

Aquatic Species and Associated Habitat

An Aquatic Biological Evaluation was completed as part of this analysis. The entire Biological Evaluation is incorporated by reference and is located in the project record, located at the Hood River Ranger District. The analysis and conclusions of the evaluation are summarized below. Reference material is contained in the full biological evaluation.

Existing Conditions

The North Fork Mill Creek Restoration Project is located on the Mt. Hood National Forest in T1S, R10E (Hood River County) and T1S, R11E (Wasco County). The planning area is approximately 6600 acres in size. Vegetation includes mixed conifer forests, meadows, and open grassy slopes. Average annual precipitation ranges from 50 inches on the westside to 30 inches on the eastside, occurring mostly during the winter months. Elevation ranges from 2,200 to 4,200 feet. The area supports a wide variety of human uses, including recreation, wood products, and grazing. The area is important for fisheries, wildlife, plant, and other natural values.

The planning area is located within portions of three 7th field watersheds: West Fork Neal Creek, Mosier Creek and North Fork Mill Creek. All of the above mentioned 7th field watersheds are located within the Neal Creek, Upper Mosier Creek and North Fork Mill Creek 6th field watersheds, respectively. The 5th field watersheds include Lower Hood River, Mosier Creek and Middle Columbia/Mill Creek. The North Fork Mill Creek 7th field watershed is part of the Mill/Fivemile/Eightmile Creeks Tier 1 Key Watershed as identified in the Northwest Forest Plan.

There are many streams, springs and wetlands located within these sub-watersheds. The primary streams include West Fork Neal Creek, Mosier Creek, and North Fork Mill Creek. There are approximately 90 miles of stream in the National Forest portion of these 7th field watersheds in the following categories: 46 miles of perennial streams (flow year around) and 44 miles of intermittent streams (streams that dry up for part of the year and generally do not contain fish).

The majority of proposed project activities lie within the Forest; however, there are several proposed culvert replacements in West Fork Neal Creek and one in Neal Creek below the Forest boundary. In these two streams, therefore, the analysis area (the area where potential effects could extend) extends two river miles downstream of the lowest culvert replacement site. For other activities in North Fork Mill Creek and Mosier Creek, the analysis area extends to the Forest boundary, but not beyond.

There is one culvert replacement in Alder Creek included in this proposal, which lies within the South Fork Mill Creek 7th field watershed. The analysis area for this culvert site extends downstream to Crow Creek Reservoir, approximately 1.5 miles downstream.

Aquatic Species Presence/Absence and Distribution

Fish Species: Only one fish species listed as threatened or endangered is known¹ to be present in streams within the analysis area. Middle Columbia River Evolutionary Significant Unit (ESU) steelhead trout (*Oncorhynchus mykiss*), listed as a threatened species, is found within North Fork Mill Creek in the analysis area (Figure 3-14). Lower Columbia River steelhead trout, also listed as threatened, reside in Neal Creek and West Fork Neal Creek, but well below the analysis area (two or more miles downstream). Cutthroat trout (*O. clarki*), likely the coastal variety, and resident rainbow trout (*O. mykiss*), both Management Indicator Species (MIS) in the Mt. Hood National Forest Land and Resource Management Plan (LRMP), are present in Neal, West Fork Neal, and North Fork Mill Creeks within the analysis area. Cutthroat trout are also known to reside in Alder Creek. The resident rainbow trout in North Fork Mill Creek are suspected to be the redband subspecies, which is a Regional Forester's Special Status species.

Aquatic Macroinvertebrates: There are three Regional Forester's Special Status aquatic mollusk species that are present or suspected to reside within the analysis area: the Columbia dusksnail (*Colligyrus sp. nov. 1*), Barren Juga (*Juga hemphilli hemphilli*), and the Purple-lipped Juga (*Juga hemphilli maupinensis*). One caddisfly species, Scott's Apatanian caddisfly (*Allomyia scotti*), has recently been added to the Regional Forester's Special Status species list.

Detailed descriptions of fish and macroinvertebrate distribution relative to the North Fork Mill Creek analysis area follow. Fish species are discussed by stream, macroinvertebrates are discussed separately.

North Fork Mill Creek

Fish present in North Fork Mill Creek include cutthroat trout, resident rainbow trout, and Middle Columbia River ESU steelhead trout. Middle Columbia River ESU steelhead trout are found in North Fork Mill Creek at least up to river mile (RM) 9.75, well within the analysis area (Figure 3-14 and Table 3-47). Steelhead spawning was confirmed by the presence of a redd in 2005 just above the 1711-630 road crossing (MHNF, unpublished data). This is noteworthy as the 1711-630 road crossing was an impassible barrier to upstream fish migration until it was replaced with a bottomless arch in 2004. Given current habitat conditions (see Habitat Condition discussion below) steelhead presence is suspected up to RM 10.5.

Electrofishing surveys indicate cutthroat trout and possibly rainbow trout reside in North Fork Mill Creek from the mouth to the headwater forks (MHNF, unpublished data, Figure 3-15). Field staff from the Forest noted there appeared to be "cutthroat-rainbow hybrids" in the headwater forks (MHNF, unpublished data). Genetic analysis of salmonids from Mill Creek indicated a mixed population of redband and cutthroat trout immediately below the confluence of the North and South Forks, predominantly redband trout. Progressing downstream, cutthroat trout presence dissipated giving way to a pure redband population. Rainbow trout identified as redband had a high frequency of the redband allele, thus Forest Service personnel assume they are the inland variety (Spruell et al. 1998, Gregg et al. 1995). The presence of cutthroat trout populations above the limits of anadromous fish use is a common pattern of species distribution in watersheds in

¹ The terms "known" and "suspected" are used to describe fish and other aquatic fauna distribution in this document. Known presence describes areas where a species has been documented. Areas of known presence could also be defined as occupied habitat. Suspected presence describes areas where a species has not been documented, but fisheries biologists believe they are present.

this area (Steve Pribyl, ODFW [retired], personal communication). It is the professional opinion of the Hood River and Barlow Ranger District zone fisheries biologist that salmonids in North Fork Mill Creek upstream from the Forest boundary are predominantly cutthroat trout (Gary Asbridge, USFS, personal communication). Further genetic analysis is warranted to determine the salmonid species observed by surveyors in the headwaters of North Fork Mill Creek. For this analysis, resident rainbow trout distribution is assumed to be identical to steelhead distribution.

West Fork Neal Creek

Salmonids known to be present in West Fork Neal Creek include resident coastal rainbow trout, Lower Columbia River ESU steelhead trout, cutthroat trout, and a naturalized population of brook trout (*Salvelinus fontinalis*). Steelhead are known to spawn within the first mile of West Fork Neal Creek (Holly Coccoli [retired], Hood River Watershed Group, personal communication), but adult steelhead have never been documented further upstream (Table 3-47). Their uppermost distribution ends at RM 2.5 due to natural gradient barriers, small stream size, and a lack of suitable spawning habitat (Steve Pribyl [retired], ODFW, personal communication). This distribution of steelhead spawning and rearing habitat is corroborated by StreamNet, which lists the upper limit as RM 2.52 (StreamNet, 2008). There are also five culverts that are upstream migration barriers between this point and National Forest system lands; the lowest located at approximately RM 5.5 (Figure 3-14) (Asbridge et al., 2001).

Forest Service personnel discovered what were believed to be cutthroat trout during electrofishing surveys in West Fork Neal Creek from RM 6.45 to the headwater forks (MHNF, unpublished data, Figure 3-15). Stream habitat surveyors also observed salmonids, likely cutthroat trout, throughout their survey from RM 2.3 to the headwaters at RM 8.8, and they appeared to be more abundant above a section of dry channel located between RM 5.9 and 6.4 (USFS, 1999). Fish studies to date have not determined whether trout found in the headwaters are cutthroat or rainbow trout. The fish observed in the headwaters morphologically appear to be cutthroat, but there could be rainbows in the population. For this analysis, fish in the headwaters are assumed to be cutthroat trout and rainbow trout distribution is assumed to be the same as steelhead.

Neal Creek

Lower Columbia River ESU steelhead trout in Neal Creek have been documented a half mile above the confluence with West Fork Neal Creek, where a culvert that was a probable barrier used to exist (Figure 3-14 and Table 3-47). Based on a field visit on March 17, 2003, it is the professional judgment of Forest Service fish biologists that steelhead are unlikely to ascend the steep, cascading section of Neal Creek that begins at approximately RM 6.0 (the confluence with West Fork Neal Creek is at RM 5.1). This point appears to be at or near the upper limit of steelhead and rainbow trout distribution in Neal Creek. It is believed that steelhead spawn in Neal Creek no higher than one mile upstream of the West Fork Neal Creek mouth (Steve Pribyl [retired], ODFW, personal communication).

Oregon Department of Fish and Wildlife (ODFW) stream survey personnel noted “trout fry (steelhead?)” throughout their survey of Neal Creek from its confluence with West Fork Neal Creek at RM 5.1 to RM 8.8 (ODFW, 1993). These “trout fry” were probably cutthroat trout which are present to at least RM 8.8, where an impassable culvert exists (Steve Pribyl [retired], ODFW, personal communication, Figure 3-15). Genetic analysis of fish in the main-stem of Neal

Creek below the confluence with West Fork Neal Creek indicates coastal rainbow trout only (Kostow, 1994). ODFW personnel found both juvenile and adult “rainbow/steelhead” in Neal Creek at RM 1.5 and at RM 5.0, and found adult cutthroat trout at RM 5.0 as well (Olsen et al., 1995).

Alder Creek

Salmonids known to be present in Alder Creek are cutthroat trout (Figure 3-15). Forest Service personnel observed cutthroat trout while electrofishing and made ocular observation of salmonids during surveys in Alder Creek from RM 1.5 to RM 1.7 (MHNF, unpublished data). Stream habitat surveyors also observed cutthroat trout during their survey up to river mile 1.8 which is above the 1721 road culvert (USFS, 1998). The 1721 road was identified as a fish passage barrier during a 2000 survey resulting in a fragmented population of cutthroat in Alder Creek (Asbridge et al., 2001).

Table 3-47: Summary of pertinent information for steelhead trout (the only federally listed aquatic species in the vicinity) distribution and stream reaches relative to the North Fork Mill Creek analysis area.

| | Neal Creek | West Fork Neal Creek | North Fork Mill Creek | Alder Creek¹ |
|--|---|--|--|---|
| Reach of stream within National Forest system lands | None | RM 6.45 – 8.8 | RM 6.4 – 13.0 | RM 0.0 – 2.7 |
| Reach of stream within the analysis area | RM 6.8 – 8.8 | RM 3.5 – 8.8 | RM 6.4 – 13.0 | RM 0.0 – 1.5 |
| Upper limit of known steelhead presence | RM 5.6 | RM 1.0 | RM 9.75 | NA |
| Upper limit of suspected steelhead presence | RM 6.0 | RM 2.5 | RM 10.5 | NA |
| Upper limit of steelhead critical habitat | RM 5.8 | RM 2.5 | RM 9.0 | NA |
| Distance (RM) from closest planned activity to suspected (uppermost) steelhead presence or critical habitat, whichever is further upstream | 2.8 miles (culvert replacement on the 1710 road crossing) | 3.0 miles (Lowest stream crossing on the 1700 road. Culvert is proposed for replacement and road is a haul route.) | 0.0 miles (Underburning is proposed along the north side of the creek. Note the closest culvert replacement site is 1.5 miles upstream of suspected steelhead distribution.) | NA (Note that cutthroat trout are present from the mouth upstream to the culvert proposed for replacement.) |

¹ Steelhead trout are not present in Alder Creek.

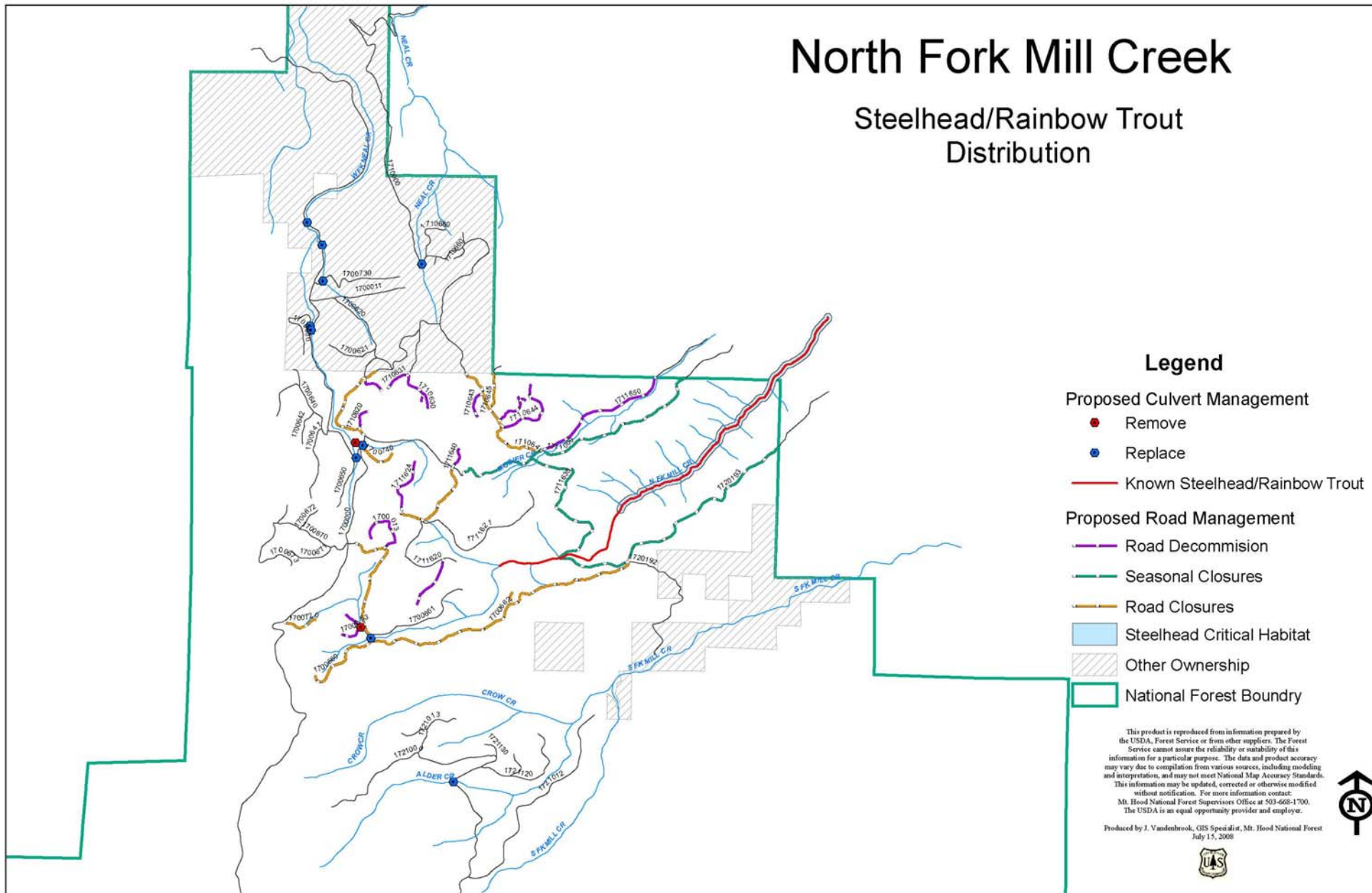


Figure 3-14: Steelhead/Rainbow Trout District in Planning Area

North Fork Mill Creek

Cutthroat Trout Distribution

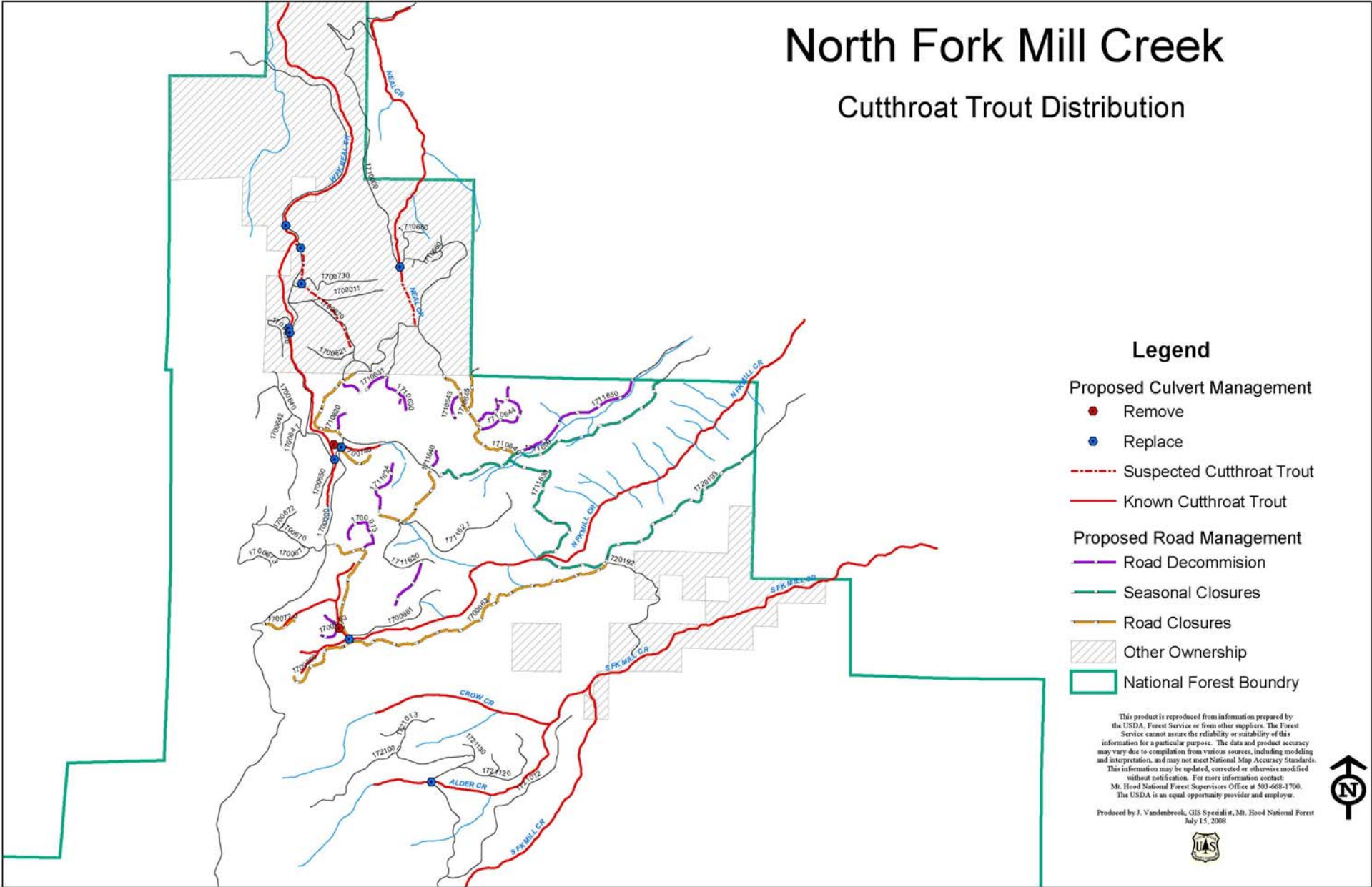


Figure 3-15: Cutthroat Trout Distribution in planning area

Aquatic Macroinvertebrates

Mollusks: The Columbia dusksnail is a Regional Forester's Special Status species and Northwest Forest Plan rare and uncommon aquatic mollusk. The Columbia dusksnail is found primarily in cold, well oxygenated perennial springs and spring outflows in shallow, slow-flowing areas. Most of the Columbia dusksnails found on the Forest have been in such habitat, although many have been found in small, non-glacial creeks as well. The substrate of known sites ranges from silt to cobble, and there seems to be a strong association with aquatic moss, especially *Fontinalis*. Often the snails are on the "fronds" of this moss. There doesn't appear to be an association with other aquatic macrophytes. Individuals have not been found in larger streams and rivers, or glacial streams of any size.

Distribution in the planning area appears to be limited. Columbia dusksnails have been found in West Fork Neal Creek near the headwaters during past surveys conducted by Forest personnel (MHNF, unpublished data). No other sites in West Fork Neal Creek were sampled. It is probable that the snails are found up and downstream in West Fork Neal Creek, but their overall distribution is unknown. Several sites were surveyed in the North Fork Mill Creek 7th field watershed, but no Columbia dusksnails were found. For the purposes of this analysis, Columbia dusksnails are considered present in West Fork Neal Creek, but not in Mosier or North Fork Mill Creeks. Presence in Alder Creek is assumed due to confirmed presence in South Fork Mill Creek nearby, although surveys have not been conducted (see below).

The Barren Juga and Purple-lipped Juga were recently added to the Regional Forester's Special Status species list and surveys were not conducted specifically for these two species. Both species prefer low elevation streams with stable gravel substrate and cold, oxygen rich water. The Barren Juga prefers small to medium size streams whereas the Purple-lipped Juga prefers larger streams. Given that, it is more likely that the Barren lipped Juga would be present in the planning area, but the presence of both species is possible.

The 2001 Survey and Manage Record of Decision (Standards and Guidelines, page 22) gives flexibility to survey or not survey for rare and uncommon species (Columbia dusksnail and Basalt Juga) – "The line officer should seek specialists' recommendations to help determine the need for a survey based on site-specific information. In making such determination, the line officer should consider the probability of the species being present on the project site, as well as the probability that the project would cause a significant negative effect on the species habitat or the persistence of the species at the site." (USFS and Bureau of Land Management (BLM), 2001).

Surveys for Regional Forester's Special Status and rare and uncommon aquatic mollusks were not conducted in all streams as part of this project, even though the Columbia dusksnail is known to occur in many streams on the District including those within the proposed project area. Because the Columbia dusksnail was found in South Fork Mill Creek, it is likely present in Alder Creek. Habitat conditions appear suitable for the Barren Juga in all streams within the planning area, whereas the Purple-lipped Juga would likely only be found in the lower reaches of North Fork Mill Creek, if at all. The Basalt Juga, a rare and uncommon species, has never been found during any survey on the Forest. Riparian reserve standards and guidelines and project design criteria/mitigation measures are sufficient to provide for the habitat needs of this species. Anticipated effects of implementing the action alternatives would not significantly affect habitat

or species persistence at each site, and thus the line officer (Responsible Official for this project) decided to not conduct surveys throughout the analysis area.

Scott's Apatanian Caddisfly: Little is known about the specific habitat requirements and distribution of this aquatic insect. In general, caddisflies prefer streams with cold water and gravel/cobble substrate. As such, most streams in the planning area would be suitable habitat for this species. Surveys were not conducted for this caddisfly, but their presence is assumed for the purposes of this analysis.

Threatened, Endangered, and Sensitive (TES) Aquatic Species Not Addressed in this Document

Bull Trout: There are no historic or current observations of Columbia River bull trout (*Salvelinus confluentus*), listed as threatened, in Neal Creek or West Fork Neal Creek (Buchanan et al., 1997). Bull trout have never been documented in Mosier Creek or North Fork Mill Creek (Jen Clark, Wasco County Soil and Water Conservation District, personal communication). Water temperatures are likely too high to support bull trout in any of these streams. Also, there is no designated bull trout critical habitat in any of these streams. As such, proposed activities in the North Fork Mill Creek planning area would have no effect on bull trout and they will not be discussed further.

Coho Salmon: Coho salmon (*O. kisutch*), listed as threatened, are known to occur in both Neal Creek and Mill Creek. However, in Neal Creek they have never been documented above the confluence with West Fork Neal Creek and are not believed to ascend past the confluence. Therefore, their presence is over 3.5 miles downstream of the proposed culvert replacement on the 1710 road, and well over 5.0 miles downstream of the closest proposed activity in the West Fork Neal Creek drainage. Similarly, coho salmon are known to occur in Mill Creek as well as short distances upstream in the North and South forks. Critical habitat for coho salmon has not been designated. Proposed activities in the North Fork Mill Creek planning area would have no effect on coho salmon because their upper limit of distribution is below the analysis area and they will not be discussed further.

Lower Columbia River Chinook salmon: Lower Columbia River ESU Chinook salmon do not reside in Neal Creek or West Fork Neal Creek. They do not ascend the Columbia River past the Hood River Basin. As such, they will not be discussed further.

Upper Willamette Chinook salmon: Upper Willamette River ESU Chinook salmon do not reside in the analysis area or downstream. As such, they will not be discussed further.

Designated Critical Habitat and Essential Fish Habitat

Critical habitat for several evolutionary significant units for steelhead trout and Chinook salmon was designated in September 2005 by the National Marine Fisheries Service (NMFS) (70 Federal Register 52630, September 2, 2005). Steelhead critical habitat has been designated in North Fork Mill Creek, Neal Creek, and West Fork Neal Creek. Steelhead critical habitat in Neal and West Fork Neal Creeks is essentially the same as suspected steelhead distribution (Table 3-47). In North Fork Mill Creek, however, designated steelhead critical habitat does not extend as far upstream as suspected steelhead presence (Table 3-47 and Figure 3-14). Chinook salmon

critical habitat was not designated in North Fork Mill Creek, Neal Creek, or West Fork Neal Creek.

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance essential fish habitat (EFH) for those species regulated under a Federal fisheries management plan – in this case Chinook and coho salmon. Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all proposed actions that may adversely affect EFH. Adverse effects include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH.

Pacific salmon (Chinook and coho) EFH was designated in 1999, but the actual identification of stream reaches considered to be EFH was left to the action agencies, such as the USDA Forest Service. Essential Fish Habitat is coincident with Chinook salmon critical habitat where designated. However, since critical habitat for coho salmon has not been designated, and Chinook salmon critical habitat was not designated in the Mill and Neal Creek watersheds, the Forest Service has identified EFH as follows:

- Neal Creek – EFH extends from the mouth upstream to the confluence with West Fork Neal Creek.
- West Fork Neal Creek – No EFH present.
- Mill Creek – EFH extends from the mouth upstream the North and South Forks confluence.
- North Fork Mill Creek – No EFH present
- Alder Creek – No EFH present.
- Mosier Creek – No EFH present.

Habitat Conditions

The following discussion regarding stream physical habitat conditions is designed to give the reader a summary of fish habitat as it pertains to proposed activities, and their potential effects, in the North Fork Mill Creek planning area. This summary provides the baseline that potential effects from proposed activities can then be compared. Based on past experience, the available literature, and some monitoring information the primary habitat elements that could be affected by some or all proposed activities include: streambed substrate (especially fine sediment), turbidity², pool quality (as measured by depth or volume), water temperature (as it relates to stream shade), recruitment potential of large woody debris (LWD) from surrounding riparian reserves, and fish passage. Other habitat elements, such as existing levels of in-channel LWD and pool quantity, would not be affected by any proposed activity thus they will not be discussed. Similarly, if only certain activities are proposed in or near a given creek, the potential effects may only impact certain habitat elements, thus only those elements will be discussed.

² Turbidity will be discussed in the effects section only. None of the streams in the planning area are naturally turbid, except during high water events.

North Fork Mill Creek

North Fork Mill Creek originates in a wet meadow/spring complex in Gibson Prairie (T. 1S, R. 10E, Sec. 14). This wet meadow/spring complex (above the 1700-662 road) often dries out as the summer progresses. North Fork Mill Creek is undergoing severe channel downcutting in Gibson Prairie, due in part to the loss of deciduous riparian vegetation (in part from livestock grazing). The Mill Creek Watershed Analysis (USFS 2000a) noted degradation of Gibson Prairie due to cows keeping “riparian grasses short” and physically altering the streambanks. “The ephemeral streams within the meadow complex are actively downcutting which has resulted in a lowered water table, effectively draining the meadow.” This was verified during the field visits during the summer of 2004 as part of the Long Prairie Grazing Allotment Environmental Analysis.

Deep pools were not abundant anywhere in North Fork Mill Creek (Table 3-48) (USFS, 2000b), but also would not be expected given the small size and power of the stream. Reach 2 (the headwaters in Gibson Prairie) has a large amount of sand/silt substrate (44%), whereas the lower steeper reach 1 had lesser amounts. The stream is generally well shaded although the uppermost reach in Gibson Prairie is more open due to the meadow nature as well as some effects from livestock grazing. Water temperatures in North Fork Mill Creek are well below Oregon Department of Environmental Quality standards (see the Watershed Resources report).

Table 3-48: Summary of habitat parameters in streams within the North Fork Mill Creek planning area (excluding Alder Creek) that could be affected by proposed activities outlined in the action alternatives.

| Stream/Reach | Surveyor | Year Surveyed | Shade | Substrate <2 mm | Bank Erosion | Pools/Pools > 3 ft deep |
|------------------------------|----------|---------------|-------|-----------------|--------------|-------------------------|
| North Fork Mill Creek | | | | | | |
| RM 6.4-10.7 | USFS | 2000 | 71% | 18% | 8.5% | 257/4 |
| RM 10.7-12.4 | USFS | 2000 | 57% | 44% | 0.1% | 39/0 |
| Neal Creek | | | | | | |
| RM 0.0-9.3 | ODFW | 1994 | 85% | 17% | 12% | 120* |
| West Fork Neal Creek | | | | | | |
| RM 0.0-2.3 | ODFW | 1994 | 93% | 22% | 13% | 25* |
| RM 2.3-8.8 | USFS | 1999 | 73% | 25% | 7% | 162/2 |

*ODFW does not count pools >3 ft deep.

There are two culvert upstream migration fish passage barriers in North Fork Mill Creek, both are in the headwaters in or near Gibson Prairie. One is located at the 1700-662 road crossing, and the other on the 1700-663 road crossing (both above RM 10.5).

Neal Creek

The Forest Service has not conducted a Level II stream survey on Neal Creek. ODFW conducted a habitat survey of Neal Creek from its mouth to RM 8.8. It is assumed that conditions documented in the 1993 ODFW survey are still relatively accurate, although the 1996 flood could have changed habitat conditions. The only project within the Neal Creek sub-watershed is the replacement of a fish passage barrier culvert on the 1710 road at RM 8.8. The only habitat elements that could be affected by the culvert replacement is substrate (fine sediment) and pool quality, thus these are the only elements that will be discussed.

Habitat in upper Neal Creek is dominated by cascades and rapids. Pool numbers were very low overall and there were no pools greater than three feet deep (Table 3-48). No pools of any depth were found in the reach from RM 6.9 -8.8. It is inferred from this data that pool quality, as measured by depth or volume, is low. However, given the steep gradient and dominant cascade/rapid habitat type this is likely within the normal range of condition. Neal Creek is dominated by cobble substrate (31% average), with relatively low amounts of fine sediment (17%, see Table 3-48).

West Fork Neal Creek

West Fork Neal Creek is the largest tributary to Neal Creek and its headwaters originate in a wet meadow/spring complex (T1S, R10E, Section 11). West Fork Neal Creek was surveyed from RM 2.3 – 8.8 by Forest Service personnel in 1999. Conditions today are likely similar to those described then because no large floods have occurred since 1999 and the creek itself is spring-fed and small – it lacks the power to move large volumes of sediment or LWD.

Pools totaled 162, but only two pools in the 6.5 mile survey reach were greater than three feet deep (Table 3-48). Given the small size and power of the stream however, large pools would not be expected. This reach had a large amount of sand/silt substrate (27% of the total), which exceeds LRMP standards. Trampled dirt banks were identified frequently from RM 6.45 to 8.8, which is the area of the stream within National Forest system lands. Percent bank instability overall was 7.0%, possibly contributing the fine sediment seen (USFS, 1999). The stream was generally well shaded, averaging 73% shade, but there were areas where the amount of shade was quite low. However, water temperatures in West Fork Neal Creek are well below Oregon Department of Environmental Quality standards (see the Watershed Resources report).

Habitat conditions in West Fork Neal Creek in the lower 2.3 miles were similar to those described above (see Table 3-48).

There are total of eight culvert fish passage barriers located on West Fork Neal Creek or its tributaries (Figure 1-5). Culvert barriers located on West Fork Neal Creek itself are as follows:

- 1700 road (RM 5.5)
- 1700-630 road (RM 6.7)
- 1700 road (RM 6.75)
- 1700 road (RM 8.27)

Culvert barriers on fish bearing tributaries to West Fork Neal Creek are as follows:

- Tributary “A” (T1N, R10E, Section 25)
 - 1700 road (RM 0.16)
 - 1700-730 road (RM 0.5)
- Tributary “B” (T1S, R10E, Section 2; headwaters near Long Prairie)
 - 1710-710 road (RM 0.06)
 - 1710 road (RM 0.1)

The first two culverts are located on the same tributary and the third and fourth culverts are located on another tributary.

Alder Creek

The only project proposed in the Alder Creek sub-watershed is a culvert replacement on the 1721 road, thus the only habitat elements discussed herein are sediment and pool quality. The Forest Service conducted a Level II stream survey on Alder Creek in 1998 from its mouth to river mile 3.2. It is assumed conditions documented in the 1998 USFS survey have not changed because no substantial human activity or natural events have occurred since the 1998 survey was conducted. There were no primary pools (pools ≥ 3 feet deep) in Alder Creek; however, pool numbers overall were low. Alder Creek has low to intermittent flow for the majority of the year and in general would not be expected to form deep pools in large numbers. Gravel was the dominant substrate. Fine substrate was observed in sections of dry channel where the water had slowed, dried, and deposited fines.

Analysis Methodology

This effects analysis utilizes research, relevant monitoring, field data, previous experience, and modeling to provide the context, amount and duration of potential effects for each alternative. Much of the analysis in regards to erosion potential, sedimentation potential, and water temperature is covered in detail in the Soil Productivity and/or Watershed Resources specialist's reports. As such, this effects analysis on aquatic fauna and habitat relies extensively on the Soil Productivity and Watershed Resources effects analyses because the primary effects to aquatic fauna are related to fine sediment and water temperature. For example, if hydrology and soils experts expect little to no sedimentation from a specific activity then that activity would have little to no effect on fish or aquatic macroinvertebrates from a sediment perspective. Other indicators incorporated in the effects analysis from a sediment perspective included the number of haul route road crossings over fish bearing streams, new trail crossings over streams, and miles of roads and trails adjacent to streams.

For LWD recruitment, potential this analysis related to existing riparian stand conditions compared to expected conditions following treatment. Canopy closure was used to compare the two conditions

Environmental Effects

No Action Alternative – Direct and Indirect Effects

Stream shading would remain at current levels and sediment delivery to stream would also remain at current levels, thus water temperatures and stream substrate conditions would remain unchanged (see Watershed Resources and Soil Productivity sections). Riparian stand conditions would also remain as is, at least in the near term. As in all forests, trees would grow, die, and fall in a natural manner thus LWD recruitment potential in riparian stands would change slowly over time. As a result of the above, there would be no effect to aquatic habitat and thus fish and aquatic macroinvertebrate populations in these areas. Because current fish barrier culverts would remain in place the current resident fish population fragmentation would remain.

As pointed out in the Watershed Resources and Soil Productivity sections, not treating vegetation and fuels in the planning area increases the risk of a higher burn severity wildfire, which in turn could lead to reduced site productivity, increased erosion, and more riparian vegetation burned. This could result in degraded stream habitat and water quality conditions in turn leading to

negative impacts to fish and/or snails such as impaired feeding, impaired respiration or suffocation, and increased stress. The magnitude of these effects, if they occurred, would depend on the fire location (proximity to occupied aquatic habitat) and intensity.

Proposed Action Alternative – Direct Effects

Direct effects associated with activities proposed in Alternative 1 relate to culvert removals and replacements, tree falling near fish bearing streams, and trail bridge construction as these are the only activities that could directly impact stream channels. All other proposed activities would occur too far from streams or other water bodies to directly harm or harass aquatic fauna or habitat.

Culvert removal/replacement: There are two proposed culvert removal sites and ten proposed replacement locations. At each location, the stream would be diverted prior to culvert removal and subsequent replacement (where proposed) as per design criteria/mitigation measures outlined in Chapter 2. As part of the diversion process a fish collection and removal procedure is also required. These actions have a high probability of impacting both fish and aquatic macroinvertebrates as described below.

Fish would be collected at each site with electrofishing gear. Electrofishing, when done properly, has minimal impact on individual fish, especially smaller fish as would be found in the creeks where the culverts are located. However, some injury or even mortality is possible and is assumed to occur, albeit at low levels. Effects of electrofishing on aquatic macroinvertebrates are not well understood, but for the purposes of this analysis, it is assumed that some injury or mortality may occur.

The diversion of creek water, causing the dewatering of the creek channel above, below, and through the culvert may also result in injury or mortality to fish or aquatic macroinvertebrates. If fish are not captured during the electrofishing process (a low probability, but possible), they may be stranded and die unless they are seen and captured by collection personnel. This situation is even more likely for aquatic insects and mollusks. For these small creatures, it is probable they would perish.

Finally, during the diversion and re-watering phases of the culvert work at each site there would be pulses of turbidity with some sediment movement downstream. These pulses would be short-term (a few hours) and are not expected to persist more than 1.5 to 2.0 miles downstream (see the Watershed Resources Section). Turbidity would be highest just below the site and then dissipate further downstream – very little suspended sediment would travel two miles downstream.

It is important to note that ESA listed fish species and Regional Forester's Special Status fish species do not reside at any culvert location (see Table 1), but cutthroat trout do. Regional Forester's Special Status mollusks and the one caddisfly may be present at one or more sites given known habitat preferences.

Riparian silviculture: There are design criteria/mitigation measures in place to maintain the existing canopy within 60 and 30 feet of perennial and intermittent streams, respectively. Tree falling may occur up to these buffer widths and the intent is to fall all trees away from the water body. However, it is possible that some trees may fall within these no treatment areas due to

wind shifts, predominant tree lean direction, or some other factor. If this occurs, the section of tree within the no treatment area would be left on site. If a tree were to fall in a perennial fish bearing stream, there is a slight chance that it could either kill or harm a fish (and/or aquatic macroinvertebrate) or disrupt its normal behavior for a short time. The risk for this is very low, but not zero.

None of the proposed thinning or other silvicultural treatment units (Figure 1-5) are located along stream segments that harbor ESA listed fish species and Regional Forester's Special Status fish species. The only units where a felled tree could land in or near a stream is in the headwaters of North Fork Mill Creek (fish bearing – cutthroat trout), along some unnamed tributaries to North Fork Mill Creek (non-fish bearing), and along Mosier Creek (non-fish bearing). Regional Forester's Special Status mollusks and the one caddisfly may be present at the North Fork Mill Creek sites given known habitat preferences, but not likely in Mosier Creek.

Trail bridge construction: There are two sites where trail bridges are required as the streams they cross are fish bearing (West Fork Neal Creek and North Fork Mill Creek). Although most trail bridges are constructed by hand or with a small, specialized excavator and the impacts are minimal, it is possible that trails personnel or equipment may have to enter the stream channel to facilitate construction. If this occurs fish or other aquatic fauna may be disturbed or killed. The risk of fish mortality is extremely remote as they normally detect presence and move out of the area.

As with the other projects listed above, no ESA listed or Regional Forester's Special Status fish species are present at either site, although cutthroat trout are present. Regional Forester's Special Status aquatic macroinvertebrates may be present.

Proposed Action Alternative – Indirect Effects

Indirect negative effects to fish, aquatic macroinvertebrates, and their habitat center on increases in water temperature, potential erosion and subsequent sedimentation, and potential reductions in LWD recruitment potential to streams and riparian areas. Each of these potential effects is discussed below.

Water Temperature

As described in the Watershed Resources Report, increases in water temperature could potentially result from vegetation treatments, recreational trail construction, road decommissioning, and culvert removal/replacement. Project designs, including appropriate design criteria/mitigation measures, coupled with the small impact area of some proposed work such as trail construction would ensure that existing canopy cover and thus shade is maintained. As such, no increase in water temperature is anticipated as a result of proposed activities and thus there would be no effect on aquatic fauna or habitat.

Sediment

Potential erosion and subsequent sedimentation into streams or other water bodies could come from a variety of proposed activities including vegetation treatment (including associated temporary roads and underburning), recreational trail construction and maintenance, road decommissioning, road maintenance, log hauling, road snowplowing, and culvert replacement/removal. Many of these activities and their anticipated effects were covered in the Soil Productivity and Watershed Resources Reports and the details will not be repeated here.

The risk of significant erosion and subsequent sedimentation into area streams was deemed quite low resulting from vegetation treatments, associated temporary road building and decommissioning, and underburning (prescribed fire). Cottonwood/aspen enhancements may result in a minor, short-term increase in sedimentation where proposed. These treatments are located in the headwaters of Mosier Creek and in the North Fork Mill Creek watershed (but not near any streams). Mosier Creek is not fish bearing in the action area.

Road maintenance on log haul routes and subsequent hauling has the potential to increase road related sediment into streams, primarily near stream crossings. Although road maintenance reduces sedimentation in the long-term, some road maintenance activities such as ditch cleaning could result in freshly disturbed soil that could be more prone to erosion after the first precipitation event. The amounts of sediment are normally quite small and short lived. Table 2-4 outlines proposed road maintenance on haul routes. The majority of these roads are located outside riparian reserves and most do not cross stream channels. The following table summarizes road crossings over perennial and intermittent stream channels.

Table 3-49: Haul route road crossings over stream channels within the North Fork Mill Creek Planning Area. These roads are also proposed for some form of maintenance depending on the location and road surfacing. The three crossings of the 1700000 road over West Fork Neal Creek are listed in downstream to upstream order.

| Road Number | Stream Crossed | Perennial or Intermittent | Fish Bearing? | PETS** Fish Species Present? |
|-------------|----------------|---------------------------|---------------|------------------------------|
| 1700000 | WF Neal Creek | Perennial | Yes | No |
| 1700000* | WF Neal Creek | Perennial | Yes | No |
| 1700000* | WF Neal Creek | Perennial | Yes | No |
| 1700660 | NF Mill Creek | Perennial | Yes | No |
| 1700663 | NF Mill Creek | Perennial | Yes | No |
| 1710000 | WF Neal Creek | Perennial | Yes | No |
| 1711000 | Mosier Creek | Intermittent | No | No |
| 1711630 | Mosier Creek | Intermittent | No | No |
| 1711630 | NF Mill Creek | Perennial | Yes | Yes*** |

*The 1700 road is paved at these two crossings.

**PETS Fish Species are Proposed, Endangered, Threatened, or Sensitive species

***Steelhead (ESA listed as threatened) and redband trout (Regional Forester's Special Status Species).

Small amounts of sediment could be washed into streams at the locations listed in Table 3-49 by maintenance activities, particularly ditch cleaning. The sediment amounts would be small and short lived and would primarily occur after the first precipitation event. Log hauling itself could exacerbate erosion, especially in wet conditions, and produce dust. Hauling is proposed in the

normal operating season (May 15-October 31) which is normally the dry part of the year in this area. When hauling on dry roads the sediment produced is dust (depending on the speed of the truck) which has a negligible effect on water quality. There are design criteria/mitigation measures in place to address hauling during wet and snowy/frozen conditions. Along with road damage, the risk of sedimentation is the prime consideration whether to haul during these periods and that decision lies with the District Ranger.

If hauling does occur in winter it may be necessary to snowplow roads to provide access to the units. Any snowplowing that occurs would follow standard operating procedures outlined in the snowplow road use permit. These procedures include not plowing at a depth where bare soil is exposed when crossing streams, not pushing any snow into streams, and incorporating breaks in the snow berm alongside the road to provide drainage. Despite these measures it is possible for runoff during snowmelt to be channeled down the roadway directly into whatever stream lies in the valley bottom. This runoff could carry sediment, especially on native surface roads, but the amount is typically quite small.

Recreational trail building may result in some erosion and subsequent sedimentation into creeks at proposed trail crossings. The most likely site this would occur is the crossing proposed over West Fork Neal Creek (see the Soils Productivity and Watershed Resources sections) because of relatively steep slopes leading in and out of the drainage. The amount of sediment generated during and after construction is expected to be quite low. West Fork Neal Creek is fish bearing at this point (cutthroat trout), but no ESA listed or Regional Forester's Special Status species reside there or nearby downstream. The Columbia dusksnail is likely in the vicinity and the Purple-lipped and Barren Juga snails are suspected, as is Scott's Apatanian caddisfly.

Road decommissioning in and of itself would have little to no chance of contributing fine sediment to area streams. The ripping of the road surface would help restore water infiltration into the soil and greatly reduce surface runoff. However, where drainage culverts are removed there could be short-term inputs of sediment downstream from these sites. Where drainage culverts emptied out onto the forest floor (as opposed to a small intermittent stream channel) any sediment produced would be metered by topography, vegetation, and distance to any nearby water bodies. If a drainage culvert emptied into an intermittent channel then sediment could be routed downstream over time and eventually make its way into a perennial stream. Given the roads to be decommissioned (Figure 1-5) the greatest chance of sediment entering a waterway is in Mosier Creek which is an intermittent, non-fish bearing stream in the action area. The presence of Regional Forester's Special Status aquatic macroinvertebrates is unlikely here as well. There is a chance some sediment could enter the headwaters of North Fork Mill Creek when the 1700663 and 1700664 roads are decommissioned, but this would be a very low risk.

Culvert removal and replacements would have the greatest impact to area streams regarding increases in turbidity and sedimentation. There is no way to complete this type work without some increase in sediment downstream. Design criteria/mitigation measures incorporated into Alternative 1, such as working during low water, de-watering construction sites, and prompt re-vegetation would greatly minimize, but not eliminate increases in turbidity and sediment. As described above, turbidity and sedimentation increases would be most likely when the site is first de-watered and then re-watered. These pulses of sediment are expected to be relatively small and short-lived. According to information presented in the Watershed Resources section, this

sediment is not likely to travel downstream more than 2.0 miles due to the small amount of material and stream velocity breaks. The amount of fine sediment traveling that far downstream would be negligible. Therefore, although cutthroat trout and Regional Forester's Special Status aquatic macroinvertebrate could be affected in all creeks, ESA listed fish species and Regional Forester's Special Status redband trout individuals would not.

Table 3-50 summarizes the above discussion regarding proposed activities that could generate sediment in streams within the action area. The information is displayed in terms of relative risk of sedimentation, both at individual sites and downstream, because it is difficult to predict exact amounts of sediment generated. The risk assessment includes the beneficial effects of design criteria/mitigation measures meant to reduce impacts

Table 3-50: The relative sedimentation risk of various activities proposed in Alternative 1, as well the potential effects risk to fish and aquatic macroinvertebrates.

| Proposed Activity | Relative Sedimentation Risk | | Potential Effects Risk | | |
|--------------------------------|-----------------------------|------------|------------------------|-----------|-----------------|
| | Site Specific | Downstream | Macro-invertebrates | Cutthroat | ESA Listed Fish |
| Vegetation Treatment | Low | Very Low | Low | Low | None |
| Road Maintenance | Low | Very Low | Low | Low | None |
| Log Hauling | Low | Very Low | Low | Low | None |
| Snowplowing | Very Low | Very Low | Very Low | Very Low | None |
| Recreational Trails | Very Low | Very Low | Very Low | Very Low | None |
| Road Decommissioning | Low-Mod | Low | Low | Low | None |
| Culvert Removal or Replacement | Moderate | Low | Moderate | Moderate | None |

Potential effects from sediment on aquatic fauna and habitat: The effects of turbidity and fine sediment on aquatic fauna and habitat vary depending on the amount, timing, existing habitat conditions, and species present. The proposed activities would produce small amounts of fine sediment as a whole and anticipated effects would be primarily site-specific in nature. The following discussion separates effects from turbidity increases and fine sediment.

Turbidity: Increases in turbidity could affect fish by reducing feeding, stimulating movement out of the area, respiratory impairment, increasing stress, and reduced tolerance to disease (Waters, 1995). In general, high levels of turbidity for long periods of time are required to cause significant effects. Feeding success could be reduced during prolonged episodes of high turbidity due to reduced sight distances and a reduced ability to see a capture prey. The amount of suspended sediment anticipated from all proposed activities would have little no effect on fish respiration given the small amount and short duration. Increased stress may be the most likely result of turbidity increases given the anticipated short-term duration of turbidity increases and relatively low amounts of suspended sediment. Overall, the impact on fish is expected to be slight and would occur in the near vicinity of the proposed projects. Turbidity would dissipate within two miles or less below culvert replacement/removal sites (the primary producer of

turbidity) so downstream effects would be immeasurable against background levels with no biological significance. Increased turbidity has little to no effect on habitat conditions.

The effect of increased turbidity on aquatic macroinvertebrates is likely similar to those described for fish, at least for aquatic insects, but most of the literature focused on fine sediment deposition rather than suspended sediment. Effects on mollusks are not well understood, but given that preferred habitat characteristics include clean water it is assumed that long periods of high turbidity would be detrimental. Since the pulses of turbidity would be short, the impact on aquatic invertebrates is likely minimal.

Sedimentation: The deposition of fine sediment on the streambed could negatively impact habitat conditions and subsequent survival and/or production for both fish and aquatic macroinvertebrates (Waters, 1995). Large amounts of fine sediment deposition in pools could reduce the available habitat area and thus reduce the rearing space for juvenile and adult fish. The amount of sediment generated from the proposed activities, even culvert removal/replacements, would not be enough to measurably reduce pool habitat.

Fine sediment deposition in pool tails and riffles could reduce the quality of spawning habitat for fish and reduce food production (i.e. insects) in riffles where they are the most abundant. Again, given the anticipated amounts of sediment generated from all proposed projects the impact to spawning and food producing habitat would be minimal. Not all sediment would deposit in the same place as it would be spread over a relatively large reach of stream. In any given riffle or pool tail the amount deposited would be relatively low. The affect on spawning habitat would be minimal; food production could be slightly reduced in some areas.

The deposition of fine sediment could affect aquatic mollusks or insects by smothering them or covering their food supply. This is actually a greater risk than that for fish given their small size and relative immobility. It is anticipated that some aquatic macroinvertebrate mortality could occur at and below culvert removal/replacement sites, but not from other activities. This is due to the relatively higher amounts of sediment generated compared to other proposed activities.

Large Woody Debris Recruitment Potential

Proposed vegetation treatments could reduce the LWD recruitment potential to stream and riparian areas within the planning area. Thinning along streams within the planning area would be the activity most likely to reduce recruitment potential in the 5-15 years following treatment. The no treatment zone would be unaffected, but trees in the outer zones of the riparian reserves would be reduced in number and thus less would be available to fall into streams and riparian areas. Most thinning is proposed along Mosier Creek with a few stands in the headwaters of North Fork Mill Creek and some tributaries to North Fork Mill Creek (non-fish bearing). The effect to fish and fish habitat would be minimal in the short-term given the location of the thinning units. Of course in the long-term stand health should improve resulting in increased growth rates of remaining trees so that bigger trees would fall into area streams in the future. In addition, the target canopy closures are commensurate with expected canopy closures under a normal fire regime thus from a historical perspective the resultant stands would provide the amount of LWD recruitment expected given natural stand conditions.

Beneficial Effects

All of the proposed projects are designed to have long-term beneficial effect in the planning area. The greatest direct benefit to fish and other aquatic fauna would result from culvert replacement/removals. Restoring unimpeded upstream passage would restore the connectivity between currently fragmented cutthroat trout populations. The restored passage would not affect ESA listed or Regional Forester's Special Status fish species given their distribution. Improved riparian and upland forest health and fuels conditions would provide larger trees faster for in-stream and floodplain LWD recruitment as well as reduce the severity of future wildfires. Lower severity wildfires result in reduced erosion potential after fires, thus reducing potential sedimentation. Road maintenance and decommissioning would reduce erosion potential and subsequent sedimentation into area streams. Finally, concentrating recreation away from streams and bridging perennial streams where crossings are necessary would reduce streamside disturbance and potential sedimentation.

Proposed Action Alternative – Cumulative Effects

Cumulative direct effects could occur if cattle grazing coincided with trail bridge construction and/or culvert removal/replacements. At present the grazing permittee is resting the allotment, but in the future if cattle are present, they browse adjacent to, or in streams within the planning area. This could increase the overall direct disturbance to aquatic macroinvertebrates or fish. Many of the areas where cattle previously “camped out” in and along streams have or will be fenced, but other streamside areas would still be accessible.

There would be no cumulative effects associated with water temperature as there are no other anticipated projects that would increase water temperatures on any streams in the action area (see the Watershed Resources section). Additional sediment input from other proposed projects including Off-highway vehicles (OHV) use and livestock grazing in the Long Prairie grazing allotment could increase the amount of fine sediment in the North Fork Mill and West Fork Neal Creeks watersheds (see the Watershed Resources section). The amount and timing of this sedimentation depends on the implementation of these projects; if they are implemented within three years of this project then increased sedimentation may occur which could then increase the magnitude of effects at the site scale. This would have greater negative effects on cutthroat trout and Regional Forester's Special Status Species aquatic macroinvertebrates. Impacts to ESA listed fish, habitat, and Regional Forester's Special Status Species redband trout would be nonexistent given the distance from anticipated sediment sources.

There are no projects proposed in the foreseeable future that would cumulatively effect LWD recruitment potential in or below the planning area.

Alternative 2 – Direct, Indirect, and Cumulative Effects

Direct effects on aquatic fauna and habitat resulting from projects proposed in Alternative 2 would be the same as described for Alternative 1 except for riparian silviculture related tree falling. There would be no effect on any ESA listed or Regional Forester's Special Status species or habitat resulting from tree falling because none of the units are located near streams that contain these species or habitat. With the exception of underburning, the vegetation treatment units are either not near streams or along Mosier Creek.

Indirect effects to aquatic resources under Alternative 2 would be essentially the same as described for Alternative 1. In regards to water temperature, there was no increase in water temperature expected in Alternative 1 and the same rationale applies to this Alternative. The situation is the same for erosion and sedimentation potential. The only difference between the two alternatives is an overall reduction in the various vegetation treatments in Alternative 2 compared to Alternative 1 (see Tables 1-1 and 2-8). The sedimentation and potential effect risks for aquatic sites and species is low to none in Alternative 1 (Table 4). Risks would be even lower overall in Alternative 2 given that there are less than half the acres proposed for treatment as compared to Alternative 1. The risks and potential effects outlined in Alternative 1 for road maintenance, hauling, snowplowing, decommissioning, recreation trail building, and culvert removal/replacements would be the same in Alternative 2.

The long-term beneficial effects of vegetation treatments resulting in improved stand health, fuel loading levels, and LWD would be less in this alternative since fewer acres would be treated overall. Thinning treatment in the Mosier Creek drainage and underburning in the North Fork Mill Creek drainage would remain essentially the same, but forest conditions would not be improved in the headwaters of North Fork Mill Creek and West Fork Neal Creek. Long-term recruitment of LWD could be slowed in these headwater areas under Alternative 2.

Given that the direct and indirect effects on aquatic fauna and habitat are very similar between alternatives, and that there is no difference in the restoration related projects that have the most impact, the effects from a cumulative standpoint are the same for both alternatives.

Determination of Effect Including Essential Fish Habitat

No Action Alternative

The No Action Alternative would have no effect or impact on any ESA threatened aquatic species, designated critical habitat, Regional Forester's Special Status aquatic species, or essential fish habitat. Although the risk of a more severe fire is increased it is impossible to predict when or where that would occur, thus it is not a foreseeable action.

Alternatives 1 and 2

Projects proposed in Alternatives 1 and 2 would have no effect on ESA listed threatened steelhead trout individuals or designated critical habitat fine sediment would be trapped and stored in the stream channel between disturbed areas and occupied habitat. Given that rainbow trout (possibly the redband subspecies) distribution is similar to steelhead distribution there would be no impact to Regional Forester's Special Status redband trout.

Proposed projects may impact Regional Forester's Special Status aquatic macroinvertebrates (Columbia dusksnail, Purple-lipped Juga, Barren Juga, and Scott's Apatanian caddisfly) or their habitat but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species. Although at the site scale individuals may be harmed or killed (highest risk from culvert replacement/removals) and habitat could be degraded in the short-term, the distribution of the species would not be reduced and overall populations in area streams would remain viable due to presence of individuals both up and downstream.

Although not Federally listed or on the Regional Forester's Special Status list, cutthroat trout individuals could be harmed or killed associated with culvert removal/replacements and the risk of habitat degradation is low to moderate. These effects would occur primarily at the site scale and in terms of habitat the effects would be short-term.

Note that in the long-term the following projects would all benefit aquatic resources in and below the planning area:

- Vegetation/fuels treatments
- Road decommissioning
- Road maintenance
- Culvert removal and replacement

Wildlife Resource

A Wildlife Biological Evaluation was completed as part of this analysis. The entire Biological Evaluation is incorporated by reference and is located in the project record, located at the Hood River Ranger District. The analysis and conclusions of the evaluation are summarized below. Reference material is contained in the full biological evaluation.

Existing Conditions

Two species of wildlife classified as threatened, endangered or proposed may occur on or adjacent to the Hood River Ranger District of the Forest. There are twenty-two Forest Service, Region 6 sensitive species that may be found on the Hood River District.

The status of threatened, endangered, and proposed species; Forest Service Region 6 sensitive species; and Forest management indicator species that may occur in the project area are listed in Table 3-51.

Table 3-51: Status of threatened, endangered, and proposed species; Forest Service Region 6 sensitive species in the project area.

| WILDLIFE SURVEY RESULTS | | | |
|--|----------------|----------------|-----------------|
| Species | Habitat | Surveys | Presence |
| Federally Threatened, Endangered or Proposed | | | |
| Northern spotted owl (<i>Strix occidentalis caurina</i>) | Y ¹ | Y ² | Y ¹ |
| Canada lynx (<i>Lynx canadensis</i>) | N ¹ | Y ¹ | N ¹ |
| R6 Sensitive Species | | | |
| Bald eagle (<i>Haliaetus leucocephalus</i>) | N ¹ | - | - |
| Great gray owl (<i>Strix nebulosa</i>) | N ¹ | - | - |
| Oregon Slender salamander (<i>Batrachoseps wrighti</i>) | Y ¹ | - | - |
| Larch Mountain salamander (<i>Plethodon larselii</i>) | N ¹ | - | - |
| Cope's giant salamander (<i>Dicombptodon copei</i>) | N | - | - |
| Cascade torrent salamander (<i>Rhyocotriton cascadae</i>) | N | - | - |
| Oregon spotted frog (<i>Rana pretiosa</i>) | N | - | - |
| Painted turtle (<i>Chrysemys picta</i>) | N | - | - |
| Northwestern pond turtle (<i>Clemmys marmorata marmorata</i>) | N | - | - |
| Baird's shrew (<i>Sorex bairdii permiliensis</i>) | N | - | - |
| Pacific fringe-tailed bat (<i>Myotis thysanodes vespertinus</i>) | N | - | - |
| Wolverine (<i>Gulo gulo luteus</i>) | Y ¹ | - | - |
| Pacific fisher (<i>Martes pennanti</i>) | Y ¹ | - | - |
| Horned grebe (<i>Podiceps auritus</i>) | N | - | - |
| Bufflehead (<i>Bucephala albeola</i>) | N | - | - |
| Harlequin duck (<i>Histrionicus histrionicus</i>) | N | - | - |
| Peregrine falcon (<i>Falco peregrinus anatum</i>) | N | - | - |
| Gray flycatcher (<i>Empidonax wrightii</i>) | N | - | - |
| Dalles sideband (<i>Monadenia fidelis minor</i>) | Y ¹ | - | - |
| Crater Lake tightcoil (<i>Pristiloma arcticum crateris</i>) | Y ¹ | - | - |
| Evening fieldslug (<i>Deroceras hesperium</i>) | Y ¹ | - | - |

| WILDLIFE SURVEY RESULTS | | | |
|--|----------------|----------------|-----------------|
| Species | Habitat | Surveys | Presence |
| Puget Oregonian (<i>Cryptomastix devia</i>) | Y ¹ | - | - |
| Columbia Gorge Oregonian (<i>Cryptomastix hendersoni</i>) | Y ¹ | - | - |
| Management Indicator Species | | | |
| Mule Deer (<i>Odocoileus hemionus</i>) and Elk (<i>Cervus elaphus nelsoni</i>) | Y ¹ | - | - |
| Pileated Woodpecker (<i>Dryocopus pileatus</i>) | Y ¹ | - | - |
| Pine Marten (<i>Martes americana</i>) | Y ¹ | - | - |
| Wild Turkey (<i>Meleagris gallopavo</i>) | Y ¹ | - | - |
| Western Gray Squirrel (<i>Sciurus griseus griseus</i>) | Y ¹ | - | - |
| Snag and Down Log Associated Species | Y ¹ | - | - |
| Neotropical Migratory Birds | Y ¹ | - | - |

1. See narrative.

2. The last surveys were conducted in 1993. In accordance with the Northwest Forest Plan, additional surveys are not needed in this area.

Threatened, endangered and proposed species

Northern spotted owl

Spotted owls generally rely on older forested habitats that contain the structures and characteristics required for nesting, roosting, foraging, and dispersal. These characteristics of older forests include a multi-layered, multi-species canopy dominated by large overstory trees; moderate to high canopy closure; a high incidence of trees with large cavities and other types of deformities; numerous large snags; an abundance of large, dead wood on the ground; and open space within and below the upper canopy for spotted owls to fly (Thomas et al. 1990). Forested stands with high canopy closure also provide thermal cover, as well as protection from predation. Recent landscape-level analyses suggest that a mosaic of late-successional habitat interspersed with other vegetation types may benefit spotted owls more than large, homogeneous expanses of older forests (Zabel et al. 2003).

Spotted owls are mostly nocturnal, but they may forage opportunistically during the day. Composition of prey in the spotted owl's diet varies regionally, seasonally, annually, and locally, which is likely in response to prey availability (Forsman et al. 2001). Northern flying squirrels and woodrats are usually the predominant prey species. Other prey species include red tree vole, red backed voles, mice, rabbits and hares, birds, and insects.

Surveys conducted on the District since 1979 have revealed a number of documented sightings. All nesting, roosting, and foraging (NRF) habitat on the Hood River Ranger District is considered 'unsurveyed' suitable habitat.

The project area contains 1462 acres of NRF habitat and 2097 acres of dispersal habitat and there are 3 spotted owl home ranges that overlap treatment units. The Surveyors Ridge Late Successional Reserve (LSR) runs along the western boundary of the project area and does not fall within any treatment units. Approximately one mile of existing trail is within the eastern edge of the LSR boundary. There is no designated critical habitat in the project area.

The *Status and Trends in Demography of Northern Spotted Owls* (Anthony et. l. 2006) states that the spotted owl numbers have fallen by roughly half over the past decade in parts of Washington, and the Confederated Tribes of the Warm Springs Reservation in Oregon, and they have dwindled by nearly a quarter in sections of Oregon's Coast and Cascade ranges. In only a few areas are owls maintaining their numbers. This report stated that determining the cause of this decline is beyond the scope of this study, and they could only speculate among the numerous possibilities, including competition from barred owls, loss of habitat from wildfire, timber harvest including lag effects from prior harvest, poor weather conditions, and defoliation from insect infestations. The *Scientific Evaluation of the Status of the Northern Spotted Owl* (Sustainable Ecosystems Institute, Courtney et al. 2004) indicated that population declines of the NSO over the past 14 years were expected, they concluded that the accelerating downward trends on some study areas in Washington where little timber harvest was taking place suggest that something other than timber harvest is responsible for the decline.

Canada lynx

Lynx rely heavily on a single prey species, the snowshoe hare (*Lepus americanus*), although they do take other small mammals, birds and carrion, particularly when hares are rare. High snowshoe hare populations are generally associated with dense, young, lodgepole pine and subalpine fir stands (Koehler and Aubry 1994). Winter snow track surveys (1993-1996) and hair sample surveys (1999-2001) were conducted on the Forest with no detections of lynx.

The Forest received direction³ in 2000 from the Lynx Steering Committee and the Lynx Biology Team addressing lynx habitat mapping in Regions 1,2,4,6, and 9. This direction identified subalpine fir plant associations as the primary vegetation component from which lynx habitat and lynx analysis units (LAU) would be delineated. The Forest ran this analysis based on plant association groups and identified approximately 1270 acres of subalpine fir plant associations primarily on the eastside of the Forest.

The Lynx Conservation Assessment Strategy identified a need for at least 10 square miles (6400 acres) of primary vegetation to warrant delineation of a LAU. A minimum number of contiguous LAUs are necessary to provide the amount and distribution of habitat required to manage for viable lynx populations. Based on our analysis above, the Forest does not have the minimum criteria to develop a LAU, and therefore, it is unlikely that lynx are resident on the Forest, although they may be present as transient or dispersing animals.

R6 Sensitive Species

Bald Eagle

Bald eagles require large bodies of water such as lakes, marshes, and rivers, which provide fish as a food source and tall trees for nesting and roosting. Bald eagles feed primarily on fish, but also eat small animals (ducks, muskrats, rabbits, snakes) and occasionally carrion (Watson et al. 1991). There are no bald eagle nest sites within or near the project area. The closest known nest site is near the Columbia River to the north of the project area and the 2 known nests on the Forest are 18 (Rock Creek) and 30 (Timothy Lake) miles to the south.

³ Refer to memoranda "Lynx Habitat Mapping" (September 19, 2000) and "Lynx Habitat Mapping Direction" (August 22, 2000).

Great Gray Owl

Great gray owls occur in mid- to high elevation conifer forests and prefer dense forests interspersed with open meadows, clearings, or bogs. This owl usually nests in mature and older forest stands using existing raptor nests or tops of broken trees and snags for a nest platform (Hayward and Verner 1994). They forage mainly during dusk and dawn from a perch at the forest edge near grassy meadows and openings where they feed on voles and pocket gophers. Surveys for great gray owls on the Forest were completed in 1997 and 1998 and no owls were located. There is no suitable habitat within the project area.

Oregon Slender Salamander

Oregon slender salamander habitat is described as evergreen forests, older second-growth, and old growth Douglas fir with large numbers of large logs and stumps. It is also characterized as a species mostly associated with the westside of the Cascade Mountains of Oregon (Corkran and Thoms 1996). This species requires down wood and tree canopy closure (50-100 percent) to maintain the microsite. The proposed project area has current tolerance levels of 30-80% for snags and down wood material (DecAid wood advisory model). This equates to 2-6 percent cover of down wood for the project area and 6.7 to 25 snags/acre greater than 10.0 in dbh (Eastside Mixed Conifer Forest, Small/Medium Trees Vegetation Condition).

Larch Mountain Salamander

Larch Mountain salamander habitat includes shaded talus areas, usually with a litter or duff covering, with interstitial spaces suitable for this species to descend into as the summer heats and dries the surface (Nussbaum 1983). Surveys north of the Columbia River have found this species within conifer habitat where litter, duff, and moisture conditions are sufficient. The surveyors indicated that even in those conditions, the substrate beneath the litter or duff tended to be an open, porous rocky material with talus-like characteristics. These conditions do not occur in any of the areas proposed for treatment within the planning area. Soil conditions are relatively tight with virtually no interstitial spaces.

Wolverine

The wolverine needs large tracts of undeveloped and uninhabited areas and are considered highly sensitive to human presence. Habitat for wolverine may consist of all forest and non-forest types. It appears that the limiting factor for wolverine is the presence of an abundant, large mammalian prey base, and the exclusion of human presence (Hatler 1989).

Wolverine tracks have been observed near the Highway 35 corridor. No denning habitat exists within or adjacent to the project area, although the general area could be considered potential foraging or travel habitat by wolverine.

Pacific Fisher

Fishers use forests with a high percentage of canopy closure, abundant large woody debris, large snags, cavity trees, and understory vegetation. Fisher habitat includes a high degree of diversity; multi-aged stands interspersed with small openings that contain wetland or riparian habitats which help support a diverse prey base (Powell 1981). Although fishers are associated with late-successional conifer forests, they also use younger stands, especially as foraging habitat (Lewis and Stinson 1998). Fishers are primarily carnivorous. The most common prey species are

porcupines, snowshoe hares, tree squirrels, mice and voles (Powell 1993). Suitable habitat exists in patches within and adjacent to the proposed project area.

There are three known specimens of fisher from Oregon; two from Lane County and one from Douglas County. Fishers have been re-introduced in southern Oregon and a small population has been established in that part of the state. The presence of fishers on the Forest has not been confirmed. Winter snow track surveys, camera bait stations, and smoke track plates have been utilized in the past decade to determine carnivore presence. No fishers were found using these survey techniques. Fishers are documented on the Deschutes National Forest to the south and are suspected on the Columbia River Gorge National Scenic area to the north. Because this species can make long distance dispersal movements of many miles, they have the potential to occur on the Forest.

Dalles Sideband, Crater Lake Tightcoil, Evening Fieldslug, Puget Oregonian, Columbia Gorge Oregonian

These species require down wood and tree canopy closure (60-100 percent) to maintain the microsite (Burke et al. 1999). The proposed project area has current tolerance levels of 30-80% for snags and down wood material (DecAid wood advisory model). This equates to 2-6 percent cover of down wood for the project area and 6.7 to 25 snags/acre greater than 10.0 in dbh (Eastside Mixed Conifer Forest, Small/Medium Trees Vegetation Condition). The project area was surveyed during the spring of 2001 and 2008. All sites needing protection would be buffered to maintain these sites.

Management Indicator Species

Deer and Elk

Deer and elk are indicative of edge associated species that require forested habitat adjacent to openings. The project area is classified as summer (western half of project area) and winter range (eastern half of project area) for black-tail deer and Rocky Mountain elk, and is inhabited by both during the summer and winter periods. The planning area contains forested cover of varying degrees with openings and early seral stands that provide forage.

Total road density for the project area is currently 3.36 miles per square mile. The total open road density is 2.24 miles per square mile. This is less than the 2.5 miles of open road density in the Mt. Hood National Forest Land and Resource Management Plan (Forest Plan) Standards and Guidelines for this allocation. Inventoried winter range is currently 1.91 miles of open road per square mile which is less than the 2.0 miles of open road density in the Forest Plan Standards and Guidelines. The current open road density in B10 deer and elk winter range is 1.11 miles of roads per square mile which is less than the 1.5 miles of open road density in the Forest Plan Standards and Guidelines.

Pileated Woodpecker

Pileated woodpeckers are an indicator species for those animals associated with larger diameter snags within mature forest/closed canopy stands. This species nests in cavities and feeds on carpenter ants, beetle larvae, other insects, fruits and nuts. The project area currently includes trees larger than 20 inches dbh which are suitable for pileated woodpeckers to nest in.

Pine Marten

Pine marten represent the status of those species associated with medium to large diameter down logs within mature old growth forests. Martens are closely associated with lodgepole pine, Douglas fir, spruce, and mixed hardwood forests (Verts and Carraway 1998). They tend to be found in structurally complex, mature forests, and can occur at all elevations where such habitat exists. They den in hollow trees, crevices, or vacant ground burrows (Bull 1997). Suitable habitat for this species is within the planning area. Pine marten have not been documented within the planning area, but based on their range and habitat suitability, are expected to occur there.

Wild Turkey

Two subspecies (Merriam's and Rio Grande) of wild turkeys are found on the Forest. Both subspecies are generally associated with the pine/oak vegetation classification. Turkeys feed on acorns, conifer seed, insects and grass/forbs. Turkey nest sites are closely associated with mixed conifer stands. Roost trees are large diameter (> 20 inch dbh) ponderosa pine and douglas fir.

Western Gray Squirrel

The Western gray squirrel is closely associated with pine/oak vegetation. Nests are generally of two kinds: large twig and leaf nests constructed with a roof for winter use and rearing of young; and looser leaf nests constructed as temporary nests, summer nests or alternative nests (Foster 1992). Western gray squirrels feed on hypogeous fungi, conifer seeds, and acorns. Western gray squirrels can be found on the Forest from the Columbia River Gorge south to the Warm Springs Reservation and are expected to occur within the planning area.

Snag and Down Log Associated Species

Snags (standing dead trees) and down logs are essential components in forests. Many wildlife species depend on them for survival. The Forest Plan (FW-215, 216, 217) recommends a 40% biological potential (0.9 snags/acre) for cavity nesting species across the landscape and a 60% biological potential (1.35 snags /acre) in new timber harvest units (Thomas, 1979). The planning area meets the 40% level. The majority of the mature stands within the planning area exceed the 100% biological potential (2.25 snags/acre). This proposed project has current tolerance levels of 30-80% for snags and down wood material (DecAid wood advisory model). The majority of the project area falls into the "Eastside Mixed Conifer Forest, East Cascades/Blue Mountains, Small/Medium Trees Vegetation Condition" as described in the DecAID tool. This zone contains 6.7 to 25 snags/acre >10.0 in dbh and 2-6 percent cover for down wood.

In the Mill Creeks watershed, snag and down woody debris density and conditions were taken from the 1995 Current Vegetation Survey (CVS). In order to have an adequate sampling intensity, the Middle Columbia-Hood subbasin was used as the 'representative area' (264,769 acres with 85 CVS plots), of which the Mill Creek Watershed forms a portion. Vegetation stratification was by ecological zone (Eastside Douglas-fir, Grand fir/Ponderosa Pine, Pacific Silver fir/ Mountain hemlock); seral stage (early, middle, late); and history (managed or unmanaged). Portions of the project falls within each of the above ecological zones.

The Mill Creek watershed was analyzed using DecAid. DecAid is a planning tool intended to help advise and guide managers as they conserve and manage snags, partially dead trees and down wood for biodiversity (Mellen, 2003). It is an advisory tool to help managers evaluate effects of forest conditions and existing or proposed management activities on organisms that use

snags and down wood. DecAid also can help managers decide on snag and down wood sizes and levels needed to help meet wildlife management objectives (such as the Forest Plan and the Northwest Forest Plan). This tool is not a wildlife population simulator nor is it an analysis of wildlife population viability. Refer to the website listed in the Literature Citations for more detail and for definition of terms. This advisory tool focuses on several key themes prevalent in recent literature concerning this subject and are as follows:

- Decayed wood elements consist of more than just snags and down wood; such as live trees with dead tops or stem decay;
- Decayed wood provides habitat and resources for a wider array of organisms and their ecological functions than previously thought; and,
- Wood decay is an ecological process important to far more organisms than just terrestrial vertebrates.

A critical consideration in the use and interpretation of the DecAid tool is that of scales of space and time. DecAid is best applied at scales of sub-watersheds, watersheds, sub-basins, physiographic provinces, or large administrative units such as Ranger Districts or National Forests. DecAid is not intended to predict occurrence of wildlife at the scale of individual forest stands or specific locations. It is intended to be a broader planning aid not a species or stand specific prediction tool.

The DecAid analysis tool can be used to evaluate wildlife objectives for certain species where there is sufficient data to predict tolerance levels. For the Mill Creek watershed black-backed woodpeckers and pileated woodpeckers warrant determining objectives and using DecAid to evaluate in relation to the historic range of variability. Black-backed woodpeckers require large amounts of snags and down wood because of their dependance on fires and insect outbreaks. Pileated woodpeckers are a management indicator species for the Forest. DecAid indicates that the Mill Creek watershed currently meets the 80% tolerance level (29.2 snags per acre) for black-backed woodpeckers based on CVS data. CVS data indicates that there is an average of 29.1 snags per acre in the unmanaged stands in the watershed. The snag objective for the treatment area is at least 4 snags per acre. This exceeds the 30% tolerance level for black-backed woodpeckers (2.5 snags per acre).

Decaid indicates that the Mill Creek watershed currently meets the 50% tolerance level (30.2 snags per acre) for pileated woodpeckers based on CVS data. CVS data indicates that there is an average of 29.1 snags per acre in the unmanaged stands in the watershed. The snag objective for the treatment area is at least 4 snags per acre. This does not meet the 30% tolerance level for pileated woodpeckers (14.9 snags per acre).

The overall objective for the project is to reduce hazardous fuels to improve forest health conditions for this area which makes meeting the snag and down wood tolerance level objectives for these snag associated species a lower priority. However, there is unmanaged habitat in the watershed that meets the 80% tolerance level for black-backed woodpeckers and the 50% tolerance level for pileated woodpeckers.

Neotropical Migratory Birds

The project area currently contains approximately 20 % early seral habitat, 50 % mid-seral habitat, and 30 % late seral habitats and supports the species associated with these seral stages.

Environmental Effects

The environmental effects to threatened, endangered, and sensitive wildlife species is summarized in Table 3-52. Each species is discussed separately in the following sections.

Table 3-52: Effects Determinations for Threatened, Endangered, and Sensitive Species.

| Species | No Action | Alternative 1 – Proposed Action | Alternative 2 |
|--|-----------|---------------------------------|---------------|
| Threatened and Endangered Species | | | |
| Northern Spotted Owl | LAA | LAA | LAA |
| Canada Lynx | No Effect | No Effect | No Effect |
| R6 Sensitive Species | | | |
| Bald Eagle | No Impact | No Impact | No Impact |
| Great Gray Owl | No Impact | No Impact | No Impact |
| Oregon Slender Salamander | No Impact | MII | No Impact |
| Larch Mountain Salamander | No Impact | No Impact | No Impact |
| Wolverine | No Impact | MII | MII |
| Pacific Fisher | MII | MII | MII |
| Dalles Sideband | No Impact | MII | No Impact |
| Crater Lake Tightcoil | No Impact | MII | No Impact |
| Evening Fieldslug | No Impact | MII | No Impact |
| Puget Oregonian | No Impact | MII | No Impact |
| Columbia Gorge Oregonian | No Impact | MII | No Impact |

LAA—May Effect, Likely To Adversely Affect

MII – May Impact Individuals, but are not likely to impact populations, nor contribute to a potential loss of viability of the species

Threatened, endangered and proposed species

Northern Spotted Owl

Direct and Indirect Effects of the No Action Alternative

The long-term effects of the No Action alternative to spotted owls would include an increase in root-rot pockets and diseased trees and the potential for an increase in stand replacing fires within the planning area. This increase in disease and fire potential would raise the likelihood of losing mature forest habitat which the owls depend on for nesting and foraging. Therefore, the No Action alternative may effect and is likely to adversely affect northern spotted owls.

Direct and Indirect Effects of Alternative 1 – Proposed Action

The tree removal activites on 54 acres which downgrade suitable habitat may affect and are likely to adversely affect spotted owls. The tree removal activites and the resulting disturbance on 28 acres which degrade suitable habitat may affect and are not likely to adversely affect spotted owls. Tree removal activites and the resulting disturbance on 928 acres which remove (275 acres) or degrade (653 acres) dispersal habitat may affect and are not likely to adversely affect spotted owls. Treatment on 54 acres of suitable habitat is 3.7 percent of the 1462 acres of

suitable habitat in the project area and treatment on 275 acres of dispersal habitat is approximately 13 percent of the dispersal habitat within the project area.

Although the short-term effects to spotted owls may be negative, the long-term effects would be positive. The improvement of stand health and the reduction in fuels would reduce the potential for disease caused mortality and stand replacing fires. Under this alternative, there is a greater chance of maintaining, through time, some of the key mature forest stands and/or key components of mature forests, such as large diameter trees, snags and logs.

The underburning of 610 acres would have a long-term positive effect on mature forest associated species. Underburning activities would reduce fuels and aid in the regeneration of the understory. These acres have a smaller diameter material throughout the area and burning would reduce the fire potential and initiate new growth. This new growth, and development of multi canopy layers would be beneficial for mature forest associated species.

Direct and Indirect Effects of Alternative 2

Tree removal activities and the resulting disturbance on 244 acres which remove (25 acres) or degrade (219 acres) dispersal habitat may affect and are not likely to adversely affect spotted owls. Treatment on 244 acres of dispersal habitat is approximately 12 percent of the dispersal habitat within the project area. Nesting habitat would not be impacted.

Under this alternative, the improvement of stand health and the reduction in fuels would reduce the potential for disease caused mortality and stand replacing fires on the acres treated. The long-term effects to the remaining untreated acres would include an increase in root-rot pockets and diseased trees and the potential for an increase in stand replacing fires. This increase in disease and fire potential would also increase the likelihood of losing mature forest habitat which the owls depend on for nesting and foraging. Therefore, Alternative 2 may effect and is likely to adversely affect northern spotted owls.

The underburning of 610 acres would have a long-term positive effect on mature forest associated species. Underburning activities would reduce fuels and aid in the regeneration of the understory. These acres have a smaller diameter material throughout the area and burning would reduce the fire potential and initiate new growth. This new growth, and development of multi canopy layers would be beneficial for mature forest associated species.

Cumulative Effects of Alternative 1 and Alternative 2

The analysis area is bordered on the south by The Dalles Watershed, on the west by the Surveyors Ridge LSR, on the north by SDS lands and other private lands, and on the east by other private lands. The Dalles Watershed Fuel Break falls within this area and would degrade 326 acres of NRF habitat, remove 455 acres of NRF habitat, and degrade 81 acres of dispersal habitat. Based on GIS analysis, the SDS lands to the north of the planning area, the Surveyors Ridge LSR, and The Dalles Watershed have adequate dispersal routes for spotted owls.

Cumulatively, the short-term effects of the North Fork Mill project and The Dalles Watershed Fuel Break projects impact spotted owl habitat negatively. All projects downgrade, remove or degrade habitat. Alternative 2 would have less short-term impacts because this Alternative treats fewer acres of spotted owl habitat. The long-term cumulative effects of these projects would

reduce future habitat loss. The purpose of the Dalles Watershed Fuel Break project is to protect the watershed from catastrophic wildfire. This would also protect the spotted owl habitat within the watershed. Therefore, the overall cumulative impacts to spotted owls would be neutral.

The effects to spotted owls for this project were consulted on with the U.S. Fish and Wildlife Service through formal consultation on FY 2007-2008 activities within the Willamette province that have the potential to adversely affect spotted owls due to habitat modification and disturbance (FWS reference: 1-7-06-F-0179). The conclusion by the US Fish and Wildlife Service is that these projects are not likely to jeopardize the continued existence of the spotted owl or result in the destruction or adverse modification of spotted owl critical habitat.

Canada Lynx

Lynx are not considered a resident on the Forest and it is anticipated that lynx use in the project area would be restricted to transient individuals, therefore, implementation of the proposed project would have no effect on lynx or their habitat because the proposed project does not alter habitat conditions for travel, foraging or denning. Long-term landscape connectivity has not been compromised. Travel habitat will be widely distributed throughout the landscape. None of the units fall within the subalpine fir plant association which is considered primary habitat for lynx.

Sensitive Species

Bald Eagle

There would be no direct, indirect, or cumulative effects to bald eagle. No suitable habitat exists for bald eagles in the project area, therefore this project would have no impact on bald eagles.

Great Gray Owl

There would be no direct, indirect, or cumulative effects to great gray owls since no habitat would be impacted, therefore, there would be no impact to this species.

Oregon Slender Salamander

Direct and Indirect Effects of the No Action Alternative

There would be no impact to Oregon slender salamander with the No Action alternative because no activities would take place in salamander habitat and no habitat would be altered or removed.

Direct and Indirect Effects of Alternative 1 – Proposed Action

The Proposed Action may impact individuals, but is not likely to impact populations, nor contribute to a potential loss of viability of this species. This project would impact habitat for salamanders by reducing snags and down wood. All known micro sites would be protected. In addition, the Northwest Forest Plan Record of Decision (ROD) recommends 120 linear feet of down logs per acre greater than 16 inches in diameter within the matrix management areas in eastern Oregon. Although this project would eliminate some habitat within the project area, a minimum of 120 linear feet of down woody material and 4 snags/acre would be retained and the populations of salamanders would continue to persist within the project area.

Direct and Indirect Effects of Alternative 2

There would be no impact to Oregon slender salamander with this alternative because no activities would take place in salamander habitat and no habitat would be altered or removed.

Cumulative Effects of Alternative 1 and Alternative 2

The cumulative effects area of consideration is the North Fork Mill Creek project area. This species has a very small home range of less than 100 meters. There would be no measurable change in cumulative effects because of the small home range for this species, the protection of known sites, and the retention of down wood and snags.

Larch Mountain Salamander

There would be no direct, indirect, or cumulative effects to Larch Mountain salamander since no habitat would be impacted, therefore, there would be no impact to this species.

Wolverine*Direct and Indirect Effects of the No Action Alternative*

Human disturbance would continue from recreational and administrative uses. There would be no habitat impacted and no change in the use patterns of wolverines with this alternative. This alternative would have no impact on wolverines.

Direct and Indirect Effects of Alternative 1 – Proposed Action

Disturbance caused by sound and human presence may impact individuals, but is not likely to impact populations, nor contribute to a potential loss of viability of this species. The construction or improvement of 17 miles of trail will increase human use which may increase disturbance to wolverines. This alternative reduces some human disturbance by proposing road closures and addressing the long-term need for roads in the watershed. This alternative will reduce road densities from 2.24 to 1.72 in the project area, and from 1.11 to 0.0 in B-10 winter range. Foraging opportunities would continue in the stands adjacent to the proposed units and no denning habitat would be impacted by this project.

Direct and Indirect Effects of Alternative 2

Disturbance caused by sound and human presence during treatment activities may impact individuals, but is not likely to impact populations, nor contribute to a potential loss of viability of this species. The construction or improvement of 13.5 miles of trail will increase human use which may increase disturbance to wolverines. This alternative address human disturbance by proposing road closures and addressing the long-term need for roads in the watershed. This alternative will reduce road densities from 2.24 to 1.72 in the project area, and from 1.11 to 0.0 in B-10 winter range. Foraging opportunities would continue in the stands adjacent to the proposed units and no denning habitat would be impacted by this project.

Cumulative Effects of Alternative 1 and Alternative 2

The cumulative effects area of consideration is the Mill Creek Watershed. Wolverine use of the habitat in the analysis area is limited by the presence of humans who are using roads and recreating throughout the watershed. The action alternatives address human disturbance by proposing road closures in the watershed. By closing roads that are currently open to public use, disturbance caused by human presence will be reduced and therefore, these alternatives would cumulatively have a beneficial effect to wolverine.

Fisher

Direct and Indirect Effects of the No Action Alternative

The long-term effects of the No Action alternative to fishers would include an increase in root-rot pockets and diseased trees and the potential for an increase in stand replacing fires within the planning area. This increase in disease and fire potential would increase the likelihood of losing mature forest habitat. This alternative may impact individuals but is not likely to impact populations, nor contribute to a potential loss of viability of this species.

Direct and Indirect Effects of Alternative 1 – Proposed Action

Treatment activities that reduce canopy cover, large woody debris, large snags, and cavity trees may impact individuals, but are not likely to impact populations, nor contribute to a potential loss of viability of this species. Foraging and denning opportunities would continue within the project area and within the stands adjacent to the proposed units. The riparian areas would continue to provide foraging habitat.

Although the short-term effects to fishers may be negative, the long-term effects would be positive. The improvement of stand health and the reduction in fuels would reduce the potential for disease caused mortality and stand replacing fires. Under this alternative, there is a greater chance of maintaining, through time, some of the key mature forest stands and/or key components of mature forests, such as large diameter trees, snags and logs.

The underburning of 610 acres would have a long-term positive effect on mature forest associated species. Underburning activities would reduce fuels and aid in the regeneration of the understory. These acres have a smaller diameter material throughout the area and burning would reduce the fire potential and initiate new growth. This new growth, and development of multi-canopy layers would be beneficial for mature forest associated species.

Direct and Indirect Effects of Alternative 2

Because this alternative does not treat stands in suitable fisher habitat, there would be no short-term impacts. The long-term effects of this alternative to fishers would include an increase in root-rot pockets and diseased trees and the potential for an increase in stand replacing fires within untreated units. This increase in disease and fire potential would increase the likelihood of losing mature forest habitat. This alternative may impact individuals but is not likely to impact populations, nor contribute to a potential loss of viability of this species.

The underburning of 610 acres would have a long-term positive effect on mature forest associated species. Underburning activities would reduce fuels and aid in the regeneration of the understory. These acres have a smaller diameter material throughout the area and burning would reduce the fire potential and initiate new growth. This new growth, and development of multi-canopy layers would be beneficial for mature forest associated species.

Cumulative Effects of Alternative 1 and Alternative 2

The cumulative effects area of consideration is the Mill Creek Watershed. Cumulatively, the short-term effects of the North Fork Mill project and The Dalles Watershed Fuel Break projects impact fisher habitat negatively by reducing canopy cover, large woody debris, large snags, and cavity trees. Alternative 2 would have less short-term impacts because this Alternative treats fewer acres of fisher habitat. The long-term cumulative effects of these projects would reduce

future habitat loss. The purpose of the Dalles Watershed Fuel Break project is to protect the watershed from catastrophic wildfire. This would also protect fisher habitat within the watershed. Therefore, the overall cumulative impacts to fisher would be neutral.

Dalles Sideband, Crater Lake Tightcoil, Evening Fieldslug, Puget Oregonian, Columbia Gorge Oregonian

Direct and Indirect Effects of the No Action Alternative

There would be no impact to these species with the No Action alternative because no activities would take place in suitable habitat and no habitat would be altered or removed.

Direct and Indirect Effects of Alternative 1 – Proposed Action

The Proposed Action may impact individuals, but is not likely to impact populations, nor contribute to a potential loss of viability of these species. This project would impact habitat for mollusks by reducing snags and down wood. All known micro-sites would be protected. In addition, the ROD recommends 120 linear feet of down logs per acre greater than 16 inches in diameter within the matrix management areas in eastern Oregon. Although this project would eliminate some habitat within the project area, a minimum of 120 linear feet of down woody material and 4 snags/acre would be retained and the populations of salamanders would continue to persist within the project area.

Direct, Indirect, and Cumulative Effects of Alternative 2

There would be no impact to these species with this alternative because no activities would take place in suitable habitat and no habitat would be altered or removed.

Cumulative Effects of Alternative 1 and Alternative 2

The cumulative effects area of consideration is the North Fork Mill Creek project area. These species have a very small home range of less than 100 meters. There would be no measurable change in cumulative effects because of the small home ranges, the protection of known sites, and the retention of down wood and snags.

Management Indicator Species

Deer and Elk

Direct and Indirect Effects of the No Action Alternative

Disturbance from human presence and activities within the planning area would remain at the current levels. Stand structural development that would occur within the planning area would be neutral for deer and elk. No forage habitat would be created for deer and elk through the No Action alternative.

Direct and Indirect Effects of Alternative 1 – Proposed Action

Variable density thinning would benefit deer and elk by creating a mosaic of forage habitat intermixed with some hiding cover. Thermal cover would be reduced on all acres proposed for timber harvest although treatment units would maintain 1 to 5 acre patches for hiding and thermal cover. Forage habitat for deer and elk would be developed in areas where heavy thinning is required. The long-term impacts to deer and elk would be neutral. Within the next 40 years, the forage habitat created by the Proposed Action would no longer be in a forage condition. In

the long-term, the habitat would likely be a combination of hiding and thermal cover, returning the area to a situation similar to the current condition.

The Mt. Hood Forest Plan Standard and Guide FW-208 recommends 2.5 mile per square mile of road on summer range and 1.5 miles per square mile on B10 winter range. Open road densities in the project area would exceed the Forest Plan Standards and Guidelines for summer range (1.72 miles per square mile) and B10 winter range (no open roads), reducing human interactions with wintering deer and elk .

Direct and Indirect Effects of Alternative 2

Thermal cover would be reduced on all acres proposed for timber harvest although treatment units would maintain 1 to 5 acre patches for hiding and thermal cover. Forage habitat for deer and elk would be developed on 25 acres where heavy thinning is required. The long-term impacts to deer and elk would be neutral. Within the next 40 years, the forage habitat created by the Alternative 2 would no longer be in a forage condition. In the long-term, the habitat would likely be a combination of hiding and thermal cover, returning the area to a situation similar to the current condition.

The Mt. Hood Forest Plan Standard and Guide FW-208 recommends 2.5 mile per square mile of road on summer range and 1.5 miles per square mile on B10 winter range. Open road densities in the project area would exceed the Forest Plan Standards and Guidelines for summer range (1.72 miles per square mile) and winter range (no open roads), reducing human interactions with wintering deer and elk.

Cumulative Effects of Alternative 1 and Alternative 2

The analysis area is bordered on the south by The Dalles Watershed, on the west by the Surveyors Ridge LSR, on the north by SDS lands and other private lands, and on on the east by the private lands. The Dalles Watershed Fuel Break project area and the North Fork Mill Creek project area combined currently have 44% forage and 56% cover. These projects would have 48% forage and 52% cover post timber removal. The optimum cover forage ratio is 60% forage and 40% cover (Thomas, 1979). Cumulatively, there would be a small change in cover forage ratios with forage increasing by 4% and cover decreasing by 4% in the North and South Fork Mill Creek areas.

The Mt. Hood Forest Plan Standard and Guide FW-208 recommends 2.5 miles per square mile of road on summer range and 1.5 miles per square miles on B10 winter range. The roads within the Dalles Watershed are not open to the public and the area meets or exceeds the Standards and Guidelines for open road densities. The North Fork Mill Creek project area would reduce open road densities and would meet or exceed the Standards and Guidelines for open road densities which would reduce human interactions with wintering deer and elk.

Pine Martin and Pileated Woodpecker

Direct and Indirect Effects of the No Action Alternative

The long-term effects of the No Action alternative to these species would include an increase in root-rot pockets and diseased trees and the potential for an increase in stand replacing fires within the planning area. This increase in disease and fire potential would increase the number of

snags, and would also increase the likelihood of losing mature forest habitat which these species depend on for reproduction and foraging.

Direct and Indirect Effects of Alternative 1 – Proposed Action

Tree removal would reduce snags, down wood and canopy closure for these species. Currently, the proposed project area is between 30 and 80 percent snag and down wood levels as outlined in the DecAID Advisor. The 30 percent levels are generally associated with previously harvested areas and the pine/oak habitat. The 80 percent levels are generally located in previously unharvested areas. The proposed project would retain snags and down wood at the 30 to 50 percent level in the planning area. The project does not impact any designated pine marten or pileated woodpecker habitat areas (B5) designated in the Mt. Hood Forest Plan.

Although the short-term effects to mature forest associated species may be negative, the long-term effect would be positive. The long-term improvement of stand health and the reduction in fuel loading would improve stand health and reduce the potential for stand replacing fires. Under this alternative, there is a greater chance of maintaining, through time, some of the key mature forest stands and/or key components of mature forests, such as large diameter trees, snags and logs.

The underburning of 610 acres would have a long-term positive effect on mature forest associated species. Underburning activities would reduce fuels and aid in the regeneration of the understory. These acres have a smaller diameter material throughout the area and burning would reduce the fire potential and initiate new growth. This new growth, and development of multi canopy layers should be beneficial for mature forest associated species.

Direct and Indirect Effects of Alternative 2

Currently, the proposed project area is between 30 and 80 percent snag and down wood levels as outlined in the DecAID Advisor. The 30 percent levels are generally associated with previously harvested areas and the pine/oak habitat. The 80 percent levels are generally located in previously unharvested areas. The proposed project would retain snags and down wood at the 30 to 80 percent level in the planning area. The project does not impact any designated pine marten or pileated woodpecker habitat areas (B5) designated in the Mt. Hood Forest Plan.

Under this alternative, the improvement of stand health and the reduction in fuels would reduce the potential for disease caused mortality and stand replacing fires on the acres treated. The long-term effects to the remaining untreated acres would include an increase in root-rot pockets and diseased trees and the potential for an increase in stand replacing fires. This increase in disease and fire potential would also increase the likelihood of losing mature forest.

The underburning of 610 acres would have a long-term positive effect on mature forest associated species. Underburning activities would reduce fuels and aid in the regeneration of the understory. These acres have a smaller diameter material throughout the area and burning would reduce the fire potential and initiate new growth. This new growth, and development of multi canopy layers would be beneficial for mature forest associated species.

Cumulative Effects of Alternative 1 and Alternative 2

The analysis area is bordered on the south by The Dalles Watershed, on the west by the Surveyors Ridge LSR, on the north by SDS lands and other private lands, and on the east by the private lands.

The Dalles Watershed Fuel Break would reduce snags to below the 30% level. The Surveyor's Ridge LSR would provide snags and down logs at the 80% level. Cumulatively, there would be no major impact on these species as adequate snags and down wood would be retained within the cumulative effects area. The area within the Surveyor's Ridge LSR would have 240 linear feet of down logs/acre (three tree length logs/acre, Surveyor's Ridge LSR Plan) and 2.25 snags/acre (Surveyor's Ridge LSR Plan, 100% biological potential).

Wild Turkey and Western Gray Squirrel

Direct and Indirect Effects of the No Action Alternative

There would be no impact to these species with the No Action alternative because no activities would take place in suitable habitat and no habitat would be altered or removed.

Direct and Indirect Effects of Alternative 1 – Proposed Action

Adequate forage would be available in the stands adjacent to and within the project area and does not appear to be a limiting factor for wild turkeys and gray squirrels within the watershed. There would be a reduction in the number of potential roost and nest trees within the project area, however, the majority of large ponderosa pine and Douglas fir would be maintained. These large trees would still supply roost sites and forage for turkeys and squirrels. Turkey nest sites would be minimally impacted by this project as nests are generally found on slopes greater than 30 percent. The majority of this project area is located on slopes less than 30 percent. Gray squirrel nest sites would be negatively impacted by this project as tree canopies need to overlap for travel connectivity.

Direct and Indirect Effects of Alternative 2

There would be no impact to these species with this alternative because no activities would take place in suitable habitat and no habitat would be altered or removed.

Cumulative Effects for Alternatives 1 and 2

The cumulative effects area of consideration is the North Fork Mill Creek Project boundary. Gray squirrels have a relatively small home range of 0.25 miles or less. Wild turkeys have a larger home range approximately 1 mile during the spring nesting season. Cumulatively, there would be a minor impact on these species. Wild turkeys and squirrels would still forage in the project area. Turkey nest sites would be minimally impacted as the majority of the habitat within the project is less than 30 percent slope. Gray squirrel nest sites would be negatively impacted in treatment areas where canopy cover is reduced.

Snag and Down Log Associated Species

Direct and Indirect Effects of the No Action Alternative

The long-term effects of the No Action alternative to these species would include the increase in root-rot pockets and diseased trees and the potential for an increase in stand replacing fires within the planning area. This increase in disease and fire potential would raise the likelihood of

losing mature forest habitat which is also a component of most snag and down log associated species.

Direct and Indirect Effects of Alternative 1 – Proposed Action

Tree removal would reduce snags, down wood and canopy closure for snag and down log associated species. Currently, the proposed project area is between 30 and 80 percent snag and down wood levels as outlined in the DecAID Advisor. The 30 percent levels are generally associated with previously harvested areas and the pine/oak habitat. The 80 percent levels are generally located in unharvested portions of the project area and the Surveyors Ridge LSR. The proposed project would retain snags and down wood at the 30 to 50 percent level in the planning area.

The ROD recommends 120 linear feet of down logs per acre greater than 16 inches in diameter within the matrix management areas in Eastern Oregon. This project would eliminate some habitat within the project area, however a minimum of 120 linear feet of down woody material and 4 snags/acre would be retained.

Direct and Indirect Effects of Alternative 2

The effects of this alternative as the same as those discussed for Alternative 1.

Cumulative Effects for Alternatives 1 and 2

The analysis area is bordered on the south by The Dalles Watershed, on the west by the Surveyors Ridge LSR, on the north by SDS lands and other private lands, and on the east by private lands.

The Dalles Watershed Fuel Break would reduce snags to below the 30% level. The Surveyor's Ridge LSR would provide snags and down logs at the 80% level. Cumulatively, there would be no major impact on these species as adequate snags and down wood would be retained within the cumulative effects area. The area within the Surveyor's Ridge LSR would have 240 linear feet of down logs/acre (three tree length logs/acre, Surveyor's Ridge LSR Plan) and 2.25 snags/acre (Surveyor's Ridge LSR Plan, 100% biological potential).

Neotropical Migratory Birds

Direct and Indirect Effects of the No Action Alternative

There would be no change in habitat for species associated with mid-seral habitats. Those species associated with late seral habitats would see a long-term negative effect due to an increase in root-rot pockets and diseased trees and the potential for an increase in disease caused mortality and stand replacing fires within the planning area. This increase in disease and fire potential would raise the likelihood of losing mature forest habitat for late seral species and may increase the amount of habitat for early seral species.

Direct and Indirect Effects of Alternative 1 – Proposed Action

Tree removal would create an additional 275 acres of early seral habitat for those bird species. This would benefit these species as more habitat would be available to them.

Species dependent upon mid-seral stands would have a reduction in 221 acres from the existing condition. This would reduce the available habitat in the planning area for these species, however approximately 1230 acres of mid-seral habitat would still remain within the planning area.

Bird species dependent upon late-seral habitat, would have a reduction of 54 acres of habitat. This would reduce the available habitat in the planning area for these species, however approximately 820 acres of late seral habitat would still remain within the planning area. Although the short-term effects to mature forest associated species may be negative, the long-term effect would be positive. The long-term improvement of stand health and the reduction in fuel loading would reduce the potential for disease caused mortality and stand replacing fires. Under this alternative, there is a greater chance of maintaining, over time, late seral habitat.

Under the Proposed Action, bird species dependent upon riparian habitat would not see a change in their habitats because the riparian vegetation is being maintained or protected within the project area.

Direct and Indirect Effects of Alternative 2

Tree removal would create an additional 25 acres of early seral habitat for those bird species. This would benefit these species as more habitat would be available to them.

Species dependent upon mid-seral stands would have a reduction in 25 acres from the existing condition. This would reduce the available habitat in the planning area for these species, however approximately 1425 acres of mid-seral habitat would still remain within the planning area.

Because this alternative does not treat stands in late-seral habitat, there would be no short-term impacts to late-seral habitat. The long-term effects of this alternative to late-seral dependent migratory birds would include an increase in root-rot pockets and diseased trees and the potential for an increase in stand replacing fires within untreated units. This increase in disease and fire potential would increase the likelihood of losing late-seral forest. Under this alternative, there is a greater chance of a reduction, over time, in late seral habitat.

Under this alternative, bird species dependent upon riparian habitat would not see a change in their habitats because the riparian vegetation is being maintained or protected within the project area.

Cumulative Effects of Alternative 1

The analysis area is bordered on the south by The Dalles Watershed, on the west by the Surveyors Ridge LSR, on the north by SDS lands and the other private lands, and on the east by private lands.

Cumulatively, there would be an increase in early seral habitat and a reduction in late seral habitat. Mid seral habitat would decrease slightly and riparian areas would remain relatively unchanged. Late seral habitat in the analysis area would remain above the 15 percent threshold as outlined in the Northwest Forest Plan.

Cumulative Effects of Alternative 2

The analysis area is bordered on the south by The Dalles Watershed, on the west by the Surveyors Ridge LSR, on the north by SDS lands and the other private lands, and on the east by private lands.

Cumulatively, there would be an very small increase in early seral habitat and a slight reduction in mid seral habitat. Late seral habitat and riparian areas would remain relatively unchanged.

Botanical Species

A Botanical Biological Evaluation was completed as part of this analysis. The entire Biological Evaluation is incorporated by reference and is located in the project record, located at the Hood River Ranger District. The analysis and conclusions of the evaluation are summarized below. Reference material is contained in the full biological evaluation.

Existing Conditions

There are 75 special status botanical species within range of the Mt. Hood National Forest. Prefield review indicates that suitable habitat may be present in the proposed project area for 38 of the 75 species - 14 vascular species, 4 bryophyte species, 4 lichen species, and 16 fungi species.

Arabis sparsiflora v. *atrorubens* (Nutt. mss.), Sicklepod rockcress

Extensive surveys for this species have been conducted in the Mill Creek watershed since 1989. Sites have not been reported off-Forest in the vicinity of Mill Creek Watershed. On the Mt. Hood National Forest, Sicklepod rockcress is widely distributed on the Hood River Ranger District along Surveyors Ridge Trail from Shellrock to the top of Bald Butte and along Mill Creek Ridge. There are also several reported sites on the Barlow Ranger District. Periodic informal monitoring between 1992 and 2007 indicate that Sicklepod rockcress populations in the Mill Creek watershed are not declining in numbers or size. On the Mt. Hood National Forest, Sicklepod rockcress appears to be a pioneer species (i.e., early seral) associated with pine/oak/grassland habitats in fire prone areas that remain in an early seral stage.

Botrychium minganense Victorin, Mingan moonwort

Extensive surveys for this species have been conducted in the Mill Creek watershed since 1989. Sites have not been reported off-Forest land in the vicinity of Mill Creek Watershed. There are approximately 15 populations of Mingan moonwort on the Mt. Hood National Forest. The majority of known sites have been found on the eastside of the Forest on the Hood River Ranger District in alluvial floodplains, seeps and springs, and along flat riparian areas with cedar and/or hardwood overstory and skunk cabbage understory (primarily early mid-late successional forests). Mingan moonwort is likely to be present in similar suitable habitat downstream from known sites in the watershed as spores are dispersed by water, wind, and migrating wildlife.

Fungi Species: *Cordyceps capitata*, *Cortinarius barlowensis*, *Gomphus kaufmannii*, *Gyromitra californica*, *Leucogaster citrinus*, *Mycena monticola*, *Otidea smithii*, *Phaeocollybia attenuata*, *Phaeocollybia californica*, *Phaeocollybia olivacea*, *Phaeocollybia oregonensis*, *Phaeocollybia picea*, *Phaeocollybia pseudofestiva*, *Phaeocollybia scatesiae*, *Ramaria amaloides*, *Ramaria gelatiniaurantia*, *Sowerbyella rhenana*.

Formal surveys for special status fungi are not currently required (2001 Northwest Forest Plan, Record of Decision, Standard & Guideline-9) and have not been conducted in the planning area. Informal surveys (incidental to surveys for other botanical surveys) have been conducted for various fungi throughout the Mill Creek watershed, but no species were found. The majority of known sites have been found on the westside of the Mt. Hood National Forest. In the vicinity of the planning area, the suitable habitat is present around North Fork

Mill Creek and in the Surveyors Ridge Late- Successional Reserve at the west edge of the planning area.

Methodology and Analysis

A controlled predetermined survey methodology was used, where all recognized habitats were initially sampled. The survey focused on specific habitat types that appeared to be suitable for one or more special status botanical species. Surveys generally focus on habitats such as seeps, springs, streams, floodplains, swales, rock outcrops, meadows, grasslands, pine/oak woodlands, and late successional forests (80 years and older). The micro-habitats that are of particular interest include; boles and branches of conifer trees from ground-level to approximately 15 feet, boles and branches of hardwood trees and shrubs from ground-level to approximately 15 feet snags rootwad in high humidity micro sites large class III, IV and V down wood cut ends of felled trees, and mossy boulders.

If surveys cannot be conducted during the appropriate season for definitive identification of a species, the presence of suitable habitat may be expected if:

- 1) Prefield review concludes that there are known sites of special status species in the project area and/or vicinity, or
- 2) Cursory pre-field and field survey finds presence of plant communities and/or micro-habitats associated with special status species botanical species.

Prefield review of the project area was conducted in 2007. District botany records indicate that surveys have been conducted throughout the planning area during May through October of 2000-2006. Special status species *Botrychium minganense* (moonwort) was found at 7 locations in and near the North Fork Mill Planning area (see Long Prairie Allotment Biological Evaluation report #2005.02). Region 6 Sensitive species *Arabis sparsiflora* v. *atrорubens* (sicklepod rockcress) and *Lomatium watsonii* (Watson's desert parsley) were found on Surveyor's Ridge and Mill Creek Ridge. No other Sensitive Plant Species were found.

Field Surveys

Field surveys for Special status species have been conducted by Forest Service botanists in the project area over the years since 1992, most recently during 2005, 2006, and 2007. Surveys focused on the verification of suitable habitats that were identified during prefield review, and on habitats for species known to be present in the project area particularly in grassy openings along Mill Creek Ridge and Surveyors Ridge and alluvial floodplains along North Fork Mill Creek and its tributaries.

Surveys also included search for botanical species formerly listed as Survey and Manage under the Northwest Forest Plan (since 1996) and also for some species that are known to be uncommon or rare in Oregon (according to the Oregon Natural Heritage Program), but which are not currently listed by the Regional Forester as R6 Sensitive.

Survey Results

1. Unit 92 – *Arabis sparsiflora* v. *atrорubens* (Sickle-pod rockcress), R6 Sensitive: Sickle-pod rockcress occupies approximately ½ acre of grassland/shrub habitat at the northern edge of

underburn unit 92. There are approximately 50 plants scattered around the edges of rabbit brush and pine forest. The grassland habitat is dominated by non-native grasses. The site was originally documented in 1990. Informal monitoring has been conducted periodically since 1990 and the population appears to be stable although there is some evidence of past off-road vehicle traffic through the habitat area.

2. Unit 95 - *Botrychium minganense* (Moonwort), R6 Sensitive and Rare & Uncommon: Moonwort occupies a seep area directly adjacent to the boundary of underburn unit 95. There are approximately 30 plants in a 1 acre seep. The population was originally documented in 2000, it has not been revisited since 2006 when the population appeared to be stable.
3. Unit 25 - *Botrychium minganense* (Moonwort), R6 Sensitive and Rare & Uncommon: Moonwort occupies approximately 2 acres along a cedar wetland the northeast edge of sapling thinning unit 25. Approximately 70 plants were documented in 2001, it has not been revisited since 2006 when the population appeared to be stable.

Fungi Surveys Not Conducted – Not Required

There are 19 special status (i.e., R6 Sensitive and Rare & Uncommon) fungi species that are within range of the Mt. Hood National Forest. Pre-disturbance surveys are only required for *Bridgeoporus nobilissimus* (if suitable habitat might be affected by project activity). Surveys are not required for the other 18 fungi species currently under direction of the Northwest Forest Plan because surveys are “not practical” (2001 Northwest Forest Plan, Record of Decision, Standard & Guidline-9). Informal surveys (incidental to surveys for other botanical surveys) have been conducted for various fungi throughout the Mill Creek watershed but no species were found. If species had been found they would be protected if required according to management direction.

Environmental Effects

No Action – Direct, Indirect and Cumulative Effects

Arabis sparsiflora v. *atrорubens* (Nutt. mss.), Sicklepod rockcress and *Botrychium minganense* Victorin, Mingan moonwort and fungi: *Cortinarius barlowensis*, *Cudonia monticola*, *Gomphus kaufmannii*, *Gyromitra californica*, *Leucogaster citrinus*, *Mycena monticola*, *Phaeocollybia attenuata*, *Phaeocollybia californica*, *Phaeocollybia oregonensis*, *Phaeocollybia piceae*, *Phaeocollybia pseudofestiva*, *Phaeocollybia scatesiae*, *Ramaria amyloidea*, *Ramaria gelatiniaurantia*, *Sowerbyella rhenana*

Assumptions - Under the No Action alternative it could be expected that: 1) Forest, riparian, and grassland habitats in the planning area would continue to evolve in response to various environmental conditions; 2) vegetation debris and forest fuels would likely continue to accumulate in unmanaged areas or where natural fires are suppressed, and 3) the severity risk of wildfire might increase as a result.

There is insufficient information available at this time to definitively measure direct, indirect, or cumulative effects that the “No Action” alternative might have on Special status botanical species *Arabis sparsiflora* v. *atrорubens* and *Botrychium minganense* or rare and uncommon fungi. It could be expected that the extent of effects, if they occurred as a result of the No Action alternative, would likely depend on the proximity of the fire to occupied habitat, the

intensity of the fire, and how both species and their habitats respond directly and indirectly to fire.

Arabis sparsiflora v. atrorubens (Nutt. mss.), Sicklepod rockcress

Under the No Action alternative recreational use of existing trails through *Arabis sparsiflora v. atrorubens* habitat on Surveyors Ridge would continue. Existing trails along Surveyors Ridge also function as dispersal corridors for noxious weeds that spread out into grassy openings and compete with Sicklepod rockcress and native plant communities for water and nutrients. Monitoring would be needed to accurately assess the direct, indirect, and cumulative effects that recreation and other trail related factors might have on Sicklepod rockcress and its habitat along Surveyors Ridge trails.

Alternative 1: Proposed Action – Direct, Indirect and Cumulative Effects

Arabis sparsiflora v. atrorubens (Nutt. mss.), Sicklepod rockcress and *Botrychium minganense* Victorin, Mingan moonwort and rare and uncommon fungi: *Cortinarius barlowensis*, *Cudonia monticola*, *Gomphus kaufmannii*, *Gyromitra californica*, *Leucogaster citrinus*, *Mycena monticola*, *Phaeocollybia attenuata*, *Phaeocollybia californica*, *Phaeocollybia oregonensis*, *Phaeocollybia piceae*, *Phaeocollybia pseudofestiva*, *Phaeocollybia scatesiae*, *Ramaria amyloidea*, *Ramaria gelatiniaurantia*, *Sowerbyella rhenana*

Direct or indirect effects to *Arabis sparsiflora v. atrorubens* and its habitat near unit 92 and *Botrychium minganense* near units 25 and 95 are not expected to occur as a result of activities proposed under the Proposed Action alternative. The sites would be protected by buffers included in the project design.

Other known populations of *Arabis sparsiflora v. atrorubens* and *Botrychium minganense* in the planning area are not in the vicinity of proposed project activities and would not be impacted directly or indirectly, therefore cumulative effects to both species are not expected as a result of project activities associated with the action alternative.

If rare and uncommon fungi individuals are present in the project area they could be impacted by soil disturbance associated with project activities. The removal of some trees could potentially impact fungi individuals, if they are present, that require host trees. The reduction of stand density that would result from the proposed action may affect suitable habitat for rare and uncommon fungi but would not likely have a cumulative effect on the viability of species because key elements of suitable habitat would remain in reserves in and outside of the planning area.

Alternative 2 – Direct, Indirect and Cumulative Effects

Arabis sparsiflora v. atrorubens (Nutt. mss.), Sicklepod rockcress and *Botrychium minganense* Victorin, Mingan moonwort and rare and uncommon fungi: *Cortinarius barlowensis*, *Cudonia monticola*, *Gomphus kaufmannii*, *Gyromitra californica*, *Leucogaster citrinus*, *Mycena monticola*, *Phaeocollybia attenuata*, *Phaeocollybia californica*, *Phaeocollybia oregonensis*, *Phaeocollybia piceae*, *Phaeocollybia pseudofestiva*, *Phaeocollybia scatesiae*, *Ramaria amyloidea*, *Ramaria gelatiniaurantia*, *Sowerbyella rhenana*

Direct or indirect effects to *Arabis sparsiflora v. atrorubens* and its habitat near unit 92 are not expected to occur as a result of activities proposed under this alternative. The site would be protected by buffers included in the project design.

Other known populations of *Arabis sparsiflora* v. *atrorubens* in the planning area are not in the vicinity of proposed project activities and would not be impacted directly or indirectly, therefore cumulative effects are not expected as a result of project activities associated with the action alternative.

If rare and uncommon fungi individuals are present in the project area they could be impacted by soil disturbance associated with project activities. The removal of some trees could potentially impact fungi individuals, if they are present, that require host trees. The reduction of stand density that would result from the proposed action may affect suitable habitat for rare and uncommon fungi but would not likely have a cumulative effect on the viability of species because key elements of suitable habitat would remain in reserves in and outside of the planning area.

Effects Determination

Table 3-53: Summary of Effects for Botanical Species

| SPECIES | Step 1. Prefield Review: Potential suitable habitat identified? | Step 2. Field Surveys: Surveys conducted? If no, explain rationale. | Survey Results: Species found? | Step 3. Effects: No Action | Step 3. Effects: Proposed Action | Step 3. Effects: Alternative 2 |
|---|---|---|--|--------------------------------------|--|--|
| <i>Ophioglossum pusillum</i> | No | No habitat | N/A | NI | NI | NI |
| <i>Phlox hendersonii</i> | No | No habitat | N/A | NI | NI | NI |
| <i>Potentilla villosa</i> | No | No habitat | N/A | NI | NI | NI |
| <i>Ranunculus reconditus</i> | Yes | Yes | No | NI | NI | NI |
| <i>Romanzoffia thompsonii</i> | No | No habitat | N/A | NI | NI | NI |
| <i>Scheuchzeria palustris</i> <i>v.americana</i> | No | No habitat | N/A | NI | NI | NI |
| <i>Sisyrinchium sarmentosum</i> | Yes | Yes | No | NI | NI | NI |
| <i>Suksdorfia violacea</i> | Yes | Yes | No | NI | NI | NI |
| <i>Sullivantia oregana</i> | No | No habitat | N/A | NI | NI | NI |
| <i>Taushia stricklandii</i> | No | No habitat | N/A | NI | NI | NI |
| <i>Wolffia borealis</i> | No | No habitat | N/A | NI | NI | NI |
| <i>Wolffia columbiana</i> | No | No habitat | N/A | NI | NI | NI |
| BRYOPHYTES | | | | | | |
| <i>Rhizomnium nudum</i> (moss) | Yes | Yes | No | NI | NI | NI |
| <i>Schistostega pennata</i> (moss) | Yes | Yes | No | NI | NI | NI |
| <i>Scouleria marginata</i> (moss) | Yes | Yes | No | NI | NI | NI |
| <i>Tetraphis geniculata</i> (moss) | Yes | Yes | No | NI | NI | NI |
| LICHENS | | | | | | |
| <i>Chaenotheca subroscida</i> | No | No habitat | N/A | NI | NI | NI |
| <i>Dermatocarpon luridum</i> | No | No habitat | N/A | NI | NI | NI |
| <i>Fuscopannaria rubiginosa</i> | No | No habitat | N/A | NI | NI | NI |
| <i>Hypogymnia duplicata</i> | No | No habitat | N/A | NI | NI | NI |
| <i>Leptogium burnetiae</i> v. <i>hirsutum</i> | Yes | Yes | No | NI | NI | NI |

| SPECIES | Step 1. Prefield Review: Potential suitable habitat identified? | Step 2. Field Surveys: Surveys conducted? If no, explain rationale. | Survey Results: Species found? | Step 3. Effects: No Action | Step 3. Effects: Proposed Action | Step 3. Effects: Alternative 2 |
|---------------------------------------|---|---|--|--------------------------------------|--|--|
| <i>Leptogium cyanescens</i> | Yes | Yes | No | NI | NI | NI |
| <i>Lobaria linita v. tenuoir</i> | No | No habitat | N/A | NI | NI | NI |
| <i>Nephroma occultum</i> | Yes | Yes | No | NI | NI | NI |
| <i>Peltigera neckeri</i> | No | No habitat | N/A | NI | NI | NI |
| <i>Peltigera pacifica</i> | No | No habitat | N/A | NI | NI | NI |
| <i>Pilophorus nigricaulis</i> | Yes | Yes | No | NI | NI | NI |
| <i>Pseudocyphellaria rainierensis</i> | No | No habitat | N/A | NI | NI | NI |
| <i>Ramalina pollinaria</i> | No | No habitat | N/A | NI | NI | NI |
| <i>Tholurna dissimilis</i> | No | No habitat | N/A | NI | NI | NI |
| <i>Usnea longissima</i> | No | No habitat | N/A | NI | NI | NI |
| FUNGI | | | | | | |
| <i>Bridgeoporus nobilissimus</i> | Yes | Yes. According to Protocol. | No | NI | NI | NI |
| <i>Cordyceps capitata</i> | No | Not required | No | NI | NI | NI |
| <i>Cortinarius barlowensis</i> | Yes | Not required | No | NI | MIIH | MIIH |
| <i>Cudonia monticola</i> | Yes | Not required | No | NI | MIIH | MIIH |
| <i>Gomphus kaufmannii</i> | Yes | Not required | No | NI | MIIH | MIIH |
| <i>Gyromitra californica</i> | Yes | Not required | No | NI | MIIH | MIIH |
| <i>Leucogaster citrinus</i> | Yes | Not required | No | NI | MIIH | MIIH |
| <i>Mycena monticola</i> | Yes | Not required | No | NI | MIIH | MIIH |
| <i>Otidea smithii</i> | No | Not required | No | NI | NI | NI |
| <i>Phaeocollybia attenuata</i> | Yes | Not required | No | NI | MIIH | MIIH |
| <i>Phaeocollybia californica</i> | Yes | Not required | No | NI | MIIH | MIIH |
| <i>Phaeocollybia olivacea</i> | No | No habitat | No | NI | NI | NI |
| <i>Phaeocollybia oregonensis</i> | Yes | Not required | No | NI | MIIH | MIIH |
| <i>Phaeocollybia piceae</i> | Yes | Not required | No | NI | MIIH | MIIH |
| <i>Phaeocollybia pseudofestiva</i> | Yes | Not required | No | NI | MIIH | MIIH |
| <i>Phaeocollybia scatesiae</i> | Yes | Not required | No | NI | MIIH | MIIH |

| SPECIES | Step 1. Prefield Review: Potential suitable habitat identified? | Step 2. Field Surveys: Surveys conducted? If no, explain rationale. | Survey Results: Species found? | Step 3. Effects: No Action | Step 3. Effects: Proposed Action | Step 3. Effects: Alternative 2 |
|---------------------------------|---|---|--|--------------------------------------|--|--|
| <i>Ramaria amaloidea</i> | Yes | Not required | No | NI | MIIH | MIIH |
| <i>Ramaria gelatiniaurantia</i> | Yes | Not required | No | NI | MIIH | MIIH |

NI = No Impact. Not Likely to Impact Individuals or Habitat or Lead to a Loss of Viability and a Trend Toward Federal Listing.

MIIH = May Impact Individuals or Habitat but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species at the site, on the Mt. Hood National Forest, or throughout the range of the species.

MIIV = May Impact Individuals or habitat and contribute to a trend towards Federal listing or cause a loss of viability on the Mount Hood National Forest and/or throughout the range of the species.

BI = Project would have a Beneficial Impact on species and habitat.

Rationale for Determination of Effects

Fungi – Potential Suitable Habitat / Surveys Not Conducted

There are 19 special status (R6 Sensitive and Rare and Uncommon) fungi species that are within range of the Mt. Hood National Forest. Pre-disturbance surveys are only required for *Bridgeopurus nobilissimus* (if suitable habitat might be affected by project activity). Surveys are not required for the other 18 fungi species currently under direction of the Northwest Forest Plan because surveys are “not practical” (2001 Northwest Forest Plan, Record of Decision, Standard & Guideline -9).

Surveys for special status fungi, except *B. nobilissimus*, are not considered practical because the presence of fruiting bodies (e.g. mushrooms and truffles) varies year to year which would require multi-year surveys to detect presence in suitable habitat. Surveys for *B. nobilissimus* are practical because the species produces perennial fruiting bodies on stumps, snags, and live trees.

The following rationale is specific to 16 fungi species that were identified as having suitable habitat in the proposed project area (see Table 1). If suitable habitat is suspected for listed fungi it is assumed that the species are likely present.

MIIH = May Impact Individuals or Habitat but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species at the site, on the Mt. Hood National Forest, or throughout the range of the species. The MIIH effects determination was made for the following species primarily due to the potential for localized impact to individuals caused by the removal of host trees, vegetation, and/or substrate.

1. *Cortinarius barlowensis*
2. *Cudonia monticola*

3. *Gomphus kaufmannii*
 4. *Gyromitra californica*
 5. *Leucogaster citrinus*
 6. *Mycena monticola*
 7. *Phaeocollybia attenuata*
 8. *Phaeocollybia californica*
 9. *Phaeocollybia oregonensis*
 10. *Phaeocollybia piceae*
 11. *Phaeocollybia pseudofestiva*
 12. *Phaeocollybia scatesiae*
 13. *Ramaria amyloidea*
 14. *Ramaria gelatiniaurantia*
 15. *Sowerbyella rhenana*
1. *Cortinarius barlowensis* is known from 16 sites in the western Cascades, Coast Range, and Olympic Mountains of Washington and Oregon. There are two known sites from the Mt. Hood National Forest on the Zigzag District. Habitat is soil under conifers. If *Cortinarius barlowensis* grows within the project area, it could be impacted by the removal of some host trees, but key elements of suitable habitat would still exist in and around the project area and presumably continue to provide undisturbed habitat for this species. Alternatives 1 and 2 May Impact Individuals and habitat but is not likely to lead to a trend toward federal listing.
 2. *Cudonia monticola* is endemic to the Pacific Northwest and grows under conifers in the spring and summer. This earth tongue fungus is scattered to gregarious or grows in dense clusters in humus, soil, and on rotting wood. If this species grows within the project area, it might be locally impacted by disturbance to the soil during project activity, but key elements of suitable habitat would still exist in and around the project area and presumably continue to provide undisturbed habitat for this species. Alternatives 1 and 2 May Impact Individuals and habitat but is not likely to lead to a trend toward federal listing.
 3. *Gomphus kaufmannii* is endemic to western North America and is found in California, Oregon, and Washington states. It is located either along the Pacific coast or in the Cascade-Sierran Range. There are 6 known sites for this mushroom on the Mt. Hood National Forest. Host trees for this species include true firs and pines. The species also forms symbiotic associations with the fine root systems of plants, growing out into the soil matrix. If this species grows within the project area, it might be impacted by the removal of some host trees, but key elements of suitable habitat would still exist in and around the project area and presumably continue to provide undisturbed habitat for this species. Alternatives 1 and 2 May Impact Individuals and habitat but is not likely to lead to a trend toward federal listing.
 4. *Gyromitra californica* is distributed from British Columbia to northern California and east to Colorado, Montana and Nevada. It is known in Washington, Oregon and northern California from 35 sites. Three sites are known from the Mt. Hood National Forest on Clackamas, Zigzag and Hood River Districts. This species is found on well-rotted stumps and logs of conifers or in soil with rotted wood. If *Gyromitra californica* grows within the project area, it might be impacted by the localized disturbance, but key elements of suitable habitat would still exist in and around the project area and presumably continue to provide undisturbed

habitat for this species. Alternatives 1 and 2 May Impact Individuals and habitat but is not likely to lead to a trend toward federal listing.

5. *Leucogaster citrinus* is endemic to the Pacific Northwest, known from western Washington, western Oregon and northern California and known from 45 sites. There are five sites from the Mt. Hood National Forest, Zigzag District. This truffle species is associated with the roots of conifers. If this species grows within the project area, it might be impacted by the removal of some host trees, but key elements of suitable habitat would still exist in and around the project area and presumably continue to provide undisturbed habitat for this species. Alternatives 1 and 2 May Impact Individuals and habitat but is not likely to lead to a trend toward federal listing.
6. *Mycena monticola* is endemic to the Pacific Northwest and is known from a number of sites in the Northwest Forest Plan area, scattered in the western and eastern Cascade Range, the Klamath Mountains, and the Olympic Mountains. On the Mt. Hood National Forest, one site has been documented (Bear Springs Campground, Barlow Ranger District). *M. monticola* is restricted to conifer forests above 1,000 meters in elevation, particularly those with *Pinus* species and usually found in gregarious, caespitose clusters in duff (Castellano et al. 1999). Key elements of suitable habitat would still exist in the project areas, and similar habitat located in reserves adjacent to the project areas would presumably continue to provide undisturbed habitat for this species, if it is present. Alternatives 1 and 2 May Impact Individuals and habitat but is not likely to lead to a trend toward federal listing.
7. *Phaeocollybia attenuata* is endemic to the Pacific Northwest from western Washington and western Oregon to northern California where it is known from 131 sites. There is one site known from the Mt. Hood National Forest on Zigzag District. This species is on soil under conifers. Although some host trees might be removed for relocation of the corral, potentially impacting individuals, others would remain continuing to provide the host trees for this species. Key elements of suitable habitat would still exist inside the planning area and similar habitat located in reserves adjacent to the area would presumably continue to provide undisturbed habitat for this species, if it is present in the area. Alternatives 1 and 2 May Impact Individuals and habitat but is not likely to lead to a trend toward federal listing.
8. *Phaeocollybia californica* is endemic to the Pacific Northwest, known from 34 sites in western Washington, western Oregon and northern California. No sites are known to occur on the Mt. Hood National Forest, however, there is a site on the adjacent Columbia River Gorge National Scenic Area. This species is terrestrial and associated with the roots of Douglas-fir, western hemlock and Pacific silver fir. If this species grows within the project area, it might be impacted by the removal of some host trees, but key elements of suitable habitat would still exist in and around the project area and presumably continue to provide undisturbed habitat for this species. Alternatives 1 and 2 May Impact Individuals and habitat but is not likely to lead to a trend toward federal listing.
9. *Phaeocollybia oregonensis* is endemic to the Pacific Northwest, know from 10 sites in the Oregon Coast Range and western Cascades. On Mt. Hood National Forest there are two sites from Zigzag District. This species is terrestrial and associated with the roots of Douglas-fir, western hemlock and Pacific silver fir. The project would not remove all host trees for *P.*

oregonensis. If this species grows within the project area, it might be impacted by the removal of some host trees, but key elements of suitable habitat would still exist in and around the project area and presumably continue to provide undisturbed habitat for this species. Alternatives 1 and 2 May Impact Individuals and habitat but is not likely to lead to a trend toward federal listing.

10. *Phaeocollybia piceae* is endemic to the Pacific Northwest, known from 49 sites in western Washington, western Oregon and northern California. There are no known sites on the Mt. Hood National Forest. This species is terrestrial and associated with the roots of Douglas-fir, western hemlock and Pacific silver fir. The project would not remove all host trees for *P. piceae*. If this species grows within the project area, it might be impacted by the removal of some host trees, but key elements of suitable habitat would still exist in and around the project area and presumably continue to provide undisturbed habitat for this species. Alternatives 1 and 2 May Impact Individuals and habitat but is not likely to lead to a trend toward federal listing.
11. *Phaeocollybia pseudofestiva* is endemic to the Pacific Northwest, known from British Columbia south through western Washington, western Oregon to California. There are 36 known sites in Washington, Oregon and California, four of which are on the Mt. Hood National Forest, Zigzag District. The species grows on soil under conifers. If this species grows within the project area, it might be locally impacted by disturbance to the soil during project activity, but key elements of suitable habitat would still exist in and around the project area and presumably continue to provide undisturbed habitat for this species. Alternatives 1 and 2 May Impact Individuals and habitat but is not likely to lead to a trend toward federal listing.
12. *Phaeocollybia scatesiae* is endemic to the Pacific Northwest with 17 sites documented in the Northwest Forest Plan area, three on the Mt. Hood National Forest (Zigzag Ranger District). This species is associated with the roots of *Abies* species, *Picea sitchensis*, and *Vaccinium* species, from sea level to 1,250 meters in elevation (Castellano et al. 1999). Soil compaction could have a localized negative impact on individuals. Key elements of suitable habitat would still exist inside the project areas, and similar habitat located in reserves adjacent to the project areas would presumably continue to provide undisturbed habitat for this species, if it is present. Alternatives 1 and 2 May Impact Individuals but is not likely to lead to a trend toward federal listing.
13. *Ramaria amyloidea* is endemic to the Pacific Northwest from western Washington to northern California. It is currently known from 16 sites. No sites are known from the Mt. Hood National Forest. Habitat for the species is soil in sites associated with true fir, Douglas-fir and western hemlock. If this species grows within the project area, it might be locally impacted by disturbance to the soil during project activity, but key elements of suitable habitat would still exist in and around the project area and presumably continue to provide undisturbed habitat for this species. Alternatives 1 and 2 May Impact Individuals and habitat but is not likely to lead to a trend toward federal listing.
14. *Ramaria gelatiniaurantia* is endemic to the Pacific Northwest, known from 24 sites from western Washington to northern California. Two sites are located on the Mt. Hood National

Forest, Clackamas River District. Habitat for the species is soil in sites associated with true fir, Douglas-fir and western hemlock. If this species grows within the project area, it might be locally impacted by disturbance to the soil during project activity, but key elements of suitable habitat would still exist in and around the project area and presumably continue to provide undisturbed habitat for this species. Alternatives 1 and 2 May Impact Individuals and habitat but is not likely to lead to a trend toward federal listing.

15. *Sowerbyella rhenana* occurs in Europe, Japan and Northwest North America. In the Pacific Northwest, it is known from 55 sites in western Washington, western Oregon and northern California, including two sites from the Mt. Hood National Forest on Clackamas River and Zigzag Districts. Habitat for the species is soil under conifers. If this species grows within the project area, it might be locally impacted by disturbance to the soil during project activity, but key elements of suitable habitat would still exist in and around the project area and presumably continue to provide undisturbed habitat for this species. Alternatives 1 and 2 May Impact Individuals and habitat but is not likely to lead to a trend toward federal listing.

Aquatic Conservation Strategy

In order for a project to proceed, “a decision maker must find that the proposed management activity is consistent with the Aquatic Conservation Strategy objectives” (ROD B-10). The nine objectives are listed on page B-11 of the ROD. Portions of the effects analysis in this document have focused on key parameters or indicators that make up elements of the nine Aquatic Conservation Strategy objectives, to determine if the project would restore, maintain, or degrade these indicators. Once this determination is made, the indicators are examined together to ascertain whether the project is consistent with the objectives. Table 3-54 displays the individual indicators and the effect the action alternatives have on those indicators at the 5th, 6th and 7th field watershed scale. Fifth field watersheds are generally large in size (40,000 acres to 250,000 acres), while 6th and 7th field watersheds are smaller (5,000 acres to 40,000 acres and 2,000 acres to 5,000 acres respectively).

The following summarizes the Individual Indicator Table:

- The proposed project would treat vegetation in Riparian Reserves to restore them to a more natural vegetation state. This would result in more natural function of the riparian area. Benefits from implementation of either Alternative 1 or 2 would be seen at the 7th field sub-watershed scale. Alternative 1 proposes to treat 9% more Riparian Reserves than Alternative 2 so benefits to Riparian Reserves would more likely be seen at the 6th field level as well in Alternative 1.
- The proposed project would remove or replace undersized culverts and decommission roads to restore this area to a more natural sediment regime as well as some benefits to floodplain connectivity and decreasing the drainage network associated with the roads. These projects may cause some minor short-term sediment introduction in order to implement them. Benefits would likely be noticeable at the 7th field sub-watershed scale and to a limited degree at the 6th field scale.
- Indicators other than those described in the bullet above would be maintained as outlined in the effects analysis above.

Table 3-54: Individual Indicators for Aquatic Conservation Strategy

| Indicators | Effects of the Actions | | | | | | | | |
|--|------------------------|-----------------------|----------------------|------------------------|----------|---------|------------------------|----------|---------|
| | No Action | | | Alternative 1 | | | Alternative 2 | | |
| | Restore ¹ | Maintain ² | Degrade ³ | Restore | Maintain | Degrade | Restore | Maintain | Degrade |
| Water Quality: Temperature | | X | | | X | | | X | |
| Sediment | | X | | X (short-term degrade) | | | X (short-term degrade) | | |
| Chemical Contamination | | X | | | X | | | | |
| Habitat Access: Physical Barriers | | X | | X | | | X | | |
| Habitat Elements: Substrate | | X | | | X | | | X | |
| Large Woody Debris | | X | | | X | | | X | |
| Pool Frequency | | X | | | X | | | X | |
| Pool Quality | | X | | | X | | | X | |
| Off-channel Habitat | | X | | | X | | | X | |
| Refugia | | X | | | X | | | X | |
| Channel Conditions and Dynamics: Width/Depth Ratio | | X | | | X | | | X | |
| Streambank Condition | | X | | | X | | | X | |
| Floodplain Connectivity | | X | | X | | | X | | |
| Flow/Hydrology: Peak/Base Flows | | X | | | X | | | X | |
| Drainage Network Increase | | X | | X | | | X | | |
| Watershed Conditions: Riparian Reserves | | X | | X | | | X | | |

- 1 "Restore" means the action(s) would result in acceleration of the recovery rate of that indicator.
- 2 Maintain" means that the function of an indicator does not change by implementing the action(s) or recovery would continue at its current rate.
- 3 "Degrade" means changing the function of an indicator for the worse.

Table 3-55 displays specific Aquatic Conservation Strategy objectives and the indicators from the previous table that comprise each objective. All of the indicators that are checked for a particular objective should be evaluated together to determine whether the action maintains or enhances the specific Aquatic Conservation Strategy objective.

Table 3-55: Aquatic Conservation Strategy Objectives

| Indicators | Aquatic Conservation Strategy Objectives | | | | | | | | |
|---------------------------|--|----|----|----|----|----|----|----|----|
| | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 | #9 |
| Temperature | | X | | X | | | | X | X |
| Sediment | | | | X | X | X | | X | X |
| Chemical Contamination | | | | X | | | | X | X |
| Physical Barriers | X | X | | | | | | X | X |
| Substrate | | | X | | X | X | | | X |
| Large Woody Debris | | | X | | | | | X | X |
| Pool Frequency | | | X | | | | | | X |
| Pool Quality | | | X | | | | | | X |
| Off-Channel Habitat | X | X | X | | | | | | X |
| Refugia | X | X | | | | | | X | X |
| Width/Depth Ratio | | | X | | | | | X | X |
| Streambank Condition | | | X | | | X | | X | X |
| Floodplain Connectivity | X | X | X | | | | X | X | X |
| Peak/base Flows | | | | | X | X | X | | |
| Drainage Network Increase | | | | | X | X | X | | |
| Riparian Reserves | X | X | X | X | X | X | | X | X |

The following is a summary the Aquatic Conservation Strategy objectives (ROD B-10) and how the action alternatives would influence them:

1. **Maintain The Distribution, Diversity And Complexity Of Watershed And Landscape-Scale Features:** This project would meet this objective because of the protection that the Riparian Reserves provide. Specific prescriptions for vegetation treatments in Riparian Reserves have been developed for this project and those prescriptions are intended to maintain or enhance the development of a diverse, healthy riparian area while protecting it

with a variety of mitigation measures and design criteria. No new road crossings of perennial streams or wetlands are proposed and several existing crossings would be upgraded or removed, which would decrease the current level of aquatic habitat fragmentation. Some temporary crossings of ephemeral channels may be constructed and removed immediately after project completion. Three new trail crossings are proposed but the crossings will be constructed to minimize aquatic habitat fragmentation by utilizing bridges and properly sized culverts where appropriate. These crossings would not result in any long-term aquatic habitat fragmentation.

2. **Maintain Spatial And Temporal Connectivity Within And Between Watersheds:** The project would increase the spatial and temporal connectivity within and between watersheds due to culvert replacement, culvert removal and road decommissioning. New major stream crossings associated with the trail construction would be bridges which would maintain spatial and temporal connectivity.
3. **Maintain the Physical Integrity of the Aquatic System, Including Streambanks, Side channels (Refugia), and Channel Bottom Configurations:** This project would meet this objective through mitigation measures, design criteria and the protection provided by Riparian Reserves. Mitigation measures and design criteria aimed at reducing soil compaction and erosion, establishment of undisturbed vegetative buffers next to perennial and intermittent streams, prescriptions for Riparian Reserves that are intended to maintain or enhance the development of a diverse, healthy riparian area and the lack of any new crossings on perennial streams would greatly reduce risks of sedimentation, increased peak flow, and resulting bank erosion and channel bed scour.
4. **Maintain Water Quality Necessary To Support Healthy Ecosystems:** This project would meet this objective through mitigation measures, design criteria and protection provided by Riparian Reserves which would maintain stream temperature. Mitigation measures and design criteria aimed at reducing erosion would maintain the reduce sediment levels in the long-term. These measures are discussed in detail in the Soil Productivity, Water Quality, and Fisheries sections in Chapter 3.
5. **Maintain Sediment Regimes:** This project would enhance this objective in the long run through culvert replacement, culvert removal and road decommissioning. Mitigation measures and design criteria such as establishment of undisturbed vegetative buffers next to perennial and intermittent streams, keeping new temporary roads and landings out of Riparian Reserves, removing or breaching snow berms to avoid accumulation or channelization of erosive melt water on roads after snowplowing and protection provided by Riparian Reserves would minimize sediment introduction in the short-term.
6. **Maintain In-Stream Flows That Are Closer To Natural Regimes:** This project would meet this objective through mitigation measures, design criteria and protection provided by Riparian Reserves. As described in the watershed section of this report, this project would maintain the Watershed Impact Area well below the 35% Management Plan Standard and Guide which shouldn't result in any peak flow increase. In addition, road decommissioning would "disconnect" the road system from streams which should move runoff toward a more natural rate.

7. **Maintain The Timing, Variability, And Duration Of Floodplain Inundation:** This project would meet this objective through mitigation measures, design criteria and protection provided by Riparian Reserves. Mitigation measures and design criteria such as establishment of undisturbed vegetative buffers next to perennial and intermittent streams, keeping new temporary roads and landings out of Riparian Reserves and maintaining the Watershed Impact Area well below the 35% Management Plan Standard and Guide would protect the integrity of the floodplains while minimizing the potential for increased peak flows. In addition, road decommissioning would “disconnect” the road system from streams which should move runoff toward a more natural rate. Floodplains are extremely limited in this area due to the steep nature of the landscape.
8. **Maintain The Species Composition And Structural Diversity Of Plant Communities In Riparian Areas And Wetlands:** This project would meet this objective through protection provided by Riparian Reserves. Treatments within the Riparian Reserves are aimed at producing a more natural vegetative composition and density that has been lost through many decades of fire suppression.
9. **Maintain And Restore Habitat To Support Well-Distributed Populations Of Native Plant And Riparian Dependent Species:** The project would meet this objective with mitigation measures, protection provided by Riparian Reserves and vegetative treatments that are designed to simulate a more natural disturbance regime within the area.

Invasive Plant Species

A more detailed invasive plant report is located in the project record, located at the Hood River Ranger District. The analysis and conclusions of the report are summarized below. Reference material is contained in the full specialists report.

Existing Conditions

Invasive non-native plants occur throughout the planning area; most notable are noxious weeds and some grass species. These plant species can inhabit and negatively alter native plant communities and ecosystems.

Direction for management of invasive plants in national forest and grasslands of the Pacific Northwest is included in a 2005 Environmental Impact Statement (EIS) that focused primarily on preventing and managing invasive plants. Prevention measures that have been used along roads on the Hood River Ranger District include the release of biological control insects that selectively feed on targeted noxious weeds, and manual/mechanical methods of treatment such as hand pulling and/or mowing noxious weeds where feasible. Under the 2008 Record of Decision for Site-Specific Invasive Plant Treatments for Mt. Hood National Forest and Columbia River Gorge National Scenic Area in Oregon high priority roads in the project area would be treated to control noxious weeds either manually, mechanically, and/or with approved herbicides. There may also be isolated noxious weeds sites along spur roads that would also be treated (see treatment map in project record, located at Hood River Ranger District, Mt. Hood/Parkdale, Oregon).

The invasive plant species below that are of concern and are legally recognized as noxious weeds, meaning laws have been developed by the State of Oregon to restrict their spread and effect on the environment. Noxious weeds are defined by the Oregon State Weed Board “as exotic, non-indigenous, species that are injurious to public health, agriculture, recreation, wildlife or any public or private property”. The following noxious weeds below are identified by the Oregon Department of Agriculture (ODA) and are known to occur within or a short distance (1 mile or less) from this planning area.

Table 3-56: Noxious Weeds in Planning Area

| Rating | Common Name | Scientific Name |
|--------|---------------------------------|-----------------------------|
| B | Diffuse knapweed | <i>Centaurea diffusa</i> |
| B,T | Spotted knapweed | <i>Centaurea maculosa</i> |
| B | Canada thistle | <i>Cirsium arvense</i> |
| B | Yellow toadflax | <i>Linaria vulgaris</i> |
| B | St. Johnswort (Klamath weed) | <i>Hypericum perforatum</i> |

***NOXIOUS WEED CONTROL RATING SYSTEM**

Noxious weeds, for the purpose of this system, shall be designated “A”, “B”, and/or “T”, according to the ODA Noxious Weed Rating System.

1. **“A” Designated weed** – a weed of known economic importance which occurs in the state in small enough infestations to make eradication /containment possible; or is not known to occur, but its’ presence in neighboring states make future occurrence in Oregon seem imminent. Recommended action: Infestations are subject to intensive control when and where found.

2. **“B” designated weed** - a weed of economic importance which is regionally abundant, but which may have limited distribution in some counties. Where implementation of a fully integrated statewide management plan is infeasible, biological control shall be the main control approach.
3. **“T” designated weed** – a priority noxious weed designated by the State Weed Board as a target weed species on which the Department will implement a statewide management plan.

Noxious Weeds

Canada thistle, St. Johnswort, and diffuse and spotted knapweed could be found along most of the major roads in the planning area, such as the 17, 1711 and 17-660 roads. These species also occur on disturbed areas such as past timber harvested units (landings/slash piles), skid trails, roadside prisms, OHV trails, trailheads, and dispersed campsites. Diffuse knapweed is also located in the Kiyi Quarry pit on the 1710 road. Forested areas with little disturbance and at least 70% canopy closure are generally weed free from these two species.

Yellow toadflax occurs in one small population along the 17-660 road by the 013 spur intersection. The Canada thistle occurs in some of the older timber harvested areas (Bronco TS, 1972-73, & Pigeon TS, 1985-86).

At the current time there are no treatment activities occurring by the Forest Service, except for some occasional hand-pulling by the Hood River County Weed specialist. Under the Mt. Hood National Forest Site-Specific Invasive Plant Treatment EIS the following sites would be treated along roads 1700 (treatment sites #66-044 and #66-074), 1700-013 (treatment site #66-055), 1700-662 (treatment sites #66-081 and #66-033).

Invasive Grasses

Non-native grass species were widely introduced in commercial seed mixes used by the Forest Service for erosion control and wildlife/livestock forage uses. These seed mixes were used for a long time as a means of site restoration efforts after timber harvesting. The efforts were identified specifically to revegetate landings, slash piles, and skid trails. These areas now sometimes exhibit a monoculture of these species in certain areas. Conversion of these areas back to a more native vegetation type mix will take a long time and will be quite costly. This practice of using non-native seed mixes has not been implemented since 1993, when the Forest Service issued policy regarding the use of native plants (FSM #2470/2600, 1-7-1993).

The following is a list of those non-native grass species known to occur within or near (1 mile or less) of this planning area, according to Susan Nugent, Hood River Ranger District Botanist. Orchard grass (*Dactylis glomerata*), Soft brome (*Bromus mollis*), Tall fescue (*Festuca arundinacea*), Perennial ryegrass (*Lolium perenne*), Timothy grass (*Phleum pratense*), Meadow foxtail (*Alopecurus pratensis*), Intermediate Wheatgrass (*Agropyron intermedium*), and Kentucky bluegrass (*Poa pratensis*). There are some non-native “early seral invader” type grass species that are also opportunistic and have established in this planning area because of past soil disturbance from timber sales and recreation. The creation of bare ground from these types of activities is where these species could gain a foot hold. These species are, Cheatgrass (*Bromus tectorum*), Barren brome (*Bromus sterilus*), Bulbous bluegrass (*Poa bulbosa*), and Voodoo grass (*Ventenata dubia*).

Environmental Effects

No Alternative – Direct and Indirect Effects

There would be no new ground disturbances within the planning area other than what is already occurring. The projects proposed in the North Fork Mill Creek planning area would not be implemented therefore would not increase in the cost of monitoring and treating weeds under the current noxious weed treatment program. There would be no new weed populations established or spread in the forested landscape from these activities. The rate of spread would be expected to continue at the same level.

No Alternative – Cumulative Effects

The potential analysis area for invasive plants/noxious weeds is as far as humans, wildlife, or vehicles range from the proposed activity area. There would be no cumulative contribution to the introduction and spread of invasive plants/noxious weeds within this planning area other than what is occurring already.

Assumptions include: U.S. Forest Service has only a slight influence on movement of humans, livestock, wildlife, or vehicles in or out of the planning area. Once a small infestation is detected, the rate of spread could be controlled. Mitigation and an active treatment program could control the rate of spread. Herbicides are the most cost effective method for controlling the spread of noxious weeds.

Activities within the next five years in this general area included road maintenance, trail maintenance, South Fork of Mill Timber Sale, prescribed fire treatments, and the Mt. Hood NF Invasive Treatment Program. Logging activities could potentially occur within the next five years on private land that borders the North Fork Mill planning area.

All of these projects could potentially cause noxious weeds/ invasive species to become established or spread, except for the Mt. Hood NF Invasive Treatment Program which would actively reduce the populations of noxious weeds and invasive species.

Past and current ground disturbing activities such as timber harvesting, road construction and maintenance, trail construction and maintenance, dispersed recreation, wildlife (deer/elk), Forest Service contractors, and fire suppression activities have all contributed to the establishment and spread of invasive species/noxious weeds in this planning area. The recreational and economic land uses (hunting, hiking, off-road vehicle use/OHV, mushroom harvesting, and firewood gathering) are also known vectors of weed seed dispersal. All these activities are likely to continue into the reasonably foreseeable future in this area.

Alternatives 1 and 2 – Direct and Indirect Effects

The proposed alternatives are intended to improve forest health conditions (removing root rot pockets, removing diseased trees) and reduce hazardous fuels (removal of surface fuels, removal of ladder fuels, and opening of the canopy). The mechanical fuels reduction treatment methods would consist of tree thinning from below, machine piling, hand thinning, pruning by hand, machine mastication, and manual brush removal. The proposed alternatives would also include a prescribed fire matrix that would identify stands/areas where prescribed fire could be utilized to help move that vegetation type to a more natural fire regime, thus more able to withstand small

more frequent fires. Also, the proposed alternatives include proposed trail, road and culvert projects. Lastly, the proposed alternatives identify design criteria or mitigation measures that would be implemented as part of this project.

The proposed action would potentially increase the spread of non-native grass species that are known to occur within 1 mile of this planning area. These non-natives are opportunistic and the creation of bare ground would provide for this. Access to the planning area would be decreased through the road closures/decommissioning and increased through trail construction/maintenance. Overall, the general public would still have access to this planning area, so this vector for seed dispersal would still exist.

The proposed alternatives could potentially increase the need for treatment and potentially the increased use of herbicides. The Region 6 Invasive Plant EIS (2005) and the Mt. Hood National Forest Site-Specific Invasive Plant Treatment EIS (2008) identify standards and guidelines pertaining to the application of herbicides used anywhere on the Mt. Hood National Forest. Both alternatives would also likely increase the cost for the Hood River Ranger District to implement their current weed management program, since the activities would add additional acres needing monitoring and treatment to the district's existing program.

General Project Associated Activity

The activity of cutting trees, temporary road building, and landing construction would cause a reduction in canopy and stems, which would provide favorable light conditions for invasive species establishment. Harvest activities (yarding material), deep ripping, and grapple piling, could expose and compact soils which would provide a seedbed for invasive species establishment. Once piles are burned, soil conditions are favorable again for these species to become established.

Prescribed Fire

Underburn projects in grassy areas could be expected to cause invasive non-native grass species and knapweed to gain competitive edge over native plants after prescribed fire (James et al., 1991, and Zimbdahl, 1999).

Alternatives 1 and 2 – Cumulative Effects

The potential analysis area for invasive plants/noxious weeds is as far as humans, wildlife, or vehicles range from the proposed activity area. The focus of this analysis is the role of activities on the Hood River Ranger District and its cumulative contribution to the introduction and spread of invasive plants/noxious weeds when added to the effects of this proposal.

Assumptions include: U.S. Forest Service has only a slight influence on movement of humans, livestock, wildlife, or vehicles in or out of the planning area. Once a small infestation is detected, the rate of spread could be controlled. Mitigation and an active treatment program could control the rate of spread. Herbicides are the most cost effective method for controlling the spread of noxious weeds.

Past and current ground disturbing activities such as timber harvesting, road construction and maintenance, trail construction and maintenance, dispersed recreation, wildlife (deer/elk), Forest Service contractors, and fire suppression activities have all contributed to the establishment and

spread of invasive species/noxious weeds in this planning area. The recreational and economic land uses (hunting, hiking, off-road vehicle use/OHV, mushroom harvesting, and firewood gathering) are also known vectors of weed seed dispersal. All these activities are likely to continue into the reasonably foreseeable future in this area.

Activities within the next five years in this general area included road maintenance, trail maintenance, South Fork of Mill Timber Sale, prescribed fire treatments, and the Mt. Hood NF Invasive Treatment Program. Logging activities could potentially occur within the next five years on private land that borders the North Fork Mill planning area.

All of these projects could potentially cause noxious weeds/ invasive species to become established or spread, except for the Mt. Hood NF Invasive Treatment Program which would actively reduce the populations of noxious weeds and invasive species.

Prescribed Fire

Underburn projects in grassland areas along Mill Creek Ridge could be expected to cause invasive non-native grass species and knapweed to gain competitive edge over native plants after prescribed fire (James et al., 1991, and Zimbdahl, 1999). There is a possibility that if the prescribed fire areas along Mill Creek Ridge are not treated annually and reseeded with native grasses, some level of decrease in diversity of native plants and pollinators and associated wildlife could result due to the increased encroachment of noxious weeds and invasive non-native species.

Noxious Weed Risk Assessment

The North Fork Mill Creek projects have a MODERATE to HIGH risk of introducing or spreading known populations of noxious weeds. Weed control measures are identified under the mitigations section of this document.

Forest Service Manual (FSM) direction requires that Noxious Weed Risk Assessments be prepared for all projects involving ground-disturbing activities. For projects that have a moderate to high risk of introducing or spreading noxious weeds, Forest Service policy requires that decision documents must identify noxious weed control measures that would be undertaken during project implementation (FSM 2081.03, 11/29/95).

The proposed project would have a Moderate Risk of spreading or introducing noxious weeds. The process for risk ranking is detailed below.

X HIGH

Has to be a combination of the following three factors:

1. Known weeds in/and or adjacent (~ 100 feet) to the project area, in large quantities (High density/acre).
2. Any four or more of vectors # 1 - 8 in the immediate project area.
3. Project operation activities not able to avoid weed populations.

MODERATE

Has to be a combination of the following three factors:

1. Known weeds in/and or adjacent (~ 100 feet) to the project area, in moderate quantities (Moderate density/acre).

2. No more than three of vectors # 1 - 8 present in the immediate project area.
3. Project operation activities are not able to avoid weed populations.

LOW

Has to be one or the other or both factors:

1. No more than two of vectors # 1 - 8 present in the immediate project area.
2. No Known weeds in/and or adjacent (~ 100 feet) to the project area without vectors

*Vectors (if contained in the project proposal) ranked in order of weed introduction risk:

1. Heavy equipment (implied ground disturbance)
2. Importing soil, cinders, or gravel
3. OHV/ATV's (mountain bikers, motorcycles, 4-wheelers etc.)
4. Grazing livestock (long-term disturbance)
5. Pack animals (short-term disturbance)
6. Plant restoration (active restoration, soil scarification, seeding, etc.)
7. Recreationists/General Public (hikers, hunters, camping, mushroom/firewood gathering)
Forest Service/contractor project vehicles

Range Management

A more detailed range management report is located in the project record, located at the Hood River Ranger District. The analysis and conclusions of the report are summarized below. Reference material is contained in the full specialists report.

Existing Conditions

This planning area encompasses the entire Long Prairie Allotment, which in itself totals 5,760 acres. The current permitted numbers of livestock on this allotment are 52 cow/calf pairs or 185 Animal Unit Months (AUM's). The permitted grazing season for this allotment is from June 15 to September 30. There is one ten year term permit issued on this allotment. In 1993 two sections of National Forest System lands (T1S, R10E, SEC.36 & T1S, R11E, SEC. 31) were exchanged out of federal ownership to private land. The new landowner has given the permittees permission to continue grazing their livestock, in order to maintain his objectives of keeping the herbaceous and shrubby vegetation low, for less competition with tree seedling survival.

Historical records at the Barlow Ranger District do indicate that documented livestock grazing (cattle and sheep) has occurred in this area from 1906 to the present. Records do indicate that livestock grazing occurred in this area before the inception of the US Forest Service in 1906, but those records are sketchy at best.

An Environmental Analysis (EA) was completed for the Long Prairie Allotment in September, 2005. This document outlined a plan that would construct 3 miles of new fencing to the north of the North Fork of Mill Creek. This new fence would essentially keep livestock north of the North Fork of Mill Creek, thus eliminating the need to maintain an existing allotment boundary fence along the 1700-662 road. To date just over one mile of this fence has been constructed (Fall 2007) starting from the southern portion of Gibson Prairie Meadow northeast to the intersection of 1711-620 and 1711-623. The fence was constructed along the 1711-620 road.

The decision from this document identifies a "two-pasture, deferred, rotation" grazing system. Under this system, the permittee's first turn out their livestock into one of the identified pastures for that season, after "range readiness" (firm soils, & maturing vegetation) has been achieved. The livestock will utilize this area for approximately one to two months, or until utilization levels are reached, whichever ever comes first. The permittee's will then move their livestock into the other identified pasture for use that season. The animals will stay there until September 30, the end of the grazing season. This system accomplishes deferring utilization of forage in the second designated pasture, until plant development is allowed to progress to a mature phenological stage. The plan is to switch this order of use, the following year. This system requires that each pasture will receive deferred use every other year. This system will allow that each pasture will be utilized early in the season one year, and then later in the season for the next year. The allotment currently has six "short-term" monitoring sites established, that measure utilization levels (the removal of the current years vegetative growth). This data is collected at every site, once before the animals are turned out, and then once at the end of the season.

The majority of permanent range occurs in the meadows and riparian areas of this allotment. In the timbered portions of this allotment the transitory range (clear-cuts, shelterwoods etc.)

provides forage on a relatively short-term basis (20 to 50 years). This is forage produced in openings created by timber harvest activities, and seeded with a grass species mix of Orchardgrass (*Dactylis glomerata*), Timothy grass (*Phleum pratense*), Intermediate Wheatgrass (*Agropyron intermedium*) and Brome grass (*bromus spp.*). This forage production is significant for the first 8-20 years following harvest, but drops off as the tree canopy shades out the herbaceous vegetation. There are some harvested areas that have almost permanently become grasslands due to the difficulty silviculture has had growing trees on them, so these areas have remained productive as far as herbaceous forage is concerned.

Specific details of allotment management such as pasture movement schedules, range readiness recommendations, utilization limits, range improvement maintenance responsibilities and locations etc., are discussed in the Long Prairie Allotment Management Plan, available at the Barlow Ranger District. Range improvements within the allotment are a combination of drift and boundary fences, stock watering ponds, spring developments, guzzlers, corrals and cattleguards.

Under current direction from the Forest Service Washington Office, range managers are striving for vegetation management. The Forest Service has the opportunity in this planning area to utilize livestock as a tool to control undesirable vegetation, such as competing vegetation in young plantations, or possibly use livestock as a tool to achieve a desired future condition for vegetation in other specific areas.

Environmental Effects

No Alternative

Under the No Action Alternative the existing condition as far as livestock carrying capacity (herbaceous forage) and permitted livestock would be expected to continue on for the next 10 to 20 years, unless a stand replacing type fire or an increase in timber harvesting were to occur in this area of the allotment. The result from that type of an action (fire or harvest) would potentially result in a temporary increase in the short-term (5 to 20 years) of herbaceous forage type species which is a positive from a range forage production stand point. The amount of AUM's (animal unit months) or numbers of livestock would not be increased from this type of an action since the Long Prairie EA identified the need for riparian fencing to be constructed first with an increase in the vegetative condition to occur before any increase in numbers. The potential for a fire to destroy range improvement structures though would be a negative, which would create a need for a financial re-investment to reconstruct those structures lost.

Alternative 1: Proposed Action – Direct and Indirect Effects

The potential herbaceous forage created from the mechanical vegetation treatments would be minimal, and would be expected to last from 5 to 20 years, depending on specific site growing conditions. This is not expected to significantly change and/or alter any of the existing foraging patterns currently used by livestock, since these areas are mostly upland and forested locations. These treated areas would help somewhat relieve grazing pressure on some of the riparian areas, created since livestock usually spend little time in the uplands unless management prescribes something like “salting” to encourage more use. The treatments would not occur in any riparian reserves, without implementing a protection buffer, thus no increase in utilization levels within the few riparian areas is expected (LRMP FW-293) from any potential herbaceous forage created. Since these harvest prescriptions call for thinning existing live mature trees and the trees

planned for leaving are grown and mature (> 6 feet tall), there would be no threat from livestock occasionally browsing on the trees left behind.

The proposed action also identifies the use of prescribed fire (underburning) which would be expected to initially increase the herbaceous forage quality and to a small degree quantity in the short-term. In the long-term these indicators would be expected to level off.

The proposed action also identifies 24.2 miles of roads to close (year-round) /and or decommission. Decommissioning or closing of roads would limit access for both livestock grazing permittees and Forest Service personnel for permit compliance and range improvement maintenance, construction and inspections. This would increase the cost of permit administration and monitoring for not only the livestock permittee but also the Forest Service. The roads prescribed for seasonal closures (7.64 miles) would not have an effect to the existing grazing management program from what is already happening.

The proposed action also identifies the new construction of recreation trails. These trails are planned for hikers, mountain bikers and horse-back riders. The proposed location for sections of these trails would go directly through existing and/ or planned range pasture fences. The need to coordinate the construction of these trails for installation of gates, or walk-through's as they cross these fences is critical. For effective and successful range management, control of permitted livestock is dependent on the ability to keep the animals in a pasture for a prescribed length of time to meet resource objectives. Maintaining the integrity of these fences without any gaps, or holes in them meets that intent. The Long Prairie Allotment Environmental Assessment signed in September of 2005 identified existing range improvements and those planned for new construction that would be needed in order to meet resource objectives identified in that plan.

Alternative 2 – Direct and Indirect Effects

The direct and indirect effects would be expected to be the same except for the amount of potential herbaceous forage created from the prescribed thinning vegetation treatments. This amount would be minimal and would depend on site specific growing conditions, which would be expected to last anywhere from 5 to 20 years. The other proposed activities would have the same effects also.

Cumulative Effects for Alternatives 1 and 2

The cumulative effects for both the Alternative 1 – Proposed Action and Alternative 2 would be expected to be the same. The analysis area for cumulative effects is the Long Prairie Allotment.

Assumptions made: Long Prairie would continue as an active allotment; timber harvest activities and road closures are likely to continue into the reasonably foreseeable future within the allotment; forage in some areas would increase for 5 to 20 years following timber harvest from past planning efforts and then decrease as the tree canopy closes in. The increase in forage capacity would also increase for potentially 5 to 20 years from any fire activity should it occur within the allotment.

Recreation and Visual Quality

A more detailed recreation and visual quality report is located in the project record, located at the Hood River Ranger District. The analysis and conclusions of the report are summarized below. Reference material is contained in the full specialists report.

Existing Conditions

Land Use Allocations and Forest Plan Consistency

The proposed project is located on lands defined as C1, Timber Emphasis in the Mt Hood Forest Plan for the most part. About one third of the eastern portion of the project area is on lands identified as B10, Deer and Elk Winter Range. Gibson Prairie Horse Camp is designated as A10 Developed Recreation. Table 1 lists the Standards and Guidelines from the Forest Plan pertinent to the action alternatives.

The lands in this planning area are classified as C1 and B10 in the Mt Hood Forest Plan. Dispersed recreation opportunities are to be provided and encouraged. The use of trails, off road vehicle use, berry picking, skiing, driving for pleasure and hunting are examples of activities that could occur. Timber management activities could temporarily interrupt recreation activities, but must protect structures and facilities. Developed recreation may also occur in facilities constructed for that purpose. In the eastern third of the project area human use would be restricted from December 1 to April 1 to reduce interaction with wintering deer and elk, based on the design criteria/mitigation measures developed for this project.

All of the above activities occur to some extent in the planning area. A fluctuating snow level and lack of a plowed snow-park precludes extensive ski and snowmobile activity, but the C1 area is open for both. No official closure to over snow use is in place for the B10 land allocation even though standard B10-001 states winter use shall be discouraged. People are not directed to the area as a winter use location, and little use is known to occur presently. Hunting and berry picking are popular activities. The open nature of the vegetation and fairly gentle slopes both lend themselves to unstructured recreation activities more so than most ground on the Hood River District which are largely either too steep or heavily vegetated. Four-wheel drive enthusiasts use the western portion of the area (primarily in the C1 allocation zones) during low to moderate snow conditions because winter recreation closures for wheeled vehicles do not exist and the area is in close proximity to the Hood River Valley. If the human use creates a conflict with the deer and elk winter range, the District Ranger has the ability to close the area as directed by the Forest Plan through a Forest Closure Order.

Table 1: Consistency with Forest Plan Standards and Guidelines

| Standards & Guidelines | Relevant Element of the Alternatives | Do the Alternatives Meet Standard as currently designed? | If no, what measures can be taken to meet standard | Would this measure reduce the effectiveness of the proposal? | Data Used for Analysis |
|---|--|--|--|--|---|
| FW-556 states that VQO's should be achieved within one year of any project activity | Activity debris, temporary roads, landings, skid trails in near foreground need to be mitigated within one year of close of activity | Yes | | No | Skid trail and Temporary road system plan. Proposed schedule for slash disposal |
| FW-584, 586, describe VQO of middle ground (1320 feet to 5 miles) for views from Surveyors Ridge and North Section Line Trail | Proposed treatment areas are in middle ground from these trails. Contrasting and diversified tree species should remain after treatment, and resultant stands should blend with surrounding landscape. | Yes | | No | Examination of similar treatments in other areas. Visit to trails to check on visibility of proposed treatment areas. |
| For B10 allocations; Management activities shall achieve a Modification VQO as viewed from roads open during the summer. | Management units need to blend with the surrounding landscape. See description of Modification below. | Yes | | No | Similar treatments accomplished on the Ranger District. |

| Standards & Guidelines | Relevant Element of the Alternatives | Do the Alternatives Meet Standard as currently designed? | If no, what measures can be taken to meet standard | Would this measure reduce the effectiveness of the proposal? | Data Used for Analysis |
|---|---|--|--|--|--|
| For C1 allocations; Management activities shall achieve a VQO of Modification as viewed from open roads; local roads and temporary roads are exceptions. | Management units need to blend with the surrounding landscape. See description of Modification below. | Yes | | No | Similar treatments accomplished on the Ranger District. |
| For Gibson Prairie Horse Camp; A10-009 states that management activities shall achieve a VQO of Partial retention as viewed from within the A10 boundary (i.e. the campground). | See mitigation measures/design criteria for vegetation management below in this document. | Yes, with mitigation measures/design criteria prescribed | | No | Management activities in similar rustic campgrounds. |
| For B10 allocations, (eastern 1/3 of project area); B10-002 states that human access should be restricted between December 1 and April 1 to reduce interaction with wintering deer and elk. | Trails are proposed for construction in this portion of the area; however, they are usually snow covered during the restricted time period. A seasonal closure needs to be incorporated for that portion of the trail system. | Yes, with closure as the mitigation measures/design criteria prescribe | | No | Forest Plan and historical snowfall and retention experience |

| Standards & Guidelines | Relevant Element of the Alternatives | Do the Alternatives Meet Standard as currently designed? | If no, what measures can be taken to meet standard | Would this measure reduce the effectiveness of the proposal? | Data Used for Analysis |
|---|---|--|--|--|---|
| For C1 allocations; C1-001 states that dispersed recreation opportunities shall be provided, including hiking and trail use. C1-002 states these activities may be altered or temporarily precluded in localized areas to facilitate timber management. C1-003 and 004 states that "Special Places" shall be identified and management prescriptions developed. | Trails are proposed for construction. Gibson Prairie horse Camp is identified as a special place and a trail system is being built to compliment the camp. Aspen groves have been identified as a special place and they are being managed to promote health and longevity. | Yes | | No | Gibson Prairie identified as a special place by horse groups. Aspen stands identified as a special place by individuals who like to visit them and because they are rare in occurrence. |
| C1-040 states that a trail system should be developed and designed to disperse use, and provide a range of difficulty levels. | Construction of a trail system to accommodate hikers, bikers and equestrians is proposed. | Yes | | No | Trail system is proposed for development and was planned with the input of user groups in the collaboration process. |

| Standards & Guidelines | Relevant Element of the Alternatives | Do the Alternatives Meet Standard as currently designed? | If no, what measures can be taken to meet standard | Would this measure reduce the effectiveness of the proposal? | Data Used for Analysis |
|---|--|--|--|--|---|
| C1-141 and 142 states that Off-highway vehicle (OHV) use should be encouraged and be restricted within specific areas with conflicting resource objectives. | OHV use is being considered under a separate planning effort in the OHV Transportation Management Plan EIS | Not included in action alternatives, but the alternatives do not preclude opportunities for OHV trails | | No | OHV EIS proposed action for Gibson Prairie area |

- Modification:** Under the modification visual quality objective **management activities may visually dominate the original characteristic landscape**. However, activities of vegetative and land form alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that its visual characteristics are those of natural occurrences within the surrounding area or character type.

Visual Quality

The area shows evidence of past harvest activities, both clear cuts and partial cuts. Current stand conditions contain many dead and dying trees, understory of fire intolerant trees and brush, and many fallen dead trees. Areas of wind throw are also prevalent in stands affected by root rot. The Visual Quality Objective (VQO) for the planning area is Modification, as described above.

Camps

The area is popular with equestrians, and the Back Country Horsemen (BCH) and Oregon Equestrian Trails (OET) groups have rebuilt and expanded the facilities at Gibson Prairie Horse Camp. A new outhouse and corrals are among the improvements. There are few trails that emanate from the camp. Dispersed camping also occurs along roads within the project area, mostly during hunting season.

Trails

The only developed trails available for equestrians are the Surveyors Ridge Trail and the North Section Line Trail. Equestrians also use gravel and native surface roads and old skid trails. Local equestrian groups have desired to work with the Forest Service to construct more trails. Planning and construction funds have not been available until the collaborative stewardship process began. The same two trails are open to mountain bikes. The Surveyors Ridge Trail receives High use by mountain bikes and is avoided by some equestrians. There is a demand for more mountain biking opportunities, especially opportunities with gentle grades. OHV use occurs on the North Section Line Trail and on unpaved roads.

Off-highway Vehicles (OHV)

The C1 land allocations are open to dispersed OHV use as defined in the Forest Plan, however in 2003, 2004 and 2005 numerous user-created unauthorized trails were constructed in the planning area and used primarily by motorcycle riders. These trails linked to extensive unauthorized user created trails to the north on private timber ground and Hood River County Forest land, and extended south to The Dalles Watershed boundary. The Forest Service closed the trails a number of times with down logs, root wads, rock, etc., but the users reopened then repeatedly. The rolling terrain and sparse tree cover make construction easy and eradication of trails difficult. The users created trails crossed wet meadows, paralleled streams, went straight up hills, and were a source of erosion. In the summer of 2005, a total closure on off-road motorized travel in the planning area was put in place and the unauthorized trail system was closed and rehabilitated with the use of machinery and a large crew. The closure has remained in place since 2005 and was very effective until the fall of 2007 when some unauthorized trail construction began again. The unpaved road system has remained open to OHV use and receives moderate use, mainly during hunting season.

Recreation pressure will continue to increase as the population of Hood River and the Portland Metro area increases. In particular, there will most likely be continued pressure from motorized users coming from private timberlands just north of the project area. OHV ownership increased from 2.9 million vehicles in 1993 to 8 million vehicles in 2003 and is continuing to rise (Cordell, Betz, Green Owens, June 2005). The report found that over 22% of people over 16 years of age participate in OHV recreation. A extensive system of user created trails have been built in the last decade on several square miles of lands owned by SDS Lumber and other private owners, as well as those managed by the County of Hood River adjacent to the north of the permit area. The

illegal trails built on the National Forest were linked to these trails. SDS has closed its lands to off road motorized travel, but does not have the resources to patrol to control use. Hood River County is engaged in a Trails Master Planning effort at this time and intends to restrict use to designated trails. The Forest Service, SDS Lumber Co., and Longview Fibre Co. have had preliminary discussions about a coordinated motorized trail system in the area where their lands adjoin. At this time, the Forest Service portion only includes the Surveyors Ridge Trail north of the power lines, which is currently open to motorized use.

Environmental Effects

No Action – Direct and Indirect Effects

Visual Quality

Visual quality would be affected by timber stands continuing to decline and more trees dying. Fire susceptible trees and brush would also increase. If a large stand replacing fire were to occur, visual quality would be greatly altered beyond the scope of the desired future condition as outlined in the Forest Plan.

Camps

Gibson Prairie would continue to be used, as well as dispersed camps along roads.

Trails

Existing trails would continue to be used and become more crowded.

OHV

Use would continue on the North Section Line Trail and unpaved roads. The outcome of the OHV Travel Management Plan EIS is uncertain, but may build more trails, or prohibit use entirely.

Alternative 1: Proposed Action – Direct and Indirect Effects

Visual Quality

Visual quality would be affected by the vegetation treatments and road closure/culvert removal activities, but remain within Forest Plan standards due to the design criteria/mitigation measures.

Camps

Gibson Prairie Horse Camp would be greatly enhanced by the addition of trails. Road closure and decommissioning proposed by the action would eliminate some opportunities for dispersed camping.

Trails

Trail opportunities would be greatly enhanced by building new trails open to bikes and horses. A horse only loop would provide a rare opportunity for beginning riders and/or horses.

OHV

The proposed action would not affect the future of OHV opportunities; the OHV Travel Management Plan EIS will determine them. However thinning of stands, burning of stands, and removal of down material would make cross-country travel by OHV much easier.

Alternative 2 – Direct and Indirect Effects

Visual Quality

Visual quality would be affected, but remain within Forest Plan standards. There would be less impact from vegetation management than the proposed action because fewer acres would be thinned.

Camps

Gibson Prairie Horse Camp would be greatly enhanced by the addition of trails. By closing roads numerous opportunities for dispersed camping would be lost. This alternative would not treat hazard trees in and near the horse camp because those treatment units are dropped, and that would have to be done with limited funding available, possible resulting in closures of campground until work is completed.

Trails

Trail opportunities would be greatly enhanced by building new trails open to bikes and horses. A horse only loop would provide a rare opportunity for beginning riders and/or horses. Alternative 2 proposes less stand treatments. This would allow trail construction to proceed on a faster timeline because the vegetation treatment would be completed sooner, however the construction would be more costly and maintenance costs would increase due to larger amounts of dead and dying trees on the routes to be cleared during construction, and during on-going maintenance.

OHV

The proposed action would not affect the future of OHV opportunities; the OHV Travel Management Plan EIS will determine them. However thinning of stands, burning of stands, and removal of down material would make cross-country travel by OHV much easier. This alternative would treat less stands and open less opportunities for cross country travel.

Cumulative Effects for Alternatives 1 and 2

Visual Quality

There are no cumulative effects for visual quality since there are no direct or indirect effects.

Camps

It is possible, but not likely that the vegetation management activities in The Dalles Watershed Fuel Break might occur at the same time as the proposed action and result in multiple camp closures. There are ample rustic camp facilities to accommodate use unless Gibson and Knebal springs are closed at the same time, which would limit the opportunities for campers with horses. Other horse camps exist on the Hood River and Barlow Districts, but not in close proximity.

Trails

There are cumulative effects to existing trails because they would not be closed during any proposed activities.

OHV

Comments from the public received in the OHV Plan have requested a motorized trail be built in the northern part of the project area to link to the multi-ownership system described above. If this idea were incorporated in to an alternative for the OHV system it would have an effect on any

trails built through the action alternatives. The addition of motorize use could degrade the experience of other trail users by increased noise and could result in motorized incursions on to horse and mountain bike trails.

Heritage Resources

A more detailed heritage resources report is located in the project record, located at the Hood River Ranger District. The analysis and conclusions of the report are summarized below. Reference material is contained in the full specialists report.

Existing Conditions

Heritage resource surveys were conducted on a planning area scale in preparation for numerous projects around the North Fork of Mill Creek and the Mill Creek Buttes areas. These previous surveys encompassed the current proposed project. Survey methodologies were conducted in compliance with the 1994 Programmatic Agreement (PA) between Region 6 of the Forest Service, the State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation (ACHP), and also meet current survey standards in compliance with the 2004 PA. The previously surveyed projects were eventually delayed in order to pursue collaborative efforts for treatment within the area, including this current proposed project. High probability areas and previously documented sites were revisited for this project in compliance with the 2004 PA. All survey methodology and findings were documented in Heritage Resource Report 2008/060606/0012.

According to the 1995 Ethnographic Study of the Mt. Hood National Forest, there are no designated traditional use areas within the proposed project area. Fieldwork by the Inter-Disciplinary Team has revealed that huckleberries exist in only occasional small, isolated patches throughout the area and do not offer any significant potential for enhancement. There are no other known traditional native plant communities within the proposed project area.

Archaeological sites within the proposed project area include four precontact lithic isolates (666NA0021, 666NA0090, 666IS0209 and 666IS0212), two precontact lithic scatters (666NA0205 and 666NA0210), a historic telephone line (666EA0156), three multi-component sites with both historic and precontact remains (666MC0211, 666MC0213 and 666MC0214), two carved aspen tree sites (666NA0154 and 666EA0243), two peeled cedar tree sites (666NA0164 and 666NA0206), and one historic lookout (666EA0057). Lithic isolate 666NA0020 lies just outside of thinning unit 4 and outside of the project area.

Lithic isolate finds 666IS0209 and 666IS0212 consist of fewer than ten artifacts and are considered to be generally insignificant finds ineligible for inclusion on the National Register of Historic Places.

Precontact lithic scatter 666NA0021 consists of a single flake recovered from a logging road. Intensive inspection of the area in 1990 proved negative for additional cultural material; however, the recorder recommended reclassifying the isolate as a potential lithic scatter due to the setting. An intensive inspection of the area in 2005 also proved negative for additional cultural material.

Precontact lithic isolate 666IS0051 consists of a single chert projectile point midsection, a flake, and a core recovered from a barren opening. Although ground visibility was excellent, intensive inspection of the area and a road passing through the vicinity proved negative for additional

cultural material.

Precontact lithic scatter 666NA0090 consists of a projectile point fragment and two flakes observed in a Forest Development Road. Information about the find is vague, imprecise, and incomplete. Intensive inspection of the general area in 2005 proved negative for additional cultural material.

Precontact lithic scatter 666NA0205 consists of six chert artifacts recovered on 0.9 acres. The site was initially documented in 1999. No cultural affiliation could be determined.

Precontact lithic scatter 666NA0210 was initially documented in 1999 as a small site of unknown dimensions within an area that may have been logged previously. The cultural affiliation of the site remains undetermined, but the site area was probably used for hunting, gathering and tool making.

Historic telephone line site 666EA0156 consists of four fragments of 9.0 gauge wire ranging in length from six feet to 30 feet long situated in an old clear cut. A fragment of a white split-tree insulator embossed with the name brand "THOMAS" was also reported at the site. A later revisit to the site in 2005 was negative for cultural material.

Multi-component site 666MC0211 consists of a sparse scatter of lithic flakes and a fragment of ground stone. No diagnostic artifacts have been found at the site; however, the area appears likely for a seasonal hunting and food processing camp. The historic component of the site consists of cookstove fragments, automobile parts and logging cables possibly dating from 1880 to 1942.

Multi-component site 666MC0213 consists of one lithic flake and considerable historic debris. No other precontact artifacts have been found at the site, and its cultural affiliation remains undetermined. The historic component of the site consists of glass and ceramic fragments, numerous tin can fragments, milled lumber, and an old rim-fir bullet casing. Possible foundation stones appear displaced from previous logging. A cabin is shown in this general location on a 1912 Oregon National Forest Map.

Multi-component site 666NA0214 consists of a possible spokeshave and two fragments of angular waste. Four additional flakes were observed at the site. Although the cultural affiliation for the site remains undetermined, the area was probably used as a seasonal camp. The historic component of the site consists of ceramic and glass fragments, including amethyst glass and Chinese ceramics.

Carved aspen tree site 666NA0154 consists of six aspen trees of various sizes with designs carved into the bark. There are no dates included with the carvings. Most of the designs or symbols appear to be abstract representations, although three of the carvings may represent projectile points. The carvings have been attributed to Native American origin.

Carved aspen tree site 666EA0243 consists of 11 aspen trees of various sizes with designs, names, two symbol, initials and three possible dates carved into the bark. A few of the trees have multiple carvings. The possible dates may include 1908, 1912 and 1945.

Peeled cedar tree site 666NA0164 consists of four peeled cedar trees situated just to the north of a log landing area. All four trees are situated within 5.0 meters (approximately 16 feet) of each other. The peel scars include two Type II scars and two Type IV scars.

Peeled cedar tree site 666NA0206 consists of a single peeled cedar tree situated within 200 meters (approximately 650 feet) of peeled cedar tree site 666NA0164 documented in 1999. However, the description, access and location for the tree are identical to the description for 666NA0164. Subsequent attempts to locate the site have been unsuccessful.

Forest Development Road 1711-630 (666EA0249) was probably constructed before the establishment of the Oregon National Forest in 1908; however, the road appears only as a trail on forest maps prior to 1939.

Forest Development Road 1711 (666EA0253) appears on the 1883 GLO plat map for T1S, R11E, suggesting that the road was constructed prior to the establishment of the Oregon National Forest in 1908. The road continues to be shown on subsequent maps.

No signs of a historic trail shown on early forest maps could be located, despite intensive inspection of the area. The trail was apparently obliterated by the past construction of Forest Development Roads 1711-620.

No signs of a historic trail shown on the 1934 Mt. Hood National Forest Map traveling north from Mill Creek Ridge, across the North Fork of Mill Creek could be located, despite intensive inspection of the area. The trail traversed very steep ground, and may have been abandoned in favor of more accessible routes across the ravine. The trail is not shown on any later maps.

Environmental Effects

Methodology for Effects Analysis

Direction for surveys for protecting, documenting effects, and consulting on heritage resources comes from various laws, regulations and policies. The most important are summarized below.

- The National Historic Preservation Act (NHPA) of 1966, as amended
This Act requires Federal agencies to consult with American Indian Tribes, state and local groups before nonrenewable cultural resources, such as archaeological and historic structures, are damaged or destroyed. Section 106 of this act requires federal agencies to review the effects project proposals may have on the cultural resources in the analysis area.

- 36 CFR Part 800 – Protection of Historic Properties

800.1 Purposes. (a) *Purposes of the section 106 process.* Section 106 of the National Historic Preservation Act requires Federal agencies to take into account the effects of their undertakings on historic properties and afford the Council a reasonable opportunity to comment on such undertakings. The procedures in this part define how Federal agencies meet these statutory responsibilities. The section 106 process seeks to accommodate historic preservation through consultation among the agency official and other parties with an interest in the effects of the

undertaking on historic properties, commencing at the early stages of project planning. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties.

- 800.5 Assessment of Adverse Effects. (1) Criteria of adverse effect. An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

When applying the criteria of effect and adverse effect, there are three possible findings:

- **No Effect:** There is no effect of any kind, neither harmful nor beneficial, on the historic properties.
- **No Adverse Effect:** There could be an effect, but the effect would not be harmful to those characteristics that qualify the property for inclusion in the National Register.
- **Adverse Effect:** There could be an effect, and that effect could harm characteristics that qualify the property for inclusion in the National Register.

No Action Alternative – Direct and Indirect Effects

Current management would remain unchanged under this alternative. There would be no effect to heritage resources under the No Action Alternative, other than the natural process that are already occurring.

Alternative 1: Proposed Action – Direct and Indirect Effects

Under this alternative, approximately 48 acres would be treated for the enhancement of aspen and/or cottonwood trees, about 26 acres would thin saplings, about 2125 acres would be commercially thinned, and about 671 acres would be underburned. Many of the acres proposed for commercial thinning would also be underburned. Long-term maintenance would occur with continued brush removal and underburning. Approximately 7.78 miles of road would be closed seasonally, while 7.64 miles of road would be permanently closed. About 8.78 miles of road are proposed for obliteration. Twelve culverts would be removed or replaced.

Potential impacts to heritage resources could result from activities associated mostly with the use of heavy machinery during the proposed commercial harvest operations, machine piling activities, installation of road closure structures, or road obliteration. Combustible heritage resources could be impacted by the proposed underburning.

Heritage Resource Report 2008/060606/0012 documented the survey methodology, findings and recommendations for archaeological resources associated with this proposed project. This report concluded with findings of **no effect** for expected impacts to archaeological resources.

Lithic isolates consist of fewer than ten artifacts and are considered to be generally insignificant finds ineligible for inclusion on the National Register of Historic Places. All significant information about the isolates has been obtained through documentation; the isolates offer no further research potential. No further archaeological work is required, and no protective measures are required or recommended for lithic isolate finds 666IS0209 and 666IS0212. Lithic isolate 666NA0020 lies outside of thinning unit 4 (outside of the project area) and would not be affected by the project.

Precontact lithic isolate 666NA0021 was initially documented as an isolate, and subsequent inspections of the general area in 1990 and 2005 proved negative for additional cultural material.

However, the isolate was reclassified as a site in 1990 because of its setting on a small bench above a wet meadow. Although the precise location of the isolate is approximate, two shovel probes in the general area also proved negative for cultural material. All significant information about the isolate has been obtained through documentation; the isolates offer no further research potential. No further archaeological work is required, and no protective measures are required or recommended for lithic isolate 666NA0021.

Precontact lithic isolate 666NA0090 was documented as a projectile point fragment and two crypto-crystalline flakes observed in a Forest Development Road during its construction in the late 1980's. The road is proposed for use as a trail. However, the site information was not formally documented, but a note was added to district files about the isolate in 1993. No sketch map was included with the notation, and the location of the isolate was not specific. Intensive inspection of the area in 2005 proved negative for cultural material. All significant information about the isolate has been obtained through documentation; the isolates offer no further research potential. No further archaeological work is required, and no protective measures are required or recommended for lithic isolate 666NA0090.

Precontact lithic isolate 666IS0051 lies within an area proposed for prescribed burning. Low temperature burns are generally considered to have no effect on lithic isolates. Existing firelines and roads would be used for fire control with no new fireline construction in the vicinity of the isolate. The proposed project would have **no effect** on the isolate. The proposed burning would have **no effect** to the lithic isolate 666IS0051.

Precontact lithic scatter 666NA0205 consists of lithic artifacts. The site is situated within areas proposed for aspen/cottonwood enhancement and thinning. A 30-meter (approximately 100-foot) buffer zone would be flagged around the site for the exclusion of heavy machinery prior to project implementation. Any trees harvested in the vicinity of the site would be felled directionally away from the buffer zone. The proposed project would have **no effect** on lithic scatter site 666NA0205.

Precontact lithic scatter 666NA0210 consists of lithic artifacts. The site is situated within an area proposed for thinning and adjacent to a road scheduled for decommissioning. A 30-meter

(approximately 100-foot) buffer zone would be flagged around the site prior to project implementation for the exclusion of heavy machinery. Any trees harvested in the vicinity of the site would be felled directionally away from the buffer zone. No road obliteration activities would occur within the site boundaries. The proposed project would have **no effect** on lithic scatter site 666NA0210.

Historic telephone line site 666EA0156 consists of one ceramic insulator and four fragments of 9.0 gauge wire. The site is situated adjacent to an existing road proposed for use as a trail. Use of the existing road as a trail would have **no effect** on site 666EA0156.

Multi-component site 666MC0211 consists of a sparse scatter of lithic flakes and a fragment of ground stone. The site is situated within an area proposed for thinning and adjacent to a road scheduled for decommissioning. A 30-meter (approximately 100-foot) buffer zone would be flagged around the site prior to project implementation for the exclusion of heavy machinery. Any trees harvested in the vicinity of the site would be felled directionally away from the buffer zone. No road obliteration activities would occur within the site boundaries. The proposed project would have **no effect** on site 666MC0211.

Multi-component site 666MC0213 consists of one lithic flake and considerable historic debris. The site is located in an area proposed for aspen/cottonwood enhancement. A 30-meter (approximately 100-foot) buffer zone would be flagged around the site prior to project implementation for the exclusion of heavy machinery. Any trees harvested in the vicinity of the site would be felled directionally away from the buffer zone. The proposed project would have **no effect** on site 666MC0213.

Multi-component site 666NA0214 consists of a possible spokeshave, two fragments of angular waste, four flakes, ceramic fragments and glass fragments. The site is situated within an area proposed for thinning. A 30-meter (approximately 100-foot) buffer zone would be flagged around the site prior to project implementation for the exclusion of heavy machinery. Any trees harvested in the vicinity of the site would be felled directionally away from the buffer zone. The proposed project would have **no effect** on site 666MC0214.

Carved aspen tree site 666NA0154 consists of six aspen trees of various sizes with designs carved into the bark. The site is situated within an area proposed for aspen/cottonwood enhancement consisting of tree felling and prescribed burning. Each tree would be flagged for avoidance and would not be harvested. Any trees harvested in the vicinity of the site would be felled directionally away from the trees. All combustible materials would be scraped away from the base of each carved tree, and reflective material may be employed to protect the trees from prescribed burning. The proposed project would have **no effect** on carved aspen tree site 666NA0154.

Carved aspen tree site 666EA0243 consists of 11 aspen trees with historic carvings. The site is situated within an area proposed for aspen/cottonwood enhancement consisting of tree felling and prescribed burning. Each tree would be flagged for avoidance and would not be harvested. Any trees harvested in the vicinity of the site would be felled directionally away from the trees. All combustible materials would be scraped away from the base of each carved tree, and

reflective material may be employed to protect the trees from prescribed burning. The proposed project would have **no effect** on carved aspen site 666EA0243.

Peeled cedar tree site 666NA0164 consists of four culturally-modified cedar trees. The site is situated within an area proposed for thinning. Each tree would be flagged for avoidance and would not be harvested. Any trees harvested in the vicinity of the site would be felled directionally away from the trees. The proposed project would have **no effect** on peeled cedar tree site 666NA0164.

Peeled cedar tree site 666NA0206 consists of a single culturally-modified cedar tree. The site is situated within an area proposed for thinning. The tree would be flagged for avoidance and would not be harvested. Any trees harvested in the vicinity of the site would be felled directionally away from the tree. The proposed project would have **no effect** on peeled cedar tree site 666NA0206.

The historic lookout site 661EA0057 consists of combustible remains situated within an open area proposed for prescribed burning. The bundle of timbers within the open area would be sprayed with water or foam and protected during burning operations. A hand or wet line would be constructed around the remains to exclude them from burning operations. Existing roads and fireline would be used with no new fireline construction in the vicinity of the site. With these stipulations, the proposed project would have **no effect** on the historic lookout site 661EA0057.

Forest Development Road 1711-630 (6660249) is thought to date back to the late 1800's, although Forest documentation shows the road dates to ca.1939. The road is scheduled for a seasonal closure. The road has been continually maintained for at least 70 years. The maintenance typically consisted of widening, blading, shaping, ditching, and graveling. The road no longer retains any historic fabric or character, and is not considered a historic resource. The seasonal closure of Forest Development Road 1711-630 would have **no effect** on heritage resources.

Forest Development Road 1711 (6660253) appears on early forest maps and its construction may date back to 1883. The road is scheduled for seasonal closure. The road has been used for past timber harvest and has been intermittently maintained for at least 120 years. The past maintenance has apparently consisted of widening, blading, shaping, and some ditching. The road no longer retains any historic fabric or character, and is not considered a historic resource. The seasonal closure of Forest Development Road 1711 would have **no effect** on heritage resources.

A historic trail shown on archival maps could not be located, despite intensive investigation. The trail was apparently obliterated during the construction of Forest Development Roads 1711-620. No protective measures are required or recommended for heritage resources that cannot be located. The proposed project would have **no effect** on the historic trail.

A historic trail shown on the 1934 Mt. Hood National Forest Map traveling from Mill Creek Ridge north across the North Fork of Mill Creek could not be located, despite intensive investigation. The trail traversed very steep ground and may have only been utilized for a short time before it was abandoned in favor of easily accessible trails. No protective measures are

required or recommended for heritage resources that cannot be located. The proposed project would have **no effect** on the historic trail.

All road obliteration would consist of ripping the roadbed for each road proposed for obliteration to the visual extent (site distance) from the nearest road intersection. No ripping would occur within any site boundaries. Road obliteration would have **no effect** on heritage resources.

All proposed road closure structures are located outside of any documented site boundaries. No ground disturbing activity is proposed for road closure other than the installation of the closure structures. The proposed road closures would have **no effect** on heritage resources.

There are no known heritage resources within any of the trails proposed for construction in association with this project. A complete heritage resource survey would be conducted after trail locations have been flagged and prior to any trail construction. Any heritage resource sites discovered during the survey for the proposed trails would be avoided with a 30-meter (approximately 100-foot) buffer zone.

All temporary road construction would occur outside of any site boundaries. The proposed temporary roads would have **no effect** on heritage resources.

All culvert removals or replacements would occur within previously disturbed road fill and outside of any heritage resources. These activities fall within the category of undertakings excluded from case-by-case review because they have little or no potential to affect historic properties. The culvert removals and replacements would have **no effect** on heritage resources.

Alternative 2 – Direct and Indirect Effects

Under this alternative, approximately 48 acres would be treated for the enhancement of aspen and/or cottonwood trees, about 26 acres would be thin saplings, about 594 acres would be commercially thinned, and about 610 acres would be underburned. Many of the acres proposed for commercial thinning would also be underburned. Long-term maintenance would occur with continued brush removal and underburning. Approximately 7.78 miles of road would be closed seasonally, while 7.64 miles of road would be permanently closed. About 8.78 miles of road are proposed for obliteration. Twelve culverts would be removed or replaced.

Potential impacts to heritage resources would be similar under this alternative to those expected under the Proposed Action (Alternative 1); however, fewer areas are proposed for treatment and fewer sites are affected. Heritage resource sites 666EA0156, 666NA0164, 666NA0206, and 666NA0210 are not contained within this alternative. This alternative would also have no effect on the remaining heritage resources.

Cumulative Effects for Alternatives 1 and 2

Anticipated projects in the vicinity of the Heritage Resources were considered for cumulative effects (Table 3-1).

Low-temperature underburning maintenance would continue with no effect to the resources. Treatment of invasive plants could occur with no effect to the archaeological resources. Heritage Resources would be avoided during the implementation of any other type of foreseeable projects

with no indirect or direct effects. There would be no cumulative effects to Heritage Resources, other than the natural processes that are already occurring.

Social Impact Analysis/Environmental Justice

On February 11, 1994, President Clinton issued the Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Executive Order 12898). This order directs agencies to identify and address disproportionately high and adverse human health or environmental effects of projects on certain populations. In accordance with this order, the proposed activities have been reviewed to determine if they would result in disproportionately high and adverse human and environmental effects on minorities and low-income populations.

The communities of Mt. Hood/Parkdale, Odell and Hood River are 5 to 20 miles to the east and southwest of The Dalles Municipal watershed. The Dalles abuts the northeast end of the municipal watershed. Other communities that may have an interest in the proposal would include Maupin, Madras, Redmond, and Bend to the south and Sandy, Gresham and Portland to the West. Census data confirm that the larger communities have minorities and low-income populations that may be affected by activities in the watershed. However, no specific concerns regarding minorities or low-income populations or communities were identified during the public information process.

The North Fork Mill Creek Restoration Opportunities Project area is located on usual and accustomed land for the Confederated Tribes of Warm Springs (as is all of the Mt. Hood National Forest). The Treaty of 1855 granted the Confederated Tribes of the Warm Springs (CTWS) the right of “usual and accustomed” gathering of traditional native plants and “special interest” use. According to the Ethnographic Study of the Mt. Hood National Forest (French et al. 1995), no traditional use areas have been identified in this planning area. No activities are proposed that would preclude any granted rights. Fieldwork by the Inter-Disciplinary Team has revealed that huckleberries exist in only occasional small, isolated patches throughout the area and do not offer any significant potential for enhancement. Therefore, the proposal to implement fuels reduction project would not have any adverse effect on members of the CTWS.

Although there is no formal tracking system, it is evident to Mt. Hood National Forest front desk staff and special-forest product personnel that many of the foliage/greenery permits are sold to low-income individuals and minorities. The fuels reduction project is not expected to affect these users because the majority of the disturbance is not in areas where permit harvesting is concentrated. It is likely that the North Fork Mill Creek Restoration project will generate more special forest products as the area is treated and new vegetation grows (e.g., firewood opportunities). Therefore, the proposal to implement fuels reduction is not expected to have any negative effect on special forest product gatherers.

Financial Efficiency Analysis

The value of the commercial fuels reduction units is expected to cover the cost of treatments in non-commercial units. Stewardship contracting allows this type of trading goods for services.