BORG ENVIRONMENTAL ASSESSMENT

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Chapter I

A. Introduction

This Environmental Assessment describes the analysis of the project proposals in the Buck Creek and Anvil subdrainages of the Oak Grove watershed. The analysis file includes maps, public involvement results, a biological evaluation and assessment, the cultural resource report, and other resource specialist reports.

The planning area is located approximately 50 miles southeast of Portland, Oregon. The location of the proposed activities are in T.5 S., R.8 E; Willamette Meridian. See Map on page 40 which shows the vicinity of the Borg planning area.

This action is proposed under the Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (hereafter referred to as the Northwest Forest Plan); and the Mt. Hood National Forest Land and Resource Management Plan (hereafter referred to as the Mt. Hood Forest Plan. The Record of Decision (ROD) for the Northwest Forest Plan amended the Mt. Hood Forest Plan.

The Borg project area contains the following land allocations identified in the Northwest Forest Plan: Matrix and Riparian Reserve. No projects are proposed in Late-Successional Reserves (LSR). The Matrix is further divided into the Mt. Hood Forest Plan land allocations of C1 Timber Emphasis. See the Northwest Forest Plan and the Mt. Hood Forest Plan for specific management direction related to these land allocations.

B. Desired Future Conditions

The following desired future conditions are derived from the **Mt. Hood Forest Plan** that are relevant to the project area.

Health — Forests have low levels of disease, damaging insect populations and storm damage. Four-92, FW-382; and Four-292, C1-22.

Stand Structure & Growth — Stands have a mix of age classes and a continuous forest cover (i.e. an uneven stand structure) which maintains dispersal characteristics for terrestrial species. Stands are healthy and vigorous, and have growth rates commensurate with the sites potential (at a rate at which the mean annual increment has not culminated). Four-5, #44; and Four-86, FW-306; and Four-91, FW-372; and Four-90, FW-361; and Four-292, C1-016 to 018.

Deer & Elk — The forest provides high quality summer rearing habitat for deer and elk. The forest contains a mix of habitats including forage, thermal cover and

optimal cover. Open road density is at a level which allows animals a sense of security. Four-277, goal; Four-278, B11-9 to 16; Four-72, FW-202 to 210.

The following statements describe desired future conditions from the **Northwest Forest Plan** that are relevant to the project area.

Riparian Reserves Riparian reserves provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration. They contain diverse vegetation as well as supply snags and course woody debris sufficient to sustain physical complexity and stability. Riparian reserves provide mature forest connectivity. ROD page B-11

Aquatic Streams have diverse structures with coarse woody debris sufficient to sustain physical complexity and stability. Streams have spatial and temporal connectivity within and between watersheds. The streams provide unobstructed routes to areas critical to fulfilling life history requirements of aquatic and riparian-dependent species. ROD page B-11.

Matrix Stands are diverse and contain patches of green trees and snags as well as dispersed green trees and coarse woody debris. ROD pages C-40 to C-42.

LSR Late-Successional Reserves provide a functional late-successional and old-growth forest ecosystem to serve as high-quality habitat for late-successional and old-growth related species. ROD page B-4.

The following statements describe desired future conditions from the **Oak Grove Watershed Analysis** that are specific to the project area.

Landscape Design LSR's and Riparian Reserves are mature forests or are rapidly moving toward a mature, diverse condition. There are large patches of late-seral interior habitats connected via Riparian Reserves.

The stand in the project area maintains dispersal habitat (between the Oak Grove Fork of the Clackamas River and the LSR 207 to the north), is healthy and vigorous, and has growth rates commensurate with the sites potential. This is provided by managing for a continuous forest cover with a mix of age classes, i.e. an un-even age stand structure.

Within this portion of C1 Timber emphasis land allocation the more common even-age silvicultural system would not provide for the special dispersal habitat needs within this area. Due to the large stand size and gentle terrain there is a unique opportunity to maintain dispersal habitat

through the use of an un-even age silvicultural management system and still meet the other objectives of this land allocation.

C. Purpose and Need and Proposed Actions

Many areas do not meet some of the desired conditions described above. The following lists the need for action, the purpose of the project, and a detailed description of the proposed action.

1. Uneven-Age Management

Need

The project area contains a stand (approximately 200 acres) that is growing slower than the site's potential and does not have a mix of age classes. If no action is taken, this stand would continue to decline in terms of both growth and health.

There is a special need to maintain dispersal habitat between the Oak Grove Fork of the Clackamas River and the LSR 207 to the north. The more common even-age silvicultural system would not provide for this dispersal habitat need. There is a unique opportunity within this stand to use an un-even age silvicultural system which would provide for this dispersal habitat.

This stand is in the Matrix land allocation identified in the Northwest Forest Plan and in the C1 Timber Emphasis land allocation identified in the Mt. Hood Forest Plan. The Watershed Analysis recommended that stand manipulations in this area should be designed in a way that maintains a continuous forest cover, thereby maintaining dispersal habitat.

Purpose

The objective is to convert this stand over time to a healthy vigorous stand that is capable of growth commensurate with the sites potential while maintaining a continuous forest cover to provide for a special dispersal habitat need.

Proposed Action

The proposed action is to use an uneven-age group selection system with some partial harvesting to manage the stand on a 25 year entry cycle. In order to design the first harvest entry, all of the entries for the entire rotation cycle must be planned. Over the duration of the rotation, the stand would be entered four times in which approximately 21% of the stand would be harvested in each entry. At least 15% of the stand would be permanently retained as green tree patches and scattered trees.

For the first entry cycle, approximately 45 acres would be harvested in 22-25 small patches or "groups" of less than 2 acres in size. In addition, some partial harvesting of shade-tolerant species within 50 feet of each group would be implemented to allow more sunlight into the harvested

groups to improve survival and growth of shade-intolerant species. Site preparation and planting of shade-intolerant species would occur in the harvested groups to ensure the presence of shade-intolerant species in the stand.
No new road construction would occur. Approximately 1 mile of existing low-standard system roads would be reconstructed. In addition, approximately 1.10 miles of skid trails or temporary roadbeds would be upgraded to temporary roads. These temporary roads would be bermed, scarified, and seeded after project implementation. Since this stand is being managed under an uneven-age management regime, the temporary roads used in this entry will be utilized in subsequent entries.

2. Culvert Upgrades / Replacements

Need The flood of 1996 caused water flow over the 5810-210 road that created scouring of its drainage facilities, a sediment producer to Buck Creek and its tributary. There is also a need to increase the carrying capacity of the culvert at the 5810-210 / Buck Creek crossing. These actions are necessary to meet the Aquatic Conservation Strategy (ACS). If no action is taken, erosion, sedimentation and road damage may occur in the future.

Purpose The objectives are to prevent road damage on the 5810-210 road and to reduce the potential for sedimentation to enter into Buck Creek and its tributary.

Proposed Action Repair the ditch scour on the 5810-210 road by filling in with riprap to armor these ditches. In addition, remove the two 18" culverts that became plugged as a result of the flood and replace with an armored dip. An additional armored dip would be placed between the 5810-220 and 5810-230 roads. Lastly, remove the culvert currently on the 5810-210 / Buck Creek crossing and upgrade with a larger, 36"-48" diameter round culvert or equivalent.

3. Road Closure

Need The Oak Grove Watershed Analysis identified a need to reduce disturbance to wildlife within the LSR as well as reduce road maintenance costs. Road 5810-210 is currently open, part of which is in the LSR. If a portion of this road is not closed, disturbance of wildlife in the LSR would continue and road maintenance expenditures for this road would still be needed.

Purpose The objective is to reduce disturbance of wildlife in the LSR and to reduce road maintenance expenditures.

Proposed Action	The proposed action is to close road 5810-210 near the junctions with road 5810 -036 and 037. This would close approximately 1 mile of road.

4. Snag Creation in Riparian Reserves

Need	The Riparian Reserve along Buck Creek is snag deficient. Under the Aquatic Conservation Strategy, riparian reserves are to be managed to provide benefits to riparian-dependent and associated non-fish species, and to improve travel and dispersal corridors for many of these terrestrial animals. A lack of snags in riparian reserves would decrease the areas value as habitat for these associated species as well as decreases its value as a travel corridor. If no action is taken, the Riparian Reserves in the planning area would continue to have a low amount of snag habitat component and thus low value as riparian dispersal habitat.
Purpose	The objective is to enhance dispersal characteristics for terrestrial species within riparian reserves by improving the snag habitat component.
Proposed Action	The proposed action is to create 4 snags per acre via girdling in the Buck Creek Riparian Reserve. A total of 148 snags would be created.

5. Forage Enhancements

Need	Forage is available within the analysis area but is scattered and generally of low quality. If no action is taken, the project area will continue to provide low levels of forage for deer and elk.
Purpose	The objective is to increase forage quality and quantity in the short term to improve deer and elk summer habitat.
Proposed Action	The proposed action is to seed the recently disturbed skid roads and landings with palatable grass/forb species and plant with palatable browse species. Approximately 5 acres would be treated.

D. Scoping

A scoping process to request public input for this project was conducted. A letter describing the proposed project and requesting comments was sent out in 1998. The project also appeared in

the Forest's Winter and Spring, 1998 issues of Sprouts, a quarterly publication that is mailed to a wide audience. The interdisciplinary team developed issue statements based on input received and their own knowledge and experience. The following issues developed as a result of this scoping.

E. Issues

The planning process is guided by issues developed during the scoping process. Analysis of these issues aided in formulating and evaluating alternatives, and defining project design criteria to meet resource management objectives.

Significant Issue

1. *Water Quality*

Water quality is a concern for many people. Even though the proposed actions have been designed to meet current standards there is still a concern about the re-opening and resultant use of roads within riparian reserves.

The re-opening of two currently closed roads located within the riparian reserve that have grown in with brush, and their resultant use by log haul traffic, may pose a risk to water quality by contributing sediment to the stream. A qualitative rating will be used to describe impacts to water quality with this proposal.

Other Issues

2. *Stream Temperatures*

One of the proposed actions would create 148 snags within the Buck Creek Riparian Reserve. Snag densities within this area are currently below the desired future condition to support 80 percent of the maximum biological potential of primary cavity nesting species set forth in the forestwide riparian standards of the Mt. Hood Forest Plan.

There is a concern that the removal of canopy cover along this stream has the potential to increase solar radiation, thus increasing stream temperatures. A qualitative rating will be used to describe the effects.

3. *Soil Compaction*

The combined cumulated detrimental impacts of soil compaction and erosion occurring from both past and planned activities should not exceed 15 percent of the project area as per the Mt. Hood Forest Plan Forestwide Standards.

There is a concern that the proposed multi-aged management regime with repeated entries into this project area within the next 100 years may cause the level of compaction to exceed the Mt. Hood Forest Plan maximum compaction level of 15%. A qualitative rating will be used to describe project impacts to soil compaction.

4. *Recreation Access*

There is a need to reduce disturbance to wildlife within the LSR that is adjacent to the project area, as well as reduce road maintenance costs. The proposed action is to close the 5810-210 road near the junctions with roads 5810-036 and 037. This would close approximately one mile of road.

There is a concern that the closure of this stretch of road which accesses an LSR would limit public use of the area for predominantly huckleberry picking and dispersed camping associated with hunting. A qualitative rating will be used to describe the effects of this proposal.

CHAPTER II - ALTERNATIVES AND DESIGN CRITERIA

A. Alternative A - No Action

"Custodial" activities would occur, including but not limited to road maintenance, data gathering, fire suppression, and activities approved by other plans or documents. All of these custodial activities would also occur with any of the other alternatives.

B. Alternative B - Proposed Action

Alternative B is designed to move the area toward the desired future conditions. It is designed with the intent of protecting or enhancing the resources listed in the issue section. The purpose and need section describes five actions.

- Action 1 involves the harvesting of the stand under an uneven-age management regime using a group selection system. This would maintain a continuous forest cover in the area to provide for a dispersal habitat need. Fuels reduction and site preparation would be accomplished prior to planting. Approximately 45 acres would be treated in this manner.

- Action 2 involves the upgrade and replacement of culverts.

- Action 3 involves the closure of approximately 1 mile of the 5810-210 road.

- Action 4 involves the enhancement of forage on approximately 5 acres.

- Action 5 involves the creation of approximately 148 snags within the Buck Creek Riparian Reserve. Snag distribution would be determined by the location of suitable large trees as well as in areas where the number of snags are deficient within the Buck Creek riparian reserve.

C. Alternative C

Alternative C is designed to respond to issue #1.

The proposed action involves the re-opening of two closed roads totalling approximately 2000 feet to access the stand. These roads have grown in with brush and are located within the riparian reserve. There are no chronic sources of erosion currently being produced by these roads. The concern expressed in issue #1 is that the ground disturbing activities necessary to re-open these roads as well as their resultant use by log haul traffic may pose a risk to water quality by contributing sediment to the stream. In alternative C these roads within the riparian area would remain closed indefinetely. Instead, approximately 1000 feet of new temporary road would be constructed outside of the riparian reserves.

D. Mitigation Measures Specific to Action Alternatives - Also see Appendix A for Clackamas River Ranger District Standard Management Requirements and Design Criterias.

SEASONAL RESTRICTIONS

1. Soils: No operation of off-road ground-based equipment would be permitted between October 1 and June 30. Also applies to ground-based equipment on connected projects. This restriction may be waived if soil moisture is appropriate for the project.

OTHER DESIGN CRITERIA

2. Snags would be retained at the level of 1.2 per acre within the harvested areas. If this level is not present, live replacement trees would be retained. If a post contract review of snag levels indicates that the units do not meet this level, blasting or girdling of live trees would create sufficient snags. Snags would be greater than 22 inches in diameter and 40 feet tall or be representative of the largest tree diameter class present as required in the Mt. Hood Forest Plan.

3. To provide for future snags over the next 30 years as required by the Mt. Hood Forest Plan; and to provide dispersed structures (individual trees) as part of the 15 percent green tree retention requirements under the Northwest Forest Plan, 5.9 green trees / acre of the healthiest, biggest, and most windfirm trees would be retained within the harvested areas. For the remaining 15 percent green tree retention requirement, 21 acres would be set aside in the stand in clumps of .50 acres and larger.

4. Blazed trees showing the segment of a historic trail found within the project area will be painted as reserve trees prior to project implementation to insure their protection.

E. Other Project Funding - The following project may be covered by another EA and may receive funding through this project.

5. The use of a slashbuster for a release treatment in the adjacent plantation to release conifers and to provide site preparation for planting those areas in the plantation that are understocked.

Table 2-1: Comparison of Alternatives with Purpose and Need

	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C
Purpose 1 Uneven-age managment	**Does not meet objectives. Stand would continue to decline in both growth and health.**	**Meets objectives. Harvests 45 acres within 25 groups of <2 acres. Maintains a continuous forest cover to provide for a special dispersal habitat need. Utilizes approx. 2000 feet of road within the Riparian Reserve.**	**Same as B except the roads within the riparian reserve would remain closed. An additional 1,000 feet of road would be constructed.**
Purpose 2 Culvert Upgrades and Replacements	**Does not meet objectives. Erosion, sedimentation, and road damage would continue to occur.**	**Meets objectives. Replaces culvert and repairs and prevents ditch scour.**	**Same as B**
Purpose 3 Road Closure	**Does not meet objectives. Disturbance to wildlife would continue and road maintenance costs would still be needed.**	**Meets objectives. Closes approximately 1 mile of road.**	**Same as B**
Purpose 4 Snag Creation	**Does not meet objective. The riparian reserves would continue to have low numbers of snags.**	**Meets objective. Creates 4 snags per acre within the Buck Creek Riparian Reserve.**	**Same as B**

Purpose 5 Forage Enhancements	**Does not meet objective. The area would continue to provide low levels of forage for deer and elk.**	**Meets objective. Creates 5 acres of quality forage.**	**Same as B**

Table 2-2: Comparison of Alternatives with Issues

Topic	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C
Significant Issue #1 Water Quality The re-opening of two currently closed roads located with the riparian reserve that have grown in with brush, and their resultant use by log haul traffic, may pose a risk to water quality by contributing sediment to the stream.	**No impacts to water quality.**	**The re-opening and use of approx. 2000 feet of existing road within the riparian reserve would occur. There is a small risk of sedimentation reaching the stream from the re-opening and use of this existing temporary road in the riparian reserve. The Aquatic Conservation Strategy would be met.**	**The existing roads in the riparian reserve would not be re-opened and used. There is less risk of sediment reaching streams than in alt. B. The Aquatic Conservation Strategy would be met.**

CHAPTER III - ENVIRONMENTAL EFFECTS

This section provides a comparison of alternatives. Alternatives are compared by the varying effects which they impart on several components of the environment. References are included for each resource to indicate where it is discusses in the Northwest Forest Plan and Mt. Hood Forest Plan and Final Environmental Impact Statement (FSEIS).

A. WATER QUALITY (Issue #1)

Mt. Hood Forest Plan References

- Forestwide Riparian Standards and Guidelines - FW-80 to FW - 136, page Four - 59
- Forestwide Water Standards and Guidelines - FW-54 to FW-79, page Four-53
- General Riparian Standards and Guidelines - B7-28 to B7-39, page Four-257
- See Mt. Hood FEIS pages IV-22, IV-47, IV-155 to IV-167

Northwest Forest Plan References

- Riparian Reserves - page A-5
- Aquatic Conservation Strategy - pages B-9 to B-34
- Riparian Reserves Standards and Guidelines-pages C-30 to C-38

Existing Condition:

The interdisciplinary team's knowledge and experience as well as the Watershed Analysis for the Oak Grove describes the existing conditions for the Oak Grove Fork and its tributaries and are as follows.

- Water quality is good

- The watershed is hydrologically stable in terms of geology and vegetative cover.

Effects of No Action Alternative (A):

The proposed action of upgrading and replacing culverts would not occur. Erosion, sedimentation, and road damage would continue to occur.

Effects of Action Alternatives (B & C) as related to issue #1

Issue Statement: The re-opening of two currently closed roads located within the riparian reserve that have grown in with brush, and their resultant use by log haul traffic, may pose a risk to water quality by contributing sediment to the stream.

The ground disturbing activities associated with road construction for both alternatives B and C do have the potential to allow sediment to enter the stream channel from surface erosion and run-off. Alternative B poses a slightly higher risk than alternative C to water quality because of the location of roads within the riparian reserve. Although a portion of the proposed road system in alternative B does lie within a riparian reserve, it is more than 100 feet from an intermittent channel and does not cross any stream. No new road cut or fill slope preparation is associated with these re-openings. Impacts to water quality and aquatic habitat for both alternatives will not pose a substantial risk to water quality or aquatic resources. Road construction and log haul would only occur during appropriate soil moisture conditions. Mitigation measures designed to minimize the risk of sediments entering stream courses and Best Management Practices (BMP) associated with road construction, would be utilized under both alternatives. The Aquatic Conservation Strategy would be met in both alternatives.

It is anticipated that the temporary roads, skid trails, and landings established at this entry will be used again in subsequent harvesting. These improvements will remain in place following sale closure. Erosion control measures including forage seeding and closure of the temporary roads between entries will minimize the risk of sediment imput into stream channels and any effects to water quality.

Effects of Action Alternatives (B & C) - As related to the other proposed actions

Actions items associated with both alternative B and C is the upgrade and replacement of culverts on the 5810 and 5810-210 roads. The objectives of the project is to prevent road damage by increasing culvert capacity to meet Northwest Forest Plan objectives and to replace some culverts with an armored dip in order to minimize ditch scour and increase resiliency.

The ground disturbing activity associated with culvert upgrade and replacement for both actionalternatives B and C do have the potential to allow sediment to enter the stream channel from surface erosion and run-off. Sediment delivery will result during implementation of the proposed culvert projects. Because of the intermittent flow regime of Buck Creek, and the short-

term nature of this disturbance, this sediment imput is not expected to exceed State Water Quality Standards. The culvert upgrades meet the Aquatic Conservation Strategy objectives and will provide long-term positive affects by preventing road damage and reducing the potential for sediment delivery into Buck Creek and its tributary.

The Aggregate Recovery Percentage (ARP) index is used to calculate cumulative effects of past and future harvest activities on hydrology. It evaluates the risk of increased peak flows from rain-on-snow events. ARP values are currently at 83.2% in the Buck Creek watershed and 73% in the Anvil Creek watershed. The proposed actions will result in a watershed recovery condition with an ARP of 82.5% in the Buck Creek watershed and 73.1% in the Anvil Creek watershed after harvest treatment. ARP values would remain above the Mt. Hood National Forest Land and Resource Management Plan threshold of 65% for this sale.

B. STREAM TEMPERATURE (ISSUE #2)

Existing Condition:

Water temperature is well within the range for optimal rearing for salmonids

Effects of No Action Alternative (A):

Current conditions in regard to stream temperature would remain the same.

Effects of Action Alternatives (B & C) as related to issue #2:

Issue Statement: There is a concern that the removal of canopy cover along this stream has the potential to increase solar radiation, thus increasing stream temperatures.

A proposed action associated with alternatives B & C would create snags within the Buck Creek Riparian Reserve to enhance dispersal characteristics for terrestrial species. Due to the current stand density within the riparian reserves along Buck Creek, and the proposed distance between snags, stream shade conditions will remain unchanged following the conversion of live trees into snag habitat. The amount of canopy cover provided by trees adjacent to those being made into snags will provide sufficient stream shading to maintain stream temperatures. Because of the ample number of large trees providing shade and the intermittent flow regime of Buck Creek durng the summer months, no significant change in stream temperatures would result from the implementation of this project. This project meets the Mt. Hood Forest Plan and the Northwest Forest Plan Aquatic Conservation Strategy objectives in regards to managing riparian reserves to provide benefits to riparian-dependent and associated non-fish species.

C. SOILS (ISSUE #3)

Mt. Hood Forest Plan References

- Forestwide Soil Productivity Standards and Guidelines - FW-22 to FW-38, page Four-49
- Forestwide Geology Standards and Guidelines - FW-1 to FW-21, page Four-46
- Earthflow Standards and Guidelines - B8-28 to B8-41, page Four-264
- Mt. Hood FEIS pages IV-11, and IV-155 to IV-167

Northwest Forest Plan ROD References

- Course Woody Debris Standards and Guidelines - page C-40
- Soil Disturbance Standards and Guidelines - page C-44
- Modify Fire and Pesticide Use, Minimize Soil and Litter Disturbance Standards and Guidelines - page C-44
- Fire and Fuels Management Standard and Guideline - page C-48

Existing Condition:

The current condition of the project area was determined from a reconnaissance visit to the area (fall, 1997) and information gathered during initial work for the completion of the Forest ecological unit inventory. There are two distinct soil types based on internal soil drainage conditions within the project area. The poorly drained areas include both stream riparian conditions and hummocky ground where subsurface water flow and surface water conditions result in a complex of poorly drained depressional areas and well drained raised areas. The other area reflects moderately well to well drained soils that generally occur on upper slope positions .

In the northern portion of the project area past silvicultural treatments included prelogging harvests from the 1970's. Observation of the magnitude and depth of compaction in existing skid trails indicated that detrimental compaction conditions did not extend below 6 inches in the soil profile on secondary and lesser used main skid trails.

Soils in the Borg sale area are classified in the Mt. Hood Soil Resource Inventory (SRI) as mapping unit 304. The SRI interpretation for this soil mapping unit is slight for surface erosion and low-moderate for subsoil erosion. The soil compaction hazard is low-moderate and the soil mantle stability is very stable. It's susceptibility to soil displacement is low.

Effects of No Action Alternative (A):

Current conditions as they relate to soil conditions would remain the same.

Effects of Action Alternatives (B & C) - As related to Issue #3

Issue Statement: There is a concern that the proposed multi-aged management regime with repeated entries into this project area within the next 100 years may cause the level of compaction to exceed the Mt. Hood Forest Plan maximum compaction level of 15%.

Harvest units were examined and determined to be suitable for timber management in terms of soil productivity. Potential soil disturbances that have been considered for avoidance or mitigation include the following: compaction from heavy equipment, the displacement of soil and organic matter by harvesting, and the effects of site preparation equipment and erosion hazards. Other factors considered were the effects to mycorrhizae and the effects to long-term site productivity. Mitigation measures and project design for harvest units and road construction would result in meeting applicable standards for soil protection.

In both action alternatives a loader logging system would be used which would result in low soil impacts. Alternative B has no new road construction but will be re-opening approximately 2000 feet of road within the riparian reserve. Alternative C has approximately 1000 feet of new road construction. Since these overgrown roadbeds that are located within the riparian reserve are located on gentle terrain and are already to grade, it is likely that the re-opening of these roads will cause less soil disturbance than the construction of the new spur road needed to access the stand under alternative C. Alternative B would therefore have slightly less effect on soils than alternative C. After implementation of the proposed actions in both alternatives B & C, compaction levels are predicted to be well below the 15% threshold.

D. RECREATION (ISSUE #4)

Mt. Hood Forest Plan References

- Forestwide Dispersed Recreation Standards and Guidelines - FW-453 to FW-466, page Four-98

Northwest Forest Plan References

- Ecological Principles for Management of Late-Successional Forests - pages B-1 to B-9

Existing Condition:

Recreation in the vicinity of the Borg planning area is relatively minor and includes mainly dispersed camping (camping at non-developed sites), hiking, hunting, huckleberry picking, gathering forest products, and recreational driving. The Buck Lake Trailhead, a maintained hiking trail, is located just west of the project area on the 5810-210 road.

Effects of No Action Alternative (A):

Current conditions as they relate to recreational opportunities and access would remain the same.

Effects of Action Alternatives (B & C) - As related to Issue #4

Issue Statement: There is a concern that the closure of this stretch of road which accesses an LSR would limit public use of the area for predominantly huckleberry picking and dispersed camping associated with hunting.
Both Alternatives B and C would close to motorized vehicles approximately 1 mile of road. This would eliminate access to the dispersed auto camp sites past the 5810 - 036 and 5810 - 210 road junction. It would also eliminate motorized access to possible huckleberry picking sites and prevent motorized hunting from occurring past the closure. The topography of the planning area is relatively flat making other forms of access such as by foot, horse or mountain bike to these sites relatively easy.

E. FISHERIES

Mt. Hood Forest Plan References

- Forestwide Fisheries Standards and Guidelines - FW-137 to FW-147, page Four-64
- Forestwide Riparian Standards and Guidelines - FW-80 to FW - 136, page Four - 59
- Forestwide Water Standards and Guidelines - FW-54 to FW-79, page Four-53
- General Riparian Standards and Guidelines - B7-28 to B7-39, page Four-257
- See Mt. Hood FEIS pages IV-22, IV-47, IV-155 to IV-167

Northwest Forest Plan References

- Riparian Reserves - page A-5
- Aquatic Conservation Strategy - pages B-9 to B-34
- Riparian Reserves Standards and Guidelines-pages C-30 to C-38

Existing Condition:

Fishery potential is low due to the intermittent flow regime and a culvert barrier located at the confluence of Buck Creek and the Oak Grove Fork of the Clackamas River. Electrofishing surveys conducted within the project area have failed to yield any fish species. The presence of fish within this section is unlikely. The effects to fisheries for this project will be based on resources within the Oak Grove Fork downstream of the project area.

The Oak Grove Fork provides habitat for both anadromous and resident fish species. All anadromous habitat within the Oak Grove Fork Watershed lies below a 30 ft. falls located at

approximately river mile (RM) 3.7. The Borg project area is approximately 11 miles above this barrier.

Effects of No Action Alternative (A):

The proposed action of upgrading and replacing culverts would not occur. Erosion, sedimentation would continue to occur.

Effects of Action Alternatives (B & C):

Lower Columbia River Steelhead (threatened) - Adult Clackamas River winter steelhead enter the waters of the Mt. Hood National Forest primarily during April through June, with peak migration occurring in May. The native winter steelhead above North Fork Dam use the majority of the mainstem and tributaries as spawning and rearing habitat. The steelhead juveniles in the Clackamas River smolt and emigrate downstream March through June during spring freshets. The Oak Grove Fork of the Clackamas River provides habitat for both adult spawning and juvenile rearing. The effects rating for Lower Columbia River Steelhead for this project is ``No Effect"

Bull Trout (threatened) - Bull trout were once prolific throughout the Clackamas River and its tributaries. At present, they are believed to be extinct in the Clackamas system. Intensive electrofishing and snorkel surveys conducted by the U.S. Forest Service and the Oregon Department of Fish and Wildlife have never yielded capture of bull trout. In 1998 the U.S. Fish and Wildlife Service found that listing of bull trout in the Columbia River segment as threatened was warranted. After several years of intensive sampling, U.S. Forest Service fisheries biologists believe that bull trout in the Clackamas River are considered to be ``functionally extinct." The effects rating for bull trout for this project is ``No Effect"

Lower Columbia River Coho Salmon (sensitive) - Lower Columbia River coho salmon in the Clackamas River are the last significant run of wild late-run winter coho in the Columbia Basin. Coho salmon occupy the Clackamas River and the lower reaches of streams in the Upper Clackamas watershed, including the Oak Grove Fork. Adult late run coho enter the Clackamas River from November through February. Spawning occurs mid-January to the end of April with the peak in mid-February. Peak smolt migration takes place in April and May. The effects rating for coho salmon for this project is ``No Impact."

Lower Columbia River Spring Chinook (sensitive) - The Clackamas River spring chinook salmon consist of both naturally spawning and hatchery produced fish. Adult Lower Columbia River spring chinook enter the Clackamas River from March through August. Spawning occurs in the mainstem and larger tributaries during mid-September through early October. The effects rating for spring chinook salmon for this project is ``No Impact"

Lower Columbia River Cutthroat Trout (sensitive) - Lower Columbia River cutthroat trout enter the Clackamas River in September and October. They are found in the larger tributaries

below River Mill Dam. A resident species of cutthroat trout occupies the Oak Grove Fork of the Clackamas River approximately one mile below the project area. A barrier culvert blocks any fish migrations into the Buck Creek drainage. The effects rating for cutthroat trout for this project is ``No Impact."

Lower Columbia River Fall Chinook (sensitive), **Lower Columbia River Fall Chum** (sensitive) - and **Redband Trout** (sensitive) - The effect analysis for fall chinook, fall chum, and redband trout for this project is ``No Impact." Fall chinook spawn below River Mill Dam on the Clackamas River and do not occupy the river above the dam. Fall chum historically have inhabited the lower portion of the Clackamas River but no current records are available to confirm any chum presence within the Clackamas River. Redband trout do not occur in the Clackamas River of its tributaries.
Implementation of the Aquatic Conservation Strategy of the Northwest Forest Plan has resulted in reduced effects on riparian and aquatic dependent resources. The proposed activities have been designed to meet the Aquatic Conservation Strategy and the State Water Quality Standards, and therefore the Clean Water Act, through adherence to Best Management Practices. Project design and mitigation minimizes effects to recreational fisheries.

F. WILDLIFE

Mt. Hood Forest Plan References

- Forestwide Diversity Standards and Guidelines - FW-162, page Four-68
- Forestwide Wildlife Standards and Guidelines - FW-187 to FW-214, page Four-71
- Deer and Elk Standards and Guidelines - B10-12 to B10-28, page Four-274, B11-9 to B1-25, page Four-278, B8-11 to B8-24, page Four-263, B2-18 to B2-31, page Four-224, See FEIS page IV-90
- Forestwide Threatened, Endangered and Sensitive Plants and Animals Standards and Guidelines - FW-170 to FW-186, page Four-69. See FEIS pages IV-76 and IV-90.

Northwest Forest Plan References

- Protection Buffers - pages C-19 to C-21, C-45 to C-48
- Matrix Standards and Guidelines - pages C-39 to C-61
- Consultation - Endangered Species Act - page A-2
- Critical Habitat for Northern Spotted Owl - page A-3
- Standards and Guidelines Common to All Alternatives: Exceptions - page C-3
- Survey and Manage Standards and Guidelines - pages C-4 to C-6
- Known Spotted Owl Activity Centers - pages C-10 and C-45
- Survey and Manage Species List - pages C-49 to C-61

Northwest Forest Plan FSEIS References

- Chapters 3 & 4: Affected Environment and Environmental Consequences - pages 205-258

Threatened, Endangered, and Sensitive Species

Northern Spotted Owl (threatened)

Existing Situation:

There are no known spotted owls within the Borg planning area.

There are five owl activity centers identified since 1987 that are located within a 1.2 mile radius of the planning area. Table 3-1 shows the suitable nesting, roosting, and foraging habitat (NRF) within this 1.2 mile radius before implementation of action alternatives.

Table 3-1: Current status of Owl Activity Centers within the Borg Planning Area.

Territory	LSR or LSR 100 Present	CHU Present	Last Year Surveyed	Current NRF acres within 1.2 miles
1. 3747R92	**None**	**None**	**1992**	**1649 acres**
2. 3040T94	**None**	**None**	**1994**	**1149 acres**
3. 3798P94	**None**	**None**	**1994**	**948 acres**
4. 2007Z91A	**Yes**	**None**	**1991**	**692 acres**
5. 2006Z89A	**Yes**	**None**	**1989**	**1171 acres**

In Oregon Spotted owls successfully breed mainly in late-successional mixed coniferous forests, usually dominated by Douglas-fir. The species prefers larger forest stands (more than 1,200 acres) with multiple layers and a closed canopy.

The critical habitat unit (CHU) OR-9 is situated approximately one mile west of the planning area. None of the activity centers within 1.2 miles of the planning area are located within this CHU.

Effects of No Action Alternative (A):

Current conditions in regards to the spotted owl and its habitat would remain the same.

Effects of Action Alternatives (B & C):

The Borg sale would involve removal of approximately 45 acres through timber harvest of spotted owl suitable habitat in all action alternatives (B & C).

Table 3-1 displays the loss of habitat that would result within a radius of 1.2 miles around each activity center after implementation of each of the action alternatives, and the remaining habitat for each territory after implementation.

Table 3-2. Effects to Owl Territory Nesting, Roosting, and Foraging (NRF) Habitat by Alternatives

Territory	Current NRF Acres Within 1.2 Miles	Loss of Habitat by Alternatives A | B | C	Habitat Remaining Within 1.2 Miles After Implementation
1) 3747R92	**1649 acres**	**0 | 20 | 20**	**1629 acres**
2) 3040T94	**1149 acres**	**0 | 0 | 0**	**1149 acres**
3) 3798P94	**948 acres**	**0 | 20 | 20**	**928 acres**
4) 2007Z91A	**692 acres**	**0 | 0 | 0**	**629 acres**
5) 2006Z89A	**1171 acres**	**0 | 5 | 5**	**1166 acres**

Disturbance effects were also analyzed. No spotted owl activity center is located within 1/4 of the planning area. Thus no seasonal restrictions are required.

There will be no effect to CHU-9 in any alternative.

There is expected to be a low risk to the population as a whole as this project is consistent with all the standards and guidelines identified in the Northwest Forest Plan. A determination of "may effect, not likely to adversely effect" had been made for the spotted owl during consultation with the USFWS.

Bald Eagle (threatened)

Existing Situation:

Bald eagles require large trees and snags for nesting and roosting and large bodies of water such as lakes and major rivers for foraging. No bald eagle nests or communal winter roosts are known within the planning area. However, 2 miles east of the area exists potential bald eagle nesting

habitat on 5157 acres, all within one mile of Timothy Lake. These acres fall within management area A13, the goal of which is to "protect and manage bald eagle nesting habitat."

Effects of No Action Alternative (A):

Current conditions in regard to the bald eagle and its habitat would remain the same.

Effects of Action Alternatives (B & C):

Suitable habitat for the eagle is not considered to be present in the planning area due to its distance from a potential foraging source, the closest of which is three miles to the east at Timothy Lake.
Thus the effects rating for all alternatives would be "no effect."

Peregrine Falcon (endangered)

Existing Situation:

Habitat for this species consists of broad cliffs and canyons on the Clackamas River Ranger District. There are no cliffs or canyons within the Borg planning area. However, two cliff sites that have the potential to support peregrine nesting occur at High Rock (high potential), and Mt. Mitchell (moderate potential). These sites are located 2.3 and 5 miles, respectively, from the planning area. Surveys to detect the presence of peregrines have been conducted for the past five years, with negative results.

Effects of No Action Alternative (A):

Current conditions in regard to the peregrine falcon and its habitat would remain the same.

Effects of Action Alternatives (B & C):

There is no potential for the project to effect these peregrine falcon potential habitats. If peregrines were to be found on these cliffs during implementation of this project, there would be no potential for the associated disturbance to impact individuals.

For these reasons, the effect rating call is "no effect"

Survey and Manage Species

Red Tree Vole

The red tree vole is a canopy dwelling vole. It appears to be more abundant in late-successional forests than young forests. These voles are limited to lower elevations of less than 3,300 feet and forests with a substantial Douglas-fir component. Primary reproductive habitat is late-successional stands greater than 100 acres. The Borg project area did not require surveys to be completed as per Regional protocol.

Larch Mountain Salamander

This species is primary associated with moss-covered talus slopes between Mt. Hood and Mt. Adams. Since the Borg planning area is south of this range and contains no known talus slopes, there appears to be no habitat present for the Larch Mt. Salamander. Due to the lack of habitat and project location, there will be no effect to the species or habitat with implementation of any alternative.

Mollusks

Many survey and manage mollusk species are associated with riparian areas which would not be affected by this proposal. There are no known sites within the planning area and surveys for mollusks are not required at this time.

Mt. Hood Forest Plan Indicator Species

Deer and Elk

Existing Situation:

Deer and elk are not known to be particularity abundant in this area. Forage is widely available but is generally of low quality. Ungulates utilize the Borg planning area primarily as summer range.

Effects of No Action Alternative (A):

The proposed action of forage seeding would not occur. The area would continue to provide low levels of forage for deer and elk.

Effects of Action Alternatives (B & C):

For analysis purposes, big game summer and winter range on the district has been divided into fixed analysis areas. The Borg planning area is located within big game Summer Range 5. Available optimal, thermal, and hiding cover, as well as forage has been analyzed for the Borg area using this fixed analysis area.

Table 3-3: Existing Situation and Past Harvest Conditions

Type of Cover	Minimum Percentage	Summer Range 5	
		Pre-harvest	Post-harvest
Optimal Cover	20%	48%	47%
Optimal and Thermal Cover	30%	53%	52%
Hiding Cover	N/A	13%	Same
Forage	N/A	34%	Same

The proposed action would remove 45 acres of optimal cover and diminish the quantity of optimal cover by approximately 1.0%. Combined amounts of thermal and optimal cover would remain above Mt. Hood Forest Plan minimum standards.

Implementation of the Forage Enhancement Proposed Action will improve the quality and quantity of forage currently being provided in the project area.

The open road density within the Summer Range 5 currently is approximately 2.3 miles / sq. miles, just below the Mt. Hood Forest Plan maximum standard of 2.5 miles / sq. miles for this area.

- Alternative B: No new road construction would occur.
- Alternative C: There would be two short temporary spur roads for approximately 1,000 feet constructed in this alternative.

The temporary roads in each alternative would be closed with a berm and seeded following harvest.

Implementation of the road closure proposed action would close approximately one mile of road at the end of the 5810-210 road.

Overall, a negligible decrease in the road density within Summer Range 5 would occur with implementation of either action alternative.

Pine Marten and Pileated Woodpecker

The proposed Borg timber sale contains habitat for the pine marten and pileated woodpecker. Both action alternatives would remove 45 acres of this habitat. However, in the Northwest Forest Plan the needs of these species were provided for by the delineation of Late-Successional Reserves. In addition, the Oak Grove watershed specifies that the retention of late-seral and interim connectivity design cells is believed to be sufficient for late seral connectivity for the pileated woodpecker and pine marten. These areas are believed to be adequate in addressing the habitat needs of the pine marten and pileated woodpecker.

Snags and Down Logs

Effects of No Action Alternative (A):

The proposed action of creating snags within the Buck Creek riparian reserve would not occur. Thus this riparian reserve would continue to have low numbers of snags.

Effects of Action Alternatives (B & C):

Project design and mitigation measures combine to ensure adequate levels of habitat for species which depend on snags and down wood. The Mt. Hood National Forest management plan requires that we maintain at the time of harvest enough snags and future snags to equal a minimum of 60% of primary cavity excavator levels over time. In the Borg planning area, 60% of the full population potential for these species translates into about 1.2 snags per acre.

Snags would be retained at the level of 1.2 per acre within the harvested areas. If this level is not present, live replacement (green) trees would be retained. If a post contract review of snag levels indicates that units do not meet this level, blasting or girdling of live trees would create sufficient snags. Snags would be greater than 22 inches in diameter and 40 feet tall or be representative of the largest tree diameter class present.

To provide for future snags over the next 30 years as required by the Mt. Hood Forest Plan; and to provide dispersed structures (individual trees) as part of the 15 percent green tree retention requirements under the Northwest Forest Plan, 5.9 green trees / acre of the healthiest, biggest, and most windfirm trees would be retained within the harvested areas. For the remaining 15 percent green tree retention requirement, 21 acres will be set aside in the stand in clumps of .50 acres and larger.

All action alternatives would retain within harvested areas a minimum of 240 linear feet per acre of decay class 1 or 2 logs greater than or equal to 20" in diameter, or largest available, as required in the Northwest Forest Plan.

G. BOTANY

Mt. Hood Forest Plan References

- Forestwide Threatened, Endangered and Sensitive Plants and Animals Standards and Guidelines - FW-170 to FW-186, page Four-69
- See FEIS pages IV-76 and IV-90

Northwest Forest Plan References

- Survey and Manage Standards and Guidelines - pages C-4 to C-6
- Survey and Manage Species List - pages C-49 to C-61
- Appendix J2
- Management Recommendations for Survey and Manage Fungi

Surveys have been conducted and no endangered, threatened, or sensitive plant species were found within the project area. Sensitive Plant *Corydalis aquae-gelidae* is the closest known population at approximately one mile from the proposed project area.
The Northwest Forest Plan Standards and Guidelines requires "Manage known sites" for species listed as "strategy 1" in Table C3. *Corydalis aquae-gelidae* mentioned above is also a C3 strategy 1 species. One strategy 1 fungal species is present within the project area, *Pollyozellus multiplex*. This same species is also classified as a Protection Buffer species in the Northwest Forest Plan.

Corydalis aquae-gelidae

Effects of No Action Alternative (A):

There would be no impact on this species from the no action alternative (A).

Effects of Action Alternatives (B & C):

Potential threats to this species include alteration of site habitat and hydrology. None of the proposed actions in any of the action alternatives will impact this population. Due to its distance away from the Borg project area there will be no alteration of site habitat in the area of this population. Potential hydrologic changes in the area of the population will be nonexistent to very minimal and are, therefore, judged to have no impact on the *C. aquae-gelidae* population.

Pollyozellus multiplex

Existing Condition:

Pollyozellus multiplex is an ectomycorrhizal fungus. As such it forms a mutually beneficial association with plant roots. The fungus assists plants with water and mineral uptake while the plant provides carbohydrates to the fungus. At the time of publication of "Management Recommendations for Survey and Manage Fungi" there were only 10 known sites of this species within the range of the Northern Spotted Owl. An unknown number of additional sites have been reported since its' publication, however, this species is currently suspected to be to be regionally rare.

Effects of No Action Alternative (A):

There would be no impact on this species from the no action alternative (A).

Effects of Action Alternatives (B & C):

There is one known site for *Pollyozellus multiplex* within the Borg project area. It is unknown how large the population is due to the presence of its mycelium underground. The known site (of the fruiting body) in the project area is riparian in association and the species in general is suspected to be associated with riparian areas. Therefore, it is important to protect biological factors associated with the riparian area in which this species is found.

A no treatment buffer consisting of the riparian reserve has been identified in the action alternatives and no activities are proposed within this buffer. The one exception to this is the proposed re-opening and use of a road located within the riparian reserve in alternative B. The effects of this are discussed below.

Alternative B involves the use of an existing temporary road within the riparian reserve bordering the Pollyozellus multiplex site. This road is located outside the vine maple/sitka alder riparian area in which the known site is located. In addition, they are a minimum of 100' from the known site. Thus there will be no impact to the Pollyozellus multiplex known site from the proposed action.

There is no use of the existing road in alternative C. Thus this alternative will not impact the known site.

In order to further manage the known site containing Pollyozellus multiplex, the population will be monitored post harvest to assure its survival.

G. ECONOMICS

Mt. Hood Forest Plan References

- Forest Management Goals - 19, page Four-3
- See FEIS page IV-112

Existing Condition:

The objectives for this project involve improving stand health, structure and diversity by using an uneven-aged management method. This would entail using small, dispersed harvest openings within the stand. Accessing these openings may cause the project to have a marginal economic value.

Effects of no action alternative (A):

Alternative A (no action) would result in a long-term reduction in site productivity. Stands which are not growing commensurate with the sites potential would remain and would continue to decline.

Effects of action alternative (B & C):

The only economic difference between Altenatives B and C is the road building costs associated with the "Uneven-age Management" portion of the proposed action. "Culvert Upgrades and Replacements", "Road Closure", "Snag Creation" and Forage Enhancements" would be the same in both alternatives.

Altenative B (proposed action) would construct no new temporary roads. 1.1 miles of existing but overgrown temporary road, and old existing bladed skid trails would be brought up to temporary road standards for logging this sale. Reconstruction of approximately 1 mile of existing low standard system roads would be completed. Both constructed and reconstructed roads would be treated with a shallow ripping, erosion control/forage seeding and a berm closure. The total cost for roading would be $44,800.00. The benefit cost ratio for this alternative is 1.66.

Alternative C would construct 0.19 mile of new temporary roads, and convert 0.6 mile of existing but overgrown temporary road, and old existing bladed skid trails back into useable temporary roads, as in alternative B. Reconstruction of approximately 0.9 mile of existing low standard system roads would be completed. Post operation road treatments would be the same as in Alt. B. Total cost for road constructions operations in this alternative would be $37,550. The benefit cost ratio is 1.78.

I. MANAGEMENT OF COMPETING AND UNWANTED VEGETATION

1. Management Objectives

Site specific vegetation management objectives have been developed. They are based on the objectives stated in the FEIS for Managing Competing and Unwanted Vegetation, FEIS for the Standards and Guidelines in the Pacific Northwest Regional Guide (1984), Mt. Hood National Forest Plan, and the Northwest Forest Plan. Vegetation management projects would be designed to minimize potential adverse impacts to the environment, project workers, and the public. The following list of objectives were used to identify the "damage thresholds" for vegetation management, vegetation management strategies and the feasible treatment methods.

Site Specific Objectives:

- Meet the recommended stocking levels within 5 years after harvesting.
- Maintain conifer stocking at levels that would produce an economical thinning at the earliest possible time.

- Meet the Mt. Hood Forest Plan standards for minimizing soil erosion and compaction.
- Maintain adequate levels of downed woody debris and snags that provide for habitat diversity and the maintenance of long-term productivity.

2. Site Conditions

Stands proposed for harvest have a low level of existing understory vegetation. Currently, the overall fuel loading in the proposed harvest units in the 0-3 inch size class averages well below 12 tons/acre. Slash created during harvesting could become a physical barrier during tree planting and can create an unacceptable fuel hazard level. Removal of this live vegetation and slash prior to planting may be necessary in order to meet management objectives for conifer seedling establishment. Past experience in this area shows that if shelter trees are retained to ameliorate the effects of an otherwise harsh site, and if trees are established immediately after site preparation, no release treatments are required to meet the stand growth objectives.

3. Damage thresholds:

1. Greater than 20% cover of live vegetation.
2. Less than 350 "well" distributed planting spots per acre.
3. Greater than 12 tons/acre of slash in the 0-3" size class.

A post harvest/pretreatment survey would be conducted on all harvest units to identify those that exceed these thresholds. If this survey determines that any of the harvested units are below these thresholds, then the no treatment alternative would be chosen, and tree planting would take place as soon as possible.

4. Strategy Selection

Several strategies were considered. Alternatives B and C would use a combination of the prevention, no action and correction strategies depending on site specific conditions.

No Action includes natural decomposition of slash. If a post-harvest review determines that the damage thresholds would not be exceeded, this treatment option could be chosen.

Prevention would be applicable to intermediate harvest prescriptions which would not create much slash and where planting is not needed. Shelterwood retention is also a technique which can be used to enhance early reforestation success which in turn minimizes the risk of brush competition.

Correction involves the treatment of brush and slash where damage thresholds are exceeded.

a. Grapple piling would involve a track-mounted vehicle with a grapple type device to pile a large portion of the slash. It would also be used to pull the larger live vegetation and place it in

the pile with the slash. These piles would then be burned under a very specific set of weather and fuel moisture conditions.

b. Machine crushing and cutting would use a track-mounted masticating machine to chip or grind up smaller dead limbs, create planting spots, and cut live vegetation.

c. Hand piling would involve a combination of use of chain saws and manual labor to pile the slash and remove the live vegetation. These piles would then be burned under a very specific set of weather and fuel moisture conditions.

d. Jackpot burning is the intentional application of fire, usually where fuels are not continuous and where the use of other treatments is not appropriate. It would be applied under a very specific set of weather and fuel moisture conditions. Measures that would be used to minimize the loss of green trees during burning. Burning would be executed in compliance with Oregon Smoke Management Regulations.

e. The burning of landing debris would involve the application of fire to the debris remaining on landings after completion of harvest operations and firewood cutting which constitutes a fire hazard or barrier to planned reforestation treatments.

f. Lop and Scatter involves the use of chain saws to get slash closer to the ground to reduce ladder fuels and speed up decay.

5. Noxious Weeds

The strategy of prevention would be used to minimize the risk of introducing new noxious weeds. Appendix A describes standard practices for the use of noxious weed free seed mixes and mulch products. Cooperative efforts would continue with Oregon Department of Agriculture which includes the use of biological controls (spreading insects which feed upon these weeds).

The following noxious weeds of concern are found near the proposed projects:

***Cytisus scoparius* (Scotch Broom)**

Existing Condition:

The Mount Hood Noxious Weed Management Plan (MHNWMP) lists *Cytisus scoparius* (Scotch broom as an "A" rated weed. The objective for the species is to prevent further spread using intensive control measures where appropriate. It is found in trace amounts on the perimeter of the project area. The ODA has released the Scotch broom seed weevil and Scotch broom twig miner to combat *Cytisus scoparius* with biocontrols.

Effects of no action alternative (A):

The risk of new infestations or spread from the no action alternative (A) is low.

Effects of action alternatives (B) and (C):

There is the potential that the movement of logging equipment over the soil is likely to expose bare soil and introduce new Scotch broom seed into these areas. For both action alternatives B and C this potential of new infestations or spread is moderate.

***Hypericum perforatum* (St.Johnswort)**

Existing Condition:

The project area contains the noxious weed *Hypericum perforatum* (St.Johnswort) which is a "B" rated weed according to the MHNWMP. The objective for this species is to control or prevent its establishment, using primarily biocontrol agents where available.

Effects of no action alternative (A):

The risk for invasion or spread of this weed is low for alternative A.

Effects of action alternatives (B & C):

The risk for invasion or spread of this weed is moderate for alternatives B & C.

J. AIR QUALITY

Mt. Hood Forest Plan References

- Forestwide Air Quality Standards and Guidelines - FW-39 to FW-53, page Four-51
- See Mt. Hood FEIS pages IV-19, and IV-155 to IV-167.

The fuel treatment methods considered in the project area may temporarily affect local air quality. Prescribed burning has the potential to degrade air quality for short periods of time. The principle impact to air quality from prescribed burning is the temporary visibility impairment caused by smoke to the recreational forest users. Past experience has shown that significant air quality declines are limited in scope to the general burn area and are of short duration. Most significant impacts occur under strong, persistent inversions of stale air masses. Both of these conditions do not comply with management direction to minimize adverse effects. The effects on air quality should be minimal due to the burning being scheduled in the spring (March - June) or fall (October - December) or during periods of inclement weather.

The project area is located approximately 22 miles from the Portland Metropolitan area Designated Air Shed. The areas of highest concern for possible impacts to air quality are:

Portland Metropolitan Area
Mt. Hood Wilderness
Bull of the Woods Wilderness
Salmon-Huckleberry Wilderness
Mt. Jefferson Wilderness

To protect visibility in Class I areas, prescribed burning would be restricted from July 4 weekend to September 15. All prescribed burning would be scheduled in conjunction with the State of Oregon to comply with the Oregon Smoke Implementation Plan to minimize the effects on air quality. Burning would be conducted when smoke dispersion conditions are favorable to minimize the potential for adverse effects.

Human Health Effects From Smoke

Health risks are considered greater for those individuals (workers and others) in close proximity to the burning site. Particulate matter is measured in microns and calculated in pounds per ton of fuel consumed. Particulate matter that is 10 microns or less in size are those which create the greatest health risk. At this size, the material can move past normal pulmonary filtering processes and be deposited into lung tissue. Particulates larger than 10 microns generally fall out of the smoke plume a short distance down range.

Members of the public are generally not at risk. Few health effects from smoke should occur to forest users due to their limited exposure. Warning signs and public notices should serve to notify forest users of areas with activity so they may avoid those areas. Due to the distance involved and the season of the burn, strong inversions are unlikely to develop and hold a dense smoke plume to adversely affect residents.

The particulate emission factor for fire (pounds of particulates produced for each ton of material burned) varies significantly between flaming and smoldering combustion. Six - 10 times more particulates are produced by smoldering combustion as compared to flaming combustion. In general, most small fuels are consumed by flaming combustion which has a relatively small emission factor (15 to 20 lbs. of particulates produced for every ton of material consumed). By removing the larger material before burning or burning only during "spring-like" conditions when the larger material's moisture content is high, the amount of smoke that is produced is significantly reduced.

K. HERITAGE RESOURCES

Mt. Hood Forest Plan References:

- Forestwide Timber Management Standards and Guidelines - FW-598 to FW-626, page Four-118
- See FEIS page IV-149 and IV-155 to IV-167

Surveys conducted for this project located no sites within the proposed project area. Segments of a historic trail were located within the project area. A mitigation measure would be to paint these blazed trees that show the trail as reserve trees prior to project implementiaton to insure their protection. There should be no effect to any listed or eligible heritage resource with project implementation. The project contract would contain provisions for the protection of sites found during project activities.

L. OTHER

1. Effects upon minority groups, women, and civil rights (Secretary Memorandum 1662, Supplement 8 and OMB Circular A-19, see also FSM 1730): Minority groups and women would benefit to the extent that they would be able to participate in additional employment generated by the projects.

2. Environmental justice - Executive Order 12898. Projects would not disproportionately adversely affect minority or low-income populations.

3. There would be no effect upon prime farm land or prime range land.

4. No flood plains or wetlands are affected by the alternatives.

5. There are no conflicts between the proposed action and the objectives of Federal, Regional, State laws and local plans or policies.

6. The relationship between short-term uses and the maintenance of long-term productivity; no significant reductions in long-term productivity are expected. See soils section.

7. Irreversible and Irretrievable Commitments. The use of rock for road surfacing is an irreversible resource commitment.

CHAPTER IV - CONSULTATION WITH OTHERS

List of those consulted:

- U.S. Fish and Wildlife Service
- National Marine Fisheries Service
- Oregon Historic Preservation Office
- Confederated Tribes of Warm Springs
- Confederated Tribes of Grande Ronde
- Yakima Indian Nation Tribal Council
- Bonneville Power Administration
- Northwest Power Planning Council
- Clackamas River Water
- South Fork Water Board
- Oak Lodge Water Board
- Mt. Scott Water District
- Bureau of Land Management

City of Estacada
City of Gresham
City of Lake Oswego
City of Gladstone
City of Oregon City
City of West Linn
Clackamas County
Oregon Department of Trans.
Oregon State Parks
Oregon Department of Forestry
Oregon Department of F&W
Oregon Division of Lands
Oregon Marine Board

- Metro
- Clackamas River Basin Council
- Eagle Creek National Fish Hatchery
- Environmental Protection Agency

The publication "Sprouts" is a quarterly newsletter sent out by the Mt. Hood National Forest to notify interested people, organizations, and other agencies of proposed projects and solicit comments on them. This project appeared in the winter and spring 1998 issues. A letter describing the project and requesting comments was sent out to a district mailing list of approximately 220 agencies, organizations and individuals.

From these public involvement efforts, 4 different responses either by mail, telephone, or email were received. They are in the analysis file. Several of the comments expressed concern about wildlife habitat, water quality, and timber management. These comments were considered during the development of the issues, alternatives, and mitigations. A complete synopsis of the comments and responses will be included in an appendix to this EA after the completion of the 30 day comment period.

CHAPTER V - LIST OF PREPARERS

Sharon Phillips	Writer/Editor & Wildlife Biologist
Jerry Polzin	Logging Systems / Economics
Craig Edberg	Silviculturalist
Carol Horvath	Botany
Terry Brown	Fuels
Dave Radetich	Transportation
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APPENDIX A

Clackamas River Ranger Districts Standard Management Requirements and Design Criteria

See Alternative Section for mitigation specific to each alternative.

1. To reduce erosion, bare soils on the landings, skid trails, and temporary roads would be revegetated. Grass seed, fertilizer and mulch would be evenly distributed at appropriate rates to ensure successful establishment. Biodegradable erosion control mats would be used at stream crossing reconstruction sites and steep, unstable slopes. Effective ground cover would be installed prior to October 1 of each year.

   Native plant species would be used to meet erosion control needs and other management objectives. Appropriate plant and seed transfer guidelines would be observed. Non-native species may be used if native species would not meet site specific requirements or management objectives. Non-native species would be

gradually phased out as cost, availability, and technical knowledge barriers are overcome. Undesirable or invasive plants would not be used.

Grass seed would be certified by the states of Oregon or Washington or grown under government-supervised contracts to assure noxious weed free status. In certain cases non-certified seed may be used if it is deemed to be free of State of Oregon listed noxious weeds.

When straw or hay is used as mulch, it would originate from the state of Oregon or Washington fields which grow state certified seed, grown under government-supervised contracts to assure noxious weed free status, or originate in annual ryegrass fields in the Willamette Valley. In certain cases, straw or hay from non-certified grass seed fields may be used if is deemed to be free of State of Oregon listed noxious weeds.

2. Avoid fertilizer use in close proximity to live streams and wetlands. Generally a 10 foot buffer would be used for manual applications and a 100 foot buffer would be used for aerial applications. This would be adjusted based on site specific conditions.

3. To minimize surface erosion and sediment delivery; road reconstruction, landing construction, and log haul would NOT occur during periods of prolonged wetness. Sale administration and watershed personnel would coordinate to evaluate the appropriateness of these type of operations during wet periods.

4. No new landing construction would occur within riparian reserves if it involves road cut or fill-slope preparation. Avoid log landing within riparian reserve if at all possible. If not, existing landings may be used within a riparian reserve if it is located at least 125 feet from streams.

5. Avoid road construction within Riparian Reserves. If not possible, roads would be located in a manner which minimizes impacts to aquatic resources.

6 Where thinning is planned for riparian reserves, no-cut areas adjacent to streams and wet areas would be "custom designed" on-the-ground with assistance and review by a fisheries biologist. The location of the no-cut boundary and the degree of thinning in the riparian reserve would be designated to achieve aquatic conservation strategy objectives by maximizing tree size, and minimizing the potential for sediment delivery to aquatic systems and to adequately protect the zone of shade influence along perennial streams.

7. Trees would be directional felled away from the interior of the riparian reserve to minimize yarding disturbances.

8. Avoid cutting of hardwoods in Riparian Reserves.

9. To reduce erosion, temporary roads, landings, skid trails, and skyline corridors would have water bars installed prior to October 1.

10. Avoid ground disturbance within riparian reserve by using techniques such as full log suspension in skyline units. (If not feasible, one-end log suspension may occur within the dry portions of the Riparian Reserves.) For tractor units, skid trails would generally be located outside of the riparian reserve and trees would be directionally felled and winched.

11. Avoid yarding corridors through riparian reserves where possible. Logging systems for each unit would be designed in a manner to minimize the total number of yarding corridors and landings within riparian reserves. Parallel settings with spacing approximately 150 feet between corridors and corridor width less than 15 feet are preferred over radial settings. The types of settings need to be analyzed in relation to the number of landings needed to log the unit while affording the most protection to riparian reserve values.

12. Locate green tree retention clumps to minimize risk of wind throw. Where possible, leave clumps around known locations of sensitive/rare species, around concentrations of hard snags, on rocky soils, around wetlands less than 1 acre, or around patches of Pacific yew trees.

13. In harvest units, leave a minimum of 240 linear feet of logs per acre in decay classes 1 or 2 that are greater than or equal to 20 inches in diameter and more than 20 feet in length. Contractors would be required to leave this quantity of material on the ground even if it must come from designated cut trees.

14. Avoid the use of ground based operations (tractors, skidders, etc.) on slopes greater than 20%, because of the risk of damage to soil and water resources. Skid trails for ground-based equipment would be designated to meet Mt. Hood Forest Plan standards for soils. Skidding machinery would not be allowed off designated skid trails ; pull bull line to designated trails would be required instead. Restrict ground-disturbing activities to nonsaturated soil areas.

15. Maintain a minimun of 60% effective ground cover throughout each unit for soil erosion protection.

16. Maintain a minimum of 25 tons per acre of dead and down woody material evenly distributed throughout the harvest unit.

17. Projects would be designed to achieve combined detrimental soil impacts of 15% or less. If impacts exceed this level based on a post project review, soils would be restored to a level of less than 15% by deep soil tillage using subsoiling equipment.

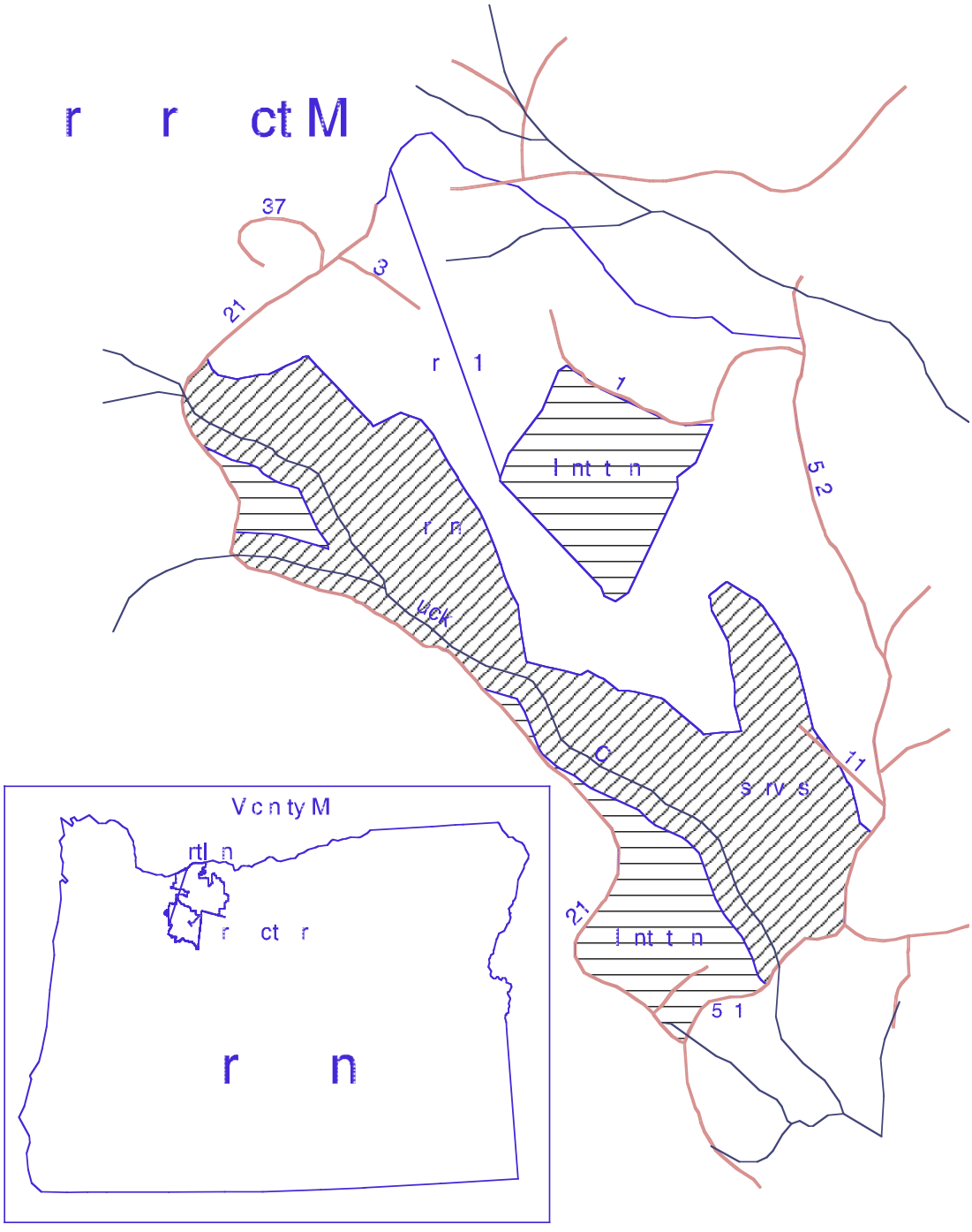
18. Following harvest activity, the contractor would remove slash created by harvest operations in units within 100 feet of mainline or secondary roads as shown in the Access and Travel Management Plan.

19. All prescribed burning would be done in accordance with state and local air quality regulations. To protect visibility in Class I areas, burning would not occur from July 4 to Labor Day.

20. When slash is piled in harvest units, one pile per acre would be retained unburned for use by wildlife.

21. When manual slash treatments, manual competing vegetation treatments, or other manual labor projects are considered, projects would be designed to reduce the exposure of workers to hazardous conditions.

22. Firewood would be made available to the public at landings where feasible.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