable fire hazard.
PO-17	Minimize impacts to water quality and soil disturbance	A skyline system capable of attaining one-end suspension during inhaul and having at least a 75-foot lateral yarding capability with a carriage capable of maintaining a fixed position on the skyline during lateral yarding will be required. Skyline roads will be no closer than 150 feet at the outer unit boundary of all units.
PO-18	Noxious weed control	Use only weed-free straw and mulch on road stabilization and erosion control projects.
PO-19	Noxious weed control	Minimize sources of weed seed in areas not yet re-vegetated. Keep active road construction sites closed to vehicles not involved with construction.
LP-1	Riparian protection	Directional fell trees away from Riparian Reserves, reserve tree clumps and snag management areas.
LP-2	Riparian protection	Trees in Riparian Reserves that are damaged during timber harvest and road reconstruction or construction activities will be left on the site.
LP-3	Erosion control	Restrict tractor logging to lands that can be harvested with a minimum of soil compaction and erosion. Restrict heavy equipment to slopes less than 35 percent.
LP-4	Erosion control	Design and locate skid trails to minimize the area affected by compaction, erosion and runoff water.
LP-5	Erosion control, soil productivity, protect residual trees	Tractor use is limited to skid trails. Use one-end suspension, end-lining and felling to the lead methods to protect water quality, soil productivity and residual trees.
LP-6	Erosion control	Tractor operation is excluded from wetlands and meadows.
LP-7	Erosion control, wildlife forage, weed exclusion	All skid roads will be decommissioned immediately following sale activities. They will be water barred and planted with native vegetation compatible for wildlife forage and consistent with the Umpqua National Forest Native Seed Policy.

Number	Objective	Actions/Practice/Mitigation
LP-8	Erosion control, wildlife forage, weed exclusion	Inactivate temporary roads as soon as contractual requirements are complete but no later than one year. Inactivation will include sub-soiling to a depth of 18 inches, water barring, and applying a native seed mix for erosion control that is compatible with wildlife forage needs and consistent with the Umpqua National Forest Native Seed Policy.
LP-9	Erosion control	Erosion control work shall be kept current immediately preceding expected seasonal periods of precipitation or runoff. Any soil disturbed during the rainy season in excess of 0.5-acre will have effective ground cover provided.
LP-10	Water quality	Refueling of heavy equipment should be done 100 feet or more from stream courses. Use absorbent pads in ditch lines if surface water is present.
LP-11	Noxious weed control	All ground based yarding equipment will be clean and inspected to assist in the control of non-native plant species.
LP-12	Noxious weed control	Survey and treat weed infestations at landings and on skid trails after harvest.
RP-1	Erosion control	Minimize erosion by conducting road construction operations when the ground is dry (within operating season).
RP-2	Erosion control	Minimize the impact of melt water on road surfaces and the probability of sediment production resulting from snow removal operations by implementing specification T-803.
RP-3	Noxious weed control	During timber sale activity roadside brushing should be accomplished prior to seed setting of noxious weeds, approximately mid-June to July. The intent is to stop the spread of existing weeds and prevent establishment of new weeds.
RP-4	Erosion control	Riparian reserves, seeps and springs will be avoided when conducting dust abatement activities (if substances other than water is used).
RP-5	Road maintenance	On Forest Service haul route ditches that show no sign of erosion, i.e., grassed-in, rocky, etc., should not be disturbed by road maintenance unless necessary to maintain drainage. Grading of these roads will be done in accordance with Maintenance Specification T-811 and ORT-839, and water shall be applied during blading (T-891) when sufficient moisture is not present.
RP-6	Road maintenance	During reconstruction and construction activities, waste material shall be placed in areas agreed upon by the District during the design phase, or in locations outside Riparian Reserves that do not affect fish, wildlife, and cultural or botanical resources.
RP-7	Water source development	Water sources #35 will be used as the supply for the water needed in the placement of crushed aggregate on roads as needed. Access roads to the water sources will be gravel surfaced to reduce sedimentation into streams.
RP-8	Noxious weed control	Utilize road surface gravel from weed free sources. Pre-inspect gravel sources for the presence/absence of noxious weeds prior to utilization of gravel from those sources.

Number	Objective	Actions/Practice/Mitigation
FM-1	Protect riparian habitat	Fuels treatments will be designed to meet the Aquatic Conservation Strategy objectives. No burning will occur in Riparian Reserves.
FM-2	Protect large woody material and duff	Burning will be carried out when fuel moistures are high to ensure retention of duff and large woody material.
FM-3	Erosion control, soil productivity, control noxious weeds	Construct water bars in firelines, where needed, to minimize erosion. Rehabilitate firelines, as feasible, to restore soil and duff layer and to reduce weed invasion.
FM-4	Erosion control	A minimum effective ground cover of 25 to 65 percent will be maintained within the first year following the end of ground disturbing activity.
FM-5	Noxious weed control	Re-vegetate areas of firelines at high risk for weed invasion.
FM-6	Protect air quality	Burning will be conducted to meet air quality standards as outlined by Oregon DEQ (Department of Environmental Quality), and air quality monitoring will be conducted in conjunction with the DEQ.

K-V Mitigation and Opportunities

Many of the above proposed actions and mitigations are eligible to be financed through K-V (Knutson-Vandenberg) collections. The following activities are either additional mitigation, have been identified as mitigation for the effects of past management practices or are considered an opportunity for improvements. Whether these activities are financed through K-V collections will be determined by the location of the sale area boundary and the total funds available for collection. Those activities considered to be mitigation are identified as mitigation. All other activities are considered enhancement opportunities and accomplishment will depend on funding availability.

Aquatics & Water Quality

- Storm-proof and gate the 2212-737 Road. This road needs to be kept accessible for Fire and miners. This project would help restore impacts from past management practices.
- Inactivate and close the 2212-809 Road. Pull pipes, cross drain, outslope, and install a closure device. Pull back old landing located at the end of the road. This project would help restore impacts from past management practices.
- Inactivate the 2212-724 Road. This road needs to be kept accessible for miners. This project would help restore impacts from past management practices

Botany

Treat soil disturbance or weeds as needed after timber harvest and regeneration activities.

Vegetation

Precommercial thin or apply other intermediate treatments (conifer pruning, and release from competing vegetation) in adjacent units in sale area. This will mitigate the effect of past management practices.

Wildlife

- Enhance cavity-nesting habitat for bird, bats and squirrels in all harvest units. A minimum of three nest boxes may be placed per acre in proposed harvest areas to restore snags destroyed or felled during harvest operations.
- Enhance wildlife forage and erosion control by planting or applying a seed mix compatible with the Umpqua Forest Native Seed Policy.

Recreation

Restore impacts from previous harvest/road activities to the Sultana or Noonday Trail. Listed in priority order:

- Decommission or block alternative trail routes that trail users have established through the Jumbo Unit.
- Improve access and trailhead parking at the Noonday Hotel site.
- Improve access and trailhead parking on Road 2212-753.
- Improve signing through old units to confine trail traffic to one established trail tread/route.
- Remove unsightly trailside stumps (approximately 10) along and at the landings of the old Jumbo Unit.

Chapter 3 Affected Environment and Environmental Consequences

This section describes potential environmental consequences or effects that may occur if the Action or No-Action Alternative were implemented. This information provides a scientific and analytic basis for comparing alternatives. Estimated effects are described in three broad categories:

- I. Environmental consequences on significant issue
- II. Effects on concerns
- III. Effects on other components of the human environment

All effects are discussed in terms of environmental changes from the current situation and include qualitative assessments, as well as quantitative assessments where possible. Applicable standards and guidelines from the Umpqua LRMP as amended by the Northwest Forest Plan ROD are either met or exceeded.

Potential cumulative effects were analyzed by considering the proposed activities in the context of past, present, and reasonably foreseeable actions within the Northnoon Planning Area (7th field watershed), or the Brice Creek watershed (6th field watershed). The term “Northnoon Planning Area” or “planning area” refers to the Upper Brice West 02H (7th field) drainage, and the phrase “Brice Creek watershed” refers to the Brice Creek sub-watershed (6th field). The Brice Creek Watershed Analysis provided a landscape-scale context for the proposed Northnoon project, as well as a summary of the past management activities influencing the existing conditions.

Timber harvest, fire suppression and road building represent the primary past management activities that contribute to the cumulative effects of the proposed Northnoon project. Approximately 800 acres (22 percent of the planning area) have been clear-cut harvested since the 1940’s. The Jumbo Timber Sale is the most recent harvest in the planning area; it occurred in 1990-95 and harvested 43 acres with a regeneration cut. Approximately 25 miles of road have been constructed in the planning area since 1950.

Present or reasonably foreseeable actions within the Brice Creek watershed that are considered in this effects analysis include, but are not limited to:

- **Blodgett Timber Sale:** between 2003 and 2008, 21 acres of regeneration harvest, 66 acres of partial harvest and 91 acres of commercial thinning
- **Precommercial thinning:** 2,000 acres scheduled to occur between 2000-2005
- **Crawdogg Planning Area:** approximately 1,200 to 1,500 acres of commercial thinning and partial harvest is anticipated between 2005 to 2010

Aquatic Conservation Strategy

The Aquatic Conservation Strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems on public lands. The intent is to protect habitat for aquatic and other riparian-dependent species and resources and to restore currently degraded habitats.

The alternatives evaluated in this section are consistent with the strategy through the following activities:

- Maintaining riparian reserves in all harvest areas
- Avoiding unstable and high-risk areas
- Mitigation measures to protect water quality
- Restoration through inactivation of 0.5-mile of road (total inactivation 2.31 miles)
- Long-term improvements through riparian silviculture treatments
- Maintaining late-successional overstory
- Maintaining and enhancing aquatic conditions
- Implementation of BMP's

The following effects analysis provides the basis for assessing consistency with the Aquatic Conservation Strategy. Full documentation of consistency with the Aquatic Conservation Objectives can be found in Appendix A.

I. Environmental Consequences on the Significant Issue

Significant Issue: Harvest would remove older trees and degrade late-successional habitat

Harvest activities in older stands may reduce habitat effectiveness for some species dependent on late-successional habitat by reducing the potential for snag and downed wood recruitment and removing some of the large older trees. Typically, moderate- or low-intensity fires would clear out the undergrowth and create openings in a mosaic of stand and fuel conditions leaving abundant snags and down wood, an important component of late-successional habitat.

Harvest by thinning would remove some of the dense stems that historically provide snags and down wood through mortality by fire, insects or disease. Creating gaps by harvest would remove some of the older trees that in a low- or moderate-intensity fire would be available as snags or remnants. Increasing the size and the acreage in gaps would result in additional older trees harvested and a greater reduction in habitat for associated late-successional species.

Overview

Current forest landscape patterns were compared to pre-timber harvest patterns using historical vegetation maps, aerial photos and ring-count studies from harvested units in the Brice Creek watershed. Five classes of vegetation are used to illustrate the variety of vegetation and wildlife habitat in the planning area.

- Establishment 0 to 30 years
- Thinning 31 to 80 years
- Mature 81 to 150 years
- Transitional 151 to 299 years
- Old-growth 300+

The term *late-successional* is used in this document to describe stands over 80 years old. Mature, transitional and old growth are broken out as subsets of late-successional vegetation.

Ten percent of the 387-acre area is classified as old-growth habitat. The remaining old-growth refugia are located on the lower slopes along Brice Creek and the cool moist sites on the upper ridges. Transitional forest stands consist of 2,224 acres (61 percent). Most of these transitional stands occur on the mid- to upper-slopes, resulting from stand replacement and partial replacement fires over the past 100 to 200 years.

The chart below shows the current and historical percent of each class of vegetation for the Upper Brice West 7th Field Watershed (21-H).

Table 6. Acres and Percent of Vegetation by Class

Age Class	Acres	% in 2002	Acres	% in 1850
Non-Forest	26	0.7	26	0.7
Establishment (0 to 20 years)	800	22.1	183	5.1
Thinning (31 to 80 years)	15	0.4	364	10.1
Mature (81 to 150 years)	162	4.5	1,505	41.4
Transitional (151 to 300 years)	2,230	61.6	1,146	31.7
Old-growth (300+ years)	387	10.7	396	10.9
Total	3,620	100	3,620	100

All of the proposed harvest units in the Northnoon Planning Area are in areas classified as transitional. They are two-storied stands with transitional overstory, 180 to 220 years, and a mature understory, 80 to 120 years. Below is a recap of the prescription by alternative.

Table 7. Alternatives by Percentage

Treatment	Alternative 1	Alternative 2	Alternative 3
Thinning in understory	0	75% of unit	85% of unit
Gap size	0	1 to 2 acres	¼- to ½-acre
% Area in gaps	0	15%	5%
% Retention within gaps	0	15%	0%
% Area in retention clumps	100	10%	10%

Prescribed burning is proposed on all units in both action alternatives. The treatments would consist of a combination of hand piling, jackpot burning (burning concentrations of fuel), and underburning depending on fuel conditions following harvest.

Historic Disturbance Patterns/Fire History

Historical fire patterns in the Northnoon Planning Area generally burned in a low- to moderately high- intensity. Canopy closure generally ranged from 60 to 80 percent with openings in the overstory occurring due to insect, disease, wind and fire events. Understory and partial stand replacement fires often produced small gaps. These gaps were usually less than 2 acres in size. Occasionally, a more intense, partial stand-replacing fire occurred that created openings greater than 2 acres. These larger openings occur on the upper portions of the slopes and are most often found at mid elevation. Openings caused by relatively infrequent stand replacing fires can exceed 10 acres in size, and usually leave some portion of the overstory intact.

The last significant fire activity in this area occurred on the lower portion of Noonday Ridge in 1917 (the Green Rock Mine Fire). It burned on the north slopes of Noonday Ridge, down to

Brice Creek, across from Wyatt and Trestle Creeks. The written account indicates this fire was of moderate- to high-intensity.

The Brice Creek Watershed is best described as a moderate fire regime. The moderate fire regime has the most complex mix of low-, moderate- and high-severity fires. Low and moderate severity fires occur at 25 to 100 year intervals and are partial stand replacement fires. In this fire regime:

fires occur in areas with typically long summer dry periods and fires will last weeks to months. Periods of intense fire behavior are mixed with periods of moderate and low intensity fire behavior; variable weather is associated with variable fire effects. The overall effect is a patchiness over the landscape as a whole, and individual stands will often consist of two or more age classes (Agee, 1990).

Though complex, there are opportunities to manage the landscape more closely along the patterns of natural disturbance, which might be used as a template for forest management (Brice WA, 1997).

The proposed project will attempt to maintain forest cover consistent with the natural fire processes by thinning and creating small gaps.

Late-Successional Vegetation

Affected Environment

Key components of late-successional habitat are live old-growth trees, standing dead trees (snags), fallen trees, multiple canopy layers and small canopy gaps (ROD B-2). Late-successional habitat is commonly associated with nesting habitat for the northern spotted owl. A moderate- to high-canopy closure is needed to meet the definition for spotted owl habitat and thus late-successional habitat. Spotted owls seem to prefer to nest in late-successional stands with an average canopy closure of 65 to 80 percent (Forsman et al. 1984).

The late-successional stands in the planning area are fragmented by previous clear-cut harvest. The connection between these stands is further weakened by the lack of snags and large wood within the previously harvested stands. Clearcut units generally increase the contrast between adjacent habitat types, producing sharp boundaries (edge) and a linear environment, and leave little, if any remaining old-growth structural characteristics. There are 800 acres or twenty-two percent of the planning area in single, even-age stands.

Environmental Effects

Alternative 1

Direct and Indirect Effects: Alternative 1 would have no impact on existing late-successional habitat.

Cumulative Effects: There are no known cumulative effects associated with Alternative 1 within the Brice Creek watershed that would adversely affect late-successional habitat.

Alternative 2

Direct and Indirect Effects: Alternative 2 will treat 163 acres of transitional forest.

The 1- to 2-acre gaps will have fragmentation/edge effects on approximately 60 acres because of the larger gap size.

In Alternative 2, the silvicultural prescription will convert approximately 15 percent of each unit to regeneration gaps of 1 to 2 acres in size. Each regeneration gap will retain the largest trees

equivalent to 15 percent of the basal area as green-tree retention areas. Additionally, thinning trees in the smaller size class will treat approximately 75 percent of the remaining area. Every stand proposed for harvest will retain approximately 10 percent of the area as untreated. The prescription somewhat replicates natural fire patterns, while providing for a continuous canopy cover on 85 percent of the area. Some structural components such as snags and down wood will be retained and created.

Alternative 3

Direct and Indirect Effects: Alternative 3 will treat 163 acres of transitional forest.

The smaller ¼- to ½-acre gaps will have little effect on wildlife habitat fragmentation within the harvest areas. This size of opening has been documented as occurring naturally in older late-seral stands.

In Alternative 3, the silvicultural prescription will convert approximately 5 percent of each unit to regeneration gaps of ¼- to ½-acre in size. Thinning the understory trees in the smaller size classes will treat approximately 85 percent of the remaining area. Approximately 10 percent of each stand proposed for harvest will be retained.

The prescription somewhat replicates natural fire patterns, while providing for a continuous canopy cover on 95 percent of the area. Some structural components such as snags and down wood will be retained and created.

Alternatives 2 and 3

Direct and Indirect Effects Common to Action Alternatives: Implementation of the silviculture prescriptions will result in stands that continue to provide dispersal habitat, and maintenance for late-seral species within 100 acres of the harvest units.

The Action Alternatives will not affect any stand that would be defined as complex old-growth.² There are only two stands within the planning area defined as complex old-growth habitat. The larger stand is 40 acres and has remnant patches of old growth within a transitional forest. The smaller stand is 12 acres, consisting of complex old-growth habitat. These stands are located north of the proposed harvest units.

The silvicultural prescriptions being applied within the 163 acres of late-successional forests will adversely affect the key components of late-successional habitat: stand structure, canopy closure, and current and future coarse wood levels. Understory thinning (thinning from below) reduces and simplifies stand structure. Coarse woody debris already on the ground will not be harvested but will be left on site. However, future coarse woody debris will be impacted directly by the harvest of trees that would have died from suppression or other causes. The greatest immediate adverse effect will be on decayed snags, because they pose safety hazards during logging operations.

Changes in microclimates from this type of prescription are not well documented in that most studies have focused on the effects of clearcut harvesting. Chen (1991) documented change in soil and air temperature, soil moisture, relative humidity, wind speed, and radiation as a function of distance from a clearcut edge into upslope forest. Patterns varied substantially with season, time of day, edge aspect, and the extent of tree removal in the harvested stand. In his study, the maximum effect on soil moisture in a clearcut was non-existent within 0.5-tree heights of the

² Franklin, Jerry, Research Note PNW-447. Complex old-growth is defined as multi-layered stands with snags, two or more tree species, large trees, gaps and down logs. Stands are not linear and greater than 40 acres in size are more valuable as wildlife habitat for spotted owls because there is less edge effect.

edge. Soil temperature was only marginally affected within 0.5-tree heights. Air temperature and relative humidity showed the greatest change and had recovered within 3 tree heights. It is expected that there will be minimal effects to microclimate when 60 to 80 percent canopy closures are retained. That same effect should be minimal to forest associated species. The proposed actions listed below will enhance habitat for associated species.

- Inactivating approximately 2.3 miles of road will enhance connectivity of late-successional forest
- Creating five snags per acre will assist in mitigating some of the loss of current and future snag habitat, a structural component of late-successional habitat within the harvested areas
- Installation of three bird/mammal boxes per acre (40 to 60 percent) use from monitoring data from boxes placed in other harvest areas on the District.
- Placement of large woody material (150 lineal feet per acre) will assist in mitigating structural components of late-successional habitat within the harvested areas
- Reforestation within the created gaps will assist in restoring habitat
- Disposal of vegetative residue from harvest activities with low intensity under burning or jackpot burning may create some snag habitat within the 163-acre harvest area
- Riparian silviculture, and planting and thinning of small trees along 4 miles of Brice Creek, will promote the development of large conifer trees adjacent to the riparian system. Usually such treatments can accelerate larger diameter trees by two decades.

Cumulative Effects Common to Action Alternatives: The cumulative loss of late-successional components such as large snags, down wood and remnant trees from past clear cuts will prolong the recovery to functional forest habitat for both early-successional and late-successional species for several decades.

There is no other known proposed actions that will impact late-seral habitat within the 3,612-acre Northnoon Analysis Area. There are approximately 5,000 acres of late-seral forested habitat within the Matrix allocation available for harvest within the Brice Creek watershed. This is 22 percent of the remaining 22,700 acres of late-seral habitat within the watershed. The Brice Creek Watershed Analysis has identified areas of refugia for late-seral habitat and associated species that provide connectivity between stands with riparian and upslope corridors. The trend, based on Standards and Guidelines in the Northwest Forest Plan, is to restore these areas, enhance connectivity across the landscape, and reduce impacts from timber harvest by retaining more late-successional components within the harvested area. The result of this trend will be that there will be an increase in late-successional habitat. With the current direction of the Northwest Forest Plan, it is expected that the acreage of late-successional habitat will continue to be within the natural range of variability within the watershed and would therefore protect associated species. The trend in acres of habitat across the range of the northern spotted owl is projected to improve.

Down Woody Debris

Down woody debris refers to snags and fallen trees that occur naturally in all forest ecosystems. It is a major structural element of late-successional forests with many crucial ecological functions. It provides habitat for many wildlife species and is a necessary component for maintaining the long-term health of the forest ecosystem. Retention of the majority of all decay classes of large down wood is important as habitat for over 100 wildlife species including arthropods, salamanders, reptiles, birds and small mammals, as well as many species of

vascular plants, fungi, liverworts, mosses and lichens. Down woody debris provides microclimates that may function as transitional islands for the maintenance and eventual recovery of some late-successional organisms in the Matrix forest. They also contribute to the genetic interchange and diversity between the different age classes of the forest. Down woody debris also provides a long lasting exchange of nutrients to the soil, contributing to soil productivity.

Affected Environment

The amount of large down woody material varies throughout the analysis area depending on stand age, past salvage activities and fire history. All stands within the 3,612-acre analysis area may have less large down wood than occurred naturally because of fire suppression. Historically, low-, moderate- and high-intensity fires occurred on a mean average of 40 to 60 years resulting in a replenishment of coarse woody material.

Previously harvested units were YUM (yard unutilized material) yarded, resulting in removal of most large woody debris from 22 percent of the planning area that was clearcut. Additionally 30 percent of the area has been subject to salvage logging of snags and down wood. This emphasizes the importance of down wood retention in future harvest units and other management activities.

All alternatives will retain coarse woody debris at a minimum of the Standards and Guidelines and recommendations from the Brice Creek Watershed Analysis. Record of Decision Standards and Guidelines state, "Coarse woody debris currently on the ground should be retained and protected to the greatest extent possible from disturbance during treatment which might otherwise destroy the integrity of the substrate." Brice Creek watershed analysis states, "All harvest units will manage for a minimum of 12 pieces of down woody material greater than 20 inches x 10 feet per acre and 12 down pieces greater than 20 inches x 20 feet at a density of 24 pieces per acre of Decay Classes I and II. All existing down wood in all decay classes will be protected on site." These practices will assist in providing down wood habitat within the proposed harvest units. There is no quantitative data on current condition of down wood. Based on site visits all proposed regeneration harvest gaps will likely exceed current management objectives and no additional down wood will be required. All partial harvest or thinned areas will require down wood input to meet required management objectives.

Information on amounts of coarse woody debris in unmanaged, late-successional forests is useful as a baseline for comparison with stands that have been managed. Typically, unmanaged old-growth Douglas-fir stands have an average coarse woody debris accumulation of about 80 tons/acre (Spies and Cline, 1988). After a new fire, additional woody debris, both standing and down, can bring the coarse wood levels to between 240 to 500 tons per acre. However, by the time the new stand reaches 100 years, coarse wood levels have decayed and are at a low point. The Northnoon Planning Area is at a low point in its coarse wood cycle. At this point, the rate at which new dead wood is added is less than the rate of loss from decomposition. As the stands mature, woody debris gradually increase again from suppression mortality of understory and overstory trees, disease, insect and blow down (Spies and Cline, 1988). The Northnoon Planning Area would likely be approaching a time when fire would interrupt this cycle, resulting in a large input of coarse wood; however, most of this wood will be removed with the harvest of the approximately 13,400 trees that would have died in the fire or died from suppression mortality.

Environmental Effects

Alternative 1

Direct and Indirect Effects: There would be no change in current down woody debris; natural processes would continue to provide input to the system.

Cumulative Effects: Fire suppression during the past 60 to 80 years combined with future fire suppression will prevent large inputs of coarse woody debris in late-successional areas within the Brice Creek Watershed. However, there will be some level of input of from mortality caused by fire suppression, insects, disease activity and blow-down. In addition, there is the potential for catastrophic insect or fire activity as these stands continue to mature over the next 100 years.

Alternatives 2 and 3

Direct and Indirect Effects: The removal of the approximate 13,400 trees during harvest operation will reduce future coarse wood levels by 43 percent over the next five decades. This data is from the Forest Vegetation Simulator model (Donnelly 1997). This model uses tree data from field inventories to project stand growth and mortality.

Prescribed fire is expected to reduce down woody debris and the duff layer. The amount of reduction is directly related to the intensity of the burn. Most of the reduction is expected to occur in the 0 to 3 inch diameter material. With a low-intensity underburn, an average reduction of approximately 60 percent is expected in the fine-fuel loading (<3 inch dia.).

Most of the larger Decay Class I and II material is not expected to be consumed but could be charred. Some fire mortality of standing trees is expected. A decrease is expected in all size classes of Decay Stages 3 and 5 but the decrease is dependent on the intensity of the burn. Low-intensity burning will have minimal effect on large wood in all decay stages.

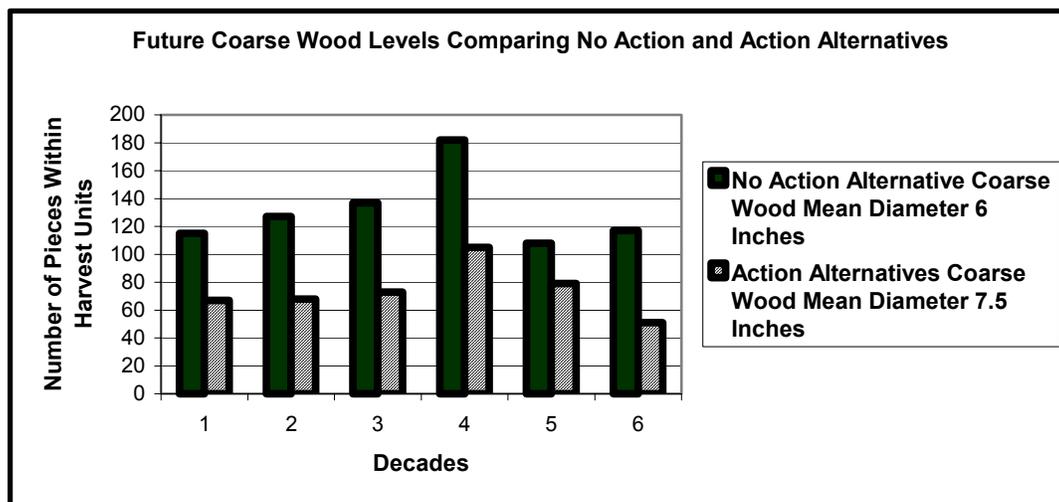


Figure 4. Future Coarse Wood Levels Comparing No Action and Action Alternatives

Cumulative Effects: There is no other known proposed actions that will impact coarse wood habitat within the 3,612-acre Northnoon Analysis Area. As mentioned above, past harvest practices and fire suppression have degraded habitat within the analysis area. These management actions will continue in the near future. However, timber harvest operations have changed with the implementation of the 1994 ROD, improving the trend for coarse wood habitat

and associated species within the watershed and throughout the range of the northern spotted owl.

Management Indicator Species

Management Indicator Species (MIS) have been designated on the Forest to track and evaluate the effects of forestland management activities on all wildlife species that occur on the Forest. The MIS for the Umpqua National Forest include the spotted owl, pileated woodpecker, pine marten, bald eagle, peregrine falcon, Roosevelt elk, blacktail deer, and one group of cavity nesters. Cavity nesters, pileated woodpeckers, and spotted owls are addressed below. The remaining MIS species are addressed in the third section of this chapter under Effects on Other Components of the Human Environment. The habitats for the indicator species that are present on the Cottage Grove District are addressed in the wildlife report and in the Biological Assessment.

Cavity Nesters

Snags are a major component in forested stands and are critical to the survival of many forest wildlife species. Snags are also a future source for down woody habitat. Standards for snag management are less restrictive in the ROD than in the Umpqua LRMP. To manage for snag structure, the Umpqua LRMP requires management of cavity-nesting species at or above 60 percent potential population capacity. The snag management standard and guideline is focused on five cavity excavator species that occur on this Forest. Snag levels required under this standard and guideline do not consider foraging habitat for cavity nesters and thus may not adequately meet all of the needs of these species.

The Brice Creek Watershed Analysis report recommends managing for a minimum of three snags per acre greater than 20 inches in diameter and a minimum of three snags per acre greater than 30 inches in diameter in Decay Classes I and II. Management will be for a total density of nine snags per acre in Decay Classes I, II, III and IV. The density of snags should be retained over time with some allowance for loss. Snag replacement trees that are green culls and lower value trees most often are satisfactory leave trees for future snags and snag creation.

Affected Environment

Previous logging practices, salvage activities and 60 years of fire suppression have reduced snag densities in some stands within the sale area. Snags were not retained in previously harvested units on approximately 810 acres or 22 percent of the 3,612-acre analysis area. Additionally, 30 percent of the area has been subject to snag reduction from salvage logging. Wildfire has been suppressed on all of the 3,612 acres within the analysis area. This emphasizes the importance of snag retention in future harvest units.

Table 8. Current Number of Snags Greater than 20 Inches

Current number of Class I and II snags > 20 in. dbh in proposed partial harvest units

Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
4 snags	4 snags	0 snags	0 snags	4 snags	0 snags

Current number of Class III and IV snags > 20 in. dbh in proposed and partial harvest units

Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
4 snags	4 snags	4 snags	5 snags	5 snags	5 snags

Environmental Effects

Alternative 1

Direct and Indirect Effects: The No Action Alternative would have no direct impact on current populations of cavity nesters, and in the long-term will likely benefit these species with the creation of snag habitat through natural processes such as tree suppression (resulting from competition among trees for sunlight, water, and nutrients), or wildfire.

Cumulative Effects: There are no past or future activities associated with Alternative 1 within the Brice Creek watershed that would adversely affect cavity nesters.

Alternatives 2 and 3

Direct and Indirect Effects: The action alternatives propose harvest on 163 acres, resulting in the loss of the majority of the existing snags within the harvest units. Additionally there would be a loss of future snag habitat. Most of the approximately 13,400 trees proposed for harvest would have died from suppression mortality or fire, providing future snag habitat.

All Action Alternatives will try to protect and retain all hard (not heavily decayed) and short snags during harvest activities. The LRMP Standards and Guidelines from the Prescription C5-VI, Wildlife Snag Management Areas, prescribe for snag habitat and are designed to maintain a minimum of 60 percent population capacity for cavity-nesting bird species. Guidelines allow an average of 3 acres of commercial forestland per 40 acres harvested to be reserved for snag management.

Snag recruitment trees left within the harvest unit to meet the near-term (three decades) snag deficit do not count toward green-tree retention requirements as prescribed in the ROD. These snags are in addition to the retention of snags on unsuitable timber ground and other land allocations such as Riparian Reserves. The trees retained for snag replacement should be left in green-tree retention clumps and scattered throughout the units.

Figure 5 below compares the estimated number of snags post-harvest, the required snags needed to meet minimum management requirements to meet 60 percent potential population capacity for cavity nesters, and the Brice Creek Watershed Analysis snag recommendations needed to comply with management objectives and Standard and Guidelines. This data is from the Forest Vegetation Simulator.

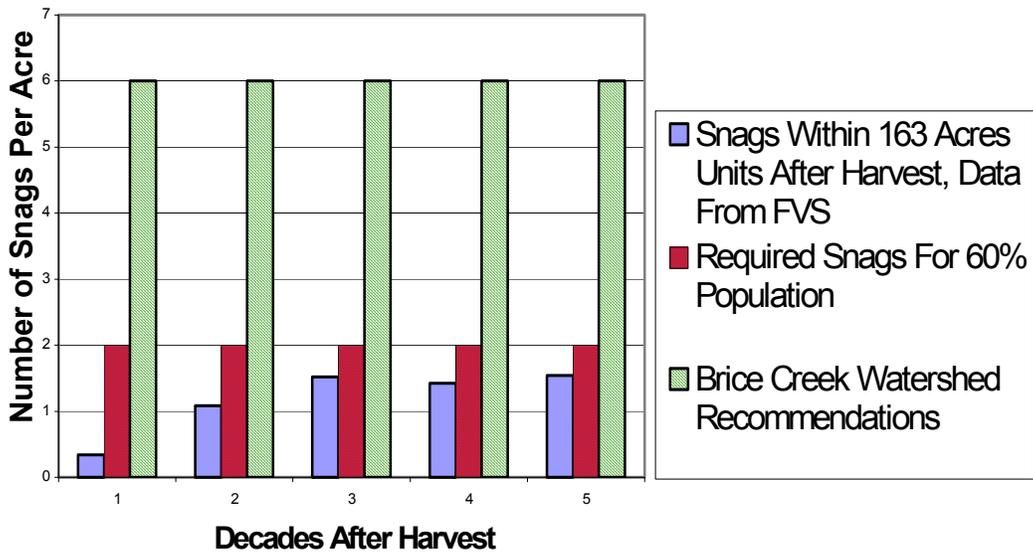


Figure 5. Required and Recommended Snag Levels vs. Snag Levels without Mitigation

There will be a corresponding reduction in populations for some snag-dependent wildlife species with the loss of existing (6.5 snags greater than 20 inches per acre) and future snag habitat within the proposed harvest units. Without snag creation, snag density is not expected to provide for 60 percent population levels of cavity nesters within the 163 harvest acres over the next five decades. See Figure 4 above. It is expected that all Class III and IV snags will be lost during harvest operations and it is estimated that 10 to 30 percent of the Class I and II snags will be retained during harvest operations.

The proposed actions listed below will mitigate or enhance adverse effects to habitat for these species or associated prey species.

- Create five snags per acre
- Install three bird/mammals boxes per acre (40 to 60 percent use from monitoring data from boxes placed in other harvest areas on the District.)
- Placement of 150 lineal feet of large woody material in the units
- Dispose of vegetative residue from harvest activities with low-intensity under burning or jackpot burning will likely create some additional snags
- Approximately three miles of road storm-proofing will reduce the need for future hazard tree falling within the planning area and will reduce the potential for roadway salvaging in the future

Cumulative Effects: The Blodgett Timber Sale, which proposes to harvest approximately 178 acres within the Matrix allocation, is the only other known proposed action that will impact cavity nester's habitat. Similar to this project, the effects to habitat and species will be a reduction in suitable snags and the potential for snag recruitment. In Lower Brice Creek, another proposal that is not yet fully developed is the Crawdog Timber Sale. This will involve commercial thinning.

Required snag mitigation for the projects and land allocations that reserve late-seral habitat from salvage and timber harvest are expected to maintain viable populations for these species.

Fire suppression will continue to affect the potential for habitat creation and will likely adversely affect population potential within the Brice Creek watershed.

When required mitigations are applied, the cumulative effects to the existing snag habitat and cavity-excavator populations within the sub-drainage are not expected to reduce populations below minimum management levels of 60 percent potential population capacity.

Pileated Woodpecker and Pine Marten

Affected Environment

The planning area is within the historical home range of the pileated woodpecker and pine marten. Pileated woodpecker and pine marten have been documented within the watershed. Both pine marten and pileated woodpeckers have been considered a species associated with late-seral forest. Late-seral forests provide large trees and large snags with structural components of old-growth that function as habitat for these species and their associated prey base.

The ROD Standards & Guidelines and the Brice Creek Watershed Analysis provide guidance and recommendations for retention of late-seral forest on a minimum of 64 percent of the 36,328-acre Brice Creek watershed. On the Cottage Grove District this is in Riparian Reserves, on unsuitable soils, in LSR and spotted owl activity centers. Connective corridors and landscape design that have been recommended in the Brice Creek Watershed Analysis will facilitate the interaction of these species with associated habitat and prey species within the 14,000-acre matrix landscape. Therefore, connectivity of late-seral habitat appears to be adequate within the Brice Creek watershed.

In the Brice Creek watershed, there are two remaining large blocks of late-successional habitat of 4,694 acres and 1,187 acres, which are in areas of historic refugia (BCWA, 1997). Retention of these areas enhances the viability of populations of late-successional species throughout the watershed. Additionally, the ROD provides direction to maintain habitat retaining viable populations of late-successional species such as pine marten and pileated woodpecker, within the range of the northern spotted owl on federally managed forests. The ROD allocates large blocks of Late-Successional Reserves and other Administratively Withdrawn Areas as habitat for these old-growth dependent species outside of Matrix land allocation.

Environmental Effects

Alternative 1

Direct Effects: Alternative 1 is not expected to have an adverse effect on pileated woodpecker or pine marten in the Brice Creek watershed. They would likely benefit from no action because there would be no disturbance and no loss of future coarse wood resources.

Cumulative Effects: As riparian reserves mature, the LSR and other areas where harvest activities are not expected to occur, habitat for pileated woodpecker and pine marten will continue to improve in the watershed over the next 100 to 200 years.

Alternatives 2 and 3

Direct and Indirect Effects: Harvest activities will have immediate and long-term effects on the development of late-successional structural components, such as snags and down wood habitat. With the absence of wildfire due to fire suppression, most down wood and snags are derived from the suppression mortality of the understory and diseased trees in the overstory.

Harvest activities will interrupt this natural suppression process by removing understory trees. (See Figure 4. Down Woody Debris discussion.)

There are approximately 6.5 snags per acre greater than 20 inches in Condition Classes I-V. Direct impacts will occur by felling these existing snags because of safety concerns, or by destruction during harvest operations.

Disturbance created during the approximate 6 months of operation will have short-term impacts to these species and their habitat within the proposed 163-acre harvest area.

The proposed actions listed below will enhance habitat of these species or associated prey species. The extent of the benefits derived from these actions is difficult to analyze because there is no information on population density or the effects from disturbances associated with the use of roads within the analysis area.

- Inactivating approximately 2.3 miles of roads will enhance connectivity of late-seral habitat and reduce disturbance associated with road access.
- Creation of five snags per acre will enhance forage, nesting and denning habitat for pine marten, pileated woodpecker and associated prey species.
- Installation of three bird/mammal boxes per acre will mitigate/enhance forage, nesting and denning habitat for associated prey species that would be lost during harvest operations. (There is 40 to 60 percent use of these boxes according to monitoring data of boxes placed in harvest areas on the District.)
- Placement of 150 lineal feet of large woody material in the units will enhance existing or damaged forage, nesting and denning habitat for pine marten, pileated woodpecker and associated prey species.
- Reforestation within the created gaps will enhance the recovery of habitat for pine marten, pileated woodpecker and associated prey species.
- Disposal of vegetative residue from harvest activities with low-intensity underburning or jackpotburning will likely result in some snag habitat being created.

Cumulative Effects Common to Action Alternatives: There is one other known proposed action that will cumulatively impact late-seral habitat; the Blodgett timber sale proposes to harvest approximately 178 acres within the Matrix allocation. Both Blodgett and the Northnoon proposed timber sales will harvest only within the Matrix land allocation. There will be no impacts to other land allocations that have been designated to maintain viability for these species.

Viable populations of late-seral associated species will be maintained within the Brice Creek watershed with implementation of these proposals, or any action to harvest within the Matrix allocation, as long as they are consistent with current Standards and Guidelines.

Northern Spotted Owl *Strix occidentalis caurina* Status: Threatened

Affected Environment

The northern spotted owl has been documented in the area. Spotted owls are strongly associated with old-growth habitat. The habitat within the Northnoon Planning Area can best be described as mid-elevation transitional western hemlock and Douglas-fir forest. The Risk Assessment as outlined in Forest Service Manual 2600, R6 Supplement No. 47, results in a Risk Index Value of 100 (Step 3), the highest value possible. This indicates that obvious adverse effects to this species may occur from the planned activity (see Northnoon Analysis File located at the Cottage Grove District). Any adverse effect on federally listed species requires initiation of consultation procedures. The listing of the northern spotted owl as a threatened species requires consultation with the U.S. Fish & Wildlife Service. Consultation occurred with U.S. Fish & Wildlife in 1999; the Biological Opinion allowed the project to continue with seasonal restrictions on any blasting or harvest activities from March 1 to July 15.

There are four known owl activity centers within 1.2 miles of the project area. Activity centers were reconfirmed in the spring of 1990. This proposed project would not impact any spotted owl activity centers.

The surrounding area was last surveyed for spotted owls in April through June of 1988 and 1990. These surveys were associated with proposed timber sales in the immediate area. Surveys used standard inventory methods and procedures (USDA Forest Service 1988a; USDA Forest Service 1990).

Environmental Effects

Alternative 1

Direct Effects: The No Action Alternative would have no impact on current spotted owl habitat.

Alternative 2

Direct Effects: One- to two-acre gaps will result in 27 acres of unsuitable habitat and approximately 65 acres of fragmented habitat.

Alternative 3

Direct Effects: Gaps of ¼- to ½-acre are not expected to result in fragmented or unsuitable habitat.

Alternatives 2 and 3

Direct Effects: There will be 163 acres of suitable nesting, roosting and foraging habitat degraded with the removal of approximately 13,400 trees. This will result in the loss of current and future snag habitat and associated prey species.

There will be no effect to dispersal habitat. Current habitat conditions are greater than 50 percent per quarter Township. There will be no change in dispersal habitat conditions.

The proposed project is within Spotted Owl Critical Habitat 026 as designated by the U.S. Fish & Wildlife Service. There will be an adverse effect to 163 acres of Critical Habitat. The degraded habitat will result from loss of late-successional structural components as snags, canopy closure and structural diversity, simplifying the stand.

Indirect Effects: The reduction of canopy may reduce cover for the spotted owl and may result in their death or the young's death from predators. Additionally there may be a reduction in their forage base because of lost coarse wood habitat and cover (USDI, 1992).

Cumulative Effects: Cumulative effects are best addressed at a regional level and are part of the consultation process with the U.S. Fish & Wildlife. Those effects are described in the Biological Opinion. A copy is available for review at the District office.

Existing Fuels and Stand Conditions

Affected Environment

Existing fuels in the Northnoon Planning Area are moderate to high based on field observations. This area has not seen significant fire activity since the early 1900's. Fuels in this area are continuous enough to carry ground fire. Ladder fuels are building in this area, which allows fire to move from the ground to the top of the tree, contributing to crown fires. Canopy closure in these stands is moderate to high, allowing for increased risk of sustained crown fire. Tree species in the understory have changed over time to less fire tolerant species of western hemlock and western red cedar.

Existing fuel loadings and canopy closure in Unit 4 are noticeably higher than the other stands.

Environmental Effects

Alternative 1

Direct Effects: Fire will continue to be excluded from the area because of suppression. Fuel loading would remain moderate to high in all stands. All existing stands are best described as a fire behavior Fuel Model 10 due to their heavy dead down woody component and continuous fine fuels and brush.³ Fuel and needle layers on the ground are continuous enough to carry ground fire. Existing large fuels would increase the intensity of a fire and add to the difficulty to control. Rate of spread in this fuel type in wildfire condition would be estimated at 13.0 plus chains per hour. Mortality of these stands given existing conditions in a wildfire scenario would be estimated at 31 to 36 percent. These mortality rates do not account for crown fire. If a crown fire occurred, mortality rates would be much higher.

With ladder fuels continuing to increase and a canopy closure of 80 percent or higher, a crown fire could spread over large areas. Natural decay will continue at its present rate unless an event such as a windstorm or major bark beetle infestation occurs; a significant increase in fuels from such an event could increase the risk of catastrophic fire.

Because of the close proximity, fire starts may also spread to or from the Late-Successional Reserve with relative ease. A wildfire in the area could be somewhat difficult to contain and control with existing fuel loading. Impacts to water quality would be low to moderate. The Riparian Reserves are somewhat susceptible to fire because fuel loadings are similar to those on matrix land; normally however, fuel moistures are higher in the Riparian Reserves than on matrix land.

Indirect Effects: Effects detrimental to short- or long-term forest health from such fires include loss of portions of the duff/litter layer and other nutrient sources, moderately to severely burned soils, and degraded water quality where Riparian Reserves are affected. As the potential for an

³ Fuel Models consider small (0- to 3-inch) size class fuels (small twigs and branches) and are used to estimate fire behavior. Fuel Model 10 represents timbered areas that are generally older (>150 years), or are in cooler, moister sites.

uncontrollable fire builds, especially within the thermal belt, the potential threat to the Late-Successional Reserve also grows, and fire effects would be more severe. Air quality would degrade over the area, and could impact the Oakridge Special Protection Zone to some extent.

Cumulative Effects: As the forest ages and current suppression policies remain in place, fuels will continue to build over the landscape. In most cases, fires will be extinguished before any beneficial effects of the fire are realized. Fires that escape control have the potential to become partial or stand replacement events; this would be especially true if a long period of time lapses before an event occurs.

Alternative 2

Direct Effects: Proposed harvest activities and fuels treatment alternatives reflect low to moderate intensity historic fire patterns. Canopy closure will be approximate 60 to 80 percent, which is reflective of low to moderate intensity fire periodically burning through the stand. Small 1- to 2-acre openings will be created, representing patches of higher intensity torching. Low-intensity prescribed fire will leave a mosaic of burned and unburned areas consistent with historical patterns.

Alternative 3

Direct Effects: Although this harvest prescription is reflective of low-intensity fires, mimicking thinning with small gaps, it does not account for larger openings of 1- to 5-acre, which were historically created by local torching or higher intensity fire.

Alternatives 2 and 3

Direct Effects: Fuel loading after harvest with no fuels treatment for all stands would best be described as a Fuel Model 12. Fuel Model 12 fires spread rapidly with high intensities capable of generating firebrands. Rates of spread in this fuel model, given a wildfire situation would be estimated at 19.0 plus chains per hour. When a fire starts, it is generally sustained until a fuel break or change in fuels is encountered. The intensity of the ground fire would carry fire into the canopy causing very high mortality of residual trees. Therefore, harvest with no fuels treatment is not a viable option from a fuel/fire risk perspective.

After fuels treatments are complete, Fuel Model 8 would best describe post harvest fuel loading. In Fuel Model 8, fires are slow burning ground fires with low flame lengths. Rates of spread would be predicted at three chains per hour, and mortality of residual trees would be estimated around 13 percent.

Fuels from harvest activities will be treated via prescribed fire of either jackpot or underburn. Thus, the overall result of this alternative will be a reduction of fine fuels for a resulting decrease in fire intensity. The harvest activities along with prescribed fire will also decrease canopy closure and ladder fuels, mitigating the risk of large-scale crown fire. However, in order for there to be a significant reduction of the risk of crown fire, thinning and fuels reduction activities would have to be completed on a larger landscape-scale (PNW-GTR-463).

Introducing prescribed fire into these stands has the potential to restore ecosystem processes related to fire, lower smoke emissions from wildfires, limit the size of wildfires by facilitating fire suppression (while using methods that have a lower environmental impact), and reduce the costs of wildfire suppression (ROD, B-8).

Direct effects associated with proposed fuels treatment methods would include some mortality of residual trees estimated at 13 to 21 percent. Mortality would be expected to occur in smaller diameter and understory trees and less fire-tolerant tree species such as western hemlock.

Indirect Effects: The use of low-intensity prescribed fire may result in a change in species components favoring species that are more adapted to fire.

Reduction of canopy closure, ladder fuels and fuel loadings has the indirect effect of providing a higher margin of safety for personnel fighting a wildfire in this area in the future.

Cumulative Effects: Due to reduction of fine fuels and canopy closure, the intensity of a fire start in the area over the next 15 to 20 years should be lessened, but without treating the stands in the area on a landscape scale the benefit is limited. The area of the Bohemia Mining District is currently under analysis for hazardous fuels reduction on a landscape-scale. The Northnoon Planning Area is within or adjacent to the Bohemia Mining District. The combination of these two projects may provide a significant risk reduction of large-scale, high-intensity fire in this area.

Mitigation Measures Common to All Action Alternatives

Many of the treatment benefits and potential consequences have been discussed above. Potential negative effects of prescribed fire can be offset by mitigation measures, some of which are incorporated into the treatment options identified. The primary, short-term negative effects that must be minimized in this planning area include impacts to soils, water quality and coarse woody debris. Depending on the activity, the following mitigation measures will be employed to minimize impacts.

Soils: Soils can be protected in several ways; such as avoiding intense burning, maintaining duff and litter layers, and by jackpot or underburning when conditions would result in a low-intensity underburn.

Water Quality/Riparian Reserves: Water quality can be protected by using treatment methods that minimize impacts to the soils and duff/litter layer (as described above) and by excluding Riparian Reserves from treatment.

Foam can be used during prescribed burn activities in harvested areas outside Riparian Reserves. It can be utilized along control lines if there are areas requiring underburning where the risk of escape is high and the risk of foam entering streams is minimal.

Wildlife/Coarse Woody Debris: Sensitive wildlife sites will be avoided during fuels treatment.

Coarse woody debris would be retained regardless of the treatment method utilized, as they would be designed to avoid consuming these larger fuels.

Maintenance of Water Source #39: Maintenance of Water Source #39 (see Wildlife Report) at the junction of Roads 2212 and 732 will be completed with this project. Maintenance of this water source includes digging out with equipment (or if this is not feasible, blasting) to increase the depth. Maintenance will also include placement of clay into the water source to better maintain water levels. Actual work at the water source will be completed during Oregon Department of Fish & Wildlife "in-water work period", between July 1 and October 15. Any blasting will take into account seasonal restrictions for northern spotted owls (no blasting between March 1 and July 15). Road maintenance to improve drainage will be completed on the access road to the water source, including the placement of gravel.

II. Effects on Concerns

Water Quality and Aquatic Habitat

Concern: *Brice Creek is listed on the Oregon DEQ Final 1998 Water Quality Limited Streams – 303(d) list for temperature concerns from the mouth up to the confluence with Parker Creek. There is a concern that timber sale activities may affect water temperatures. Specifically, harvesting riparian trees may increase stream temperatures by decreasing shade to the stream channel. Another concern is that created openings near streams may increase the temperature of the groundwater thereby increasing stream temperature.*

Concern: *Timber harvest activities can affect aquatic habitat. Removal of trees may reduce the potential for large woody debris to enter the stream channel. A reduction in large woody debris can cause channel stability concerns and limit hiding cover and pool habitat. Fine sediment can enter the streams by being transported down roadside ditches. Use of roads and decreased maintenance of these roads increases these concerns. Fine sediment can impact aquatic habitat by decreasing spawning habitat and by reducing macro invertebrate habitat.*

Affected Environment

Brice Creek is currently listed on the Oregon DEQ's 303(d) Water Quality Limited Stream List for having too warm temperatures during the summer months. The area listed is from the mouth of Brice Creek up to the Parker Creek confluence. The seven-day average temperatures for data collected from 1997 to 2001 showed Brice Creek exceeding the State Standard of 64° F from the mouth to the data collection site above the confluence with Crawfish Creek. The data collection site above Champion Creek ranged from 59.34° F to 62.77° F for the last five years. This indicates that the reaches of Brice Creek within the Upper Brice West Drainage have been within the State standards for the last five years, however just downstream the temperatures do increase and are expected to be causing a concern to the downstream aquatic resources.

The proposed timber sale is within the Upper Brice West 7th Field Drainage (02H). This drainage includes a section of Brice Creek (between the Champion Creek and Grass Creek confluences) where cutthroat trout are the only fish species present. Much of the stream in this part of Brice Creek has been altered due to the road that is confining the channel and from past in-stream timber salvage activities that removed the large woody debris. The stream is now unstable and cannot reach dynamic equilibrium with the amount of bed-load moving down the channel. Boulders within the channel are loose and material tends to be unsorted. This has resulted in long riffles with minimum pool habitat. In-stream salvage of large woody debris is also evident in sections of the channel. As mentioned in the Brice Creek Watershed Analysis, large woody debris is minimal throughout most of Brice Creek. Riparian condition is poor where the road is adjacent to the channel. Hardwoods between the stream and the road limit large conifers from growing within the riparian areas. Combinations of large and small conifers are within the riparian area for much of the stream opposite the roadside. The stream inventory data indicates most of the riparian vegetation in this area consists of small trees (60 to 67 percent) with some larger conifers (25 to 38 percent). The channel tends to be well shaded; however some areas are more open with direct solar radiation. Pools, when present, are deep and tend to provide good adult trout habitat. Juvenile trout were more abundant, although numbers were moderate.

Excessive bank erosion and downstream fine sediment deposition in Brice Creek is currently low. However, the high road density may contribute to local effects. The ditches from mid slope

and valley bottom roads intercept overland flows and essentially function as intermittent streams. This cumulative effect can cause an increase in peak flows within the area causing bank erosion, which would result in fine sediment deposition. The ditches also transport fine sediments picked up from the road surfaces (Everest et. al., 1987).

When water is retained in soils, the chances of soil movement are higher. Well-drained soils tend to be more stable. The soils in the planning area are well drained and do not hold water. Although the tributary streams within the drainage are steep, there are blown down trees that also help stabilize the soils. The tributary stream channels also appear to be stable, not showing frequent signs of peak flow concerns. There are a few areas where the channels are experiencing bank erosion that may be a result from increased runoff where road ditches capture surface water.

Environmental Effects

Alternative 1

Direct and Indirect Effects: No trees will be removed under this alternative. Conditions will be similar to those discussed above under Affected Environment.

Road restoration projects will not occur. These roads will be at a higher risk for failure and may contribute fine sediment into Brice Creek. However, these risks are low. Fine sediment is not a high concern for the upper Brice Creek Watershed. There is a downstream concern in the lower reaches. Existing conditions will be maintained under this alternative. There will be no direct or indirect effects. The riparian silviculture project along Brice Creek will not be implemented. There will be no direct or indirect effects to water quality.

Cumulative Effects: Cumulative effects from sediment coming off unmaintained roads may occur at low levels. There will be no measurable cumulative impacts to water quality. There will also be no long-term cumulative benefits

Alternatives 2 and 3

Both action alternatives will have similar effects in respect to water quality. The difference between the alternatives is the size of gaps from 1 to 2 acres to $\frac{1}{4}$ - to $\frac{1}{2}$ -acre. Both alternatives maintain full riparian reserves along all streams within or adjacent to the harvest units. The majority of all stands within the units will have 60 to 80 percent canopy cover.

Water Temperature Concern

Direct and Indirect Effects: These alternatives will maintain full riparian reserves, 190 feet on both sides of all streams, within the timber harvest areas. The small openings of $\frac{1}{4}$ to 2 acres will not affect the ground water in this area with such well-drained soils. Direct or indirect effects to stream temperature from timber harvest are not expected to be detectable.

The riparian silviculture restoration project along Brice Creek will enhance riparian conditions. Current conditions consist of a narrow band of trees between the stream and the road. In places, there are hardwoods out competing small conifers, in other areas there are dense patches of small conifers that would benefit from being released and in other areas there are no trees growing at all. Existing hardwoods will be maintained at least 30 to 50 feet from the stream channel. The trees that will be girdled or felled will be a pre commercial size, typically between 6 and 15 feet high. The shade to the stream channel will not be reduced since the trees to be thinned will be a greater distance from the channel than the height of the trees. No measurable effects are expected. Girdling will be the common method to thin out the trees; removal will be kept at a minimum.

Cumulative Effects: There are several other timber sale projects planned within the Brice Creek Watershed. These include Blodgett Timber Sale and the future sale that will be in the Marten and Inch Creek area. These timber sales will provide riparian protection that will maintain stream temperatures. Cumulative effects to stream temperature from timber harvest are not expected to be measurable within Brice Creek. Long-term cumulative effects will be positive as the trees continue to grow in the riparian areas.

Fine Sedimentation Concern

Direct and Indirect Effects: Fine sediment can embed cobbles and gravels with subsequent effects on spawning and macro invertebrate habitat. Lower Brice Creek does have fine sediment concerns as seen by the high amount of embedded cobbles. Fines do not currently appear to be a large concern within the upper watershed. Water draining off roads and through ditches along roads can be a source for bringing fines into stream channels. If not maintained properly, culverts within roads can also plug and fail during storm events. To prevent these impacts, these alternatives list several road restoration projects that improve the drainage off the roads, which will limit the need for maintenance.

The mid-slope roads that cross stream-channels, along with the valley bottom road along Brice Creek are the largest concern with regard to negative effects to water quality. The valley bottom road will be maintained at the current level. Along with providing access for future timber activities, recreation and fire suppression, the majority of the mid-slope roads south of Brice Creek within the planning area also lead to active lode mining claims. In order to provide access for miners, these roads will be left open. The roads will be water barred to improve drainage where needed. Some roads that will not be used except for fire suppression or future timber harvest will be stored by closing, water barring and installing drain dips to replace the function of culverts. These roads will be considered to be in a self-maintaining status and are expected to have less of a chance of failure. Improving the drainage will also reduce sedimentation within the Brice Creek Watershed.

A total of 2.3 miles of road will be inactivated. Most of these roads are small spur roads. The restoration of all but 0.5-mile of these roads will have no measurable benefit to the aquatic resources. The road density will be decreased to 3.4 mi/sq. mile. Fine sedimentation to the stream channels may occur while implementing these road restoration projects. Best Management Practices, such as implementing the projects during the dry times of the year are expected to minimize the potential for fine sediment from entering the stream channel. Following BMP guidelines will reduce potential effects so that detection of fine sediment is not measurable within the watershed.

Cumulative Effects: The long-term and cumulative benefits of well-drained roads will improve aquatic conditions in the Brice Creek Watershed. The 2216-821 Road is within the planning area north of Brice Creek. This is a mid-slope road that is recommended to be decommissioned (0.5-mile) when funds are available.

The roads restoration projects will help reduce cumulative fine sedimentation concerns within the Brice Creek watershed.

Aquatic Habitat Concern

Habitat for fish and other aquatic species within this section of Brice Creek is in fair to poor condition. The amount of large woody debris, which is important in forming pool habitat, providing cover and channel stability, is low throughout Brice Creek. In addition, Road 22 was

constructed along the valley bottom and in some areas, is immediately adjacent to the stream channel. This has created areas where the stream is now channelized and is not in dynamic equilibrium with the sediment being transported by the channel, resulting in a stream channel that is not stable in these areas.

Direct and Indirect Effects: Timber harvest from these alternatives is not expected to have direct or indirect impacts to aquatic species. Full riparian reserves will be maintained adjacent to harvest units. These intact riparian reserves will continue to provide a future source of large woody debris, which provides habitat and helps stabilize channels. The small openings of ¼ to 2 acres, for either Action Alternative are not expected to have an impact on the aquatic habitat within Brice Creek. This project will have a small direct beneficial effect on the riparian areas of Brice Creek.

Cumulative Effects: The riparian silviculture project along Brice Creek will enhance the riparian area to meet the goal of having 80 percent of the riparian trees over 80 years old. The road has a large effect on the riparian reserve along Brice Creek. This project will have a small cumulative beneficial effect on the riparian areas of Brice Creek.

Soils

Concern: *Soils in portions of the planning area are characterized as unsuitable for regeneration because they are shallow, well drained and rocky. The concern is that harvested areas will not be successfully reforested.*

Affected Environment

Much of the planning area lies within the inner gorge of Brice Creek where slopes are very steep and soils are mostly shallow and rocky. The hard rock that is exposed in this inner gorge has been mantled with cobble-size rock fragments in the stream bottoms and concave foot slopes that are located below long smooth steep slopes. These foot slope landforms combined with headwall scarps and ridges where rock outcrop and very shallow soils exist are the landform basis for mapping the soils that are unsuitable for regeneration.

Aside from limitations for plant-ability, soil characteristics that may affect the survival and growth of tree seedlings include cool temperatures on north-facing slopes and ridge tops above 3,500 feet. The drought quality of shallow and extremely rocky soils on westerly aspects may also affect the survival of planted seedlings.

Environmental Effects

Alternative 1

Direct and Indirect Effects: No trees will be removed under this alternative. Existing conditions will remain the same. There are no expected direct or indirect effects from Alternative 1.

Cumulative Effects: There are no expected cumulative effects from Alternative 1.

Alternatives 2 and 3

Direct and Indirect Effects: All harvest units were drawn outside of the identified and verified unsuitable soils. Harvest and prescribed burning will remove some of the duff and litter, exposing small inclusions of shallow soil and rocky areas. If gaps are located in these areas, there could be problems with regeneration; however, the gaps are small, somewhat shaded and trees on the edges will provide annual opportunities for seed fall. Regeneration with appropriate stock is expected to be successful

Cumulative Effects: Since harvesting started in the 1940's in the Brice Creek watershed, the majority of harvested areas have been successfully reforested. The majority of the proposed Blodgett and Crowdog timber harvest projects are thinning. There are no anticipated cumulative impacts to soil productivity that would prevent successful reforestation in Brice Creek watershed over the next 10 years.

Trail Impacts

Concern: *Existing developed recreation facilities within the Northnoon Planning Area include the Noonday Wagon Road Trail #1405 and Sultana Way Trail #1405A. These trails are historic mining routes or wagon roads. The first portion of the Parker Creek Falls Trail #1415 and its associated trailhead are also within the Northnoon Planning Area. The concern is that harvest activity will alter the forest experience and the visual integrity of the trails.*

Affected Environment

The Northnoon Planning Area is located in the Brice Creek watershed, which is a popular and heavily used corridor for recreation activities. Most of the recreation use in the Brice Creek watershed occurs along Brice Creek between the western forest boundary eastward to the confluence of Champion and Brice Creeks. The Northnoon Planning Area is located on the north and south slopes of Brice Creek between the confluences of Trestle Creek on the west and Grass Creek on the east. The planning area encompasses mostly the northern slopes of the Noonday Ridge with areas crossing over Brice Creek and onto the southern slopes above Brice Creek.

Existing developed recreation facilities within Northnoon Planning Area include the Noonday Wagon Road Trail #1405 and Sultana Way Trail #1405A. These trails are historic mining routes or wagon roads and because of their average eight-foot road width, they serve a variety of trail uses including 4x4, ATV, mountain bikes, equestrian and hiking. The first portion of the Parker Creek Falls Trail #1415 and its associated trailhead are also within the Northnoon Planning Area. Recreation sites near, but not in, the Northnoon Planning Area include Hobo Camp and Lund Park Campgrounds. These two semi-developed campgrounds indirectly serve the Brice Creek corridor and the Noonday Trail system. There are several dispersed camps within the Northnoon Planning Area. Most of these dispersed sites are along Brice Creek however there are a few along the Noonday Ridge area. There are several access points to the Noonday Trail system that are utilized as dispersed camps and trailheads as well. Miners and campers typically use the dispersed campsites along Brice Creek for overnight and/or day use recreation activities. The Noonday Ridge Hotel site, a historic miner's camp and way station, and one other site at the end of Spur Road 753, serves as access trailheads.

Primary recreational activities that occur within the Northnoon Planning Area include camping, picnicking, swimming, sunbathing and fishing; and trail uses including hiking, mountain biking, ATV, 4x4, and some equestrian. Other common recreation activities include hunting, gathering of forest products and driving roads for pleasure.

Noonday Wagon Road and Sultana Way Trails

These trails occupy historic routes used by miners to access the Bohemia Mining District. Much of the Noonday Wagon Road occupied the original Annie Trail, constructed in 1892, and served as the principle route into the northern portion of the mining district. In 1896, the Noonday Road was constructed almost entirely over the Annie Trail. Having the characteristics of a primitive access road averaging 8 feet in width, and a moderate to light level of use, the route provides

opportunities for a variety of users. Four-wheel use has increased significantly and a local 4x4 group has adopted, and helps maintain the route for 4x4 access. Recently, the route has been utilized as a principle route for the Jeep Jamboree Special Permit recreation event. There are several access points to the trail system and a few serve as undeveloped trailheads. One of these access points is the Sultana Way trail, a 0.25-mile route that junctions with the Noonday route and Forest Service Road #2212-732.

The location of the Noonday Wagon Road has had little change for its 100+ year life; however there have been numerous impacts on the trail setting. Of the original location, from Wildwood Falls, up Brice Creek to Champion Creek, along the present route of the trail and continuing westward along the main Calapooya Ridge to Grouse Mountain, less than 30 percent, or 7 miles, remain intact and maintained as a trail. Of these 7 miles, approximately 5 miles are located within a forested environment with about 2 miles traveling through clear-cut units that were logged during the mid- to late-1980's and early-1990's (Chanoos, Midway, and Jumbo Timber Sales). These large clear-cut units have negatively impacted the trail experience in regard to visual aesthetics. The Jumbo Timber Sale widened and utilized a portion of the trail for timber haul, which affected the 4x4 experience and challenge. Road 22 has also affected the upper portion of the trail by occupying short pieces of the trail or crossing over it in several areas.

Environmental Effects

Alternative 1

Direct and Indirect Effects: Recreation opportunities will remain static with some slow progress in development and improvements. The level of use in the Brice Creek corridor has been steadily increasing and the public and mining communities have been the impetus for many or most of the dispersed activities and sites. Trail emphasis is on maintenance and reconstruction of existing routes.

Cumulative Effects: There are no cumulative impacts associated with Alternative 1 within the planning area.

Alternative 2 and 3

Direct Effects: Proposed thinning at 75 percent and the creation of 1- to 2-acre gaps will open up the visitors' view of harvesting activities to a lesser extent than the presently located clear-cut units along other portions of the Noonday Trail. The Sultana Trail receives minimal use and the use is predominantly motorized which limits the impact to a brief encounter. The objectives of the proposed harvest prescription is to "maintain the natural appearance of existing stands" which may minimize the visual impact along the trail as well.

Impacts to the recreation resource from Alternative 3 are very similar to Alternative 2. However, the impacts may be slightly more due to the 10 percent increase in thinning levels. The smaller created gaps may be less noticeable to the trail user's view.

Indirect Effects: Timber harvest activities may cause temporary effects on hunting and other recreational forest product activities; however, effects are expected to be minimal and short term. Timber harvest activities may increase the availability of firewood for public collection, which is viewed by some as a recreational activity.

The following mitigations will reduce or eliminate the effect of harvest activities in Unit 3 near the Sultana Way Trail:

- Locate retention patches in areas closest to the trail
- No trail alteration or relocation for the purpose of timber haul or landings
- Avoid creation of snags near the trail route
- Locate gaps away from trail

Cumulative Effects: There are no anticipated cumulative effects associated with Alternative 2 and 3 within the planning area.

Road Access and Impacts

Concern: *The road density is high in the planning area and there are roads with potential failure concerns. Roads are needed for access for fire suppression, mining and timber harvest. The concern is that the need and potential to reduce the road density may be in conflict with the need for road access.*

Affected Environment

Over the last 40 years, road use was primarily for logging, recreation, hunting, mining and gathering of special forest products. The road system in the analysis area was originally constructed to provide mining access in the watershed. More recently built roads were developed in support of the timber management program and other human uses in the area. Total road length in the Upper Brice west 02H drainage is 25 miles, with a road density of 3.8-mi/sq².

A road inventory was completed for the Northnoon Planning Area. The focus of field investigations was to assess the mass wasting potential of stream crossings; however the stability of cut and fill slopes, and potential for surface erosion along the road surface (ditch lines and wheel tracks) was also considered. Forty-one stream crossings were examined within the Northnoon Planning Area. Several stream crossing sites and road segments were identified in the planning area where work could be undertaken, if funds were available, to mitigate the potential for mass wasting and surface erosion.

Slope stability throughout the Northnoon Planning Area was accomplished by examining the 1995 Flight Year, 1:12,000 scale aerial photographs for the presence of landside features, and by making several foot-traverses through areas proposed for timber harvest to confirm or deny interpreted landslides. Existing clearcut units were observed from vantage points along the Forest road network to determine the presence of timber harvest-related landslides on those hillsides. Road-related landslides were identified during the road inventory. Field verification revealed that many of the photo-interpreted landslides were in actuality an array of natural physical features, including talus chutes, wet areas with contrasting vegetation patterns and grass-covered rock meadows.

The temporary construction and improvement of 230-feet of an old mining road is proposed to access the upper portion of Unit 6 for timber harvest. In Unit 8 a 200-foot temporary road is also proposed for access.

Environmental Effects

Alternative 1

Direct and Indirect Effects: No temporary road construction will occur. Road restoration projects will not occur. These roads will be at a higher risk for failing and may contribute fine sediment into Brice Creek. However, these risks are low. Fine sediment is not a high concern

for the upper Brice Creek watershed. There is a downstream concern in the lower reaches. Existing conditions will be maintained under this alternative.

Cumulative Effects: There are no cumulative effects associated with Alternative 1 within the planning area.

Alternatives 2 and 3

Direct and Indirect Effects: For timber access, 430 feet of road will be constructed, decommissioned and planted. Because of the road building, there will be soil disturbance, compaction and the potential for noxious weed invasion. However, effects are expected to be minor and the mitigation measures of decommissioning and planting will reduce long-term impacts.

A total of 2.3 miles of road will be inactivated. Most of these roads are small spur roads. The restoration of these roads will have no direct, measurable benefit to the aquatic resources but will reduce disturbance to wildlife and cumulatively improve water quality by reducing fine sediments. The road density will be decreased to 3.4 mi/sq². Fine sedimentation will occur during restoration processes; however, this is expected to be minimal and short-term.

Cumulative Effects: The long-term and cumulative benefits of well-drained roads will improve aquatic conditions in the Brice Creek watershed. The road restoration projects will help reduce cumulative fine sedimentation concerns and reduce impacts to wildlife habitat

Late-Successional Reserves

Concern: *The 9,636-acre portion of LSR-222 in upper Brice Creek is in the eastern portion of the Northnoon Planning Area. There is a concern that harvest and associated activities such as prescribed fire will impact late-successional habitat recovery in the LSR.*

Affected Environment

The Record of Decision allocations provide habitat within the LSR's to assist in maintaining viable populations of late-successional associated species. The entire LSR-222 is a total of 508,000 acres; it is located on three national forests (Willamette, Umpqua and Rogue River) and two Bureau of Land Management units. The Cottage Grove Ranger District portion is only 9,636 acres or 1.8 percent. Some additional small reserves are managed as a patchwork of late-successional forest throughout the matrix lands.

The boundary of Unit 7 is adjacent to the LSR boundary. The stand within the LSR adjacent to Unit 7 is a plantation that is in the establishment stage. None of the other proposed harvest units are adjacent to the LSR.

Environmental Effects

Alternative 1

Direct and Indirect Effects: Late-successional vegetation would continue to grow. There would be no harvest activity adjacent to the LSR under Alternative 1. Inactivating approximately 2.3 miles of road within the Late-Successional Reserve would not occur. This would slow the recovery of late-successional habitat within the road prism.

Roads would continue contributing to fragmentation and impede connectivity of late-seral habitat.

Cumulative Effects: There are no cumulative effects associated with Alternative 1 within the planning area.

Alternatives 2 and 3

Direct and Indirect Effects: Thinning and harvest activity in Unit 7 would have negligible direct effect to the LSR because the stand adjacent to Unit 7 is a young plantation that will be managed to grow into late-successional vegetation. Maintaining late-successional canopy in Unit 7 will benefit the LSR while the young plantations in the LSR develop. Planting gaps with white pine would restore some of the conifer diversity to the area near the LSR.

Prescribed fire in Unit 7 will be conducted in a manner to reduce the risk of effects on the LSR. This will occur through timing of the fire activities, type of burn (jackpot or low-intensity under-burn) and mitigation of fire lines.

Inactivation of approximately 2.3 miles of road within the Late-Successional Reserve would enhance the recovery of late-successional habitat within the road prism and would enhance connectivity of late-seral habitat.

Cumulative Effects: Another action that may affect the LSR within the Brice Creek drainage is the paving of 4 miles of Road 22 proposed as a Secure Rural Schools Act project (known as PAYCO). This will not change the effect to wildlife habitat within the LSR. However, paving may reduce fine sediment from running off, and into the stream channel, which would be a beneficial effect to water quality.

Forest Health

Concern: *The majority of the trees in the southern portion of the planning area are 120 to 250 years in age. The stands are dense in some areas and are becoming susceptible to a high intensity fire, insect or disease activity. White pine blister rust has killed the majority of white pine in the planning area. The concern is that left alone, the area will burn at high intensity or be susceptible to insect or disease epidemics.*

Affected Environment

Cool moist western hemlock plant associations characterize the planning area. At the highest elevations there is a transition to silver fir plant associations. Historically, fire has determined the pattern and structure of the forests in these plant associations. Northnoon has a moderately high-severity fire regime. Fires occur at 25- to 100-year intervals and are partial stand replacement fires. Stand replacement fires occur over large areas at a 140- to 200-year interval. Lower slopes near Brice Creek typically experienced only low- to moderate-intensity fires providing small patches old-growth refugia.

Unit #3: This stand is a mosaic. The stand appears to have originated from two major fire events, one approximately 180 years ago and a second approximately 100 to 120 years ago. On the western side of the unit the second fire was stand replacement in nature; in the remainder of the stand the fire was partial replacement or thinning. There are individual trees in the 45- to 50-inch category that date to even earlier fires and are as old as 300 years. There is limited shrub understory in most of the unit. Diseases present within the unit are white pine blister rust and red ring rot (*Phellinus pini*) occurring on both Douglas-fir and western hemlock. Conifer regeneration in the understory is generally quite old and of poor vigor.

Unit #4: The oldest component of this stand originated from a stand replacement fire approximately 180 years ago. Since then this stand has experienced a succession of low to

moderate fires that have resulted in a mosaic of species composition and size classes. Patches have from one to three stories with most having two. White pine blister rust occurs on sugar pine in the lower portions of this stand (Units 1 and 2) and on western white pine in the upper portion (Unit 4). There is minimal shrub understory in most of the stand.

Unit #5: This stand originated from a stand replacement fire occurring approximately 150 years ago. It appears a second fire replaced most of the resulting stand 15 to 20 years later. The resulting stand is single story in character and is fairly uniform. There is very little understory shrub vegetation with some Rhododendron and Pacific yew. Blister rust occurs on western white pine

Unit #6 & 8: The oldest individual trees in this stand date back to a stand replacement fire occurring approximately 180 years ago. Frequent low to moderate intensity fires have resulted in a mosaic of stand conditions, such as age, species composition, and stand density. Historically, western white pine was an important minor seral species in the upper portion of the stand (Unit 6) with sugar pine occurring in the lower portion of the stand (Unit 8), but white pine blister rust has killed most of these five needle pine components. This mortality has resulted in a large number of snags and down woody material.

Units 6 and 8 are separated by a band of unsuitable soils that are not plant-able because of high rock content.

Unit #7: The oldest components of this stand date back approximately 200 years with most of the stand dating back to moderate to high intensity fire disturbance occurring about 140 years ago. Frequent low intensity fires have left this stand quite variable. In the upper portion of this stand, western white pine comprised up to 20 to 25 percent of the overstory. Most of this is now dead due to white pine blister rust with a resulting large number of snags and down wood.

Environmental Effects

Alternative 1

Direct and Indirect Effects: This alternative would maintain the existing conditions. Stands currently are densely stocked with 70 to 80 percent canopy closure and low tree vigor and growth. The stands would continue to grow slowly with the understory trees experiencing suppression mortality. The shrub layer would remain minimal except where individual trees die or until each stand reaches the old-growth stage. The stands would be at risk for insect and disease or crown fire because of the moderately high fuel loading.

Unit 7 is adjacent to the LSR and some of the other units are near the LSR boundary. Maintaining high density and fuel loading in these stands may affect the resiliency of the stands in the LSR to future insect, disease or fire events.

Cumulative Effects: Failure to treat high-density stands and reduce fuel loading in the Brice Creek drainage places the watershed at risk for catastrophic events eventually. It is very difficult to evaluate the risk because of the variable fire regime history. The oldest trees in the watershed are Douglas-fir at approximately 500 years. The average age of the older stands is 200 to 300 years. The fire return interval for the planning area is 25 years; the stand replacement interval is 93 years and the interval for low- to moderate-intensity fire is 31.3 years. Clearly, these stands rarely existed without some stand-disturbance from fire every 70 to 100 years. The risk of widespread insect, disease or catastrophic fire is not immediate but will increase over the next 70 years depending on weather conditions and the health of the forest within the watershed.

Alternatives 2 and 3

Direct Effects and Indirect Effects: The direct effect of the action alternatives is similar in terms of forest health benefits. Thinning the understory trees would reduce the canopy closure to approximately 60 percent. The stand structure would be simplified, removing from 55 to 88 percent of the understory trees in the areas proposed for thinning. The large overstory trees would be retained except in the gaps where only 15 percent would be retained in 1- to 2-acre gaps and no overstory would be retained in the smaller gaps. The effect to the remaining trees would be increased growth from reduced competition. A new understory of hemlock, western redcedar and hardwoods would develop. Creation of gaps would allow rust resistant white pine to be planted. Combined with prescribed burning there would be a lower fuel loading and the potential for crown fires would be reduced.

The indirect effects of thinning and prescribed burning would not be significant to the watershed in terms of fuel loading because of the low number of acres being treated. However, because one stand is adjacent to the LSR, and some of the stands are near the LSR, there would be some benefit to having vigorous stands with reduced fuel loading near the LSR. More stands would need to be treated in the area before any measurable benefits were gained. The re-introduction of white pine would improve the species diversity in the planning area.

Cumulative Effects: Thinning to treat stand density and areas with *Phyllinus pini* infection (stem rot) such as the proposed Blodgett Timber Sale and possibly the Crawdog Timber Sale, will improve the stand vigor over a certain percentage of the watershed thus reducing the potential for high levels of insect or disease activity. If a substantial proportion of the watershed is treated over the next fifty years, there will be an overall reduction in fuel loading, an increase in stand vigor and a subsequent lower risk for stand-replacement fires or catastrophic insect or disease events.

Visual Impacts

Concern: *The Brice Creek corridor is valued for its aesthetic attributes and for the recreational opportunities including hiking, camping, fishing, hunting and driving for pleasure. There are currently multiple, large clearcuts detracting from the visual quality of the area. There is a concern that harvest activities will impact the view shed from Road 22 and the Noonday Trail #1405.*

Affected Environment

The proposed harvest units for the Northnoon Planning Area have a VQO (Visual Quality Objective)⁴ of maximum modification, while the northwestern portion of Unit 4, along Road 2212, has a VQO of modification. The majority of this planning area is not identified as being visible from any high-use viewpoints. The Sensitivity Level of management activities is 3 (low), and the Variety Class is B (common). A small portion of Unit 4 is visible as background from Road 2470 and has a Sensitivity Level of 2 (average). All three of the management alternatives identified in the EA comply with the VQO for the created opening restraint in this area.

Environmental Effects

Alternative 1

Direct and Indirect Effects: This alternative will not change the current VQO condition of the Northnoon Planning Area. Existing condition indicates that there are approximately 355 acres

⁴ Visual Quality Objectives is based on Forest Service Manual 2380 Landscape Management Direction. Each VQO has specific objectives for alteration of the visual resource. In areas with a VQO of modification, management activities may visually dominate the original landscape characteristic.

with vegetation less than 20 feet tall that are identified as “background” and qualify as “created openings”. The current percent of created opening is 9.8 percent.

Cumulative Effects: There are no cumulative effects associated with Alternative 1 within the planning area.

Alternative 2 and 3

Direct and Indirect Effects: Creating gaps of 1 to 2 acres totaling 27.1 acres with 15 percent green-tree retention will result in 10.6 percent created opening, which is below the restraint of 33 percent maximum modification.

Created openings will be ¼- to ½-acre in size for a total 9 acres, increasing the percent of created openings to 10.1 percent, which is also below the maximum modification restraint of 33 percent.

Cumulative Effects: There are no cumulative effects associated with Alternative 2 and 3 within the planning area.

Geology

Concern: *Could harvest accelerate landslide rates? The Northnoon Planning Area is located on steep rocky soils. There are several Debris Slide Basins within the planning area. Portions of most of the units are within mapped Debris Slide Basins. Stability of these areas is a concern.*

Affected Environment

The Northnoon Timber Sale Planning Area can be characterized as rugged, highly dissected, mountainous terrain. Elevations range from 1,820 feet at the confluence of Trestle and Brice Creek to 5,069 feet on Noonday Ridge, representing some 3,250 feet of vertical relief. Erosional landforms present within the Northnoon Planning Area include V-shaped canyon walls or sideslopes, valley inner gorge, fan-shaped debris slide basins, and broad ridge-tops. Depositional landforms found within the Northnoon Planning Area include conical-shaped debris fans at the mouths of some of the major tributaries, and floodplains and terraces associated with the alluvial valley floor. Large deep-seated landslide earthflow landforms are not present in the Northnoon Planning Area.

A slope stability assessment was accomplished by examining the 1995 aerial photos for the presence of landslide features and by making several foot traverses through areas proposed for timber harvest to confirm or deny interpreted landslides. Existing clearcut units were observed from vantage points along the forest road network to determine the presence of timber harvest related landslides. Road related landslides were identified during the road inventory.

Environmental Effects

Alternative 1

Direct and Indirect Effects: Existing conditions will remain the same. There are no anticipated direct or indirect effects under Alternative 1.

Cumulative Effects: There are no anticipated cumulative effects within the planning area associated with Alternative 1.

Alternatives 2 and 3

Direct and Indirect Effects: Hill slopes within the designated sale area boundary are considered generally stable due to the presence of highly permeable soils. The rate of natural landslide activity is low relative to other areas on the Forest where clay-rich soils are widespread. Although natural landslides seem to occur rather infrequently in the Northnoon Planning Area, when they do occur sediment yield is usually significant. Relatively few rapid, shallow-seated landslides of either natural or management-related derivation occurred throughout the Northnoon project area during the November 17, 1996 storm, a 100-year flood event.

Several recent cut-slope failures, all involving less than 100 cubic yards of displaced material, were observed during the road inventory. The majority of the road-related failures occurred within the valley-inner-gorge of Brice Creek, specifically along the 200 and 2212 Roads. Findings of the inventory indicated that road systems located within the Northnoon project area were relatively unscathed by the recent storm events.

Planned timber harvest subscriptions for the Northnoon Timber Sale (¼- to 2-acre patch cuts and thinning treatments) are not expected to accelerate landslide rates.

Cumulative Effects: Although past management activities have contributed to landslide activity in the Brice Creek watershed, the Northnoon Timber Sale and the proposed Blodgett and Crawdog Timber Sales are not expected to contribute to the cumulative effects of harvesting and road building within the watershed. These sales are mainly thinning harvests and the proposed temporary roads will be decommissioned and re-vegetated.

Abandoned Mines and Safety

Concern: *There is an open mineshaft on Road 2212 at milepost 3.01. There is a concern about the safety of this shaft.*

Affected Environment

Mining activity historically occurred throughout the Northnoon Planning Area. The original trails through this area were used to access the Bohemia Mining District. The open abandoned mineshaft is about 100-feet above Road 2212 at milepost 3.01. In the past, a fence was placed around the opening to prevent accidental falls into the opening; eventually the fence material deteriorated or was removed. The proposed action is to fill the hole with 10- to 20-cubic yards of rock and soil material.

Environmental Effects

Alternative 1

Direct and Indirect Effects: The mineshaft would stay open and continue to be a safety hazard.

Cumulative Effects: There are no anticipated cumulative effects associated with Alternative 1 within the planning area.

Alternative 2 and 3

Direct and Indirect Effects: The material would be moved with a track type front-end loader from the road through the timber to the hole and dumped. This operation would take place in August or when the soils are dry and there would be very little compaction of existing soils. Down logs may need to be moved but no timber would be cut. The direct effect would be an

elimination of an existing safety hazard. The indirect effect would be the restoration of soil and ground cover over the period of a few hundred years.

Cumulative Effects: No mineshafts have been closed in the past five years. There are no plans to close other mineshafts in the Brice Creek watershed in the next five years.

III. Effects on Other Components of the Human Environment

Wildlife and Habitat

Affected Environment

The planning area contains a variety of wildlife habitat including late-successional vegetation, riparian habitat, unique habitat, old-growth and early-seral vegetation.

Environmental Effects

Alternative 1

Direct and Indirect Effects: Existing conditions would continue. There would be no disturbance to wildlife within the planning area.

Cumulative Effects: In the next 10 years, there are no cumulative effects anticipated with this Alternative within the planning area.

Alternative 2 and 3

Direct and Indirect Effects: The following proposed actions would cause short periods of disturbance to the list of species addressed below. These actions will occur during the summer months when wildlife species generally are in their best physical condition and suffer less from disturbances. Activities that cause disturbance in the earlier part of spring may cause adverse effects to their young, from abandonment to temporary avoidance. The effects of disturbance are expected to be minimal and will not cause concerns for viability.

Partial harvesting 163 acres

- Temporary road construction and decommissioning
- Re-surfacing 3.7 miles of Road 2212 with crushed aggregate
- Road 2212-142 will have water bars removed for access, and replaced after harvest operations are completed
- Out sloping road, installing drain-dips and/or water bars, which will help stabilize the roads
- Snag creation at nine per acre
- Installation of bird/mammal boxes at three per acre
- Placement of 150 lineal feet of large woody material within the units
- Reforestation within the created gaps
- Precommercial thinning
- Disposal of vegetative residue from harvest activities with low-intensity under burning or jackpot burning
- Removal of noxious weeds and nonnative plants
- Filling the abandoned mining shaft hole with 20 cubic yards of rock and soil material

Cumulative Effects: Although past management activities disturbed wildlife habitat in the planning area, there are no future planned activities that cumulatively would have measurable impacts to wildlife habitat within the planning area in the next 10 years.

Prescribed Fire Effects to Wildlife Habitat

Affected Environment

Wildfires have played a major role in changing wildlife habitat conditions within this planning area. In the late 1800's, a fire of moderate- to high-severity burned throughout the Northnoon Planning Area.

Environmental Effects

Alternative 1

Direct and Indirect Effects: Fires will continue to be suppressed. This will maintain the late-successional habitat with a dense understory. Some of the understory will turn into snags and down wood through suppression from the overstory. Fuel loading will continue to build. Many species will benefit from retention of the understory and the creation of down wood.

Cumulative Effects: With more than 50 percent of Brice Creek watershed in allocations or conditions that will result in little if any harvest activity (LSR, Riparian Reserve, Roadless Area, unsuitable soils, etc.) and suppression continued in the majority of the watershed, cumulatively the Brice Creek watershed in the foreseeable future will have a trend of high fuel loading.

Alternatives 2 and 3

Direct and Indirect Effects: Information that generalizes these effects is scarce and difficult to quantify due to the variable nature of fire and the ecosystem in which it occurs (Walstad et. al. 1990). The effects vary with the intensity of the burn and other site factors (Borchers et. al. 1990). A few studies have shown that fire kills or injures many immobile or slow moving terrestrial organisms outright (Mitchell and McMahon 1990) including species such as terrestrial mollusks and amphibians and other litter-dwelling organisms. Damage to forest litter invertebrates seems to be directly related to the intensity of the burn (Christiansen and Lavigne 1996). More mobile species are able to escape injury by seeking refuge in the unburned areas or by going deeper into the soil profile or escaping to the remaining overstory trees. One such study on arthropods showed that the impacts of fire seem to be mitigated by the retention of trees in the overstory to provide for more favorable forest floor microclimates (Fellin 1980).

Low-intensity ground fires and jackpot burning will not consume all of the organic material on the forest floor. Typically low-intensity ground fires create mosaics of burned and unburned areas and species will be able to seek refuge in unburned areas during the prescribed burn, allowing re-colonization of the area. The effects of prescribed fire should be minimal to wildlife species.

Minimal impacts will occur to large coarse wood by low-intensity burns and can serve as refugia to wildlife.

Coarse woody debris will be reduced in some areas and in other areas new coarse wood will be recruited due to fire mortality.

Indirectly, the prescribed fire will contribute to alteration of forest habitat structure and microclimate, though the effect will likely be minimal. It may result in a change in species components favoring species that are adapted to more of an open forest environment.

Cumulative Effects Common to all Action Alternatives: There has been discussion of proposed prescribed fire application over 3,000 acres adjacent to the Bohemia Mining District. The effects have not been analyzed but the fire intensities are expected to be low to moderate, mitigating the risk of high-intensity fire. The effects of implementing both proposed projects are expected to be low to moderate and are not expected to cause viability concerns for any species. As mentioned above, fire was a frequent visitor (average 60 years, Brice Creek Fire Study, BCWA 1997) to the Northnoon Analysis Area, before active fire suppression occurred in the late 1800's. Species adapted to the transition in forest structure contracted or expanded their population level depending of habitat suitability for that species.

Trees disturbed by wildfire often remain standing, creating large areas of early-seral habitat with abundant large coarse wood including snags and down wood. Logging however, traditionally removed most of the trees from a stand. Early-seral habitat with natural levels of coarse wood, including standing dead trees, are virtually absent within the watershed; only 15 acres exist at the head of Brice Creek within the entire watershed, compared to the 11,000 plus acres that would be expected without fire suppression.

There are some remaining areas of historical old-growth refugia in the Northnoon Planning Area and the proposed actions will not impact these refugia areas. Although associated species are suspected to persist within the watershed, most of the complex old-growth stands in Brice Creek watershed have been logged, resulting in loss of historical refugia habitat. Cumulatively, old-growth dependent and early-seral species that require extensive areas of large coarse wood are suspected to be the most impacted by the loss of old growth functional components throughout the watershed. Past harvesting and fuel treatments combined with future activities to reduce fuel throughout the watershed may cumulatively impact levels of snag and down wood habitat.

Management Indicator Species

Effects to the spotted owl, cavity nesters, pine marten and pileated woodpecker were addressed earlier in this chapter. Effects to peregrine falcon and bald eagle are discussed in the Threatened and Endangered Species section.

Big Game (Blacktail Deer and Roosevelt Elk)

Affected Environment

Evidence and sighting of big game within the analysis area include deer, black bear and occasionally elk. The sighting of elk has been limited to a half dozen in the last ten years, consisting of one- to six-head of elk. The majority of the area where the proposed actions will occur serves as summer range for deer. The Northnoon Analysis Area encompasses 3,612 acres. Twenty-two percent has been previously harvested and have been regenerated. A total of 397 acres currently provide forage habitat and 433 acres function as hiding cover; the remaining acres would be classified as thermal habitat. Permanent foraging opportunities exist in approximately 28 acres of natural meadows. Current forage/hiding/thermal ratios are 11%/12%/77%. Most of the mature stands are heavily stocked with trees, while shrubby understory (browse) is sparse. Old-growth stands (387 acres) are more complex and forage opportunities exist in gaps and shrub layers. The slopes are northerly, with heavy snow loads most of the winter months.

Environmental Effects

Alternative 1

Direct and Indirect Effects: There are no direct effects under Alternative 1. The available forage (397 acres) in previously harvested regeneration units will diminish within the next 20 years, as these Douglas-fir plantations develop and the overstory canopy closes. Existing mature stands are expected to retain closed canopies for several decades with little understory development until the formation of gaps occur.

Cumulative Effects: The retention of large areas of the watershed without current or future disturbance will lead to a reduction of big game habitat. Forage in open clearcuts becomes unavailable because it is covered with snow; deer or elk generally expend more energy digging through the snow than they gain from eating the food they uncover, resulting in loss of body weight. Additionally the browse in open clearcuts generally has poor nutritional value because nutrients have been leached out from winter rains and snow.

Alternatives 2 and 3

Direct and Indirect Effects: Alternative 2 will increase forage/hiding/thermal ratios to 12%/12%/76%. The proposed regeneration gaps range from 1 to 2 acres in size, providing a high edge-to-area ratio. The small regeneration gaps are well distributed within the analysis area, creating a good opportunity for high utilization of available forage. Additional forage opportunities will occur in areas that are going to be partial harvested. The understory will respond to the reduction in tree canopy closure and underburning with an increase in vegetation growth in the short term (10 years). Habitat could be improved by enhancing the shrub layers under the forest canopy, providing forage in winter months during a time of critical need for big game.

In Alternative 3 forage/hiding/thermal ratios will remain the same. Additional forage opportunities will occur in areas that are going to be partial harvested with small ¼- to ½-acre gaps. The understory vegetation will increase in response to the reduction in tree canopy closure and underburning in the short-term (10 years).

The following actions will provide some benefits to big game and their habitats:

- Temporary skid road and landing construction will provide habitat for spring forage on approximately 2 acres through application of a native seed mix
- Decommissioning approximately 3 miles of road will reduce road densities and associated disturbance
- Disposal of vegetative residue from harvest activities by low-intensity underburning or jackpot burning will release nutrients that will promote sprouting of browse and stimulate new growth for a year or two within the treated areas
- A reduction in noxious weeds and nonnative plants will likely provide more native forage habitat

The extent of the benefits derived from these actions would be difficult to analyze because there is no information on population densities or the effects from disturbances associated with the use of roads in the analysis area.

Cumulative Effects Common to the Action Alternatives: There are no other known proposed projects at this time that would change forage/hiding/thermal ratios within the analysis area. Forage will continue to decrease until gaps develop within the forest canopies, generally

by processes such as disease, wind-throw or wildfire. Populations are expected to decline within the analysis area in the future as forage opportunities decrease. However, these species are adaptive to changes in successional stages of the forest ecosystem and mobility allows population densities to shift throughout the watershed. These actions are not expected to adversely affect the viability of these species within the Brice Creek watershed.

Historically wildfire provided areas of early-seral habitat creating gaps in the forest matrix. Over the last forty years of logging operations, clearcut plantations provided forage that replaced early-seral habitat typically created by fire. However, most clearcut harvest units were larger than fire-created openings (greater than 10 to 20 acres) so the edge-to-area ratio was low, with little cover remaining within the units. Consequently, there was poor utilization of existing forage within these harvested areas. Over the last ten years, harvest activity has slowed considerably resulting in fewer acres of forage habitat. The trend, including the proposed action, is for more partial harvest or thinning operations, which will likely reduce the abundance of deer within the watershed.

Threatened, Endangered and Sensitive Species

Biological Evaluation

Activities considered in this project require a BE (Biological Evaluation) to be completed (FSM 2672.4). The BE process documents activities necessary to ensure that proposed management actions will not jeopardize the continued viability or cause adverse modification of habitat for:

- Species listed or proposed to be listed as threatened or endangered by the USDI-Fish and Wildlife Service
- Species listed as sensitive by USDA-Forest Service Region 6
- Species listed as Survey and Manage/Protection Buffer Species (ROD)

The BE is a four-step process. Evaluation of impacts on a given species may be complete at the end of Step 1 or may extend through Step 4.

Table 9. Summary of Biological Evaluation Process

SPECIES	STEP 1 Pre-field Review Habitat Present?	STEP 2 Reconnaissance Assessment Species Located?	STEP 3 Risk Conflict?	STEP 4 Biological Investigation Required?
<i>Clemmys marmorata marmorata</i>	NO			
<i>Corynorhinus townsendi</i>	YES	NO		
<i>Falco peregrinus</i>	NO			
<i>Gulo gulo luteus</i>	NO			
<i>Haliaeetus leucocephalus</i>	NO			
<i>Histrionicus histrionicus</i>	YES	NO		
<i>Martes pennanti pacifica</i>	YES	NO		
<i>Myotis thysanodes vespertinus</i>	YES	NO		
<i>Rhyacottiton cascades</i>	YES	NO		
<i>Sorex pacificus cascadenis</i>	YES	NO		
<i>Strix occidentalis</i>	YES	YES	YES	YES

Birds

Northern Bald Eagle *Haliaeetus leucocephalus* Status: Threatened

Affected Environment

The northern bald eagle is not a potential inhabitant of the project area. This raptor prefers large bodies of water supporting fish populations or flocks of waterfowl in combination with mature or old growth forest habitat for nesting and roosting. They are strongly affiliated with these habitat features although they may be observed over any terrestrial or aquatic area.

Environmental Effects

Alternative 1, 2 and 3

Direct and Indirect Effects: All proposed alternatives will have no significant effect to this listed species, no consultation will be required under ESA (Endangered Species Act) Section 7. There were no direct, indirect or cumulative effects to this species.

Cumulative Effects: There are no cumulative effects within the planning area associated with the Alternatives.

American Peregrine Falcon *Falco peregrinus anatum* Status: Sensitive

Affected Environment

The American peregrine falcon is not a potential inhabitant of the project area. The peregrine falcon inhabits cliffs or rock bluffs with suitable ledges that provide nesting habitat. This habitat type is not present within or near the area of the proposed Northnoon Timber Sale.

Environmental Effects

Alternative 1, 2 and 3

Direct and Indirect Effects: All proposed alternatives would have no impacts to the loss of viability to this species. There are no direct or indirect effects to this species.

Cumulative Effects: There are no cumulative effects within the planning area associated with the Alternatives.

Harlequin Duck *Histrionicus histrionicus* Status: Sensitive

Affected Environment

The Harlequin duck is not a potential inhabitant of the project area. This species may occur along any fish-bearing or large Class III stream that supports an adequate forage base and is relatively free from human disturbance. The close proximity of Road 22 and the disturbance associated with timber harvest, road use and recreation, limits habitat suitability for this species along Brice Creek. A member of the Eugene Audubon Society documented one Harlequin duck within the lower Brice Creek system during the summer of 2000. No streams within the proposed project area would provide habitat.

Environmental Effects

Alternative 1, 2 and 3

Direct and Indirect Effects: All proposed alternatives and related actions would have no impacts to the loss of viability to this species. There are no direct or indirect effects to this species.

Cumulative Effects: There are no cumulative effects within the planning area associated with the Alternatives.

Mammals

Pacific Western Big Eared Bat *Corynorhinus townsendi townsendi* Status: Sensitive

Pacific Fringe-Tailed Bat *Myotis thysanodes vespertinus* Status: Sensitive

Affected Environment

The big-eared bat and Pacific fringe-tailed bat are possible inhabitants of the project area. These bats form nursery colonies in open caves, adits, bridges, tunnels, cavities or buildings, and prefer structures with two openings for ventilation. The bats congregate at historical nursery sites in late spring and summer months, and are very sensitive to human disturbance. No nursery sites were located within the proposed project site. These bats are somewhat rare in Oregon, but have been documented within the Brice Creek watershed. Population densities are not known, and there is no information on their reproductive success. Roost sites are a critical resource for bats and availability may play a major role in determining population size. Bats are known to roost under and in thick bark of down trees, snags and green trees. Additional known roost sites are caves, cavities, adits and rock crevices. Human disturbance and reduction of adequate roost sites can lead to reduced body fitness, resulting in lack of reproductive success or death.

Environmental Effects

Alternative 1

Direct and Indirect Effects: Alternative 1 will have no impact on nursery colonies or habitat; therefore, there will be no direct or indirect effects.

Cumulative Effects: There are no cumulative effects within the planning area associated with Alternative 1.

Alternatives 2 and 3

Direct and Indirect Effects: The action alternatives will have no direct impact on known nursery colonies. The action alternatives may have impacts to individuals but are not likely to cause a trend to federal listing or a loss of viability when snag mitigations are applied.

Disturbance to individuals during harvest and other proposed action operations may occur if bats use the snags or trees as day roost sites. The roosting activity is critical for bats so that they may conserve energy and slow their metabolism. The effects from disturbance are not well documented. It is suspected that disturbance will increase the metabolic rate of the bats while they are roosting, which can lead to a reduction in fitness.

Most harvest activities occur during the summer months, which may make disturbance less of an issue compared to disturbance during the winter months. However, these small bats expend a lot of energy during flight and live on the threshold of life during their day-to-day existence; the effects are not measurable. It is not known if bats actively roost within or near the proposed units, but they do have the ability to select or move to other roost sites. It is not suspected that this will lead to a viability concern for this species.

Activities associated with timber harvest will eliminate individuals of the species from the use of their habitat (snags/trees) and may lead to their death if not detected during felling of trees/snags. Alternatives 2 and 3 will result in a loss of current and future snags or potential snag habitat on approximately 163 acres from the removal of trees that would have normally died from suppression mortality or other natural processes, reducing opportunities for roost sites, which correlates to a reduction in fitness.

The proposed actions listed below will enhance or mitigate effects to habitat for these species or associated prey species.

- Five snags created per acre
- Installation of bat boxes
- Placement of large woody material in the units
- The disposal of vegetative residue from harvest activities with low-intensity underburning or jackpot burning may create snag habitat

Cumulative Effects: Past and current management practices have made snags a limited resource for bats. This concern for snag habitat will likely continue for the near future. There is no information on the impacts of this loss of habitat feature (snags) and the effects to populations of bats. Arnett (2001, unpublished) indicates a strong correlation between increased numbers of snags and increased number of bats. Population size, condition or trends for bats are not known, but are suspected to be declining from habitat loss. Management activities that are expected to continue to have an effect on snag density within the watershed are: fire suppression (100 percent of the watershed) and timber harvest (Matrix allocation 46 percent of watershed).

Pacific Shrew *Sorex pacificus cascadensis* Status: Sensitive

Affected Environment

Pacific shrews are generally found around fallen trees in wet areas along forest streams flowing through areas occupied by red alder and salmonberry. They can also be found around fallen trees in moist conifer forest (Maser 1998). Shelter is important to shrews, and they are seldom found far from protective cover, such as logs and thickets.

Pacific shrews are carnivores and eat small reptiles, snails, slugs, earthworms, insects, centipedes and millipedes. Population densities are not known and there is no information on their reproductive success. They seem to be strongly associated with riparian habitat and are seldom captured elsewhere. There is habitat in the planning area adjacent to the proposed harvest units; this habitat will be protected with Riparian Reserve buffers.

Environmental Effects

Alternative 1, 2 and 3

Direct and Indirect Effects: All proposed alternatives would have no impacts to the loss of viability to this species. There are no direct or indirect effects to this species.

Cumulative Effects: There are no cumulative effects within the planning area associated with the alternatives.

California Wolverine *Gulo gulo luteus* Status: Sensitive

Affected Environment

The wolverine is not a potential inhabitant of the project area. This species is associated with large tracts of forested wilderness at higher elevations, generally in the vicinity of riparian systems or lakes.

Environmental Effects

Alternative 1, 2 and 3

Direct and Indirect Effects: There is no suitable habitat in the proposed project area. All proposed alternatives would have no impacts to the loss of viability to this species. There are no direct or indirect effects to this species.

Cumulative Effects: There are no cumulative effects within the planning area associated with the Alternatives.

Pacific Fisher *Martes pennanti pacifica* Status: Sensitive

Affected Environment

The fisher is not a potential inhabitant of the project area. This species is associated with large tracts of alpine forest at higher elevations.

Environmental Effects

Alternative 1, 2 and 3

Direct and Indirect Effects: There is no suitable habitat in the proposed project area. All proposed alternatives would have no impacts to the loss of viability to this species. There are no direct or indirect effects to this species.

Cumulative Effects: There are no cumulative effects within the planning area associated with the Alternatives.

Herptiles

Cascade Torrent Salamander *Rhyacottiton variegates* Status: Sensitive

Affected Environment

The Cascade torrent salamander is the smallest of the Pacific Northwest salamanders. They are seldom far from small cold-flowing streams or seeps; moss-covered gravel or splash zones are their preferred habitat. The area was surveyed and torrent salamanders were located within the Riparian Reserve, adjacent to a small stream. These habitat types will be protected from disturbance with full Riparian Reserve buffers.

Environmental Effects

Alternative 1

Direct and Indirect Effects: Alternative 1 would have no impacts to the loss of viability or habitat to this species. There are no direct or indirect effects to this species.

Cumulative Effects: There are no cumulative effects within the planning area associated with the Alternatives.

Alternative 2 and 3

Direct and Indirect Effects: Thinning activities in Alternative 2 and 3 may increase surface temperatures within the forest adjacent to the Riparian Reserves. Thus, there may be minimal increase of temperatures within the riparian buffers. This increase in surface temperatures will adversely affect this species, because they are usually located within the splash zone of the stream.

Cumulative Effects: There are no known proposed projects that cumulatively would impact the torrent salamander.

Northwest Pond Turtle *Clemmys marmorata marmorata* Status: Sensitive

Affected Environment

This species is found in backwater areas of larger stream systems and lakes and ponds with adequate basking sites and cover. The larger pools along lower Sharps Creek may provide suitable habitat. No turtles have been captured or seen within the Brice Creek system within National Forest lands. Several incidental surveys have been conducted over the past six years without success in detecting pond turtles. Pond turtles have been documented in adjacent drainages, Sharp Creek, Layng Creek and Row River.

The Northwestern pond turtle is not a potential inhabitant of the project area. Suitable wintering, nesting or basking habitat would be several miles from the proposed project area.

Environmental Effects

Alternative 1, 2 and 3

Direct and Indirect Effects: No suitable habitat exists in the proposed project area. All proposed Alternatives would have no impacts to the loss of viability to this species. There are no direct or indirect effects to this species.

Cumulative Effects: There are no cumulative effects within the planning area associated with the Alternatives.

Survey and Manage/Protect Buffer Species

The Forest Plan requires protection and the implementation of management recommendations for Survey and Manage wildlife species. These species were identified because of viability concerns when implementing the Forest Plan. Survey and Manage Standards and Guidelines provide additional benefits to amphibians, mammals, mollusks and arthropods. Surveys are required prior to ground disturbing activities.

Great Gray Owl *Strix nebulosa*

Affected Environment

Great gray owls generally nest in forested habitat above 3,000 ft. elevation containing structural features that allow for large nest platforms (large broken snags) with good canopy cover (greater than 60 percent cover) within 1,000 ft. of natural meadows greater than 10 acres in size (R6 Survey Protocol for the Great Gray Owl, April 1995). Surveys are required for ground disturbing activities that would impact these nest sites. Active nest sites are to be protected by a 1-mile buffer and foraging habitat (meadows) is to be protected with a 300 ft. no-harvest buffer (ROD C-2 1).

Environmental Effects

Alternative 1, 2 and 3

Direct and Indirect Effects: The proposed project would have no impact to great gray owls; there is no potential nesting and foraging habitat within or near the proposed harvest units.

Cumulative Effects: There are no known activities within Brice Creek watershed that would have adverse cumulative effects to this species.

Red Tree Vole *Arborimus longicaudus*

Affected Environment

The red tree vole is an arboreal rodent that appears to prefer late-successional Douglas-fir habitat. Protocol surveys (version 2.0) were conducted within and adjacent to the project area, Red tree voles were not located within these areas and there will be no required management recommendations implemented for this project.

Environmental Effects

Alternative 1

Direct and Indirect Effects: The No Action Alternative would have no known impact to red tree voles.

Cumulative Effects: There are no cumulative effects within the planning area associated with Alternative 1.

Alternative 2 and 3

Direct and Indirect Effects: The Action Alternatives are not expected to impact the viability of this species. Proposed thinning and gap creation may have short-term adverse effect on the ability for red tree voles to disperse through the project area because of a 20 to 40 percent reduction in canopy closure. All Action Alternatives will continue to provide habitat (although it may be degraded because of canopy reduction) and connectivity for dispersal. The adverse effects on habitat are not measurable.

The application of prescribed fire may reduce ground cover within the stands in the short-term. The decommissioning of roads will enhance dispersal of the red tree vole.

Cumulative Effects: There is one other known proposed action that will impact red tree vole habitat within the watershed. The proposed Blodgett Timber Sale would harvest approximately 87 acres by partial harvest or regeneration harvest within the Matrix allocation. All known red tree vole sites will be protected.

Implementation of these actions is not expected to impact the viability of this species. Management recommendations, current habitat condition and expected future conditions should provide habitat to allow for dispersal and the maintenances of viable populations of red tree voles.

Mollusks

Affected Environment

There are four terrestrial mollusk species potentially inhabiting the project area: *Prophysaon coeruleum*, *Prophysaon dubium*, *Pristiloma arcticum crateris* and *Megomphix hemphilli*. Aquatic mollusk species are not expected to occur on this District. Ground disturbing activities implemented after fiscal year 1999 require surveys if they have the potential to impact these species or their habitat; field surveys were conducted in the project area using the Survey Protocol version 2.0 (10/29/97). *Prophysaon coeruleum*, *Prophysaon dubium* species were located in the project area during surveys.

Revisions to the ROD removed *Prophysaon coeruleum* and *Prophysaon dubium* from the survey and manage list because it was determined that there is no longer a viability concern. No mollusk sites will require management.

Environmental Effects

Alternative 1

Direct Effects: There are no impacts to the surveyed mollusk species anticipated under this alternative.

Cumulative Effects: There are no cumulative effects within the planning area associated with Alternative 1.

Alternative 2 and 3

Direct and Indirect Effects: The action alternatives are not expected to affect the viability of the surveyed mollusk species. There will be some loss to individuals during project implementation activities such as timber harvest and slash removal. The proposed thinning units will likely maintain suitable habitat conditions after harvest operations because micro site effects will be minimized by the retention of the overstory canopy. Sufficient crown cover and understory vegetation is required to shade the ground, provide humidity through evapotranspiration, and impede air movement that would tend to displace the cool moist air. Also required for mollusk survival is maintenance of large and small woody debris, and a thick layer of litter and duff on the forest floor. These components provide cool moist places in which the animals spend their days, hide from predators, deposit their eggs, and find food.

Cumulative Effects: The loss of coarse wood and ground disturbance from past harvest entries will have long-term impacts on dispersal and occupancy of this species within the Matrix allocation in Brice Creek watershed. Implementation of these actions is not expected to impact the viability of this species.

Riparian Habitat

Affected Environment

The Riparian Reserves are portions of Matrix land where riparian dependent resources receive primary emphasis and provide protection to aquatic resources along with riparian dependent terrestrial organisms. These riparian corridors along streams and wet depressions are important habitat areas for many species of plants and animals. Wildlife use is extensive in riparian zones because of the three essential survival elements found there: food, cover and water. Of all the mammals that occur in Western Oregon, 89 percent utilize riparian zones or wetlands. There are 1.5 times more small mammals found in riparian habitats than in uplands. Riparian habitats are utilized by 72 percent of the raptor species in Western Oregon for their primary foraging and nesting sites. Many bats and birds exclusively forage in riparian areas, and there are a large number of aquatic species including invertebrates, fish and herptiles that are totally dependent on the riparian zone. Extremes in climate are moderated in riparian areas producing a microclimate more compatible to plants and animals year round.

Riparian Reserves allow for the recruitment and retention of down woody material that is valuable for wildlife, fish habitat and stream channel stability. The continual contribution of woody debris is important not only to the immediate stream channel, but also it becomes available for movement to larger downstream systems.

Riparian habitat will be maintained by complying with the ROD Riparian Reserve Standards and Guidelines for Matrix lands. As recommended in the Brice Creek Watershed Analysis, Class II stream channels will be buffered with a minimum of 360-foot slope distance on each side of all streams and a minimum of 180-foot slope distance buffer will occur on all Class III and IV streams.

Environmental Effects

Alternatives 1

Direct and Indirect Effects: The trend in existing conditions in the Riparian Reserves would be maintained throughout the planning area.

Cumulative Effects: Retention of late-successional vegetation in Riparian Reserves within the planning area and the Brice Creek watershed is a positive trend for species associated with late-successional riparian vegetation.

Alternatives 2 and 3

Direct and Indirect Effects: Proposed harvest units will retain full Riparian Reserve widths within partial harvest units. It is expected that with the retention of 60 to 80 percent canopy closure within the partial harvest areas, there will be minimal adverse effect on riparian habitat or riparian dependent wildlife species.

Riparian silviculture, planting and thinning of small trees along four miles of Brice Creek would assist in the development and establishment of conifer tree species adjacent to Brice Creek.

Cumulative Effects: Past harvesting along streams in the planning area has resulted in fragmentation of the riparian habitat for species associated with late-successional vegetation. Maintenance of late-successional vegetation in the Riparian Reserves within the planning area and Brice Creek watershed will continue a trend of improving habitat for these species. There are no known future projects that will harvest late-successional vegetation in the Riparian Reserves.

Habitat Diversity/Unique Habitat

Affected Environment

Unique habitat areas have been identified in the planning area. These areas are recommended for management under the Umpqua National Forest Land and Resource Management Plan Prescription C5-I, "Unique Habitat, Protected." Unique wildlife habitats have vegetative and non-vegetative features that set them apart from other habitat in the forest matrix such as natural forest openings or geologic features, dry meadows, cliffs, talus, wet meadows and caves. This prescription concentrates on maintaining the unique components of these habitats. Although these areas are comprised of small areas, they contribute significantly to the diversity of wildlife found in the Forest. These areas are typically quite stable compared to other plant communities. Chambers and Ross (1988) note, "while most of the Cascade Range is forested, 85 percent of the flowering plants are found in the non-forested areas which comprise only five percent of the range." Within the analysis area, no sites would be impacted by any of the alternatives.

Environmental Effects

Alternative 1

Direct and Indirect Effects: Alternative 1 will result in no impact to these unique habitats.

Cumulative Effects: There are no cumulative effects within the planning area associated with Alternative 1.

Alternative 2 and 3

Direct and Indirect Effects: Alternatives 2 and 3 will result in no impact to these unique habitats.

Cumulative Effects: There are no known past or future actions in the planning areas or within the Brice Creek watershed that may cumulatively affect unique habitats within the Northnoon Analysis Area.

Threatened, Endangered and Sensitive Plants

Activities considered in this project require a Biological Evaluation to be completed (FSM 2672.4). The intent of the Biological Evaluation process is to conduct and document activities necessary to ensure that the proposed management actions will not jeopardize the continued viability or cause adverse modification of habitat for:

- Species listed or proposed to be listed as threatened or endangered by the USDI-Fish and Wildlife Service
- Species listed as sensitive by USDA-Forest Service Region 6

The Biological Evaluation is a four-step process. Evaluation of impacts on a given species may be complete at the end of Step 1 or may extend through Step 4. The review process for this project included a Pre-field Review for TES (Threatened, Endangered, and Sensitive) plants and field reconnaissance.

This assessment examines the potential effects to plant resources that may result from implementation of actions or activities associated within the Northnoon Analysis Area. Information was obtained from several sources including, file records at the Cottage Grove Ranger District, Interdisciplinary Team specialist reports, and numerous journal articles and reports addressing forest management. There was on-site review of the analysis area by the District Botanist and Biological Technicians on staff. Fieldwork was conducted during May - July 1998 and June 1999. All areas identified with potential for disturbance in connection with this project were inspected. The following table summarizes the species suspected to occur in the analysis area and the results of surveys performed in the area.

Table 10. Summary of Threatened, Engangered and Sensitive Plant Species Evaluation Process for Northnoon Timber Sale

Plant Species	STEP 1 Prefield Review (Habitat Present?)	STEP 2 Species Located?	STEP 3 Risk Conflict?	STEP 4 Biological Investigation Required?
<i>Arabis suffrutescens</i> var. <i>horizontalis</i>	NO			
<i>Arnica viscosa</i>	NO			
<i>Asplenium septentrionale</i>	YES	NO		
<i>Aster vialis</i>	NO			
<i>Botrychium lanceolatum</i>	NO			
<i>Botrychium minganense</i>	YES	NO		
<i>Botrychium pumicola</i>	YES	NO		
<i>Calamagrostis breweri</i>	NO			
<i>Calachortus umpquaensis</i>	NO			
<i>Carex crawfordii</i>	YES	NO		
<i>Carex serratodens</i>	YES	NO		
<i>Cimicifuga elata</i>	YES	NO		
<i>Collomia mazama</i>	NO			
<i>Cypripedium fasciculatum</i>	YES	NO		
<i>Frasera umpquaensis</i>	YES	NO		
<i>Fritillaria glauca</i>	NO			
<i>Gentiana newberryi</i> var. <i>newberryi</i>	NO			
<i>Hazardia whitneyi</i> var. <i>discoidea</i>	NO			
<i>Illiamna latibracteata</i>	YES	NO		
<i>Isopyrum stipifafum</i>	YES			
<i>Kalmiopsis fragens</i>	YES	NO		
<i>Lewisia columbiana</i> var. <i>columbiana</i>	NO			
<i>Lewisia leana</i>	NO			
<i>Lupinus sulphureus</i> ssp. <i>kincaidii</i>	NO			
<i>Montia howellii</i>	NO			
<i>Ophioglossum pusillum</i>	YES	NO		
<i>Pellaea andromedaefolia</i>	NO			
<i>Perideridia erythrorhiza</i>	NO			
<i>Polystichum californicum</i>	NO			
<i>Romanzoffia thompsonii</i>	YES	NO		
<i>Wolffia borealis</i>	YES	NO		
<i>Wolffia columbiana</i> Karst.	NO			

Affected Environment

There are no threatened or endangered plant species known to occur on lands administered by the Cottage Grove Ranger District. Surveys conducted in the analysis area found none, therefore, proposed activities would have no impact on these species.

Sensitive Plants: There are 32 sensitive plant species suspected or documented on the Umpqua National Forest. Only one sensitive species, *Romanzoffia thompsonii*, has been documented on the Cottage Grove Ranger District.

Many sensitive plant species are restricted to specific habitat types and elevations. As determined by the pre-field review, suspected habitat is present within the timber sale area for 12 sensitive plant species. Surveys were completed by district botanical personnel using complete or intuitive control survey protocols. Field surveys for these species were accomplished during the appropriate survey period. No sensitive plant species were located in any of the proposed harvest units; no additional surveys will be required.

Environmental Effects

Alternative 1, 2 and 3

There are no impacts to TES botanical species as none were located within the project area. Unique habitats where these species are typically found will not be affected by the proposed activities.

Survey and Manage Plant Species

Affected Environment

The Northwest Forest Plan requires protection of certain vascular and non-vascular plant, lichen, and fungi species that may not be protected by other standards and guidelines.

Vascular Plants: There were no SM (Survey and Manage) vascular plant species found within or adjacent to the proposed project area.

Non-Vascular Species (Bryophytes and Lichens): There were no SM non-vascular species found within or adjacent to the proposed project area.

Fungi: Currently, surveys are required for a single fungi species: the noble polypore, *Bridgeoporus nobilissimus*. The noble polypore is associated with Pacific silver fir and noble fir in Oregon and Washington. Known sites are in a wide range of seral stages from a 35-year old plantation (on old-growth stumps) to old-growth forest with large diameter silver or noble fir. The conks are found on live trees, standing dead trees, snags and stumps. During pre-field review, two units were identified as having suspected habitat for this species. There were no populations of this species located within the proposed harvest units.

Noxious Weeds and Other Invasive Non-Native Species

Affected Environment

Several species of potential invaders have been discovered on the District within the last two years and risk of invasion by other noxious weed species increases as existing populations on nearby federal and private lands continue to expand. Populations of extremely aggressive species such as yellow star-thistle (*Centaurea solstitialis*), rush skeletonweed (*Chondrilla juncea*), and spotted knapweed (*Centaurea maculosa*) have become roadside weeds on frequently traveled highways in the State of Oregon and along arterial roads in adjacent Ranger Districts on the Umpqua and Willamette National Forests. Risk of weed introduction into this proposed project area is a possibility if vehicles and equipment have traveled in infested locations and have picked up seeds.

Scot's broom (*Cytisus scoparius*), tansy ragwort (*Senecio jacobaea*), ox-eye daisy (*Chrysanthemum leucanthemum*), St. John's wort (*Hypericum sp.*), Canada thistle (*Cirsium arvense*) and bull thistle (*Cirsium vulgare*) are the noxious weed species currently known to exist within the analysis area of the project.

Alternative 1

Direct and Indirect Effects: Current and potentially new invaders will continue to spread along existing roads. There will be no new ground disturbance from harvest, temporary roads, landings or prescribed fire.

Cumulative Effects: There are no cumulative effects within the planning area associated with Alternative 1.

Alternative 2 and 3

Direct and Indirect Effects: The noxious species noted within this analysis area are often early invaders after soil disturbance. Activities such as land-based tree yarding, road construction and road upgrade result in soils disturbances that benefit the continued survival and spread of these species. Impacts from thinning actions would be of less concern than other types of harvest prescriptions because the treatment is ultimately designed to promote late-seral characteristics and weeds would not thrive under shaded conditions in a maturing forest.

The setback of native herbaceous communities from physical damage would enhance weed invasion, as it would weaken the competitive ability of native species. This would be of greatest concern around canopy openings including landings, roadsides and edges of forest such as along unit or property boundaries.

Heavy machinery can bring seed from infested areas into uninfested areas—for example, from existing populations along roadsides into the adjacent forested stands. Consequently, weed seed is likely to be moved from existing roadside populations into the project units as the work is done. Tractor yarding poses a high-risk weed introduction due to weed seeds on the equipment and the soil exposure and compaction caused by the tractor.

These effects would be mitigated by application of required and recommended weed prevention practices described in Chapter 2 and the Botanical Report in the Appendices.

Cumulative Effects: An analysis of cumulative impacts from weed introduction and spread is difficult because little baseline data exists on the District distribution of noxious weeds even as recently as 10 years ago. Historic railroads, logging and road construction likely introduced weeds to the area in the early part of the 20th Century. Continuous timber harvests and extensive road construction have radically increased potential habitat for invasive noxious weeds. Recreational use of the forest including ORV and horse use (e.g. Northnoon Wagon Road) is also responsible for introducing new weeds and spreading existing populations. Presently, weeds occupy most roadsides, landings and trailheads on the Cottage Grove Ranger District.

Reasonably foreseeable future actions in the Brice Creek watershed include the proposed Blodgett Timber Sale, as well as the potential Crowdog Timber Sale in the lower Brice Creek area. In addition, prescribed fire projects and trail reconstruction are in the planning stages. All of these activities will contribute to further weed spread due to dispersal of seeds and release of existing seed banks. Some of these effects can be minimized through mitigations, K-V opportunities or appropriated funds for weed treatment.

Air Quality/Smoke Management

Affected Environment

The Fire Weather Regulated Use Map for the State Forester's Smoke Management Instructions identifies the Cottage Grove Ranger District as Cascade Range Zone 617. Proposed units are 20 to 21 miles from the Willamette Valley designated area and are within the Oakridge Special Protection Zone. This zone requires that from November 15 through February 15 we check the Oregon Smoke Management Advisory for special instructions for this area. These instructions may put further restrictions on burning done on the District during this time.

The closest Class I areas are Diamond Peak Wilderness, approximately 22 miles away, and Three Sisters Wilderness, over 30 miles away. The closest Class II areas are the Boulder Creek

Wilderness, approximately 16 miles away and Waldo Lake Wilderness approximately 27 miles away. Burning will not impact these areas during the July 1 to September 15 restricted period. Therefore, at the time of year the District would conduct prescribed burn, smoke produced would not reach these areas. Sufficient heat is needed to loft smoke to the heights necessary to carry the smoke those distances. That heat will not likely be produced, as a cooler burn would be required to protect residual trees and course woody debris.

Oakridge is the main population center that could be affected by the smoke from these stands. Burn planning would require favorable winds that would carry smoke away from the town. Based on experience in this area, the smoke produced would likely disperse well before reaching populated areas.

Alternative 1

Direct and Indirect Effects: Under the No-Action Alternative, there would be no prescribed burning. Effects to air quality would only occur in the instance of a wild fire.

Cumulative Effects: There are no cumulative effects within the planning area associated with Alternative 1.

Alternatives 2 and 3

Direct and Indirect Effects: Smoke Emission Predictions

Different treatment options cause different emission effects. Hand-pile burning is usually accomplished in the late fall to early spring months; consumption occurs mostly in the flaming phase and smoldering is minimal. Jackpot and underburning consume much of the fuels in the flaming stage of combustion, and can contribute to emissions in the smoldering phase if not mopped up afterward.

Table 11. Smoke Emission Predictions

Stand	PM10 Emissions Tons/acre ⁵	PM 2.5 Emissions Tons/acre
Stand 4	0.44	0.52
Stand 5,6, & 8	0.39	0.46
Stand 3 & 7	0.41	0.49

Utilizing burning techniques that minimize consumption in the smoldering phase of burning can directly influence emissions production. Early season (spring, early summer) burning can lessen emissions output by reducing primarily 0- to 3-inch fuels and leaving the majority of the duff and litter layer and larger woody material intact; these are the fuels that tend to generate the most emissions from the smoldering phase of combustion.

Prescribed burning will be accomplished only when the State of Oregon Smoke Management Advisory is favorable and when atmospheric conditions are favorable. All burning will be conducted in accordance with the Oregon Smoke management plan. Through the plans and techniques described above, the health standards established by the EPA (Environmental Protection Agency) will likely be met.

⁵ The acronym PM stands for particulate matter.

Cumulative Effects: There are no cumulative effects within the planning area associated with the Alternatives.

Military Training Route

A military training route exists to the north of the planning area. The centerline enters the Forest from the west at T21S R1E sec. 19, SW/SW (43.43.5 N Lat, 122.45 W Lon.) and proceeds directly east to exit at T21S-R2E sec. 29, NE/NE (43.43.2 N Lat, 122.35.5 W Lon.). The width of the route extends four nautical miles both north and south of centerline, airspeed is subsonic above 360 knots ground speed, and allows operations by pilots VFR (visual flight rules) between 200 AGL (above ground level) day and 800 AGL night. Navy aircraft may operate between 500 AGL and the MINIMUM OBSTRUCTION ALTITUDE regardless of weather, both day and night. It is essential that any activities related to this timber sale take this active route into consideration. This may include but is not limited to cables spanning canyons, yarders that protrude above the surrounding canopy or terrain, helicopter work or any activities that may include blasting.

Cost Efficiency

Sunk Costs

Timber sale project planning costs are considered a “sunk” cost, in that the money is spent regardless of which alternative is chosen. While these costs are included in the economic viability portion of the analysis, the following costs are displayed to demonstrate the financial effects to the District timber sale program.

Alternative 2 would provide the greatest amount of wood fiber for the dollars invested in timber sale planning (2.264 MMBF) with a cost of approximately \$90/MBF. Alternative 3 would provide less volume for the dollars invested (1.8 MMBF costing approximately \$8/MBF). These estimates do not include overhead. Alternative 1, the No-Action Alternative, would return no product for the money spent.

Benefit/Cost Ratios

Benefit/cost analysis shows both alternatives are cost effective. Alternative 3 has a lower benefit/cost ratio. This is mostly due to the low volume per acre and the amount of fuels reduction activities.

Alternative 2 has a positive benefit/cost ratio of 1.28/1, while Alternative 3 has a lower benefit/cost ratio of 1.02/1.

Present Net Value

Alternative 2 has a present net value without planning costs of \$90/MMBF. This present net value does not include other K-V project costs. The net receipts of the timber sale available for other funding such as other K-V projects or returned to the treasury would be approximately \$174,689.

Alternative 3 has a present net value without planning costs of \$8/MMBF. This present net value also does not include other K-V project costs. The net receipts of the timber sale available for other funding, such as other K-V projects, or returned to the treasury would be approximately \$14,503.

Social Analysis Summary

Local Economy – County Timber Receipts

In 2000, Act 106-393, the Secure Rural School and Community Self Determination act, was passed by Congress, which gave counties the option of receiving timber receipts or a fixed payment based on past revenues. The counties have opted to receive fixed payments at this time. As a result, this proposed timber sale would have little effect to county receipts if sold prior to 2006, when the Act expires.

The action alternatives provide some costs and opportunities that are different from those disclosed in the ROD for 1990 Umpqua National Forest Land and Resource Management Plan, including effects to local employment. Local employment would be somewhat less per MBF than estimated in the LRMP because the type of harvest activities require less reforestation and stand tending investments. Lumber and associated manufacturing jobs would remain consistent with estimates per MBF made in the LRMP.

Non-Quantified Values and Costs – Knutson-Vanderberg Funds for Sale Area Improvement

The amount of other K-V work accomplished following sale completion would be dependent on the amount of revenue the project generates. Much of this work is associated with mitigation of the current and past harvest and management activity. Some of the projects are enhancement of wildlife, aquatic or botanical resources. The amount of funds available for K-V projects differs between alternatives.

Summary

The following table summarizes some of the costs and benefits associated with this analysis.

Table 12. Economic Summary

Alternative	Volume (MBF)	Planning Costs	Benefit/Cost Ratio	Present Net Values	Available Other K-V Funds
1	0	\$0	0/0	\$0	\$0
2	2264	\$49,950	1.28/1	\$204,056	\$204,056
3	1800	\$49,950	1.02/1	\$14,503	\$14,503

Specifically Required Disclosures

The CEQ (Council for Environmental Quality) Regulations at 40 CFR 1508.27(b) list characteristics of the action the Responsible Official should consider in evaluating the intensity of a proposal. Intensity refers to the severity of the impact on the characteristic.

Wetlands and Floodplains – Affected Environment and Environmental Consequences

There are approximately 354 miles of perennial and intermittent streams within the Brice Creek sub-watershed. Floodplains are within the riparian areas of perennial streams, and vary from 50 to 200 feet within these streams. As disclosed previously in the water quality and aquatics section, harvest or road building will not impact riparian areas. There would be no direct, indirect or cumulative effects to floodplains. The No-Action Alternative would also have no effect on floodplains.

Prime Farmlands, Rangelands or Parklands – Affected Environment and Environmental Consequences

The project area is designated and managed in accordance to the Management Areas designated by the Umpqua National Forest LRMP, as amended by the Northwest Forest Plan. The Northnoon Planning Area is designated and managed as Matrix and Late-Successional Reserve. No prime farmlands, rangelands or parklands exist within the watershed; therefore, no direct, indirect or cumulative effects would occur. Effects to forest lands are described throughout Chapter 3 of this document.

Roadless Areas – Affected Environment and Environmental Consequences

The Northnoon Planning Area has approximately 25 miles of roads. Principal access to this area is via Road 22.

There are no unroaded areas of 1,000 acres or more adjacent to the Northnoon Planning Area. No roadless or wilderness areas are adjacent to the project; thus this project would have no direct, indirect or cumulative effect on any roadless or wilderness area. The No-Action Alternative would have no effect on roadless areas.

Environmental Justice – Affected Environment and Environmental Consequences

None of the alternatives impose a hardship on minority or low-income communities. The alternatives would not produce hazard waste or conditions that might affect human populations. There would be no direct, indirect or cumulative effects to environmental justice with any alternative.

Public Safety – Affected Environment and Environmental Consequences

There would be no effects to public safety from any action alternative. Short-term increases in log truck traffic would occur during hauling operation under Alternatives 2 and 3. This increase in traffic is not expected to cause any adverse safety problems in the area. Both action alternatives comply with State Water Quality Standards. This project is not designed to promote increased public use within the analysis area.

Long Term Soil Productivity – Affected Environment and Environmental Consequences

All alternatives leave all standing and down wood on site, where possible. Alternatives 2 and 3 would leave less, as some standing snags may be felled, but not removed, during harvest operations. The No-Action Alternative would leave the most down wood and snags on site and would have the least impact from ground disturbance and soil compaction.

Potential or Unusual Expenditures of Energy

Both action alternatives would require expenditures of fuel for harvest and road related operations. Alternative 2 would require more expenditures of fuel than Alternative 3, as more trees would be harvested. However, neither action alternative would result in any unusual expenditure of fuel. No other direct, indirect or cumulative effects are expected to occur. The No-Action Alternative would have no effect on expenditures of energy.

Conflicts with Plans or Policies of Other Jurisdictions

Implementation of either alternative would not conflict with the plans or policies of other jurisdictions. The project area is entirely within the Brice Creek watershed and is under the jurisdiction of the USDA Forest Service, Umpqua National Forest, and Cottage Grove Ranger District.

Irreversible and Irretrievable Commitment of Resources

There would be no irreversible or irretrievable commitment of resources with any alternative.

Cultural Resources – Affected Environment and Environmental Consequences

A qualified cultural resource technician conducted an office review of the project area. There are three known historic sites in the Northnoon Planning Area. Field reconnaissance was completed during the summer of 2002. No new heritage sites were located during the field survey. Mitigation measures listed previously will provide protection of significant cultural resources that may be discovered prior to or during harvest and restoration activities.

There will be no impact to any known sites, structures, or objects listed in or eligible for listing in the National Register of Historic Places. Mitigation measures included with the action alternatives are intended to prevent the loss or destruction of any culture resources.

Potential Impacts to Consumers, Civil rights, Minority Groups and Women

There would be no impact to consumers, civil rights minority groups or women with implementation of any of the alternatives. Contracting procedures would ensure that projects made available to contractors through this project would be advertised and awarded in a manner that gives proper consideration to minority and women-owned business groups.

Controversy in Regard to Effects on the Human Environment

The degree of controversy with regard to effects on the quality of the human environment are limited and considered not significant. This is based on public responses to the proposed action, and interdisciplinary team discussion during scoping and analysis.

Impacts to the Human Environment

No impacts to the human environment that are highly uncertain or involve unique or unknown risks have been identified in this analysis. Projects similar to this have occurred on this Ranger District since 1913 and in this analysis area since the late 1940's. Supporting documentation including but not limited to silviculture, aquatic, transportation, fuels and wildlife substantiate this statement.

Precedent for Future Activities

No precedent for future actions with significant effects or representation of a decision in principle about future considerations will be established through implementation of this site-specific project.

Cumulative Impacts

Supporting documentation in the appendices and analysis file, and information detailed in Chapter III indicates that this action is not related to other individually insignificant actions that would have cumulatively significant impacts on the environment.

Threatened and Endangered Species

This project will have insignificant effects with regard to endangered or threatened species or habitat that has been determined to be critical under the Endangered Species Act of 1973. This is substantiated in the supporting documentation and is specifically addressed in the Wildlife Report and a Biological Opinion developed through consultation with the U.S. Fish and Wildlife Service. A copy is available for review at the Cottage Grove District office of the Umpqua National Forest.

Federal, State and Local Laws

There is no indication that this project violates any Federal, State, or local law or requirements imposed for the protection of the environment. This statement is based on a process that includes scoping for issues, analysis, documentation, and public comment and review.

Aquatic Conservation Strategy

This project is consistent with the objectives of the Aquatic Conservation Strategy. Documentation can be found in Appendix B.

Chapter 4 Consultation with Others

Public Involvement

Notice for the Northnoon Timber Sale project was first made in April of 1998, when it appeared in the Umpqua National Forest Schedule of Proposed Actions. Scoping for public interest generated 23 written inquires for the Northnoon Timber Sale project.

Scoping identified a number of issues and concerns related to the proposed timber sale project in the Brice Creek Watershed. In particular, scoping focused on:

- Harvesting old-growth
- Water quality concerns
- Aquatic habitat concerns
- Soil suitability concerns
- Trail impacts
- Road access and impacts
- Forest health concerns
- Visuals
- Geology
- Late-Successional Reserves
- Abandoned mines and safety

For more information on comments received during scoping, please see the scoping summary in the analysis file.

Northnoon Interdisciplinary Team

The following people were members of the Interdisciplinary Team that participated in the preparation or review of all or part of this environmental assessment:

Jerry Astrella	Logging Systems Specialist
Ron Barber	NEPA
Larry Broeker	Geologist
Daryl Berlie	Cultural Resource Technician, Mining
Laurie Bernstein	Fisheries Biologist, Editor
Robert Cox	Wildlife Biologist
Mike Dito	Interdisciplinary Team Leader, 1998-99
Terry Fairbanks	Interdisciplinary Team Leader/Silviculturist, Writer/Editor
Ken Kimberling	District Engineer
Melissa Kirkland	Botanist
Don Morrison	Soil Scientist
Cindy Pack	Recreation, Visuals
John Petrick	Silviculturist, 1998-99
Sheryl Tooker-Dilley	Fuels Specialist

Appendix A

References

- Agee, J.K. 1993. *Fire Ecology of Pacific Northwest Forests*. Island Press. Washington D.C 493 pp.
- Barclay, Robert M.R. and Brigham mark R. 1996. *Bat and Forest Symposium*, October 19-21. Victoria, British Columbia, Canada. Res. Br., B.C. Ministry of forest, Victoria, B.C. Work. 23/1996.
- Benda, Lee, 1990. *The Influence of Debris Flows on Channels and Valley Floors in the Oregon Coast Range, USA: Earth Surface Processes and Landforms*, V. 15, p. 457-466.
- Benda, Lee, and Thomas Dunne, 1997. *Stochastic Forcing of Sediment Routing and Storage I Channel Networks: Water Resources Research*, v. 33, no. 12, (dec.), p. 2865-2880.
- Borchers, J.G. and D.A. Perry. 1990. Effects of prescribed fire on soil organisms. In: Walstad, J.D.; Radosevich, S.R.; Sandberg, D.V., eds. *Natural and prescribed fire in Pacific Northwest Forests*. Corvallis. Oregon State University Press: 143-157.
- Brice Creek Stream Inventory. 2001. On file at Umpqua National Forest, Cottage Grove Ranger Station.
- Castro, J. and F. Reckendorf. 1995. *RCA III Effects of Sediment on the Aquatic Environment; Potential NRCS Actions to Improve Aquatic Habitat*. Natural Resource Conservation Service, Oregon State Univ, Dept of Geosciences. 48pp.
- Chen, J. 1991. *Edge effects: microclimatic pattern and biological responses in old growth Douglas fir forests*. Seattle, Washington: University of Washington. 174 p. Ph.D. dissertation.
- Connolly, P.J., M.G. Wade, J.M. Hutchinson, J.S. Ziller. 1992. *Coast Fork Willamette Subbasin Fish Management Plan*. Oregon Department of Fish and Wildlife. 44pp.
- Everest, F.H., R.L. Beschta, J.C. Scrivener, K. V. Koski, J.R. Sedell and C.J. Cederholm. 1987. *Fined Sediment and Salmonid Production: A Paradox*. In E.O Salo and T.W. Cundy eds. *Proceedings of a Symposium; Streamside Management Forestry and Fisheries Interactions*, edited by. University of Washington. pp 98-142.
- Finch, M. Deborah. 1991. *Population Ecology, Habitat Requirements and Conservation of Neotropical Migratory birds*. USDA Forest Service General Technical Report RM-205.
- Franklin, Jerry, Chairman. 1986. *Interim Definitions for Old-Growth Douglas-fir and Mixed-Conifer Forests in the Pacific Northwest and California*. Research Note PNW-447. Portland, OR: USDA Forest Service, Pacific Northwest Research Station.
- Gregory, S.V.; Swanson, F.J.; McKee, W.A.; Cummins, K.W. 1991. *An ecosystem perspective of riparian zones*. *BioScience*. 41:540 551.

- Hanek, Gordon, and Mikeal Jones, 1997. Use of Rustlines in Peak Flow and Culvert Capacity Estimates – A Limited Study on the Umpqua National Forest: Unpublished Report, Umpqua National Forest, 3p.
- Hubbard, L. E., T.A. Herrett, J.E. Poule, G.P. Ruppert, and M.L. Courts, 1996. *Water Resources Data, Oregon – Water Year 1996*: U.S. Geological Survey, Water-Data Report OR 96-1.
- Hubbard, L. E., T.A. Herrett, J.E. Poule, G.P. Ruppert, and M.L. Courts, 1997. *Water Resources Data, Oregon – Water Year 1996*: U.S. Geological Survey, Water-Data Report OR 97-1.
- Jones, Mikeal, 1996. November 18, 1996 Flood, internal 2530 memorandum, December 6, 1996, Umpqua national Forest, 2p.
- Lee, D.C.; J.R. Sedell, B.E. Rieman, R.F. Thurow, J.E. Williams, D. Burns, J. Clayton, L. Decker, R. Gresswell, R. House, P. Howell, K.M. Lee, K. MacDonald, J. McIntyre, S. McKinney, T. Noel, J.E. O'Connor, C.K. Overton, D. Perkinson, K. Tu, P. Eimeren, 1997. Broadscale assessment of aquatic species and habitats. Vol III, Chapter 4 In: Quigley, T.m.: S.J. Arbelbide, eds. An Assessment of ecosystem components in the interior Columbia basin and portions of the Klamath and Great Basins. Gen. Tech. Rep. PNW-405. Portland, Or: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.
- Lutton, Richard J., 1962. Geology of the Bohemia Mining District, Lane County, Oregon: University of Arizona, AZ, PhD dissertation, 172 p., pl., 1:16,675.
- McChesney, Stephen M., 1987. Geology of the Sultana Vein, Bohemia Mining District, Oregon: University of Oregon, Eugene, Oregon, Dept., of Geology, Masters Thesis.
- McMahon, T.E. and D.S. de Calesta. 1990. Effects of fire on fish and wildlife. In: Walstad, J.D.; Radosevich, S.R.; Sandberg, D.V., eds. Natural and prescribed fire in Pacific Northwest Forests. Corvallis. Oregon State University Press: 143-157.
- Mitchell, R.G. 1990. Effects of prescribed fire on insect pests. In: Walstad, J.D.; Radosevich, S.R.; Sandberg, D.V., eds. Natural and prescribed fire in Pacific Northwest Forests. Corvallis. Oregon State University Press: 143-157.
- Neuenschwander, LF, James W. Byler, Alan E. Harvey, GERAL I. McDonald, Denise S. Ortiz, Harold L. Osborne, Gerry C. Snyder, Arthur Zack, White Pine in the American West: A Vanishing Species, Can We Save It? 1999. Gen. Tech. Rep., RMRS-GTR-35, University of Idaho, Moscow, Idaho, US Dept of Agriculture, Forest Service, Rocky Mountain Research Station.
- Oregon Department of Environmental Quality. 1998. Oregon's Final 1998 Water Quality Streams - 303(d) List.
- Oregon Department of Geology and Mineral Industries, 1951. Oregon Metal Mines Handbook, Bulletin 140d. 161p.

- Peck, Dallas L., Allan B. Griggs, Herbert G. Schlicker, Francis G. Wells, and Hollis M. Dole, 1964. *Geology of the Central and Northern Parts of the Western Cascade Range in Range in Oregon*: U.S. Geological Survey, Professional Paper 449, 56p.
- Swanson, Frederick J., Lee E. Benda, Stanley H. Duncan, Gordon E. Grant, Walter F. Megahan, Leslie M. Reid, and Robert R. Ziemer, 1987. *Mass Failures and Other Processes of Sediment Production in Pacific Northwest Forest Landscapes*: in; E.O. Salo and T.W. Cundy, eds., *Streamside Management: Forestry and Fishery Interactions*, contract no. 57, Institute forestry Resources, University of Washington, Seattle, WA., p. 9-38.
- Taber, John W., 1949. *A Reconnaissance of Lode Mines and Prospects in the Bohemia Mining District, Lane and Douglas Counties, Oregon*: U.S. Bureau of Mines, Information Circular 7512. 50 p.
- Trexler, Bryson D., Jr., and Dale R. Ralston, Dennis R. Reece, and Roy E. Williams, 1975. *Sources and Causes of Acid Mine Drainage*: Idaho Bureau of Mines and Geology, Moscow, Idaho. Pamphlet No. 165, 129 p.
- USDA Forest Service and USDI BLM. 1994. Final Supplemental Environmental Impact Statement and Record of Decision on Management of Habitat for Late-Successional and Old Growth Species Within the Range of the Northern Spotted Owl. Referred to as the Northwest Forest Plan.
- USDA Forest Service, Pacific Northwest Region. 1988. General Water Quality Best Management Practices.
- USDA Forest Service, Pacific Northwest Region. 1990. Umpqua National Forest Land and Resource Management Plan, Umpqua National Forest, Roseburg, Oregon.
- USDA Forest Service. 1990. Umpqua National Forest Standard and Guideline Procedures For Watershed Cumulative Effects and Water Quality.
- USDA Forest Service. 1997. Brice Creek Watershed Analysis, Umpqua National Forest, Cottage Grove Ranger District.
- USDA/USDI. 1993. Forest Ecosystem Management: An Ecological, Economic, and Social Assessment. USDA Forest Service, USDI Fish and Wildlife Service, USDI National Park Service, USDI Bureau of Land Management, USDC National Oceanic and Atmospheric Administration and National Marine Fisheries Service, and Environmental Protection Agency, Report of the Forest Ecosystem Management Assessment Team, Portland, OR.
- USDI. 1992. Recovery plan for the northern spotted owl - Draft. 662pp.
- Walstad, J. D; Radosevich, S. R; Sandberg, D. V. 1990. Natural and Prescribed Fire in Pacific Northwest Forests. Corvallis, Oregon State University Press.
- Wellman, Roy E., Janice M. Gordon, and Robert L. Foffatt, 1993. *Statistical Summaries of Streamflow Data in Oregon*: Volume 2 – Annual Low and High Flow, and Instantaneous Peak Flow: U.S. Geological Survey, Open-file Report 93-63.

Wisdom, M.J.; R.S. Holthausen, B.K. Wales, 2000. Source habitats for terrestrial vertebrates of focus in the interior Columbia basin: Broad-scale trends and management implications, Gen. Tech. Rep., PNW GTR-485. Portland, OR: USDA Forest Service, Pacific Northwest Research Station.

Appendix B

Evaluation of Aquatic Conservation Strategy Objectives

Evaluation of Aquatic Conservation Strategy Objectives for the Northnoon Planning Area Environmental Assessment September 26, 2002

OVERVIEW

The Umpqua National Forest Land and Resource Management Plan (Forest Plan), as amended, requires that "the decision maker must find a proposed management activity consistent with the Aquatic Conservation Strategy objectives (ROD, B-10)." The purpose of this document is to provide a larger landscape scale assessment, than that of the project area for meeting the ACS objectives. A 6th field watershed analysis (Brice Creek) was completed in April 1997. The scale for analysis of this report will be based on the Brice Creek Watershed. This review is based on the Action Alternatives of the Northnoon Environmental Assessment.

To accomplish this focused review of the ACS consistency objectives, I convened a journey level interdisciplinary team that included a fisheries biologist, wildlife biologist, silviculturist, planner, and forest engineering expertise.

ACTION ALTERNATIVES

The action alternatives are similar in regards to meeting ACS objectives. Refer to Chapter 2 of the Northnoon Environmental Assessment for a detailed description of these alternatives.

CONSISTENCY WITH AQUATIC CONSERVATION STRATEGY OBJECTIVES

ACS Objective 1:

Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

The goal of this objective is to have the riparian reserves throughout the watershed in a predominantly late-successional seral condition and to be within the natural range of variability. The Brice Creek Watershed Analysis recommends that at least 80% of the riparian reserves should be at least 80 years old. The Brice Creek Watershed Analysis did not analyze the private land downstream from the Forest Service boundary. This area has a poor riparian condition, with much of the riparian harvested. Upstream from the Forest Service boundary 51.6% of the trees are over 80 years old. This percentage would be even lower if the private land was also included. The current riparian habitat is considered to be in a degraded condition. The Upper Brice West Drainage, which the Northnoon Timber Sale is located is in better condition with 70% of the riparian reserves greater than 80 years old.

The valley bottom road adjacent to Brice Creek, within the riparian reserves, limits available habitat and reduces habitat diversity and complexity. The high road density and stream

crossings within the Brice Creek Watershed has an effect on the connectivity and distribution of aquatic habitat in the smaller streams.

This timber sale will not be harvesting within the riparian reserves and will not be building any new system roads. Two temporary roads totaling 430 feet, will be built to access Units 6 and 8. These roads will be decommissioned after sale activities are complete. Approximately 2.3 miles of road are planned for inactivation under this NEPA document. However only 0.5 of these miles will have restoration benefits to the aquatic system. Current conditions will be maintained in most places, while restoration occurs in a small part of the watershed. The riparian silviculture restoration project will harvest some hardwoods along the stream. The long-term goal of this project will be to establish larger conifers which will help restore the riparian reserves to reach the desired goal sooner.

The Brice Creek Watershed Analysis identified the areas within the watershed with the most diverse aquatic habitat. These areas are downstream from the project area. This project is not expected to impact these areas.

This objective will be maintained and the riparian silviculture project will help enhance conditions along Brice Creek.

ACS Objective 2:

Maintain and restore spatial and temporal connectivity within and between watersheds, lateral, longitudinal and drainage network connections include floodplains, wetlands, push-up areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

As mentioned in objective 1, the riparian reserves for the Brice Creek Watershed are currently in a degraded condition. There are no human made barriers within the fish-bearing portion of Brice Creek. However barriers do exist to many of the smaller tributaries near where they enter Brice Creek (at the valley bottom road crossings). Most of these streams with barriers are small and non-fish bearing. Mid slope roads that cross these small high gradient tributaries also have culverts that are barriers to aquatic species. As indicated in the Aquatic Report for the Northnoon Timber Sale, road density is high in Brice Creek, with an overall average of 3.8 miles of road per square mile. The drainage extension has also increased due to the many mid slope and valley bottom roads. Fortunately the sediments in this upper part of the watershed are coarse, with little fines. The cumulative effect of fine sediment that is often deposited into the stream channels from roads like these combined with other sources of fines within stream channels does not appear to be a concern within most of this watershed. Fine sediment has been observed to be more of a concern in the lower reaches of Brice Creek. In addition, there may be higher flows from the increased drainage network due to the ditches along the roads, however the bedrock-controlled channels are stable and have not shown indications of bank erosion from an increase of peak flows. This project is proposing to improve drainage on approximately 9 miles of road and inactivate 0.5 miles of road that will have a positive effect on the aquatic system.

Refugia habitat was identified in the Brice Creek Watershed Analysis as the area with the most diverse aquatic habitat. These areas will not be affected by the proposed timber sale activities.

Brice Creek is a high gradient bedrock controlled watershed with minimal floodplains. The lower reaches of Brice Creek does have some floodplain habitat. However the stream has down-cut in

areas and is no longer fully connected to its floodplain. The Northnoon project area is approximately 4.5 miles upstream from this area. There are no large wetlands within the watershed.

The full no-harvest riparian reserves along the tributaries should maintain stability, temperature and riparian connectivity. No new permanent roads will be built. Approximately 430 feet of temporary road will be built to access Units 6 and 8. These roads will be restored after timber sale activities are complete. Current conditions will be maintained. Some road upgrading and restoration will occur that will help restore conditions in these areas.

ACS Objective 3:

Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

Lower Brice Creek is a depositional area that has down-cut to bedrock in some places. Deposition is still occurring in some of these low gradient reaches, although the habitat is considered to be at-risk. This situation is believed to have been a result from past practices of instream salvage logging. Without the large woody material the channel was unable to capture the sediments. Some large wood has recently entered the stream channel and conditions are expected to improve over time.

Overall Brice Creek is a bedrock controlled stream channel that is fairly stable. However, past instream salvage of logs and road construction has affected the streams. Brice Creek has a high amount of course bedload. As discussed in the Aquatic Report for the Northnoon Timber Sale, the stream channel above the Champion Creek confluence is out of dynamic equilibrium. The road has confined and straightened the channel. This has resulted in long riffles with lots of unstable boulders and little pool habitat.

This project is not expected to affect stream channels. This objective will be maintained.

ACS Objective 4:

Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

As mentioned in the Aquatic Report for the Northnoon Timber Sale, Brice Creek is listed on the Oregon Department of Environmental Quality 303(d) List for being temperature limited from the mouth up to the confluence of Parker Creek. Full riparian reserves (180 feet) will be left along non-fish bearing streams adjacent to timber harvest units. Current conditions will be maintained.

The riparian silviculture project along Brice Creek will remove some of the hardwood vegetation within the riparian. To help maintain shading and stability, this project will keep the hardwoods immediately adjacent to the stream channel (30-50 feet) intact. The precommercial sized trees that will be thinned out will be more than 30-50 feet from the stream channel. These trees will not be large enough to influence stream temperatures from those distances. Long term effects (10+ years), from the larger conifers growing in the riparian, are expected to keep water temperatures cool. This objective will be enhanced.

ACS Objective 5:

Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage and transport.

The Brice Creek Watershed has a high amount of coarse bedload. The high gradient streams, such as the tributaries in the planning area, are source areas for coarse sediment. The mainstem of Brice transports material, while the lower reaches of Brice Creek are depositional storage areas. As mentioned above, due to past road construction and instream salvage of large woody debris, the mainstem of Brice Creek within the planning area and in the lower depositional areas are not properly functioning. The lower depositional areas are currently functioning more as transport reaches than they would if large woody debris was abundant able to capture sediments. Fine sediment is a concern for the streams located in the earthflow terrain of Brice Creek. The planning area is not associated with any earthflow terrain.

No harvest or new road construction within the riparian reserves along the high gradient source tributaries will maintain channel stability. This project is expected to maintain current conditions.

ACS Objective 6:

Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

The Brice Creek Watershed Analysis concluded that an increase of peak flows has not been detected downstream at the Row River gauging station. Local effects may be occurring within certain drainages of the Brice Creek Watershed. Stream inventories of the small tributary streams within the planning area drainage have not shown signs related to cumulative peak flow concerns. These high gradient streams tend to be stable with little erosion. Blowdown is common in some areas and these down trees provide stability to these channels. Full no harvest riparian reserves will help maintain this condition.

ACS Objective 7:

Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

Brice Creek Watershed is steep and predominantly bedrock controlled with minimal meadow or wetland habitat. This project will not affect any meadow or wetland habitat. This objective will be maintained through this project.

ACS Objective 8:

Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

As discussed under Objective 7 above, this project will not affect any meadow or wetland habitat. If any wet areas are found in matrix, they will be protected by not harvesting the trees immediately around these areas. In addition, this project proposal does not include harvest within the riparian reserves. This objective will be met because existing riparian conditions will be maintained.

ACS Objective 9:

Maintain and restore habitat to support well-distributed populations of native plant, invertebrates, and vertebrate riparian-dependent species.

As discussed in Objective 8, this proposed sale will not be harvesting within the riparian reserves. There are no anticipated effects to riparian plant communities. This objective will be met because existing riparian conditions will be maintained.

Conclusion

The information above was generated from the Interdisciplinary Team members or specialists that are familiar with the Northnoon Timber Sale Project. Based on this review I conclude that the objectives of the Aquatic Conservation Strategy of the Northwest Forest Plan are being met for the proposed action of the Northnoon Environmental Assessment.

DEBORAH G. SCHMIDT
District Ranger

Appendix C

Best Management Practices, Mitigation Measures and Management Requirements and Monitoring

Number	Type	Source				Objective	Actions/Practice/Mitigation	Location	Responsibility	
		BMP	S&G	CT/RM	Mitigation				Implementation	Monitoring
G-1	General	T-7	UFP IV-60-5			Protect water quality and riparian resources, reduce erosion	Stream course protection (identification of Riparian Reserves) will be used on all stream classes and designated on Timber Sale Area maps.		Timber	Aquatic
G-2	General		NFP C-31			Protect water quality and riparian resources, reduce erosion	Prohibit or regulate activities in Riparian Reserve that retard or prevent attainment of the Aquatic Conservation Strategy objectives.		Timber/ Engineering/ Silviculture	Aquatic/ Botany
G-3	General	T-4	NFP C-30, BCWA-188			Protect water quality and riparian resources, reduce erosion	Riparian Reserve widths will be equal to the height of one site-potential tree (190 feet) for all non-fish bearing perennial and intermittent streams and two site-potential trees for all fish bearing streams.		Timber/ Engineering	Aquatic/ Wildlife
G-4	General	T-8	UFP-60-1	X		Protect water quality and riparian resources, reduce erosion	No timber harvest will be conducted within Riparian Reserves. Establish no-cut buffers on all streams and wet openings; the exception will be where skyline corridors will cross through Riparian Reserves in some units that will be skyline yarded. These corridors will be kept to a maximum of 10' in width. These areas will be protected with directional felling and will have debris clean out waived.	Unit 7	Timber	Aquatic/ Wildlife

Number	Type	Source				Objective	Actions/Practice/Mitigation	Location	Responsibility	
		BMP	S&G	CT/RM	Mitigation				Implementation	Monitoring
G5	General		UFP 37-6	X		Protect Sensitive and Threatened & Endangered Species	Any management activity that will negatively affect species listed on the Regional Forester's Sensitive Species List, or their habitat, will be modified to either avoid or minimize the impact. Threatened or Endangered species will be protected if found during sale operations.		Timber/ Engineering/ Silviculture/ Fire	Wildlife/ Botany
G-6	General		UFP IV-36-4	X		Protect Native Vegetation	Native hardwood trees or tree-like shrubs will be maintained on at least 10 percent of the area in all harvest units. This standard applies in areas where hardwoods are a natural component of conifer timber stands and are intended to ensure that hardwoods will continue to be represented in the stand.		Timber	Silviculture
G-7	General				Wildlife	Protect Native Vegetation	Retain 10 percent of the area associated with each harvest unit to provide options for habitat diversity.		Timber	Silviculture
G-8	General		UFP IV-201 Prescription C5-1			Protect Unique Habitats	Apply a 150' no-activity buffer around all unique habitats to minimize potential impacts of harvest and post-sale fuels treatments. This mitigation applies to all unique habitats currently known or those located in subsequent fieldwork.		Timber/ Fire	Wildlife/ Botany
G-9	General	W-7	UFP IV-61-12			Erosion Control	The application of Best management Practices for the protection of water quality and beneficial uses will be monitored on Ground-disturbing activities.		Timber	Aquatic

Number	Type	Source				Objective	Actions/Practice/Mitigation	Location	Responsibility	
		BMP	S&G	CT/RM	Mitigation				Implementation	Monitoring
G-10	General	W-9	UFP IV-72-16			Identify Erosion Control Needs	Erosion control needs will be identified where developed areas, including recreation sites, roads, trails, rock pits and others, produce erosion/sedimentation that may affect water quality and beneficial uses in surface waters.		Engineering	Aquatic
G-11	General		UFP IV-68-3			Protect Soil Productivity	Existing surface organic material (litter, duff, and wood) needed to maintain soil productivity will be protected to the greatest extent possible from all ground disturbing activities.		Timber/ Engineering/ Fire	Fire/ Silviculture
G-12	General		UFP IV-29-4			Protect Cultural Resources	In the event that an unknown historic or prehistoric site is discovered in the course of the project, the activity will be stopped and the appropriate measures will be taken to stop any adverse effects to the site resulting from the activity. All known sites will be protected. No ground disturbance activities will occur on known sites.		Timber/ Engineering/ Fire/ Silviculture	Cultural Resources
PO-1	Project Operations	T-19				Maintain control of project operations through contract	Contract preparation and administration will include operating periods, modification language, and control and acceptance of purchaser work.		Timber/ Engineering	FSR/ER
PO-2	Project Operations	T-22				Maintain control of project operations through contract	Modification of the TSC during the life of the contract will be accompanied through appropriate TSC provisions		Timber/ Engineering	FSR/ER
PO-3	Project Operations	T-18				Erosion Control	Purchaser erosion control structures and maintenance work that will be inspected prior to acceptance by the Forest Service are to be specified in the TSC.		Timber/ Engineering	FSR/ER

Number	Type	Source				Objective	Actions/Practice/Mitigation	Location	Responsibility	
		BMP	S&G	CT/RM	Mitigation				Implementation	Monitoring
PO-4	Project Operations	T-5			Wildlife/BO	Protect northern spotted owl	No harvest activities will occur from March 1 to July 15 unless approved by the District Wildlife biologist.		Timber	Wildlife
PO-5	Project Operations	T-5			Wildlife	Prevent resource damage, protect wildlife	The operating period for the sale will be from May 1 to October 31 unless otherwise agreed to by the Forest Service Contracting Officer.		Timber	FSR
PO-6	Project Operations	W-4	UFP IV-61-9	X		Water quality	The Umpqua National Forest Spill Prevention and Response Plan will be followed for the transportation of hazardous materials. If the volume of fuel exceeds 660 gallons in a single container or a total on-site storage of 1320 gallons, a Spill Prevention Control and Countermeasure (SPCC) Plan is required.		Timber/ Engineering	Aquatics
PO-7	Project Operations			X	Botany	Noxious Weed Control	Require that all off-road equipment be seed-free prior to entering the Ranger District		Timber/ Engineering	Botany
PO-8	Project Operations	T-14	UFP IV-68-2		Soils	Erosion control	Maintain effective ground cover in ground-disturbed areas of 45-65 percent. Re-vegetate landings, skid roads and other disturbed ground according to Umpqua Native Species policy.		Timber/ Botany/ Engineering	Botany/ Aquatic
PO-9	Project Operations	T-10				Erosion control	Landings are located so that designated timber can be yarded with minimal disturbance to riparian reserves. Locate landings in such as way as to minimize creation of hazardous watershed conditions. Landing size shall not exceed that needed for safe and efficient yarding and loading operations.		Timber	Aquatic
PO-10	Project Operations	T-10				Erosion control	All landing locations will be approved by the Forest Service prior to landing construction and agreed upon plans for the landing shall insure water quality protection.		Timber	FSR/ Aquatic

Number	Type	Source				Objective	Actions/Practice/Mitigation	Location	Responsibility	
		BMP	S&G	CT/RM	Mitigation				Implementation	Monitoring
PO-11	Project Operations	T-15	UFP IV-71-13			Erosion control	Provisions are made in the TSC for landings to be rehabilitated by providing proper drainage and by planting with native vegetation if necessary.		Timber/ Botany	Aquatic/ Botany
PO-12	Project Operations		UFP-67-1			Project soil productivity	The combined total amount of unacceptable soil condition (compaction) within an activity area should not exceed 20 percent.		Timber	Silviculture/ Fire
PO-13	Project Operations		UFP-67-1			Protect soil productivity	To the extent practicable, leave and protect from disturbance all large diameter snags that were present prior to harvest activity. If snags must be felled for safety concerns, leave the snags on site.		Timber/ Fire	Wildlife
PO-14	Project Operation		BCWA 179-1		Wildlife	Maintain snag habitat	Retain or create a minimum of three snags greater than 20" diameter and three snags greater than 30" diameter per acre in Decay Class I and II. Manage for a minimum density of nine snags per acre in Decay Class I, II, III and IV throughout the drainage. Priority is to retain the existing snags within the units.		Timber	Wildlife
PO-15	Project Operations		UFP IV-68-4			Maintain down wood habitat and site productivity	To the extent practicable, leave and protect from disturbance all large down logs that were present prior to harvest activity.		Timber/ Fire	Wildlife

Number	Type	Source				Objective	Actions/Practice/Mitigation	Location	Responsibility	
		BMP	S&G	CT/RM	Mitigation				Implementation	Monitoring
PO-16	Project Operations		UFP IV-68-4, BCWA-179		Wildlife	Maintain down wood habitat	Follow recommendations in the BCWA to achieve down woody material objectives within the Matrix allocation. Manage for a minimum of 12 pieces greater than 20 inches in diameter and 20 feet long and 12 pieces greater than 20 inches in diameter and 10 feet long at a density of 24 pieces per acre of Decay Class I and II across the harvest units. Additional material will be left when logs have little or no commercial value and do not produce an unacceptable fire hazard.		Timber	Wildlife
PO-17	Project Operations	T-12		X		Minimize impacts to water quality and soil disturbance	A skyline system capable of attaining one-end suspension during inhaul and having at least a 75-foot lateral yarding capability with a carriage capable of maintaining a fixed position on the skyline during lateral yarding will be required. Skyline roads will be no closer than 150 feet at the outer unit boundary of all units.		Timber	FSR/Aquatic
PO-18	Project Operations				Botany	Noxious Weed Control	Use only weed-free straw and mulch on road stabilization and erosion control projects		Timber/ Engineering	Botany
PO-19	Project Operations				Botany	Noxious Weed Control	Minimize sources of weed seed in areas not yet revegetated. Keep active road construction sites closed to vehicles not involved with construction.		Timber/ Engineering/ Aquatic	Botany
LP-1	Logging Practices			X	Aquatic	Riparian Protection	Directional fell trees away from Riparian Reserves, reserve tree clumps and snag management areas.		Timber	Aquatic/ Wildlife
LP-2	Logging Practices				Aquatic/ Wildlife	Riparian Protection	Trees in Riparian Reserves that are damaged during timber harvest and road reconstruction or construction activities will be left on the site.		Timber	Wildlife/ Aquatic

Number	Type	Source				Objective	Actions/Practice/Mitigation	Location	Responsibility	
		BMP	S&G	CT/RM	Mitigation				Implementation	Monitoring
LP-3	Logging Practices	T-9 VM-1 VM-4		X		Erosion Control	Restrict tractor logging to lands that can be harvested with a minimum of soil compaction and erosion. Restrict heavy equipment to slopes less than 35 percent.	Unit 4	Timber	Aquatic
LP-4	Logging Practices	T-11				Erosion Control	Design and locate skid trails to minimize the area affected by compaction, erosion and runoff water.		Timber	Aquatic
LP-5	Logging Practices	T-11	UFP IV-60-6	X	Aquatic Silviculture	Erosion control, soil productivity, protect residual trees	Tractor use is limited to skid trails. Use one-end suspension, end-lining and felling to the lead methods to protect water quality, soil productivity and residual trees.	Unit 4	Timber	Aquatic/Silviculture
LP-6	Logging Practices	VM-2			Aquatic	Erosion Control	Tractor operation is excluded from wetlands and meadows.	Unit 4	Timber	Aquatic/Wildlife/Botany
LP-7	Logging Practices	T-9		X	Aquatic/Soils/Wildlife	Erosion control, wildlife, forage, weed exclusion	All skid roads will be decommissioned immediately following sale activities. They will be waterbarred and planted with native vegetation compatible for wildlife forage and consistent with the Umpqua National Forest Native Seed Policy.		Timber	Aquatic/Wildlife/Botany
LP-8	Logging Practices	T-16, R-23	UFP IV-83-6		Wildlife/Botany	Erosion control, wildlife forage, weed exclusion	Inactivate temporary roads, as contractual requirements are complete but no later than one year. Inactivation will include sub-soiling to a depth of 18 inches; waterbarring and applying a native seed mix for erosion control that is compatible with wildlife forage needs and consistent with the Umpqua National Forest Native Seed Policy.	Unit 6 / Unit 8	Timber/Engineering	Aquatic/Botany

Number	Type	Source				Objective	Actions/Practice/Mitigation	Location	Responsibility	
		BMP	S&G	CT/RM	Mitigation				Implementation	Monitoring
LP-9	Logging Practices	T-13	UFP IV-82-5			Erosion control	Erosion control work shall be kept current immediately preceding expected seasonal periods of precipitation or runoff. Any soil disturbed during the rainy season in excess of 0.5-acre will have effective ground cover provided.		Timber/ Engineering	Aquatic/ Botany
LP-10	Logging Practices	T-21				Water quality	Refueling of heavy equipment should be done 100 feet or more from stream courses. Use absorbent pads in ditch lines if surface water is present.		Timber/ Engineering	Aquatic
LP-11	Logging Practices			X	Botany	Noxious weed control	All ground based yarding equipment will be clean and inspected to assist in the control of non-native plant species.		Timber/ Engineering	Botany
LP-12	Logging Practices				Botany	Noxious weed control	Survey and treat weed infestations at landings and on skid trails after harvest		Botany	Botany
RP-1	Road Practices	R-3 R-20				Erosion control	Minimize erosion by conducting road construction operations when the ground is dry (within the operating season).		Timber/ Engineering	Aquatic
RP-2	Road Practices	R-21				Erosion control	Minimize the impact of melt water on road surfaces and the probability of sediment production resulting from snow removal operations by implementing specifications T-803.	Rds. 2212, 2212-724, 2212-737 and 2212-732	Timber/ Engineering	Aquatic
RP-3	Road Practices				Botany	Noxious weed control	During timber sale activity roadside brushing should be accomplished prior to seed setting of noxious weeds, approximately mid-June to July. The intent is to stop the spread of existing weeds and prevent establishment of new weeds.		Engineering/ Timber	Botany
RP-4	Road Practices	T-21				Erosion control	Riparian Reserves, seeps and springs will be avoided when conducting dust abatement activities (if substances other than water is used).		Engineering/ Timber	Aquatic

Number	Type	Source				Objective	Actions/Practice/Mitigation	Location	Responsibility	
		BMP	S&G	CT/RM	Mitigation				Implementation	Monitoring
RP-5	Road Practices	R-19 R-21				Road Maintenance	On Forest Service haul routes ditches that show no sign of erosion, i.e. grassed-in, rocky, etc., should not be disturbed by road maintenance unless necessary to maintain drainage. Grading of these roads will be done in accordance with maintenance specification T-811 and ORT-839, and water shall be applied during blading (T-891) when sufficient moisture is not present.	Rds. 2212, 2212-724, 2212-737 and 2212-732	Engineering	Aquatic
RP-6	Road Practices	R-15				Road maintenance	During reconstruction and construction activities, waste material shall be placed in areas agreed upon by the District during the design phase, or in locations outside Riparian Reserves that do not affect fish, wildlife, cultural, or botanical resources.		Engineering	Aquatic/ Wildlife/ Botany/ Cultural
RP-7	Road Practices	R-17				Water source development	Water sources #35 will be used as the supply for the water needed in the placement of crushed aggregate on roads as needed. Access roads to the water sources will be gravel surfaced to reduce sedimentation into streams.		Engineering	Aquatic
RP-8	Road Practices				Botany	Noxious weed control	Utilize road surface gravel from weed-free sources. Pre-inspect gravel sources for the presence/absence of noxious weeds prior to utilization of gravel from those sources.		Engineering	Botany
FM-1	Fire Management		NFP C-35			Protect riparian habitat	Fuels treatments will be designed to meet the Aquatic Conservations Strategy objectives. No burning will occur in Riparian Reserves.		Fire	Aquatic/ Wildlife
FM-2	Fire Management	F-2				Protect large woody material and duff	Burning will be carried out when fuel moistures are high to ensure retention of duff and large woody material.		Fire	Fire/ Wildlife; Silviculture

Number	Type	Source				Objective	Actions/Practice/Mitigation	Location	Responsibility	
		BMP	S&G	CT/RM	Mitigation				Implementation	Monitoring
FM-3	Fire Management	F-3				Erosion control, soil productivity, control of noxious weeds	Construct waterbars in firelines, where needed, to minimize erosion. Rehabilitate firelines, as feasible, to restore soil and duff layer, and to reduce weed invasion.		Fire/Timber	Aquatic/ Silviculture/ Botany
FM-4	Fire Management	F-3	UFP IV-68-2			Erosion control	A minimum effective ground cover of 25% to 65% will be maintained within the first year following the end of ground disturbing activity.		Fire	Wildlife/ Botany
FM-5	Fire Management	F-3				Noxious weed control	Revegetate areas of fireline at high-risk for weed invasion.		Botany/ Silviculture	Botany/ Silviculture
FM-6	Fire Management		UFP IV-92-8			Protect air quality	Burning will be conducted to meet air quality standards as outlined by Oregon DEQ and air quality monitoring will be conducted in conjunction with the DEQ.		Fire	Fire

UFP=Umpqua Forest Plan
NFP=Northwest Forest Plan
BCWA=Brice Creek Watershed Analysis

Appendix D

Definition of Acronyms

AGL – Above-ground Level
BCWA – Brice Creek Watershed Analysis
BMP – Best Management Practice
DEQ – Department of Environmental Quality
EA – Environmental Assessment
EPA – Environmental Protection Agency
ESA – Endangered Species Act
FVS – Forest Vegetation Simulator
IDT – Interdisciplinary Team
K-V – Knudson-Vandenberg
LRMP – Land and Resource Management Plan
LSR – Late-Successional Reserve
MA – Management Area
MBF – Thousand Board Feet
MIS – Management Indicator Species
MMBF – Million Board Feet
NEPA – National Environmental Policy Act
PPC – Potential Carrying Capacity
ROD – Record of Decision
SM – Survey and Manage
SOPA – Schedule of Proposed Action
SPCC – Spill Prevention Control Countermeasures
VE – Biological Evaluation
VQO – Visual Quality Management