

Appendix D – Government Camp Trails Project Biological Evaluation of Fisheries

Fisheries – Affected Environment Report

The Government Camp Trails Project Area lies within two 5th field watersheds, the Zigzag River and the Salmon River. All of the proposed trails except a ¾ mile hike/bike summer trail adjacent to Forest Road 2656 are within the Zigzag River watershed. The ¾ mile trail is proposed to access Trillium Lake within the Salmon River Watershed south of Summit Meadows.

The Salmon River watershed is designated as a Tier 1 Key Watershed under the Northwest Forest Plan because it contains crucial refugia for at-risk fish species. The remainder of the proposed trails is located within the Zigzag River watershed. Both the Salmon River and Zigzag River watersheds support populations of winter steelhead, coho salmon, Chinook salmon, and resident cutthroat trout, Redband trout, and rainbow trout.

Alternative 2 has 0.8 miles of trail proposed within the Still Creek drainage (Zigzag Watershed) and Alternative 3 has 2.9 miles of trail proposed in Still Creek drainage. In both alternatives, these trails are located more than ¼ mile from Still Creek and its tributaries.

Most of the trail projects (7.6 miles in both action alternatives) are proposed in the upper reaches of the Camp Creek drainage (Zigzag Watershed). The upper Camp Creek drainage emerges out of out of a large wetland complex just south of Hwy 26 through Government Camp, known as “The Fen”, another wetland/small lake complex known as Collins Lake just north of Hwy 26, and from a series of perennial and intermittent streams located on the forested slopes above Government Camp.

Most of the trails are located between 3600 feet and 4300 feet in elevation. The two exceptions are the last part of the Multipor Mountain Hiking Trail proposed to reach the summit of Multipor Mountain at 4656 feet, and the Timberline to Town hike/bike trail that starts at 4100 feet and climbs to 6000 feet to Timberline Lodge. Both of these trails have no perennial stream crossings.

Existing Condition

For purposes of this EA, and for ease of analysis, the action area has been defined as a hydrologic analysis area (HAA) that extends from the uppermost extent of any stream that is intersected by trail construction to the bottom of the microwatershed associated with trail construction. For this project, the hydrologic planning area is 5481 acres. See Hydrology section of the EA for HAA map.

In addition to the land allocations listed above the Salmon River Fifth Field Watershed is a Tier 1 Key Watershed under the Northwest Forest Plan. There are 975 acres of the HAA in the Key Watershed. The objective is to contribute directly to conservation of at-risk anadromous salmonids and resident fish species. The emphasis within Key Watersheds is to reduce existing system and non-system road mileage and receive priority for restoration.

Fish Distribution

Salmon River Watershed

The Salmon River originates from the Palmer Glacier at an elevation of approximately 6000 feet near Timberline Ski Area on the south side of Mt. Hood and is a tributary to the Sandy River. The river is 34.75 miles long, and ranges in elevation from 6000' at the headwaters to 1000' at the mouth. The Salmon River drainage area is 74,240 acres. The unnamed tributary to the Salmon River, which the proposed Airstrip to Trillium Trail project crosses, enters the Salmon River at RM 29.8. The tributary contributes approximately 15% of the flow to the Salmon River at this point, has a 4% gradient at the mouth and is fish accessible (2001 Salmon River Stream Survey). At the intersection of the tributary to the Salmon River, the Salmon river is in a broad, trough-like valley form where the average stream gradient is 1.6%. Remarkably, there are only two culverts on the mainstem Salmon River, at RM 30.35 and at RM 30.7 (the location of the proposed project). All other road and trail crossings have bridges.

A culvert exists upstream of this junction of the tributary and the Salmon River at RM 30.7. In 2004, this culvert was deemed a barrier to upstream fish passage (USFS 2004 Salmon River Fish Passage Project *Fisheries Biological Evaluation*). The stream channel immediately upstream from the existing culvert on Highway 35 cuts through soft, sandy substrate of glacial fines that appear to be deposited in an alluvial-fan-like formation.

Riparian vegetation in the bankfull and floodprone area near the project site is dominated by a sedge-grass community with interspersed forbs and shrubs, and coltsfoot is also present. Upslope vegetation is dominated by western hemlock, huckleberry, and dogwood.

The entirety of the Salmon River contains habitat suitable for salmonids. The substrate in the upper reaches is dominated by small cobbles and sand, especially where the river is in the glacial area of Mt. Hood. The Salmon River is relatively well-shaded with adequate amounts of large woody debris to provide channel stability, pool formation, and high flow refuge for fish. Although water temperatures in the lower reaches do not meet Mt. Hood National Forest plan, Region 6 Desired Future Conditions or NOAA Fisheries standards, the temperatures in the upper reaches, especially upstream of Highway 35, are likely cooler due to lack of human impacts and are suitable for salmonids.

Coastal cutthroat trout (*Oncorhynchus clarki*), Redband trout, and brook trout (*Salvelinus fontinalis*) are the only fish species known to reside in the Salmon River in this location as anadromous species are limited to below Final Falls at RM 14. Brook trout are non-native and occur in the Salmon River, probably as a result of stocking in Trillium Lake. Brook trout are known to occur downstream of the Highway 35 culvert, however, their presence upstream of the culvert is unknown.

The Survey and Manage aquatic mollusks Columbia dusksnail *Lyogyrus* n. sp. 1 may reside in this area of the Salmon River. Surveys have not been conducted for this species in the Salmon River at or near the project site. Based on the available information and the fact that the Columbia dusksnail has been found primarily in small seeps, springs and smaller perennial

streams it is suspected that the Columbia dusksnail is present in the Salmon River in this location. Only coastal cutthroat trout will be discussed further in this document.

Zigzag River Watershed

Within the Zigzag River, anadromous fish distribution occurs in the lower reaches of the main drainages; the mainstem Zigzag River, Camp Creek, and Still Creek. Resident fish populations (Redband trout, cutthroat trout, and rainbow trout) are know to occur throughout the watershed. Within Still Creek, the limit of anadromous fish distribution is likely the 75 foot waterfall at RM14.4. Within Camp Creek, the limit of anadromous fish distribution is Yocum Falls at RM 5.75.

Camp Creek

Camp Creek is a fourth order stream with the following flow regime: fourth order from RM 0 to 6.7, third order from RM 6.7 to 7.2. The creek flows from the headwaters at 3680 feet elevation to its confluence with the Zigzag River at 1800 feet elevation over 7.2 miles with an average gradient of 4.6%.

Past survey reports in 1990 and 1991 indicate the presence of coho salmon, Chinook salmon, steelhead, and rainbow trout, sculpin, and Pacific lamprey in Camp Creek. Yokum falls at RM 5.75 is the only barrier to fish passage (USFS 1994) and the upper limit of anadromy is to this falls. Sampling by forest crews confirmed the presence of brook trout and cutthroat trout above the falls at river mile 5.8 in April of 1993 (USFS 1994). Based on captures at trapsites in other streams of the Upper Sandy Basin, Redband trout are suspected to occur in Camp Creek above Yokum Falls.

All of the reaches surveyed in the 1994 stream survey report were below Mt. Hood National Forest Land and Resource Management Plan(LRMP) standards for woody debris densities and pool frequencies.

Still Creek

The Still Creek subwatershed lies south of the Sandy River basin just south of Highway 26 and flows from the headwaters at an elevation of 5000 feet over a distance of 15.2 miles to the mouth at an elevation of 1600 feet. Still Creek is a 4th order stream from RM 0-3.1, 3rd order from RM 3.1-5.3, 2nd order from Rm 5.3-14.7, and 1st order from RM 14.7-15.2.

Still Creek supports populations of steelhead, Chinook, coho, rainbow trout, cutthroat trout, Redband trout, and sculpin. The only barrier to fish passage is a 75 foot falls at RM 14.4 (USFS 1996). The LRMP standard for primary pools was only met in Reach 1. The Project implementation guide (PIG) standard for pools was not met in any of the reaches (USFS 1996).

Still Creek has approximately 13.9 river miles of available anadromous fish habitat upstream of the smolt trap site (USFS, 1998). Still Creek population estimates for coho salmon smolts ranged from a high of 6,697 in 1994 to 987 in 2002. Winter steelhead pre-smolt and smolt estimates ranged from 6,885 in 1998 to 569 in 2002. Average yearly coho salmon smolt

production is 3,275 fish, with approximately 236 smolts per river mile. Average yearly winter steelhead pre-smolt and smolt production above the trap site is 2,619 fish, with approximately 188 fish per river mile (USFS 2004 unpublished data).

Salmonids known to be present in Still Creek include resident coastal rainbow, steelhead, cutthroat, redband, coho, and Chinook salmon.

Surveys conducted within Still Creek in 1978, 1984, and 1992 found presence of coho salmon up to approximately RM 12.15. (USDA, 1992; USDA 1996).

The *Zigzag Watershed Analysis* has documented the existence of LCR steelhead in the 6th field Still Creek sub-watershed (USDA, 1995). A barriers at RM 14.4 prevent steelhead from traveling further upstream. Fall Chinook primarily spawn and rear in the mainstem lower Sandy River Basin near Oxbow Park, over 15 miles downstream of the project area for the proposed trails. Distribution of Spring Chinook in Still Creek is restricted to the lower three miles of Still Creek, over 8 miles downstream from the Project areas. Coho salmon have been documented in Still Creek at Reach 8, (RM 11.4-13 (USFS 1980, 1984). Redband Trout have been found in the Zigzag, Still, and Sandy Watersheds as recently as 2002 and 2003 (Zigzag 2003 Smolt Trap Report). Redband trout are present in Still Creek as evidenced by screw trap captures at RM 0.25. Until genetic identification of these fish can be made, effects determinations can only be based on assumed or suspected presence. Therefore, Redband trout are suspected to within the upper reaches of Still Creek. The *Zigzag Watershed Analysis* does not document the existence of bull trout in the 6th field Still Creek sub-watershed (USDA, 1995b)

ENVIRONMENTAL CONSEQUENCES

Direct Effects

No direct effect to PETS Listed aquatic species would occur as no work is proposed within stream channels under any of the Action Alternative where PETS listed fish or mollusks are present.

Indirect Effects

The effects of implementation of the proposed actions on PETS listed aquatic species are based on local populations of these species known to occur or suspected to occur within the Action Areas.

Indirect impacts to special status species may occur from through changes in sedimentation and flow, stream temperature, and/or riparian vegetation. Some of these impacts could be carried downstream and, in combination with natural and existing anthropogenic influences, could have an adverse effect and degrade stream conditions downstream.

The following sections discuss the effects to special status aquatic species, listed in Table 1, by each Action Alternative.

ALTERNATIVE 1

Under the no action alternative there would be trail construction. Changes from the current condition are not anticipated to peak or base streamflow timing, duration, or magnitude, or water quality parameters of temperature and in-channel fine sediment and thus no effects to existing aquatic TES species.

ALTERNATIVES 2 AND 3

Below are brief descriptions of environmental impacts to parameters affecting aquatic TES species habitat (peak streamflows, base streamflows, sedimentation, stream temperatures, and wetland impacts). For a more detailed discussion of the effects of the proposed actions on these parameters, refer to the appropriate sections of this EA.

Peak Streamflows

Based on the processes that affect peak streamflows and the associated methodologies for analysis, effects are analyzed at the subwatershed and fifth-field watershed scale during a cumulative effects analysis

Base Streamflows

There are no direct effects anticipated to base streamflows because there are no water uses, impoundments or diversions associated with this project. Base streamflows can be influenced by the amount of disturbance to forest cover in a watershed so the potential effects of this project will be assessed in a base streamflow cumulative effects analysis.

Based on activities associated with this project baseflows are predicted to increase from 0 to 0.2%. This is an extremely slight increase and most likely would not be detectable.

Stream Temperatures

In the Camp Creek Subwatershed activities within 100 feet of perennial streams under alternatives II and III include 5 stream crossings that would remove approximately 100 feet of stream shade, and approximately 750 feet of trail construction between 75 and 100 feet away from a perennial tributary to Camp Creek.

Three of the stream crossings with bridges are associated with the Camp Creek Trail. The streams in this area are narrow (approximately 3 to 4 feet wide wetted perimeter during summer low flows) with a shade layer provided by the shrubs in this area. The stands in this area are dense mid seral stands with 90-100% canopy closure. The streams in this area flow from north to south so the overstory shade will be removed on the east and west side of the stream and not the critical south side where the solar radiation is the strongest.

The openings adjacent to the stream are narrow (20 feet) with mature vegetation remaining outside the cleared corridor that will provide stream shade. In addition streams in this area are

feed by groundwater with stream temperatures estimated around 5⁰C¹. Based on the factors listed there are no water temperature impacts anticipated associated with these 3 stream crossings.

The construction and clearing of approximately 750 feet of trail associated with the Camp Creek Trail is 75 to 100 feet away from the stream. As with the bridge crossings the stream in this area is narrow with shrubs providing a layer of shade. The trees and shrubs between the trail clearing and the stream are dense mid seral stands with 90 to 100 percent canopy closure and will remain intact. Also as with the bridge crossings, streams in this area fed by groundwater with temperatures estimated around 5⁰C. Based on these factors there are no impacts anticipated to stream temperature associated with the trail clearing.

There are two bridge crossings on Camp Creek associated with the West Summit Fen Trail. In this area the stream is running east to west and the creek is about 11 feet wide (based on the 1994 stream survey) so the stream is not completely shaded by shrubs. The vegetation in this area is classified as late successional with associated large trees with large canopies. Due to the approach of this trail at the northern most bridge a 40 wide area will be cleared adjacent to the stream on the north side and 20 wide area on the south side. On the southern most bridge 20 feet will be cleared on either side of the bridge. Stream temperature in this area is estimated at about 8⁰C. Due to the limited area that is being cleared and the late successional vegetation in the area it is assumed that there will be little change in the amount of shade provided for Camp Creek so there will be no impacts anticipated to stream temperature.

There is one stream crossing with an associated bridge in the West and East Fork Salmon River Subwatershed on an unnamed tributary to Salmon River. The vegetation in this area is large conifers with approximately 85% canopy closure. The stream in this area is approximately 6 feet wide. This trail is planned for bikes and hikers so there are no plans to cut any overstory vegetation to place the bridge. Based on fact that no overstory vegetation will be cut there are no impacts anticipated to stream shade.

WEPP Sediment Yield

Based on the sediment yield models, there will be 200 pounds of sediment delivered to Camp Creek per year (5 stream crossings and West Summit Fen cut and fill slope) and 32 pounds per year delivered to the Salmon River (one stream crossing). For visualization purposes 200 pounds of sediment is equivalent to an area of 3 cubic feet.

Wetland Impacts

There are 575 feet of trail construction and 0.2 acres of clearing planning in wetlands under Alternatives 2 and 3. The Mt Hood Land and Resource Management Plan (LRMP) (USFS 1990) gives direction that: Special aquatic habitat (e.g. alcoves, secondary and overflow channels, ponds and wetlands) and associated subsurface aquatic habitat (hyporheic zone) shall be maintained in a natural condition or enhanced in both quality and quantity (FW-104).

Special design criteria and associated best management practices that require trails within wetland areas to be constructed on puncheon structure or turnpike to minimize impacts to the wetlands will be implemented. Trails will be designed to avoid wet areas when possible and to minimize the amount of overstory vegetation to be cleared in wetland areas.

Individual Trail Impacts

Multipor Mt Trail

This trail, located in the Still creek subbasin, is a 0.64 mile hiking trail that branches off the existing East Summit trail and ascends the east side of Multipor Mountain. There are no stream crossings for this trail and the trail does not traverse through any riparian reserves. No tree/vegetation clearing will occur. Even though trail construction will occur on steep mountain terrain, there is no potential for any created sedimentation to reach stream channels due to relatively small disturbance of the created trail and the distance of over ¼ mile from the Still creek channel. Based on this and expected effects to stream temperatures, flows, and sedimentation discussed above, construction of this trail is expected to have *No Effect/No Impact* on TES listed aquatic species in Still Creek.

West Blossom Connector/Crosstown Thunderhead Tie:

This trail complex, located in the Camp Creek subbasin, is a 0.66 mile bike/XC ski/hiking trail located between Government Camp and Enid Lake. There are no stream crossings for this trail. The south terminus of the trail will end at the Government Camp loop road, within the riparian reserve of the northernmost fork of Camp Creek. Even though a small portion of this trail will occur within a riparian reserve, any potential effects due to clearing will be negated by the presence of the Government Camp loop road which lies between the trail terminus and the Camp Creek fork. Trail clearing near the Loop road has the potential to create sedimentation which could run into the Loop road ditchline. However the ditch will not connect to Camp Creek. Thus, the small amounts of sedimentation that could be generated will be of short duration and is not expected to reach any stream channels. Based on this and expected effects to stream temperatures, flows, and sedimentation discussed above, construction of this trail is expected to have *No Effect/No Impact* on TES listed aquatic species in Camp Creek

East Summit Trail Extension

This trail, located in the Camp Creek subbasin, is a 0.08 mile bike/XC ski/hiking trail is located south of Hwy 26 where the east end of the Government Camp Loop joins the highway. There are no stream crossings for this trail and the trail does not traverse through any riparian reserves. The nearest stream/water body is over ½ mile away (Multipor Fen).

The small amounts of sedimentation that could be generated by construction of this trail will be of short duration and will not reach any stream channels. Based on this and expected effects to

stream temperatures, flows, and sedimentation discussed above, construction of this trail is expected to have *No Effect/No Impact* on TES listed aquatic species in Camp Creek

Barlow Tie

This trail, located in the Still Creek subbasin, is a 0.13 mile bike/XC ski/hiking trail below Multipor mountain on the northeast side. Located on relatively flat terrain, this trail does not pass through any riparian reserves. Still Creek is located over 1/8 mile away. The small amounts of sedimentation that could be generated by construction of this trail would be of short duration and would not reach any stream channels because of the large distances to any stream channels. Based on this and expected effects to stream temperatures, flows, and sedimentation discussed above, construction of this trail is expected to have *No Effect/No Impact* on TES listed aquatic species in Still Creek.

Gentle Glade Trail

This 5.5 mile long trail will not pass through any riparian reserves. No stream crossings or wet areas exist in this trail project area. The small amounts of sedimentation that could be generated by construction of this trail would be of short duration and would not reach any stream channels because of the large distances to any stream channels. Construction of this trail is expected to have *No Effect/No Impact* on TES listed aquatic species.

West Summit Fen project #2.19

This proposed trail crosses upper Camp Creek in two places, downstream of the Multipor Fen. Two bridges are needed for the project. .

There are two wet areas that will likely need construction of turnpike (a raised elevated section of trail between curb logs approximately 36" wide. This is located directly south of the south bridge. Distance to stream channel is approximately 50 feet on a 15% slope. Predominant drainage is perpendicular to the creek. Use of a turnpike will prevent erosion and mobilization of sediments.

Another area is located on relatively flat terrain where the trail heads west from the bottom of the Multipor chair, approximately 125 feet from the Fen. Water does not drain from this area. Use of puncheons or turnpikes will prevent erosion and sedimentation..

1st Stream Crossing:

This tributary contributes approximately 25% of the flow to Camp Creek (USFS 1994). A September 21, 2004 survey found 12' bankful widths with fines and gravels.

2nd Stream crossing:

This tributary contributes approximately 40% of the flow (USFS 1994). Bankfull widths are to 10 feet, depths to 2 feet. Aquatic vegetation prevalent, and the old bridge with footer logs in channel creating habitat. Left bank looking upstream shows some bank instability due to existing bridge (ZZRD September 21, 2004 survey). The 29' south bridge is proposed to be in the same location as an existing partially fallen bridge from the old ski race course.

A barrier to anadromous fish passage exists at RM 5.75 (Yocum Falls), approximately 1.25 miles downstream of the crossings (approximately RM 7.2). Stream gradient downstream of the proposed crossing is approximately 3% for the next 0.5 miles to Rm 6.7 with in a Rosgen B3 channel type. From RM 6.7 to 4.8, gradient averages 7% and Rosgen A3 channel type. Below RM 4.8, the creek gradient shallows to 4% from RM 4.5-4.8 in a Rosgen C3b channel type. The closest identified depositional zone is below the steep gradient downstream of RM 6.7 where Yocum Falls is located. However, the upper reaches of Camp Creek below the bridge site (RM 7.2 to 6.7) has likely shallow enough gradients that deposition of sediments may occur, especially during low flow seasons.

Given the relatively small amounts of ground disturbance near the creek, construction planned for the dry season, the full-spanning bridge design (no midstream spans), restriction of disturbance to above the 100year floodplain, disturbance restricted to being well back from the active channel, restriction of equipment away from the creek, the use of sediment fencing and BMP's, and the low-level of disturbance associated with use of hiking/skiing trails, the construction and use of the bridge and trail is expected to result in little sedimentation reaching the creek. If any sedimentation did reach the creek, it would be expected to be small in amounts and short in duration.

Based on this and expected effects to stream temperatures, flows, and sedimentation discussed above, construction of this trail is expected to have *No Effect/No Impact* on TES listed aquatic species in Camp Creek

Camp Creek Trail

Project Area: Trail junctions from the Alpine Ski Trail just above the Summit Ski Area. Trail would be approximately one mile in length. The first quarter mile is located on an old cross country ski trail route developed by Summit Ski Area.

There are 3 stream crossings on this trail. Each crossing would require a bridge between 25 and 29 feet in length. Stream channel types in these areas are Rosgen A4 with bankfull widths to 4' and depths to 1 foot.

One area on the Camp Creek trail has been identified that exceeds 25% and will need grading to allow for use of a winter trail groomer. This section is approximately 250 feet in length and will require excavation for a balanced construction bench. A total of 375 yds of material will be redistributed to create this section of trail. The affected area of disturbed and or filled ground would encompass a little less than ¼ acre (33'x250' = 8300sf total area).

Given the relatively small amounts of ground disturbance near the creek, construction planned for the dry season, the full-spanning bridge design (no midstream spans), restricting disturbance to above the 100year floodplain and well back from the active channel, restriction of equipment

away from the creek, the use of sediment fencing and BMP's, and the low-level of disturbance associated with use of hiking/skiing trails, the construction and use of the bridge and trail is expected to result in little sedimentation reaching the creek. If any sedimentation did reach the creek, it would be expected to be small in amounts and short in duration.

Based on this and expected effects to stream temperatures, flows, and sedimentation discussed above, construction of this trail is expected to have *No Effect/No Impact* on TES listed aquatic species in Camp Creek

2.23 Airstrip to Trillium Trail

There is one creek crossing (the only wet area for this trail) that will need a bridge. The creek (identified as Tributary 80 in the Salmon River Stream Survey (2001) intersects the Salmon River at Red Top Meadows, at RM 29.8 and contributes approximately 15% of the flow to the Salmon River at this point and has an approximately 2% gradient at its mouth (USFS 2001).

The bridge will be 10 feet in length with a 4' wide (30" tread with 9" on each side for curbs) decked bridge with round curbs and 4' above the 100 year floodplain.

Given the relatively small amounts of ground disturbance near the creek, construction planned for the dry season, the full-spanning bridge design (no midstream spans), restricting disturbance to above the 100year floodplain and well back from the active channel, restriction of equipment away from the creek, the use of sediment fencing and BMP's, and the low-level of disturbance associated with use of hiking/skiing trails, the construction and use of the bridge and trail is expected to result in little sedimentation reaching the creek. If any sedimentation did reach the creek, it would be expected to be small in amounts and short in duration.

Based on this and expected effects to stream temperatures, flows, and sedimentation discussed above, construction of this trail is expected to have *No Effect/No Impact* on TES listed aquatic species in the Salmon River drainage

Optimator Multipor trail

This trail will not pass through any riparian reserves. No stream crossings or wet areas exist in this trail project area. The small amounts of sedimentation that could be generated by construction of this trail would be of short duration and would not reach any stream channels because of the large distances to any stream channels (Still Creek is over 1/8 mile away). Construction of this trail is expected to have *No Effect/No Impact* on TES listed aquatic species.

Existing Trail Upgrades

Because the proposed trail upgrades are limited in scope, occur on previously disturbed areas, and BMP's and design criteria will limit or prevent adverse shading effects, loss of large woody debris recruitment, or sedimentation into streams, the proposed existing trail upgrades are expected to have *No Effect/No Impact* on TES listed aquatic species.

Trailhead Parking

Because the proposed parking lot paving occurs greater than 200 feet from any stream, will occur on an existing road prism, no new ground disturbance is proposed, and BMP's will be employed, the proposed paving of the road prism is expected to have *No Effect/No Impact* on TES listed aquatic species.

Cumulative Effects Sediment Yield

Implementation of the Government Camp TIFF Trails project will is projected to increase sediment yield in the subwatershed by 0.5% and at the key depositional reach by 2%. Both of these increases are very small and are not expected to affect the beneficial uses in this area. For a more detailed discussion, see Sediment Yield discussion in EA.

References

- USFS 1980. Stream survey report for Still Creek. Mt. Hood National Forest, Sandy, Oregon.
- USFS 1984. Stream survey report for Still Creek. Mt. Hood National Forest, Sandy, Oregon.
- USFS. 1990. Land and Resource Management Plan. Mt. Hood National Forest, Sandy, Oregon.
- USFS 1994. Stream survey report for Camp Creek. Mt. Hood National Forest, Sandy, Oregon.
- USFS. 1995. Zigzag Watershed Analysis. Mt. Hood National Forest, Sandy, Oregon.
- USFS. 1996. Stream survey report for Still Creek. Mt. Hood National Forest, Sandy, Oregon.
- USFS. 1998. Stream survey report for Still Creek. Mt. Hood National Forest, Sandy, Oregon. Unpublished report.
- USDA-Forest Service, Pacific Northwest Region. 1996. Upper Sandy Watershed Analysis. Mt. Hood National Forest. 1996.
- USFS. 2001. Stream survey report for the Salmon River. Mt. Hood National Forest, Sandy, Oregon.
- USFS. 2004. Still Creek and Clear Fork smolt trap report, 2004. Zigzag Ranger District, unpublished data, Zigzag, Oregon.

Government Camp Trails Project

Fisheries Biological Evaluation

Zigzag Ranger District
Mt. Hood National Forest
Fifth Field Watersheds: Zigzag

March 17, 2005

Table 1. List of Proposed, Threatened, Endangered, or Sensitive (PETS) Species addressed under this Biological Evaluation:

ESU Species/Status	Date of Listing	Suitable Habitat Present	Species Present	Effects of Actions		
				Alternatives		
				1	2	3
<u>Threatened</u>						
Lower Columbia River steelhead <i>(Oncorhynchus mykiss)</i>	3/99	Yes	Yes	NE	NE	NE
Lower Columbia River chinook <i>(Oncorhynchus tshawytscha)</i>	3/99	Yes	No	NE	NE	NE
Columbia River Bull Trout <i>(Salvelinus confluentus)</i>	5/98	Yes	No	NE	NE	NE
<u>Proposed Threatened</u>						
Lower Columbia River/Southwest WA coho <i>(Oncorhynchus kisutch)</i>	07/95	Yes	Yes	NE	NE	NE
<u>Sensitive</u>						
Redband Trout <i>(Oncorhynchus mykiss spp.)</i>	NA	Yes	Yes	NI	NI	NI
Aquatic Mollusk Columbia dusky snail <i>Lyogyrus n. sp. 1</i>	NA	Yes	Yes	NI	NI	NI

Abbreviations/ Acronyms:

- Th Listed as Threatened under the Federal Endangered Species Act
- C Federal Candidate Species
- S Forest Service Region 6 sensitive species
- P Federal Proposed Species
- C3 Aquatic mollusks listed in Table C-3 requiring survey & protection under the NW Forest Plan (1994)
- NI / NE No Impact / No Effect
- 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
- NAA Not Adversely Affected
- NLAA May Affect, Not Likely to Adversely Affect

Written by: David Saiget, Fisheries Biologist

Date: _____

I. INTRODUCTION

Forest management activities that may alter the aquatic habitat or affect individuals or populations of PETS (Proposed, Endangered, Threatened, and Sensitive) fish and aquatic species require a Biological Evaluation to be completed (FSM 2671.44 and FSM 2670.32) as part of the National Environmental Policy Act process to determine their potential effects on sensitive, threatened or endangered species. The Biological Evaluation process (FSM 2672.43) is intended to conduct and document analyses necessary to ensure proposed management actions will not likely jeopardize the continued existence or cause adverse modification of habitat for:

- A. Species listed or proposed to be listed as endangered (E) or threatened (T) by the USDI-Fish and Wildlife Service or National Marine Fisheries Service (NOAA Fisheries).
- B. Species listed as sensitive (S) by USDA-Forest Service Region 6.

This Biological Evaluation (BE) addresses a proposal to:

1. Construct new trails and reconstruct existing trails around the community of Government Camp to link with adjacent Forest trails and/or key destinations.
2. Construct and reconstruct trailhead and trailhead parking to clearly identify trail opportunities and inform users.
3. Upgrade some existing winter trails for Nordic grooming.

This biological evaluation addresses all alternatives presented in the Draft Government Camp Trails Environmental Assessment (DEA).

II. PROJECT LOCATION

The Government Camp Trails Project Area is situated in the Cascade Mountain Range on the southwestern slope of Mt. Hood, approximately 50 miles east of Portland, Oregon (see Figure 1 – Project Area Vicinity Map). The Trails Project Area is located within the Zigzag Ranger District (ZZRD) of the Mt. Hood National Forest (MHNF).

The Government Camp Trails Project Area is bounded on the north by Timberline Lodge, on the south by Trillium Lake, on the east by Timberline Road (State Hwy 173) and Forest Road 2656, and on the west by Mirror Lake and Enid Lake. All of the proposed trail projects are located within the following legal description:

- ★ R8E, T3S, Sections 13 and 24,
- ★ R8 ½ E, T3S Sections 12, 13, 14, 23, 24, 25, and 36, and
- ★ R9E, T3S, Sections 6 and 7.

The Government Camp Trails Project Area lies within two 5th field watersheds, the Zigzag River and the Salmon River. All of the proposed trails except a ¾ mile hike/bike summer trail adjacent to Forest Road 2656 are within the Zigzag River watershed. The ¾ mile trail is proposed to access Trillium Lake within the Salmon River Watershed south of Summit Meadows.

The Salmon River watershed is designated as a Tier 1 Key Watershed under the Northwest Forest Plan because it contains crucial refugia for at-risk fish species. The remainder of the proposed trails are located within the Zigzag River watershed. Both the Salmon River and

Zigzag River watersheds support populations of winter steelhead, coho salmon, chinook salmon, and resident cutthroat trout, Redband trout, and rainbow trout.

Alternative 2 has 0.8 miles of trail proposed within the Still Creek drainage (Zigzag Watershed) and Alternative 3 has 2.9 miles of trail proposed in Still Creek drainage. In both alternatives, these trails are located more than ¼ mile from Still Creek and its tributaries.

Most of the trail projects (7.6 miles in both action alternatives) are proposed in the upper reaches of the Camp Creek drainage (Zigzag Watershed). The upper Camp Creek drainage emerges out of a large wetland complex just south of Hwy 26 through Government Camp, known as “The Fen”, another wetland/small lake complex known as Collins Lake just north of Hwy 26, and from a series of perennial and intermittent streams located on the forested slopes above Government Camp.

Most of the trails are located between 3600 feet and 4300 feet in elevation. The two exceptions are the last part of the Multipor Mountain Hiking Trail proposed to reach the summit of Multipor Mountain at 4656 feet, and the Timberline to Town hike/bike trail that starts at 4100 feet and climbs to 6000 feet to Timberline Lodge. Both of these trails have no perennial stream crossings.

The action alternatives in the Government Camp Trails Environmental Assessment, propose to construct 9.15 (Alt 2) to 11.25 (Alt. 3) miles of trails, and a total of 17725 square feet of asphalt parking along an existing road prism. The proposed trails in both of the action alternatives include 6.75 miles of hike/bike summer trails where clearing of trees will be limited and most of the impact will be establishing an 18-24” trail tread with an additional 3 feet of pruned vegetation on either side of the trail.

A total of 2.4 miles of trail in Alternative 2, and 4.5 miles of trail in Alternative 3 are proposed to be hike/bike/Nordic ski trails. A motorized groomer that is 10-14 foot wide will groom these trails to set tracks for Nordic skiing and snowshoeing, when sufficient snow exists to protect vegetation under snow. The clearing area for these trails is expected to be 20 feet in order to get sufficient and relatively even snowfall in the opening. The trails follow natural openings where possible to reduce the amount of tree clearing. The twenty feet opening will be cleared of trees, but lower growing vegetation (bushes, etc.) will remain as they will be covered by snow in winter. The trail tread for summer use on these trails will be 18-24”. In places where side slopes exceed 30% (estimated to be approximately 626 feet in Alternative 2, and 3,826 feet in Alternative 3), additional cutting and filling will be necessary to reduce the side slope enough for a groomer to travel over in winter. Estimated width of cut and fill in these sections ranges from 15 to 24 feet. Additional details on lengths and widths of cut and fill are available in the design narratives.

There are a total of 5 trail bridges proposed. The footings of these trail bridges will be located out of the 100 year flood plain. The bridges will be constructed with logs and dimensional lumber. All of the ski trail bridges will be designed to accommodate a groomer. The hike/bike trail bridge will be standard 24-36 width. Trail construction will be done by hand and with a small excavator. The two parking areas located on existing road prisms will contain 17525 square feet of asphalted surface.

III. PROJECT/HYDROLOGIC ANALYSIS AREAS

For purposes of this BE, and for ease of analysis, the action area has been defined as a hydrologic analysis area (HAA) that extends from the uppermost extent of any stream that is intersected by trail construction to the bottom of the microwatershed associated with trail construction. For this project, the hydrologic planning area is 5481 acres. See Figure 1 for HAA map.

There are 4 land allocations in the HAA that address water resources. These allocations are detailed in 2

Table 2– Land Allocations related to Watershed Resources

Allocation	Acres	Management Direction
Special Emphasis Watershed	765	Maintain or improve watershed, riparian, and aquatic habitat conditions and water quality for municipal uses and/or long-term fish production.
Wild and Scenic River	70	Protect and enhance the resource values for which a river was designated into the Wild and Scenic Rivers System
Riparian Reserve	1485	Riparian resources receive primary emphasis and special standard and guidelines apply
Key Site Riparian	226	Maintain or enhance habitat and hydrologic conditions of selected riparian areas, notable for their exceptional diversity, high natural quality and key role in providing for the continued production of riparian dependent resource values.

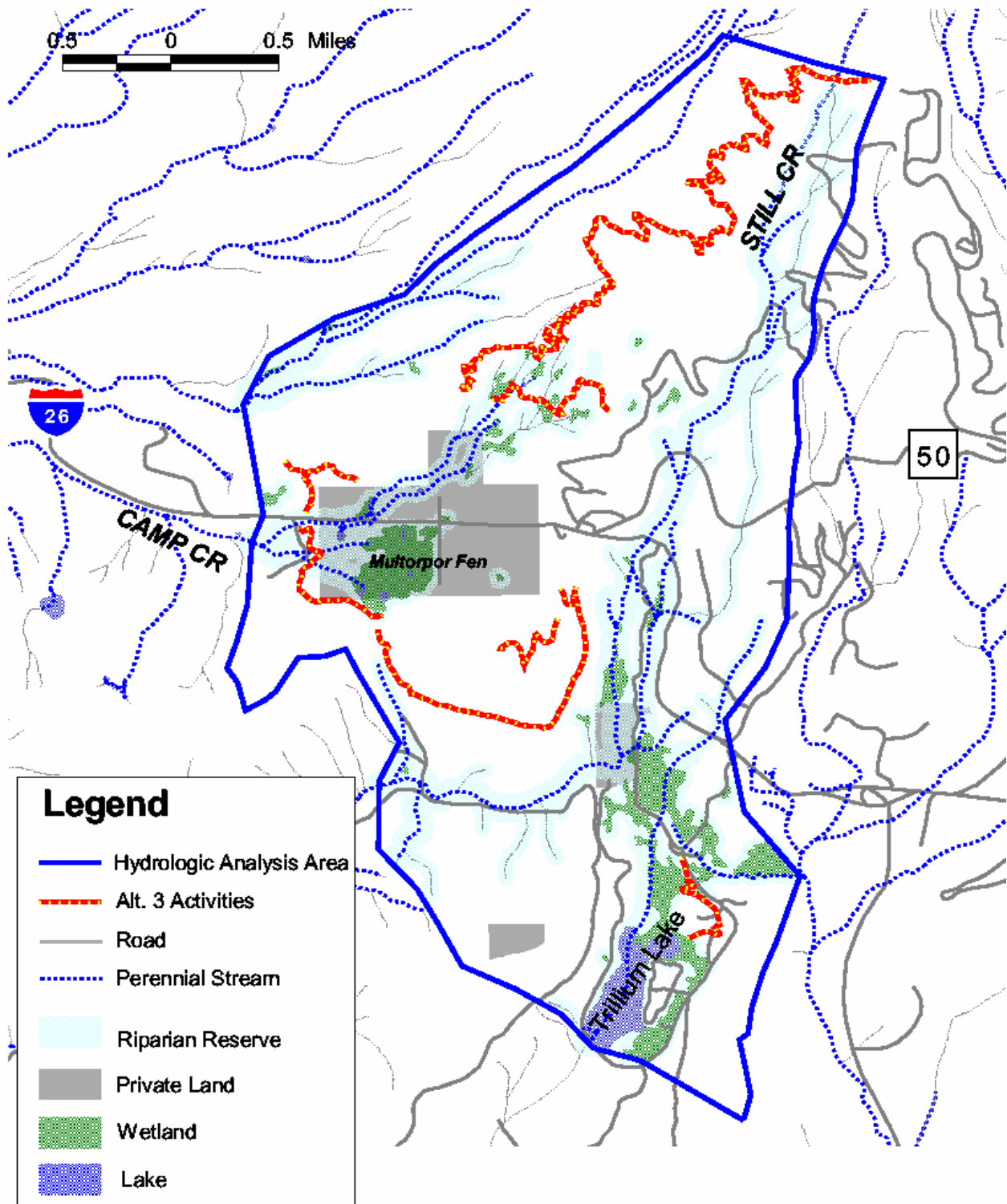
In addition to the land allocations listed above the Salmon River Fifth Field Watershed is a Tier 1 Key Watershed under the Northwest Forest Plan. There are 975 acres of the HAA in the Key Watershed. The objective is to contribute directly to conservation of at-risk anadromous salmonids and resident fish species. The emphasis within Key Watersheds is to reduce existing system and non-system road mileage and receive priority for restoration.

The hydrologic planning area contains 488 acres of the 582 acre Government Camp Drinking Water Protection Area (DWPA). Although the boundary of the Government Camp DWPA has been identified, a Drinking Water Protection Plan has not been developed, and therefore, no management guidelines or protection standards have been established.

As designated in the Record of Decision for the Northwest Forest Plan (USDA,USDI 1994), riparian reserve widths within the Action area are 300 feet for fishing bearing streams, 150 feet for permanently flowing, non fish bearing streams, 150 feet for wetlands >1 acre, 100 feet for wetlands <1 acre, seasonal flowing or intermittent streams, and unstable and potentially unstable areas Page C-30-31 Standards and Guidelines, USDA, USDI 1994).

The downstream extension of the Action Area is warranted due to potential indirect effects to aquatic species or habitat (i.e. decreased water quality, sedimentation or changes in flow, resulting from disturbance in the project area.

Figure 1. Hydrologic Analysis Area.



IV. DESCRIPTION OF THE ACTION ALTERNATIVES

Activities common to all Alternatives

The following equipment may be used during trail and bridge construction: small tracked excavator (5' width), chain saws, chain saw winch, mechanized wheelbarrow, crane that operates from existing roadway.

Time of year for construction would be typically late May to early October. Best Management practices will be specified in all work documents to provide for silt/erosion control. Revegetation will be conducted at the conclusion of the project.

The use of trail digging machines on the project would be approved as well as ORV's for use by the contractor except as noted above. Finish would be by hand tools, rakes, etc. Use reverse grade and drain dips.

In areas where wet areas cannot be avoided, the trail would be constructed on puncheon structure or turnpike to minimize effects on the wet environment. Trail building machines would not be allowed to travel or work directly in wet areas.

Trail tread would be constructed to a 24 inch width with drain dips designed into the grade to minimize the need for drainage structures. Tread will generally be sloped to the outside at a grade not exceeding 5% except in drain dips where the slope could be 10% at the bottom of the drain dip. Tread finish goal will be to a one inch. Locating and constructing trail in wet areas will be avoided.

Clearing would be done by hand crew. Brush and trees would be lopped and scattered outside of the clearing limits by hand crew. When wet areas cannot be avoided, the trail would be constructed on puncheon structure or turnpike to minimize erosion from trail use.

To be able to operate with minimal snow cover the ski width surface needs to be relatively free of obstacles. Outside the 24" tread width but within the 20' clearing width the surface, the area will be cleared of protruding rocks, stumps and logs. No grading will take place and areas of short brush and thin ground cover will not be cleared.

Bridges:

Bridges would be built with a combination of treated and untreated wood. Local material for the bridge stringers will be utilized where possible. Decking would be treated rough Douglas fir lumber. Sills would be of either treated or plastic wood. Bridges would be built 16' wide, and strong enough to support a small groomer.

Bridges would be constructed using a tracked excavator (5' wide or less) working from either side of the drainage but not in the drainage. Rigging may be necessary using snatch blocks and cable to bring logs across the creeks. Best Management Practices (BMP's) will be specified in all work documents to provide for silt control.

Trees may be harvested for stringers outside of established stream buffers. Downhill grades approaching the bridges would be avoided whenever possible

A footprint to place sills on will be the main excavation needed for the bridge. A yard of crushed rock may need to be brought in to each bridge to help level out this sill placement. Excavation for sills will be approximately 18 feet (a little more than the width of the bridge) by 18 inches and deep enough so that sill plus the stringer plus the decking will be at grade with the finished trail. Sill size will be approximately 6" tall x 18" wide x 16' long. Placement of sills will require some excavation. Sill placement will be set 4' back from the active channel to insure that the bank is not undercut and to prevent excavated material from entering the stream.

Excavated material will be pulled back and piled behind the excavator away from the stream at each site during work. Silt fences will be installed prior to earthwork between the work and the stream. At least 4' of freeboard will be established between the height of the 100 yr flood plain and the bottom of the stringers. Sills and bulkheads will be located so as to not constrict or change the free flowing characteristic of the streams. Excavated material will serve as backfill and any excess will be utilized in the treadway of the trail leading to the bridge.

Sills, stringers and decking would be brought in from off site. Sills and decking would be of treated lumber. The treated wood would be steam cleaned by the manufacturer. The stringers would be of an engineered material such as steel or gluelam. Curb logs would be made of small native logs averaging 6" in diameter.

Wood treatment will be used on any milled lumber. While type of treatment has not been specified to date, Penta with light oil is the treatment being used on the most current bridge being build on the Mt Hood National Forest. Best management practices (BMP's) for wood treatment include that the manufacturer steam wash off treated wood after treatment to insure that no excess treatment remains.

The travelway portion of the bridges would be constructed of treated materials. The aprons needed to support snow and snow machines would be constructed of local material (logs) obtained near the crossings.

Side hill grading:

Where the sideslope exceeds 25%, a 15' bench with a 15% sideslope will need to be constructed. The 24" tread will be within this and the remainder of the 15' width can be revegetated. Cut and rill slopes would be constructed at a 1.5:1 grade and revegetated when complete.

Alternative 1: (No action).

Under this alternative, the proposed trails and upgrades would not be built and therefore no impacts would occur from construction activities.

Alternative 2-Proposed Action Alternative

The Proposed Action is to:

- Construct new trails and reconstruct existing trails to a safe standard that is designed to minimize erosion and heavy maintenance.
- Establish connector trails around the community of Government Camp to link with adjacent Forest trails and/or key destinations.
- Construct and reconstruct trailhead and trailhead parking to clearly identify trail opportunities and inform users.
- Upgrade existing winter trails for Nordic grooming.

Table 3 below, and the narrative that follows, contain a more detailed list of projects included in the Proposed Action. Figure 2 shows a map of Alternative 2 proposed trails and trailhead parking.

Table 3: Alternative 2 – Proposed Action New Trail Construction

Trail	Trail Name	Miles	Designed Use	Design Notes
2.19	West Summit Fen	0.57	Bike/Ski/Hike	< 8% grade, 20 ft clearing, 24 inch tread. 2 bridges, one wet area of standing water
2.22	Multipor Mt.	0.64	Hike	18" tread, No water crossings
2.28	East Summit Trail Extension	0.08	Bike/Ski/Hike	< 8% grade, 20 ft clearing, 24 inch tread. No water crossings.
2.6	Barlow Tie	0.13	Bike/Ski/Hike	< 8% grade, 20 ft clearing, 24 inch tread. No water crossings.
2.3	Crosstown Thunderhead Tie	0.42	Bike/Ski/Hike	< 8% grade, 20 ft clearing, 24 inch tread. No water crossings.
2.2	West Blossom Connector	0.24	Bike/Ski/Hike	< 8% grade, 20 ft clearing, 24 inch tread. Small wet area near south end of trail.
2.4	Camp Creek Trail	0.35	Bike/Ski/Hike	< 8% grade, 20 ft clearing, 24 inch tread. 3 water crossings
2.26	Timberline to Town	5.36	Bike/Hike	18 inch tread. No stream crossings
2.23	Trillium Bike	0.75	Bike/Hike	18 inch tread. One stream crossing
	TOTAL MILEAGE	9.14		

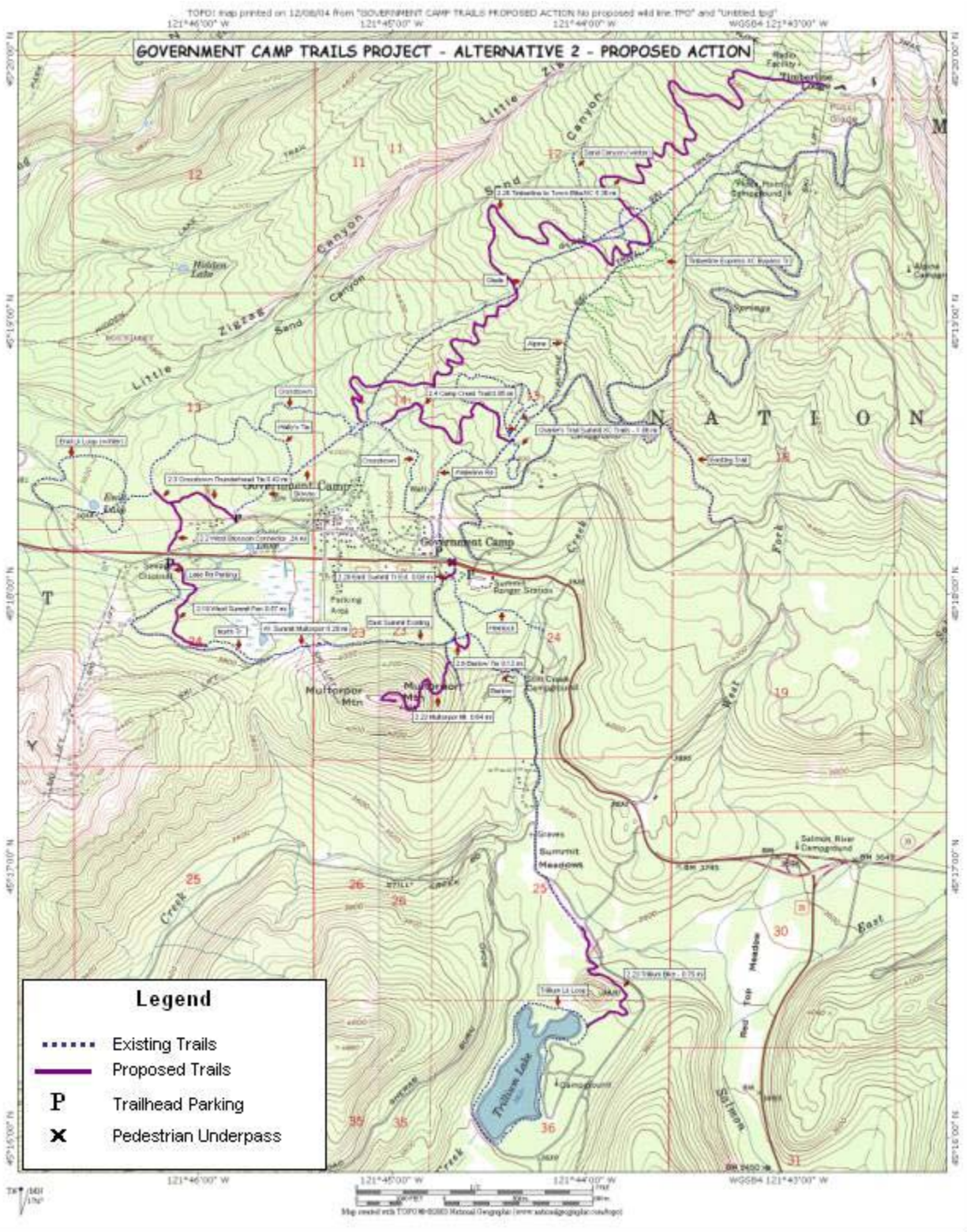
Proposed Action Existing Trail Upgrades

- Remove and replace 4 existing trail bridges on Crosstown and Summit Nordic trail loops.
- Install 5 water bars and 2 side ditches total on Hemlock and Barlow Trails.
- Construct a fence or other barrier on road prism along edge of Lake Road where it approaches the Multipor Lodge.
- Realignment of existing Eastleg Trail approach to Timberline Road for better sight distance and access to Snowbunny and Yellowjacket.

Proposed Action Trailhead Parking

- Construct and pave with asphalt a parking area approximately 43 feet wide by 175 feet long on existing road prism of Lake Road
- Surface approximately 100 foot by 100 foot size area with asphalt on the existing road prism along Government Camp Loop Road near Thunderhead Lodge

Figure 2. Map of Alternative 2 – Proposed Action



PROPOSED NEW TRAIL CONSTRUCTION DESCRIPTIONS

Multipor Mountain

Project Area: From powerline on the east side of Multipor Mountain to the top of Multipor Mountain.

Construct a trail to the top of Multipor Mountain primarily utilizing the old railway. This trail does not pass through any riparian reserves. No stream crossings or wet areas are encountered for this trail.

Some drainage structures will need to be installed, particularly on the bottom half. Drain dips or rock water bars would be installed.

East Summit Tr Ext. project #2.28

Project Area: The segment would be open to hikers and mountain bikes in the summer and cross country skiing and snowshoeing in the winter.

This segment is primarily on the ground that the old generator site utilized and is less than a 0.1 of a mile. Clearing is limited to brush. Skiers have been utilizing this route for more than 20 years but no tread exists for summer use.

No stream crossings or wet areas encountered for this trail. No significant side slope exists.

Barlow Tie project #2.6

Project Area:

The Barlow Tie Trail between Summit Trail and Barlow Trail.

Project Description: Relocate a short connector trail between the Barlow Trail and Summit Trail. The trail will be built for cross country skiers, hikers and mountain bikers at the low end of more difficult.

The terrain is dry and fairly gentle. There are no stream crossings or wet areas encountered on this trail.

West Blossom Connector/Crosstown Thunderhead Tie:

Project Description: Construct trails on contour from Thunderhead Lodge Trailhead to the powerline to the west then downhill to connect with the Crosstown trail. Approximately 0.66 miles of trail would be constructed. All work would be done with mechanical equipment initially and handwork to finish. Clearing would be done by hand crew. Brush and trees would be lopped and scattered outside of the clearing limits. Trail construction would be accomplished using a small tracked excavator and finish would be by hand. There are no stream crossings on this trail.

Grades will be less than 8%, clearing widths would be 20' to open the canopy for snow capture.

Gentle Glade Trail

Project Area: Area just west of the bottom terminal of the Magic Mile Lift down to Crosstown Trail/Glade Trail Junction. Length of trail is approximately 5.5 miles long.

Project Description: Construct a year round trail from Timberline to Government Camp. The trail would be open to Mountain bikes and hikers in the summer and Cross country Skiers in the winter. Grades would generally be less than 8% with 5% or less being the target sustained grade. Reverse grades would be designed in at intervals as rest grades and doubling as drain dips. Approximately 5.5 miles of trail would be constructed.

No stream crossings or wet areas exist in this trail project area.

Camp Creek Trail

Project Area: Trail junctions from the Alpine Ski Trail just above the Summit Ski Area. Trail would be approximately one mile in length. The first quarter mile is located on an old cross country ski trail route developed by Summit Ski Area.

Project Description: Approximately one mile of trail would be constructed. All work would be done with mechanical equipment initially (tracked excavator, 5' or less in width) and handwork to finish.

There are 3 stream crossings on this trail. Each crossing would require a bridge.

Grades will be less than 8%, clearing widths would be 20' to open the canopy for snow capture. Trail tread would be constructed to a 18 inch width with drain dips designed into the grade to minimize the need for drainage structures. Wet areas will be avoided.

One area on the Camp Creek trail has been identified that exceeds 25% and will need grading to allow for use of a winter trail groomer. This section is approximately 250 feet in length and will require excavation for a balanced construction bench.

The bench will be constructed with a 15% outslope to reduce the excavation requirements. The grade will be rolled to create cross drains every 50'. Approximately 3' of excavation will be required to obtain proper grade. This combined with laying the slope back to 1.5:1 and establishing a fill slope of the same dimension will require approximately 15 yds of material to be moved per 10' of trail. Final product will be a 15' wide road type bench with a 15% outslope. A total of 375 yds of material will be redistributed to create this section of trail. The affected area of disturbed and or filled ground would encompass a little less than ¼ acre (33'x250' = 8300sf total area).

West Summit Fen project #2.19

The trail would be open to hikers and mountain bikes in the summer and cross country skiing and snowshoeing in the winter.

Where the sideslope exceeds 25%, a 15' bench with a 15% sideslope will need to be constructed. The 24" tread will be within this and the remainder of the 15' width can be revegetated. In most cases this will be a balanced construction. Cut slope will be 1.5:1 in most locations. On steeper sections it may be 1:1.

Two bridges are needed for the project. The 29' south bridge is proposed to be in the same location as a bridge from the old ski race course. The 25' north bridge is a new location. Both bridges would be single span meaning no midspan structure in the stream. No concrete work is expected. Dimensions are 16' width for winter use, 4' width for summer use giving 32" center tread with 9" on each side for curb logs.

There is a 120' section of wet area that will likely need construction of turnpike (a raised elevated section of trail between curb logs approximately 36" wide. This area consists of saturated soils and non-flowing, standing water. Gravel is backfilled inbetween the curb logs. This is located directly south of the south bridge. Decking will not work here given the 10% slope of the trail. This section exists on relatively flat terrain.

Another wet area is located on relatively flat terrain where the trail heads west from the bottom of the Multipor chair. There is a 287' section of new construction that has some short wet areas in it. This is near the edge of the fen. It will likely need a few short section of puncheon or turnpike.

2.23 Airstrip to Trillium Trail

Project Area: South end of old Summit Airstrip to the northeast section of the Trillium Lake loop Trail.

Project Description: Construct a trail from the south end of the old airstrip connecting to the existing Trillium Lake Loop Trail just north of the Trillium lake Campground.

There is one stream crossing and one bridge proposed for this trail. The proposed bridge will be a 4' wide (30" tread with 9" on each side for curbs) decked bridge with round curbs. Standard bridge construction will be as described for West Summit Fen and Camp creek Trails. The bridge will be less than 10' in length and 4' above the 100 year flood plain.

ALTERNATIVE 3 - MULTIPOR MT. ALTERNATIVE

Alternative 3 has all the same components as Alternative 2 - Proposed Action, except for the addition of one additional trail (Optimotor Multipor Trail) that would go from the base of a lift area at Multipor Ski Area, and travel around the south side of Multipor Mountain.

Optimator Multipor project #2.29

This trail would be open to cross country skier, snowshoes, hikers and mountain bikes. There are no stream crossings on this trail. The trail begins on its west end by following the Optimator Trail that Ski Bowl utilizes as part of its summer mountain bike program. It leaves the Optimator Trail after a mile and all new construction continues contouring around to the east side of Multipor Mt. The trail ends at the east of the Barlow Tie Trail.

There are no stream crossings on this trail and the trail does not pass through any riparian reserves. Refer to Table 4 for trail distances. See Figure 3 Alternative 3.

Table 4. Alternative 3 Multipor Mt. New Trail Construction

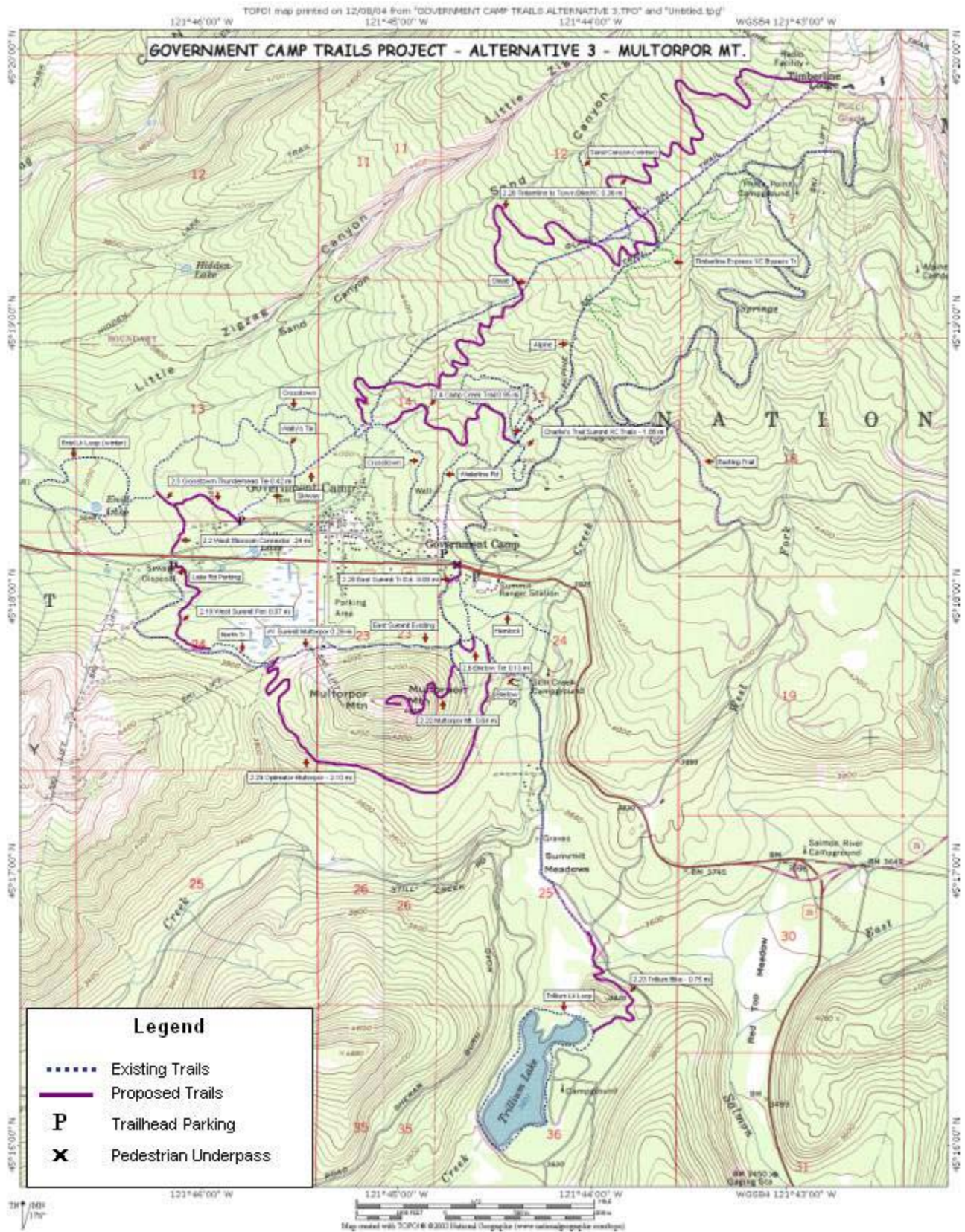
Trail	Trail Name	Miles	Designed Use	Design Notes
2.29	Optimator Multipor	2.10	Bike/Ski/Hike	18 inch tread. No stream crossings
	TOTAL MILEAGE	11.24		

There are 2 sections that will need excavation to reduce the side slope for grooming operations. See table 5.

Table 5: Alternative 3 –Bench excavation

Section	Sideslope %	Length	Cross section width of ground exposed	Volume of material excavated in cubic yards
Optimator	Average 45%	3000'	24	1333
East side	Average 28%	200'	21	44

Figure 3. Map of Alternative 3 – Multorpor Mt.



V. Comparison of Alternatives

Table 6 compares areas and amounts of tree harvest by alternative.

Table 6. Comparison of Alternatives

Facility or Improvement Constructed	Alternative 1 – No Action	Alternative 2 – Proposed Action	Alternative 3 – Multipor Mt.
Hiker only trails	0 miles	0.64 miles	0.64 miles
Hike/Bike trails	0 miles	6.11 miles	6.11 miles
Hike/Bike/Nordic ski trails	0 miles	2.39 miles	4.49 miles
Trailhead Parking	0 ft.	17525 sq feet paved parking area	17525 sq feet paved parking area
Existing Trail Upgrades	No	Yes	Yes

VI. INTERRELATED, INTERDEPENDENT ACTIONS

Secondary impacts include interrelated projects that have no independent utility apart from the proposed action, and interdependent projects that are a part of a larger action and depend on the larger action for justification.

There are no interrelated or interdependent actions for any of the proposed action alternatives.

VII. PRESENCE OF LISTED FISH AND AQUATIC SPECIES WITHIN OR DOWNSTREAM OF THE ACTION AREA

Lower Columbia River (LCR) Steelhead (*Oncorhynchus mykiss*) Federally Listed Threatened

The Sandy River consistently rates as one of Oregon's top 10 winter steelhead producers. Virtually every passable reach of the basin contains winter steelhead spawning habitat. In the upper basin, good winter steelhead production exists in the Salmon River system below Final Falls, and in Still Creek and many small upper basin tributaries. Production also occurs in turbid stream reaches such as the Muddy Fork of the Sandy River, the upper Sandy River and the Zigzag River where glacial flour is evident.

Wild Sandy River winter steelhead are widely distributed, and spawn and rear in many tributaries and mainstem reaches throughout the subbasin. Historically, wild winter steelhead typically migrated past Marmot Dam after late February with the majority of the fish passing the dam in April and May.

Presently, most of the spawning and rearing habitat for winter steelhead lies above Marmot Dam, with significant amounts in the Salmon River and its tributaries below Final Falls, and in Still Creek.

Spawning of wild winter steelhead generally occurs from April to June. Adults usually spawn in second to fourth order tributaries, and often higher in respective drainages than either coho or chinook. Wild winter steelhead smolts migrate downstream to the ocean typically as age 2+ smolts in spring, but 3+ smolts are not uncommon.

Typically, winter steelhead smolts depart natal tributary streams and enter the Columbia River in late spring or early summer, and then descend to the ocean. Sandy River winter steelhead usually spend two summers in the ocean before returning to spawn. Age at return is variable both between and within brood years.

Distribution of LCR steelhead in the Upper Sandy Basin is to RM 13 of Still Creek, Camp Creek at Yocum Falls at RM 5.75 (1.25 miles downstream of the nearest proposed trail project in the Camp Creek drainage (West Summit Fen Trail), and below Final Falls of the Salmon River at RM 14 (over 14 miles downstream of the nearest proposed trail project in the Salmon River drainage (Airstrip to Trillium Bike Trail) and thus is not expected to be present in any of the project areas (USFS 1980, 1984).

Lower Columbia River Chinook (*Oncorhynchus tshawytscha*) Federally Listed Threatened

Fall Chinook

Fall chinook are indigenous to the Sandy River. The Oregon Department of Fish and Wildlife (ODFW) presently describes two run components: early maturing tule, and later maturing Sandy stock fall chinook that is the dominant fall chinook stock in the subbasin.

Early maturing tule fall chinook enter the Columbia River as early as July and may enter the Sandy River sometime in August. Tule fall chinook generally spawn from late September to mid-October and distribution in the basin is limited by low flow conditions typical of the Sandy River at this time. Peak spawning usually occurs in early November

Spawning generally occurs in the mainstem from Lewis and Clark State Park to the upstream boundary of Oxbow Park. Spawning activity is usually highest near Oxbow Park where there are large deep resting pools and wide gravel bars.

Though the bulk of spawning for fall chinook presently occurs in the mainstem and tributaries of the lower basin near Oxbow Park, historical spawning distribution is

documented to have occurred both in the Bull Run River and in large tributary streams above Marmot Dam.

USFS and the Bureau of Land Management (BLM) surveyors observed Chinook, spawning activity in Sixes Creek, a tributary to the lower Salmon River, in early November of 1994 and 1995. These observations occurred several weeks after spring Chinook spawning activities in the area ended, and scale samples taken in 1994 showed distinct fall chinook patterns (Taylor, 1998). Also, some chinook migrating over Marmot Dam in October and November have shown morphological similarities to fall chinook according to pictures taken at the counting facility ((Taylor, 1998).

Fall chinook primarily spawn and rear in the mainstem lower Sandy River Basin near Oxbow Park, over 18 miles downstream of the nearest proposed trail project (Airstrip to Trillium Bike Trail) and thus is not expected to occur within the project area of any of the proposed actions.

Spring Chinook

Most naturally producing Sandy River spring chinook spawn in the upper watershed above Marmot Dam. Primary spawning areas include the Salmon River up to Final Falls (RM 14) and the lower three miles of Still Creek. Spring chinook also spawn in the Zigzag River, upper Sandy River and the lower reaches of several tributaries when flows permit. Generally, chinook salmon prefer large pools in low gradient areas within the mainstem and large tributaries. They are not usually found in smaller tributaries or side channels (ODFW 1997).

Spring chinook may enter the Sandy River as early as February, but peak movement into the subbasin typically occurs in April and May. Spring chinook typically migrate into the upper subbasin above Marmot Dam from May to early October; however, some migrants are observed as early as April and as late as November.

Spring chinook returning to the Sandy River typically spawn from August to early October, and spawning activity is generally complete by mid-October based on spawning ground surveys conducted by the USFS in Still Creek and Salmon River(USDA 1996).

Naturally produced juvenile spring chinook typically outmigrate to the Columbia River in the spring of their second year as yearling (1+) smolts. Some juvenile spring chinook may outmigrate in the fall as sub-yearlings, however. Information on size at outmigration for naturally produced spring chinook in the subbasin is limited.

Distribution of Spring Chinook in the Upper Sandy Basin is restricted to the lower three miles of Still Creek (over 8 miles downstream from the nearest trail project in the Still Creek drainage (Airstrip to Trillium Bike Trail), Camp Creek at Yocum Falls at RM 5.75 (1.25 miles downstream of the nearest proposed trail project in the Camp Creek drainage (West Summit Fen Trail), and below Final Falls of the Salmon River at RM 14 (over 14 miles downstream of the nearest proposed trail project in the Salmon River drainage (Airstrip to Trillium Bike Trail) and thus this species is not expected to be present in any of the project areas.

Lower Columbia River/SW Washington Coho Salmon (*Oncorhynchus kisutch*) Federally Proposed for Threatened Status

The Sandy River Basin supports two coho stocks: a native late-spawning stock (November-February) and an early-spawning hatchery stock (September-November). The basin's native coho population generally spawns and rears in the clearwater tributaries above Marmot Dam, though some production also occurs in the lower basin.

Studies show that coho salmon prefer areas with low water velocities, such as low gradient small and medium-sized streams, side channels and the margins of mainstem rivers (ODFW 1997). Primary habitat exists in the Salmon River and tributaries below Final Falls, and in Still Creek. The mainstem Sandy River and side channels also support some coho production (ODFW 1997).

Most coho escape above Marmot Dam in September and October with most spawning occurring in late October through November. Though natural reproduction continues to occur in the lower subbasin below Marmot Dam, primary spawning and rearing areas are currently located in the clearwater tributaries above Marmot Dam, primarily in the Salmon River and its tributaries below Final Falls, and in Still Creek.

Emergence from the gravels takes place February to April. Winter water temperatures vary at different elevations in the basin and are generally cooler in headwater areas. Thus, incubation timing of eggs in redds in lower elevation tributaries may develop faster than eggs developing in redds at higher elevations. Later returning coho bound for the upper subbasin may encounter colder water temperatures than earlier migrating fish. Emergent coho fry have been identified at Marmot Dam as late as June 1.

Juvenile coho typically migrate from the Sandy River at about 12 to 14 months of age, and are referred to as age 1+ smolts. Actual time and size of ocean entry for naturally produced Sandy stock coho is unknown.

Distribution of LCR/SW Washington Coho is to RM 13 of Still Creek, Camp Creek at Yocum Falls at RM 5.75 (1.25 miles downstream of the nearest proposed trail project in the Camp Creek drainage (West Summit Fen Trail), and below Final Falls of the Salmon River at RM 14 (over 14 miles downstream of the nearest proposed trail project in the Salmon River drainage (Airstrip to Trillium Bike Trail) and thus this species is not expected to be present in any of the project areas (USFS 1980, 1984).

Columbia River Bull Trout (*Salvelinus confluentus*) Federally Listed Threatened

Bull trout are believed to be a glacial relict whose distribution has expanded and contracted with natural climate changes. Bull trout often occur upstream from barriers in many drainages, an indication of early colonization (Meehan et al. 1991).

Bull trout live in a variety of habitats including small streams, large rivers, and lakes or reservoirs. In some drainages, the fish spend their lives in cold headwater streams

Basic rearing habitat requirements for juvenile bull trout include cold summer water temperatures (<15°C (59°F)) with sufficient surface and shallow groundwater flows. High sediment levels and embeddedness can result in decreased rearing densities.

Adult bull trout would reside in the mainstem and larger tributaries until their spawning period during mid-August through September, at which time they would migrate upstream to smaller tributaries to spawn.

The ODFW has no historic documentation or evidence of bull trout (*Salvelinus confluentus*) in the Sandy River. However, two bull trout have been documented recently in the lower Sandy River. In April 2000, the ODFW fish survey crews identified a 18 inch bull trout caught in the trap at Marmot Dam. The other fish was caught and released by an angler in the lower Sandy River below Oxbow Park.

Based on lack of historical evidence of Bull trout presence in the Upper Sandy Basin and lack of sightings by survey crews, Bull trout are not expected to be present within any of the drainages comprising the HAA.

Redband Trout (*Oncorhynchus mykiss* spp) USFS Listed Sensitive

Redband trout are a native trout of western North America. There is considerable variation in the life history in this group of trout. Resident stream populations are found throughout the Columbia River Basin.

Redbands are typically a stream-resident fish that make short spawning migrations either in the same stream or often into smaller tributaries. Redband trout prefer cool, clean, relatively low gradient streams but, in some circumstances, are able to withstand wider temperature variations than their cousins the westslope cutthroat trout. Interior redband trout feed mainly on aquatic insects but eat what is available to them. Large adults also eat fish (Montana Fish Wildlife and Parks website 2004).

Redband trout are known to occur in sympatry with both resident and anadromous rainbow forms on the MHNH and fish suspected to be Redband trout have been found in the Zigzag, Still, and Sandy Watersheds as recently as 2003.

Until genetic identification of these fish can be made, effects determinations can only be based on assumed or suspected presence. Therefore, Redband trout are suspected to within the HAA of Still Creek, Camp Creek, and the Salmon River.

Columbia Dusky Snail (*Lyogyrus n. sp. I*) USFS Listed Sensitive

This species of aquatic mollusks has a very sporadic distribution in the central and eastern Columbia Gorge, Washington, and Oregon. Known sites on the Mt. Hood National Forest occur in Clackamas, Multnomah, and Hood River counties.

This species occurs in cold, well oxygenated springs and spring outflows on soft substrates in shallow, slow-flowing areas where it appears to feed on decaying organic particles. It prefers areas without macrophytes (macroscopic emergent and submerged aquatic plants), but may also occur in areas with watercress and water hemlock.

Potential habitat for the Columbia Dusky Snail occurs in the Action Area.

Based on habitat definitions for this species *Lyogyrus* is expected to occur within the HAA of Still Creek, Camp Creek, and the Salmon River.

VIII. EFFECTS OF THE ALTERNATIVES

Direct Effects

No direct effect to PETS Listed aquatic species would occur as no work is proposed within stream channels under any of the Action Alternative where PETS listed fish or mollusks are present.

Indirect Effects

The effects of implementation of the proposed actions on PETS listed aquatic species are based on local populations of these species known to occur or suspected to occur within the Action Areas.

Indirect impacts to special status species may occur from through changes in sedimentation and flow, stream temperature, and/or riparian vegetation. Some of these impacts could be carried downstream and, in combination with natural and existing anthropogenic influences, could have an adverse effect and degrade stream conditions downstream.

The following sections discuss the effects to special status aquatic species, listed in Table 1, by each Action Alternative.

ALTERNATIVE 1

Under the no action alternative there would be trail construction. Changes from the current condition are not anticipated to peak or base streamflow timing, duration, or magnitude, or water quality parameters of temperature and in-channel fine sediment and thus no effects to existing aquatic TES species.

ALTERNATIVES 2 AND 3

Below are brief descriptions of environmental impacts to parameters affecting aquatic TES species habitat (peak streamflows, base streamflows, sedimentation, stream temperatures, and wetland impacts). For a more detailed discussion of the effects of the proposed actions on these parameters, refer to the EA.

Peak Streamflows

Based on the processes that affect peak streamflows and the associated methodologies for analysis, effects are analyzed at the subwatershed and fifth-field watershed scale during a cumulative effects analysis

Base Streamflows

There are no direct effects anticipated to base streamflows because there are no water uses, impoundments or diversions associated with this project. Base streamflows can be influenced by the amount of disturbance to forest cover in a watershed so the potential effects of this project will be assessed in a base streamflow cumulative effects analysis.

Based on activities associated with this project baseflows are predicted to increase from 0 to 0.2%. This is an extremely slight increase and most likely would not be detectable.

Stream Temperatures

In the Camp Creek Subwatershed activities within 100 feet of perennial streams under alternatives II and III include 5 stream crossings that would remove approximately 100 feet of stream shade, and approximately 750 feet of trail construction between 75 and 100 feet away from a perennial tributary to Camp Creek.

Three of the stream crossings with bridges are associated with the Camp Creek Trail. The streams in this area are narrow (approximately 3 to 4 feet wide wetted perimeter during summer low flows) with a shade layer provided by the shrubs in this area. The stands in this area are dense mid seral stands with 90-100% canopy closure. The streams in this area flow from north to south so the overstory shade will be removed on the east and west side of the stream and not the critical south side where the solar radiation is the strongest.

The openings adjacent to the stream are narrow (20 feet) with mature vegetation remaining outside the cleared corridor that will provide stream shade. In addition streams in this area are fed by groundwater with stream temperatures estimated around 5⁰C². Based on the factors listed there are no water temperature impacts anticipated associated with these 3 stream crossings.

The construction and clearing of approximately 750 feet of trail associated with the Camp Creek Trail is 75 to 100 feet away from the stream. As with the bridge crossings the stream in this area is narrow with shrubs providing a layer of shade. The trees and shrubs between the trail clearing and the stream are dense mid seral stands with 90 to 100 percent canopy closure and will remain intact. Also as with the bridge crossings, streams in this area fed by groundwater with temperatures estimated around 5⁰C. Based on these factors there are no impacts anticipated to stream temperature associated with the trail clearing.

There are two bridge crossings on Camp Creek associated with the West Summit Fen Trail. In this area the stream is running east to west and the creek is about 11 feet wide (based on the 1994 stream survey) so the stream is not completely shaded by shrubs. The vegetation in this area is classified as late successional with associated large trees with large canopies. Due to the approach of this trail at the northern most bridge a 40 wide area will be cleared adjacent to the stream on the north side and 20 wide area on the south side. On the southern most bridge 20 feet will be cleared on either side of the bridge. Stream temperature in this area is estimated at about 8⁰C. Due to the limited area that is being cleared and the late successional vegetation in the area it is assumed that there will be little change in the amount of shade provided for Camp Creek so there will be no impacts anticipated to stream temperature.

There is one stream crossing with an associated bridge in the West and East Fork Salmon River Subwatershed on an unnamed tributary to Salmon River. The vegetation in this area is large conifers with approximately 85% canopy closure. The stream in this area is approximately 6 feet wide. This trail is planned for bikes and hikers so there are no plans to cut any overstory vegetation to place the bridge. Based on fact that no overstory vegetation will be cut there are no impacts anticipated to stream shade.

WEPP Sediment Yield

Based on the sediment yield models, there will be 200 pounds of sediment delivered to Camp Creek per year (5 stream crossings and West Summit Fen cut and fill slope) and 32 pounds per year delivered to the Salmon River (one stream crossing). For visualization purposes 200 pounds of sediment is equivalent to an area of 3 cubic feet.

Wetland Impacts

There are 575 feet of trail construction and 0.2 acres of clearing planning in wetlands under Alternatives 2 and 3. The Mt Hood LRMP gives direction that: Special aquatic habitat (e.g. alcoves, secondary and overflow channels, ponds and wetlands) and associated subsurface aquatic habitat (hyporheic zone) shall be maintained in a natural condition or enhanced in both quality and quantity (FW-104).

Special design criteria and associated best management practices that require trails within wetland areas to be constructed on puncheon structure or turnpike to minimize impacts to the wetlands will be implemented. Trails will be designed to avoid wet areas when possible and to minimize the amount of overstory vegetation to be cleared in wetland areas.

Individual Trail Impacts

Multipor Mt Trail

This trail, located in the Still creek subbasin, is a 0.64 mile hiking trail that branches off the existing East Summit trail and ascends the east side of Multipor Mountain. There are no stream crossings for this trail and the trail does not traverse through any riparian reserves. No tree/vegetation clearing will occur. Even though trail construction will occur on steep mountain terrain, there is no potential for any created sedimentation to reach stream channels due to relatively small disturbance of the created trail and the distance of over ¼ mile from the Still creek channel. Based on this and expected effects to stream temperatures, flows, and sedimentation discussed above, construction of this trail is expected to have *No Effect/No Impact* on TES listed aquatic species in Still Creek.

West Blossom Connector/Crosstown Thunderhead Tie:

This trail complex, located in the Camp Creek subbasin, is a 0.66 mile bike/XC ski/hiking trail located between Government Camp and Enid Lake. There are no stream crossings for this trail. The south terminus of the trail will end at the Government Camp loop road, within the riparian reserve of the northernmost fork of Camp Creek. Even though a small portion of this trail will occur within a riparian reserve, any potential effects due to clearing will be negated by the presence of the Government Camp loop road which lies between the trail terminus and the Camp Creek fork. Trail clearing near the Loop road has the potential to create sedimentation which could run into the Loop road ditchline. However the ditch will not connect to Camp Creek. Thus, the small amounts of sedimentation that could be generated will be of short duration and is not expected to reach any stream channels. Based on this and expected effects to stream temperatures, flows, and sedimentation discussed above, construction of this trail is expected to have ***No Effect/No Impact*** on TES listed aquatic species in Camp Creek

East Summit Trail Extension

This trail, located in the Camp Creek subbasin, is a 0.08 mile bike/XC ski/hiking trail is located south of Hwy 26 where the east end of the Government Camp Loop joins the highway. There are no stream crossings for this trail and the trail does not traverse through any riparian reserves. The nearest stream/water body is over ½ mile away (Multipor Fen).

The small amounts of sedimentation that could be generated by construction of this trail will be of short duration and will not reach any stream channels. Based on this and expected effects to stream temperatures, flows, and sedimentation discussed above, construction of this trail is expected to have ***No Effect/No Impact*** on TES listed aquatic species in Camp Creek

Barlow Tie

This trail, located in the Still Creek subbasin, is a 0.13 mile bike/XC ski/hiking trail below Multipor mountain on the northeast side. Located on relatively flat terrain, this trail does not pass through any riparian reserves. Still Creek is located over 1/8 mile away. The small amounts of sedimentation that could be generated by construction of this trail would be of short duration and would not reach any stream channels because of the large distances to any stream channels. Based on this and expected effects to stream temperatures, flows, and sedimentation discussed above, construction of this trail is expected to have ***No Effect/No Impact*** on TES listed aquatic species in Still Creek.

Gentle Glade Trail

This 5.5 mile long trail will not pass through any riparian reserves. No stream crossings or wet areas exist in this trail project area. The small amounts of sedimentation that could be generated by construction of this trail would be of short duration and would not reach any stream channels because of the large distances to any stream channels. Construction of this trail is expected to have ***No Effect/No Impact*** on TES listed aquatic species.

West Summit Fen project #2.19

This proposed trail crosses upper Camp Creek in two places, downstream of the Multipor Fen. Two bridges are needed for the project. .

There are two wet areas that will likely need construction of turnpike (a raised elevated section of trail between curb logs approximately 36" wide. This is located directly south of the south bridge. Distance to stream channel is approximately 50 feet on a 15% slope. Predominant drainage is perpendicular to the creek. Use of a turnpike will prevent erosion and mobilization of sediments.

Another area is located on relatively flat terrain where the trail heads west from the bottom of the Multipor chair, approximately 125 feet from the Fen. Water does not drain from this area. Use of puncheons or turnpikes will prevent erosion and sedimentation..

1st Stream Crossing:

This tributary contributes approximately 25% of the flow to Camp Creek (USFS 1994). A September 21, 2004 survey found 12' bankful widths with fines and gravels.

2nd Stream crossing:

This tributary contributes approximately 40% of the flow (USFS 1994). Bankful widths are to 10 feet, depths to 2 feet. Aquatic vegetation prevalent, and the old bridge with footer logs in channel creating habitat. Left bank looking upstream shows some bank instability due to existing bridge (ZZRD September 21, 2004 survey). The 29' south bridge is proposed to be in the same location as an existing partially fallen bridge from the old ski race course.

A barrier to anadromous fish passage exists at RM 5.75 (Yocum Falls), approximately 1.25 miles downstream of the crossings (approximately RM 7.2). Stream gradient downstream of the proposed crossing is approximately 3% for the next 0.5 miles to Rm 6.7 with in a Rosgen B3 channel type. From RM 6.7 to 4.8, gradient averages 7% and Rosgen A3 channel type. Below RM 4.8, the creek gradient shallows to 4% from RM 4.5-4.8 in a Rosgen C3b channel type. The closest identified depositional zone is below the steep gradient downstream of RM 6.7 where Yocum Falls is located. However, the upper reaches of Camp Creek below the bridge site (RM 7.2 to 6.7) has likely shallow enough gradients that deposition of sediments may occur, especially during low flow seasons.

Given the relatively small amounts of ground disturbance near the creek, construction planned for the dry season, the full-spanning bridge design (no midstream spans), restriction of disturbance to above the 100year floodplain, disturbance restricted to being well back from the active channel, restriction of equipment away from the creek, the use of sediment fencing and BMP's, and the low-level of disturbance associated with use of hiking/skiing trails, the construction and use of the bridge and trail is expected to result in little sedimentation reaching the creek. If any sedimentation did reach the creek, it would be expected to be small in amounts and short in duration.

Based on this and expected effects to stream temperatures, flows, and sedimentation discussed above, construction of this trail is expected to have *No Effect/No Impact* on TES listed aquatic species in Camp Creek

Camp Creek Trail

Project Area: Trail junctions from the Alpine Ski Trail just above the Summit Ski Area. Trail would be approximately one mile in length. The first quarter mile is located on an old cross country ski trail route developed by Summit Ski Area.

There are 3 stream crossings on this trail. Each crossing would require a bridge between 25 and 29 feet in length. Stream channel types in these areas are Rosgen A4 with bankfull widths to 4' and depths to 1 foot.

One area on the Camp Creek trail has been identified that exceeds 25% and will need grading to allow for use of a winter trail groomer. This section is approximately 250 feet in length and will require excavation for a balanced construction bench. A total of 375 yds of material will be redistributed to create this section of trail. The affected area of disturbed and or filled ground would encompass a little less than ¼ acre (33'x250' = 8300sf total area).

Given the relatively small amounts of ground disturbance near the creek, construction planned for the dry season, the full-spanning bridge design (no midstream spans), restricting disturbance to above the 100year floodplain and well back from the active channel, restriction of equipment away from the creek, the use of sediment fencing and BMP's, and the low-level of disturbance associated with use of hiking/skiing trails, the construction and use of the bridge and trail is expected to result in little sedimentation reaching the creek. If any sedimentation did reach the creek, it would be expected to be small in amounts and short in duration.

Based on this and expected effects to stream temperatures, flows, and sedimentation discussed above, construction of this trail is expected to have *No Effect/No Impact* on TES listed aquatic species in Camp Creek

2.23 Airstrip to Trillium Trail

There is one creek crossing (the only wet area for this trail) that will need a bridge. The creek (identified as Tributary 80 in the Salmon River Stream Survey (2001) intersects the Salmon River at Red Top Meadows, at RM 29.8 and contributes approximately 15% of the flow to the Salmon River at this point and has an approximately 2% gradient at its mouth (USFS 2001).

The bridge will be 10 feet in length with a 4' wide (30" tread with 9" on each side for curbs) decked bridge with round curbs and 4' above the 100 year floodplain.

Given the relatively small amounts of ground disturbance near the creek, construction planned for the dry season, the full-spanning bridge design (no midstream spans), restricting disturbance to above the 100year floodplain and well back from the active channel, restriction of equipment away from the creek, the use of sediment fencing and BMP's, and the low-level of disturbance associated with use of hiking/skiing trails, the construction and use of the bridge and trail is

expected to result in little sedimentation reaching the creek. If any sedimentation did reach the creek, it would be expected to be small in amounts and short in duration.

Based on this and expected effects to stream temperatures, flows, and sedimentation discussed above, construction of this trail is expected to have *No Effect/No Impact* on TES listed aquatic species in the Salmon River drainage

Optimator Multipor trail

This trail will not pass through any riparian reserves. No stream crossings or wet areas exist in this trail project area. The small amounts of sedimentation that could be generated by construction of this trail would be of short duration and would not reach any stream channels because of the large distances to any stream channels (Still Creek is over ¼ mile away). Construction of this trail is expected to have *No Effect/No Impact* on TES listed aquatic species.

Existing Trail Upgrades

Because the proposed trail upgrades are limited in scope, occur on previously disturbed areas, and BMP's and design criteria will limit or prevent adverse shading effects, loss of large woody debris recruitment, or sedimentation into streams, the proposed existing trail upgrades are expected to have *No Effect/No Impact* on TES listed aquatic species.

Trailhead Parking

Because the proposed parking lot paving occurs greater than 200 feet from any stream, will occur on an existing road prism, no new ground disturbance is proposed, and BMP's will be employed, the proposed paving of the road prism is expected to have *No Effect/No Impact* on TES listed aquatic species.

ESA Cumulative Effects

ESA cumulative effects are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation [50 CFR section 402.02].

Two future projects, the Collins Lake Development and the Timberline Ski Area expansion (Timberline Express) are reasonably certain to occur in the future.

Timberline Express occurs in the Still Creek subwatershed and is not expected to contribute sediments to the Camp Creek subwatershed.

The Collins Lake Development comprises housing development in the upper Camp Creek subwatershed in the vicinity of Government Camp. The developers for this project have been issued a NPDES 1200-C Permit from the State of Oregon Department of Environmental Quality (DEQ) for controlling erosion and sediment and thus sedimentation into Camp Creek is not expected to occur.

Cumulative Effects Sediment Yield

Implementation of the Government Camp TIFF Trails project will be projected to increase sediment yield in the subwatershed by 0.5% and at the key depositional reach by 2%. Both of these increases are very small and are not expected to affect the beneficial uses in this area. For a more detailed discussion, see Sediment Yield discussion in EA.

X. CONCLUSION

Under Alternatives 2 and 3, the implementation of this project warrants a **"No Effect" (NE)** determination for Lower Columbia River steelhead, Lower Columbia Chinook, and Lower Columbia River/Southwest WA coho salmon because of low potential for adverse conditions of sedimentation, stream temperature, or flows to occur in areas where these species are known or suspected to occur.

Under Alternatives 2 and 3, the implementation of this project warrants a **"No Effect" (NE)** determination for and Columbia River Bull Trout because these fish are not expected to occur in the Upper Sandy River Basin.

A determination of **"No Impact" (NI)** is warranted for Redband trout and Columbia Dusky Snail under Alternative 2 and 3 because of the low potential for adverse conditions of sedimentation, stream temperature, or flows to occur in areas where these species are known or are suspected to occur.

XI. DESIGN CRITERIA

Design Criteria for all Action Alternatives

The design criteria identified below would be included in the site plans and construction plans, as appropriate. All design criteria would be approved by the USFS prior to authorization for construction.	
Geology and Soils	
GS1	In graded areas, topsoil would be carefully removed and stockpiled for placement onto the graded area. During construction, topsoil would be carefully stored using approved erosion and sediment control methods, as described in the construction plan (SWPCP) in order to avoid erosion. Soil would be covered to prevent erosion during inclement weather.
GS2	As specified in the construction plan (SWPCP), excess soil material from construction would be transported to a suitable upland site, approved by the USFS, so that it is stored outside of stream or ditch corridors, wetlands, and Riparian Reserves.
GS3	If flooding or weather results in detrimental erosion or sedimentation, operations would stop until the conditions improve.
GS4	Forest clearing in the proposed trail corridors would be reduced to the extent practical through careful trail layout during construction, the area of soil compaction would be reduced by limiting access by construction equipment and drainage structures for stormwater and erosion control would not divert water into these mapped Landslide Hazard Areas.
Watershed Resources	
WR1	Project-specific Stormwater Pollution Control Plans (SWPCP) would include additional erosion protection (such as two rows silt fence, straw bales and/or more permanent structures such as logs) to be provided between streams and construction areas close to stream channels.
WR2	A Spill Prevention and Response Plan would be developed and included in the SWPCP as part of the construction documents. Petroleum products would not be discharged into drainages or

Design Criteria for all Action Alternatives

	bodies of water. No fuels or construction machinery would be stored within Riparian Reserves.
WR3	Plant material and topsoil would be salvaged for use in revegetation in Riparian Reserves. Revegetation of disturbed areas of Riparian Reserves would emphasize the objectives of filtration of eroded soil material, stream bank stability and wildlife habitat.
WR4	Vegetation removal in wetlands and riparian vegetation zones will be conducted by hand/chainsaw. No ground-based heavy equipment would operate in wetlands. Trees may be felled away from wetland areas and removed by heavy equipment operating from uplands, provided that no disturbance to wetland or riparian soils occurs. The shrub layer, where present, would be maintained at a height of 5 feet above ground to provide thermal shading.
Fisheries	
F1	No access corridors, staging areas, spoils piles, or other construction-related materials would be staged or stored within Riparian Reserves. Whenever feasible, potential impacts to streams would be minimized by bringing construction materials and equipment to the project site during the snowpack.
Vegetation	
V1	The Revegetation Plan would include stabilization of exposed soils during construction operations, as well as disturbed sites on ski trails and other project sites.
V2	All mulch and seed mixes utilized in the area would be free of noxious weeds and other invasive nonnative plant species.
V3	When clearing of trees is required in wetlands or riparian vegetation zones, the shrub layer, where present, would be maintained at a height of 5 feet to provide shade for emergent wetland species.
V4	Clean heavy equipment either: A) prior to arrival on MHN land, to prevent the introduction of new noxious weed seed. The contract administrator or project activity coordinator would inspect all project equipment before it is allowed to operate at the project site. The equipment shall be free of soil clumps and vegetative matter or other debris that could contain or hold seeds. Cleaning of the equipment may include pressure washing and shall be done outside of the National Forest boundary.; or B) a self-contained heavy equipment cleaning station may be set up at the project site, for cleaning the equipment thoroughly in order to remove soil clumps and vegetative matter or other debris that could contain or hold weed seeds.

References

- USFS 1980. Stream survey report for Still Creek. Mt. Hood National Forest, Sandy, Oregon.
- USFS 1984. Stream survey report for Still Creek. Mt. Hood National Forest, Sandy, Oregon.
- USFS. 1990. Land and Resource Management Plan. Mt. Hood National Forest, Sandy, Oregon.
- USFS 1994. Stream survey report for Camp Creek. Mt. Hood National Forest, Sandy, Oregon.
- USFS. 1995. Zigzag Watershed Analysis. Mt. Hood National Forest, Sandy, Oregon.
- USFS. 1996. Stream survey report for Still Creek. Mt. Hood National Forest, Sandy, Oregon.
- USDA-Forest Service, Pacific Northwest Region. 1996. Upper Sandy Watershed Analysis. Mt. Hood National Forest. 1996.
- USFS. 2001. Stream survey report for the Salmon River. Mt. Hood National Forest, Sandy, Oregon.
- USFS. 2004. Still Creek and Clear Fork smolt trap report, 2004. Zigzag Ranger District, unpublished data, Zigzag, Oregon.