

**KIWANIS CAMP IMPROVEMENTS FINAL DRAFT BIOLOGICAL ASSESSMENT**

**Prepared by Turnstone Environmental Consultants Inc**

**January 22, 2003**

**Mt. Hood Kiwanis Camp**

**Documentation for Environmental Baseline and Effects  
of Preferred Action(s) on Relevant Indicators**

**This Biological Assessment Addresses the Following Listed, Proposed, or Candidate Fish Species:**

<b>Lower Columbia River steelhead (<i>Oncorhynchus mykiss</i>)</b>	<b>LAA</b>
<b>Columbia River bull trout (<i>Salvelinus confluentus</i>)</b>	<b>NE</b>
<b>Columbia River chinook salmon</b>	<b>NE</b>
<b>Columbia River chum salmon</b>	<b>NE</b>
<b>Lower Columbia River/Southwest Washington coho salmon (<i>Oncorhynchus kisutch</i>)</b>	<b>LAA</b>

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**Date: January 22, 2003**

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## Introduction

This Biological Assessment (BA) has been prepared in compliance with Section 7c of the Endangered Species Act (ESA) of 1973, as amended. Section 7 of the ESA assures that through consultation (or conferencing for proposed species) with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS), federal actions do not jeopardize the continued existence of any threatened, endangered, or proposed species, or result in the destruction or adverse modification of designated Critical Habitat.

The purpose of this BA is to describe and analyze the impacts of the Mt. Hood Kiwanis Camp Improvements on any fish species listed as endangered, threatened, proposed, or candidate for listing under the ESA. Lower Columbia River steelhead (*Oncorhynchus mykiss*) are known to reside in Little ZigZag River. Historically, Lower Columbia River/Southwest Washington coho salmon may have used Little ZigZag River (pers. comm. Forest Service fish biologist Duane Bishop/). There is no substantiated evidence of Columbia River (CR) bull trout (*Salvelinus confluentus*) in the Upper Sandy River watershed.

### Threatened Species, National Marine Fisheries Service (NMFS)

Lower Columbia River (LCR) steelhead trout, listed in the Federal Register on March 19, 1998. Vol. 63, No. 53, pg. 13347 are present throughout the Upper Sandy River watershed. Approximately 54 miles of habitat has been confirmed within the watershed, with 20 additional miles of habitat believed to support steelhead, with approximately 0.1 miles identified in the project area.

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Lower Columbia River spring chinook salmon, listed in the Federal Register on March, 24, 1999, Vol. 64, No. 56, pg. 14308, utilize portions of the Upper Sandy River watershed with an estimated 27 miles of known or suspected habitat. There is no evidence of historic or present utilization of Little ZigZag River.

Lower Columbia River fall chinook salmon, listed in the Federal Register on March, 24, 1999, Vol. 64, No. 56, pg. 14308, were historically found, and are suspected to be re-establishing within the Upper Sandy River watershed. The Sandy stock has expanded its range from the lower basin above Marmot Dam into the Salmon and Zigzag River subwatersheds (located just downstream from the Upper Sandy River watershed).

Chinook carcass scale samples from the Upper Sandy are being analyzed by Oregon Department of Fish and Wildlife (ODFW) for confirmation of LCR fall chinook. (Samples collected from Lost and Clear Fork creeks, per. comm. with B. Lindsey, ODFW 1999). No proposed activities are within suspected LCR fall chinook habitat.

Lower Columbia River chum salmon, listed in the Federal Register on March, 25, 1999, Vol. 64, No. 57, Pg. 14508, appear to utilize the lowest reaches of the mainstem Sandy River and its tributaries (Beaver Creek), but there is no evidence of historic or present utilization of the Upper Sandy and Zigzag River watersheds.

### Candidate Species (NMFS)

Lower Columbia River coho salmon, listed in the Federal Register on July 25, 1995, Vol. 60, No. 142, Pg 14308, are present within the Upper Sandy River watershed, with an estimated 56 miles of known or suspected habitat. Current coho salmon distribution occurs in the ZigZag River, Still Creek, and Camp Creek. Historically, Lower Columbia River/Southwest Washington coho salmon may have used Little ZigZag River (pers. comm. Forest Service fish biologist Duane Bishop).

### Threatened Species (US Fish and Wildlife Service [USF&WS])

There is no substantiated evidence of Columbia River (CR) bull trout, listed in the Federal Register on June 10, 1998, Vol. 63, No. 111, Pg. 31647, populations currently inhabiting the Upper Sandy River watershed. While data is lacking regarding historical or current presence/absence of bull trout, the Upper Sandy River Watershed does apparently contain limited suitable habitat for bull trout. The Sandy river basin does not contain any proposed bull trout critical habitat areas as recently announced by the Fish and Wildlife Service [Federal Register: November 29, 2002 (Volume 67, Number 230)]

## **Background Information**

The Mt. Hood Kiwanis Camp is located along the banks of the Little ZigZag River on Mt. Hood National Forest lands. The little ZigZag River is not designated as a key watershed. The camp operates under a special use permit administered by the U.S. Forest Service providing outdoor experiences to children and adults with disabilities. Access to the camp is via two stream crossings, one that is used as the main entrance and another that provides access to a ropes-style course. In 2001, Kiwanis Camp began the Biological Assessment – 2003 Kiwanis Camp Improvements

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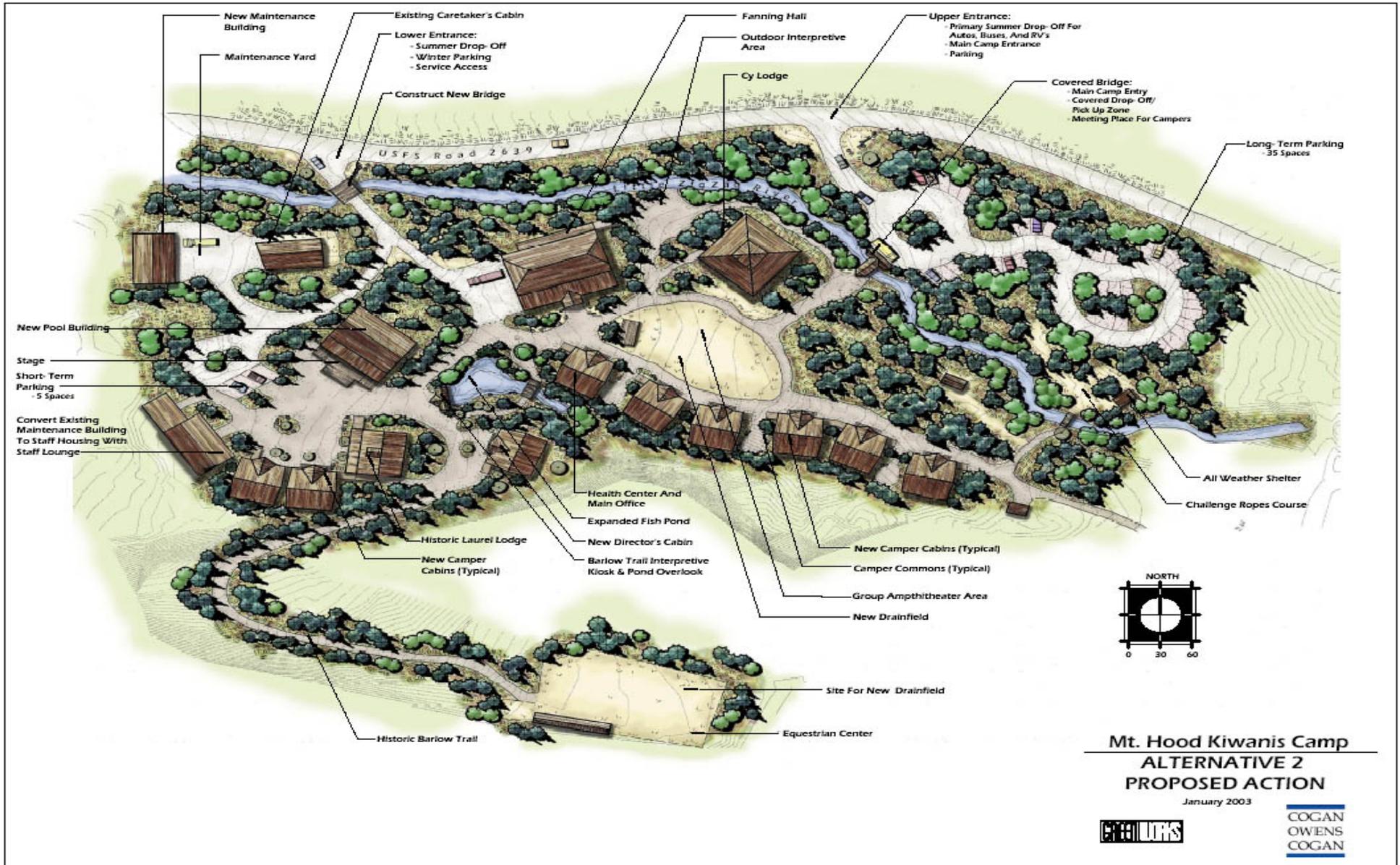
NEPA process for their facility to amend their original 1979 master plan for the facility to update and construct new buildings, an indoor pool, a covered shelter in the camp's rope course area, a campfire assembly area/amphitheater, a sewage treatment facility, an interpretive kiosk, a new parking area, a new bridge entry, an increase in the size of the existing fish pond, a maintenance yard, and rehabilitation of streambanks and other disturbed areas with native vegetation. As part of that process they tentatively agreed to analyze and possibly replace the culverts at the two stream crossings within the camp that currently block fish passage. Subsequently, the USFS has identified replacement of these two culverts as part of a Forest-wide culvert-replacement, with the Kiwanis culverts ranked high on the list of proposed individual replacement projects. Funding for replacement most likely would be a partnership effort between the Kiwanis Camp, the USFS and the Sandy River Basin Watershed Partners. Replacement of both of these culverts to provide volitional passage to resident and anadromous fish is considered a high Forest priority. A NEPA analysis for the replacement of these two culverts and in-stream habitat restoration is being completed by the Forest Service and these projects will be covered under programmatic consultations.

In summer, 2000, the Forest Service replaced a concrete box culvert at the mouth of the Little ZigZag River. Before that time this structure was a velocity barrier to any fish that wanted to pass upstream of the mouth into the Little ZigZag River. Fish currently have access to west of the existing culvert at the main entrance of the Kiwanis Camp, which includes the section of the Little ZigZag River within the westernmost portion of the camp -- approximately 0.1 miles of stream, or about 10% of the length of the portion of the river running through the camp.

Two Kiwanis Camp culverts are located at river mile (RM) 0.45 and 0.6, respectively, within the Kiwanis Camp special use permit area. The (RM) 0.45 culvert is a barrier to juvenile fish passage. The (RM) 0.6 culvert is a barrier to juvenile and adult fish passage. There are approximately 0.65 miles of available habitat upstream of the uppermost crossing. Little ZigZag River falls, at RM 1.25, is the uppermost limit of potential anadromous fish movement (assuming removal of the culverts at miles 0.45 and 0.6). Fish that use the river include cutthroat trout and winter steelhead. Replacing both culverts crossings would provide access to a total of 0.65 miles of habitat. The culvert replacement project is being coordinated by the US Forest Service and analyzed under a separate Environmental Assessment. Therefore, potential effects are not analyzed as part of this BA, though they are discussed under the cumulative effects section.

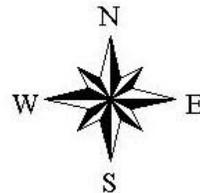
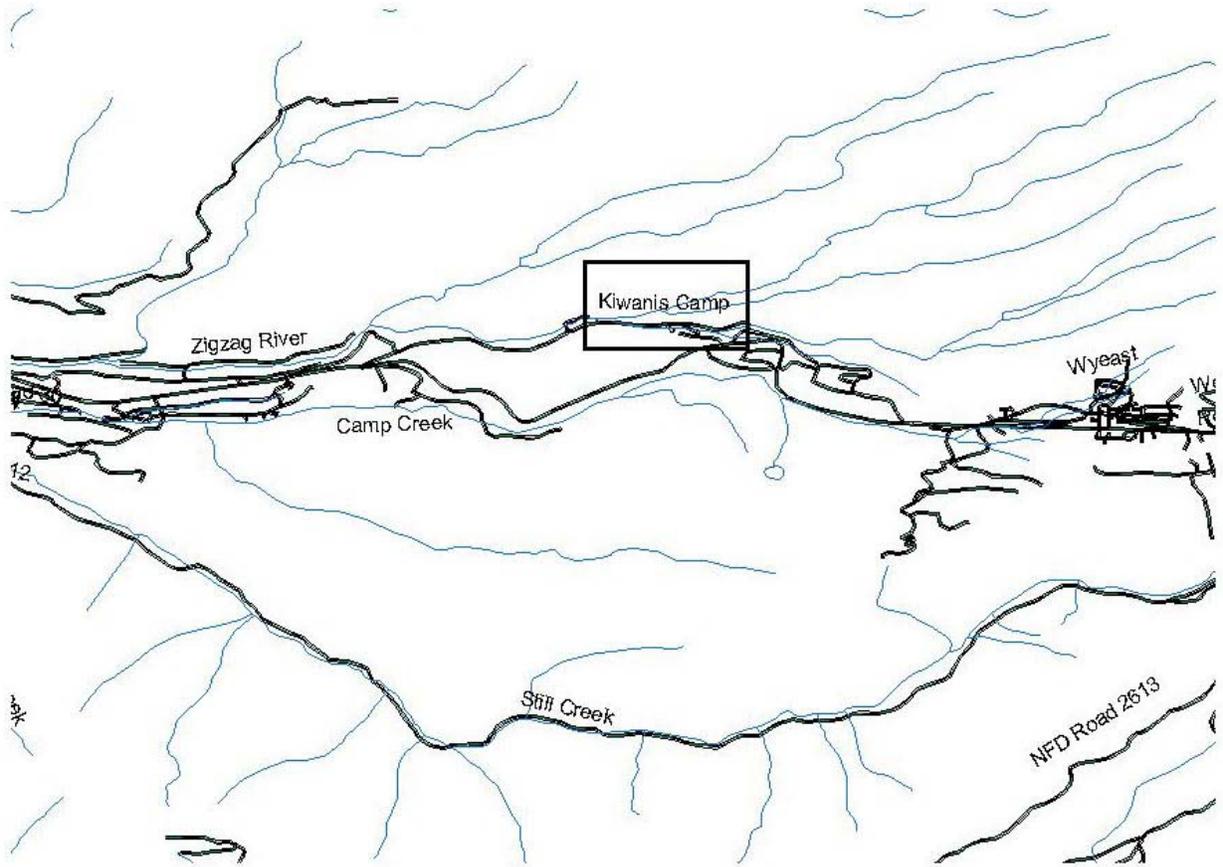
Fish surveys were conducted by Turnstone Environmental Consultants in 2002 in accordance with the NOAA Fisheries/ODFW Protocol for Upper Limits Sampling. A snorkeling survey was conducted from the confluence of the North Fork Little ZigZag River and extending 30 meters past the falls on the ZigZag River. The site was snorkeled on a one-day visit (08/02/02). Eleven pools were snorkeled along a 1.3-mile length of stream. No fish were detected. The pools tended to be small lateral scour, often barely meeting the minimum requirement for survey, with little cover for juveniles and poor spawning habitat noted throughout the survey area for adult salmonids (Miranda, R and Jensen, B). Little ZigZag River meets minimum habitat requirements for salmonid species such as steelhead or cutthroat trout based on historical records and stream survey information.

Vicinity and Fish Distribution



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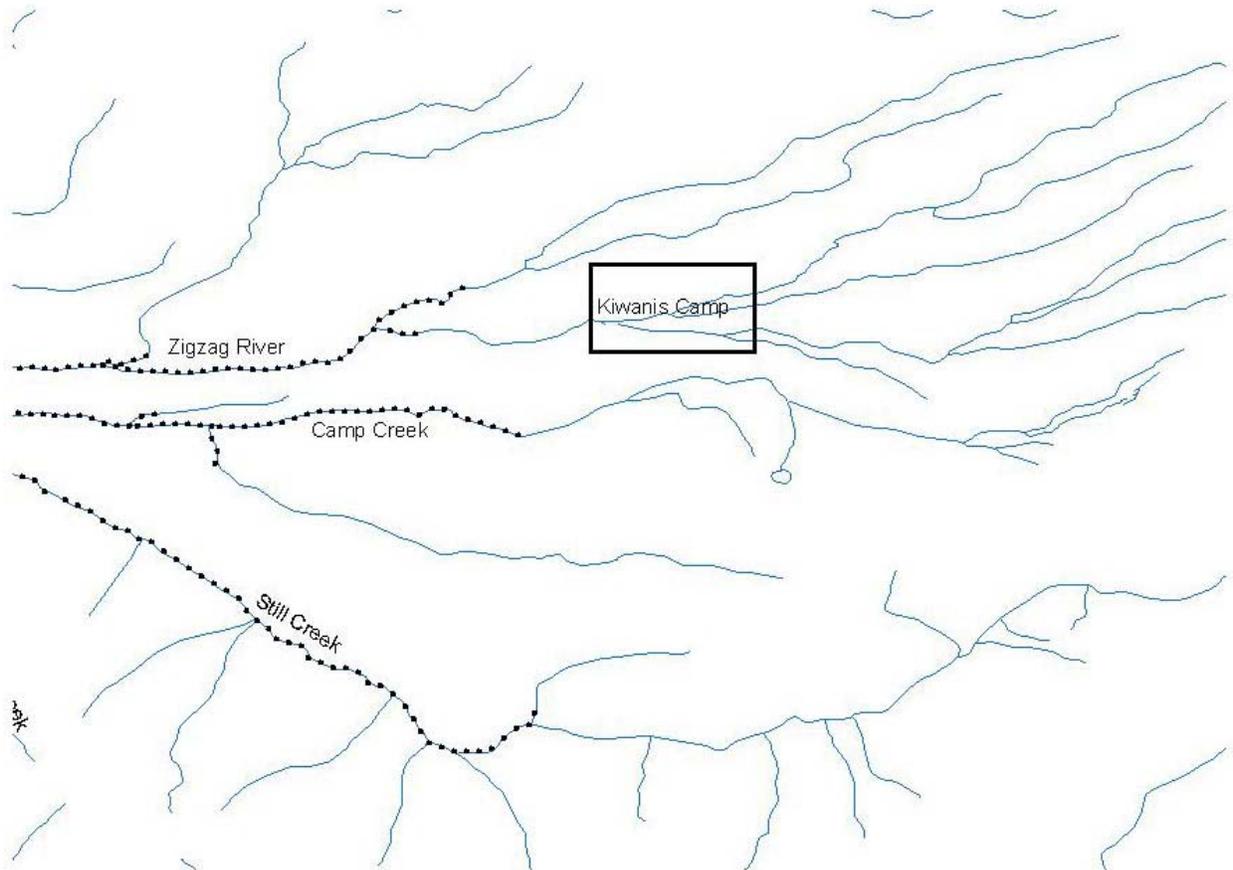
Kiwanis Camp Improvement Project  
Vicinity Map (Inset Frame)  
Mt. Hood Ranger District  
Mt. Hood National Forest



Source: Turnstone Environmental Consultants Inc. GIS Lab

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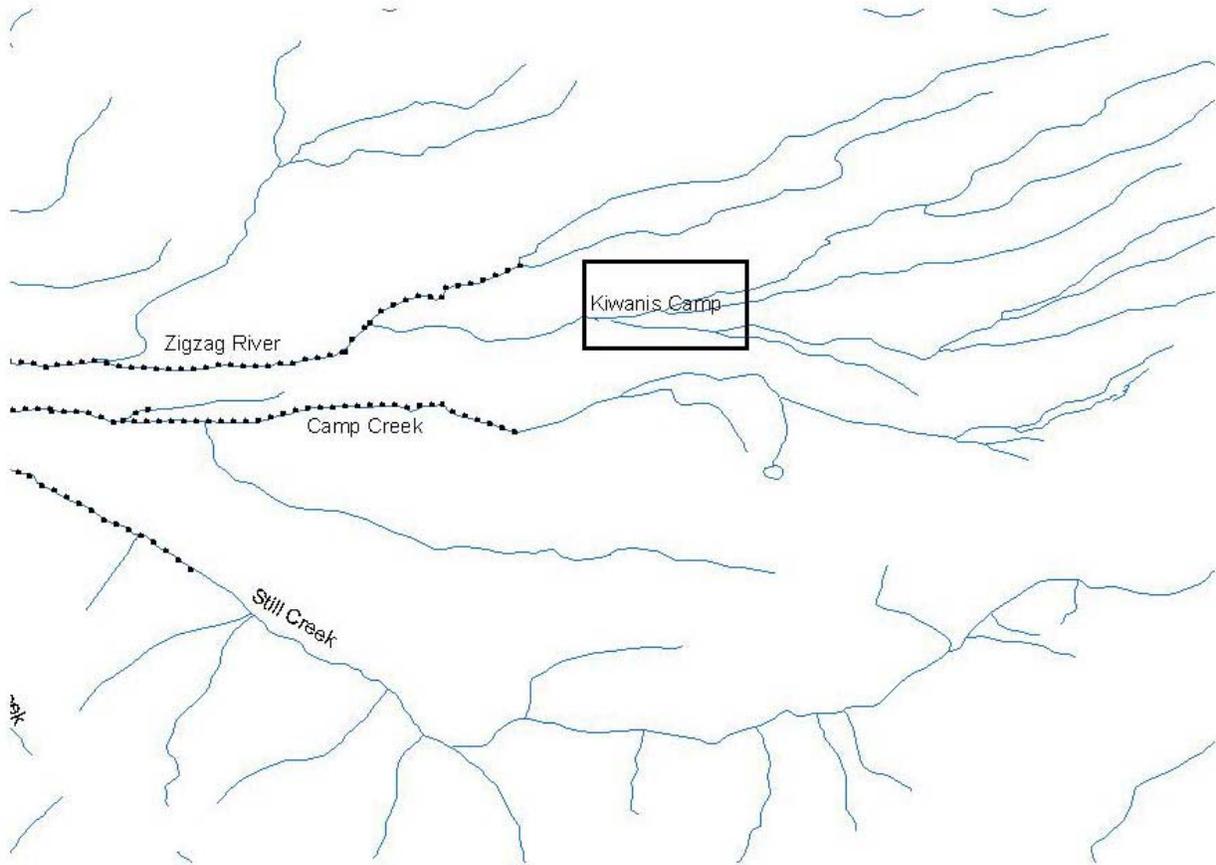
Kiwanis Camp Improvement Project  
Steelhead Distribution  
Mt. Hood Ranger District  
Mt. Hood National Forest



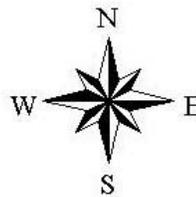
Source: USDA Forest Service, Pacific Northwest Region, Mt. Hood National Forest. 1995 (WA) ZigZag Watershed Analysis.

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Coho Distribution  
Mt. Hood Ranger District  
Mt. Hood National Forest



 **Coho Distribution  
Streams**



Source: USDA Forest Service, Pacific Northwest Region, Mt. Hood National Forest. 1995 (WA) ZigZag Watershed Analysis.

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### **Proposed Action**

This proposed action would replace the current master plan authorized by the Mt. Hood National Forest in 1979 with a new master plan. A new 30-year Special Use permit would be issued to the Mt. Hood Kiwanis Camp for exclusive use and occupancy of the project area. The proposed action includes a variety of improvements proposed to improve facilities and services for campers, including complying with the Americans with Disabilities Act and other special requirements; enhance the natural environment; improve transportation circulation and access; provide additional recreational activities; and maintain the historic character of the Kiwanis Camp. The proposed action would include the construction of a number of new facilities and the modification of several existing facilities.

### New Facilities

The proposed action would entail the following new site-specific improvements to the existing camp.

- **Seven new camper cabins and a director's cabin.** These cabins would replace all existing camper housing. Cabins would be approximately 1,300 square feet in size. They would meet ADA accessibility requirements and space and other needs of special needs populations at the camp. Two cabins would be sited in the location of the existing Hemlock dorm, which would be demolished. The remaining cabins would be located along the southeastern edge of the camp. Architectural design would be consistent with the character of historic structures at the camp. A new director's cabin would replace the existing "front" and "back" cabins which currently are dilapidated and do not meet the space or other needs of the camp. It would be similar in size and architectural design to the new camper cabins. The total new built area of the cabins would be approximately 7,800 square feet. This does not include the two cabins which would replace the Hemlock dorm with an equivalent amount of square footage. In addition, three unpaved common areas, totaling approximately 1,000 square feet would be created. Native vegetation would be removed from this area as part of the construction. Native vegetation consists of relatively small (second-growth) trees and shrubs such as rhododendron, salal and other species common to this area. Table 2 (see page 14) summarizes the approximate number and size of trees to be removed in concert with construction of these and other improvements.
- **Health care center/office building.** This building would be approximately 1,300 square feet in size and would include the camp office and a nurse's station for campers and staff. It would be located just east of the existing pond and south of Fanning Hall. The exterior would be similar in design and appearance to the new camper cabins.
- **Covered shelter in the camp's ropes course area.** This relatively small, open-air structure would be located at the east end of the ropes course and would be approximately 300 - 500 square feet in size. It would protect campers from adverse weather conditions during use of the ropes course area.
- **Campfire assembly area/amphitheater.** This would be located in the open space between the cluster of buildings formed by Laurel Lodge, the proposed new pool building, new camper cabins and new staff housing. The entrance to the new pool building would be used as a stage and focal point for activities here.
- **Relocation and improvement of the Camp's swimming pool.** A new enclosed and sealed pool building would replace the existing outdoor pool in a similar location, north of Laurel Lodge. It would contain a swimming pool and restroom facilities and could be used year-round. It would be approximately 6,400 square feet in size, including an outdoor, covered porch/stage. The pool would be

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drained infrequently. Prior to draining, the chlorine in the water would be neutralized. The pool would be drained into the soil at a sufficient distance and in a such a manner as to ensure that the water would not flow directly into the Little ZigZag River. Alternatively, if necessary and required by the camp's special use permit, the water could be drained to the camp's wastewater treatment system.

- **New maintenance building.** A new maintenance building would be constructed and located approximately 60 feet south of the Little Zigzag River, near the existing maintenance yard. The maintenance building would be used primarily to store equipment and supplies. No maintenance of motor vehicles would occur in or adjacent to this building. It would be approximately 2,400 square feet in size. The vegetative buffer between the building and Little Zigzag River would be expanded and enhanced for a distance of approximately 100 feet along the stream and an increased buffer width of approximately 20 – 30 feet. This building would be sited to minimize tree and other vegetation removal.
- **New sewage treatment facility.** The existing septic drainfield for the camp would be reconstructed; contaminated materials from the existing system would be disposed of at an approved landfill. New drainfields would be constructed in the upper equestrian center and on a bench about 30 feet from the equestrian area (reserve drainfield). The existing amphitheater area would serve as a second reserve drainfield but would not be expected to be used within the life of the special use permit. The new septic system would treat wastewater to state and county standards and keep fecal contaminants from entering ZigZag Creek.
- **Barlow Road Interpretive Kiosk.** An interpretive sign or kiosk would be located at the base of the existing trace of the Old Barlow Trail to provide information about the historic use and development of the trail.
- **New parking area in the old Barlow campground.** Parking in this area would replace parking areas for staff and visitors adjacent to Laurel Lodge and reduce the need for overflow parking on the Mt. Hood Loop Highway. Access from this area would be provided by a covered foot bridge just east of Cy Lodge. This parking area would serve as the main drop-off, pickup and meeting area for campers and other visitors during the summer. Approximately 35 parking spaces would be provided. "Eco-paving" surfaces would be utilized to reduce compaction and runoff impacts. Eco-paving refers to the use of paving stones with holes or spaces between or within them to allow percolation of runoff through the ground, reducing runoff and sediment impacts on nearby waterways. They typically are placed over a crushed rock base, similar to construction practices for other roads and parking areas. In addition, bio-swales and other water detention and filtering methods would be constructed along the edge of the parking area closest to the Little ZigZag River to further reduce the impacts of runoff and sediment transport. Trees of over 12 inches that would need to be felled in this area to accommodate parking spaces would be left on site in the riparian area to minimize impacts on loss of large woody debris.

### *Existing Facilities Modified*

The proposed action would entail the following modifications to existing facilities at the Camp:

- **Conversion of existing maintenance building to staff housing and lounge.** The existing building would be renovated and reconfigured to provide space for staff to sleep and congregate. The building would accommodate approximately 15 to 20 staff and/or counselors overnight.

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- **Outdoor interpretive area.** An outdoor educational area would be provided near the Little Zigzag River. Features would include benches, accessible riverbank, erosion protection, and riparian revegetation. The new interpretive area would replace the entire existing interpretive trail which meanders along the southern fringe of the river at varying distances up to 20' from the bank, consolidating access to the riparian area in a smaller area to reduce watershed impacts. The current trail runs from the western bridge access to the east bridge adjacent to the rope course. No educational or other activities currently occur or would occur in the future inside the stream.
- **Reconstructed bridge entry.** The existing bridge at the camp's main entry would be replaced in concert with removal of the existing culvert at the main entrance to the camp as part of a separate US Forest Service action. In-stream work and related impacts would be evaluated in a separate EA conducted by the USFS for the culvert replacement. The reconstructed bridge at this location would enhance the entrance experience of campers, create a platform from which to view the river, and provide safe pedestrian access for campers at this location. The bridge would be designed to minimize sedimentation impacts.
- **Fish pond.** The pond would be increased in size by about 75 %, with a small pedestrian bridge added near its east end (see map for approximate location and size – about 1,500 - 2,000 square feet). Reconstruction efforts would retain existing measures to prevent fish from traveling between the pond and the Little Zigzag River. A fish barrier grate and screening would continue to be located at the outflow. Currently, water enters the fish pond through a small diameter pipe (2-4 inches) from the Little ZigZag River and drains back to the River through an underground pipe. The camp also would work with the US Forest Service to identify and implement appropriate measures to ensure that fish cannot enter the fish pond from the Little ZigZag River.
- **Maintenance Yard.** This area would be reduced in size somewhat to allow for location of the new maintenance building adjacent to the yard. Areas on the edge of the existing yard would be revegetated to improve the quality of potential plant and animal habitat areas near the Little Zigzag River.
- **Covered foot bridge.** The existing pedestrian bridge between the Old Barlow campground (proposed future parking area) and the main portion of the camp (between Cy Lodge and Fanning Hall) would be modified to include a covered structure. No in-stream work or tree removal is proposed as part of this improvement. Cedar or other materials would be utilized to minimize environmental impacts.

### *Other Actions*

- **Rehabilitation of stream banks and other disturbed areas with native vegetation.** Banks within the camp would be replanted with native vegetation. Approximately 1,000 linear feet along the stream banks would be replanted, with a varying buffer distance of 10 - 30 feet, as conditions allow, totaling about 20,000 in riparian areas. About 50,000 square feet of other existing disturbed areas also would be restored/replanted. These restoration efforts would be coordinated with Forest-wide efforts proposed to be undertaken by the US Forest Service.

The proposed action does not represent an expansion of the permit boundary, the current authorized capacity, or authorized uses. No amendment to the Mt. Hood National Forest Plan management direction,

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land allocations, or standards and guidelines are proposed.

Because the proposed action would include renewal of the camp's special use permit, there would be some interrelated and interdependent effects related to continued operation and maintenance of the camp. These would be expected to be limited to removal of hazard trees in riparian areas and impacts associated with camper activity in or near the Little ZigZag River. To minimize impacts associated with hazard tree removal, it is recommended that hazard trees of 12 inches in diameter or larger within 50 feet of the river be felled and remain or be placed within the riparian area to ensure they remain part of the large woody debris supply. Given the lack of history of flooding at the camp, trees farther than 50 feet from the river would not be expected to contribute to the supply of woody debris for the river. Impacts on fish related to camper activity in or near the stream are expected to be minimal for two reasons. First, the camp is primarily a facility for adults and children with disabilities that significantly limit their ability to access the river or affect fish in any other way (e.g., throwing rocks in the stream). Second no in-stream interpretive or educational activities currently take place or are planned in the future.

Table 2. Proposed Action Individual Component Size and Distance from Little ZigZag River

<i>Proposed Action</i>	<i>QTY.</i>	<i>Unit Size</i>	<i>Total Size SQ/FT</i>	<i>Approx. Distance From River</i>	<i># of Trees Removed</i>
Phase I Camper Cabins	6	1,300	7,800	90 - 260 feet	30-50 trees; 4 – 12" dia.; 15'-40' tall <sup>1</sup>
Phase II Camper Cabins	2	1,300	2,600	90 - 260 feet	
Hemlock Dormitory	1	-2,600	-2,600	320 feet	None
Pool Building	1	6,400	6,400	120 feet	None
Convert Maintenance Building *	1	4,300	4,300	260 feet	None
New Maintenance Building	1	2,400	2,400	60 feet	None
Directors Cabin	1	1,300	1,300	275 feet	2-3 trees/4" – 12" dia.
Fish Pond Enhancement *	1	2,500	2,500	190 feet	None
All Weather Shelter	1	300	300	20 feet	None
Covered Bridge	1	120	120	0 feet	None
New parking area	1	15,000	15,000	20 - 120 feet	5-10 trees/6"-18" dia./40'-60' tall
New commons areas	3	350	1,050	90 - 260 feet	12-18 trees; 4 – 12" dia.; 15'-40' tall
Restoration areas along streambanks	1	20,000	20,000	0 - 20 feet	NA
Restoration areas along streambanks	1	55,000	55,000	Variable	NA
<b>Total Impervious surface</b>			15,120		
<b>Total modified semi-permeable or permeable surface</b>			16,050		
<b>Total restored/revegetated area</b>			75,000		
* no additional impervious surface					

Notes

1. It is estimated that 6-10 trees would be removed for each camper cabin. Most trees are about 4" to 8" in diameter, with a few as large as 12" in diameter. Most are 15 - 25 feet tall, with a few as tall as 40 feet.

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### Minimization Measures

*BMPs*: Best Management Practices were used in the planning of this project. BMPs are the primary mechanism to enable the achievement of water quality standards to ensure compliance with; 1. The Clean Water Act of 1972, as amended (1977 and 1987); 2. Oregon Administrative Rules (OAR 340-41-001-975, Oregon Department of Environmental Quality (DEQ); and 3. The Memorandum of Understanding between the Oregon DEQ and the USDA, Forest Service.

BMPs are applied as a system of practices that are basically a preventative rather than an enforcement system. BMPs are a whole management and planning system in relation to sound water quality goals, including both broad policy and site-specific prescriptions. BMPs are designed to accommodate site-specific conditions. They are tailor made to account for the complexity and physical and biological variability of the natural environment. General BMPs are described in the document General Best Management Practices, USDA Forest Service, Pacific Northwest Region (11/88). BMPs are primarily based on and include various requirements as Forest Service Manual direction, timber sale contract provisions, environmental documents, Mt. Hood Forest Plan Standards and Guidelines, and the Northwest Forest Plan Standard and Guidelines which includes the Aquatic Conservation Strategy (ACS).

- **Erosion:** Most construction activities would take place during the dry period (between June 15 and October 31) to reduce the likelihood of surface erosion and sediment transport and reduce the intensity and duration of anticipated short-term turbidity increases. This restriction may be waived with the concurrence of a soil, watershed or fisheries specialist, if long periods of dry weather are anticipated and to allow for some construction to take place during non-peak camp usage (e.g., during April-June or early November). Standard erosion control practices to contain sediment runoff from disturbed areas. (“Sedi-mats”, mulch and seed, silt fences, and or erosion blankets or should be used in all perennial streams below project work sites where sediment delivery could occur.) The project area would be revegetated with native plant materials to help control erosion in the future. The objective is to have no detectable increase in sediment levels in-streams below the project area in both the short and long term.
- **Spill Prevention:** Currently, only a limited amount of fuels are used at the camp. Propane is used for cooking activities and stored in sealed containers. Small amounts of oil and diesel fuels are used and similarly stored in enclosed, sealed containers and dispensed with a hand pump. The only other chemicals stored at the camp are cleaning supplies stored in sealed containers indoors. No fuels are drained at the camp for purposes of vehicle maintenance or other activities. No additional fuel use or storage would be proposed in the future. If needed, a site specific Spill Prevention Control and Countermeasure Plan for project sites and staging areas would be developed.
- **Fertilizer Use:** Currently, no fertilizers are used at the camp and none are expected to be used in the future. Any future use would be coordinated with the ZigZag Ranger District and restricted or prohibited within 50 feet of the Little ZigZag River.

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- Aquatic Habitat Protection: Minimize the number of access points through the riparian areas by decommissioning and revegetating trails and disturbed areas. As noted previously, no in stream activities take place at the camp or are proposed in the future. Signage could be used to further reduce the potential for damaging vegetation in riparian areas.
- Grade parking areas and roads to reduce channelization and runoff into the Little ZigZag River.
- As described in the proposed action, use semi-permeable surfaces in new parking areas, in concert with bio-swales or other natural filtration and detention facilities, to avoid compaction and minimize effects of runoff.
- Target construction activities in previously disturbed area to avoid disturbing native vegetation and the need for tree removal.
- Cover excavated soil or other materials being transported in or out of the camp to avoid sediment transport impacts.
- Replace the existing pathway along the Little ZigZag River between Fanning Hall and Cy Lodge with a consolidated interpretive area (see proposed action).

### Effects of Project Implementation

The implementation of this project warrants a **"Likely to Adversely Affect" (LAA)** determination for Lower Columbia River steelhead and **"May Affect, Likely to Adversely Affect"** determination for Lower Columbia River/Southwest WA coho. Lower Columbia River steelhead (*Oncorhynchus mykiss*) are known to reside in Little ZigZag River. Historically, Lower Columbia River/Southwest Washington coho salmon may have used Little ZigZag River and their current range is up to the mouth of the Little ZigZag river (pers. comm. Forest Service fish biologist Duane Bishop). A **"No Effect" (NE)** determination is warranted for Columbia River chinook and Columbia River chum salmon because these species are not present nor were known to be present historically. **"No Effect" (NE)** determination also is warranted for Columbia River bull trout - this species has been extirpated from the Sandy River system. This project is not expected to have any long-term adverse effects on any listed, proposed, or candidate fish species, and riparian and aquatic habitats would benefit from riparian restoration in the long term.

The proposed actions **"May Not Adversely Affect"** Essential Fish Habitat as designated under the 1996 Amendment to the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Essential Fish Habitat (EFH) includes those waters and substrate necessary to ensure the production needed to support a long-term sustainable fishery (i.e., properly functioning habitat conditions necessary for the long-term survival of the species through the full range of environmental variation). EFH includes all streams, lakes, ponds, wetlands, and other water bodies currently, or historically, accessible to salmon in Washington, Oregon, Idaho, and California. Three salmonid species are identified under the MSA, Chinook salmon, coho salmon and Puget Sound pink salmon. Coho salmon may have historically occurred in Little ZigZag River.

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The ground disturbing activities associated with the proposed action have the potential to allow sediment to enter the stream channel from surface excavations and construction traffic causing a temporary reduction in water quality. Revegetating disturbed areas and BMP's (Best Management Practices) would minimize the risk of any channel impacts, including detrimental effects to water quality caused by sediments reaching the stream channels. No long-term water quality effects are foreseen and the overall condition of the inner riparian area will be enhanced over time as native vegetation is replanted in historically disturbed areas and areas disturbed during the construction phase of the proposed action.

### **Cumulative Effects**

Cumulative effects are defined as the effects of future state, local, or private activities that are reasonably foreseeable to occur in the Little ZigZag River watershed. Projects on federal lands are designed to be consistent with the Aquatic Conservation Strategy of the Northwest Forest Plan and Best Management Practices. Any short-term sedimentation associated with the proposed action when combined with all other sources would not likely result in harm to fish habitat or water quality because each project would contain mitigations to minimize or eliminate sources of erosion, and seasonal restrictions would be observed where appropriate to accomplish work during the dry season.

Cumulative actions likely to affect this area would include proposed actions on private lands along the Little ZigZag or major construction or maintenance projects for US Highway 26 in the vicinity of the Little ZigZag River. No such actions are planned or underway at this time.

### **Aggregated Federal Actions**

As part of a separate Forest-wide project undertaken by the U.S. Forest Service, culverts at the main camp entrance and the east end of the camp would be removed or replaced to remove existing velocity barriers to fish passage. Existing culverts and bridges would be replaced with a bridge or open bottom arch at each location. The proposal also calls for in-stream habitat restoration for the length of the stream through the Kiwanis Camp. This action is being assessed as part of a separate EA being prepared by the USFS. This project ultimately would result in creation of additional fish habitat with a beneficial long-term effect on fish populations.

### **Consistency with the Aquatic Conservation Strategy**

This work would improve conditions for all species listed above in the long term. All activities associated with this project are found to be consistent with the Aquatic Conservation Strategy (ACS) of the Northwest Forest Plan by maintaining or improving water quality and connectivity within the Upper Sandy River Watershed Management Unit.

Specifics on how the proposed action meets the nine ACS objectives:

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### **ACS Objective 1. Maintain or restore the distribution, diversity, and complexity of the watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.**

The proposed actions are designed to maintain and or increase the natural distribution, diversity and complexity on little ZigZag River by reducing present forest visitor activities within the riparian area and increasing the restored/repaid riparian area by 75,000 sq. ft.. Additionally, the proposed relocation of existing pathways farther from streambanks/riparian areas would further enhance the riparian areas. Thus, this project meets the intent of ACS Objective 1.

### **ACS Objective 2. Maintain or restore spatial and temporal connectivity within and between watersheds.**

Existing trails with exposed soils allow for an unconstrained pathway of sediment inputs into streams, which could hinder future spatial and temporal connectivity. The Proposed action would replace the existing interpretive trail along the river, consolidating access to the riparian area in a smaller area to reduce watershed impacts. Features would include benches, accessible riverbank, erosion protection, and riparian revegetation. Thus, this project meets the intent of ACS Objective 2, by improving large-scale connectivity.

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

The proposed action of creating the outdoor interpretive area and decommissioning the existing trail would restore the current physical integrity of the aquatic system, including shorelines, banks, and bottom configurations of Little ZigZag River. Banks within the camp would be replanted with native vegetation. Approximately 1,000 linear feet along the stream banks would be replanted, with a varying buffer distance of 10 - 30 feet, as conditions allow, totaling about 20,000 in riparian areas. About 50,000 square feet of other existing disturbed areas also would be restored/replanted. These restoration efforts would be coordinated with the Zigzag Ranger District. These actions meet the intent of ACS Objective 3.

### **ACS Objective 4. Maintain or restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems.**

Reducing and funneling forest visitor activities would maintain or reduce the risk of high levels of sediment inputs into the streams. "Eco-paving" surfaces (a porous and permeable pavement that allows water percolation) would be utilized to reduce compaction and runoff impacts. This would improve water quality on an incremental basis. These actions meet the intent of ACS Objective 4.

### **ACS Objective 5. Maintain or restore the sediment regime under which aquatic ecosystems evolved.**

The decommissioning/repair or improvement of trails would reduce the risk of future catastrophic mass sediment inputs, which could damage the physical integrity of the stream channel. "Eco-

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paving” surfaces would be utilized to reduce compaction and runoff impacts. Improvement of pedestrian trails is consistent with ACS Objective 5.

### **ACS Objective 6. Maintain or restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing.**

The proposed actions would maintain current in-stream flows sufficient to create and sustain riparian aquatic, and wetland habitats and to retain (restore) patterns of sediment, nutrient, and wood routing. These projects would help attain ACS Objective 6.

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

The proposed actions would partially restore the timing, variability and duration of floodplain inundation and water table elevation in meadows and wetlands. The proposed decommission of existing trails in the immediate riparian area should not alter or cut off flood plain access or water table elevation. These projects would help attain the ACS Objective 7.

### **ACS Objective 8. Maintain or restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.**

Reducing and funneling forest visitor pedestrian trails and revegetating the banks within the camp with native vegetation would maintain the current species composition and structural diversity of plant communities in riparian areas to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability. These projects would help attain the ACS Objective 8.

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

The proposed activities would restore habitat for native plants, macroinvertebrates, and vertebrates such as salamanders and frogs. This would occur by increasing the connectivity of vegetation within the riparian reserve and restoring/revegetating degraded areas. These projects would maintain or improve conditions pertaining to ACS Objective 9.

In the short term, there is a risk of small sediment introduction to stream reaches downstream of project areas through project operations. Minimization measures and Best Management Practices (BMPs) would limit the amounts of sediment input and longevity of the sediment inputs to the downstream reaches. Projects would reduce long term sediment inputs to the downstream reaches that have anadromous steelhead and salmon habitat.

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**Documentation of Effects Determination**

Table 3. Checklist for Documenting Environmental Baseline and Effects of Proposed Action(s) on Relevant Little ZigZag 6<sup>th</sup> field Watershed Indicators

Forest:	Mt. Hood National Forest	Ranger District:	ZigZag
ESUs:	Lower Columbia River steelhead, Lower Columbia River/Southwest Washington coho salmon,	Watershed:	Sandy River
Project:	Kiwanis Camp Improvements		

PATHWAYS: INDICATORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS		
	Properly Functioning <sup>1</sup>	At Risk <sup>1</sup>	Not Properly Functioning <sup>1</sup>	Restore <sup>2</sup>	Maintain <sup>2</sup>	Degrade <sup>2</sup>
<u>Water Quality:</u>						
Temperature(WA)	X				X	
Sediment(SS)		X			Watershed	Site
Chem. Contam. Nut(WA)	X				Watershed	Site
<u>Habitat Access: (SS)</u>						
Physical Barriers(SS)			X		X	
<u>Habitat Elements:</u>						
Substrate(SS)			X		X	
Large Woody Debris(SS)			X		X	
Pool Frequency(SS)			X		X	
Pool Quality(SS)			X		X	
Off-channel Habitat(SS)	X				X	
Refugia(SS)	X				Watershed	Site
<u>Channel Cond. &amp; Dyn</u>						
Width/Depth Ratio(SS)		X			X	
Streambank Condition(+)	X				X	
Floodplain Connectivity	No Data				X	
<u>Flow/Hydrology</u>						
Peak/Base Flows(SS)	X				X	
Drainage Network Incr.( +)		X			X	
<u>Watershed Conditions:</u>						
Road Dens. & Loc.( +)		X			Watershed	Site
Riparian Reserves(+)			X		Watershed	Site
Disturbance History	X				X	

<sup>1</sup>These three categories of function ("properly functioning," "at risk," and "not properly functioning") are defined for each indicator in the "Matrix of Factors and Indicators" table found in the document "Making Endangered Species Act Determinations of Effect for individual or Grouped Actions at the Watershed Scale" (National Marine Fisheries Service 1996).

<sup>2</sup>Effects are based on which way this project is likely to move the relevant indicator, but no change in baseline is expected.

<sup>3</sup> indicates potential short-term effects, with long-term restoration of the indicator.

(SS) Miranda, R. and Jensen, B. The 2000 Little Zigzag River Stream Survey Report USDA Forest Service, Pacific Northwest Region, Mt. Hood National Forest Zigzag Ranger District

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(WA) USDA Forest Service, Pacific Northwest Region, Mt. Hood National Forest. 1995 (WA) ZigZag Watershed Analysis

(+) Source: USDA Forest Service, Pacific Northwest Region, Mt. Hood National Forest. ZigZag River and Tributaries, Stream Restoration Project

### **Water Quality**

#### Temperature

##### *Environmental Baseline = **Properly Functioning***

Stream temperatures in the Little ZigZag River are well below the state standard of 14.4°C. This is based on both STORET data and water quality data from 1995. This range meets the state standard of <14.4°C and the NMFS criteria of 10 to 13.9° C.

##### *Effects of the actions = **Maintain***

Removal of trees in the area closest to the Little Zigzag River (proposed new parking area) would be selective in nature, with negligible loss of shade, given remaining trees in this area. The size and location of other trees proposed to be removed similarly would have negligible effects on shading.

The proposed action includes rehabilitation of stream banks, decommissioning trails, and other disturbed areas with native vegetation resulting in moving this indicator in a positive direction towards restore over time.

#### Sediment

##### *Environmental Baseline = **At Risk***

The levels of silt, clay, and sands were high in all reaches during a stream survey of Little ZigZag River.

##### *Effects of the actions = **Maintain(-)***

There would be some effects on transport of sediment into the Little ZigZag River in the short term related to the following:

- Excavation and vegetation removal related to construction of proposed improvements.
- Increased truck traffic into and within the camp related to construction of proposed improvements.
- Transport of excavated earth and demolition debris for disposal off-site.

However, effects on sediment transport would be minimized through the following activities and best management practices:

- **Concentrate activities in disturbed areas.** The master plan has been developed to minimize actions in previously undisturbed areas. Most activities, particularly those in relatively close proximity to the Little ZigZag River are proposed in previously disturbed areas. No vegetation removal or excavation are proposed within 60 feet of the River.
- **Level of activity.** Proposed improvements are expected to be conducted over a period of approximately ten years. Consequently, in any given season, month or year, the total number of truck trips in and out of the camp for delivering and removing construction materials, excavated earth and

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other debris would be relatively limited and would not exceed typical traffic levels at or within the camp by a significant percentage.

- **Construction schedule.** To the extent possible, construction activities would be conducted during the dry season to minimize the degree of sediment transport which would be exacerbated during the rainy season. Given the elevation of the camp, this also is necessary from a construction window standpoint.
- **Best management practices.** A variety of best management practices would be used to minimize sediment transport, including:
  - Standard erosion control practices to contain sediment runoff from disturbed areas. (“Sedi-mats”, mulch and seed, silt fences, and or erosion blankets or should be used in all perennial streams below project work sites where sediment delivery could occur.)
  - The project area will be revegetated with native plant materials to help control erosion in the future. The objective is to have no detectable increase in sediment levels in-streams below the project area in both the short and long term.
  - Cover excavated earth removed during construction.
  - Minimize the number of access points through the riparian areas by decommissioning and revegetating trails and disturbed areas, and adding signage to discourage damage of vegetation.
  - Grade parking areas and roads to reduce channelization and runoff into the Little ZigZag River.

Implementation of this project is expected to have a minor degrade effect to turbidity or gravel quality where there are threatened fish species. Any effects to anadromous species are expected to be short-term during project work, and will be localized. Because this section of the Little ZigZag River is identified as spawning habitat, sediment transport could impact spawning if increased sediment cover coho or steelhead eggs. Revegetation of historically degraded areas and newly disturbed sites will restore these areas and return them to a level of function that meets historical levels or may move them towards restore

### Chemical Contaminants/Nutrients

#### *Environmental Baseline = **Properly Functioning***

Based on DEQ assessment, a major source of the watershed’s non-point pollution appears to be sediment into the stream channels from highway sanding and road cutbank erosion. Concentrations of chloride ranged between 1.75 and 6.8mg/L which is below the National water Quality Criteria of 230 mg/L as a four day average and a one hour average of not more than 860 mg/L. There are also no known activities currently in the basin to significantly increase the probability of a chemical spill.

#### *Effects of the actions = **Maintain(-)***

Project activities would not increase chemical pollution in Little ZigZag River, except if an accidental spill occurred through a vehicle accident or other mishap. Precautions would be taken during project implementation to reduce the risk of any chemical spills entering the stream. As noted in the description of the proposed action, there currently is very limited use of chemicals and fuels at the camp. All fuels currently used are stored in sealed containers and dispensed with hand pumps. Chemicals are limited to cleaning supplies which are stored indoors in sealed containers. These practices are not expected to change in the future. Paint, glues, and other construction materials that have the potential to adversely affect the aquatic environment will be located no closer than 33 meters (108 feet) to the river. All

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hazardous materials storage, refueling areas, and maintenance areas will be designed and located to prevent any spills from entering any body of water.

Measures would be taken to minimize impacts associated with pool maintenance. Pool water would be drained into the septic system and/or would be drained as infrequently as possible. Prior to draining, chlorine in the water would be neutralized. Neutralized water would be drained to soil at a distance and in a manner to ensure that the water would not directly enter the Little ZigZag River. Alternatively, if required by the camp's special use permit, the water could be drained to the camp's wastewater treatment (septic) system. The parking area would be paved with a semi-permeable surface (as described in the proposed action) to minimize oil/water run-off. Bio-swales or other natural filtration and detention devices also would be used to minimize water quality and sediment transport impacts.

While impacts would be minimized through the actions described above, minor impacts on water quality as a result of pool drainage procedures or in the event of a small chemical spill could impact fish. These potential impacts would be related to both the proposed improvements and continued operation of the camp as it currently exists.

### **Habitat Access**

#### Physical Barriers

##### *Environmental Baseline = **Not Properly Functioning***

Barriers to Fish Passage: Two culverts at Kiwanis camp at RM 0.45 and RM 0.6 are considered barriers to juvenile fish. The RM 0.6 culvert is a barrier to adult fish. Currently, fish have access to only a small part of the portion of the Little ZigZag that runs through the camp (approximately 0.05 miles or less than 10 % of the section within the camp's special use permit boundary).

##### *Effects of the actions = **Maintain***

A separate proposed action to both of these culverts would provide volitional passage to resident and anadromous fish. No other potential barriers would be created in this proposed action.

### **Habitat Elements**

#### Substrate

##### *Environmental Baseline = **Not Properly Functioning***

The dominant substrate in the stretch of the Little ZigZag River (Reach 1 – stream survey) that runs through the Kiwanis Camp is large cobble. Reach 1 spans from the mouth of the Little ZigZag River to RM 1.19. The amount of silt, clay, and sands were high.

##### *Effects of the actions = **Maintain***

Project activities are not anticipated to have more than a negligible impact to substrate composition in Little ZigZag River.

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Minimization measures :Adherence to project design criteria and General Best Management Practices (BMP's) would reduce the risk of erosion causing habitat degradation within or downstream of the project area. Minimization measures such as restrictions on ground disturbance to drier seasons and erosion control measures reduce the risk of activities that might affect substrate composition. Very little, if any erosion or sediment would impact water quality and spawning gravels that are utilized by anadromous salmonids.

Banks within the camp would be replanted with native vegetation. Approximately 1,000 linear feet along the stream banks would be replanted, with a varying buffer distance of 10 - 30 feet, as conditions allow, totaling about 20,000 in riparian areas. About 50,000 square feet of other existing disturbed areas also would be restored/replanted. These replanted/restored areas are designed to positively enhance water quality and spawning gravels that are utilized by anadromous salmonids.

Large Woody Debris

**Environmental Baseline = Not Properly Functioning**

Little Zigzag River does not meet NMFS, LRMP, or PIG woody debris standards. 5)

Table 4. Large Woody Debris

Reach	Corrected Length	Number of Pieces In-Channel				Density per Mile			Standard Density per Mile	
		Small	Medium	Large	Total	Medium	Large	Total	LRMP	PIG/NMFS
1	1.19	52	3	1	4	2.52	.84	3.35	106	80
2	1.33	49	14	0	14	10.56	0	10.56	106	80
3	1.56	10	5	0	5	3.21	0	3.21	106	80

Table 5. Definition of Wood Size Classes West of the High Cascades

Size	Diameter	Length
Small	>12 inches at 25 feet from large end	>25 feet or 2X the bankfull width
Medium	>24 inches at 50 feet from large end	>50 feet or 2X the bankfull width
Large	>36 inches at 50 feet from large end	>50 feet or 2X the bankfull width

Very few debris jams were identified in Little Zigzag River. Small wood comprised 63% of the wood in the debris jams that were observed, medium sized wood comprised 37%, and no large wood was found in the debris jams (Table 6).

Table 6. Debris Jams

Reach	# of Debris Jams	Total Pieces of Woody Debris					
		Small		Medium		Large	
		Single	Debris Jam	Single	Debris Jam	Single	Debris Jam
1	3	48	4	3	0	1	0
2	1	45	4	10	4	0	0
3	1	8	2	3	2	0	0

Large conifers line the streams banks in the proposed action area and future LWD recruitment potential is good. Conditions upstream of the project area have not been evaluated.

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### *Effects of the actions = **Maintain***

The proposed action would have some effect on the supply of woody debris at the site due to the need for tree removal in specific areas. However, effects would be minimal based on the location and size of trees to be removed, topography and hydrology of the site, and proposed mitigation measures. Table 2 summarizes the approximate number and size of trees proposed to be removed. Tree removal in three areas potentially could affect the supply of woody debris, including the site of the new director and campers cabins on the south side of the camp, the proposed new parking area in the old Barlow Campground/ropes challenge course area, and the site of the septic drainfield reserve area north of the equestrian area. Some trees identified for removal on site will be placed in the riparian reserve to reduce impacts on loss of woody debris. Placement of these trees would be performed in consultation with district fish biologists to maximize the potential value of the woody debris.

In the process of constructing seven new structures and common areas proposed in the new camper cabin area, approximately 50-80 trees, generally 4" to 8" in diameter and 15 to 40 feet in height, over a total area of 7,800 square feet (approximately equal to an area 80x100 feet in size) would be felled and removed (see Table 2, page \_\_\_). On average, this area is approximately 150 feet from the Little ZigZag River. Tree removal in this area would not be expected to affect the supply of woody debris for the Little ZigZag River for the following reasons:

- The size of these trees and distance from the river would prevent them from reaching the River if they were to fall naturally.
- The relatively flat nature of the site and presence of large buildings separating this area from the River would prevent transport of woody debris from this area to the River.
- There is no history of flooding at the camp, which would be necessary to transport any woody debris from this area to the river.
- For the most part, the site is generally flat, with limited sloped areas that would facilitate the transport of sediment into the Little ZigZag River. This is particularly true of most portions of the camp within 80-100 feet of the river.

Approximately five to 10 trees would be felled to accommodate construction of a new parking area in the old Barlow Campground area, adjacent to the camp's existing ropes challenge course facility. Much of this area is cleared of trees, as a result of its historical use as a campground. A relatively limited number of parking spaces are proposed in the portion of the new parking area which has not been cleared previously. Consequently, relatively few trees would need to be removed. In comparison to other portions of the camp, trees in this area are relatively large, averaging about 12"-18" in diameter and 40-60 feet in height. Trees that would be removed are between 60 and 150 feet from the Little ZigZag River. Some of the trees removed could serve as future woody debris for the River if they were to fall naturally. It is proposed that trees of 12 inches in diameter or more felled in this area be left on site in riparian areas or the floodplain to serve as future potential woody debris. As a result, removal of trees in this area also would have no effects on the future supply of wood debris.

Approximately 20-30 trees, typically 15-40 feet in height and 6" to 12" in diameter, would be removed to construct the septic drainfield reserve area north of the equestrian area. This area is approximately 375

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feet from the Little ZigZag River. Given these conditions, felling and removal of trees in this area would be expected to have no effect on the supply of woody debris for the river.

All other proposed new facilities have been sited to eliminate the need for tree removal.

In addition to the actions sited above, ongoing maintenance and operation of the camp could entail felling of hazard trees in riparian areas. It is recommended that hazard trees of 12 inches or greater felled in riparian areas or floodplain be left on site to serve as future woody debris.

Pool Frequency

**Environmental Baseline = Not Properly Functioning**

Little Zigzag River did not meet LRMP, PIG, and NMFS pool quality standards.

Table 7. Existing number of Pools (pools >= 3' depth) frequency vs. the LRMP standard; and frequency of pools of all depths vs. the PIG and NMFS standards (shaded columns)

Reach	Correct. Length	Avg. Bankfull Width	Avg. WidthW etted	Pool to Riffle Ratio	Total Number		Primary Pools per Mile	LRMP Standard per Mile	Pools all Depths per Mile	NMFS Standard per Mile	PIG Standard per Mile
					Primary	All Depths					
1	1.19	18.55	17.52	1:14.0	12	24	<b>10.06</b>	<b>94.88</b>	20.12	56	56
2	1.33	9.41	8.58	1:15.6	10	28	<b>7.54</b>	<b>187.03</b>	21.12	96	96
3	1.56	3.23	5.37	1:10.6	1	19	<b>0.64</b>	<b>544.89</b>	12.19	96	96

**Effects of the actions = Maintain**

The proposed action is expected to have a negligible impact on pool frequency.

Pool Quality

**Environmental Baseline = Not Properly Functioning**

Pool control structures were as follows. Reach 1 (Kiwanis Camp Reach)- 58% substrate, 25% wood, and 17% a wood substrate combination. Reach 2 - 50% substrate, 39% wood, and 11% a wood substrate combination. Reach 3 - 44% substrate, 39% wood, and 17% a wood substrate combination. No man-made pool control structures were identified. . Pool quality was good in Little Zigzag River. The residual depths of the pools were high, with Reach 1 having a residual depth of 1.97 feet, Reach 2 with 2.24 feet, and Reach 3 with 1.43 feet. Step-pool Sequences: Step pool sequences are a step-like series of riffle and pool units in a high gradient segment of stream. If pool habitat dominates a step pool sequence it means that there are a number of pools in sequence with a short riffle in between. The riffle is added to the upstream habitat length. If riffle habitat is dominant it means that pocket pools are located in the habitat unit but are not channel spanning and can't be broken out into separate units. Pool dominated step-pool sequences in the stream were relatively scarce. Six percent of the pools were identified as step-pools. Pocket pools in riffles were more abundant and were identified in 31% of the riffles.

**Effects of the actions = Maintain**

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The potential exists for some surface erosion and silt to enter stream channels as the result of project activities. Adherence to BMP's and minimization measures will reduce the risk of fine sediments entering stream channels and filling in pool habitats. Project activities are expected to have a negligible impact on pool depths or pool quality in the Little ZigZag River.

Off-channel Habitat

*Environmental Baseline = **Properly Functioning***

One side channel was identified in the stream and was located in Reach 2. Side channels are not expected to be abundant in this system due to its high gradient and narrow valley width. One braid was identified in Reach 3 at RM 3.5 (NSO 166, F2). The Braid was 32 feet long and 10 feet wide. There were no significant backwater areas or off-channel ponds.

*Effects of the actions = **Maintain***

Channel forming processes are not expected to be altered by this project (no removal of LWD and no channel straightening). The implementation of this project would have negligible effects on off-channel habitat along Little ZigZag River.

Refugia

*Environmental Baseline = **Properly Functioning***

Inner riparian zones occurring in the project area of Little ZigZag River are intact closed and open large conifer/ closed small conifer except for small areas where the bridge structures exist. Late seral patches would not be disturbed.

*Effects of the actions = **Maintain(-)***

Some trees would need to be felled (table 2) and some areas will have disturbances to native vegetation as part of the improvements project. Loss of shade from felled trees and minimal impacts from camper activity in riparian areas could impact fish in the Little ZigZag River. However, over time, the proposed action would result an overall positive trend to the riparian and off-channel habitat condition as trails are decommissioned and other historically disturbed areas are revegetated. Late seral patches would not be disturbed. Minimizations and the use of BMP's as well as rehabilitation of stream banks and other disturbed areas with native vegetation will move this parameter toward restore over time.

Mitigation = Use of BMP's. Rehabilitation of stream banks and other disturbed areas with native vegetation.

**Channel Condition & Dynamics**

W/D Ratio

*Environmental Baseline = **At Risk***

Table 8. Width to Depth Ratios of Little ZigZag River

Reach	To NSO	To River Mile	Avg. Width ft	Entrench -ment Ratio	Width to Depth Ratio	Average Percent Gradient	Dominant Substrate	Rosgen Channel Type	Valley Form
1	57	1.2	17.52	1.3	18.2	6%	Gravel	B4a	Moderate

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									Flat-Floored
2	129	2.5	8.58	1.8	8.6	8%	Gravel	B4a	Narrow Flat-Floored
3	187	4.4	5.37	6.4	7.1	10%	Cobble	A3a+	Moderate V-Shaped

Bankfull width to depth ratios averaged 9.5 for Reach 1 and 6.0 for Reach 2, based on stream survey data of Little ZigZag River. The stream survey report does not indicate any downcutting or widening problems but the excess of fine sediment put the width to depth ratio at risk.

*Effects of the actions = **Maintain***

The project activity is expected to result in no measurable effects to the width to depth ratio. This project will not increase peak flows, cause direct bank damage, or measurably affect sediment delivery to streams that could potentially affect width to depth ratios and habitat quality.

Streambank Condition

*Environmental Baseline = **At Risk***

Stream reaches with sensitivity to disturbance, sediment supply and/or streambank erosion potential have been identified in the Little ZigZag River. The upper reach is associated with mudflow deposits consisting of poorly sorted material in a sandy matrix.

*Effects of the actions = **Maintain***

This project would not increase peak flows. The potential exists for some surface erosion and silt to enter stream channels as the result of project activities. Adherence to BMP's and minimization measures will reduce the risk of fine sediments entering stream channels. Revegetation areas of eroding of fragile streambanks at campsites and other high use areas would maintain the streambank structure and may result in a small enhancement of this parameter. Adherence to BMP's project design criteria and minimization measures would maintain the width to depth ratio within the Little ZigZag River.

Floodplain Connectivity

*Environmental Baseline = **No Data***

*Effects of the actions = **Maintain.***

No activities would take place that would alter negatively floodplain function, result in loss of side-channel habitat, or cause channel downcutting.

**Flow/Hydrology**

Change in Peak/Baseflows

*Environmental Baseline = **Properly Functioning***

A Discharge Rate of 27.7 cubic feet per second (cfs) was recorded on September 19<sup>th</sup>, 2000

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### *Effects of the actions = **Maintain***

Project activities are not expected to increase peak/baseflows in the Little ZigZag River. The proposed action would not result in a perceptible change peakflows or baseflows.

### Drainage Network Increase

#### *Environmental Baseline = **At Risk***

Assessment was completed using methodology developed on the Siskiyou national Forest. Watershed analysis indicates increases greater than the 10% threshold of concern for the ZigZag subwatersheds.

### *Effects of the actions = **Maintain***

Implementation of this project will not cause an increase in drainage network within the Little ZigZag River watershed. No new roads or stream crossings will be built with this project.

### Road Density/Location

#### *Environmental Baseline = **At Risk***

Road density for the Little ZigZag River = 0.54 mi/sq.mi.

### *Effects of the actions = **Maintain(-)***

The proposed action would have negligible impacts on overall road density within the drainage at the watershed level. There would be some impacts at the site level. Construction of the new parking area would increase the amount of road surface at the camp somewhat. However, use "Eco-paving" surfaces (see description of proposed action) would reduce compaction and runoff impacts. No other new roads would be constructed as part of the proposed action. There could be some minor impacts on fish related to impacts on water quality and sediment transport based on the increase in road density at the camp. However, temporary or local negative effects from road construction are expected to be negligible.

### Disturbance History

#### *Environmental Baseline = **Not Properly Functioning***

There is no current ARP analysis for the Zigzag watershed or associated subwatersheds. During the completion of the watershed analysis, the Washington DNR's process for assessing changes in peak streamflows associated with rain on snow events was conducted. Based on this methodology it was concluded that the watershed as a whole or the subwatersheds individually were not at risk from increased peak flows associated with created openings during rain on snow events (pers. comm. Forest Service District Hydrologist Todd Parker).

### *Effects of the actions = **Maintain***

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The proposed action would have negligible effect on the baseline. Removal of trees would increase openings in the short term. Riparian revegetation would decrease opening size in eroded/disturbed areas over time mitigating the effects of tree removal.

### Riparian Reserves

#### *Environmental Baseline = **Not Properly Functioning***

Canopy closure greater than 70%. There are indications that the fires, which burned approximately 86% of the watershed since the turn of the century, impacted the riparian reserves. Most subwatersheds within the ZigZag watershed have a high concentration (80-100%) of its riparian reserves within the moderate woody debris recruitment potential class. The entire ZigZag watershed is well outside the range of historic conditions for late seral stand structure within the Riparian Reserve. Most riparian reserve areas in this watershed now support second growth trees.

#### *Effects of the actions = **Maintain(-)***

Tree removal as part of the proposed action would have an effect on woody debris recruitment potential and seral makeup of the Riparian Reserve. There would be little to no loss of shade in the project area given the location and size of trees proposed for removal and the selective nature of tree removal in the areas closest to the Little ZigZag River. Impacts on fish related to this indicator are based on related effects for other indicators described previously.

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**Table 9. Checklist for Documenting Environmental Baseline and Effects of Proposed Action(s) on Relevant 5<sup>th</sup> field Watershed Indicators**

Forest:	Mt. Hood National Forest	Ranger District:	ZigZag
ESUs:	Lower Columbia River steelhead, Lower Columbia River/Southwest Washington coho salmon, Southwestern Washington/Columbia River coastal cutthroat trout	Watershed:	ZigZag River
Project:	Kiwanis Camp Improvements		

PATHWAYS: INDICATORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS		
	Properly Functioning <sup>1</sup>	At Risk <sup>1</sup>	Not Properly Functioning <sup>1</sup>	Restore <sup>2</sup>	Maintain <sup>2</sup>	Degrade <sup>2</sup>
<u>Water Quality:</u>						
Temperature(+)	X				X	
Sediment (+)		X			X	
Chem. Contam. Nut (+)		X			X	
<u>Habitat Access:</u>						
Physical Barriers(+)			X		X	
<u>Habitat Elements:</u>						
Substrate(+)	X				X	
Large Woody Debris(+)			X		X	
Pool Frequency(+)			X		X	
Pool Quality(WA)		X			X	
Off-channel Habitat(WA)		X			X	
Refugia(+)		No data			X	
<u>Channel Cond. &amp; Dyn</u>						
Width/Depth Ratio(+)		X			X	
Streambank Condition(+)		X			X	
Floodplain Connectivity(+)		X			X	
<u>Flow/Hydrology</u>						
Peak/Base Flows(+)		X			X	
Drainage Network Incr. (+)		X			X	
<u>Watershed Conditions:</u>						
Road Dens. & Loc. (+)			X		X	
Riparian Reserves(+)			X		X	
Disturbance History	X				X	

<sup>1</sup>These three categories of function ("properly functioning," "at risk," and "not properly functioning") are defined for each indicator in the "Matrix of Factors and Indicators" table found in the document "Making Endangered Species Act Determinations of Effect for individual or Grouped Actions at the Watershed Scale" (National Marine Fisheries Service 1996).

<sup>2</sup>Effects are based on which way this project is likely to move the relevant indicator, but no change in baseline is expected.

<sup>3</sup> indicates potential short-term effects, with long-term restoration of the indicator.

† Source: USDA Forest Service, Pacific Northwest Region, Mt. Hood National Forest. ZigZag River and Tributaries, Stream Restoration Project

(WA) USDA Forest Service, Pacific Northwest Region, Mt. Hood National Forest. 1995 (WA) ZigZag Watershed Analysis

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### **Water Quality**

#### Temperature

##### **Environmental Baseline = Properly Functioning**

ZigZag stream temperatures measured in August and September of 1991 ranged between 42° and 49° with an average temperature of 47°.

##### **Effects of the actions = Maintain**

This project should have no measurable effect on temperature. Removal of trees in the area closest to the Little Zigzag River (proposed new parking area) would be selective in nature, with no measurable loss of shade, given remaining trees in this area. The size and location of other trees proposed to be removed similarly would have negligible effects on shading. In the long term, with increased shading from the riparian revegetation there would be a maintenance or reduction in temperature.

##### **Sediment = At Risk**

Environmental Baseline = The 1988 Oregon Department of Environmental Quality assessment of non-point pollution indicates moderate problems with sediment and erosion of ZigZag river. These problems are attributed to glacial runoff, unstable channels, loss of woody structure, road cuts, and highway sanding.

##### **Effects of the actions = Maintain**

During construction of proposed improvements, a small amount of sediment would be produced. In the long-term restoration of riparian and other vegetation at the camp would result in maintaining or reducing sedimentation effects. Furthermore, short-term impacts would be minimized through use of best management practices and as a result of topographic and other conditions at the site.

#### Chemical Contaminants/Nutrients

##### **Environmental Baseline = At Risk**

Salting of the Palmer snowfield appears to be causing increased levels of sodium and chloride in Still Creek. Conductivity and chloride levels are well above those for adjacent streams and the Bull Run River. Monitoring indicates that these levels are within EPA standards for acceptable levels of chloride concentrations. However, the levels appear to be above background levels with the potential to bring water quality above the range that benefits the biological, physical, and chemical integrity of the system.

Additionally, there have been 8 incidents of high fecal coliform discharges of short duration from sewage treatment effluent entering Camp Creek

##### **Effects of the actions = Maintain**

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The existing septic drainfield for the camp would be reconstructed; contaminated materials from the existing system would be disposed of at an approved landfill. New drainfields would be constructed in the upper equestrian center and on a bench about 30 feet from the equestrian area (reserve drainfield). The existing amphitheater area would serve as a second reserve drainfield but would not be expected to be used within the life of the proposed renewed special use permit. The new septic system would treat wastewater to state and county standards and keep fecal contaminants from entering ZigZag Creek.

### **Habitat Access**

#### Physical Barriers

##### *Environmental Baseline = **Not Properly Functioning***

On the mainstem ZigZag, there is a natural series of barrier falls at river mile 9.0. Several tributaries to Still Creek, Henry Creek, and Lady creek have culverts that are currently blocking passage to suitable upstream habitat. In the summer of 2000, the Forest Service replaced a concrete box culvert at the mouth of the Little ZigZag River. Before that time this structure was a velocity barrier to any fish that wanted to pass upstream of the mouth into the Little ZigZag River. Currently a culvert at the main entrance to the camp prevents fish from accessing the majority of the section of the Little ZigZag River that passes through the camp.

##### *Effects of the actions = **Maintain***

No new culverts or other fish blocking structures would occur with this project. A concurrent project would remove two blocking culverts to upstream passage on Little ZigZag River at river mile 0.4 and 0.65.

### **Habitat Elements**

#### Substrate

##### *Environmental Baseline = **Properly Functioning***

Dominant substrate for the mainstem ZigZag River is cobble/small boulder and cobble/gravel. This is a natural condition.

##### *Effects of the actions = **Maintain***

Project activities are anticipated to have a negligible impact to substrate composition to ZigZag River.

*Mitigation measures* = Adherence to project design criteria and General Best Management Practices (BMP's) would reduce the risk of erosion causing habitat degradation within or downstream of the project area. Very little, if any erosion or sediment would impact water quality

#### Large Woody Debris

##### *Environmental Baseline = **Not Properly Functioning***

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Past history of LWD removal and channel straightening. On the mainstem ZigZag River, there is an average of 1.8 pieces of large woody debris per mile. Woody debris levels on the Little ZigZag River, Camp Creek, and Devil Canyon are also below the LRMP and range of natural variation for large woody debris. The entire ZigZag watershed is outside the range of historic condition for late seral stand structure within the Riparian Reserves. Subwatersheds vary from 2-20% late seral structure as compared to the historic condition of 76% in Riparian Reserves. There is a relatively even distribution of moderately large woody debris recruitment potential largely due to fires that burned 86% of the watershed at least once since the turn of the century.

### *Effects of the actions = **Maintain***

No LWD is proposed to be added or subtracted in the proposed action.

### Pool Frequency

#### *Environmental Baseline = **Not Properly Functioning***

Frequency of pools within the Camp Creek and Lady Creek are below Forest LRMP standards and are outside the low end of the range of natural variation. Levels within Still Creek, Cool Creek, and the Little ZigZag and ZigZag Rivers are well below the range of natural variation and LRMP standards with survey reaches ranging from 0 pools/mile to approximately 12 pools/mile.

### *Effects of the actions = **Maintain***

The proposed action is expected to have a negligible impact on pool frequency.

### Pool Quality

#### *Environmental Baseline = **At Risk***

Pool volumes across the watershed (with the exception of the anadromous portions of Still and Camp creeks) are well below the undisturbed condition.

### *Effects of the actions = **Maintain***

The action would not affect pool depths because there is little likelihood of a marked increase in detectable fine sediments entering Little ZigZag River.

### Off-channel Habitat

#### *Environmental Baseline **At Risk***

Scarcity of high quality side channel habitat may be one of the factors limiting coho production. Side channel habitat was lost due to cleanout of large woody debris and channel straightening throughout the watershed..

### *Effects of the actions = **Maintain***

Channel forming processes are not expected to be altered by this project (no removal of LWD and no channel straightening). The implementation of this project would have negligible on off-channel habitat along Little ZigZag River.

## DRAFT VERSION

Effects of the actions **No data Check WA**

### Refugia

*Environmental Baseline = No Data*

*Effects of the actions = Maintain*

The proposed action would result in an overall positive trend to the overall riparian condition. Late seral patches would not be disturbed.

Mitigation = Use of BMP's. Rehabilitation of stream banks and other disturbed areas with native vegetation.

### **Channel Condition & Dynamics**

#### W/D Ratio

*Environmental Baseline = At Risk*

Reach 2 ZigZag River = 9; Average for Still Creek = 24. Cool Creek average = 10, Camp Creek average 15.6, Little ZigZag River reach 2 = 7.5. Channel is simplified due to channel cleanout that occurred after the 1964 flood on Still Creek and ZigZag River.

*Effects of the actions = Maintain*

There is a possibility of the W/D ratio increasing, due to the ZigZag River continuing it's natural channel widening. Stream morphology, geology, and lack of LWD and streambank armoring all contribute to this process. The proposed action would not affect the above conditions.

#### Streambank Condition

*Environmental Baseline = At Risk*

Stream reaches with sensitivity to disturbance, sediment supply and/or streambank erosion potential have been identified in the Little ZigZag River, Camp Creek, Wind Creek, Still Creek, and the ZigZag River. Many of these stream reaches are associated with mudflow deposits consisting of poorly sorted material in a sandy matrix.

*Effects of the actions = Maintain*

Revegetation areas of eroding of fragile streambanks at campsites and other high use areas would maintain the streambank structure and may result in a small enhancement of this parameter.

#### Floodplain Connectivity

*Environmental Baseline = At Risk*

ZigZag River and Still Creek have a history of large woody debris removal that caused downcutting and impaired floodplain connectivity.

## DRAFT VERSION

*Effects of the actions = **Maintain***

The proposed action would not result in the removal of large woody debris.

### **Flow/Hydrology**

#### Change in Peak/Baseflows At Risk

*Environmental Baseline = **At Risk***

Trend analysis for the upper ZigZag Watershed indicates a decreasing trend exists in daily maximum peak flows between 1982 and 1993. This is due to stands that are recovering from fire events at the turn of the century. As stand age matures, the increasing canopy closure gets closer to the accumulation of snow of an undisturbed site. Baseflow trend conditions for the ZigZag River cannot be made as results were not significant at the 80% significance level. However, it should be noted that there are a number of domestic water rights within the watershed that have the potential to alter baseflow during low flow periods. Because the ZigZag River watershed peakflow trend is still in a recovery state, peakflows are at risk

*Effects of the actions = **Maintain***

The proposed action would negligibly alter total canopy cover and would not alter the baseline.

#### Drainage Network Increase

*Environmental Baseline = **At Risk***

Assessment was completed using methodology developed on the Siskiyou National Forest. Watershed analysis indicates increases greater than the 10% threshold of concern for Still Creek and Henry/ZigZag subwatersheds. Additionally, the Still Creek drainage is approaching a 20% increase in the stream drainage network.

*Effects of the actions = **Maintain***

Devil/Lady, Camp, ZigZag/Little ZigZag are below the 10% threshold of concern

### **Watershed Condition**

#### Road Density/Location

*Environmental Baseline = **At Risk***

Road density for Henry/ZigZag subwatershed = 2.59 mi./sq. mi. Camp Creek = 2.14 mi./sq. mi. Still Creek = 1.30 mi./sq. mi. ZigZag/Little ZigZag = 0.54 mi./sq. mi.. Devil/Lady = 0.47 mi./sq. mi. Still Creek has low road densities and high levels of drainage network enhancement due to the many stream crossings with 51% of its roads located within 300' of streams.

*Effects of the actions = **Maintain***

The proposed action would not increase the roads in the drainage.

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### Disturbance History

#### *Environmental Baseline = **Not Properly Functioning***

The ZigZag Watershed Analysis assessed changes in the peak flow magnitude from rain or snow events to indicate cumulative effects from timber harvest created openings and road on snow accumulation and melt. The threshold for concern for increases in peak flows based on this methodology is 10%. For the entire ZigZag Watershed there is an increase of 11.7% in the peak flow magnitude for the 2+ storm (two years recurrence interval event with unusually high storm intensity).

#### *Effects of the actions = **Maintain***

The proposed action would have negligible effect on the baseline. Riparian revegetation would decrease opening size in eroded areas.

### Riparian Reserves

#### *Environmental Baseline= **Not Properly Functioning***

Canopy closure is greater than 70%. There are indications that fires, which burned approximately 86% of the watershed since the turn of the century, impacted the riparian reserves. Most subwatersheds within the ZigZag watershed have a high concentration (80-100%) of their riparian reserves within the moderate woody debris recruitment potential class (only Devil/Lady Creek has a higher large woody debris recruitment potential). The entire ZigZag watershed is well outside the range of historic conditions for late seral stand structure within the Riparian Reserve. Subwatersheds vary from 2-20% late seral structure compared to the historic condition of 76%.

#### *Effects of the actions = **Maintain***

The proposed action would have a negligible effect on woody debris recruitment potential and seral makeup of the Riparian Reserve.

## References

Bergamini, R., and R. Lindland. 1990. *Monitoring and evaluation of stream habitat improvement and rehabilitation projects, 1992 annual report*. USDA Forest Service, Pacific Northwest Region, Mt. Hood National Forest.

Meehan, W.R.; Bjornn, T.C. 1991. Salmonid distributions and life histories. In W.R. Meehan, editor, *Influences of forest and rangeland management on salmonid fishes and their habitats*. American Fisheries Society Special Publication 19. Bethesda, MD. pp 47-82.

Montgomery, D.R., and J.M. Buffington. 1993. *Classification, prediction of channel response, and assessment of channel condition*. WA DNR Timber, Fish and Wildlife.

Overton, K.C., J.D. McIntyre, R. Armstrong, S.L. Whitwell, and K.A. Duncan. 1995. *User's guide to fish habitat: Descriptions that represent natural conditions in the Salmon River Basin, Idaho*. USDA Forest Service, Intermountain Research Station, General Technical Report INT-GTR-322.

Rosgen, D. 1996. *Applied River Morphology*.

USDA Forest Service, Pacific Northwest Region, Mt. Hood National Forest. 1995b. Upper Clackamas Watershed Analysis.

USDA Forest Service, Pacific Northwest Region, Mt. Hood National Forest. 1995 (WA) ZigZag Watershed Analysis.

USDA Forest Service, Pacific Northwest Region, Mt. Hood National Forest, Zig Zag Ranger District, June 20, 2000. Three Creeks Facility/Trails and Environmental Education with Instream Activities Fisheries and Aquatic Macroinvertebrate Biological Assessment/Evaluation.

USDA Forest Service, Pacific Northwest Region, Regional Ecological Assessment Analysis (REAP). 1993.

USDA Forest Service, Pacific Northwest Region, Mt. Hood National Forest. ZigZag River and Tributaries, Stream Restoration Project.

(SS)Miranda, R and Jensen, B. The 2000 Little Zigzag River Stream Survey Report USDA Forest Service, Pacific Northwest Region, Mt. Hood National Forest Zigzag Ranger District.