APPENDIX 4

PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

Environmental Assessment Number OR-086-02-01

The proposed treatments are located within the Upper Scoggins Creek, Middle Scoggins Creek and Sain Creek subwatersheds of the Upper Tualatin watershed. A Watershed Analysis was completed in February 2000 (i.e. *Upper Tualatin-Scoggins Watershed Analysis*). Since most of the proposed treatment drains into Henry Hagg Lake, the focus of the discussion will be on lands west of its dam, Scoggins Dam

The past, present and reasonably foreseeable future actions within the Upper Tualatin watershed watershed are listed below, and are followed by a discussion of the character of the watershed and affects of those actions on the relevant resources within the watershed. The cumulative effects of the past, present, and reasonable foreseeable actions will be analyzed in Chapter 4 of the Environmental Assessment.

Actions:

Past: * high rates of logging beginning as early as the late 1800s; associated actions include the building of at least 4 splash dams on Scoggins Creek; blasting rock and removal of large wood from stream channels; snag felling; railroad logging; extensive salvage logging operations following the Tillamook fires of 1933, 1939, and 1945; gathering of special forest products such as landscape translants, floral greenery, Christmas trees, seed cones, berries, mushrooms, western red cedar shake bolts * fire, including prescribed fire and the landscape level fires of 1933, 1939 and 1945 * storm events * streams channelized * The Scoggins dam was built in 1978, with no fish passage facilities; Henry Hagg lake was created by this dam * Coho salmon were first introduced in the 1920's and were continued to be introduced until 1999; steelhead trout from hatcheries were released into Scoggins creek and the upper Tualatin river between 1976 and 1998, this practice stopped in 1999; bass introduced into Henry Hagg lake * 1 historical sandstone quarry on Scoggins Creek.

Present: * logging with harvest rates below historic levels * BLM parcels have a maintained road density of 2.0 mi/mi^2, there also exists an unknown quantity of legacy roads and there are an estimate 4.9 miles of actual roads, including new roads and legacy roads, per square mile * very little dispersed recreation use on or near BLM lands since the majority are behind locked gates and not accessible to the public; hunters occassionally walk into BLM parcels; * Scoggins dam provides a large recreation facility for fishing, boating and swimming within the Henry Hagg lake * storm events * effects from past stocking of hatchery fish; * rapid urban and rural development (While the population within the watershed has remained low, the population within Washington County increased 31% during the last decade.) and subsequently increased water use * increase

of impervious surfaces in the eastern portion of the watershed * manufacturing * minor amount of gathering of special forest products such as mushrooms, firewood, and landscape vegetation * active water right permits * vandalism, resource thefts, and dumping garbage

Reasonably Foreseeable: logging will continue at the current rate on private industrial lands because many of the stands are entering the 40-60 year old age class which is desirable for harvesting by private industry (more timber was harvested in 1995 from land in Washington County than in any other since 1954) * it is assumed that all logging will occur in accordance with the Oregon Forest Practices Act and the resultant clearcuts will be intensively managed (thinning, spraying herbicides, etc) * logging will continue on Federal lands at current levels * increased road density on private lands and somewhat decreased density on public lands (due to road decomissioning projects) * dispersed recreation opportunities to continue at current rate * implementation of some stream enhancement projects by the BLM, Tualatin Watershed Council, private landowners and others * storm events * steelhead populations will likely continue to decrease; this trend may potentially be reversed if fish passage is provided at Scoggins Dam * minimal new mineral extraction due to low quality of materials * continuing effects from past stocking of hatchery fish * control measures applied to noxious weeds along roadsides and in regeneration areas *

Currently the BLM has no active restoration, road decomissioning, density management or wildlife habitat enhancement projects in the Upper Tualatin-Scoggins Watershed. However, during the summer of 1999, an interdisciplinary team completed a watershed-level planning effort in this watershed. In addition to the projects that are being analyzed in this environmental assessment, there are a number of potential restoration, habitat improvement and density management projects that have been proposed, and which could be implemented within the next five years.

Introduction

The Upper Tualatin- Scoggins Watershed drains 136 square miles (86, 900 acres) in the western part of the Tualatin river basin. It is almost entirely located in Washington county, is south-west of the town of Forest Grove and contains the small town of Gaston. The watershed is drained by the mainstem Tualatin River and two fourth-order tributaries: Scoggins Creek and Wapato Creek.

Elevations within the watershed range from a high of 3525 feet at Saddle Mountain to a low of 148 feet at the point where the watershed ends, which is the confluence of Gales Creek. Elevation generally decreases in an easterly direction. The BLM holdings all lie between 500 and 1000 feet, and are typified by broad ridges, and gently sloping hillsides that are dissected by many draws and streams. The Tualatin basin lies in a region of moderate climate. Weather is often cloudy, most precipitation is in the form of rain, 73% of which falls between November and March. Annual precipitation ranges from 110 inches at Windy Point to 46 inches at Gales Creek.

The geology of the western portion of the watershed consist of sequence of Eocene extrusive

marine volcanic and sedimentary rocks, tectonically uplifted and folded to form the Coast Range. Many of these rocks were later forcibly entered by intrusive igneous rock, diabase. The volcanic rocks are mainly basaltic lavas and tuffs, and are overlain by the sedimentary rocks, which are mainly shale, tuffaceous sandstone, and siltstone. Also present within the area are ancient landslides with deep weathering zones on relatively gentle terrain.

Land in the Upper Tualatin-Scoggins watershed is primarily privately owned. About 87% of the watershed is in private ownership: 27,800 acres (36.5%) is private industrial timberland, and 43, 693 acres (50.3%) in other private lands. The Oregon Department of Forestry manages 10,280 acres (11.8%) of the watershed and the Bureau of Land Management manages 3763 acres (4.5%) of the watershed lands. The majority of these lands are Oregon and California Railroad lands. Due to this legacy, these lands are distributed in a patchy fashion, rather than a single block.

Condition of Relevant Resources

The 2000 BLM *Upper Tualatin-Scoggins Creek Watershed Analysis* contains a detailed discussion of the existing condition (refective of past and present actions) and reference condition of the Upper- Tualatin Watershed. The following resource condition information is taken in part from the watershed analysis with the addition of a discussion of the predicted trend in the condition of the relevant resources within the watershed in consideration of the reasonably foreseeable actions. This discussion is based primarily upon the professional opinion of the interdisciplinary team.

Vegetation: Most of the mountainous portions of the watershed are within the western hemlock zone described by Franklin and Dryness (1973). Over time and in the absence of major disturbance, the eventual climax community would be dominated by western hemlock along with western redcedar. The few old-growth stands in this zone (400 to 600 years old), still retain a major compoent of Douglas-fir and most of the large stumps that are still evident after the Tillamook burns are also of Douglas-fir. Currently, even-age stands of Douglas-fir dominates most of the uplands. This pattern is encouraged by extensively planting this species following timber harvest and intensively managing competing vegetation in the young developing plantations. Hardwood stands that are dominated by Red Alder are also common in Riparian areas. Approximately 46% of the Federal lands are in the Riparian Reserve land-use allocation. Bigleaf maple is common in canyons and is often a minor component in upland Douglas-fir forests.

Several plant associations similar to those described for the Siuslaw National Forest by Hemstrom and Logan (1986) are common in the watershed area. These include western hemlock/salal, western hemlock/vinemaple-salal, western hemlock/swordfern, western hemlock/vine maple/swordfern, and western hemlock/dwarf Oregon grape-salal.

Considering all ownerships, a minute percentage, .l% of the watershed is classified as old-growth/mature (these characteristics begin at anywhere from 130 to 200 years old).

Approximately 17.5% of the watershed is in the sapling and pole stage (this occurs between 5 and 35 years old), 40.4% is in the small conifer stage (which lasts from about 35 to 75 years), and 9.8 % is in the mature conifer stage, which usually begins at about 80 years old.

The Federal lands contain slightly older forests than adjacent private lands, since there hasn't been any timber harvesting since the salvage operations were completed after the last Tillamook burn. .3% of the land is covered with forest that is less than 20 years old, 68.1% has forests that are 30 to 50 years old, 24.7% is in the 60 to 80 year old age classes and 6.9% is in the 90 to 110 year old age classes.

Laminated root rot, caused by the fungus *Phellinus weirii*, is widespread and has a major influence on the character of many Douglas-fir stands in the watershed. *P. weirri* readily infects and kills highly susectible conifer species such as Douglas-fir and grand fir. Western hemlock is considered intermediately susceptible and western redcedar is thought to be resistant to the disease. All hardwood species are immune.

The location and extent of exotic plant and noxious weed infestations are not well known within the watershed at this time. In the Upper Tualatin-Scoggins watershed, common exotic plant pest species include Himalayan blackberry (*Rubus discolor*), Scotch broom (*Cytisus scoparius*) and thistles (*Cirsium sp.)* Dense weed populations are often dependant on locations with ample sunlight.

The trend on private land is to harvest stands while they are still well within the small conifer stage, maintaining primarily Douglas-fir plantation. The present ownership pattern and federal land allocations will most likely continue to maintain a landscape pattern characterized by early seral stage stands, and a high degree of forest fragmentation. Past and present forest management activities (primarily timber harvest and road construction, has greatly reduced the amount of legacies (green trees, snags, and coarse woody debris) from the previous stands, degraded riparian habitat and increased the spread of exotic plants and noxious weeds. Future management actions on federal land will be in accordance with the April, 1994 *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl*, which contains management direction to provide for legacies, restore and maintain the ecological health of riparian ecosystems, and contain and/or reduce noxious wee infestations. Since only 4.5% of the watershed is managed by the BLM, any action taken on federal land will have minimal impact on these elements within the watershed as a whole. In consideration of this, coupled with the future actions expected to occur on private land, there is limited potential for improvement in the amount of legacies, riparian habitat condition, or the rate of spread of noxious weeds in the watershed.

Soils:: Soils in the mountains and hills are mainly deep, well-drained and productive. They weathered from diabase, basalt, tuffs, sandstone, and siltstone and volcanic ash. Soil textures are

generally silt loam over silt loam or silty clay loam. These soils are moderately permeable, have low bulk densities, high organic carbon, high chemical and physical resilency, but are susceptible to compaction when moist and erosion when exposed. These soils with their favorable phycial and biological properties, in combination with the mild temperatures and abundant moisture and precipitation, make them highly productive for growing trees. Typical soil series are the Tolany, Hembre, Olyic and Melby. Soils in the Tualatin plain are typically very deep, high in silt and clay and are well drained.

The dominant erosion processes in the watershed are landslides. Forest hillslopes are generally stable. Landslides, in the form of debris avalanches and debris flows, occur most frequently on steep, (greater than 70%) stream-adjacent slopes. Steep slopes and inner gorges are most prevalent in the western portion of the watershed along the major drainages. Large deep-seated, rotational landslides and earthflows are associated with deeply weathered sedimentary rock and recent long periods of high precipitation. Many of the past landslides have been triggered by human activities such as logging and road construction.

Roads are the most significant source of anthropogenic surface erosion and sediment on forest lands. Many of the roads were built prior to 1980 under less stringent standards and guidelines than today. Many roads were built adjacent to streams with long, steep vertical side cuts. Some are located on unstable ground. The mean road density for the watershed is 3.73 miles of road per square mile. According to the BLM GIS database, roads average about 2.4 miles of road per square mile on BLM land within the watershed. However, it is estimated that there are 30 to 40% additional legacy roads present but not accounted for in the GIS database. Compacted and otherwise disturbed surfaces, such as roads and OHV trails, are a chronic source of sediment in the watershed.

The current condition for erosion processes varies from the reference condition in the rate and timing of erosion. Under reference conditions major disturbances (wind, floods, fire, and landslides) are estimated to have occurred once every 200 years. Low surface erosion would have occurred after the major disturbance in impulses, for about 20 to 40 years. It is believed that 80 to 90% of the time the watershed had low surface erosion rates. Removal of vegetation from burning and logging, compaction and displacement of soil from logging and road construction, etc. has increased erosion rates over a much longer time than under natural conditions. In addition, the type of material delivered to stream channels and riparian areas from landslides has changed. Landslides were a major source of large woody debris in streams in historic times. Large areas of adjacent stream sides were formerly covered by older timber. With the younger timber that dominates the watershed today, there is little or no large wood input to the channels from landslides.

Future management actions on federal land will be in accordance with the Salem RMP which contains management direction to maintain and restore the sediment regime under which aquatic ecosystems evolved. Since only 4.5% of the watershed is administered by the BLM, any beneficial action taken on federal land will have minimal impact on the sediment regime within the

watershed. In consideration of this, coupled with the future actions expected to occur on private land, there is limited potential for improvement in the sediment regime in the watershed.

Water: The beneficial uses of water in the Tualatin River Sub- Basin are listed in the Oregon Administrative Rules (OAR 340-41-442). They include private and public domestic water supply, and municipal consumption, industrial water supply, irrigation, livestock watering, boating, hydro power, aesthetic quality, salmonid fish (trout) spawning and rearing, resident fish and aquatic life, anadromous fish passage, wildlife and hunting, fishing, water contract recreation, and commercial navigation and transportation.

The Oregon Department of Environmental Quality (DEQ), as required by Section 303(d) of the 1972 Federal Clean Water Act, is responsible for identifying waters in the state that cannot meet the water quality standards without applying additional pollution controls already required for industrial sources or sewage treatment plants. Parameters impaired by the water quality limited water bodies are directly tied to the beneficial uses. Stream segments and parameters, which exceed water quality standards for this region, are summarized in the table below.

Table 1. Regional Water Quality Limited Stream (Final 1998 303(d) List)

Stream Segment	**Parameter Standard Exceeded**	**Season of Concern**
Carpenter Creek, mouth to headwaters	Bacteria (Water Contact Recreation - E. coli), Fresh Water	Summer
Scoggins Creek, mouth to Hagg Lake	Dissolved Oxygen (DO)	November 1 - April 30

DEQ is also responsible for developing water quality standards to protect the most sensitive beneficial uses. Total Maximum Daily Loads (TMDLs) have been developed for waters within the Tualatin Sub-Basin that fall short of water quality standards. DEQ has developed TMDLs to address temperature, bacteria and low dissolved oxygen and has revised the existing ammonia and total phosphorus TMDLs (in the mainstem Tualatin River). On January 31, 2001, the DEQ Tualatin River Sub-basin TMDL report was sent to U.S. Environmental Agency for their approval. TMDLs will not be developed for habitat and flow modification (identified under biologic criteria). The focus on new TMDLs will be mainly on Tualatin's tributaries.

Phosphorus loading is a concern in the upper watershed. High phosphorous levels in streams can lead to reduced dissolved oxygen, algal blooms, fish kills, and foul odors. The primarily source of phosphorous is believe to come from increased wastewater, fertilizer use, urban runoff and leaching, and fine sediment from phosphorus rich soils. Some of it appears to come off disturbed

forest soil, particulary soils that were formed from sedimentary rocks.

Past and present actions, primarily timber harvest, road construction, and residential development, have influenced the hydrologic processes of the watershed to the point that the most of the stream channels are not in “proper functioning condition.” Future management actions on federal land will be in accordance with the Salem RMP which contains management direction to maintain or restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Since only 4.5% of the watershed is administered by the BLM, and these lands are not distributed in a major block, any beneficial action taken on federal land will have minimal impact on water quality within the watershed. In consideration of this, coupled with the future actions expected to occur on private land, there is limited potential for improvement in the hydrologic processes of the watershed.

Fisheries: Steelhead trout and chinook salmon are the only anadromous fish native to the Upper Tualatin-Scoggins watershed. In March of 1999, the upper Willamette ESU (evolutionarily significant unit) of steelhead, which inlcudes the steelhead within the Scoggins creek drainiage, were federally listed as threatened under the ESA (Endangered species Act). Scoggins Creek also falls within the Upper Willamette chinook salmon ESA area, also listed as threatened. Chinook salmon sightings in the watershed are very rare and sporadic. Cutthroat trout is also native to the system. Studies by BLM/ODF/ODFW found cutthroat trout in most fish-bearing streams in this watershed. Coho salmon are present due to hatchery releases, but are not native. Common native non-salmonids include dace and sculpin. Pacific lamprey and brook lamprey are also present.

Salmonids differ somewhat in their habitat, but all require cool water, structurally diverse channels and clean spawning gravel for maintenance of healthy populations. Less is known about the requirements of the non-salmonid species, however the same general habitat features are expected to benefit them as well. Large wood pieces play a vital role in maintaining channel complexity by creating scour to form pools, recruiting and maintaining spawning gravel, and providing cover. There is an estimated 15 to 20 miles of spawning habitat that is accessible to anadromous fish in the Upper Tualatin-Scoggins Watershed.

Logging and farming practices in the past century have drastically altered riparian areas in these watershed. On the lower reaches, much of the vegetation that buffered streams and provided habitat has been removed and as a result, water quality has been adversely impacted. The reduction of water quality in the streams has impacted wildlife and fisheries. On the forested sections in the middle and upper reaches, old growth conifers have been mostly eliminated, removing an important fisheries habitat component.

The population of upper Willamette steelhead has been declining for the past 10 years which led to the proposal for listing under ESA. Under the current conditions, the loss of habitat contributing to the downward trend is unlikely to be reversed since lack of adequate large woody debris for structure will continue to be a problem over most of the watersheds due to the lack of

large conifers on private lands for recruitment to the channel. Since other fish species, both resident and anadromous, have habitat requirements similar to those of steelhead, it is likely that they are also experiencing a downward trend. There are no current plans to provide fish passage at Scoggins creek dam. However, if fish passage were to be installed than approximately 15 miles of upstream habitat would become available to upper Willamette steelhead and potentially to Willamette chinook salmon, if any are left in the system.

Future management actions on federal land will be in accordance with the Salem RMP which contains management direction to maintain or restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems, and to maintain or enhance fisheries potential. Since only 4.5% of the watershed is managed by the BLM, and any action taken on federal land will have minimal impact on fish species and their habitats within the watershed. The BLM will likely pursue cooperative efforts with the Tualatin Watershed Council, private landowners and others to implement instream habitat improvements, which would lead to some improvement in aquatic habitat conditions throughout the watershed. In addition, the *Oregon Plan for Salmon and Watersheds* should lead to some improvement in aquatic habitat, though to what extent is unknown, as this is largely a volunteer effort.

Wildlife: The Upper-Tualatin Scoggins Creek Watershed is dominated by highly fragmented timber stands, that are mostly 40 to 60 years old, interspersed with early seral stage habitat primarily located on intensively managed industrial forest lands. As a consequence of patches of younger, small conifers and larger aggregated clearcuts being distributed across the landscape, the area is permeated with high contrast edges and contains little interior forest habitat. Many forested riparian corridors have been harvested or reduced to thin strips of red alder. There is very little mature forest and virtually no old-growth timber (.1%) left within the watershed. As a result of forest fragmentation and the general landscape pattern, the ability of some species to disperse, within this watershed or move across the larger landscape, has been greatly limited. For species dependant upon later seral stage habitat, these factors and the resulting landscape pattern have resulted in dispersal problems.

In general, past and present actions have resulted in little or no habitat for those species dependant upon later seral stage habitat including snags or coarse woody debris, large blocks of interior forested habitat or diverse, cool, shaded, riparian habitats within the watershed. Conversely, there is a great deal of habitat for those species which depend upon or utilize early seral stage habitats, smaller patches and the juxtaposition of differing habitat types. Overall, the instream habitat conditions within the watershed are poor. Future management actions on federal land will be in accordance with the Salem RMP management plans which contains management direction to provide for healthy forest ecosystems with habitat that will support populations of native species and includes protection for riparian areas and waters. Since only 4.5% of the watershed is managed by the BLM, any action taken on federal land will have minimal impact on wildlife species and their habitats within the watershed. In consideration of this, coupled with the future actions expected to occur on private land, there is limited potential for improvement of habitat for species with larger home ranges requiring later-seral habitat characteristics, or in-stream habitat conditions within the watershed.

APPENDIX 5

AQUATIC CONSERVATION STRATEGY OBJECTIVES

Documentation of Consistency with Aquatic Conservation Strategy Objectives of the Scoggins Creek Project Timber Harvest Alternatives

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.

Alternative 1 No Action: The current distribution, diversity and complexity of watershed and landscape-scale features would be maintained. **Does not retard or prevent the attainment of ACS Objective 1.**

Alternative 2 Density Management Thinning and Watershed Restoration : Thinning would maintain and help increase (restore) diversity and complexity by encouraging development of understory species and growing larger trees. Approximately 152 acres of thinning within RR would help **restore** species composition and structural diversity by promoting development of grass, forb, shrub and understory tree development. Increased individual tree growth resulting from this treatment would allow some trees to express dominance over others, enhancing the development of vertical structure in the stand. Leaving portions of RR untreated would increase diversity by providing a contrast to the treated portions. For example, thinned portions will provide larger trees sooner while the unthinned portions will provide more, but smaller snags through time. The protection of the aquatic system will be ensured through no-cut buffers on all streams (100 feet on fish bearing and 50 feet on non-fish bearing), and no road construction in RR. The road density in the watershed would be reduced by approximately 3.0 miles. Roads that are removed would be subsoiled and the reduction of these compacted areas may help restore normal patterns of infiltration and subsurface flow of water. This may restore timing, magnitude duration, and spatial distribution of flows. **Does not retard or prevent the attainment of ACS Objective 1.**

Alternative 2 Wildlife Habitat Enhancement: In general, this work will be done in older forest stands, or riparian areas that will not be treated with density management, or in younger forest stands that are not suitable for density management. Snags would be created through girdling or by inoculation with heart rot. Individual conifers would be released from competition by girdling adjacent trees. In some cases, a small patch would be created around the release tree to add structural diversity and down wood to the stand. These treatments would help **restore** species composition and structural diversity. **Does not retard or prevent the attainment of ACS Objective 1.**

Alternative 3 Density Management: Same as Alternative 2. There would be 28 more acres of RR treated, approximately 14 more acres in total would be treated, but the rationale outlined for Alternative 2 is also valid for this alternative. **Does not retard or prevent the attainment of ACS Objective 1.**

Alternative 3 Watershed Restoration: The 2.4 miles of road decommissioning included as a separate action apart from the timber sale will provide benefits to this ACS objective. The protection of aquatic systems will be realized by this action as the removal of existing roads that are not currently maintained is undertaken. **Does not retard or prevent the attainment of ACS Objective 1.**

ACS Objective 2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. The network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian dependent species.

Alternative 1: The current condition of connectivity would be maintained. **Does not retard or prevent the attainment of ACS Objective 2.**

Alternative 2: Density Management Thinning and Watershed Restoration: Approximately 152 acres of RR would be thinned. This which would increase the quality of the riparian reserve stand habitat by creating some larger trees. Connectivity would be maintained within the RR. No-cut buffers on all perennial and intermittent streams will ensure that connectivity would be maintained among all drainages by maintaining canopy cover over streams and maintaining connections of RR on federal land. The road density in the watershed would be reduced by approximately 3.0 miles. Roads that are removed would be subsoiled and the reduction of these compacted areas may help restore normal patterns of infiltration and subsurface flow of water. This may restore timing, magnitude duration, and spatial distribution of flows. **Does not retard or prevent the attainment of ACS Objective 2.**

Alternative 2 Wildlife Habitat Enhancement: In general, this work will be done in older forest stands, or riparian areas that will not be treated with density management, or in younger forest stands that are not suitable for density management. Snags would be created through girdling or by inoculation with heart rot. Individual conifers would be released from competition by girdling adjacent trees. In some cases, a small patch would be created around the release tree to add structural diversity and down wood to the stand. These treatments would **maintain** spatial and temporal connectivity. **Does not retard or prevent the attainment of ACS Objective 2.**

Alternative 3 Density Management: Same as Alternative 2. There would be 28 more acres of RR treated, approximately 14 more acres in total would be treated, but the previous rationale is valid for this alternative. **Does not retard or prevent the attainment of ACS Objective 2.**

Alternative 3 Watershed Restoration: The 2.4 miles of road decommissioning included as a separate action apart from the timber sale will provide benefits to this ACS objective. The protection of aquatic systems will be realized by this action as the removal of existing roads that are not currently maintained is undertaken. **Does not retard or prevent the attainment of ACS Objective 2.**

Alternative 3 Wildlife Habitat Enhancement: Generally the same as Alternative 2 wildlife within RR; 14 more acres would be treated in RR as compared to Alternative 3. **Does not retard or prevent the attainment of ACS Objective 2.**

ACS Objective 3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

Alternative 1: The current condition of the physical integrity of the aquatic system would be maintained. **Does not retard or prevent the attainment of ACS Objective 3.**

Alternative 2 Density Management Thinning and Watershed Restoration: No-cut buffers on all perennial and intermittent streams would ensure that the physical integrity of the aquatic system would be maintained. In units with cable yarding, logs would be fully suspended across non-fish bearing streams. Logs would be fully suspended over the stream by generally a minimum (and likely much more than) 25 feet on either side. One end suspension would be required through-out the RR areas. There would not be any impact on stream banks and bottoms. The road density in the watershed would be reduced by approximately 3.0 miles. Roads that are removed would be subsoiled and the reduction of these compacted areas may help restore normal patterns of infiltration and subsurface flow of water. This may restore timing, magnitude duration, and spatial distribution of flows. **Does not retard or prevent the attainment of ACS Objective 3.**

Alternative 2 Wildlife Habitat Enhancement: This action will not alter shorelines, banks, and bottom configurations of the aquatic system **Does not retard or prevent the attainment of ACS Objective 3.**

Alternative 3 Density Management: Same as Alternative 2. There would be 28 more acres of RR treated, approximately 14 more acres in total would be treated, but the previous rationale is valid for this alternative. **Does not retard or prevent the attainment of ACS Objective 3.**

Alternative 3 Watershed Restoration: The 2.4 miles of road decommissioning included as a separate action apart from the timber sale will provide benefits to this ACS objective. The protection of aquatic systems will be realized by this action as the removal of existing roads that are not currently maintained is undertaken. Specific benefits to this objective include the removal of several culverts restoring bottom configurations. **Does not retard or prevent the attainment of ACS Objective 3.**

Alternative 3 Wildlife Habitat Enhancement: Generally the same as Alternative 2. There would be 14 more acres treated in RR as compared to Alternative 2. **Does not retard or prevent the attainment of ACS Objective 3.**

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.

Alternative 1: The current condition of water quality would be maintained. **Does not retard or prevent the attainment of ACS Objective 4**.

Alternative 2 Density Management Thinning and Watershed Restoration: Timber harvest activities, including road construction, reconstruction and decommissioning, and yarding and hauling timber, could lead to sediment movement into streams in the short-term. Roads are mainly located on benches and ridgetops, which reduces potential for runoff and sediment movement. Road decommissioning will result in a net reduction of road mileage within the watershed of 3.0 miles. The Proposed Action is expected to have little to no impact on stream temperatures because of the small size and distance between openings in RR and no-cut buffers on all streams (50 feet on non-fish bearing and 100 feet on fish bearing streams). The reduction in road mileage may help **restore** this objective in the long term. **Does not retard or prevent the attainment of ACS Objective 4.**

Alternative 2 Wildlife Habitat Enhancement: In general, this work will be done in older forest stands, or riparian areas that will not be treated with density management, or in younger forest stands that are not suitable for density management. Snags would be created through girdling or by inoculation with heart rot. Individual conifers would be released from competition by girdling adjacent trees. In some cases, a small patch would be created around the release tree to add structural diversity and down wood to the stand. Water quality will 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. **Does not retard or prevent the attainment of ACS Objective 4.**

Alternative 3 Density Management: This alternative differs from Alternative 2 in that it utilizes a helicopter instead of cable logging and ground-based thinning. The discussion on RR harvest and no-cut buffers on streams is the same as for Alternative 2 with the exception of 5 helicopter landings and no cable corridors through RR **Does not retard or prevent the attainment of ACS Objective 4.**

Alternative 3 Watershed Restoration: The 2.4 miles of road decommissioning included as a separate action apart from the timber sale will provide benefits to this ACS objective. The protection of aquatic systems will be realized by this action as the removal of existing roads that are not currently maintained is undertaken. Specific benefits to this objective include the removal of several culverts restoring bottom configurations. **Does not retard or prevent the attainment of ACS Objective 3.**

Alternative 3 Wildlife Habitat Enhancement: Same as alternative 2. **Does not retard or prevent the attainment of ACS Objective 4.**

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.

Alternative 1: The current condition of the sediment regime would be maintained. **Does not retard or prevent the attainment of ACS Objective 5.**

Alternative 2 Density Management Thinning and Watershed Restoration: There is a low risk that a small amount of sediment could move from the harvest areas or roads into surface water. If that occurred, the sediment delivery impacts would small and short term. The probability of sediments entering streams from roads is low due to: 1) the filtering effects of untreated reserves around the streams; 2) the design features of the roads; and 3) subsoiling many roads upon completion of the project. No new road construction would occur within the RR. Decommissioning roads (approximately 7.0 miles) within the watershed would contribute to the restoration of the sediment regime, and sediment movement into stream channels would be expected to decrease below existing conditions. **Does not retard or prevent the attainment of ACS Objective 5.**

Alternative 2 Wildlife Habitat Enhancement: Since no soil disturbance is anticipated ACS objectives will be maintained. **Does not retard or prevent the attainment of ACS Objective 5.**

Alternative 3 Density Management: This alternative increases the total area harvested by approximately 14 acres, eliminates both ground-based logging and cable yarding in thinning units. It also eliminates the need to build new semi permanent road. Only 4.5% of the total road reconstruction to be completed in alternative 2 would need to be done. There should be less ground disturbance and compaction, and it would be more likely to **restore** than Alternative 2. **Does not retard or prevent the attainment of ACS Objective 5.**

Alternative 3 Watershed Restoration: The 2.4 miles of road decommissioning included as a separate action apart from the timber sale will provide benefits to this ACS objective. The protection of aquatic systems will be realized by this action as the removal of existing roads that are not currently maintained is undertaken. Specific benefits to this objective include the reduction of potential sediment sources which may affect water quality by the reduction of road compaction and an increase in infiltration rates. **Does not retard or prevent the attainment of ACS Objective 5.**

Alternative 3 Wildlife Habitat Enhancement: This alternative would increase the amount of wildlife treatment by 14 acres as compared to Alternative 2. **Does not retard or prevent the attainment of ACS Objective 5.**

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.

Alternative 1: The current condition of in-stream flows would be maintained. **Does not retard or prevent the attainment of ACS Objective 6.**

Alternative 2 Density Management Thinning and Watershed Restoration: The treatment will take place mainly outside Riparian Reserves. All proposed treatments will consist of density management thinning. The road density in the watershed would be reduced by approximately 3.0 miles. Roads that are removed would be subsoiled and the reduction of these compacted areas may help restore normal patterns of infiltration and subsurface flow of water. This may restore timing, magnitude duration, and spatial distribution of flows. Patterns of sediment, nutrient, and wood routing would be maintained, since the area to be thinned is less than 1% of the watershed. In addition, none of the roads proposed for construction are likely to intercept ground water or instream flows. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows would likely return to pre treatment conditions as the remaining forest canopy closes. **Does not retard or prevent the attainment of ACS Objective 6.**

Alternative 2 Wildlife Habitat Enhancement: No alterations in stream flow or basin hydrology are anticipated from this project. **Does not retard or prevent the attainment of ACS Objective 5.**

Alternative 3 Density Management: Generally the same as Alternative 2. Fourteen additional acres would be harvested, and there would be less soil compaction from harvesting. This alternative would be better than Alternative 2 in protecting and restoring timing, magnitude duration, and spatial distribution of flows. **Does not retard or prevent the attainment of ACS Objective 6.**

Alternative 3 Watershed Restoration: The 2.4 miles of road decommissioning included as a separate action apart from the timber sale will provide benefits to this ACS objective. The protection of aquatic systems will be realized by this action as the removal of existing roads that are not currently maintained is undertaken. Specific benefits to this objective include the reduction of potential sediment sources which may affect water quality by the reduction of road compaction and an increase in infiltration rates. **Does not retard or prevent the attainment of ACS Objective 6.**

Alternative 3 Wildlife Habitat Enhancement: No alterations of in stream flow or basin hydrology are anticipated from this project. **Does not retard or prevent the attainment of ACS Objective 6.**

ACS Objective 7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

Alternative 1: The current condition of floodplain inundation and water tables would be maintained. **Does not retard or prevent the attainment of ACS Objective 7.**

Alternative 2 Density Management Thinning and Watershed Restoration: The current condition of floodplain inundation and water tables would be maintained. No ground disturbing activities would occur in meadows and wetlands. Compacted surfaces on adjacent hillslopes would be minimized by adhering to design features and management directives listed in the EA and RMP, and by the subsoiling of landings, semi permanent roads and existing roads. Roads would be decommissioning by subsoiling and blocked to traffic. The road density in the watershed would be reduced by 3.0 miles. **Does not retard or prevent the attainment of ACS Objective 7.**

Alternative 2 Wildlife Habitat Enhancement: This action will not alter timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands. **Does not retard or prevent the attainment of ACS Objective 7.**

Alternative 3 Density Management: The current condition of floodplain inundation and water tables would be maintained. No ground disturbing activities would occur in meadows and wetlands. Current conditions would be maintained by not building new semi permanent or permanent roads and minimizing ground compaction. **Does not retard or prevent the attainment of ACS Objective 7.**

Alternative 3 Watershed Restoration: The 2.4 miles of road decommissioning included as a separate action apart from the timber sale will not affect this ACS objective. There will be an increase in infiltration rates into the roads decommissioned, however any change in the duration or water table elevation in meadows and wetlands is not anticipated as the roads to be decommissioned are generally in ridge top locations. **Does not retard or prevent the attainment of ACS Objective 7.**

Alternative 3 Wildlife Habitat Enhancement: This action will not alter timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands. **Does not retard or prevent the attainment of ACS Objective 7.**

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.

Alternative 1: The current condition of plant communities within riparian areas would be maintained. **Does not retard or prevent the attainment of ACS Objective 8.**

Alternative 2 Density Management Thinning and Watershed Restoration: No-cut buffers along streams (both perennial and intermittent) will maintain thermal regulation and supply nutrients, LWD, and bank protection. The thinning within RR may help **restore** species composition and structural diversity within the riparian zone by promoting development of grass, forb, shrub and understory tree layers. Increased individual tree growth resulting from this treatment would allow some trees to express dominance over others, enhancing the development of vertical structure in the stand. The road density in the watershed would be reduced by approximately 3.0 miles. Roads that are removed would be subsoiled and the reduction of these compacted areas may help restore normal patterns of infiltration and subsurface flow of water. This may restore timing, magnitude duration, and spatial distribution of flows. **Does not retard or prevent the attainment of ACS Objective 8.**

Alternative 2 Wildlife Habitat Enhancement: In general, this work will be done in older forest stands, or riparian areas that will not be treated with density management, or in younger forest stands that are not suitable for density management. Snags would be created through girdling or by inoculation with heart rot. Individual conifers would be released from competition by girdling adjacent trees. In some cases, a small patch would be created around the release tree to add structural diversity and down wood to the stand. This action may restore species composition and structural diversity of plant communities in riparian areas and 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. **Does not retard or prevent the attainment of ACS Objective 8.**

Alternative 3 Density Management: Generally the same as Alternative 2. There will be 4 less acres treated both in RR and outside, however the rationale is the same. There would be little impact to riparian plant communities. **Does not retard or prevent the attainment of ACS Objective 8.**

Alternative 3 Watershed Restoration: The 2.4 miles of road decommissioning included as a separate action apart from the timber sale will provide benefits to this ACS objective. The protection of aquatic systems will be realized by this action as the removal of existing roads that are not currently maintained is undertaken. Specific benefits to this objective include the reduction of potential sediment sources which may affect water quality by the reduction of road compaction and an increase in infiltration rates and an anticipated increase in the amount and complexity of vegetation on the decommissioned roads. **Does not retard or prevent the attainment of ACS Objective 8.**

Alternative 3 Wildlife Habitat Enhancement: Generally the same as Alternative 2. There will

ACS Objective 9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.

Alternative 1: The current condition of habitat to support riparian-dependent species would be maintained. **Does not retard or prevent the attainment of ACS Objective 9.**

Alternative 2 Density Management Thinning and Watershed Restoration: No-cut buffers along streams (both perennial and intermittent) will maintain the habitat for riparian-dependent species. Thinning within RR would also maintain and may help **restore** habitat for riparian-dependent species by promoting development of grass, forb, shrub and understory tree layers. Increased individual tree growth resulting from this treatment would allow some trees to express dominance over others, enhancing the development of vertical structure in the stand as well (WA p. 111). Leaving portions of RR untreated would increase diversity by providing a contrast to the treated portions. For example, thinned portions will provide larger trees sooner while the unthinned portions will provide more, but smaller snags through time. Overall there would be little impact on riparian-dependent species. The road density in the watershed would be reduced by approximately 3.0 miles. Roads that are removed would be subsoiled and the reduction of these compacted areas may help restore normal patterns of infiltration and subsurface flow of water. This may restore timing, magnitude duration, and spatial distribution of flows. **Does not retard or prevent the attainment of ACS Objective 9.**

Alternative 2 Wildlife Habitat Enhancement : These actions both inside and outside of RR may help **restore** habitat for riparian-dependent species by promoting development of grass, forb, shrub and understory tree layers. Increased individual tree growth resulting from this treatment would allow some trees to express dominance over others, enhancing the development of vertical structure in the stand as well. **Does not retard or prevent the attainment of ACS Objective 9.**

Alternative 3 Density Management: Generally the same as Alternative 2. There will be 35 more acres treated in RR and 4 less acres altogether, however the rationale is the same. Overall there would be little impact on riparian-dependent species. **Does not retard or prevent the attainment of ACS Objective 9.**

Alternative 3 Watershed Restoration: The 2.4 miles of road decommissioning included as a separate action apart from the timber sale will provide benefits to this ACS objective. The protection of aquatic systems will be realized by this action as the removal of existing roads that are not currently maintained is undertaken there will be approximately 5 acres treated with a portion of that located within riparian reserves. **Does not retard or prevent the attainment of ACS Objective 9.**

Alternative 3 Wildlife Habitat Enhancement: Generally the same as Alternative 2. There will be 14 more treated acres total both in RR and outside, however the rationale is the same. Overall there would be little impact on riparian-dependent species. **Does not retard or prevent the attainment of ACS Objective 9.**

APPENDIX 6

Table 1: CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS AT THE PROJECT LEVEL

Administratiave Unit: Salem District BLM **5th field watershed**: Scoggins
Project: Scoggins Creek Project **6th Field watershed**: Sain Creek

FACTORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)***		
INDICATORS	Properly Functioning	At Risk	Not Proper. Functioning	Restore	Maintain	Degrade
Water Quality: Temperature	X				X	
Turbidity		X		X		X
Chem. Contam./Nut.	X				X	
Overall (303d reaches)	X				X	
Habitat Access: Physical Barriers			X	X	X	
Habitat Elements: Substrate/Sediment		X		X		X
Large Woody Debris (LWD)		X			X	
Pool Area %		X*			X	
Pool Quality			X*		X	
Pool Frequency	X				X	
Off-Channel Habitat			X*		X	
Channel Cond. & Dyn.: Streambank Condition	X*				X	
Floodplain Connectivity		X*			X	
Watershed Condition: Road Des. & Loc.			X	X		X[2]
Disturbance History			X		X	X[3]
Stream Influence Zone			X		X	
Refugia		X			X	

* the data for this stream segment is a Rosgen B type channel with a gradient of 4.4% on average.

** Analysis of detailed matrix indicators in the Sain Creek 6th and at the 5th field (Scoggins) watershed scale was conducted form data collected by the Oregon Department of Fish and Wildlife in 1993, 1994, and 1997. The Sain creek drainage was chosen for detailed analysis as 91% of the project area falls within this 6th field watershed. The other two 6th field watershed on either side of Sain creek are very similar in drainage patterns, gradient, amount of sand or silt and in the amount of Large Woody Debris. The amount of stream bank erosion is identical at the 5th field scale to that of Sain Creek 6th field. There are significantly more quality pools on average in the 5th field analysis than in the Sain Creek 6th field. Also it should be noted that none of this habitat analyzed is accessible to Upper Willamette steelhead or any other anadromous fish due to the dam that forms Henry Hagg Lake and an

impassable barrier at Haines Falls on the Lee Creek Drainage. For these reasons detailed analysis was limited to the Sain Creek 6th Field.

[2] Short term degrade, long term restore
[3] Short term degrade, long term maintain

***The above matrix shows a "short-term degrade" and "long-term restore" or "maintain" is expected for the indicators of turbidity, substrate/sediment, road density and location, and disturbance history. However, if this analysis was done at the 5th field scale a short-term degrade would not be expected for any of these indicators. The most important single reason that these four indicators show a "short term degrade" on a 6th field scale is because the project location is above Henry Hagg lake.

For the turbidity and substrate/sediment indicators are expected to be impacted by such areas as road ditches and new road construction where there are direct hydrologic ties to stream channels. These occurrences are anticipated to be separated in both time and location, and the inputs are not anticipated to be outside the range of natural variability at even the 7th field scale. Because the 1st and 2nd order tributaries are relatively steep, they are anticipated to accept and transport high volumes of sediments. without changes to their physical processes. The amounts of sediment anticipated to be introduced by these action alternatives are not anticipated to affect the stream's biotic community.

The road density/location and disturbance history can be applied at both the 5th and 6th field scale. Initially there will be an increase in road density (miles of road per square mile), however most of these roads will only be in-place for three years or less. At the completion of the project there will be a net reduction of almost 3 miles of road and therefore a long term net benefit to this indicator is anticipated. For the disturbance indicator , there will be a decrease in the number of trees in the watershed, however there is no change in the type of land base. The loss of productivity on approximately 10 acres is expected to last for several decades.

Note: effects are based on which way this project is likely to move the relevant indicator, but no change in baseline condition is expected.

Description of projects

1. No Action Alternative: There will be no new actions in this planning area outside of those covered by other planning or decision documents.

2. Timber harvest and Watershed Restoration Alternative 2: This action entails the harvest of 526 acres of which 152 would be within Riparian Reserves (RR). As designed the action would have approximately 262 acres of ground based harvest and 264 acres of cable yarding together yielding 6.86MMBF of commercial timber. This action involves the construction of 3.9 miles of new semi- permanent road, 2.2 miles of road reconstruction and 7.0 miles of road decommissioning. The result of this action as it relates to roads will be a net reduction of 3 miles of road.

3. Timber harvest and Watershed Restoration Alternative 3: This action includes the harvest of 542 acres using a helicopter for timber harvest. Of the 542 acres 177 acres would be

within RR and the predicted commercial volume of timber to be removed is 7.044MMBF. This action requires 474 feet of road reconstruction and building of 5 landings for the helicopter and commercial timber removed from the harvest units. Analyzed with this option would be road decommissioning of 2.4 miles of existing road, and the removal of two culverts, however as this is not tied to the timber sale it would be funded separately.

4. Wildlife Habitat Improvement Project: This project varies slightly based on which action alternative is implemented, if #2 above is selected the wildlife improvement project would take place on 192 acres in both RR and upland areas and would include 206 acres if #3 were selected. This project involves work in older forest stands, or riparian areas that will not be treated with density management, or in younger forest stands that are not suitable for density management. Snags would be created through girdling or by inoculation with heart rot. Individual conifers would be released from competition by girdling adjacent trees. In some cases, a small patch would be created around the release tree to add structural diversity and down wood to the stand.

Water Quality

Temperature: The Upper Tualatin-Scoggins Watershed Analysis describes the headwater streams in the project area as not exceeding the 64 degree cool water standard. **Properly Functioning**.

No Action Alternative: No action would occur, therefore there would be no impact on this indicator. **Maintain.**

Timber Harvest and Watershed Restoration (Alternative 2): The timber harvest and associated activities in Alternative 2 would have little impact on canopy cover over the stream channels due to the no-cut buffers on all streams, and therefore would not impact water temperature. "No-cut" buffers would be placed along all stream channels (50-foot on non-fish bearing and 100-foot on fish bearing stream). While logs would be fully suspended while cable yarding over streams and adjacent stream banks, there is a low risk of some damage to residual trees. Any damage would be likely be small and short-term. Most stream channels in the project area are well shaded and do not flow during the summer. Streams which flow during the summer generally receive little solar radiation due to their narrow channel widths, thicker riparian vegetation and topographic shading. Most summer flowing streams are located in deep narrow valleys or canyons. **Maintain**.

Timber Harvest and Watershed Restoration (Alternative 3 Helicopter): Lower potential than described in Alternative 2. Some tree tops or limbs may be knocked off during harvest, but opening size would be minimal. Impacts to water temperature would be negligible to non-existent. **Maintain**.

Wildlife Habitat Improvement: The small number of individual trees in any one area and the use of no cut buffers will maintain ample shade on stream channels to maintain water

temperatures. **Maintain**.

Turbidity: The Upper Tualatin-Scoggins Watershed Analysis suggests that turbidity within the watershed may currently be higher that reference conditions, primarily due to human uses. Trends concerning turbidity appear to be improving as Best Management Practices are applied. **At Risk**.

No Action Alternative: The roads that are currently in this area on BLM lands are generally not in use and most have some vegetation growing on them. The major sources of erodible material have already moved off them. Erosion from them is anticipated to be the same or lower through time. **Maintain.**

Timber Harvest and Watershed Restoration (Alternative 2): Log yarding and hauling, and road building/decommissioning activities may result in short-term sediment input leading to increased turbidity. Road decommissioning following timber harvest would result in approximately three miles net reduction of road mileage within the watershed, which would reduce long-term potential for sedimentation by increasing infiltration. The following actions would minimize or eliminate sediment movement into streams: no-cut buffers on streams, no ground-based yarding within RR except where logging equipment is able to operate from an existing road or from outside the RR, and roads generally located on benches and ridgetops. Though there is a potential for short-term increases in sediment input to streams due to the hauling thereby increasing turbidity, the long-term effect would be a decrease in sedimentation due to subsoiling of roads. Short-term **Degrade**, Long-term **Restore**.

Timber Harvest and Watershed Restoration (Alternative 3 Helicopter): The impacts of log hauling in Alternative 3 would be similar to those of Alternative 2. The potential for increased turbidity is less than in Alternative 2, because there would not be any construction of new, semi-permanent roads or road reconstruction. The net decrease in roads at the completition of the project would be 2.4 miles. Short-term **Degrade** with a long-term **Restore**.

Wildlife Habitat Improvement: Should have no impact on stream turbidity. **Maintain**.

Chemical Contamination/Nutrient Input: The Upper Tualatin-Scoggins watershed has two stream segments that are on the 303d list for Dissolved Oxygen and E coli. None of the stream reaches within the project area are on the 303d list. **Properly Functioning**.

No Action Alternative: No action would occur, therefore there would be no impact on this indicator. **Maintain.**

Timber Harvest and Watershed Restoration (Alternative 2): The Proposed Action would not have any effect on chemical or nutrient contamination, this indicator will be

maintained. **Maintain.**

Timber Harvest and Watershed Restoration (Alternative 3 Helicopter): Same as Alternative 2. **Maintain.**

Wildlife Habitat Improvement: Same as Alternative 2 and/or 3. **Maintain.**

Overall (303d reaches): The Upper Tualatin - Scoggins watershed has two stream segments that are on the 303d list for Dissolved Oxygen and E coli. None of the stream reaches within the project area are on the 303d list. **Properly Functioning**.

No Action Alternative: No action would occur, therefore there would be no impact on this indicator. Not implementing this action would neither contribute to more 303d listing of stream reaches, nor help in removing any currently listed reaches from the 303d list. **Maintain.**

Timber Harvest and Watershed Restoration (Alternative 2): The Proposed Action would have negligible effect on chemical or nutrient contamination, temperature or any other 303d category for water quality, nor would it add or remove any 303d listed reaches. This indicator will be maintained. **Maintain.**

Timber Harvest and Watershed Restoration (Alternative 3 Helicopter): The Proposed Action would have negligible effect on chemical or nutrient contamination, temperature or any other 303d category for water quality, nor would it add or remove any 303d listed reaches, therefore this indicator will be same as Alternative 2. **Maintain**.

Wildlife Habitat Improvement: No impacts are expected by the implementation of this proposal. **Maintain**.

Habitat Access

Physical Barriers: There are known fish passage barriers throughout the Upper Tualatin - Scoggins watershed identified in the Upper Tualatin - Scoggins Watershed Analysis (BLM 2000). **Not Properly Functioning**.

No Action Alternative: Implementing this action would not remove any barriers to fish passage, therefore not implementing this action would have no impact on fish passage barriers. **Maintain**.

Timber Harvest and Watershed Restoration (Alternative 2): Implementing this action would not remove any barriers to fish passage, therefore not implementing this action would have no impact on fish passage barriers. **Maintain**.

Timber Harvest and Watershed Restoration (Alternative 3): Implementing this action would remove one culvert that has potential of being a barrier to fish passage. This action would be separate from the timber sale. WA shows fish distribution downstream of this culvert but there is potential for fish to use the portion up to the existing culvert due to low steam gradient. **Maintain**. And may **restore** if fish are present.

Wildlife Habitat Improvement: This separate action is not tied to culvert use and as such would maintain the current conditions. **Maintain**.

Habitat Elements

Substrate/Sediment: Low gradient riffle substrate is comprised of 18.8% sand or silt. **At Risk**.

No Action Alternative: No action would occur, therefore there would be no impact on this indicator. **Maintain.**

Timber Harvest and Watershed Restoration (Alternative 2): Log yarding and hauling, and road building/decommissioning activities may result in short-term sediment input to streams. Approximately 7 miles of road decommissioning following timber harvest would reduce long-term potential for sedimentation by increasing infiltration. The following actions would minimize or eliminate sediment movement into streams: no-cut buffers on streams; no ground-based yarding within RR, except where logging equipment is able to operate from an existing road, or from outside the RR; and roads are generally located on benches and ridgetops. Though there is a potential for short-term increases in sediment input to streams and increased turbidity due to hauling, the long-term effect would be a decrease in sedimentation due to subsoiling of roads. Short-term **Degrade**, Long-term **Restore**.

Timber Harvest and Watershed Restoration (Alternative 3 Helicopter): The impacts of Alternative 3 would be less than those in Alternative 2 as the amount of new semi-permanent road construction would be limited to approximately 474 feet. The impacts of hauling would be essentially the same as alternative 2. The potential for increased sedimentation is less than in Alternative 2, an additional 2.4 miles of road would be decommissioned. In the short-term, this indicator would be a **Degrade** but would be considered a long-term **Restore** when the 2.4 miles of roads are subsoiled.

Wildlife Habitat Improvement: No changes in substrate/sediment would occur with the implementation of this action. **Maintain**

Large Woody Debris: The surveyed reaches in the upper portion of this watershed where the proposed action would occur contain 49 key pieces of large wood per mile. Large wood in this survey was defined as at least 10 feet in length and at least 20 inches in diameter. **At Risk**

No Action Alternative: No action would occur, therefore the current and future sources of large wood to the stream would be maintained. **Maintain**.

Timber Harvest and Watershed Restoration (Alternative 2): No-cut buffers on all streams and a thinning within RR with at least 50% canopy closure would maintain the current and future sources of large wood to the stream. **Maintain**.

Timber Harvest and Watershed Restoration (Alternative 3): Same as alternative 2. 25 additional acres would be harvested in RR, but the effect would be the same. **Maintain**.

Wildlife Habitat Improvement: This action would improve the stand diversity of both upland and RR areas and may increase the current amount of LWD. **Maintain**.

Pool Area %: Surveyed reaches had 28% of total area in pools. **At Risk**.

No Action Alternative: No action would occur, therefore there would be no impact on this indicator. **Maintain.**

Timber Harvest and Watershed Restoration (Alternative 2): No-cut buffers on all streams and a thinning prescription within RR and uplands would maintain the current and future sources of large wood to the stream, which is the main pool-forming element. No other portion of this alternative would alter the amount of pools within the watershed. **Maintain**.

Timber Harvest and Watershed Restoration (Alternative 3 Helicopter): Same as alternative 2. There is a little more RR harvest, but the effect would be the same. **Maintain**.

Wildlife Habitat Improvement: The wildlife activities will have no influence on the percent of pool area. **Maintain**.

Pool Quality: Less than 1% of pools were greater than 1 meter deep. It should be noted that the stream analyzed is a Rosgen B channel type with a gradient of 4.4%. **Not Properly Functioning.**

No Action Alternative: No action would occur, therefore there would be no impact on this indicator. **Maintain.**

Timber Harvest and Watershed Restoration (Alternative 2): Current and future sources of large wood to the stream would be maintained by no-cut buffers on all streams; and thinning within RR and upland areas that would maintain 50% canopy closure. No other portion of this alternative would alter the amount of quality pools within the watershed. **Maintain**.

Timber Harvest and Watershed Restoration (Alternative 3): Same as alternative 2. 25 additional acres would be harvested in RR, but the effect would be the same. **Maintain**.

Wildlife Habitat Improvement: No change in pool quality is expected by the implementation of this action. **Maintain**.

Pool Frequency: The pool frequency is calculated at 4.6 active channel widths between pools. **Properly Functioning.**

No Action Alternative: No action would occur, therefore there would be no impact on this indicator. **Maintain.**

Timber Harvest and Watershed Restoration (Alternative 2): Current and future sources of large wood to the stream would be maintained by no-cut buffers on all streams; and thinning within RR and upland areas that would maintain 50% canopy closure. No other portion of this alternative would alter the amount of quality pools within the watershed. **Maintain**.

Timber Harvest and Watershed Restoration (Alternative 3 Helicopter): Same as alternative 2. Twenty-eight additional acres are planned for harvest in the RR, but the anticipated effects are the same. **Maintain**.

Wildlife Habitat Improvement: No change in pool frequency is expected by the implementation of this action. **Maintain**.

Off-Channel Habitat: Off-channel habitat is very minimal in the area surveyed however, as this is a Rosgen B type channel with a gradient of 4.4%, extensive off channel habitat would not be anticipated. **Not Properly Functioning**.

No Action Alternative: No action would occur, therefore there would be no impact on this indicator. **Maintain.**

Timber Harvest and Watershed Restoration (Alternative 2): Current and future sources of large wood to the streams and proposed density management thinning throughout the project area, would maintain the current and future sources of large wood to the stream. This may help provide off-channel habitat. No portion of the action would result in a reduction of off-channel habitat. **Maintain**.

Timber Harvest and Watershed Restoration (Alternative 3 Helicopter): Same as alternative 2. Twenty-eight additional acres are planned for harvest in the RR, but the anticipated effects are the same. **Maintain**.

Wildlife Habitat Improvement: No change in off channel habitat is expected by the

implementation of this action if funded. **Maintain**.

Channel Conditions

Streambank Condition: Eroding streambanks make up 13% of the total area surveyed. This amount is within the range expected for streams of this type. There are 181 units that were recorded as having some amount of erosion out of 811 surveyed. **Properly Functioning**.

No Action Alternative: No action would occur, therefore there would be no impact on this indicator. **Maintain.**

Timber Harvest and Watershed Restoration (Alternative 2): No-cut buffers on all streams, and required full suspension over streams, and generally within 25 feet of either side, would eliminate any impacts to streambanks from logging activities. Where logs will be yarded across a steam full suspension would be required, therefore no streambank impacts would occur. **Maintain**.

Timber Harvest and Watershed Restoration (Alternative 3 Helicopter): Same as Alternative 2. **Maintain**.

Wildlife Habitat Improvement : No impacts to stream banks are anticipated with the implementation of this action. **Maintain**.

Floodplain Connectivity: As described above the amount of large wood in the channel is fairly substantial but due to a gradient of 4.4% little connectivity is recorded. However with this channel type floodplain connectivity is likely within a natural range. **At Risk**

No Action Alternative: No action would occur, therefore there would be no impact on this indicator. **Maintain.**

Timber Harvest and Watershed Restoration (Alternative 2): No-cut buffers on all streams and thinning within RR would maintain the current and future sources of large wood to the stream and floodplain, which improves floodplain connectivity. **Maintain**.

Timber Harvest and Watershed Restoration (Alternative 3 Helicopter): Same as alternative 2. Sixteen additional acres are planned for harvest in the RR, but the anticipated effects are the same **Maintain**.

Wildlife Habitat Improvement: No changes to flood plain connectivity are anticipated as a result of the action if funded. **Maintain**.

Watershed Conditions

Road Density and Location: Road milage in this 6th field watershed based on GIS data and using a 40% addition to that GIS number to account for old unmapped roads and other new roads constructed. With this method road density of 5.8 miles/mile^2 within the Sain Creek 6th Field Watershed was calculated. **Not Properly Functioning**.

No Action Alternative: No action would occur, therefore there would be no impact on this indicator. **Maintain.**

Timber Harvest and Watershed Restoration (Alternative 2): There would be 3.9 miles of semi-permanent road construction, 2.2 miles of road reconstruction and 7.0 miles of road decommissioning. Road density will be slightly increased for the duration of the project due to new road construction, however decommissioning at the end of the action would result in a net decrease in road mileage of 3 miles within the Upper Tualatin analysis area. New roads are generally located on benches and ridgetops. This indicator will be **Degraded** in the short-term but **Restored** in the long-term.

Timber Harvest and Watershed Restoration (Alternative 3 Helicopter): The would be 474 feet of road reconstruction and no new permanent road construction under this alternative. With this alternative an additional 2.4 miles of road will be decommissioned. Short-term **Degrade**, long-term **Restore**.

Wildlife Habitat Improvement: No changes to road density or road location would occur as a result of this action. **Maintain.**

Disturbance History: Terrestrial vegetation has been extensively altered from reference conditions throughout the watershed. **Not Properly Functioning**.

No Action Alternative: No action would occur, therefore there would be no impact on this indicator. **Maintain.**

Timber Harvest and Watershed Restoration (Alternative 2): The timber harvest activities within this portion of the watershed include approximately 526 acres of timber harvest by commercial thinning. The timber harvest, would create some additional disturbance within the watershed. The commercial thinning would be expected to develop better understory vegetation and become more diverse through time. There would be a temporary increase in road mileage within the watershed, however there would be a net decrease of 3 miles of road after completion of timber harvest activities. **Degrade** in the short-term, **Maintain** in the long-term.

Timber Harvest and Watershed Restoration (Alternative 3 Helicopter): There would 16 additional acres of timber harvest. There would be no increase in road mileage and a net

decrease of 2.4 miles of road after completion of timber harvest activities. **Maintain** in the short-term, **Restore** in the long-term.

Wildlife Habitat Improvement: The activities associated with this action if funded mimic natural processes and as such will not alter the disturbance history. **Maintain**

Stream Influence Zone: Riparian zones have been impacted in the past due to roads and timber harvest. The upper watershed does contain some areas that are intact or have recovered to some extent, but probably less than 60% of the analysis area. **Not Properly Functioning**.

No Action Alternative: No action would occur, therefore there would be no impact on this indicator. **Maintain.**

Timber Harvest and Watershed Restoration (Alternative 2): No-cut buffers on all streams and thinning within the RR would result in negligible disturbance to stream influence zones. Cable yarding skyline corridors will each be 10-12 feet wide and spaced about 150 feet apart. They will cross RR and their construction may requiring felling of a several trees within the no-cut buffer. If this occurs, the openings would be small and are expected to have little impact on the stream influence zone. Trees felled within the no-cut buffer would be left on site in either the stream or in the riparian area. This may benefit this indicator. **Maintain**.

Timber Harvest and Watershed Restoration (Alternative 3 Helicopter): The no-cut buffers are generally the same as Alternative 2, however cable corridors will not be needed. Differences in amount of acres harvested would result in negligible differences in impacts. **Maintain**.

Wildlife Habitat Improvement: No changes to the stream influence zone are anticipated as a result of this action if it is implemented. **Maintain**.

Refugia: Survey data and professional judgement rate most of the habitat indicators within the analysis area as At Risk or Not Properly Functioning. Historically this channel type has never provided refugia habitat in great quantities, and therefore it is expected to be providing excellent refugia habitat now. **At Risk**.

No Action Alternative: No action would occur, therefore there would be no impact on this indicator. **Maintain.**

Timber Harvest and Watershed Restoration (Alternative 2): No-cut buffers on all streams and thinning within RR and uplands would buffer aquatic and riparian habitat and maintain the current and future sources of large wood to the stream and floodplain, which help **Maintain** refugia.

Timber Harvest and Watershed Restoration (Alternative 3 Helicopter): Same as Alternative 2. **Maintain**.

Wildlife Habitat Improvement: No change to refugia is anticipated. **Maintain**

APPENDIX 7

WILDLIFE RESOURCES
BIOLOGICAL EVALUATION
of the Proposed Scoggins Creek Projects

USDI - BLM, Salem District, Tillamook Resource Area

Prepared by: Steve Bahe, Wildlife Biologist
Date: July 2, 2001 *(revised December 18, 2001)*

Scoggins Creek Projects Locations: Township 1 South, Range 5 West,
Sections 1, 3, 5, 8, 9, and 15. W. M.

The two action alternatives within the proposed Scoggins Creek project include a combination of several types of projects. For the purpose of impact analysis, these proposed projects are being grouped and thus analyzed as either two or three projects. All acreages are approximate.

Alternative 1 - No Action

Alternative 2 - Two proposed projects

1.) Density management treatments on approximately 526 acres accomplished with a combination of cable and ground based yarding systems. The project includes all proposed road and landing construction, reconstruction and decommissioning.
2.) Wildlife habitat enhancement projects.

Alternative 3 - Three proposed projects

1.) Density management treatments on approximately 542 acres accomplished with a helicopter yarding system. The project includes only the proposed road and landing construction, reconstruction and/or decommissioning associated with the Density Management treatments.
2.) Wildlife habitat enhancement projects.
3.) Decommissioning of identified roads within the vicinity which are not used in the implementation of the Density Management proposal, and one 42" culvert removal project.

Units of measure: The units of measure used for impact analysis relative to wildlife resources include the following:

Species listed under the ESA - Narrative discussion describing the expected impacts as it relates to the potential for disturbance; impacts to suitable habitat; and in the case of the spotted owl, impacts to dispersal habitat.

Survey and Manage mollusks - Maintenance and enhancement of the species at the site.

Survey and Manage red tree voles - Protection of the physical integrity of the nest site to maintain its population and provide for expansion of the number of active nests at the site.

Bureau 6840 Special Status Species Policy Species - Not elevating their status to any higher level of concern including the need to list under the ESA.

AFFECTED ENVIRONMENT relative to wildlife and wildlife habitat

Watershed Scale: Because all of the proposed projects are located within the Upper Taulatin-Scoggins watershed, the following watershed scale discussions apply to all of the projects contained within this Biological Evaluation.

Approximately 87% of the land within the Upper Tualatin-Scoggins watershed is privately owned; approximately 37% is owned by private industrial timber companies while approximately 50% is owned by other private individuals or companies. Most of the publicly owned land within the watershed is managed by the Oregon Department of Forestry; these holdings are roughly 12% of the watershed. BLM lands (3,763 acres) comprise approximately 4.5% of the watershed and are contained within the North Coast Adaptive Management Area as defined within the Salem District RMP (*Salem District Record of Decision and Resource Management Plan* - May 1995). Approximately 535 acres of BLM land within the watershed are also within the LSR (Late Successional Reserve) land allocation. These 535 acres of LSR, which are contained within a 480-acre parcel and two smaller stands of mature timber totaling approximately 55 acres, are not proposed for treatment within the Scoggins Creek project.

The LSRA (*Late-Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area* - USDA and USDI, January 1998) identifies the federal lands within the general project area, including the stands proposed for treatment, as being Early-Seral Landscape Cells located in the Buffer Landscape Zone. Based on ownership patterns, stands within this landscape zone are unlikely to develop into large, contiguous blocks of late-successional habitat, but are considered important to ecosystem function by providing for connectivity, dispersal, and provisions of refugia for species dependent on late-successional habitat characteristics.

In general, past and present actions have resulted in little habitat within the watershed for those

species dependent upon later-seral stage habitat including snags and other coarse woody debris; large blocks of interior forested habitat; or cool, shaded, riparian habitats. Existing late-seral habitat within the watershed is present in scattered small patches which are generally less than about 30 or 40 acres in size; some of these late-seral patches contain large remnant old-growth trees. Conversely, there is a great deal of habitat for those species which depend upon or utilize earlier-seral stage habitats; smaller forested patches; and/or the high contrast edges resulting from the juxtaposition of differing habitat types. While many forested riparian corridors have been harvested or reduced to thin strips of red alder, the in-stream habitat conditions for aquatic species within the watershed are generally quite variable.

Although large portions of the forested lands within the watershed are behind private gates which are often locked, the portion of the watershed that includes the proposed Scoggins Creek project is relatively highly disturbed due to the levels of forest management activities occurring on state and private industrial lands. This general disturbance is probably most pronounced along arterial haul routes such as the Old Railroad Grade Road, Sain Creek Road and especially the Stimson Mainline Road. Road density as reported within the Watershed analysis varies by subwatersheds. According to the GIS analysis reported within the watershed analysis, road density within the watershed averages about 3.7 miles of road per square mile, with a range per subwatershed of approximately 2.1 mi/mi^2 to 5.2 mi/mi^2. Due to unmapped legacy roads and new road construction, actual road densities in forested landscapes generally average about 30 to 40% higher than the figures determined by GIS analysis.

For more detail of the condition of the Upper Tualatin-Scoggins watershed relative to wildlife and wildlife habitat, see the *Upper Tualatin-Scoggins Watershed Analysis* (2000).

Project Area Scale for the Density Management Treatment Units: The proposed density management treatment units are located at Township 1 South, Range 5 West, Sections 3, 5, 8, 9, and 15, Willamette Meridian. The proposed project would occur on lands allocated as AMA (Adaptive Management Area) and Riparian Reserve as identified in the NWFP (Northwest Forest Plan or *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl, and Standard and Guidelines for Management of Habitat for Late-successional and Old-growth Forest Related Species Within the Range of the Northern Spotted Owl* - April 1994) and Salem District RMP. There are no unmapped LSRs within the vicinity of the proposed action. The project area is not within designated spotted owl or marbled murrelet critical habitat nor a spotted owl RPA (Reserve Pair Area). There are no known special habitats (e.g., talus slopes, cliffs, caves, or mines or abandoned wooden bridges) within the vicinity of the proposed project.

The proposed Scoggins Creek density management treatment units are forested primarily with trees that are approximately 35- to 50-years-old. In general, the stands are strongly dominated by densely stocked Douglas-fir and are fairly homogenous in tree sizes and stand structure. Although Douglas-fir dominates most of the stands proposed for treatment, some stands contain various levels of hardwoods, primarily big-leaf maple and red alder that are present in variously sized patches and as single scattered trees. Madrone is an uncommon component in some units.

In addition, limited amounts of western redcedar, and scattered uncommon components of cherry, grand fir and western hemlock are also present in some units. A few of the stands contain or are in the vicinity of scattered or clumped larger trees.

With an average of 4,573 cubic feet of CWD (Course Woody Debris) per acre in the stands included in the density management treatment areas and in some of the surrounding stands, levels of CWD, including both snags and downed logs, are near the upper end of the high range (1,980 to 4,840 cubic feet per acre) for Oregon Coast Range stands 50 to 79 years old as identified in the LSRA. According to the forest survey data, approximately 96% of this CWD volume is down wood and 4% is coming from snags. Approximately 22% of the conifer down wood volume is in decay classes 1, 2, and 3 and 78% is in the decay classes 4 and 5. There is a weighted average of almost 18 snags per acre which average about10 inches DBH. Approximately 97% of these snags are less than 20 inches in diameter; stand exam data indicate that all snags greater than 20 inches DBH are in decay classes 4 and 5, however field exams identified the presence of a few larger decay class 1 and 2 snags generally associated with root rot pockets. These few larger hard snags are generally expected to be short lived based on the poor condition of their root system.

There are minor differences in the amounts of acres proposed for treatment under the two action alternatives. Alternative 2 proposes to treat a total of approximately 376 acres within the AMA land allocation and approximately 152 acres within the Riparian Reserves. Alternative 3 proposes to treat a total of approximately 365 acres within the AMA land allocation and approximately 177 acres within the Riparian Reserves. Table 1 displays the acreage by land allocation for the individual density management treatment units proposed for treatment under Alternative 2; Table 2 displays the same information for the units proposed for treatment under Alternative 3.

Table 1. Scoggins Creek Project - Alternative 2
Summary of the Proposed Density Management Treatment Units
by Yarding System, Land Allocation and approximate Acreages

Unit Number	Yarding System	Land Allocation	Acres
3-1	Cable	AMA	20
3-1	Cable	R.R.	14
Unit Total			34
3-2	Cable	AMA	47
3-2	Cable	R.R.	64
3-2	Ground	AMA	37
3-2	Ground	R.R.	6
Unit Total			154
3-3	Ground	AMA	11
3-3	Ground	R.R.	3
Unit Total			14
5-1	Cable	AMA	35
5-1	Cable	R.R.	27
5-1	Ground	AMA	63
5-1	Ground	R.R.	2
Unit Total			127
8-1	Ground	AMA	2
8-1	Ground	R.R.	1
Unit Total			3

Unit Number	Yarding System	Land Allocation	Acres
9-1	Cable	AMA	14
9-1	Cable	R.R.	10
9-1	Ground	AMA	27
9-1	Ground	R.R.	3
Unit Total			54
9-2	Cable	AMA	4
9-2	Cable	R.R.	3
Unit Total			7
9-3	Ground	AMA	54
9-3	Ground	R.R.	3
Unit Total			57
15-1	Cable	AMA	8
15-1	Cable	R.R.	9
15-1	Ground	AMA	7
15-1	Ground	R.R.	1
Unit Total			25
15-2	Cable	AMA	8
15-2	Cable	R.R.	1
15-2	Ground	AMA	37
15-2	Ground	R.R.	5
Unit Total			51

Table 2. Scoggins Creek Project
Alternative 3 - Helicopter Yarding,
Summary of the Proposed Density Management Treatment Units
by Land Allocation and Approximate Acreages

Unit Number	Land Allocation	Acres	Unit Number	Land Allocation	Acres
3-1	AMA	21	9-1	AMA	45
3-1	R.R.	18	9-1	R.R.	15
Unit Total		39	Unit Total		60
3-2	AMA	82	9-2	AMA	4
3-2	R.R.	84	9-2	R.R.	3
Unit Total		166	Unit Total		7
3-3	AMA	11	9-3	AMA	24
3-3	R.R.	3	9-3	R.R.	1
Unit Total		14	Unit Total		25
5-1	AMA	98	9-4	AMA	9
5-1	R.R.	30	Unit Total		9
Unit Total		128	15-1	AMA	17
8-1	AMA	8	15-1	R.R.	9
8-1	R.R.	10	Unit Total		26
Unit Total		18	15-2	AMA	45
			15-2	R.R.	5
			Unit Total		50

Table 3. lists those Bureau Special Status Species, S&M and federally listed wildlife species which are potentially located within and/or near the Scoggins Creek project areas.

Table 3.

Wildlife species of the Tillamook Resource Area
that have such status that their evaluation is warranted under NEPA.

Project: SCOGGINS CREEK PROJECT

Common Name	ESA	NWFP	BLM	Impact Synopsis
Mammals:				
Columbian White-tailed Deer	FE	-	FE	No - Not within expected range
Fisher	-	-	BS	No - Presence is very unlikely; negligible impact to habitat.
Fringed Myotis	-	ROD	BT	No - Negligible impact to habitat, see BE text
Long-eared Myotis	-	ROD	BT	No - Negligible impact to habitat, see BE text
Long-legged Myotis	-	ROD	BT	No - Negligible impact to habitat, see BE text
Red Tree Vole	-	S&M	-	Yes - Felling of Douglas-fir trees
Silver-haired Bat	-	ROD	BT	No - Negligible impact to habitat, see BE text
Townsend's Big-eared Bat	-	-	BS	No - Negligible impact to habitat, see BE text
Birds:				
Aleutian Canada Goose	FT	-	FT	No - No habitat
Bald Eagle	FT	-	FT	Yes - Habitat modification and potential for disturbance
Brown Pelican	FE	-	FE	No - No habitat
Harlequin Duck	-	-	BA	No - Not within current range
Lewis' Woodpecker	-	-	BS	No - Not within current range
Marbled Murrelet	FT	-	FT	Yes - Habitat modification and potential for disturbance
Northern Spotted Owl	FT	-	FT	Yes - Habitat modification and potential for disturbance
Northern Goshawk	-	-	BS	No- Negligible impact to habitat, see BE text
Peregrine Falcon	-	-	BS	No - No impact to habitat, see BE text
Purple Martin	-	-	BS	No - Presence very unlikely
Yellow-breasted Chat (WV)	-	-	BS	No - Not in range
Amphibians and Reptiles:				
Columbia Torrent Salamander	-	-	BS	Yes - Possible impact to habitat.
Cope's Giant Salamander	-	-	BA	No - Not in range.
Oregon Spotted Frog	FC	-	FC	No - Not in current range
Painted Turtle	-	-	BS	No - Not in range
Western Pond Turtle	-	-	BS	No - Not in range

Table 3. (cont.)

Wildlife species of the Tillamook Resource Area
that have such status that their evaluation is warranted under NEPA.

Project: SCOGGINS CREEK PROJECTS

Common Name	ESA	NWFP	BLM	Impact Synopsis
Invertebrates: (arthropods and worms)				
American Acetropis Grass Bug	-	-	BS	No - No habitat
Insular Blue Butterfly	-	-	BS	No - No habitat
Oregon Giant Earthworm	-	-	BS	No - Not in range
Oregon Silverspot Butterfly	FT	-	FT	No - No habitat
Valley Silverspot Butterfly	-	-	BA	No - No habitat
Willamette Callippe Fritillary	-	-	BS	No - No habitat
Invertebrates: (mollusks)				
Blue-grey Tail-dropper	-	0	-	Yes - Potential habitat
Evening Fieldslug	-	S&M	-	Yes - Potential habitat
Malone Jumping-slug	-	S&M	-	Yes - Potential habitat
Oregon Megomphix	-	S&M	-	Yes - Potential habitat
Papillose Tail-dropper	-	0	-	Yes - Potential habitat, species identified during surveys
Puget Oregonian	-	S&M	-	Ye s- Potential habitat
Warty Jumping-slug	-	S&M	-	Yes - Potential habitat

ESA - Endangered Species Act: **FE** - Federal Endangered; **FT** - Federal Threatened; **FC** - Federal Candidate

NWFP - Northwest Forest Plan: **S&M** - Survey and Manage; **ROD** - Bat species whose roost sites are protected in the ROD; **0** - Former Survey & Manage species which were included in surveys but have since been removed from the S&M list.

BLM - BLM Manual 6840 Special Status Specie Policy list: **BS** - Bureau Sensitive; **BA** - Bureau Assessment; **BT** - Bureau Tracking

Impact Synopsis: **NO**- No appreciable impacts to the species or it's habitat. Unless otherwise noted, no further analysis will be conducted in the EA. **YES** - Impacts to a species or it's habitat may occur and further analysis will be conducted in the BE (Biological Evaluation).

<u>Wildlife Species listed or proposed under the Endangered Species Act:</u>

Based on the fact that no suitable habitat nor critical habitat for the Oregon silverspot butterfly, Fender's blue butterfly, western snowy plover, brown pelican or Columbia white-tailed deer is present within the project areas, and there are no expected effects upon these species which are either proposed or listed under the Endangered Species Act, they will receive no further discussion or analysis.

Northern Spotted Owl - Federally Threatened (FT)
The proposed action would not occur within or near designated spotted owl critical habitat.

There are no known occupied or historic spotted owl sites or 100-acre core areas as identified within the NWFP in the vicinity of the project area nor within the entire Upper Tualatin-Scoggins watershed. The nearest known occupied owl site is approximately 9 miles to the north of the proposed action area. It is not known if the spotted owl is currently using any of the project areas because of the lack of current survey data, however aside from perhaps an occasional dispersing individual, it would not be expected based on the general lack of suitable habitat within the area.

> *Note: The Forest Grove District of the Oregon Department of Forestry, is currently planning a timber sale (Sein Combo) within T1N., R5W., section 16; portions of this sale are directly adjacent to the BLM proposed Scoggins Creek units 9-3 and 15-1. As per Laurie Brown, ODF biologist, ODF is currently planning to survey all suitable spotted owl habitat on ODF and BLM land within 1.5 miles of the Sein Combo units during the 2001 and 2002 survey seasons (project record document #54). This would include a large portion of the suitable habitat in the vicinity of the Scoggins Creek project.*

Much of the forestland in that portion of the state which includes the project area is privately owned and managed for timber production in such a way as to preclude the development and/or maintenance of suitable spotted owl habitat. Based upon the Watershed Analysis, of the forest lands within the Upper Tualatin-Scoggins 5th Field watershed, including all ownerships, roughly 10% is considered suitable habitat for the spotted owl (based on stands which are 80-years-old or older) while a total of approximately 74% (including the 10% suitable) is of an age and condition to function as owl dispersal habitat (1993 data). Recent state and private logging activity within the area, as well as that likely to occur within approximately the next 5 years, is expected to reduce the amount of dispersal habitat within the general area, however it is unlikely to reduce it to below a level of approximately 50%. This expectation is based largely upon ownership pattern, the current distribution of the clearcut harvest units and guidelines within the Oregon Forest Practices Rules limiting the size of clearcut harvest units.

The federal lands in the watershed are distributed in a scattered, checkerboard fashion and do not lend themselves to the management of larger blocks of suitable habitat for a wide-ranging species such as the spotted owl. Approximately 17% of the BLM land within the watershed or approximately 640 acres is considered to be suitable owl habitat. This is based upon a GIS sort of the timber database primarily identifying forest stands which contain at least a 1 bar stocking

conifer component which is greater than or equal to 80-years-old. None of these acres of suitable spotted owl habitat are proposed for density management treatments. Approximately 97% of the BLM land within the watershed (3,668 acres) is in a condition to function as dispersal habitat.

All of the proposed density management treatment areas within the Scoggins Creek project, totaling up to approximately 526 acres in Alternative 2 and 542 acres in Alternative 3, are considered to be spotted owl dispersal habitat. Primarily as a function of the stands' ages and lack of vital habitat characteristic including large trees and structural diversity, they are not currently considered to be suitable foraging, roosting, and/or nesting habitat.

The majority of the proposed density management treatment units as well as portions of the haul routes are within 0.25 miles of suitable spotted owl habitat which is currently unsurveyed.

Marbled Murrelet - (FT)
The Scoggins Creek project areas are not located within or near marbled murrelet designated critical habitat.

Ranging from approximately 31 to 34 miles from the ocean, the project areas are located within Marbled Murrelet Zone 1 (NWFP C-10). In Oregon, Zone 1 is located in a band up to 35 miles inland and Zone 2 is located further than 35 miles from the sea; Zone 1 holds a higher likelihood for murrelet occupancy than Zone 2. With the nearest known occupied murrelet sites being approximately 20 miles from the proposed project areas, there are no known occupied murrelet sites within the vicinity of the Scoggins Creek project areas.

Three areas within the vicinity of the proposed density management treatment units have been identified which contain trees that are potential nesting habitat for murrelets based upon the presence of suitable nesting platforms. The areas containing the potential nest trees are either within the stands proposed for density management treatment or in proximity to and contiguous with the proposed units. The potentially suitable nest trees in these threes areas are either individual trees, small groups of trees, or in one instance, a stand approximately 50 acres in size. Two of these areas are located within section 3 (along the western edge in unit 3-2 and in the north-central portion of the section). The third area of potential habitat is located in the southeast portion of section 15. All three of these areas of potential murrelet habitat were surveyed for murrelets during the 2000 and 2001 survey seasons as per the Pacific Seabird Group Marbled Murrelet Technical Committee protocol; there were no detections. There is no additional potential marbled murrelet habitat identified within or near (within 0.25 miles) any of the other proposed density management treatment units.

The older block of forest in the northern portion of the eastern BLM parcel located within section 15 (E1/2 of the NE1/4) has also been determined to contain potentially suitable murrelet nest trees. Likewise, there are a few scattered old-growth trees located along the stream on private land within the west-central portion of section 15 which are likely suitable as murrelet nest trees. Neither of these areas have been surveyed based upon the fact that they are greater that 0.25 miles from a proposed treatment unit or haul route.

One additional group of approximately six larger trees that are scattered within a stand of Douglas-fir approximately 50 to 60 years of age, has been identified directly adjacent to a portion of the haul route. Some of these trees, which are located on private land, may contain potential murrelet nesting platforms although it was not verified based upon the fact that they are not located on public land. This group of larger trees is located along the lower 1.5 miles of the private Stimson Mainline Road which is a two-lane, graveled major haul route that accesses a large block of industrial forestland. This road receives a considerable amount of log truck traffic. These trees will not be surveyed.

Bald Eagle - (FT)
No recent eagle sightings have been recorded within or near the proposed treatment areas, however dispersed eagle usage, primarily roosting or resting, may occur throughout the project area where suitable habitat is present. This occasional, dispersed eagle usage would most probably occur during the winter months. The nearest known bald eagle nest is near Henry Hagg Lake, approximately 2 miles east of the closest proposed density management treatment unit.

For the purposes of this assessment, suitable habitat for bald eagles is generally defined as conifer habitat of at least 80 years of age, or younger stands containing scattered groups or individual residual old-growth or larger second-growth trees, which is located within approximately 1.0 mile of a major river or approximately 0.5 mile of a major tributary. Applying the definition above and considering factors such as impediments to anadromous fish passage including Henry Hagg Lake, known fish distribution as identified in the Upper Taulatin-Scoggins Watershed Analysis, as well as professional judgement, one of the proposed treatment units (15-2), has been determined to be adjacent to a patch of suitable habitat for bald eagles. This habitat is probably best suited for roosting and resting rather than nesting based upon the general lack of suitable nest trees and the fact that the coho salmon and steelhead trout runs within the Upper Tualatin River are quite depressed. No eagle nests nor eagle usage has been observed in this patch of suitable eagle habitat.

There is no additional identified eagle habitat within or near any of the other proposed action areas, although it is possible that a limited number of unidentified scattered individual trees or small groups of trees which are suitable for roosting or resting may be located near some of the treatment units or along portions of the various haul routes.

Survey and Manage Wildlife Species (S&M) :

Red Tree Vole
The NWFP and RMP identify one vertebrate Survey and Manage species that may occur in the area of the Scoggins Creek Project. This species is the red tree vole, a category 1A species (survey prior to activities and manage known sites). Although the red tree vole is more often associated with larger and older Douglas-fir trees than those commonly found within the proposed treatment units, some of the project areas currently contain potential habitat for the red tree vole.

All of the proposed treatment units which require pre-project surveys have been surveyed to protocol for red tree voles; these surveys resulted in no red tree voles or red tree vole nests being located. *Survey Protocol for the Red Tree Vole* (Version 2.0) was followed for all surveys.

Mollusks
There are several Survey and Manage invertebrate species (mollusks) as identified within the NWFP and RMP with the potential of being located within the proposed treatment units and/or in the general project area (see table 3). In general, these species are associated with the organic duff layer on the forest floor as well as with habitat types containing CWD, sword ferns and a hardwood component, especially big-leafed maple.

Survey and Manage mollusk surveys for the Scoggins Creek Project were conducted in and near all proposed timber sale units in the spring and fall of 2000. "*Survey Protocol for Terrestrial Mollusk Species from the Northwest Forest Plan*" (Draft Version 2.0, Oct. 29, 1997) was followed for all surveys. After the Survey and Manage mollusk surveys were complete, the *Final Supplemental Environmental Impact Statement for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (USDA and USDI, November 2000) determined that new information indicated that 72 species, in all of part of their range, were secure or otherwise did not meet the basic criteria for Survey and Manage. The *Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (USDA and USDI, January 2001) removed these species from the S&M list in all or part of their range. Two of these species, the blue-grey tail-dropper and the papillose tail-dropper had been surveyed for in or near the Scoggins Creek project area with approximately 7 papillose tail-dropper "known sites" being located in or near the proposed treatment units (see project record document #43). As per the *Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (USDA and USDI, January 2001) guidelines to manage these sites are not required. The papillose tail-dropper was the only target species located during these surveys.

<u>Other Special Status Species:</u>

Amphibians and Reptiles:

Columbia Torrent Salamander - (BS) Bureau Sensitive
The Columbia torrent salamander is strongly associated with the splash zone directly adjacent to permanently flowing streams and seeps. Suitable habitat for this species is located entirely within the no-cut buffers of the riparian reserves which are situated within and/or adjacent to the proposed treatment units.

Birds:

Peregrine Falcon - (BS)
The peregrine falcon was officially delisted from the ESA species list, effective 8/25/99; it is now

treated as “Bureau Sensitive” under the Bureau’s Special Status Species Policy. There have been no peregrine falcon sightings recorded in the area of the proposed action. The habitat within and around the proposed action is not suitable for falcon nesting. It will receive no further analysis in conjunction with the Scoggins Creek project.

Northern Goshawk - (BS)
Goshawks are generally associated with older conifer stand types with closed canopies, but have also been seen in younger seral and mixed stands. Goshawks are extremely rare in the Coast Range, and though thought to be possible, they have not been documented as breeding in the Northern Oregon Coast Range. Although goshawks have not been observed in the vicinity of the project area, migrating or dispersing birds could periodically be using the area.

Mammals:

NWFP Bats
In addition to the red tree vole which is a Survey & Manage Species, the NWFP identifies five species of bats which would benefit from additional habitat protection. Four of these five species have potential of being located within or near the proposed action areas. These species include the fringed myotis, long-eared myotis, long-legged myotis, and the silver-haired bat. All of these bat species are known to inhabit immature coniferous forest and may forage near riparian areas, open areas, and along forest edges while utilizing large hollow trees for roosting, hibernating, and maternity colonies.

There are no known bat roosting or hibernaculum sites within the project area. Surveys for these species are required under the NWFP if caves, mines, or abandoned wooded bridges and buildings are within or near the project area. There are no known caves, mines, or abandoned wooded bridges within or near the project area therefore no bat surveys will be conducted within or near the Scoggins Creek project area.

Townsend’s Big-Eared Bat - (BS)
In addition to the bat species identified within the NWFP, one species of bat, Townsend’s big-eared bat, is covered by the Bureau’s Special Status Species Policy. Townsend’s big-eared bats are seldom abundant but are known to occupy a variety of habitats. In western Oregon, these bats are associated with coniferous forests, but they are also considered characteristic dwellers of caves, abandoned mines, and buildings. No caves, abandoned mines or buildings are known to be located within the vicinity of the proposed action. Some of the more open forested and riparian habitats within and near the proposed treatment units could function as foraging habitat and it is possible although rather unlikely that this species of bat could be encountered within or near the proposed project area.

<u>Other Species of Concern</u>

Roosevelt Elk and Black-tailed deer
Roosevelt elk and black-tailed deer use a wide range of habitat types and use of the proposed sale

area by these species is considered moderate. The quality of the habitat for these species in the sale area is considered to be good. This is based on the fact that areas affording hiding cover are adjacent to, and interspersed with, areas seeded for forage and/or containing adequate browse. The relatively high density of roads within some portions of the project area may limit the habitat quality of the area, especially for Roosevelt elk, however the fact that much of the area is behind gates which are often closed would serve to minimize the potential negative impacts associated with high road density.

ENVIRONMENTAL CONSEQUENCES resulting from the alternatives of the Scoggins Creek Density Management Projects

ALTERNATIVE 1 - (The "No Action" Alternative)

Under this alternative no forest management activities would occur within the proposed project areas at this time and the forest stands would continue to grow and develop without management intervention. Under the "No Action" Alternative, the identified impacts of the action alternatives would not occur at this site at this time. Another project area would be selected to replace the proposed project and the associated PSQ volume resulting from the density management treatment of the stands within the AMA land allocation, potentially resulting in impacts of a similar nature at a different location.

Under the "No Action" alternative, the density management treatment of approximately 152 to 177 acres of densely stocked forest within the Riparian Reserve allocation as proposed under the action alternatives would not occur. No existing roads would be decommissioned. The expected benefits from density management treatment and road decommissioning to attaining the ACS objectives and the development of some features of late-seral stage habitat would be expected to occur in a slower time frame than with density management as the untreated stands continue to develop naturally.

Selection of the "No Action" Alternative would be of *NO EFFECT* upon the marbled murrelet, spotted owl, bald eagle and all other species listed under the ESA. In addition, it would not be expected to adversely impact (result in a loss in population viability or elevate their status to any higher level of concern) any of the wildlife S&M, Special Status, or other Species of Concern discussed above.

ALTERNATIVE 2

Alternative 2 includes density management through a combination of cable and ground-based logging systems and all proposed road and landing construction, reconstruction and decommissioning. A detailed description of the activities proposed under alternative 2 and the incorporated design features are included in sections 2.3.1.2 and 2.3.1.3 of the EA.

Alternative 2 proposes density management of approximately 526 acres, approximately 374 acres within the AMA land allocation and approximately 152 acres within the Riparian Reserves. In general, the density project has been designed to promote the long-term development of late-seral stage habitat while minimizing or mitigating expected short-term adverse impacts. The project is primarily intended to increase the average tree diameter, increase the growing space dedicated to crown and limb development, and enhance the existing tree species diversity. Density management thinning would greatly increase the rate at which these younger stands developed larger, more windfirm, overstory trees. Understory development is expected to be increased. Within the overstory, density management would tend to increase the tree canopy size and the size of individual limbs. Larger individual trees would eventually develop into larger size snags and down wood, both of which appear to be lacking in the more recent decay classes. Several small root rot pockets would be planted using tree species resistant to the laminated root disease.

While project design features to minimize the potential for adverse impacts to existing CWD have been included, it is expected that the majority of small snags within the treatment units will be knocked over during yarding or felled for reasons of safety; the substrate of some of the larger, decay class 3, 4 and 5 logs will be damaged during yarding. To offset these expected adverse impacts, project-wide and unit specific mitigation measures addressing CWD objectives have been designed considering a number of factors including the following: stand data, including existing CWD levels and mean tree diameter; existing levels of *P. weirri* root rot; proposed yarding system; and the proximity of the density management unit to wildlife habitat enhancement units. Incorporated mitigation measures include retaining a portion of the larger green reserve trees felled in cable yarding corridors; snag and CWD creation in low density patches in unit 9-1; snag creation in unit 3-2; retaining large trees with deformities at least in proportion to their occurrence in the stand in all units; retaining all trees greater than 20 inches DBH in all units; maintaining live tree stocking levels which allow for growing larger trees as a source of future CWD, more rapidly; and retaining no-cut buffers on streams and other unthinned patches in units 5-1 and 9-1 to allow for suppression mortality as well as meet other management objectives.

<u>Species listed or proposed under the Endangered Species Act</u>:

In accordance with regulations pursuant to Section 7 of the Endangered Species Act of 1973, as amended, formal consultation with the USFWS concerning the potential impacts of implementing Alternative 2 of the Scoggins Creek project upon the spotted owl, marbled murrelet and bald eagle would be completed. This would most likely be accomplished by including the Scoggins Creek project within the annual programmatic habitat modification biological assessment prepared by the interagency Level 1 Team (terrestrial subgroup) for the North Coast Province, rather than with the preparation of a project site-specific Biological Assessment.

Northern Spotted Owl - (FT)
The project area is not located in or near spotted owl designated critical habitat therefore, the proposed project would be of *"NO EFFECT"* upon spotted owl designated critical habitat.

The majority of the proposed density management treatment units including the roads to be constructed, reconstructed and/or decommissioned, as well as portions of the haul routes are within 0.25 miles of suitable spotted owl habitat which is currently unsurveyed. Although there are no known occupied sites within the vicinity of the proposed project, alternative 2 would be expect to result in the generation of noise above the ambient level with 0.25 miles of this suitable owl habitat during the critical and non-critical breeding periods.

Of the forest lands within the Dairy Creek 5th Field watershed which include all ownerships, roughly 10% is considered suitable habitat for the spotted owl (based only on a stand age of 80-years-old or older) while a total of approximately 74% (including the 10% suitable) is of an age and condition to function as dispersal habitat. Approximately 17% of the BLM land within the watershed, or approximately 640 acres, is considered to be suitable owl habitat. This is based upon a GIS sort of the timber database primarily identifying forest stands which contain at least a 1-bar stocking conifer component that is greater than or equal to 80-years-old[1]. Approximately 97% of the BLM land within the watershed (3,668 acres) is in a condition to function as dispersal habitat.

Approximately 526 acres of spotted owl dispersal habitat are proposed for density management under Alternative 2. While there are some potential short-term adverse impacts to the dispersal habitat proposed for thinning, these acres are expected to continue to function as dispersal habitat post-harvest. This is based upon the fact that the average post-harvest canopy closure is expected to be greater than 40%; it is expected to be approximately 50%. While small openings, patch-cuts, roads, clearings and landings may result in isolated portions of the thinning treatment areas having a post-treatment canopy closure of less than 40%, the portions of the project area being proposed for thinning as a whole are not expected to be removed from a condition to function as spotted owl dispersal habitat.

Aside from the attention to canopy closure, the project incorporates other design features to minimize or mitigate the potential for adverse impacts and to promote the development of late-seral stage habitat within the treated stands. Some of these design features include the retention and creation of CWD (both snags and down logs); retention of hardwoods, large trees and trees determined to have features desirable to wildlife; clumps and gaps in the distribution of the retained overstory trees; and as appropriate, reforestation of landings, cable corridors, created gaps and/or areas infected by *Phellinus weirri*.

The proposed thinning is expected to result in increased or maintained growth rates of the understory conifer and shrub species as well as the trees retained within the overstory. This would result in the development of some features of spotted owl suitable habitat earlier than would occur without treatment. These features include large trees within the overstory which would be potential sources of future snags and down logs, and generally a more diverse and/or complex vertical and horizontal stand structure.

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[1] A 1-Bar stocking component contributes approximately 10% to 39% canopy closure to the stand average.

With approximately 74% of the forest lands (all ownership) and approximately 97% of the BLM land within the watershed being in a condition to function as dispersal habitat, it has been determined that adequate dispersal habitat would be present post-harvest to facilitate owl dispersal.

Alternative 2 *MAY AFFECT* and is *LIKELY TO ADVERSELY AFFECT* the spotted owl based upon the fact that it would result in an increased potential for disturbance of unsurveyed suitable habitat during the critical and non-critical breeding periods, and approximately 526 acres of dispersal habitat would be impacted although it is not expected to be removed from a condition to facilitate owl dispersal.

Marbled Murrelet - (FT)
The project area is not located in or near murrelet designated critical habitat therefore it would have *NO EFFECT* upon marbled murrelet designated critical habitat.

Three proposed treatment units (3-1, 3-2 and 15-2) contain, or are in proximity to and contiguous with stands which contain, individual trees and/or small groups of trees which are potentially suitable as murrelet nest trees based upon the presence of suitable nesting platforms. All of these potentially suitable murrelet nest trees were surveyed to protocol during the 2000 and 2001 survey seasons. There were no detections. There is no additional potential marbled murrelet habitat identified within or near (within 0.25 miles) any of the other proposed treatment areas.

One additional clump of approximately six larger trees that are scattered within a stand of Douglas-fir approximately 50 to 60 years old has been identified directly adjacent to a portion of the haul route. Some of these trees which are located on private land, may contain potential murrelet nesting platforms; they will not be surveyed. They are located along the lower 1.5 miles of the private Stimson Mainline Road which is a two-lane, graveled major haul route which accesses a large block of industrial forestland. This road receives a considerable amount of traffic in order to support logging operations. Implementation of that portion of the Scoggins Creek project which is accessed by the Stimson Mainline Road is expected to result in approximately 1,000 loads of logs being removed; at least half of these loads, those yarded with a grounded based yarding system, would be expected to be hauled during portions of the critical and non-critical murrelet breeding periods. Given there is an appreciable amount of disturbance within the general area of the Scoggins Creek project as a result of the logging activities on ODF and private industrial forest lands, especially along arterial haul routes such as the lower end of the Stimson Mainline Road, hauling activities associated with the Scoggins Creek Project are not expected to raise the ambient noise level along that portion of the haul route that is adjacent to the small stand of trees discussed above.

The project does not include daily time restrictions (two hours after sunrise to two hours before sunset) based upon the fact than all suitable murrelet habitat within 0.25 miles of the treatment units would be surveyed, and hauling is not expected to raise the ambient noise level along that portion of the Stimson Mainline haul route which is adjacent to a small clump of trees that may contain potentially suitable nesting platforms.

No potentially suitable murrelet nest trees will be felled as a part of the Scoggins Creek project and where possible no openings would be created within one tree length surrounding a potential murrelet nest tree. However, thinning in the vicinity of these potentially suitable nest trees will change the current and future character of the treated stands. This may have some impact (beneficial or adverse) upon the likelihood that at some point in the future these trees are used successfully by murrelets for nesting. As discussed above relative to the promotion of suitable spotted owl habitat, the Scoggins Creek project is expected to result in the development of some features of marbled murrelet suitable habitat earlier than would occur without treatment. These features include large trees within the overstory with platforms suitable for murrelet nesting and generally a more diverse stand structure within the areas treated.

Alternative 2 *MAY AFFECT* and is *LIKELY TO ADVERSELY AFFECT* the marbled murrelet based primarily upon the fact that thinning would occur within three treatment units which are the vicinity of surveyed potentially suitable marbled murrelet nest trees.

Bald Eagle - (FT)
No recent eagle sightings have been recorded within or near the proposed treatment areas. The nearest known bald eagle nest is approximately 2 miles from the proposed action.

One of the proposed treatment units (15-2), has been determined to be adjacent to a patch of suitable habitat for bald eagles. This habitat is probably best suited for roosting and resting rather than nesting based upon the general lack of suitable nest trees and the fact that the coho salmon and steelhead trout runs within the area are quite depressed. No eagles or eagle nests have been observed in this patch of suitable eagle habitat.

There is no additional identified eagle habitat within or near any of the other proposed action areas, although it is possible that a limited number of unidentified scattered individual trees or small groups of trees which are suitable for roosting or resting may be located near some of the treatment units or along portions of the various haul routes.

The potential dates of operation for the proposed project are such that activities may occur which would generate noise above the ambient level during the eagle breeding season (January 1 to August 31). One unit (15-2) may be within 0.25 miles of suitable eagle habitat. This suitable habitat is currently not known to be used by eagles however, occasional dispersed eagle usage (roosting, resting) may occur throughout the area where suitable habitat is present.

It has been determined that Alternative 2 *MAY AFFECT, and NOT LIKELY TO ADVERSELY AFFECT* the bald eagle. This is primarily based upon an increased potential for disturbance during the breeding season as a result of logging unit 15-2, as well as potentially along portions of the various haul routes.

<u>Survey and Manage Wildlife Species (S&M)</u>

Red Tree Vole

Although the red tree vole is generally associated with much larger and older Douglas-fir trees than those found in the vicinity of the proposed action, the project area currently contains potential habitat for the red tree vole.

All of the proposed treatment units which require pre-project surveys have been surveyed to protocol for red tree voles; these surveys resulted in no red tree voles or red tree vole nests being located. *Survey Protocol for the Red Tree Vole* (Version 2.0) was followed for all surveys.

There would be some long-term benefits to the development of higher quality red tree vole habitat resulting from the effects of thinning within the 11 proposed treatment units which total approximately 526 acres. This is based upon the fact that the treatment is expected to maintain a post-harvest average canopy closure of approximately 50% and trees generally favored for retention would be the largest within the stand. The reserve trees are expected to respond to the thinning with an accelerated growth rate and increased crown development within a few years after the harvest. This would result in a higher quality of vole habitat within these units sooner than would be expected to develop without treatment. There are no expected short-term positive or negative impacts to the red tree vole resulting from the proposed thinning. This is based upon the fact that all action areas containing suitable habitat have been surveyed to protocol and found to be unoccupied by red tree voles.

S&M Mollusks

Survey and Manage mollusk surveys for the Scoggins Creek Project were conducted in and near all proposed density management units in the spring and fall of 2000. "*Survey Protocol for Terrestrial Mollusk Species from the Northwest Forest Plan*" (Draft Version 2.0, Oct. 29, 1997) was followed for all surveys.

As per the discussion within the Affected Environment section above, pre-project Survey and Manage mollusk surveys resulted in no S&M mollusk being located.

Even though there are no S&M mollusk known sites within the density management project area, there are several project design features which help reduce the potential for short and longer term adverse impacts to S&M mollusks and/or their habitats throughout the general project areas. These additional design features include but are not limited to reserving all hardwoods; where appropriate, incorporating red alder and/or bigleaf maple into reforestation plantings including landings, cable corridors, created gaps and/or areas infected by *Phellinus weirri*; protecting and reserving existing CWD; minimizing disturbance to the existing organic duff layer by designating skid trails and minimizing the use of fire; and maintaining a post-harvest canopy closure which averages approximately 50%.

Even though measures are incorporated into the proposed action to minimize soil disturbance, it would not be totally eliminated. Within thinning units this usually results in red alder naturally seeding into areas with disturbed soil if a seed source is available; the proposed action is expected to result in an increased amount of alder growing within portions of the treatment units which would be expected to result in some benefit to the quality of future mollusk habitat within the

treated stands.

Other Special Status Species of Wildlife:

Alternative 2 would not result in the loss of population viability for any Special Status Species that may occur in the project area, or result in the need to elevate their status to any higher level of concern including the need to list under the ESA.

Amphibians and Reptiles:

Columbia Torrent Salamander - (BS)
The Columbia torrent salamander is directly associated with the splash zone of permanently flowing streams and seeps. Suitable habitat is located within the riparian reserves located within and adjacent to the proposed units.

In general, the "no cut" riparian buffers would provide adequate protection to any Columbia torrent salamander habitat in the area. The yarding corridors needing to be created through the riparian areas would not be expected to appreciably reduce the quality of the habitat within these areas especially given the fact that full suspension would be required across the creeks, all trees needing to be cut within these buffers would be retained on site as CWD, and it would be expected that nearly full shade within the riparian area would rapidly recover as the retained and/or planted trees and brush species take advantage of the created openings.

Birds:

Northern Goshawk - (BS)
The proposed action is expected to have no, or a negligible short-term impact upon goshawks and goshawk habitat based upon the low likelihood of goshawks currently utilizing the area, the maintenance of the "no-cut buffers" within the riparian reserves, the light nature of the proposed thinning prescriptions, and the dispersed nature of the treatment units which are often intermingled with other areas not proposed for treatment.

The density management treatments would be expected to result in long-term benefits to goshawk habitat by maintaining or increasing the growth rates of reserve trees thus aiding the development of some late-seral stage habitat features.

Mammals:

Bats
There are no known bat roosting or hibernaculum sites within the project area.

Bats are known to forage near riparian areas, open areas, and along forest edges. The Scoggins Creek project would be expected to immediately improve the quality of bat foraging habitat within

the density management units by opening up the canopy and creating small fragmented openings in an otherwise closed canopy. The project's design features for CWD, snag and green tree protection and retention, including those trees with features desirable to species such as bats, should provide adequate structure for roosting or resting bats and greatly reduce any short- and/or long-term adverse impacts to bats which may result from the proposed project. Within the units proposed for thinning, there is potential for long-term benefits to these bats as a result of the proposed action based upon the fact that it would favor the development of some older forest characteristics favored by these species.

Other Species of Concern

Roosevelt Elk and Black-Tailed Deer

It is expected that implementation of the Scoggins Creek project would temporarily displace individual deer and elk as they react to an increased human presence within the vicinity of the treatment units. This would not impact the health of the population based upon the expected limited length of time of the disturbance and the fact that adequate additional suitable habitat is present within the vicinity of the proposed action.

The project would result in areas with an increased quality of browse and/or forage interspersed with areas of cover and overall, it would be expected to result in an improvement in the habitat quality available for elk and deer. This is generally based upon the basic configuration of the units, light nature of the proposed treatments and the proposal to obliterate many of the roads accessing the units at the completion of the harvest thereby resulting in a decrease of approximately 2 miles of road within the area. Within the density management treatment units, the vigor of the herb and shrub understory layers would be greatly increased thereby improving the quality of available browse and/or forage.

Although the proposed treatments could have a slight, adverse short-term impact upon escape and/or thermal cover for big game in portions of the thinned units, other suitable thermal and/or escape cover exists within the general area including within the no-cut buffers within riparian reserves and in the other intermingled areas not proposed for treatment. Areas which are thinned would continue to function, in some regard as cover for big game; forested stands should still serve to help moderate temperature and wind extremes as well as serve as a visual buffer. The project would not be expected to result in a short-term reduction of available cover to the point where it would be become a limiting factor, adversely impacting the population health of big game species. Additionally, thermal cover is probably less important or limiting within the Coast Range of northern Oregon than in other portions of these species' range, due to both the mild winters and summers within the region.

ALTERNATIVE 3

Alternative 3 includes density management treatments accomplished with a helicopter yarding system. The project includes only the proposed road and landing construction, reconstruction and/or decommissioning associated with the Density Management treatments. A detailed

description of the activities proposed under alternative 3 and the incorporated design features are included in sections 2.3.1 of the EA.

No helicopter yarding would occur between March 1 and July 7 to minimize the potential for disturbance to unsurveyed suitable spotted owl habitat, however road and landing construction and decommissioning may occur during all periods of low soil moisture. Between July 8 and August 5, yarding flight paths would be designed to avoid areas containing unsurveyed potential murrelet habitat by at least 0.25 miles; based upon the current placement of the proposed landings, this would most likely impact only the yarding operations within section 15. All helicopter yarding which occurs between August 6 and September 15 and takes place within 0.25 miles of unsurveyed potential murrelet habitat would not begin until two hours after sunrise and would end two hours before sunset; use of the designated flight paths between August 6 and September 15 would avoid the necessity for daily time restrictions.

Under alternative 3, the positive and negative impacts associated with timber harvest upon wildlife and wildlife habitat would generally be the same as those discussed under Alternative 2. (Alternative 3 proposes density management of approximately 542 acres - 365 acres within the AMA land allocation and 177 acres within Riparian Reserves, while Alternative 2 proposes density management of approximately 526 acres - 374 acres within AMA and 152 acres within Riparian Reserves.) Notable exceptions in the general differences between the two action alternatives as it relates to wildlife habitat include the expected impact upon existing CWD; helicopter yarding would be expected to result in considerably less damage to the existing CWD than would occur under traditional ground based or cable yarding operations.

Species listed or proposed under the Endangered Species Act:

In accordance with regulations pursuant to Section 7 of the Endangered Species Act of 1973, as amended, formal consultation with the USFWS concerning the potential impacts of implementing Alternative 3 of the Scoggins Creek project upon the spotted owl, marbled murrelet and bald eagle would be completed. This would most likely be accomplished by including the Scoggins Creek project within the annual programmatic habitat modification biological assessment prepared by the interagency Level 1 Team (terrestrial subgroup) for the North Coast Province, rather than with the preparation of a project site-specific Biological Assessment.

Northern Spotted Owl - Federally Threatened (FT)
Alternative 3 would effectively result in an equal amount of spotted owl dispersal habitat being treated with a density management thinning operation as under Alternative 2. Consequently, under this alternative, the positive and negative impacts associated with habitat modification upon the northern spotted owl would be similar as the impacts discussed for Alternative 2.

Unsurveyed suitable owl habitat is located within 0.25 miles of the proposed treatment units. Alternative 3 would result in all road and landing construction and decommissioning occurring in seasons of low soil moisture; this would include portions of the critical and non-critical breeding periods. No helicopter yarding would occur between March 1 and July 7 (the critical nesting period

however it may occur between July 8 and September 30 (the non-critical nesting period).

Alternative 3 *MAY AFFECT* and is *LIKELY TO ADVERSELY AFFECT* the spotted owl based primarily upon the fact that there would be an increased potential for disturbance of unsurveyed suitable habitat during the critical and non-critical breeding periods. In addition, approximately 542 acres of dispersal habitat would be treated with a density management treatment resulting in both positive and negative impacts, although the areas are still expected to function for owl dispersal post-harvest based on the maintenance of a canopy closure that is expected to be approximately 50%.

Marbled Murrelet - (FT)
The potential impacts to the marbled murrelet resulting from habitat modification would basically be the same under Alternative 3 as were discussed under Alternative 2. This is based upon the fact that the three proposed treatment units (3-1, 3-2, 15-2) that contain or are in proximity to potentially suitable murrelet nest trees would receive the same treatment as proposed under Alternative 2.

Like alternative 2, the design features for alternative 3 allow for the yarding and hauling of logs during portions of the critical and non-critical murrelet breeding periods. No helicopter yarding would occur between March 1 and July 7. Between July 8 and August 5, yarding flight paths would be designed to avoid areas containing unsurveyed potential murrelet habitat by at least 0.25 miles; flight paths would not be designed to avoid areas of surveyed potential habitat. All helicopter yarding which occurs between August 6 and September 15 and takes place within 0.25 miles of unsurveyed potential murrelet habitat would not begin until two hours after sunrise and would end two hours before sunset; use of the designated flight paths between August 6 and September 15 would avoid the necessity for daily time restrictions.

Alternative 3 *MAY AFFECT* and is *LIKELY TO ADVERSELY AFFECT* the marbled murrelet based upon the fact that although daily time restrictions would be observed, there would be an increased potential for disturbance of unsurveyed suitable habitat as a result of helicopter yarding during the non-critical breeding periods, and thinning would occur within three treatment units (3-1, 3-2, 15-2) which are in the vicinity of surveyed potentially suitable marbled murrelet nest trees.

Bald Eagle - (FT)
The potential impacts to the bald eagle would basically be the same under Alternative 3 as were discussed under Alternative 2. This is based upon the fact that one of the proposed treatment units (15-2) is adjacent to a patch of potentially suitable eagle roosting and resting habitat. No eagles or eagle nests have been observed in this patch of suitable eagle habitat. Helicopter yarding activities between July 8 and February 29, would be expected to disturb this patch of eagle habitat. Portions of this period of potential disturbance include portions of the eagle breeding season which is January 1 to August 31.

It has been determined that Alternative 3 *MAY AFFECT, and is NOT LIKELY TO ADVERSELY AFFECT* the bald eagle. This is primarily based upon the fact that the alternative includes an

increased potential for disturbance during the breeding season within 0.25 miles, or within a 0.5 mile line-of-sight distance, of marginally suitable roosting and resting habitat.

Survey and Manage Wildlife Species, Special Status Species or Other Species of Concern
Under alternative 3, the positive and negative impacts associated with timber harvest upon Survey and Manage Wildlife Species, Special Status Species or Other Species of Concern would generally be the same as those discussed under Alternative 2. A possible exception is the expected impact to existing CWD; helicopter yarding would be expected to result in considerably less damage to the existing CWD than would occur under traditional ground based or cable yarding operations. This would be beneficial to species which utilize CWD such as clouded salamanders and pileated woodpeckers both Bureau tracking species, as well as S&M mollusks.

WILDLIFE HABITAT ENHANCEMENT PROJECTS

The proposed Wildlife Habitat Enhancement Projects include snag and down woody debris creation projects, and the release of individual and small groups of trees.

Affected Environment: Wildlife Habitat Enhancement Projects are proposed to be implemented in T1S., R5W., Sections 1, 3, 5, 8, and 9 W. M..

There are no known occupied spotted owl or marbled murrelet sites within the vicinity of any of the proposed wildlife habitat enhancement project areas; the nearest known eagle nest is approximately two miles from the nearest proposed habitat enhancement unit.

Portions of some of the proposed wildlife habitat enhancement units are considered to be marginally suitable for the spotted owl; those which are not currently considered to be suitable owl habitat are considered to be owl dispersal habitat. Some of this dispersal habitat is of a very poor quality, most notably portions of units W8-1 and W9-2, W9-3, based upon the extreme density of the stand. Portions of one habitat enhancement unit, W1-1 is considered suitable habitat for the spotted owl and bald eagle; individual trees with suitable marbled murrelet nesting platforms may also be present in portions of the unit. Some of the areas identified for wildlife habitat enhancement treatment may be within 0.25 miles of suitable habitat for the spotted owl, marbled murrelet and/or bald eagle.

All of the wildlife habitat enhancement project areas are within the Northern Coast Range AMA (Adaptive Management Area). Alternative 2 proposes to treat a total of approximately 181 acres; approximately 110 of these acres are located within Riparian Reserves. Alternative 3 proposes to treat approximately 196 acres; approximately 115 acres are located within Riparian Reserves.

Under alternative 2, approximately 77% of the areas proposed for wildlife habitat enhancement, are located within those areas identified within the 15% Analysis Documentation (as updated 11/15/99) which was completed to assure conformance with the 15 percent Retention Standard and Guideline. These areas include all or parts of wildlife habitat enhancement treatment units W1-1, W3-1, W3-2, W5-1, and W9-1 which total approximately 140 acres. Alternative 3 proposes 15

acres of treatment in addition to those acres proposed under Alternative 2; approximately 6 of these additional acres, located in unit W9-3, were also identified in the 15% analysis.

All of the wildlife habitat enhancement treatments, including the portions within areas identified as helping to meet the 15% Retention Standard and Guideline, have been designed to promote the development of late-seral habitat, or to enhance the current quality of late-seral habitat by promoting the development of certain important habitat features. Implementation of the habitat enhancement projects would help better achieve the objectives of the 15% S&G, as well as AMA and Riparian Reserve land allocations.

Project Design Features: Under both action alternatives, all wildlife habitat enhancement treatments have been designed to protect and enhance the development of late-seral habitat features. Projects in general include snag and down wood creation, and/or releasing individual or small groups of understory or overstory trees.

With the exception of one unit, all of the projects which result in the generation of noise above the ambient level would be implemented between July 8 and February 28. Within unit W1-1, work which results in the generation of noise above the ambient level or requires climbing more than 25 feet into the canopy, would be implemented between August 6 and February 28. Between August 6 and September 15, daily time restrictions would apply to work conducted in unit W1-1. Daily time restrictions would confine work to the period of time between two hours after sunrise and two hours before sunset.

No tree which is potentially suitable as nest tree for the spotted owl or marbled murrelet, or contains a suspected nest of any other bird or mammal would be treated. In addition, no tree adjacent to a potentially suitable spotted owl or marbled murrelet nest tree or any tree containing a suspected nest of a bird or mammal would be treated. Felling of trees would be conducted in such a way as to assure no damage to potentially suitable spotted owl or marbled murrelet nest tree, or any tree containing a suspected nest of a bird or mammal.

The general design features below have been developed to reflect the overall general stand types and will be used for analysis of the project. Actual treatments on the ground may vary in order to reflect site specific stand conditions of the individual treatment areas within the units.

ALTERNATIVE 2
WILDLIFE HABITAT ENHANCEMENT PROJECTS

T1S., R5W, Section 1:
Wildlife Habitat Enhancement Unit W1-1: This proposed unit contains a total of approximately 60 acres and two general forest types, conifer-dominated and hardwood-dominated.

In the relatively well-stocked and uniform 100-year-old Douglas-fir stands in the northeast portions

of the parcel, some individual-tree or small-group (~ 3 to 6 trees) snag creation is proposed on approximately 30 acres to enhance late-seral stage forest conditions. Snag creation is also proposed in the approximately 5-acre sized patch of 100-year-old timber in the southwest portion of the parcel. Placement of created snags would focus on opportunities to maintain rapid growth and crown expansion of some of the larger dominant overstory trees within the stand and to provide advance grand fir reproduction with additional light and growing space thereby further enhancing late-seral forest conditions by encouraging understory tree development. Snags would be created by basal girdling and/or girdling within the crown. A qualified field botanist, wildlife biologist or trained staff would be involved in selecting all trees to be girdled. Up to approximately 150 trees would be treated over approximately 35 acres.

Approximately 30- to 50-year-old hardwoods generally dominate the riparian areas proposed for treatment with red alder being the most abundant overstory tree species. Various-sized conifers are also present within some portions of the riparian zone. Release of some understory and mid-story conifers (mainly grand fir and western redcedar) by basal girdling and/or felling selected competing red alder trees is proposed. This would help achieve some of the objectives of the Aquatic Conservation Strategy by helping to promote conifer growth and late-seral stage habitat development and thereby providing a future source of large conifer logs. Some short-term benefits to wildlife would also be realized through the creation of hardwood snags and CWD. Felled trees would be selected and/or felled in such a way as to minimize impact with existing decay class 3, 4, and 5 down woody debris which is greater than 15 inches in diameter. A qualified field botanist, wildlife biologist or trained staff would be involved in selecting all trees to be felled or girdled. Up to approximately 25 acres of alder dominated stands would be treated by releasing up to 10 conifers per acre (where available). Depending upon site-specifics and the size of the overstory alder, generally 1-6 alders would be treated per released tree.

T1S., R5W, Section 3:
Wildlife Habitat Enhancement Unit W3-1: The 80-year-old stand located in the southwest portion of the section is proposed for wildlife habitat enhancement. It is proposed that treatments be applied to selected Douglas firs within the stand to increase their value to wildlife. This would be accomplished by girdling trees within the live crown in such a manner as to allow them to continue living with a distorted growth form, and/or by inoculating healthy trees with a heart rot fungus. Trees selected for these treatments would primarily include those larger, well-spaced trees with adequate growing space to help assure their continued growth following treatment. Up to approximately 52 Douglas-firs would be treated over approximately 26 acres.

T1S., R5W, Section 3:
Wildlife Habitat Enhancement Unit W3-2: The 80-year-old stand located in the Riparian Reserve is proposed for wildlife habitat enhancement. The structure of the stand is relatively diverse primarily as a result of the hardwood/conifer species mix and the uneven distribution of the overstory conifers. Conifers are primarily Douglas-fir although some western redcedar are also present. Snags are generally lacking from the stand as are live trees with characteristics of late-seral habitat such as broken or dead tops, and hollow cavities. It is proposed that treatments be applied to selected Douglas-firs within the stand to introduce these lacking habitat elements. This would be

accomplished by girdling trees within the live crown in such a manner as to allow them to continue living with a distorted growth form, and/or by inoculating healthy trees with a heart rot fungus. Trees selected for these treatments would primarily include those larger, well-spaced trees with adequate growing space to help assure their continued growth following treatment. In addition, individual or small groups (~ 2 - 3 trees) of Douglas-firs and/or possibly alder would also be selected for treatment by basal-girdling. These trees would be primarily located within the denser clumps of overstory trees. Selection of trees for basal-girdling would focus on opportunities to provide advance conifer reproduction (primarily western redcedar) with additional light and growing space thereby further enhancing late-seral forest conditions by encouraging understory tree development, or to maintain rapid growth and crown expansion of some of the larger dominant overstory trees within the area. Up to approximately 50 trees would be treated by girdling within the crown or inoculation with heart rot, and up to approximately 70 trees would be treated by basal girdling over a total of approximately 35 acres.

T1S., R5W, Section 3:

Wildlife Habitat Enhancement Unit W3-3: Portions of the medium-stocked 33-year-old stand in the NE¼ of the NE¼ of the section are not feasible or practical to treat with a density management treatment based upon excessively steep and unstable slopes. Selected individual tree release is proposed to encourage tree growth (overstory and in some cases understory trees), structural diversity, and enhance coarse woody debris levels. Selected trees would be the more dominant ones or would be under-represented conifer species. In some cases, pairs or small groups of trees may be selected for release rather than single trees. Release would be accomplished by girdling and/or possibly felling all trees in the lower crown classes which are located in a ring around the selected trees. This ring would have a radius of up to approximately 25 or 30 feet and encompass up to approximately 0.06 acres. Up to approximately 40 "release patches" would be created over approximately 10 acres.

T1S., R5W, Section 5:

Wildlife Habitat Enhancement Unit W5-1: Five, five-acre pockets of 80-year-old Douglas-fir, and one five-acre patch of a conifer-hardwood mix is proposed for wildlife habitat enhancement. The areas proposed for wildlife habitat enhancement are located within a 50-year-old stand of Douglas-fir which is proposed for density management. Within the stands proposed for habitat enhancement treatments, a combination of girdling within the live crown and at the base is proposed, with the majority of the trees being treated within their live crowns. Up to approximately 35 Douglas-firs would be treated on a total of approximately 25 acres.

T1S., R5W, Section 8:

Wildlife Habitat Enhancement Unit W8-1: Within the parcel proposed for treatment, there are two general 50-year-old Douglas-fir stand types; a well-stocked portion and mediumly stocked portion. Within the well-stocked portion of the parcel which is not identified for thinning, it is proposed that up to approximately 8 to 10 individual trees, pairs or small groups of trees growing in proximity per acre, would be selected for release. This would add structural diversity to the stand and promote the development late-seral stage habitat features such as scattered larger trees with well-developed crowns. Selected trees would be trees within the more dominant crown

classes or would be under-represented conifer species. Release would be accomplished by girdling and/or possibly felling all trees in the lower crown classes located in a ring around the selected trees. This ring would have a radius of approximately 20 or 25 feet and encompass up to approximately 0.05 acres. Felled or girdled trees would be relatively small but still provide some snag and CWD habitat component to the stand. Treatment would be applied in both Riparian Reserves and AMA land allocations however, a no-cut buffer would be applied along all active stream channels to provide shade and protect bank stability. Up to approximately 100 "release patches" would be created over approximately 20 acres.

Scattered portions of the BLM parcel are forested with a medium-stocked, 50-year-old Douglas-fir stand type. There are a few smaller snags in the general area which have been or are being used by pileated woodpeckers, but in general, larger snags are generally lacking from the stand as are live trees with characteristics of late-seral habitat such as broken or dead tops, and hollow cavities. It is proposed that treatments be applied to selected larger Douglas-firs within the stand to introduce these lacking habitat elements. This would be accomplished by girdling trees within the live crown in such a manner as to allow them to continue living with a distorted growth form following treatment. Trees selected for these treatments would primarily include those larger, well-spaced trees with adequate growing space to help assure their continued growth. Approximately 15 Douglas-firs would be treated over approximately 10 acres.

T1S., R5W, Section 9:
Wildlife Habitat Enhancement Unit W9-1: An area forested with a mixed hardwood/Douglas- fir stand which is 50 to 80-years-old is proposed for habitat enhancement. The area is within the Riparian Reserve land allocation. It is proposed that treatments be applied to selected larger Douglas firs within the area to increase their value to wildlife. This would be accomplished by girdling trees within the live crown in such a manner as to allow them to continue living with a distorted growth form following treatment. Trees selected for these treatments would primarily include those larger, well-spaced trees with adequate growing space to help assure their continued growth. Approximately 15 firs would be treated over approximately 10 acres

T1S., R5W, Section 9:
Wildlife Habitat Enhancement Unit W9-2: An approximately 5-acre sized patch of well-stocked 40 to 50-year-old Douglas-fir within the AMA land allocation is proposed for habitat enhancement. It is proposed that approximately 8 to 10 individual, pairs or small groups of trees growing in proximity per acre, be selected for release. This would add structural diversity to the stand and promote the development late-seral stage habitat features such as scattered larger trees with well-developed crowns. Selected trees would be trees within the more dominant crown class or would be under-represented conifer species. Release would be accomplished by girdling and/or possibly felling all trees in the lower crown classes located in a ring around the selected trees. This ring would have a radius of up to approximately 20 feet and encompass up to approximately 0.03 acres. Felled or girdled trees would be relatively small but still provide some short-term CWD habitat component to the stand. Approximately 45 "release patches" would be created over approximately 5 acres.

Table 4. Scoggins Creek Project Wildlife Habitat Enhancement Treatment Units - Acreage Summary		
Unit number	Alternative 2	Alternative 3
W1-1	78	78
W3-1	26.3	26.3
W3-2	34.8	34.8
W3-3	10	10
W5-1	17.7	17.7
W8-1	12.9	9.6
W9-1	4.8	4.8
W9-2	6.7	6.7
W9-3	0	17.9
Total Acres	191.2	205.8

ALTERNATIVE 3
WILDLIFE HABITAT ENHANCEMENT PROJECTS

The Wildlife Habitat Enhancement Projects proposed under Alternative 3 are essentially the same as those proposed under Alternative 2 with the exception of some minor modifications to unit W8-1 and the addition of an 18-acre unit, W9-3 (see table 4).

T1S., R5W, Section 9:
Wildlife Habitat Enhancement Unit W9-3: Under alternative 3, an approximately 18-acre unit is proposed for habitat enhancement. Approximately 12 acres is well-stocked 35 to 40-year-old Douglas-fir and 6 acres is a medium-stocked 80-year-old Douglas fir stand. Within the younger type, it is proposed that approximately 8 to 10 individual, pairs or small groups of trees growing in proximity per acre, be selected for release. This would add structural diversity to the stand and promote the development late-seral stage habitat features such as scattered larger trees with well-developed crowns. Selected trees would be trees within the more dominant crown class or would be under-represented conifer species. Release would be accomplished by girdling and/or possibly felling all trees in the lower crown classes which are located in a ring around the selected trees. This ring would have a radius of up to approximately 20 feet and encompass approximately 0.03 acres. Felled or girdled trees would be relatively small but still provide some snag and CWD habitat component to the stand. Approximately 48 "release patches" would be created over approximately 12 acres. Within the 6 acres of the 80-year-old Douglas-fir stand, approximately 2 snags per acre would be created by girdling either at the base or within the crown.

ENVIRONMENTAL CONSEQUENCES resulting from the wildlife habitat enhancement projects.

ALTERNATIVE 1 - (The "No Action" Alternative)

Under this alternative the wildlife habitat enhancement projects would not be implemented. The forest stands would continue to grow and develop without management intervention. The development of some features of late-seral stage habitat would be expected to occur in a slower time frame than with the implementation of the wildlife habitat enhancement projects. Under the "No Action" Alternative, the identified beneficial and adverse impacts of the action alternative upon wildlife and wildlife habitat would not occur at this site at this time.

Selection of the "No Action" Alternative would be of *NO EFFECT* upon the marbled murrelet, spotted owl, bald eagle and all other species listed under the ESA. In addition, it would not be expected to adversely impact (result in a loss in population viability or elevate their status to any higher level of concern) any of the wildlife S&M, Special Status, or other Species of Concern discussed above.

ALTERNATIVE 2

All wildlife habitat enhancement treatments have been designed to reflect the stand condition and protect and enhance the development of various late-seral habitat features. Depending upon the individual treatment unit and nature of the specific treatment, there would be variation in the number and type of late-seral habitat feature promoted or enhanced. Treatments involving the release of individual and small groups of trees would promote the development of larger conifers and gaps in the canopy. Where this occurs in alder dominated riparian stands it would help promote a future source of down wood for the stream and/or riparian area. In dense fir stands, it would help accelerate crown development and stand differentiation, and result in an increased level of diversity, both within the small gaps and across the stand as a whole. Snag creation, by girdling at the base, within the crown or through inoculation with a heart rot fungus would help promote the development of various habitat features such as large, thick or clustered branches; decay and hollow cavities; loosened bark; broken and/or dead tops; and eventually down logs. These features serve as vital denning, hiding, roosting, nesting, drumming, and/or foraging sites for a large range of species and are important components in late-successional habitat.

Wildlife Species listed or proposed under the Endangered Species Act:

In accordance with regulations pursuant to Section 7 of the Endangered Species Act of 1973, as amended, formal and/or informal consultation with the USFWS concerning the potential impacts of the Scoggins Creek Wildlife Habitat Enhancement projects upon the spotted owl, marbled murrelet and bald eagle would be completed where appropriate. This would most likely be accomplished by including the Scoggins Creek Wildlife Habitat Enhancement Projects within the annual programmatic habitat modification biological assessment prepared by the interagency Level 1 Team (terrestrial subgroup) for the North Coast Province, although some of the proposed treatments may require the preparation of a project site-specific Biological Assessment.

Spotted Owl and Marbled Murrelet Designated Critical Habitat - Since none of the proposed wildlife habitat enhancement projects are located within or near designated critical habitat for the spotted owl or the marbled murrelet, all of the projects would be of *NO EFFECT* upon designated critical habitat for the spotted owl or the marbled murrelet.

Northern Spotted Owl - (FT)
There are no known spotted owl sites within the vicinity of any of the proposed wildlife habitat enhancement project areas.

Alternative 2 proposes to treat a total of approximately 192 acres. Some of the proposed wildlife habitat enhancement units are considered to be marginally suitable for the spotted owl; those which are not currently considered to be suitable owl habitat are considered to be owl dispersal habitat. In addition, some of the areas identified for treatment are within 0.25 miles of unsurveyed suitable habitat for the spotted owl. The project has potential to create noise above the ambient level through the use of chainsaws, during the non-critical nesting season within 0.25 miles of unsurveyed suitable habitat.

Based upon the scale and nature of the proposed treatments, minimal adverse impact to spotted owl dispersal and suitable habitat is expected; no stand would be removed from its current condition to function as dispersal or suitable habitat. Some of the affected dispersal habitat is currently of a very poor quality, most notably portions of units W3-3, W8-1, W9-2 and W9-3, based upon the age and extreme density of the stand. These dense portions of the treated stands would be treated with the release of individual and small groups of trees. This would be expect to benefit the quality of the dispersal habitat by opening portions of stand thereby facilitating an owls ability to movement through the treatment area. Other beneficial impacts resulting from the wildlife habitat enhancement projects include increasing the abundance of major constituent elements of spotted owl habitat in an area identified as generally lacking those elements - trees suitable for owl and prey base nesting, large conifers within mixed hardwood/conifer stands, and CWD (Coarse Woody Debris) in the form of both standing snags and down logs. The wildlife habitat enhancement project could likely afford (1) future nest trees for the owl (2) denning and/or foraging sites for prey species and (3) CWD which could be utilized by prey species and other special status species.

No tree which is currently, potentially suitable as a spotted owl nest tree nor any tree adjacent to a potentially suitable nest tree, would be affected.

Based upon the potential for disturbance resulting from the fact that chainsaws could be utilized after July 7 (within the non-critical owl nesting season), as well as any potential short-term impacts and long-term potential beneficial impacts to spotted owl suitable and dispersal habitat, the project has been determined to *MAY AFFECT but NOT LIKELY TO ADVERSELY EFFECT* the spotted owl.

Marbled Murrelet - (FT)
There are no known marbled murrelet sites within the vicinity of any of the proposed wildlife habitat enhancement project areas. One of the proposed treatment units, W1-1, is within and adjacent to unsurveyed potential murrelet habitat. There is potential for increase disturbance to this habitat as a result of the use of chainsaws, as well as climbing into the canopy during the non-critical portion of the murrelet breeding season. Daily time restrictions would be utilized for work occurring on or prior to September 15.

Based upon the scale and nature of the proposed treatments, minimal adverse or beneficial impact to murrelet potential habitat is expected. No tree which is currently, potentially suitable as a murrelet nest tree nor any tree adjacent to a potential murrelet nest tree would be treated affected.

The wildlife enhancement project *MAY AFFECT but NOT LIKELY TO ADVERSELY AFFECT* the murrelet based primarily upon the potential for disturbance. This analysis also considers the potential for short and long-term potential adverse and beneficial impacts to murrelet potential habitat.

Bald Eagle - (FT)
The nearest known eagle nest is approximately 2 miles from the proposed project areas. Portions

of one habitat enhancement unit, W1-1 is considered suitable habitat for the bald eagle although eagles are not known to utilize the area. Additional suitable habitat may also be within 0.25 miles of this unit or within 0.5 miles line-of-sight distance. The bald eagle breeding season is considered to be January 1 until August 31. The project has potential to create noise disturbance during portions of the breeding season (August 6 to August 31, and January 1 to March 1).

Based upon the scale and nature of the proposed treatments, no short or long-term adverse impacts to eagle habitat is expected. The creation of additional snags within this unit has the potential for longer-term beneficial impacts to the quality of eagle habitat within the area through providing an increased opportunity for roosting sites although this impact is considered minor.

Based primarily upon the potential for disturbance within portions of eagle breeding season (August 6 to August 31, and January 1 to March 1) to the suitable habitat within and near unit W1-1, the project *MAY EFFECT* although it is *NOT LIKELY TO ADVERSELY EFFECT* the bald eagle.

<u>Survey and Manage Wildlife Species (S&M)</u>

Red Tree Vole

Although the red tree vole is generally associated with much larger and older Douglas-fir trees than those found in the vicinity of the proposed wildlife habitat enhancement projects, some portions of the project areas currently contain potential habitat for the red tree vole. In general this habitat is of a marginal quality based upon the stand age and average diameter of the trees.

The wildlife habitat enhancement treatments involve only the treatment of trees which do not contain any nests and are not adjacent to any trees which contain nests. Treatment units which are stocked with relatively larger trees such as W1-1, W3-1, W3-2, W5-1 and W9-1 do not involve the felling of trees rather the creation of snags or snag-topped live trees. Based upon the general fact that such a small percentage of available Douglas-firs within the stands would be treated and these trees would not contain nests or be adjacent to trees containing nests, the project would not impact the suitability of the treated stands for use by red tree voles. No red tree vole surveys will be conducted within these units per se, although a portion of these units may be surveyed in conjunction with an adjacent density management treatment unit.

S & M Mollusks

The proposed wildlife habitat enhancement project areas currently contain suitable habitat for S&M mollusks. However, based upon the various design features of the individual treatment units, as well as the nature of the habitat features to be impacted, only a portion of the wildlife habitat enhancement projects have been determined to be potentially “habitat altering” to the point of triggering the need for pre-project surveys. In some situations, where a wildlife habitat enhancement treatment unit is adjacent to a density management treatment unit, S&M mollusk surveys were conducted wholly or partially within the habitat enhancement unit even though the expected impacts of the wildlife habitat enhancement treatment was not believed to be of the nature to trigger the need to conduct pre-project surveys (see project record document #43). Units

which were surveyed for S&M mollusks include W3-1, W3-2, W3-3, W5-1, W8-1, and W9-1; no known sites were identified. No portion of Unit W1-1 was surveyed as the nature of the project is not expected to impact the suitability of the treated stands for use by S&M mollusks or disturb any habitat elements. No impact to S&M mollusk species is expected to result from the proposed projects.

Other Special Status Species:
No species identified under the Bureau's 6840 manual Special Status Species policy are expected to be adversely impacted by the wildlife habitat enhancement treatments resulting in the need to elevate their status to any higher level of concern including the need to list under the ESA. Species which utilize or depend upon snags and/or downed logs such as the clouded salamander and pileated woodpecker, both Bureau Tracking species, would benefit from the proposal.

ALTERNATIVE 3 **WILDLIFE HABITAT ENHANCEMENT PROJECTS**

Under this alternative, the positive and negative impacts associated with wildlife habitat enhancement upon species proposed or listed under the ESA, Survey and Manage Wildlife Species, or Special Status Species would generally be increased proportionately from the impacts discussed for Alternative 2 to reflect the increase in treatment under alternative 3. The differences in these acres are displayed on table 4.

ALTERNATIVE 3 **DECOMMISSIONING OF IDENTIFIED ROADS WITHIN THE VICINITY WHICH ARE NOT USED IN THE IMPLEMENTATION OF THE DENSITY MANAGEMENT PROPOSAL, AND ONE 42" CULVERT REMOVAL PROJECT.**

Project location: T1S., R5W, Sections 3, 5, 9, and 15.
Project Design Features: Work would be completed during periods of low soil moisture and where appropriate during the in-water work period (July 1 to September 30).

Affected Environment: There are no known occupied spotted owl or marbled murrelet sites within the vicinity of the roads proposed for decommissioning. The nearest known eagle nest is approximately three miles from the project area.

Unsurveyed suitable habitat for the spotted owl is located within 0.25 miles of the proposed project. No suitable habitat for the bald eagle is located within 0.25 miles (or 0.5 miles line-of-sight distance). All potential murrelet habitat within 0.25 miles of the roads proposed for decommissioning will be surveyed to protocol prior to project implementation.

Removal of a 42-inch culvert.
Project location: T1S., R5W, Section 1.

Project Design Features: Work would be completed between August 6 and September 30. All work which would result in the generation of noise above the ambient level between August 6 and September 15 would incorporate daily time restrictions limiting work to the period between two hours after sunrise to two hours before sunset.

Removal of the culvert will require clearing the fill-slopes of all vegetation, including trees which are primarily hardwoods. No trees which are potentially suitable as nest trees for spotted owls, marbled murrelet or bald eagles will be felled. Design features will include the minimization of tree felling; any trees needing to be felled will be retained on site for CWD.

Affected Environment: There are no known occupied spotted owl or marbled murrelet sites within the vicinity of the proposed culvert removal site. The nearest known eagle nest is approximately two miles from the project area.

Unsurveyed suitable habitat for the spotted owl and marbled murrelet is located within 0.25 miles of the proposed project. Suitable bald eagle habitat is also located in the vicinity of the culvert removal site.

ENVIRONMENTAL CONSEQUENCES resulting from the decommissioning of identified roads within the vicinity, which are not used in the implementation of the Density Management proposal, and one 42" culvert removal project.

ALTERNATIVE 1 - (The “No Action” Alternative)

Under this alternative no decommissioning of identified roads within the vicinity, which are not used in the implementation of the density management proposal would occur, and the 42" culvert removal project would not be implemented. Under the “No Action” Alternative, the identified impacts of the action alternative upon wildlife would not occur at this site at this time.

Selection of the “No Action” Alternative would be of *NO EFFECT* upon the marbled murrelet, spotted owl, bald eagle and all other wildlife species listed under the ESA. In addition, it would not be expected to adversely impact (result in a loss in population viability or elevate their status to any higher level of concern) any of the wildlife S&M, Special Status, or other Species of Concern.

ALTERNATIVE 3

Wildlife Species listed or proposed under the Endangered Species Act:

In accordance with regulations pursuant to Section 7 of the Endangered Species Act of 1973, as amended, formal and/or informal consultation with the USFWS concerning the potential impacts of the Scoggins Creek Wildlife Habitat Enhancement projects upon the spotted owl, marbled murrelet and bald eagle would be completed where appropriate. This would most likely be accomplished by including the Scoggins Creek Wildlife Habitat Enhancement Projects within the

annual programmatic habitat modification biological assessment prepared by the interagency Level 1 Team (terrestrial subgroup) for the North Coast Province, rather than with the preparation of a project site-specific Biological Assessment.

Spotted Owl and Marbled Murrelet Designated Critical Habitat - The projects would be of *NO EFFECT* upon designated critical habitat for the spotted owl or the marbled murrelet.

Northern Spotted Owl - (FT)
There are no known spotted owl sites within the vicinity of the proposed project areas. Some of the roads identified for treatment, as well as the culvert proposed for removal, are within 0.25 miles of unsurveyed suitable habitat for the spotted owl. The decommissioning of roads has potential to create noise above the ambient level during portions of the critical and non-critical breeding season, while the culvert removal has potential to create noise above the ambient level during portions of the non-critical breeding season.

Based upon the scale and nature of the proposed project, as well as the areas to affected, no adverse impacts to spotted owl dispersal and suitable habitat are expected. No tree which is currently suitable as a spotted owl nest tree would be affected. Trees needing to be cut are expected to be generally confined to smaller hardwoods which would be retained on site as CWD.

Based primarily upon the potential for disturbance to unsurveyed suitable habitat during the critical and non-critical owl nesting season, the project has been determined to *MAY AFFECT LIKELY TO ADVERSELY EFFECT* the spotted owl.

Marbled Murrelet - (FT)
There are no known marbled murrelet sites within the vicinity of any of the proposed project areas.

All of the potential murrelet habitat within 0.25 miles of the roads proposed for decommissioning were surveyed to protocol in 2000; protocol surveys are scheduled to be completed in 2001. As per the NWFP (pg. C-10) and RMP (pg. 32), if surveys determine these stands of potential habitat to be occupied by murrelets, all contiguous existing and recruitment habitat within a 0.5 mile radius would be protected.

The culvert proposed for removal is within 0.25 miles of unsurveyed potential habitat for the marbled murrelet. Work on the culvert removal project would be completed between August 6 and September 30; this includes the murrelet non-critical breeding period. All work which would result in the generation of noise above the ambient level between August 6 and September 15 would incorporate daily time restrictions to reduce the potential for adverse impacts to the murrelet.

Based upon the nature of the proposed treatments, no adverse or beneficial impacts to murrelet potential habitat are expected. No tree which is currently, potentially suitable as a murrelet nest tree nor any tree adjacent to a potential murrelet nest tree would be treated affected.

The proposed project involving the decommissioning of roads and one 42" culvert removal *MAY*

AFFECT but is NOT LIKELY TO ADVERSELY AFFECT the murrelet based upon the potential for disturbance during the noncritical breeding season as a result of the noise generated by the culvert removal. Daily time restrictions have been included on this portion of the project to minimize the potential for disturbance.

Bald Eagle - (FT)
The nearest known eagle nest is approximately 2 miles from the proposed project areas.

None of the roads identified for decommissioning treatment are within 0.25 miles of suitable habitat or within a 0.5 mile line-of-sight distance. The culvert proposed for removal is within 0.25 miles of suitable eagle habitat although eagles are not known to utilize the area. The culvert removal project has potential to create noise disturbance during the later portion of the eagle breeding season (August 6 to August 31).

Based upon the nature of the proposed treatments, no impacts to eagle habitat is expected.

Based primarily upon the potential for disturbance within the later portion of eagle breeding season (August 6 to August 31) to the suitable habitat near the culvert removal site, the project *MAY EFFECT* although it is *NOT LIKELY TO ADVERSELY EFFECT* the bald eagle.

Survey and Manage Wildlife Species (S&M)
The impacted areas have been determined to be non-habitat for the red tree vole and S&M mollusks. Surveys for these species are therefore not required and none would be conducted within the project areas per se, however, the bulk of the roads proposed for decommissioning are located within density management treatment units which were or will be surveyed if suitable habitat is present. No impacts to the red tree vole and S&M mollusks are expected to result from the decommissioning of roads and culvert removal project.

Other Special Status Species:
Based upon the scale and nature of the proposed project, as well as the areas to be affected, no species identified under the Bureau's 6840 manual Special Status Species policy are expected to be adversely impacted by the road decommissioning or culvert removal resulting in the need to elevate their status to any higher level of concern including the need to list under the ESA.

CUMULATIVE EFFECTS

"Cumulative Effects" are the impacts on the environment which result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively significant actions taking place over a period of time (CEQ 1508.7). Cumulative effects analysis provides greater insight into understanding the current environmental factors and the likely trends which might affect the environment.

Relative to wildlife resources, the only issue identified within the *Upper Tualatin-Scoggins Watershed Analysis* (2000) with a likelihood for cumulative effects is related to factors affecting the distribution of sensitive species. There are no adverse cumulative effects associated with the modification of habitat for the species of concern which utilize late-seral habitat which are expected to result from the proposed action alternatives. This is based upon the facts that the proposed density management projects would not take place within stands which are currently providing late-seral habitat; the proposed treatments would in fact, promote the development of late-seral habitat sooner than would occur without treatment. Similarly, the wildlife habitat enhancement projects are also designed to promote the development or enhance the quality of some late-seral habitat features. The density management treatments would not occur within spotted owl, marbled murrelet or bald eagle suitable habitat but rather would occur within stands which have been determined to be dispersal habitat for the spotted owl; the treated stands are expected to continue to be able to function as dispersal habitat post-harvest. There are no known historic or current spotted owl or marbled murrelet sites within the watershed.

The federal lands in the Upper Tualatin-Scoggins watershed are distributed in a scattered, checkerboard fashion and do not lend themselves to the management of larger blocks of late-seral habitat including suitable habitat for wide-ranging species such as the northern spotted owl. Based upon this ownership pattern, late-seral stands within the landscape are expected to function more as an important element of general connectivity, dispersal, and refugia for late-successional associated species with smaller home ranges, or for those species such as bats or pileated woodpeckers which may utilize other habitat types but are dependent upon some specific late-successional habitat features.

BLM lands (3,763 acres) comprise approximately 4.5% of the watershed and are contained within the North Coast Adaptive Management Area as defined within the RMP (*Salem District Record of Decision and Resource Management Plan* - May 1995). Approximately 535 acres of BLM land within the watershed are also within the LSR (Late Successional Reserve) land allocation. These 535 acres of LSR, which are contained within a 480-acre parcel and two smaller stands of mature timber totaling approximately 55 acres, are not proposed for treatment within the Scoggins Creek project. Roughly 50% of the federal lands within the Scoggins-Tualatin watershed are allocated as Riparian Reserves and are being managed for the attainment of the Aquatic Conservation Strategy objectives.

There are no other BLM projects anticipated to take place within the Upper Tualatin-Scoggins Watershed during the same relative time frame which would impact late-seral stage habitat. (See also Appendix 4 - Past, Present, and Reasonably Foreseeable Future Actions)

Less information is available on habitat altering management activities to occur on non-federal lands however, the general trend on private land is one of decreasing quantities of late-seral habitat. The majority of non-federal forestland within the watershed is owned by industrial timber companies and is managed for timber production. This generally precludes the development and/or maintenance of late-seral habitat. While private lands within the northern portion of the Oregon Coast Range, including the Upper Tualatin-Scoggins Watershed, support some dispersal habitat for the northern spotted owl, the suitable habitat for the spotted owl, marbled murrelet and bald eagle on these lands is very limited in quantity and marginal in quality thereby not notably contributing to the viability of the species. Before the spotted owl was listed as a threatened species under the ESA, Thomas et al. estimated in *A Conservation Strategy for the Northern Spotted Owl* (USDA and USDI 1990) that most privately-owned spotted owl habitat in Oregon would be eliminated within 10 years. Within the *Recovery Plan for the Marbled Murrelet* (USDI 1997) the USFWS recognized that most of the nesting habitat on private land had been eliminated by timber harvest and that the remaining tracts of potentially suitable habitat on private lands are subject to continuing timber harvest operations. Additionally, in most areas, second-growth forests have been or are planned to be harvested before they will attain the characteristics of older forests. Because the majority of private forest land within the vicinity of the proposed action area is managed for timber production, little spotted owl, bald eagle or murrelet suitable habitat remains on these lands. Habitat conditions on these lands are not expected to appreciably improve within the foreseeable future and the limited mid- and late-seral stage habitat that does remain is expected to be greatly reduced over time.

Given the expectation of continuing trends on non-federal lands within the watershed resulting in decreasing quantities of mid- and late-seral habitat, there is potential for adverse cumulative impacts associated with the “No Action” alternative. This is based upon the fact that the proposed density management and wildlife habitat enhancement projects would not take place; the projects have been designed specifically to promote the development of late-seral habitat sooner than would occur without treatment. That is to say, the accelerated development of late-seral habitat resulting from the implementation of action alternatives would in effect, be helping to offset the expected trends occurring on non-federal land; by selecting the “No Action” alternative there would be adverse cumulative impacts. The timing of the adverse cumulative impacts associated with the “No Action” alternative would be expected to mirror the timing of the benefits associated with the implementation of the action alternatives. In the case of some of the wildlife habitat enhancement projects, benefits would begin essentially at the time of project implementation while for the density management treatments, the benefits would be expected to increase gradually over time as the reserve trees within the treated stands respond to the decreased competition (see *Silvicultural Prescription for the Scoggins Creek Density Management Project* - Appendix 2).

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APPENDIX 8

BIOLOGICAL EVALUATION
FOR SPECIAL STATUS PLANT SPECIES / SURVEY & MANAGE SPECIES AND NOXIOUS WEEDS

Project Name: Scoggins Creek Project (Density management and Wildlife Habitat Enhancement)

Legal Description: T1S R5W Sec. 03,05,08,09,15

Preparer / Title: Marilyn Lowery, Kurt Heckeroth / Tillamook Resource Area

Date Prepared: 12/10/01

I. PREFIELD REVIEW (Level 1 Clearance)

A. General habitat description:

	Density Management Area			Wildlife Treatment Area		
Acres:	**Unit #**	**Alt. #2**	**Alt. #3**	**Unit#**	**Alt. #2**	**Alt. #3**
	Unit 03-1:	34	39	W1-1	78.0	78.0
	Unit 03-2:	154	166	W3-1	26.3	26.3
	Unit 03-3:	14	14	W3-2	34.8	34.8
	Unit 05-1:	127	128	W3-3	10.0	10.0
	Unit 08-1:	3	18	W5-1	17.7	17.7
	Unit 09-1:	54	60	W8-1	12.9	09.6
	Unit 09-2:	7	7	W9-1	04.8	04.8
	Unit 09-3:	57	25	W9-2	06.7	06.7
	Unit 09-4:	9	9	W9-3	00.0	17.9
	Unit 15-1:	25	26			
	Unit 15-2:	51	50			

(Approximately 10 acres have been added to NW corner of unit 03-1)

Elevation Range: 1640-2020

Habitat: Mixed conifer / deciduous forest

Surveys completed in the vicinity of the proposed actions:

No known surveys have been completed in this area.

Recommended season of reconnaissance:

Lichens and bryophytes:	no snow
Vascular plants:	April - August

II. FIELD RECONNAISSANCE (level 2 clearance)

III. Survey Completion Date(s):

Botanical surveys for Scoggins Creek project area began in June 2000. Special status plant species surveyed for included: Species listed under the BLM Manual 6840 categories, Survey & Manage Species listed under the Salem District Record of Decision dated 1995 and the Record of Decision and Standard and Guidelines, Jan 2001, and any species listed under the Endangered Species Act.

Surveyor(s) Name:	**Fungi**	-Southern Oregon Ecological
		Matt Hoover
		Jordan Mayor
	Vascular Nox./Weed	-Environmental Consultants Ore.
		Orin C. Schumcher
		Christopher A Borg
		Karen A. Tate
		-Southern Oregon Ecological
		Matt Hoover
		Jordan Mayor
		Cameron Williams
		Chris Riddle
	Lichen / Bryophyte	-Rhizosphere, LLC
		Abraham Svoboda
		Shana Gross
		Richard Gaines
		Kate Sullivan
		John Villela
		Jay Scelza
		-Tillamook Resource Area Staff
		Heckeroth
	Tetraphis / Buxbaumia	-Tillamook Resource Area Staff
		Heckeroth
		Pampush

In Nov, 2001 approximately 10 acres was added to the NW corner of unit 03-1 involving approx.1/4 mile of road and approx. 6 acres of thinning. Lichen / Bryophyte surveys were conducted to protocol by Tillamook Resource Area staff. Based on a review of habitat conditions throughout the Project area it has been determined that an adequate coverage

of habitats was accomplished under contract to meet the survey protocols for vascular plants.

Special Status Species Found: None

Survey and Manage Species Found: Surveys were conducted to the protocols for each group (Survey Protocols for Component 2 Lichens v.2.0, Survey Protocols for Survey Strategy 2 Bryophytes v.2.0, Survey Protocols for Protection Buffer Bryophytes v.2.0, and Survey Protocols for Survey and Manage Strategy 2 v.2.0). In January 2001, a Record of Decision (ROD) for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standard and Guidelines was adopted. Although the species lists changed the Survey Protocols remained the same. The following table indicates the species found within, and adjacent to, the Scoggins Creek Project area and the change of their status according to the Record of Decision and Standard and Guidelines, Jan 2001.

Table of Survey and Manage Species Found

SPECIES	1994 NFP Category	PRESENT STATUS
Nephroma resupinatum	Strategy 4	removed from list
Pannaria saubinetti	Strategy 4	Category F
Peltigera pacifica	Strategy 4	Category E
Sticta fuliginnosa	Strategy 4	removed from list
Sticta limbata	Strategy 4	removed from list
Lobaria pulmonaria	Strategy 4	removed from list
Lobaria scrobiculata	Strategy 4	removed from list
Nephroma laevigatum	Strategy 4	removed from list
Nephroma helveticum	Strategy 4	removed from list
Peltigera collina	Strategy 4	removed from list
Pseudocyphellaria anomala	Strategy 4	removed from list
Pseudocyphellaria anthrapsis	Strategy 4	removed from list
Pseudocyphellaria crocata	Strategy 4	removed from list
Antitrichia curtipendula	Strategy 4	removed from list
Buxbaumia viridis	Protection Buffer	Category D[1]

Helvela maculata	Strategy 1 and 3	Category B
Otidea onotica	Strategy 3 and PB	Category F

Both *Buxbaumia sp.* and *Tetraphis sp.* were located, during contract surveys, within the Scoggins Creek Project Area but were not identified to species. Additional surveys have been conducted by BLM staff to assure proper identification /verification for *Tetraphis, geniculata* in unit 9-1, 9-2 and 9-3 and each *buxbaumia spp* site. No sites were identified as *Tetraphis, geniculata* while one site was identified as *Buxbaumia, viridis*. Sites that could not be verified will not be considered as known sites.
Noxious Weeds found: *Hypericum perforatum, Cirsium vulgare, Ilex aquifolium Senecio jacobaea, Cirsium arvense, Rubus laciniatus, Rubus discolor, Cytisus scoparius*.

Description of project area and general remarks on survey results:

Survey Area - Stand Composition Summary
The Scoggins-Tualatin survey area consists of 30-70 yr old *Pseudotsuga menziesii* forest. Areas of densely stocked stands were abundant however areas of less significant canopy density were also common. These open areas often contained well established, mixed stands of *Alnus rubra*, and *Acer macrophyllum* amongst the dominant species. All units were mesic, with gentle to moderate slopes from 5 to 25%. The dominant understory species was *Acer circinatum* with its abundance directly related to canopy density. Other common understory species found in the survey area were *Corylus cornuta*, and *Holodiscus discolor*. Many of the units had abrupt stand edges bordering a clearcut, young stands, or roads. *Alnus rubra, Acer macrophyllum*, and the common understory species were found in abundance along these stand edges, canopy gaps, moist draws, and riparian areas.

Common plant associations with *Pseudotsuga* were *Acer, Alnus, Corylus, Holodiscus, Polystichum, Berberis, Gaultheria*, and *Pteridium*. The degree of canopy closure and density influenced the abundance of these species.

Coarse woody debris was abundant throughout all units, mostly in the form of windfall poles. Decay class 3 snags, as well as class 2-5 logs, usually with a charred exterior, were abundant to common throughout the survey area.

Survey Area - Important Habitat Features
The majority of surveyed units contained riparian habitat. The stand composition of this habitat area changed to *Alnus rubra, Acer macrophyllum, Acer circinatum, Polystichum munitum, Oxalis oregana, Lysichitum americanum*, and occasionally *Oplopanax horridum. Pseudotsuga menziesii, Tsuga heterophylla*, and *Thuja plicata* were common but rarely abundant within these habitat areas. The surveyed riparian areas consisted

primarily of seasonal streams with perennial streams occurring frequently.

Draws, steep ravines, and shallow gullies were common throughout the survey area. These features allowed for a thicker understory and shrub layer due to the patchiness in the canopy.

Surrounding the borders of the units were roads, cuts, young stands, and forest gaps. Stand edges were often dominated by deciduous species, and usually contained the highest diversity of flora. Factors such as moisture, light, aspect, and substrate availability directly influenced the abundance of lichens and bryophytes in these areas.

Survey Area Diversity

The average species richness of this survey area was 67.5 species per unit. The greatest species richness was found in Sec.5, with 91 species. Unit 9C had 13 Survey and Manage species located in one (approximately 100 foot radius) area. This represents the greatest concentration of diverse survey and manage species found during the entire survey. The lowest species richness was found in Sec. 8, also the smallest unit, with 29 species. The lichens were generally more diverse than the bryophytes throughout the Scoggins-Tualatin survey area. The areas of greatest diversity were associated with dense *Acer circinatum* understory, as well as moist/mesic sights with decay class 4-5 logs common and canopy closure < 70%.

III. IMPACT ANALYSIS

Special Status Species: N/A

Wildlife Enhancement Areas: In unit W1-1, falling of trees when trees are not removed, and creation of snags within the proposed wildlife enhancement areas do not constitute habitat disturbing activity for Vascular plants and Bryophytes. Therefore surveys for these species are not required in those areas. However certain epiphytic S&M Lichen species inhabit mature coniferous and deciduous tree and shrub species in forests characterized by high humidity and cool temperatures. Based on design features for this project such as (felled trees would be selected and felled in such a way as to minimize impacts to existing decay class 3,4, and 5 down woody debris which is greater than 15 inches in diameter plus a Qualified field botanist, a Wildlife Biologist, or trained staff would be involved in selecting all trees to be felled or girdled) surveys will not be required.

For all other Wildlife enhancement units, surveys were conducted under contract because of their close proximity to the density management areas. Therefore the need for a qualified botanist is not required to assist in tree selection.

Survey and Manage Species: All survey and manage species found were strategy 4 (conduct general regional surveys) except *Buxbaumia* which was a Protection Buffer, *Otidea onotica* which was a strategy 3 and Protection Buffer, and *Helvella maculata* which was strategy 1 and 3 according to the April 1994 Record of Decision for amendments to Forest Service and Bureau of Land Management planning document within the range of the northern spotted owl. All species except *Pannaria saubinetii, Buxbaumia viridis, Peltigera pacifica, Otidea onotica* and *Helvella maculata* have been removed from the survey and manage list in all or part of their range (refer to table 1-2 of the current Standards and Guidelines dated Jan. 2001).

Pannaria saubinetii is a category F species included in Survey and Manage Standards and Guidelines table 1-1. Manage known sites for category F species is not required, (page 13 Standard and Guidelines Jan. 2001).

Buxbaumia viridis is a category D[1] Survey and Manage species. Although Pre-disturbance Surveys are deemed practical for these species, continuing pre-disturbance surveys is not necessary in order to meet management objectives. The objective for category D species is to identify high-priority sites to provide for a reasonable assurance of species persistence. Until high priority sites can be determined, manage all known sites. (pg 11-12 of Standards and Guidelines, Jan 2001).

Peltigera pacifica is a category E Survey and Manage species. Manage all known sites for category E species is required (pg 12-13 of Standards and Guidelines, Jan 2001).

Otidea onotica is a Category F Survey and Manage Species. (Table 1.1 Record of Decision and Standards and Guidelines Jan. 2001) Manage known sites for category F species is not required, (page 13 Standard and Guidelines Jan. 2001).

Helvella maculata is a category B Survey and Manage species. Manage all known sites for category B species is required (pg 9-10 of Standards and Guidelines, Jan 2001).

Noxious Weeds: All noxious weeds identified within the project area were Priority III (established infestations). These weed species are commonly found throughout Western Oregon tending to occupy areas of high light. Some degree of noxious/exotic weed introduction or spread is probable as management activities occur in the project areas. Soil disturbing activities such as skid trails, landings, etc. would be the most likely places for weed establishment. In time these non-native species are expected to return to low levels as native vegetation becomes reestablished.

IV. ANALYSIS OF SIGNIFICANCE OF EFFECTS

Special Status Species: N/A

Survey and Manage Species: Removal of Strategy 4 species from survey and manage designation was based on information regarding their abundance, habitat association, or presence in the planning area (pg 6, ROD Jan 2001). For these species we expect future information to indicate that other standard and guidelines of the Northwest Forest Plan provide a reasonable assurance of persistence (pg 8, ROD Jan 2001).

Manage Known Sites

Buxbaumia sp. is dependent on shade and a supply of moist logs in an advanced state of decay. With adequate buffering to known sites, removal of trees associated with this project should not alter microclimates for *Buxbaumia*. Proposed project activities for Scoggins Creek Project Area do not threaten species viability.

Helvella maculata produces solitary to gregarious sporocarps in a wide variety of habitats including suburban habitats and rotation age conifer stands. Although this is a category B species, the Management Recommendations for S&M fungi Sept 1997 states, "this taxa does not appear to be in need of special protection beyond that provided by the Northwest Forest Plan and the prospects of sustained habitat viability are excellent (group 25-8). The Proposed project activities do not threaten the species viability.

Peltigera pacifica: Found on substrates of soil, moss, logs, and tree bases. With adequate buffering to known sites, removal of trees associated with this project should not alter microclimates. The Proposed project activities do not threaten the species viability.

Decommissioning of roads should have no additional effect to S&M species.

Alternative 1 (no action) : No adverse impacts to the S&M species found in these units would be expected to occur under this alternative. None of the species found are restricted to a single ecological condition and so are not dependant upon management of forest stands to maintain their habitat.

Alternative 2 (Groundbase / cable yarding) : In this alternative groundbase and cable yarding would occur. Groundbase yarding can be expected to disturb the litter layer, soil, and woody debris to a greater extent than would cable yarding. Because most S&M species found grow in those substrates, they could be negatively impacted. The proposed recommendations should be sufficient to protect S&M sites from adverse impacts.

Alternative 3 (helicopter yarding) : In this alternative helicopter yarding would occur. Impacts to the litter layer, soil, and woody debris could be expected. Because all S&M species found grow in those substrates, they could be negatively impacted. Helicopter yarding should provide a lesser amount of ground disturbance than Groundbase or cable yarding and thus be least detrimental for the S&M species encountered. proposed recommendations should be sufficient to protect S&M sites from adverse impacts.

Noxious Weeds: No appreciable increase in the noxious weed / invasive exotics identified during the field surveys is expected to occur. Within the thinning units, any increase that does occur should be mostly confined to road corridors and would be expected to decrease over time as native species re-vegetate.

V. RECOMMENDATIONS

1. All earth moving equipment be cleaned and free of soil, brush, weeds and any part thereof before entering B.L.M. lands to prevent the spread of any noxious weed species.

2. A no disturbance buffer will be placed around the *Buxbaumia viridis* site in unit 3-1 and all *Peltigera pacifica* sites. No trees shall be felled into or dragged through any no disturbance buffer zone. The actual size and shape of the buffer would be determined by considering a number of ecological variables including, aspect, slope, canopy closure, herbaceous ground cover, moss cover, and incident solar radiation which will vary from site to site and will be implemented with the intention of maintaining existing site and microsite conditions.

Attachment A: Species surveyed for in Scoggins Tualatin Project Area

BLM Manual 6840 lichen and bryophyte species list

6840 (State Office list for Salem district) D=documented, S=suspected, U=unknown
Type: b=bryophyte, l=lichen
Ref: references for bryophytes, page in Lawton

SPECIES & STATUS	HABITAT	ELEV (FT)	BEST I.D. SEASON	TYPE	REF	6840
BUREAU SENSITIVE (BS)						
Sulcaria badia Brodo & D. Hawksw.	Cr, Km, WV; CA, WA; Bent, Coos, Doug, Jose			l		S
ASSESSMENT SPECIES (AS)						
Andreaea schofieldiana B. Murr.	KM: CA, BC; Curr			b		D
Barbilophozia lycopodioides (wallr.) Loeske Giant fourpoint, maple liverwort	CR; Bake, Clat, Linn, Gran peaty or highly organic soils in forest with regular snowfall	mid-high		b		S
Calypogeia sphagnicola (H. Arn. & Perss.) K. Muell. Bog pouchwort	WC, CR; Clac, Coos, Curr, Lane, Linc, Linn, Till sphagnum containing wetlands, associated with Drosera, Tofielda, Ledum, Carex, Kalmia, Spirea, Trientalis, Vaccinium			b		D
Diplophyllum plicatum Lindb.	CR; Clat, Coos, Linc West slope of the Cascades where cool, humid conditions occur. Substrates include: decayed wood, down logs, conifer trunks, moist north facing cliffs, shaded cliff crevices along river and stream banks, soil of upturned roots			b		S
Encalypta brevipes Schljak stubby extinguisher moss	CR; Clat soil on ledges and in crevices on cliffs, usually on igneous or siliceous rocks, Fog			b	115	U
Erioderma sorediatum D.J. Galloway & P.M. Jørg.	CR; Coos, Lane, Linc			l		U
Gymnomitrion concinnatum (Lightf.) Corda	WC; Hook, Mult peaty soil often assoc. w/ cliffs & rocks	subalp		b		S
Herbertus aduncus (dicks.) S.F. Gray	CR, WC; Clat, Mult on a variety of substrates, areas w./ high moisture and moderate temperatures	various		b		S
Herbertus sakuraii (Warnst.) Hatt. Pacific scissorleaf	CR; Clat, usu. on peaty substrates where constantly cool and moist			b		S
Hypogymnia pulverata (Nyl. Ex Crombie) Elix	CR; Till			l		D
Hypogymnia subphysodes (Kremp.) Filson	CR; Lane			l		S
Iwatsukiella leucotricha (Mitt.) Buck & Crum	CR; Clat Bark of conifers & alders, along ridges subject to fog, wet areas along immed. coast. Silver fir zone at mid-high elev. Forms mats w/ other bryophytes	various		b		S
Lobaria linita (Ach.) Rabenh.	CR; Linn, Polk			l		D
Lophozia laxa (Lindb>) Grolle	CR, WC; Lane, Linn, Till growing among sphagnum			b		S

BLM Manual 6840 lichen and bryophyte species list (Continued)

SPECIES & STATUS	HABITAT	ELEV (FT)	BEST I.D. SEASON	TYPE	REF	6840
Metzgeria temperata Kuwah. nubbly daintyribbons	CR; Till On tree trunks usually shaded near the coast in mats or mixed w/ other bryos			b		S
Micromitrium tenerum (Bruch & Schimp. *in* B.S.G.) Crosby	WV; BC; Bent, Linn			b		S
Physcomitrella patens (Hedw.) Bruch & Schimp. *in* B.S.G.	WV; BC, MB; Bent			b		S
Pilophorus nigricaulis Sato	CR, WC; Clat, Linn, Mari, Mult on rock, cool moist rocky slopes			l		D
Plagiochila semidecurrens var.*alaskana* (Evans) H. Inoue	CR; Clat On wet rocks & trees, moist n-facing slopes			b		S
Pohlia sphagnicola (Bruch & Schimp.) Lindb. & Arnell Sparse hummock moss, Nodding bog moss	CR; Till, Lane growing amongst sphagnum on top of hummocks			b		S
Polytrichum strictum Brid. (= P. juniperum affine) Hummock haircap, slender haircap, narrow-leaved haircap	CR; Clat scattered individually or forming loose turfs on organic soils, particularly on top of sphagnum hummocks, in coastal and montane mires			b	42	S
Radula brunnea Steph.	CR; Clat Peaty ledges on cliffs sheltered by ridgetops, grows in mats			b		S
Rhytidium rugosum (Hedw.)Kindb. crumpled-leaf moss, droop-branch moss, beruffled moss	CR; Clat forming loose mats over dry exposed rocks or on dry soil, usu on the sloping sides and tops of dry bluffs and cliffs. Fog			b	331	S
Schistostega pennata (Hedw.) Web. & Mohr	CR; Polk			b		D
Sticta arctica Degel.	CR; Clat			l		S
Teloschistes flavicans (Sw.) Norman	CR; Coos, Curr, Till on bark or wood in coastal headland forests			l		D
Tetraplodon mnioides (Hedw.) Bruch & Schimp. *in* B.S.G. Black-fruited stink moss, dung moss	CR, WC; Lane, Linc, Mari forming stiff, densely packed sods in old dung or soil and rotten wood enriched by dung, in peatlands as well as drier uplands such as forests, old clearcuts and along roads and trails. Ephemeral			b	161	D
Tritomaria exsectiformis (Breidl.) Loeske forest brownwort	WC; Desc, Jeff, Okan, Wash On peaty or humic soil or rotting wood, often on creek banks where perpetually shady, cool and moist	3200-5100 ft		b		S
Tritomaria quinquedentata (Huds.) Buch	CR; Clat Organic substrates where shady, cool, & moist. Soil over rock			b		S
TRACKING SPECIES (TS)						
Anomobryum filiforme (Dicks.) Solms in Rabenhorst	CR, WC; Bake, Clat, Klam			b	185	S
Barbilophozia barbata (Schmid.) Loeske	CR; Clat Peaty soil or organic substrate, often assoc. w/ rock outcrops			b		S

BLM Manual 6840 lichen and bryophyte species list (Continued)

SPECIES & STATUS	HABITAT	ELEV (FT)	BEST I.D. SEASON	TYPE	REF	6840
Bruchia bolanderi Lesq. Bolander's candle moss, Bolander's pygmy moss	WC; Clac, Desc, Lane, Klam occurring as individual plants among grasses, or forming large colonies in openings, on moist disturbed soil with organic content, shaded to partial sun in the subalpine zone. Montane meadows and streambanks. Disturbed sites with minimal vegetation			b		S
Bryoria bicolor (Ehrh.)Brodo & D. Hawksw.	CR; Clat, Till, Linc			l		S
Bryoria subcana (Nyl. Ex Stizenb.) Brodo & D. Hawksw	CR, WC; Bent, Clac, Clat, Coos, Lane, Till wet Picea, Abies and Pseudotsuga forest within 50 miles of coast	low-high		l		S
Fissidens grandifrons Brid.	CR, KM, WC; CA, BC, NV; Curr, Doug, Mult			b		S
Hedwigia stellata Hedenas	WC; Mari, Mult, Polk, Whee, Yamh			b		S
Ochrolechia subplicans (Nyl.) Brodo	CR; Clat			l		S
Pannaria rubiginosa (Ach.) Bory	CR, WC; Lane, Linc, Mari			l		D
Physcomitrium immersum Sull.	WV; CA, WA, BC, MB; Bent, Linn			b		S
Platyhypnidium riparioides (Hedw.) Dix.	CR, WC; Coos, Lane, Linc, Till			b	302	S
Pressia quadrata (Scop.) Nees Blister-ribbon	BM, WV; Bake, Mult, Wall terrestrial on damp mineral soil w/ other thalloid liverworts, sandy river, calcareous substrates			b		S
Pseudocyphellaria rainierensis Imshaug	CR, WC; Clac, Lane, Linc, Linn, Mari, Polk, Till usu on conifers, moist old-growth forests	low-mid		l		D
Rhizomnium nudum (Britt. & Williams) T. Kop.	CR, WC, BM; Bake, Clac, Linc, Linn, Wall			b		S
Thamnobryum neckeroides (Hook.) Lawt.	WC; Lane, Linn, Mult			b	245	S
Usnea hesperina Mot.	CR, WV; Bent, Coos, Curr, Doug, Jack, Lane, Linn, Till			l		S
Usnea rubicunda Stirton	CR; Coos, Lane, Linc, Till			l		S

Lichen, bryophyte and Vascular Survey and Manage species list

	CATEGORIES					
SPECIES	**A**	**B**	**C**	**D**	**E**	**F**
Lichens						
Rare Forage Lichen						
Bryoria tortuosa	x					
Rare Leafy (arboreal) Lichens						
Hypogymnia duplicata	x					
Tholurna dissimilis		x				
Rare Nitrogen-fixing Lichens						
Dendriscocaulon intricatulum		x				
Lobaria linita	x					
Nephroma occultum		x				
Pannaria rubiginosa						x
Pseudocyphellaria rainierensis	x					
Nitrogen-fixing Lichens						
Lobaria oregana	x					
Nephroma bellum						x
Pannaria saubinetii						x
Peltigera pacifica					x	
Pin Lichens						
Calicium abietinum		x				
Calicium adspersum					x	
Calicium glaucellum						x
Calicium viride						x
Chaenotheca chrysocephala		x				
Chaenotheca ferruginea		x				
Chaenotheca furfuracea						x
Chaenotheca subroscida					x	
Chaenothecopis pusilla					x	
Microcalicium arenarium		x				
Stenocybe clavata					x	
Riparian Lichens						
Cetralia cetrarioides						x
Collema nigrescens						x
Leptogium cyanescens	x					
Platismatia lacunosa				x		
Ramalina thrausta	x					
Usnea longissima	x					
Aquatic Lichens						
Leptogium rivale		x				

SPECIES	CATEGORIES A	B	C	D	E	F
Rare Oceanic-Influenced Lichens						
Buellia oidalea					x	
Hypogymnia oceanica						x
Niebla cephalota	x					
Pseudocyphellaria mougeotiana		x				
Teloschistes flavicans		x				
Usnea hesperina		x				
Oceanic-Influenced Lichens						
Pyrrhospora quernea					x	
Additional Lichen Species						
Heterodermia sitchensis					x	
Hygomnia vittiata					x	
Hypotrachyna revoluta					x	
Ramalina pollinaria					x	
Nephroma isidiosum					x	
Bryophytes						
Brotherella roelli					x	
Buxbaumia viridis				x		
Diplophyllum albicans				x		
Diplophyllum plicatum		x				
Encalypta brevicolla var. crumiana		x				
Herbertus aduncus		x				
Iwatsukiella leucotricha		x				
Kurzia makinoana		x				
Marsupella emarginata var. aquatics		x				
Orthodontium gracile			x			
Racomitrium aquaticum		x				
Rhizomnium nudum		x				

BLM Manual 6840 vascular plant species list

6840 (State Office list for Salem district) D=documented, S=suspected, U=unknown
Type: v=vascular plant
Ref: references for: vascular plants, Hitchcock vol: page

SPECIES & STATUS	HABITAT	ELEV (FT)	BEST I.D. SEASON	TYPE	REF	6840
FEDERAL PROPOSED ENDANGERED (FPE)						
Erigeron decumbens Nutt. var. *decumbens* Willamette daisy	WV; Bent, Clac, Lane, Linn, Mari, Polk, Wash, Yamh open places, seasonally wet prairies		June-July	v	5:174	S
FEDERAL PROPOSED THREATENED (FPT)						
Lupinus sulphureus var. *kincaidii* (Smith) Phillips Kincaid's lupine	WV, KM; WA; Bent, Doug, Lane, Linn, Mari, Polk, Wash, Yamh			v		S
FEDERAL THREATENED (FT)						
Castilleja levisecta Greenm. golden paintbrush	WV; Linn, Mari, Mult Wet or vernally wet meadows	<1000	April - Aug	v	4:310	S
Howellia aquatillis A. Gray	WV; Clac, Mari, Mult Shallow ponds and marshes	<200	May	v	4:491	S
Sidalcea nelsoniana Piper Nelson's sidalcea	CR, WV; Bent, Linn, Mari, Polk, Till, Wash, Yamh on gravelly, well-drained soil		May-July	v	3:428	D
STATE ENDANGERED						
Cordylanthus maritimus Nutt ex Benth. ssp. *palustris* (Behr) Chuang & Heckard Salt marsh bird's-beak	CR; Coos, Lane, Linc, Till			v	4:328	S
Delphinium leucaphaeum Greene white rock larkspur	WV; Clac, Mari, Mult dry bluffs, open ground, ditches & fencerow	<1000	May - early June	v	2:355	S
D*elphinium pavonaceum* Ewan peacock larkspur	WV; Clac, Mari, Mult, Bent, Polk roadsides, dry areas	<1500	May - June	v	2:362	S
STATE THREATENED						
Aster curtus Cronq. white-topped aster	WV; Clac, Linn, Mari, Mult. Prairies		July-Aug	v	5:80	S
Erythronium elegans Hammond & Chamb. Coast Range fawn lily	CR; Linc, Polk, Till open meadows to deep shade under conifers pink to white flowers	2500+	April-June	v	1:785	D
BUREAU SENSITIVE (BS)						
Agrostis howellii Scribn. Howell's bentgrass	WC, WV; Mult moist rocks		June-Aug	v	1:469	U
B*olandra oregana* S. Watson Oregon bolandra	WC; Mult (Columbia Gorge) moist mossy rocks usu. near waterfalls		May -June	v	3:3	S
Cimicifuga elata Nutt. tall bugbane	WV, WC: Clac, Linn, Mari, Mult Moist, cool, woods, north slopes, usu. assoc. w/ big leaf maple and sword fern	<2000	June-Aug	v	2:337	D
Corydalis aquae-gelidae Peck & Wilson cold-water corydalis	WC; Clac, Linn, Mari, Mult Cold springs and streams	>1000	Mid June-July	v	2:423	D
Cypripedium fasciculatum Kell. ex S. Watson clustered lady's-slipper	KM, WC, BM; CA, CO, ID, MT, WA, WY; Bake, Curr, Doug, Jack, Jose			v		U

BLM Manual 6840 vascular plant species list (Continued)

SPECIES & STATUS	HABITAT	ELEV (FT)	BEST I.D. SEASON	TYPE	REF	6840
Delphinium oreganum How. Willamette Valley larkspur	CR, WV, WC; Bent, Clat, Linn, Mari, Polk			v	2:346	D
Dodecatheon austrofrigidum Chamb. ined. frigid shootingstar	CR; Clat, Till shallow soils deposited on basaltic bedrock by floodwaters, or among mosses & short herbs which colonize moist rock			v	4:40	D
Erigeron howellii A. Gray Howell's daisy	WC; Clac, Mult Columbia Gorge moist & often rocky places		April-June	v	5:181	S
Erigeron oreganus A. Gray Oregon daisy	WC; Mult Columbia Gorge moist shady cliffs & ledges		July-Aug	v	5:185	U
Filipendula occidentalis (S. Watson) How. queen-of -the-forest	CR; Clat, Linc, Polk, Till full sun or partial shade, rock riverbanks just above high waterline, & rocky N-facing cliffs overlooking streams where seeps & crevices provide moisture		June - July	v	3:105	D
Horkelia congesta Douglas ssp. *congesta* shaggy horkelia	WV; Doug, Lane, Linn, Mari, Polk, Wash open sandy or rocky flats, sparsely wooded areas		April-June	v	3:117	S
Montia howelli S. Watson Howell's montia	CR, WV, WC; Clac, Linn, Mult rocky river banks esp. in disturbed sites	<2500	April - early May	v	2:240	S
Sullivantia oregana S. Watson Oregon sullivantia	WV, WC; Clac, Mult moist cliffs esp. near waterfalls		May-August	v	3:58	S
ASSESSMENT SPECIES (AS)						
Anemone oregana Gray. var. *felix* (Peck) C.L. Hitchc. bog anemone	CR; Linc, Polk moist wood to open hillsides, cool moist grassy areas with a high water table		May-Aug	v	2:329	D
Arabis sparsiflora Nutt. Var. *atrorubens* (Greene) Roll. Sickle-pod rockcress	WC; Mult		April-June	v	2:455	U
Botrychium minganense Vict. gray moonwort	WC, EC, BM, BR; CA, ID, WA; Bake, Croo, Gran, Harn, Hood, Linn, Unio, Wall, Wasc, Whee riparian zones w/ old-growth Thuja plicata, dense shade but also in meadows, alder thickets, shrublands, roadcuts			v	1:	U
Carex comosa Boott	WV; Colu, Jose, Mult marshes, lake shores, wet meadows		May-July	v	1:255	U
Carex livida (Wahl.) Willd. Pale sedge	CR, WC: Clac, Mult peat bogs, swampy woods	low		v	1:285	S
Carex macrochaeta C.A. Mey. Alaska long-awned sedge	CR, WC; Mult moist or wet open places often near beaches		June-Aug	v	1:289	S
Carex pluriflora Hulten many-flowered sedge	CR; Clat marshes, streambanks, boggy shores near the coast		June-July	v	1:311	S
Castilleja rupicola Piper cliff paintbrush	WC; Clac, Desc, Lane, Linn, Mari, Mult perpendicular cliffs and rocky slopes	4000-7000 ft.	June-Aug	v	4:321	S
Cicendia quadrangularis (Lam.) Griseb. timwort	CR, KM; CA; Coos, Doug, Lane, Linn			v		S

BLM Manual 6840 vascular plant species list (Continued)

SPECIES & STATUS	HABITAT	ELEV (FT)	BEST I.D. SEASON	TYPE	REF	6840
Delphinium nuttallii A. Gray Nuttall's larkspur	WC; Clac, Mult gravelly outwash "prairies", basaltic cliffs		May-June	v	2:360	S
Dryopteris filix-mas (L.) Schott male fern	CR, WC, BM, OU; CA, WA, ID; Bake, Colu, Malh, Umat, Unio, Wall, Wasc thickets, moist woods, streambanks			v	1:75	S
Erigeron peregrinus (Pursh) Greene ssp. *peregrinus* var. *peregrinus* wandering daisy	CR; Clat, Till moist meadows, streamsides, or bogs	mid-high	July-Aug	v	5:186	S
Eriophorum chamissonis C.A. Mey. russet cotton-grass	CR; Clat, Coos, Lane, Linc, Till swamps & other wet places in mountains	mid		v	1:361	S
Fritillaria camschatcensis (L.) Ker-Gawl	CR, WC; Linc, Mult, Polk moist areas near tideflats to wet mtn. meadows. Mid-elev. cool sphagnum bogs		May-July	v	1:791	D
Geum triflorum Pursh var. *campanulatum* (Greene) C.L. Hitchc western red avens	CR; Clat moister spots in sagebrush plains and low foothills to subalpine ridges and talus		April-Aug	v	3:115	S
Hydrocotyle verticillata Thunb. whorled marsh-pennywort	CR, WV; CA; Bent, Coos, Curr, Doug wet ground			v	3:535	S
Isopyrum stipitatum A. Gray dwarf isopyrum	CR, WV; Bent, Doug, Jack, Mari, Polk, Yamh shady areas		Feb-May	v	2:366	S
Lewisia columbiana (How.) Robins. var. *columbiana* Columbia lewisia	WC; Mult exposed gravel banks and rocky slopes		May-Aug	v	2:232	S
Lewisia columbiana (How.) Robins. var. *rupicola* (Engl.) C.L. Hitchc. Rosy lewisia	CR; Clat, Till		May-Aug	v	2:232	S
Limonium californicum (Boiss.) A.A. Heller western marsh-rosemary	CR; CA; Coos, Linc			v		S
Lycopodiella inundata (L.) Holub bog club moss	CR, WC, EC; Clac, Coos, Doug, Klam, Lane, Linc, Linn acid bogs and wet meadows			v		D
Lycopodium complanatum L. ground cedar	WC; Clac, Mari, Mult Moist forests	>3000		v	1:25	S
Microseris bigelovii (A. Gray) Sch. Bip. coast microseris	CR; CA, WA; Coos, Curr, Lane, Linc open, rather moist places		May-June	v	5:268	U
Poa unilateralis Scribn. San Francisco bluegrass	CR; Linc dunes, open facing cliffs			v	1:674	S
Scirpus subterminalis Torr. water clubrush	CR, WC; CA, ID, WA; Doug, Coos, Jack, Klam, Lane, Linc, Linn			v		U
Stellaria humifusa Rottb. creeping chickweed	CR; WA; Lane, Linc along coast esp. in salt marshes		June-Aug	v	2:306	D
Taushia stricklandii (Coult. & Rose) Math. & Const. Strickland's tauschia	WC Mult meadows and moist slopes	high		v	3:585	U

BLM Manual 6840 vascular plant species list (Continued)

SPECIES & STATUS	HABITAT	ELEV (FT)	BEST I.D. SEASON	TYPE	REF	6840
Wolffia borealis (Hegelm.) Landolt & O. Wildi dotted water-meal	WV; WA; Bent, Lane, Polk			v		D
Wolffia columbiana Carst. Columbia water-meal	WV, WC; Clac, Linn, Mult aquatic			v	1:735	S
TRACKING SPECIES (TS)						
Abronia latifolia Eschsch. yellow sandverbena	CR; Clat, Coos, Curr, Doug, Lane, Linc, Till coastal beaches	low	May-Aug	v	2:222	D
Allium unifolium Kell. One-leaved onion	WV: Polk, Yamh (near Willamina) moist soils		May-July	v	1:758	S
Carex macrocephala Willd. ex Spreng. bighead sedge	CR; Clat, Coos, Doug, Linc, Till sandy beaches and dunes along coast		June-Sept	v	1:287	D
Cypripedium montanum Douglas mountain lady's-slipper	WV, WC, EC, BM; Jack, Jeff, Jose, Klam, Lake, Lane, Mari, Morr, Unat, Unio, Wall, Wasc, Whee dry to fairly moist, open to shrub or forest covered valleys or mountain sides	Low - mod	May - Aug	v	1:833	S
Darlingtonia californica Torr. California pitcher-plant	CR; Coos, Curr, Doug, Jose, Lane, Linc, Till bogs along coast and inland esp. by trickling streams		June-Aug	v	2:563	S
Douglasia laevigata A.Gray smooth-leaved douglasia	WC; Clac, Mari, Mult, Linn Rock crevices on wet cliffs. Talus slopes to rocky ledges	Mod - high	June - July	v	4:47	D
Elodea nuttallii (Planchon) H. St. John Nuttall's waterweed	WC, WV; Colu, Lake, Lane, Mult fresh to slightly brackish water			v	1:152	S
Erythronium revolutum Smith coast fawn-lily	CR; Clat, Coos, Curr, Bent, Doug, Lane, Linc, Polk, Till, Yamh Along river banks or in edge of woods in open or mod. shade. More freq. near coast		April - May	v	1:790	D
Euonymus occidentalis Torr. Western wahoo	WV, WC; Clac, Mult			v	3:409	D
Huperzia occidentalis (Clute)Beitel= *Lycopodium selago* fir club moss	WC: Clac, Hood, Linn, Mari, Mult, Wall, Wasc humid exposed cliffs & talus slopes to streambanks & dense moist woods			v	1:27	D
Juncus kelloggii Engelm. Kellogg's dwarf rush	WV; Colu, Hood, Jose, Linn, Mari moist banks damp areas in open fields, montane meadows, edge of vernal pools	mid	April-July	v	1:199	S
Lathyrus holochlorus (Piper) C.L. Hitchc. thin-leaved peavine thin-leaved peavine	WV; Bent, Clac, Lane, Linn, Mari, Polk, Yamh fencerows and partially cleared land		May-July	v	3:282	D
Montia diffusa (Nutt.) Greene branching montia	WV, WC; Clac, Linn, Mari, Mult moist woods, recently burned areas	<3500	April-July	v	2:239	D
Parvisedum pumilum (Benth.) Clausen sierra mock-stonecrop	WV; Mult?			v		
Poa laxiflora Buckl. Loose-flowered bluegrass	CR, WC; Clac, Mult, Bent. Moist woods to rocky open slopes.	Low	June	v	1:666	D

SPECIES & STATUS	HABITAT	ELEV (FT)	BEST I.D. SEASON	TYPE	REF	6840
Poa marcida Hitchc. weak bluegrass	CR, WC; Clac, Clat, Linc,Mult, Polk, Till, Yamh Moist areas in coastal mountains		June - July	v	1:669	D
Rhinanthus crista-galli L. yellow rattle	CR; Clat, Till Meadows, fields, and moist slopes	various	June - Aug	v	4:411	S
Sidalcea campestris Greene meadow sidalcea	CR, WV; Clac, Linn, Mari, Mult fencerows and roadsides	<1000	Late June - July	v	1:426	D
Spirodela punctata (G. Meyer) C. Thompson dotted water-flaxseed	CR, WV?; Bent, Clat, Doug quiet water			v	1:735	
Synthyris schizantha Piper fringed synthyris	CR; Clat, Till moist, often shaded cliffs and ledges in the mountains		May-Aug	v	4:416	U
Vaccinium oxycoccuus L. Va	CR, WC; Clac, Linn, Mari, Mult. Sphagnum bogs	Low - mod	May - July	v	4:34	D
Verbena hastata L. Blue verbena	WV, WC; Clac, Mult			v	4:244	U

Vascular plant Survey and Manage species list

				CATEGORIES		
SPECIES	A	B	C	D	E	F
Botrychium minganense	x					
Botrychium montanum	x					
Coptis asplenifolia	x					
Coptis trifolia		x				
Corydalis aqua-gelidae			x			
Cypripedium fasciculatum			x			
Cypripedium montanum			x			
Eucephalus vialis	x					
Galium kamstchaticum	x					
Plantanthera orbiculata			x			

Noxious weed list

SCIENTIFIC NAME	COMMON NAME	BEST ID. SEASON
PRIORITY I SPECIES - POTENTIAL NEW INVADERS		
Carduus pycnocephalus	Italian thistle	May - June
Carthamus lanatus	distaff thistle	
Carthamus leucocaulos	whitestem distaff thistle	
Centaurea solstitialis	yellow starthistle	
Centaurea virgata	squarrose knapweed	
Chondrilla juncea	rush skeletonweed	mid July - Frost
Centaurea calcitrapa	purple starthistle	
Centaurea iberica	Iberian starthistle	
Carduus tenuiflorus	slenderflower thistle	
Lythrum salicaria	purple loosetrife	Aug. - Sept.
Silybum marianum	milk thistle	Late April - Early June
Linaria vulgaris	yellow toadflax	June-Sept
PRIORITY II SPECIES - ERADICATION OF NEW INVADERS		
Centaurea diffusa	diffuse knapweed	July - Sept.
Centaurea maculosa	spotted knapweed	July - Oct.
Centaurea pratensis	meadow knapweed	July - Oct.
Ulex europarus	gorse	April - Sept.
Linaria dalmatica	dalmation toadflax	
PRIORITY III SPECIES - ESTABLISHED INFESTATIONS		
Cirsium arvensis	Canada thistle	July - Aug
Cirsium vulgare	bull thistle	July - Sept
Cytisus scoparius	Scotch broom	May - June
Dipspacus sylvestris	teasel	July - Oct
Hedera helix	English ivy	year round
Hypericum perforatum	St. Johnswort	June - July
Ilex aquifolium	English holly	year round
Rubus discolor	Himalayan blackberry	year round
Rubus laciniatus	evergreen blackberry	year round
Phalaris arundinacea	reed canary grass	June - Sept
Polygonum sachalinense	giant knotweed	June - Oct
Senecio jacobaea	tansy ragwort	July - Sept
Senecio sylvaticus	wood groundsel	June - Sept

APPENDIX 9

ESTIMATED ACRES OF SOIL DISTURBANCE AND NET SOIL PRODUCTIVITY LOSS

Forest soil productivity may be defined as the capacity of a soil to sustain plant growth. Currently there is limited data available quantifying the long-term effects on soil productivity from forest management activities. Quantifying the effects of soil disturbance on long-term soil productivity is difficult because of its variability and complexity. It is dependent on various interacting facts such as climate, soil properties, organic matter, living organisms, topography and management practices. Long-term soil productivity (LTSP), focusing mainly upon organic matter and compaction, is currently being conducted by the BLM, Forest Service, and major universities and government worldwide. There has been no study completed for an entire rotation. Most research studies have reported reductions in height and diameter grown of generally 5%to 50% on conifer species with increasing compaction or bulk density. But the results have been mixed. Recently several researchers have found some short-term (less than 10 years) reductions but no long-term reductions in tree growth with increasing bulk density. Favorable soil and climate conditions may potentially compensate some of the adverse effects of soil compaction and disturbance.

The following assumptions were used to predict soil productivity losses.
1. Existing roads, skid trails and landings would be used as much as practically possible.
2. Ground disturbance from designated skid trails and landings would be limited to less than 10% in each timber harvest unit. (This estimate assumes an average skid trail width of about 12 feet and an average spacing of 150 feet.)
3. Implementing appropriate design features and BMPS would result in mostly light to moderate soil compaction on skid trails and cable yarding corridors and little top soil displacement.
4. Operating ground-based equipment would result in a loss of soil productivity of about 30% from compacted surfaces (skid trails & landings). This estimate is based on an unpublished, 1981 MS on file at the BLM Salem District Office titled “Impacts of Subsoiling on Soil Compaction” by William E. Power. The study compared measured volume difference on 50 to 60 year old Douglas fir on severely compacted landings and railroad beds compared to undisturbed areas. Assuming that the project design features and appropriate BMPs are fully implemented, it is expected that most of the compaction on skid trails would be light to moderate and little top soil lost. Losses in productivity for this project are likely to be less 30% due lower compaction level expected and more favorable soil and climate conditions than the research study area.
5. Cable yarding in Section 3, done with a large standing skyline, would create a narrow (less 4 feet wide) trail resulting in about 3% to 5% ground disturbance including about 2.6 acres in landings, and resulting in productivity loss, after subsoiling the landings, of 2%.
6. Cable yarding in all other cable units except Section 3, done with a swing yarder, would create a narrow (less 4 feet wide) trail resulting in about 2% to 4%ground disturbance and resulting in productivity loss of 1%.
7. Average road disturbance width = 23 feet.

8. Average road compaction width = 16.1 feet
9. Ripping natural surfaced roads and natural surfaced landings would mitigate 50% of the negative effects of soil compaction. Consequently, 1) ripping new construction, temporary, natural surfaced roads would reduce soil productivity by 50%. 2) ripping existing natural surfaced roads would improve soil productivity by 50%.

Table 1. Alternative 2, Density Management Soil Disturbance

Section Number Affected	Treatment Area Ground/ Cable (Acres)	Soil Disturbance from Timber Harvest Activities (Acres)				Soil Disturbance from Road Construction and Decommissioning (Acres)		Total Disturb-ance
		Ground - Based	Cable	New Perm. Road	Temp. Road (Semi-	Road Recon-struction	Addi-tional Road	
1	0/0	0.0	0.0	0.0	0.0	0.0	0.0	0
3	52/163	5.2	6.5	0.0	3.0	0.4	1.1	16.2
5	58/70	5.8	2.1	0.0	3.4	0.6	0.5	12.4
8	3/0	0.3	0.0	0.0	0.0	0.0	0.0	0.3
9	78/45	7.8	1.3	0.0	3.9	0.9	1.6	15.5
15	49/27	4.9	0.8	0.0	0.7	1.2	0.3	7.9
Total	240/305=	24.0	10.7	0.0	11.0	3.1	3.5	52.3

Table 2. Alternative 2, Density Management Soil Productivity

Section Number Affected	Soil Productivity Loss (Acres)				Soil Productivity Gain (-Acres)		Total Loss in Produc-tivity (Acres)
	Ground-Based	Cable	New Perm. Road	Temp. Road (Semi-perm)	Road Recon-struction	Road Decom.	
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	1.8	3.3	0.0	0.5	-0.3	-0.6	4.7
5	2.0	0.7	0.0	0.0	-0.4	-0.6	1.7
8	0.1	0.0	0.0	0.0	0.0	0.0	0.1
9	2.7	0.5	0.0	0.8	-0.6	-0.5	2.9

15	1.7	0.3	0.0	0.2	-0.9	-0.4	0.9
Total	8.4	4.7	0.0	1.5	-2.2	-2.1	10.3

Table 3. Alternative 3, Density Management- Soil Disturbance

Section Number Affected	Treatment Area (Acres)	Soil Disturbance from Timber Harvest and Road Reconstruction (Acres)			
		Helicopter Yarding	Landings	Road Recon-struction	Total Disturbance
1	0	0.0	0.0	0.0	0.0
3	222	4.4	0.5	0.0	4.9
5	140	2.8	0.5	0.0	3.3
8	18	0.4	0.5	0.0	0.9
9	77	1.5	0.5	0.1	2.1
15	94	1.9	0.5	0.0	2.4
Total	551	11.0	2.5	0.1	13.6

Table 4. Alternative 3, Density Management Soil Productivity

Section Number Affected	Soil Productivity Loss			Soil Productivity Gain (-Acres)	Productivity Loss Rocked/Natural (Acres)
	Helicopter Yarding	Landings If Rocked	Landings If Natural	Road Reconstruction	
1	0	0.0	0.0	0.0	0.0/0.0
3	negligible	0.5	0.3	0.0	0.5/0.3
5	negligible	0.5	0.3	0.0	0.5/0.3
8	negligible	0.5	0.3	0.0	0.5/0.3
9	negligible	0.5	0.3	0.0	0.5/0.2
15	negligible	0.5	0.3	0.0	0.5/0.3

Total	negligible	2.5	1.5	0.0	2.5/1.5

Table 5. **Alternative 3, Watershed Restoration and Road Management Soil Disturbance**

Section Number Affected	Total Soil Disturbance from Road Decommissioning (Acres)
1	0.0
3	1.8
5	1.1
8	0.0
9	1.8
15	0.0
Total	4.7

Table 6. **Alternative 3, Watershed Restoration and Road Management - Soil Productivity**

Section Number Affected	Total Increase in Soil Productivity from Decommissioning Existing Road (Acres)
1	0.0
3	1.0
5	0.6
8	0.0
9	0.9
15	0.0
Total	2.5