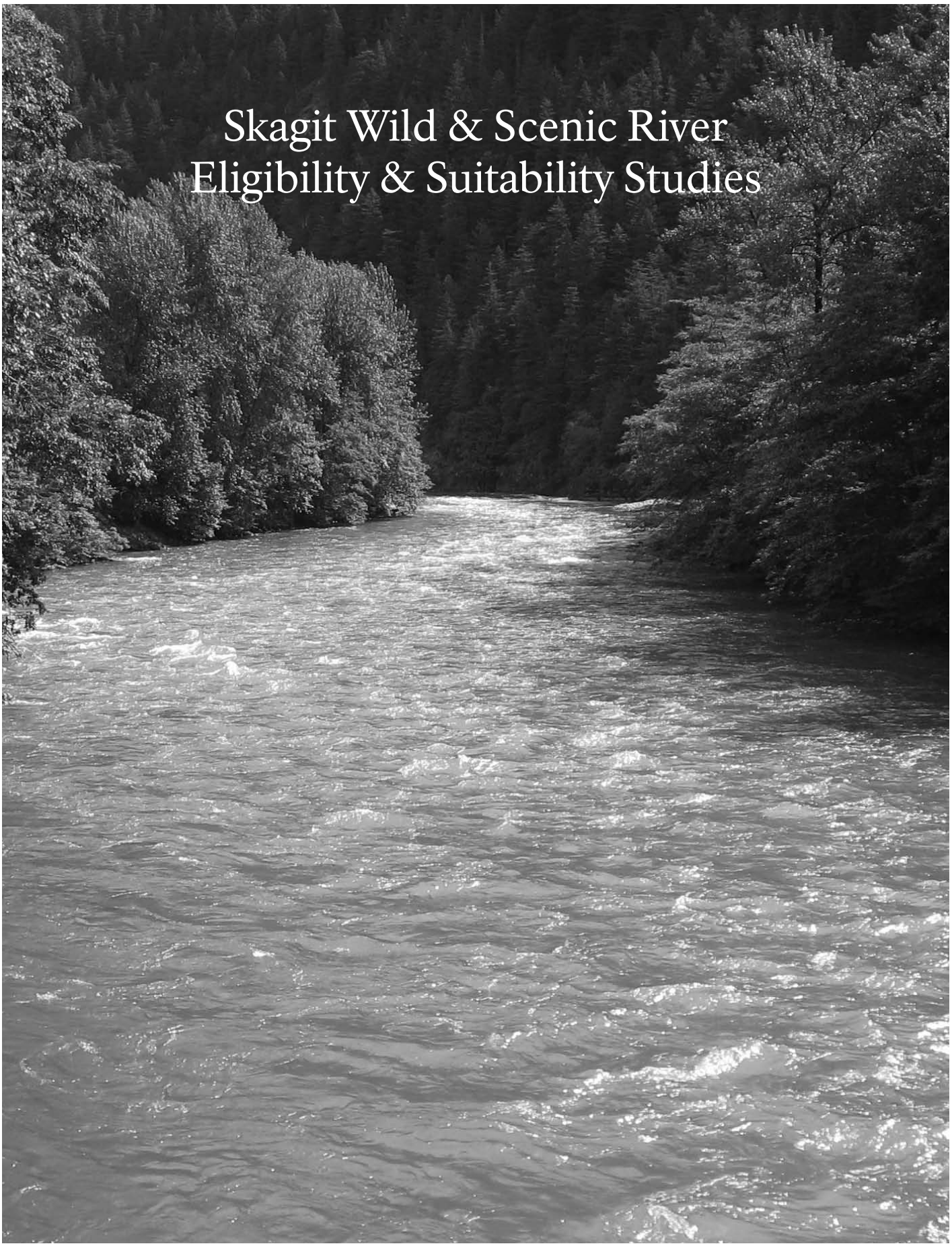
Skagit Wild & Scenic River
Eligibility & Suitability Studies

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Executive Summary

This study report evaluates the eligibility and suitability of the Skagit River, from Gorge Dam to the Ross Lake National Recreation Area (NRA) boundary, and its tributaries for inclusion in the Wild and Scenic River (WSR) System. This report also identifies preliminary classifications of eligible river segments. The result is a recommendation to extend WSR designation to the 11-mile segment of the Skagit River and two major tributaries.

This analysis is being conducted in conjunction with the development of Ross Lake National Recreation Area's General Management Plan. This study meets the requirement, under Section 5(d)(1) of the Wild and Scenic Rivers Act, for agencies to evaluate potential WSR rivers as part of their land management planning processes.

The Wild and Scenic Rivers Act, passed in 1968, protects the free-flowing waters of many of our nation's greatest rivers, while also recognizing the potential for appropriate use and development. It ensures the public's enjoyment of the river and its resources for present and future generations; new dams and other water resources projects that would have adverse impacts are prohibited on WSR segments.

There are three different classification types based on the existing level of human development or impact on the river –wild, scenic, and recreational. To be eligible for inclusion in this system, a river must be free-flowing and posses at least one outstandingly remarkable value (ORVs) or characteristic that is river-related and unique, rare, or exemplarily compared on a regional or national scale.

If a river is found eligible, the next step is a suitability analysis which assesses whether or not eligible segments should be included in the National WSR System. The suitability study findings are based on public input and an assessment of the ability of the river segment(s) to be managed to protect the outstandingly remarkable river values. Designation of eligible and suitable river segments into the National WSR System on NPS lands would be decided through a Congressional Act.

The Skagit River from Gorge Powerhouse to the Ross Lake NRA boundary, Goodell Creek, and Newhalem Creek were found to be eligible. They all are free-flowing. The Skagit River was found to have ORVs in the fish, wildlife, geology, history, pre-history, recreation and scenery resources. Goodell Creek was found to have ORVs in the fish, wildlife, geology, and scenery resources. While Newhalem Creek was found to possess ORVs in the wildlife, geology, history, pre-history, and scenery resources. The water quality of all eligible river segments were determined to be high quality. Table 1 summarizes the ORVs.

The Skagit River segment from below Gorge Dam to Gorge Powerhouse does not meet the free-flowing requirement of the WSR Act and therefore was found to be ineligible. In addition, the remaining 21 tributaries flowing into the study reach, though free-flowing, were not found to possess any ORVs, and therefore are not eligible. This assessment was based on available information through staff knowledge and literature research. Varying amounts of information were available for these creeks, with most creeks lacking thorough surveys of natural and cultural resources. Therefore, this assessment will be updated in the future if new information is found indicating the potential for a river segment to possess an ORV.

Eligible rivers or river segments were classified as recreational or wild, as listed below:
The Skagit River was classified as:

- recreational - due to the hydropower dams upstream and presence of the North Cascades Highway paralleling the river for this entire segment.

Goodell Creek was classified as:

- wild – headwaters to river mile one-half
- recreational – river mile one-half to its confluence with the Skagit River

Newhalem Creek was classified as:

- wild – headwaters to upstream of the diversion dam (river mile one)
- recreational – upstream of the diversion dam (river mile one) to its confluence with the Skagit River

The suitability analysis was primarily based on the following factors:

- The characteristics that make the river segments worthy of designation.
- The ability of NPS and its non-Federal partners to manage the river segments to protect their ORVs, water-quality, and free-flow.

- The compatibility of WSR designation with other potential uses of the river segments.
- The public's support for designation.

The upper Skagit River and the two eligible tributaries in this reach – Goodell and Newhalem creeks - were found to be suitable for WSR designation. The addition of this 11-mile upper Skagit River segment and its key tributaries would complete the Skagit WSR system from the downstream end of the Skagit Hydroelectric Project to the town of Sedro-Woolley and create more opportunities for holistic watershed management.

The support for this designation from the general public and two other land management agencies, Seattle City Light and the Washington State Department of Transportation, was overwhelming positive. Only one comment was received opposing designation. Two more comments also expressed concerns about the potential effects of WSR designation on new water resource projects, but no known proposals in the foreseeable future would be prohibited by the WSR designation.

Seattle City Light is committed to managing their lands to protect fishery and wildlife resources generally consistent with the intent of the WSR Act. The National Park Service manages the majority of the lands in the study area and manages the river system to protect the outstandingly remarkable values, water quality, and free-flowing character of the river segments.

Existing protections are in place prohibiting logging and mining, as well as limiting hydropower development. WSR designation would add additional protections from hydropower facilities and encourage natural bank protection, thus furthering regional and national goals for recovery and protection of salmon and bald eagle populations.

River segments found eligible and suitable will be managed by the National Park Service in a manner that protects their free flowing character, water quality, and ORVs as required under the WSR Act.

Designation would require the development of a comprehensive river management plan which would allow focus on the river segments and their special resources. WSR designation would also direct further protection and enhancement of natural, geological, cultural, scenic and recreation resources.

Therefore the National Park Service recommends that Congress extend the Skagit WSR designation to include this 11-mile upper Skagit segment and the two largest tributaries flowing into it.

Introduction

Purpose and Scope

This report includes the draft Wild and Scenic River (WSR) Eligibility and Suitability Study findings for the Skagit River and its tributaries from below Gorge Dam to the Ross Lake National Recreation Area (NRA) boundary just upstream of Bacon Creek. In a previous eligibility study conducted by the National Park Service (NPS) in 1989, the entire segment of the Skagit River within the Ross Lake NRA was found eligible for inclusion in the National WSR System based on fishery and wildlife outstandingly remarkable values (ORVs). As a result of this initial study, the Skagit River within Ross Lake NRA is located on the Nationwide Rivers Inventory[1] list. The first purpose of this report is to update these eligibility findings based on new information and changes that have occurred since 1989 and new guidance and criteria that have been developed and adopted by the Interagency Wild and Scenic River Coordinating Council. The second purpose is to conduct a suitability analysis to determine whether or not the eligible river segments should be recommended for designation.

This WSR study area includes the Skagit River below Gorge Dam to the Ross Lake NRA boundary and the tributaries flowing into this reach. The evaluated tributaries are identified by name or by an identifying number from the Washington State Stream Catalog System. Starting upstream and moving downstream, the north tributaries are listed below:

- #1965,
- Afternoon Creek,
- Falls Creek,
- Goodell Creek,
- #1865,
- Babcock Creek,
- Thornton Creek,
- Sky Creek,
- Damnation Creek, and
- #1826.

The south tributaries are:

- #1966,
- Ladder Creek,
- Newhalem Creek,

Table 1: Summary of Outstandingly Remarkable Values

Skagit River from Gorge Powerhouse to the Ross Lake NRA Boundary

Resource	Characteristics
Fish	The Skagit River system is one of the few remaining systems in the contiguous states which supports significant numbers of five native salmon species, two species of trout, and two species of char. It provides essential habitat for three federally listed species (Chinook salmon, bull trout, and steelhead) that spend a portion or all of their lives in Skagit River. It is one of the most important rivers for natural fishery stocks in Washington.
Wildlife	The Skagit River watershed has one of the greatest concentrations of bald eagles of any river in the lower 48 states. The quality and abundance of cottonwood overstory habitat make it possible for several other species (American Redstart, Verry, Lazuli Bunting, Nashville Warbler, and Red-eyed Vireo) to breed in western Washington where they are otherwise rare or not found at all.
Geology	The Skagit River watershed is the most glaciated river system in the lower 48 states, with over 300 active glaciers. Several examples of glacial processes including glaciers, cirques, horns, arêtes, and hanging valleys are found particularly in the Goodell & Newhalem tributaries. The geologic formation history, including how the river once flowed northward and the Damnation Creek erosional landslides processes which created the main-stem river rapids, contribute to the exceptional geologic characteristics.
History	The Skagit River and Newhalem Creek Hydroelectric Projects Historic Districts are river-dependent and nationally unique. For this section of the Skagit River, the town of Newhalem and Ladder Creek Falls are elements of this historic district.
Pre-history	Pre-history is an ORV because the uniqueness of the Goodell Creek site which represents six hundred years of river use and is the only site where salmon remains from prehistoric human use including teeth and head parts have been found near a river segment.
Recreation	The Skagit River offers a unique beginner-intermediate whitewater opportunity in the Northwest providing a chance for boaters of all age groups and experience levels to enjoy the river. This river segment is used by families and expert boaters alike and is an important training ground. Wildlife viewing opportunities of salmon and bald eagles contribute to the outstanding recreation experience. The river is also unique in the region because it provides boatable flows year-around when other rivers are dry.
Scenery	The Skagit River is a breathtaking scenic river with beautiful clear water, waterfalls, mountain views, and exemplary wildlife viewing opportunities.

Goodell Creek

Resource	Characteristics
Fish	Goodell Creek, known as the 'salmon headquarters', provides regionally exemplary spawning and rearing habitat for salmon.
Wildlife	Goodell Creek provides regionally unique habitat for a diversity of wildlife species including bald eagles, harlequin duck, and the American dipper.
Geology	The Skagit River watershed is the most glaciated river system in the lower 48 states, with over 300 active glaciers. Goodell Creek drains the Picket Range, one of the most rugged mountain ranges in the contiguous states. Several examples of glacial processes including glaciers, cirques, horns, arêtes, and hanging valleys are found in Goodell Creek.
Scenery	Goodell Creek begins on the vertical steps of the wilderness Picket mountain range, one of the most rugged, scenic and remote massifs in the lower 48 states. The mountain views, numerous cascades, wildlife and fishery resources, and limited human-made features make scenery an ORV for Goodell Creek.

Newhalem Creek	
Resource	**Characteristics**
Wildlife	Newhalem Creek provides regionally unique habitat for a diversity of wildlife species including harlequin duck and the American dipper.
Geology	The Skagit River watershed is the most glaciated river system in the lower 48 states, with over 300 active glaciers. Newhalem Creek showcases examples of glacial processes including glaciers, cirques, horns, arêtes, and hanging valleys.
History	The Skagit River and Newhalem Creek Hydroelectric Projects Historic Districts are river-dependent and nationally significant. Newhalem Creek Dam and Powerhouse was the first hydroelectric project constructed in the upper watershed and is an important contributing factor to the nationally unique historic district.
Pre-history	The Newhalem rockshelter, an eligible National Register site, is regionally unique and one of only a few rockshelters that have been excavated in Washington State. The rockshelter was likely created because of its proximty to the creek which was a travel corridor for Native Americans moving from Cascade Pass to the Skagit River. Remains from here included salmon and goats with some dating 1500 years old.
Scenery	The Newhalem Creek waterfall is one of the most scenic waterfalls in the North Cascades NPS Complex and rated as one of the top 100 northwest waterfalls.

- #1860,
- Martin Creek,
- #1857,
- #1854,
- #1853,
- #1851,
- #1849,
- #1843,
- Alma Creek, and
- Copper Creek.

Staff and financial resources were not available to conduct WSR analysis for all Skagit River tributaries within the North Cascades NPS Complex. The Skagit tributaries above the dams were not evaluated during this study. Bacon Creek was also not evaluated since it is outside the boundary of the Ross Lake NRA. Previous findings for these river segments are incorporated into the GMP and the GMP also directs NPS to work in cooperation with the U.S. Forest Service to update the WSR analysis for these tributaries sometime over the life of the GMP (see the GMP Alternatives Section).

The National Park Service focused on the main-stem Skagit River below the dams and the tributaries in this reach for the following reasons:

- This study was conducted as part of the General Management Plan (GMP) for Ross Lake NRA. The main-stem Skagit River segment is the only river segment entirely within the Ross Lake NRA. All the tributaries begin either in U.S. Forest Service lands or the North Cascades National Park, and then enter Ross Lake NRA before flowing into the Skagit River.
- The Skagit River downstream of the Ross Lake NRA boundary is already designated as a WSR. Inclusion of this 11-mile main-stem segment would complete designation from the downstream end of the Skagit Hydroelectric Project to the town of Sedro-Woolley.
- The dams and the Newhalem Gorge create a fish barrier and a distinctive watershed break for the upper Skagit River System. The selected study area allows a focus on salmon and other anadromous fish resources.

Skagit River Watershed

The headwaters of the Skagit River lie in British Columbia, Canada, in the North Cascades Mountains. Skagit River then flows approximately 150 miles before it empties into Puget Sound. Abundant glaciers in the surrounding jagged peaks provide stable flows that help make it the only Puget Sound tributary to host all native species of anadromous fish and attracts one of the highest concentrations of wintering bald eagles in the lower 48 states. It is the largest river draining into the

Puget Sound and the third largest river on the west coast of the contiguous states. The entire Skagit River Watershed Basin covers 3100 square miles; it provides 20-percent of the flows into Puget Sound.

Wild and Scenic Rivers Act – Criteria & Process

The Wild and Scenic Rivers Act, enacted in 1968, established a system to permanently protect selected free-flowing rivers in their natural condition for the present and future generations' enjoyment of the river. It was intended to balance the water resource development policies with river conservation and recreation goals. Rivers that are designated or included in the National WSR System receive protection from water resource projects that would have adverse affects on the river and its resources. A river can be designated as wild, scenic, or recreational. The WSR Act originally designated eight river segments and specified how others rivers were to be added. Rivers can be considered for addition into the WSR system if Congress authorizes a specific river segment studied, and Section 5(d)(1) of the WSR Act also directs federal agencies to evaluate rivers conjunction with their land management planning processes.

The three main steps involved in a WSR study are eligibility, classification, and suitability analysis. The eligibility analysis is a resource inventory and evaluation to determine if the river is free-flowing and possess one or more outstandingly remarkable value (ORV) such as fishery, wildlife, scenery, recreation, geology, or cultural resources. An ORV is defined as a river-related value that is unique, rare or exemplary within a national or regional context. Rivers that are found eligible are also classified as wild, scenic, or recreational primarily based on the level of human impact along the river and its water quality. The last step in the WSR study process is a suitability analysis which assesses whether or not eligible segments should be included in the WSR System. Suitability determination is based on an assessment of the characteristics that make the river segments worthy of designation; the ability of NPS and its non-Federal partners to manage the river segments to protect their ORVs, water-quality, and free-flow; the compatibility of wild and scenic river designation with other potential uses of the river segments; and public support and involvement. Designation of eligible and suitable river segments into the National WSR System on NPS lands would be decided through a Congressional Act.

Previous WSR Studies in the North Cascades NPS Complex

WSR eligibility studies for the North Cascades NPS Complex were completed in both 1989 and 2002. The draft 1989 eligibility report evaluated a number of river segments in the Skagit River watershed within the North Cascades NPS Complex as well as other watersheds in the North Cascades NPS Complex. The following river segments were found eligible:

- Agnes Creek/Bridge Creek,
- Baker River,
- Big Beaver Creek,
- Chilliwack River,
- North Fork Nooksack River,
- Ruby Creek/Granite Creek/Canyon Creek,
- Skagit River (Gorge Dam to park boundary), Stehekin River, and
- Thunder Creek/Fisher Creek.

In 2002 a detailed eligibility report determined that the entire Stehekin River watershed was eligible for WSR designation.

Skagit River Management

Skagit River Hydroelectric Project & Seattle City Light Management

The Skagit River Hydroelectric Project, managed by Seattle City Light (SCL) includes three hydroelectric dams: Ross, Diablo, and Gorge Dam. The largest lake, Ross, extends 22 miles within the U.S. and its headwaters are located just across the border in Canada. The project produces 690 megawatts of power and has been in operation since 1927 under the Federal Energy Regulatory Commission's (FERC) jurisdiction; it received a 30-year relicense in 1995. The three dams are located above a natural fish barrier at Newhalem Gorge and because of this, fish passage was not required as part of their FERC license. This license was largely based on a multiparty settlement agreement and was one of the first projects in the country to successfully negotiate an agreement on river management that included protecting resources and generating hydropower. SCL received the 1998 Public Service Award from the Nature Conservancy of Washington for its environmental stewardship of the Skagit River basin. The Skagit River below the Gorge Powerhouse is managed to protect fishery resources, primarily for federally listed threatened and endangered salmon species. The hydropower accounts for a significant portion of the City of Seattle's electric power,

providing 25-percent of Seattle's electrical needs.

SCL also owns property along the Skagit River to help them manage the hydropower project, Newhalem & Diablo town sites, and associated facilities. In the Skagit River study segment within a one-quarter of a mile on either side of the high water mark, SCL owns approximately 21-percent of the land.

Washington State Department of Natural Resources

The State of Washington asserts jurisdiction and ownership over approximately 480 acres of the bed of the Skagit River below the ordinary high water mark.

Skagit River Downstream & United States Forest Service Management

In 1978, Congress designated 158.5 miles of the Skagit River and its tributaries, the Sauk, Suiattle, and Cascade rivers, as wild and scenic rivers. This system is managed by the Mt. Baker-Snoqualmie National Forest and includes a mixture of public and private lands with 50-percent of the land in private ownership. The ORVs are: fish, wildlife, and scenery. The main-stem Skagit River reach begins at the Ross Lake NRA boundary and extends down to Sedro-Woolley and is designated as a recreational river. This reach is known for its salmon resources, bald eagles, and scenic boating opportunities.

National Park Service Management

The North Cascades National Park Service Complex was created in 1968 and consists of the North Cascades National Park, Ross Lake NRA, and Lake Chelan NRA. In 1988, 93 percent of the lands in the Complex were included in the Stephen Mather Wilderness. Ross Lake NRA contains the three hydroelectric dams, three reservoirs, as well as the free-flowing section of the Skagit River. The wilderness boundary is within approximately one-quarter of a mile to two miles from banks of the Skagit River. The south-side of the river below Newhalem Creek is road-less and only accessible by boat.

Eligibility Evaluation

The WSR Act has two requirements for eligibility; the river segment must be free-flowing and possess one or more outstandingly remarkable value in fish, wildlife, geological, recreational, scenic, historic, cultural, or other similar value. This section evaluates the eligibility of the Skagit River from Gorge Dam to the Ross Lake NRA boundary and the tributaries in this reach.

Free-Flowing Condition

"Free-flowing" is defined in section 16(b) of the Act as:

> . . .existing or flowing in natural condition without impoundment, diversion, straightening, riprapping, or other modification of the waterway. The existence, however, of low dams, diversion works, and other minor structures... shall not automatically bar its consideration for inclusion: Provided, that this shall not be construed to authorize, intend, or encourage future construction of such structures within components of the National Wild and Scenic Rivers System.

Hydrology of the Skagit Watershed

The Skagit River watershed is surrounded by dramatic glacier-covered peaks which feed meltwater to the river. It begins in British Columbia, winding through forests and flowing through steep canyons, before flattening out into a broad valley as it reaches Puget Sound. High flows occur when mountain snow melts in the spring and during fall/winter rain and rain-on-snow events. Melting glaciers deliver 15 to 30-percent of summer flows, providing stable base flows during summer drought.

The Skagit River is heavily influenced by the Skagit Hydroelectric Project. The project consists of three dams and associated facilities (Ross, Diablo, and Gorge) operated together for a combined capacity of 690 megawatts (MW). The dams are all located above a natural fish barrier at Newhalem Gorge. Water is diverted at Gorge Dam, located furthest downstream, through penstocks or large pipes and this creates a two and one-half mile long bypass reach of the Skagit River. There is no minimum flow requirement in this bypass reach and it remains dry or with limited water throughout the year. Tributaries and occasional spills from the dams provide flows for this reach. The project below is operated in "peaking mode", meaning water is stored in the reservoirs and released in accordance with energy needs; the flows fluctuate on a daily

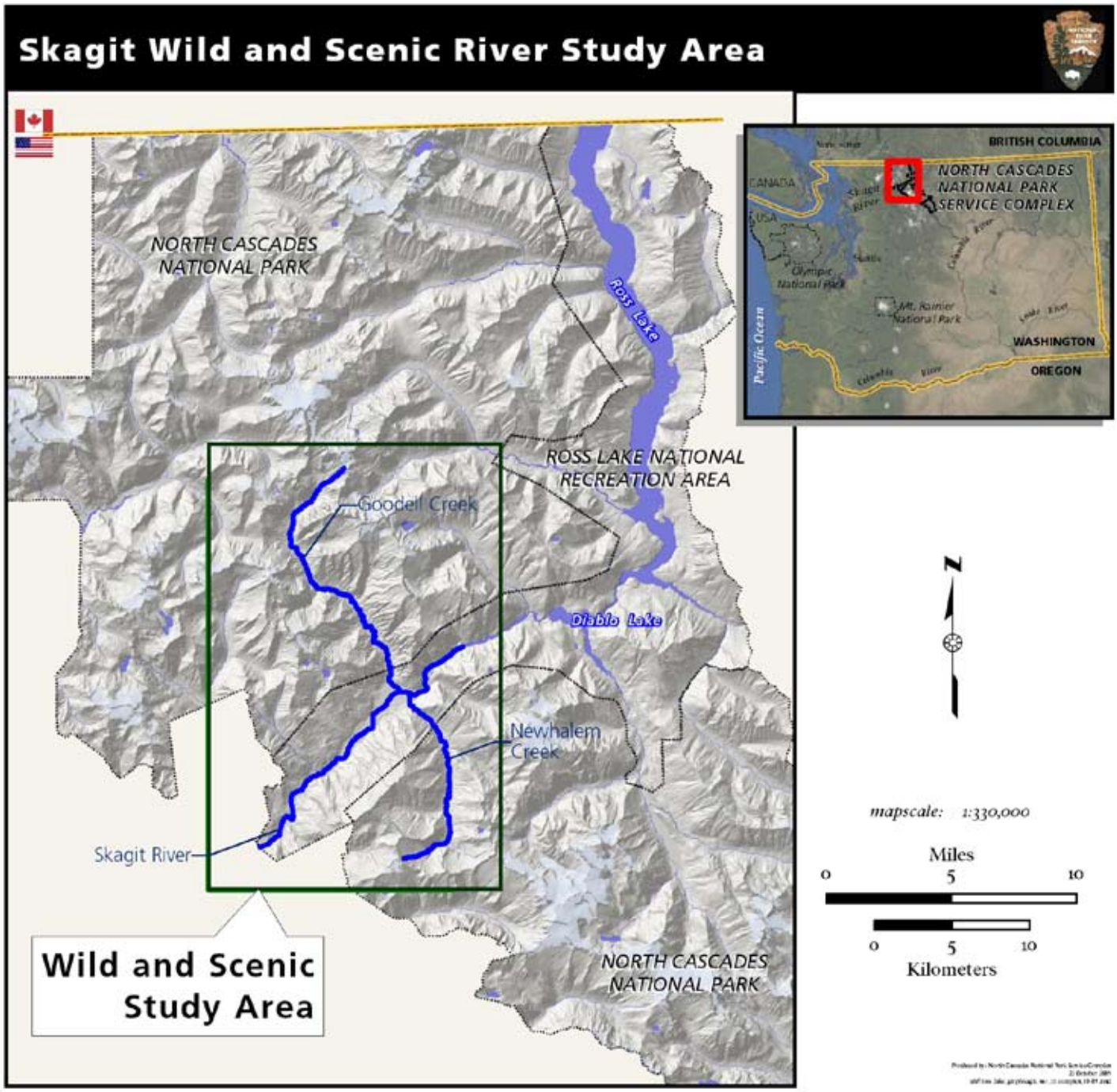

Figure 1. Skagit Wild and Scenic River Study Area

and seasonal basis. The project is also managed to protect fishery resources with different flow requirements for different life stages of anadromous fish species. The flow regime is a complex, model-based arrangement with minimum and maximum flows as well as ramping rates designed to meet the needs for fishery resources while also maximizing hydroelectric power operations. While the flows are managed for hydropower generation and to protect fishery resources, they do not mimic the natural hydrography. The Settlement Agreement for relicensing this hydroelectric project was considered a national model for river conservation and outlined several key environmental and recreational improvements including:

- Releasing flows to meet the important life stage needs of salmon and steelhead trout
- Reducing daylight downramping rates to reduce stranding of salmon fry
- Funding habitat acquisition and restoration of estuary areas to help restore Chinook salmon and bull trout
- Acquiring lands for important wildlife habitats
- Providing annual funding for environmental research, studies, and monitoring
- Providing funding for cultural resource mitigation
- Funding the development of the Environmental Learning Center on Diablo Lake
- Rehabilitating recreation facilities

SCL also owns and operates a small hydroelectric project on Newhalem Creek. This project consists of a ten foot high diversion dam, penstocks, and a powerhouse. This 2.3 MW hydroelectric project diverts water from Newhalem Creek, which then is used for generation and returned to the Skagit River via a man-made channel. The project has been in place since 1921 and was originally built to provide power to Newhalem town site while the construction of the Skagit River hydropower projects was underway. The project was relicensed in February 1997. Minimum flows vary by different times of the year to protect the fishery resources. Ramping rates also limit flow fluctuations. Salmon are prevented from going up the tailrace channel by a concrete

The Skagit River is often referred to as the 'Emerald Skagit' due to its clear blue green water.

barrier put in place as a requirement of the last license.

River Bank Alteration and Shoreline Development

The North Cascades Scenic Highway parallels the Skagit River through the study area. Efforts to protect the road include riprap in several short segments constructed during the State Department of Transportation's maintenance operations. In the segment below the powerhouse to Ross Lake NRA boundary approximately three miles or 15-percent of the shoreline contains some kind of modification. This includes rip-rap located on the north-side of the river. There are four bridges spanning the Skagit River:

- a vehicle bridge right below the powerhouse (RM 94.2)
- a pedestrian bridge directly below the powerhouse (RM 94.12)
- a pedestrian bridge in Newhalem (RM 93.75)
- a vehicle bridge to the NPS Visitor Center (RM 93)

There is also an old bridge abutment at RM 86. In addition, there are two powerlines in the study area vicinity. The highway also cross the Skagit River tributaries on the north side including Goodell, Babcock, Thornton, Damnation, and other unnamed creeks.

Flow Conditions of Specific River Segments

Segment 1. Gorge Dam to Gorge Powerhouse (RM 96.63 to RM 94.18)

There is no minimum flow in this 2.5 mile reach and it remains dry or with limited water much of the year. Water from Gorge Dam is piped through penstocks to generate hydroelectric power and released below the Gorge Powerhouse. Tributaries including Afternoon, Falls, and other unnamed creeks, as well as occasional spills, feed this reach. The flow regime does not support flow-dependent ORVs or water quality requirements; therefore this reach does not meet the definition of free-flowing.

Segment 2. Gorge Powerhouse to Ross Lake NRA Boundary (RM 94.18 to RM 83.1)

The flows are returned to the river at the Gorge Powerhouse, and the Skagit again becomes a powerful river. As mentioned in the Skagit River hydrology section above, the river flows are managed by the hydropower dams. While the flow regime is not natural, they are managed to protect and enhance significant fishery resources. Once reservoirs fill in spring, summer runoff in the river becomes more natural. This reach meets the free-flowing requirements of the WSR Act.

Tributaries

The headwaters of the tributaries of the Skagit River in this reach are located in the North Cascades National Park; their river segments enter Ross Lake NRA in their lower stretches and then drain into the Skagit River. The tributaries are fed by glaciers and contain primarily natural banks. There is one low-head dam and hydropower facility on Newhalem Creek which is not operated in the dry summer months to allow for protection of natural resources. The presence of a low-head dam does not automatically bar a river segment from inclusion in the WSR system. This diversion was found to not significantly impact the free-flow character of the river system. The other tributaries are free of dams and have limited human made features such as rip-rap and bridge crossings. Therefore, all of the tributaries of the Skagit within the study area were found to meet the free-flowing requirement of the WSR Act.

Outstandingly Remarkable Values

The second criteria that a river must meet to be eligible for inclusion in the WSR System is that it must possess one or more Outstandingly Remarkable Values (ORVs). The Interagency Wild and Scenic Council's technical report, "The Wild and Scenic River Study Process", provides guidance on evaluating eligibility and identifying ORVs. This is the current guidance used by all four agencies that make up the council – the NPS, Bureau of Land Management (BLM), United States Fish and Wildlife Service (USFWS), and USFS; this report adheres to this guidance as well.

An ORV is defined as a river-dependent feature that is unique, rare, or exemplary at a comparable regional or national level. Typically, a "region" is defined on the scale of an administrative unit, a portion of a state, or an appropriately scaled physiographic or hydrologic unit. To be considered river-dependent, a value must be located in the river or on its immediate shorelands and contribute substantially to the functioning of the river ecosystem or owe its location or existence to the presence of the river. A determination of whether or not a river area contains

ORVs is based on the professional judgment of the interdisciplinary study team utilizing criteria set forth in the WSR Interagency Council's technical paper.

Fish

The Interagency WSR Council's guidance for outstandingly remarkable fish resources are:

- Fish values may be judged on the relative merits of either fish populations or habitat – or a combination of these river-related conditions.
- Populations: The river is nationally or regionally an important producer of resident and/or anadromous fish species. Of particular significance is the presence of wild stocks and/or federal or state listed or candidate threatened endangered or sensitive species. Diversity of species is an important consideration and could, in itself, lead to a determination of outstandingly remarkable.
- Habitat: The river provides exceptionally high quality habitat for fish species indigenous to the region of comparison. Of particular significance is habitat for wild stocks and/or federal or state listed or candidate threatened endangered or sensitive species. Diversity of habitats is an important consideration and could, in itself lead to a determination of outstandingly remarkable.

The Skagit River system is one of the few remaining systems in the contiguous states which supports significant numbers of five native salmon species, two species of trout, and two species of char, and several racial sub-groups or stocks. These include six Chinook stocks (spring, summer, and fall), pink salmon, coho salmon, chum salmon, and sockeye salmon; summer and winter run steelhead; sea run cutthroat trout; and Dolly Varden and bull trout. Of these stocks, all season-specific Chinook, sockeye, coho, and steelhead species are under review by state and federal agencies for potential listing under the Endangered Species Act. The Skagit is also one of the few rivers, in the lower 48 states, supporting a natural fishery. The system's fishery produces an average of 2,210,000 anadromous fish each year. Of this number, about 500,000 return to spawn; the balance is harvested by commercial and sport fishermen or by natural predators in the Pacific Ocean. These numbers of fish represent a significant percentage of the Puget Sound anadromous fish harvest (approximately between 20-percent and 30-percent).

The study reach of the Skagit River provides some of the most important salmon and steelhead spawning habitat in the Skagit River basin. This section is highly conducive to the migration, spawning and rearing of both anadromous and resident fish. Factors contributing to the high-quality water in the Skagit include high dissolved oxygen content, relatively low nutrient level, low bacterial content and relatively cool temperatures.

Endangered Species Act Listed Species

Three species of fish are listed under the federal Endangered Species Act in the Skagit system: Chinook salmon, bull trout, and steelhead trout.

Chinook Salmon - The Puget Sound Chinook Salmon Evolutionarily Significant Unit was listed as a threatened species on March 24, 1999 by the National Marine Fisheries Service under the federal Endangered Species Act. Chinook salmon stocks originating from the Skagit River have been in a long-term decline. Chinook catches in the Skagit terminal area have declined since at least 1935; ranging from 40,000 to 50,000 in the 1930s, dwindling down to annual catches of a few thousand or even hundreds during the 1990s. Return/spawner rates have been below average since brood year 1983. Since about 1984, upper Skagit summer Chinook have made up an increasing percentage of the total escapement. Prior to 1984, approximately 60-percent of the summer and fall production unit escapement was comprised of upper Skagit summer Chinook, yet, since that time, upper Skagit summer Chinook have averaged about 75-percent of the total summer and fall production unit escapement.

This section of the Skagit River primarily supports all fresh water life history stages (egg, fry, juvenile rearing, and adult spawning) of one of the six separate Skagit Chinook populations (upper Skagit summer Chinook). Upper Skagit River summer Chinook spawn in the Skagit main-stem and its tributaries upstream of the Sauk River, primarily from September through early October. Genetic analyses have shown that upper Skagit summer Chinook is significantly differentiated from other Skagit Basin Chinook populations. Along with the main-stem Skagit, Goodell Creek provides critical habitat for Chinook salmon.

Bull Trout - The Coastal Puget Sound Distinct Population Segment of bull trout was listed as a threatened species under the Endangered Species Act on November 1, 1999 by the U.S. Fish and Wildlife Service. The Puget Sound Management Unit consists

of eight core areas, each supporting one or more local populations of bull trout and their habitat. The Coastal-Puget Sound Distinct Population Segment of bull trout occurs in a unique ecological setting because it supports the only known anadromous forms of bull trout in the contiguous United States.

This section of the Skagit River is part of the Lower Skagit core area and supports bull trout that exhibit anadromous, fluvial and resident life history patterns. Three local populations (Bacon Creek, Goodell Creek and Newhalem Creek) spend a portion of their lives in this section of river. The population trend of the lower Skagit bull trout is stable to increasing. In addition to the main-stem, Goodell Creek and the lower portions or Alma and Newhalem Creek provide critical habitat for bull-trout.

Steelhead Trout -The Puget Sound Distinct Population Segment of steelhead was listed as a threatened species under the federal Endangered Species Act on May 11, 2007 by the National Marine Fisheries Service.

This section of the Skagit River supports all fresh water life history stages (egg, fry, juvenile rearing, and adult spawning) of both summer and winter steelhead. In 2002 the Main-stem Skagit/tributaries winter steelhead was rated as depressed due to a long-term negative trend in escapements since 1992 and a short-term severe decline in 2000 and 2001.

Conclusion

This section of the Skagit River drainage is one of the few remaining river systems in the contiguous states which support significant numbers of all five species of salmon, two species of trout, and two species of char. It is one of the most important river systems in Washington for salmon. The three federally listed species: Chinook salmon, steelhead trout, and bull trout use this section for spawning and rearing. In addition to the main-stem, Goodell Creek is important for salmon and bull trout. The quality of the habitat, abundance and variety of wild anadromous and resident fish, and the presence of three federally listed species in this section of the Skagit River and Goodell Creek contribute to the determination of ORV with regard to "fish".

The fishery habitat and use is limited in the other tributaries due to the steep terrain and barriers present, therefore "fish" was not found to be an ORV for the remaining tributaries.

Wildlife

The Interagency WSR Council's guidance for outstandingly remarkable wildlife is:

> Wildlife values shall be judged on the relative merits of either terrestrial or aquatic wildlife populations or habitat - or a combination of these conditions.

- Populations: The river or area within the river corridor contains nationally or regionally important populations of indigenous wildlife species. Of particular significance are species considered to be unique, and/or populations of federal or state listed or candidate threatened, endangered and sensitive species. Diversity of species is an important consideration and could in itself lead to a determination of outstandingly remarkable.
- Habitat: The river or area within the river corridor provides exceptionally high quality habitat for wildlife of national or regional significance, or may provide unique habitat or a critical link in habitat conditions for

The Skagit River watershed is an important basin for salmon. Pink salmon swimming in Goodell Creek.

Kids get a close look at sockeye salmon.

federal or state listed or candidate threatened, endangered and sensitive species. Contiguous habitat conditions are such that the biological needs of the species are met. Diversity of habitats is an important consideration and could, in itself, lead to a determination of outstandingly remarkable.

Surrounded by several million acres of designated wilderness, the Skagit River corridor provides essential habitat for a diverse array of wildlife species. Over 60 species of mammals, 125 bird species, 12 amphibians, and four reptile species inhabit the study segment and corridor. These lands are home to animals that require large tracks of land to survive, such as grizzly bears and gray wolves.

The Skagit River corridor, with its abundance of spawning anadromous fish and mild climate, hosts the largest concentration of over-wintering bald eagles in Washington.

With its broad hardwood floodplain of black cottonwood, red alder, big leaf maple and several species of willow, the Skagit River supports bird species rare elsewhere in western Washington such as veerys, Nashville warblers, American redstarts, and lazuli buntings.

Endangered Species Act Listed Species:

Within the Skagit River corridor, two mammal species are listed under the federal Endangered Species Act. These include the "endangered" gray wolf (*Canis lupus*) and the "threatened" grizzly bear (*Ursus arctos*). Two bird species, marbled murrelet (*Brachyramphus marmoratus marmoratus*) and northern spotted owl (*Strix occidentalis caurina*), are both listed as "threatened". There is also one 'Candidate' species, the fisher (*Martes pennanti*). Additionally, two 'monitor' species, both recently delisted, include bald eagle (*Haliaeetus leucocephalus*) and peregrine falcon (*Falco peregrinus*). Harlequin ducks are also listed as a State Species of Concern.

Gray Wolf and Grizzly Bear - These two species were listed on March 11, 1967; the gray wolf was listed as 'endangered' and the grizzly bear as 'threatened'. Both species required large tracks of undisturbed land to meet their ecological needs. Small numbers of gray wolves persist within the North Cascades, as evidenced by annual observations. The Skagit River corridor is within the North Cascades Grizzly Bear Recovery Zone and provides important spring foraging habitat for this species. The current grizzly population estimate for the North Cascades is believed to be less than 35 individuals.

Marbled Murrelet - The U.S. Fish and Wildlife Service listed the murrelet as a 'threatened' species on October 1, 1992. USFS surveys, conducted in the early 1990s, documented murrelets nesting in suitable habitat within the Skagit River watershed. Baseline surveys are currently being conducted in the Skagit River and preliminary results suggest murrelets are using the area.

Northern Spotted Owl - Listed as 'threatened' on June 26, 1990, the Northern Spotted Owl occupies mature/old-growth Douglas-fir / western hemlock forests that have multi-layered, multi-species canopies with moderate to high canopy closure. Surveys completed in 1996 by National Park Service staff documented five owl activity sites within the upper Skagit River reach. Newhalem Creek is home to two of these sites.

Bald Eagle - This species was delisted in July 2007. Occupied nests are now being monitored by federal and state agencies to ensure that the post-delisting monitoring plan goals are met and the species continues on its recovery path.

The Skagit River has one of the largest wintering bald eagle concentrations in the contiguous states. Eagles arrive in November to take advantage of the numerous spawning salmon using the Skagit. The bald eagles feed on the carcasses of salmon which die after spawning. Mild winter weather enables these eagles to continue using this area throughout the winter. They depart the Skagit River for the breeding grounds in early March.

Servheen (1975) documented the Skagit River as the most important wintering habitat for bald eagles in the continental United States. The Nature Conservancy and the NPS have monitored eagle use of the upper Skagit River since 1978. Eagle use of the river peaked in the early 1990s and has been stable since that time. The upper Skagit River continues to be an important wintering resource for this species. In addition to the main-stem, bald eagles also use the tributaries where salmon are present to forage and for night roost habitat.

Peregrine Falcon - Bjorklund (1984) surveyed suitable habitat within the Skagit River watershed. While he surveyed many highly suitable areas of breeding habitat, he did not observe any peregrines during

the breeding season. Peregrines have recovered dramatically over the past two decades and were removed from Endangered Species Act protection on August 25, 1999. Washington Department of Fish and Wildlife biologists, conducting surveys of breeding habitat over the last several years, have documented four active eyries along the upper Skagit River.

Other Species of Interest

Harlequin Duck - The harlequin duck is a medium size duck who breeds on fast-flowing streams and winters along rocky coastlines in the crashing surf. It is federally listed as a species of concern and is found in the tributaries of the Skagit River watershed, including Goodell and Newhalem in this reach of the river.

American Dipper - The American dipper is North America's only truly aquatic songbird. It catches all of its food underwater in swiftly flowing streams by swimming and walking on the stream bottom. The American dipper is found in the Skagit River Watershed and prefers the tributaries, particularly Goodell and Newhalem in this river reach.

Black Swift - The black swift is the largest of Washington's swifts. Its nests are often located behind waterfalls or on damp cliffs, where the environment is dark, wet, steep, and inaccessible to predators, and which provides the swifts with an unobstructed flyway to approach the nest. This highly specialized nesting habitat results in patchy distribution of Black Swifts. They eat insects and forage in the open sky over mountainous areas or cliffs. The North Cascades NPS Complex contains one of the greatest population concentrations of black swifts in the contiguous states. It is believed that one or two pairs may nest in the Big Devils waterfall on unnamed creek #1851.

The Skagit River has one of the greatest concentrations of bald eagles in the contiguous United States. They spend winters here using the spawning salmon as a food source.

Species that Breed in Skagit River System

There are also a number of species that breed in the cottonwood overstory in Skagit River system that are otherwise rare in Western Washington. This includes American Redstart, Veery, Lazuli Bunting, Nashville Warbler, and Red-eyed Vireo.

Conclusion

The upper Skagit River corridor has one of the largest concentrations of bald eagles in the contiguous states. In addition, the quality and abundance of cottonwood overstory habitat make it possible for several other species to breed in western Washington (American Redstart, Veery, Lazuli Bunting, Nashville Warbler, and Red-eyed Vireo) where they are otherwise rare or not found at all. Goodell and Newhalem Creeks are important tributaries in Western Washington for a diversity of wildlife species including the harlequin duck and American dipper. Therefore, "wildlife" is deemed to be an ORV in this segment of the Skagit River, Goodell Creek, and Newhalem Creek.

The study section of the upper Skagit River also provides essential habitat for a diverse array of wildlife including four listed and one candidate species. However grizzly bear, gray wolf, marbled murrelet, northern spotted owl, and peregrine falcon are not river-dependent; therefore are not ORVs.

Geology

The criteria used by the interagency WSR council states:

> The river or the area within the river corridor contains an example(s) of a geologic feature, process, or phenomena that is rare, unusual, or unique to the region of comparison. The feature(s) may be in an unusually active stage of development, represent a "textbook" example, and /or represent a unique or rare combination of geologic features (erosional, volcanic, glacial, and other geologic structures).

The North Cascades Mountains, a relatively young range, are some of the most rugged in North America. Ice age glaciers left a legacy of jagged peaks,

deep valleys, and craggy skyline profiles throughout the northern Cascades. Alpine glaciers and much larger Cordilleran ice sheets took turns shaping the watershed, with local alpine glaciers having the largest effect on the landscape. The history of the Skagit River is unusual in that geologists believe the upper river once flowed north to the Fraser River, before being captured by the lower river and draining into Puget Sound. Continental glaciers flowing south out of Canada led to the elimination of a regional divide and the stream capture resulting in the Skagit River reversing its direction. This process created the spectacular Skagit River Gorge and exposed rocks formed deep beneath the surface. Further evidence of this process in the form of gravel terraces can be found downstream of Gorge Dam. The Skagit may be a classic example of how other large rivers in the region formed, including the Columbia, Okanagan, and Fraser River systems.

Several large landslides have impounded the Skagit River in the area between Damnation and Bacon Creeks. The largest of these is the Damnation Creek landslide, which blocked the river from about 8,000 to 6,000 years ago, creating Lake Ksnea. Volcanic ash from the eruption of Mt. Mazama filled the lake Ksnea basin to thickness of forty feet. The landslides represent a unique opportunity to study slope instability as related to river erosion. Macrofossils held in deposits from landslide-dammed Lake Ksnea represent a record of environmental changes from the distant past. Shovel spur rapids (also known as The Portage) occurs where the Skagit River cuts through the dam formed by the Damnation Creek landslide.

The Skagit River drains the most glaciated watershed of its size in the lower 48 states, containing more than 300 active glaciers. The glaciers impart a unique summer color to the river, as well as drought protection during the dry summer months. Glaciers also feed waterfalls that roar all year, unlike many parts of the Cascades, Sierras and Rocky mountains without glaciers where waterfalls are silenced after reservoirs of melting alpine snow are exhausted during summer warmth. High summer flows attract river recreationists as well as fish.

The Skagit River above Bacon Creek contains outstanding examples of alpine scenery created by the activity of glaciers. Spectacular glacial horns, arêtes, cirques and hanging valleys can be found in

Snow-capped Pinnacle Peak also known as the "Chopping Block" is part of the rugged and remote Picket Mountain Range.

the gneiss and granite bedrock of the upper Skagit, particularly in Goodell Creek which includes the southern Picket Range and Newhalem tributaries.

Conclusion
The Skagit River watershed contains many exceptional geologic resources that make them an ORV including:

- the most glaciated river system in the lower 48.
- examples of glacial processes including glaciers, cirques, horns, arêtes, and hanging valleys, particularly in Goodell Creek.
- notable geologic history, particularly how the river once flowed northward and the erosional processes at Damnation creek which created this segment's river rapids, also contribute to the geologic exceptional characteristics.

Prehistoric Resources

The Interagency WSR Council's criteria states:

> The river or area within the river corridor contains a site(s) where there is evidence of occupation or use by Native Americans. Sites must have unique or rare characteristics or exceptional human interest value(s). Sites may have national or regional importance for interpreting prehistory; may be rare and represent an area where a culture or cultural period was first identified and described; may have been used concurrently by two or more cultural groups; or may have been used by cultural groups for rare or sacred purposes. Many such sites are listed on the National Register of Historic Places, which is administered by the NPS.

This reach of the Skagit River possesses abundant evidence of human use spanning at least the last six millennia. The Skagit River and its tributaries were important to prehistoric people. Goodell and Newhalem Creeks in particular were important travel routes into the mountains. Twenty-two total archeological sites that have been inventoried along the river segment include nineteen pre-contact period sites and three historic period sites. At historic contact, this reach of the Skagit River was the traditional home of the Miskaiwhu band of Upper Skagits. The significance of the archeology along this reach should not be underestimated because bands like the Miskaiwhu, who dwelled up-river, in the remote interior distant from saltwater, are the most poorly documented in ethnohistoric records. Archeological investigations, however, help to correct this information void by documenting the long history of Upper Skagit bands' subsistence, settlement, and land use in the mountainous interior.

Two of the nineteen archeological sites have been formally determined to be eligible for listing on the National Register of Historic Places at local and state levels of significance. The two sites are Newhalem Rockshelter (45WH477) and Goodell Raft Launch (45WH64). Both of these sites are protected from vandalism and flooding by several hardening and armoring stabilization techniques; and both are open to public visitation and appreciation for the history they reflect and preserve.

Newhalem Rockshelter, located a short distance upstream from the mouth of Newhalem Creek, preserves evidence of hunting, butchering, and processing of animal and fish resources, particularly native mountain goats, over the last 1500 years. Currently the rockshelter remains the only excavated and evaluated rockshelter in northwest Washington State and it is one of the few archeological sites in the Northwest preserving evidence of mountain goat exploitation. The name Newhalem means 'goat-snare' because Skagit Indians drove goats off mountains and into the snares or traps located near the creek. Newhalem Creek was a travel corridor for Native Americans who moved from Cascade Pass in the mountains to the Skagit River. The shelter was likely located here due to it's proximity to the creek. Salmon remains were also found in this rockshelter.

Goodell Raft Launch, located on the banks of the Skagit River just downstream of Goodell Creek, preserves a 600 year record of Skagit Indian fishing history. This area was known for salmon and trout fishing and it was also a launching point for canoe travel. Located just downstream of Newhalem Gorge which was thought to be impassible by salmon and canoes, this site served as the head of fishing opportunities and canoe travel. The remains of several heating fires used to dry salmon, along with abundant charred salmon bones and stone tools, are stratified between Skagit River flood sands and extend to a depth of two meters below the ground surface. This site is significant for its contribution of new information about Washington State prehistory; presence of salmon remains, head parts, and teeth; and the long history and number of different time periods of use. Salmon remains have been uncovered in coastal areas, but it is unique to find remains this far up a river segment. Since salmon

reach sexual maturity when they spawn and their teeth are enlarged at this time, it is very unusual to find salmon teeth. Given the quantity and quality of salmon remains, it may be possible to use the remains to distinguish among native species. This site is also unique as it represents the first site where the full manufacturing sequence of soapstone from river pebble to decorated object has been found in a single site. This site is currently used as a boat launch, continuing the long history of river-use.

It is important to note that this entire reach of the Skagit River has not been surveyed for cultural resources, particularly the roadless eastern side of this valley segment. Based on both the park's archeological predictive model and the empirical results of previous surveys, it is highly probable that more significant archeological sites remain to be found and assessed in the river corridor segment which could be eligible for the National Register of Historic Places. The NPS also intends to nominate the area of the Skagit River near the mouth of Goodell and Newhalem Creeks as a National Historic District under the National Register of Historic Places.

Conclusion

Pre-history is an ORV for the Skagit River because of the uniqueness of the Goodell Creek site which represents six hundred years of river-use and is the only river site where salmon remains from prehistoric use including teeth and head parts have been found in an interior river segment. The Newhalem rockshelter, an eligible National Register site, is also regionally unique and one of the few rockshelters that have been excavated in Washington State. Newhalem Creek was a travel corridor for Native Americans moving from Cascade Pass to the Skagit River. Salmon remains were found at the rock shelter. Therefore the Skagit River and Newhalem Creek were found to have "pre-history" as an ORV.

History

The Interagency WSR council's criteria states:

> The river or area within the river corridor contains a site(s) or feature(s) associated with a significant event, an important person, or a cultural activity of the past that was rare, unusual, or one-of-a-kind in the region. A historic site(s) and/or feature(s) in most cases is 50 years or older. Many such sites are listed on the National Register of Historic Places.

While explorers, fur traders, and surveyors were the first European Americans to view the upper Skagit River watershed, the first large non-native immigration into the valley came in 1877 on rumors of gold. Miners soon learned that finding the gold was the least of their problems. Difficulties in getting men and equipment in, and getting ore out, negated any potential profits. A few hardy settlers managed to establish simple homesteads in the narrow valleys. In the early 1900s, a second gold rush saw some extraction and processing operations, but these never proved profitable. Neither miners nor farmers could make much of a living along the Skagit.

The most profitable mining operations along the upper Skagit River were for talc or soapstone. The Rainbow Talc Mine was the earliest talc mine in the area. Located on the north side of the Skagit River, it used a number of ledges to extract talc and send it down river in barges. The Skagit Talc Mine was located on the south side of the river east of the Rainbow Talc Mine. The Skagit Talc mine provided talc for walkie-talkies used in World War II. This mine produced refractory bricks, finely ground powder used in cosmetics and fertilizers, and also single blocks, including a single block that formed a bathtub for a wealthy Seattle industrialist. The

This trail leads to an overlook of the Newhalem Rockshelter which was used by Native Americans over 1500 years ago.

products of the talc mines were important for the industry of the Northwest, including logging and ship building. Talc was used as fire-resistant material to make the ovens used by the logging industry and to mark steel used to build ships. Crystal quartz was also profitably mined on the north side of the river in the early 20th century. Volcanic ash was removed by box car loads in the early 20th Century from Damnation Creek.

There were at least six homesteads located on the upper Skagit River between Bacon Creek and Newhalem. Below Bacon Creek the river valley narrowed noticeably and good bottomland was virtually non-existent. Located on high ground above the Skagit River, the present-day town of Newhalem was first developed by N.E. Goodell, an entrepreneur from Portland, Oregon who set up a store for miners in 1879. As the final outpost of civilization before the mountain wilderness, the post rapidly became known as the place to obtain lodging, or to exchange gold for food and supplies. In the 1890's, Ruby Creek had a population of 3,000 to 5,000 people, drawn by the promise of gold. Getting to the upper Skagit was very challenging and required use of a number of different methods of travel – boat, horse, and foot. Steamwheelers and canoes would travel up to the portage where the main rapids on the Skagit begin. From there, miners developed a hazardous route, the Goat Trail that traveled from the portage to the mines up at Ruby Creek. The trail, which was chiseled out of granite alongside the cliff, demonstrates the harsh conditions that miners and settlers endured. The most dangerous section known as Devil's Elbow, required climbing up a 40 foot cliff on a ladder. The adventure to Ruby Creek took three days; while today the route can be driven in a half-hour. The railroad was constructed in the 1920s allowing a safer route to the upper Skagit. In 1897, much of the upper Skagit watershed lands became part of the Washington National Forest Reserve.

SCL Superintendent James Delmage Ross had seen the hydropower potential of the Skagit River as early as 1912. In 1917 SCL received a permit from the Department of Agriculture for a dam at Diablo Canyon, a six mile tunnel, and a powerhouse. Power was necessary to construct this permitted project, and Newhalem Creek was an ideal location for a small hydropower facility that could generate electricity for the larger effort. The first hydropower project to be constructed in the watershed was a small dam on Newhalem Creek that was connected by a tunnel to a powerhouse. A small Westinghouse generator was installed and in August 1921, produced power for the dam, tunnel and powerhouse construction project. A railroad was built from Rockport to Gorge Creek, a distance of 25 miles, because Ross, concerned about encroachment into the valley by private power companies, was reluctant to build a road. Between 1924 and 1952, SCL built three dams on the river; Gorge Dam was completed in 1924, Diablo Dam in 1936, and Ross Dam in 1952. Gorge Dam was later replaced with a higher dam in 1961. These dams are an important part of SCL's hydropower portfolio, producing about 25 percent of the Seattle's power needs.

Two SCL company towns were established to provide residences and communities for the hundreds of SCL employees. The company towns still exist today within the boundaries of Ross Lake NRA. The Skagit Hydroelectric and Newhalem Hydroelectric Projects are on the National Register of Historic Places as significant historic districts. The project was recognized for its innovative design and the towns Newhalem and Diablo represent rare examples of working company towns under municipal ownership. SCL has also been providing tours of the project since its inception, with thousands of people enjoying tours every year. The tours highlight the Skagit Hydroelectric Project and the Ladder Creek falls and garden. Historically, Ross collected trees and plants from around the world and planted them here. A trail was built leading visitors through the garden and close-up view of the falls.

While the idea of a North Cascade National Park was first proposed as early as 1906, the North Cascades Complex – including North Cascades National Park, Ross Lake NRA, and Lake Chelan NRA - became part of the National Park System in 1968 after a number of compromises between interests representing recreation, conservation, hydropower, and highway development.

Exploration of a highway crossing the North Cascades was first appropriated in 1895. However, the North Cascades Highway, which runs through Ross Lake NRA crossing the Cascades and connecting into Eastern Washington, was not opened until 1972. The pass still closes every winter due to high snow levels.

In the 1960's, SCL made plans to raise Ross Dam to accommodate growth in the Seattle area. Construction of a high Ross Dam would have flooded more of Canada. While at first the idea was

accepted, Canadians began to object to the loss of the upper Skagit River, internationally known for trout and fly-fishing. A compromise was reached whereby SCL agreed to drop plans to raise Ross Dam in exchange for the right to buy electric power from British Columbia. A treaty between the two governments was signed in 1984 and extends to 2066.

Conclusion

The history of the upper Skagit River valley was important for mining, hydropower development, recreation and conservation. The talc mines in particular are unique and rare to the region, but not directly river-dependent. The Skagit River and Newhalem Creek Historic Districts are river-dependent and nationally exemplary. For this section of the Skagit River and its tributaries, the town of Newhalem, Ladder Creek Falls, and the Newhalem Dam and Powerhouse are all elements of this historic district. Due to the national uniqueness of the Skagit River and Newhalem Creek Historic Districts, history was found to be an ORV for the Skagit River and Newhalem Creek. Ladder Creek Falls, located just above the Gorge Powerhouse on Ladder Creek, was an important part of the historic Skagit River tours. Given its close proximity to the main-stem and its relationship to the Skagit River Historic District, Ladder Creek Falls is considered a contributing factor in determining history to be an ORV for the main-stem Skagit River. History was considered locally significant for the other remaining tributaries and not found to be an ORV.

Recreation

In order to be considered an ORV, the recreational resource of a river must meet one of the following:

- Recreational opportunities are, or have the potential to be, unique enough to attract visitors from throughout or beyond the region of comparison or are unique or rare within the region. Visitors would be willing to travel long distances to use the river resources for recreational purposes. River-related opportunities could include, but not be limited to, sightseeing, wildlife observation, photography, hiking, fishing, hunting and boating.
- Interpretive opportunities may be exceptional and attract, or have the potential to attract, visitors from outside the region of comparison.
- The river may provide, or have the potential to provide, settings for national or regional usage or competitive events.

The upper Skagit River has been a long-time favorite of fishermen, rafters, and outdoor enthusiasts. With the creation of the North Cascades National Park Service Complex in 1968, that interest increased as the area became better known both regionally and nationally.

Boating

The Skagit River provides a year-round boating opportunity. The most popular times are in August and September; however, scenic winter trips to view bald eagles are also popular. The allure of the Skagit River is its gentle flows and the spectacular scenery; a perfect environment for the first-time rafter or for families with children. The Skagit River is popular with families because of the wild nature of the surroundings, but the generally calm water flow with mild rapids. The river is rated class II-III, with most of the rapids occurring in a short section along the S curves (a.k.a. The Portage). This river segment is often used as a training ground for beginners and experts including the U.S. whitewater team. The Skagit River offers a unique beginner-intermediate run in Washington State which has more opportunities for advanced boaters. The mountain scenery and abundance of waterfowl make the Skagit an attractive nature experience. The bald eagles, present during the winter months, attract visitors seeking eagle tours. The 11-mile river run starts at Goodell Creek Campground site and concludes at the Copper Creek take-out site. Some boaters continue down the Skagit crossing into the wild and scenic stretch through Mount Baker-Snoqualmie National Forest and private land below Bacon Creek. In addition to the Goodell put-in and Copper Creek take-out sites, there is a boat-in only access site at Damnation Creek. This scenic location, along the river's edge, has been a popular stopping point for rafting parties.

Rafters at the 'S' curve rapids on the Skagit River.

The stable summer flows of the Skagit have provided a consistent opportunity for these companies to operate. As other popular white-water rivers in Washington dry-up mid-summer ending the rafting season, commercial rafters and private boaters come to the Skagit.

Fishing

The Skagit River is home to seven species of anadromous fish (five salmon species plus steelhead and cutthroat trout) and freshwater trout and char. Some fishing occurs in Ross Lake NRA, but fishing experiences in the upper Skagit River are typical of other protected areas in Washington State.

Hiking & Climbing

Several short trails offering hiking and educational opportunities are concentrated in the Newhalem area. Trails include: Sterling Munro Trail (330'), River Loop Trail (1.8 mile), "To Know a Tree" Nature Trail, (0.5 mile), Rockshelter Trail (0.75 miles), Ladder Creek Falls (0.6 mile), and "Trail of the Cedars" Nature Walk (0.3 mile). These trails follow the river or one of its tributaries and offer recreational and educational day-trip opportunities.

Longer trails/routes are found in the Goodell Creek, Newhalem Creek, and Thornton Creek watersheds. A trail along an old abandoned logging road follows Goodell Creek and its tributaries; this route is popular among mountaineers climbing the Picket Range. The lower portion of this route is also used by hikers and campers at Upper Goodell Group Campground. A view of the 2003 Goodell Creek landslide can be seen about one-mile up the river. Another trail follows an old abandoned logging road along Newhalem Creek for about four and one-half miles. This relatively flat trail ends at a backcountry campsite and is not popular or regularly maintained. The most popular trail in the study area is up the Thornton Creek drainage to Thornton Lakes. This five and two-tenths mile trail occasionally crosses Thornton Creek and provides mountain views and access to three aesthetic mountain lakes. A side route then leads to Trapper Peak, with views of the rugged Picket Range.

Camping

Newhalem Creek Campground is the largest car camping campground (130 individual sites and several group sites) in the study area and is located on the banks of the Skagit near Newhalem Creek. The campground is located near the town of Newhalem and the NPS Visitor Center, and interpretive trails provide day-trip opportunities for campers. The Goodell Creek Campground, situated in the forest on the Skagit River near the confluence with Goodell Creek, also provides car camping opportunities featuring 21 river-side campsites with scenic views. A picnic shelter and toilet are also available. Additional group campsites are found at Upper and Lower Goodell Group Campgrounds. Backcountry camping opportunities are provided at Thornton Lakes and Newhalem Creek.

Sight-Seeing

Sightseeing or driving for pleasure occurs along the North Cascades Scenic State Highway 20. In 1984, the stretch of the North Cascades Highway through the mountains was designated a U.S. Forest Service National Forest Byway and Washington State Scenic Byway. Drivers stop at overlooks to view the Skagit River and surrounding scenery.

Damnation Creek boat-in acccess site.

Trail of the Cedars Bridge.

Hunting

Some hunting also occurs in this area, primarily for deer and bear.

Canyoneering

Some canyoneering, an adventure sport that involves rappelling down creek canyons, occurs in Thornton Creek and Falls Creek. Little is known about the quality of these opportunities in the upper Skagit River Watershed.

Conclusion

The Skagit River is a regional attraction for boaters and nature lovers. Gentle flows and the spectacular scenery provide a perfect environment for the first-time rafter or for families with children. The whitewater boating run provides a high quality beginner-intermediate run. This is unique to Washington State which has many high quality advance runs, but limited beginner-intermediate runs. The mountain scenery and abundance of waterfowl make the Skagit an attractive nature experience. The reliability of flows in this reach throughout the summer, while many other rivers are to low, adds to its popularity. The Skagit River also provides a unique whitewater training area. Due to all of the reasons above, whitewater boating was found to be an ORV on the Skagit River.

Other recreational experiences in the upper Skagit River and its tributaries were either not directly river-related or were found to be typical of other recreational experiences in protected areas in Washington State; therefore they were not found to be ORVs.

Scenery

Under the Interagency WSR council's guidelines, the criteria for an outstandingly remarkable rating are:

> The landscape elements of landform, vegetation, water, color, and related factors result in notable or exemplary visual features and/or attractions. When analyzing scenic values, additional factors — such as seasonal variations in vegetation, scale of cultural modifications, and the length of time negative intrusions are viewed — may be considered. Scenery and visual attractions may be highly diverse over the majority of the river or river segment length.

The Skagit River watershed is known for its beautiful alpine scenery. Visitors enjoy views of rugged mountains, glaciers, lush forests, spawning salmon, soaring eagles, and rushing waterfalls. The water is sparkling clear with a blue-green color caused by the abundance of glaciers feeding the river.

The lands bordering the Skagit River in this reach are surrounded by the Cascades Mountains, sometimes referred to as the "American Alps." They are managed by NPS and SCL and largely undeveloped, providing for a scenic river float featuring views of mountain glaciers and perennial glacier-fed waterfalls, pristine water, and the only remaining old growth forest along the entire main-stem of the Skagit River.

The North Cascades Highway parallels the river for the entire stretch and can be seen from the river at times when the buffer between the two narrows. In addition, two transmission lines also parallel the river, crossing the main-stem three times and all the north-side tributaries, interrupting natural views.

Goodell Creek and Newhalem Creek are the two creeks that drain u-shaped valleys in the study area; other tributaries drain v-shaped valleys with steep gradients. Goodell Creek begins in the heart of the Picket Range; one of the most rugged, dramatic, and remote ranges in the lower 48. Glaciers from the Picket Range feed this scenic cascading stream. Abundant wildlife and fish call this creek home contributing to its scenic value. This dynamic creek is known as the 'salmon headwaters,' and salmon can be spotted in its crystal clear ponds. An informal route following Goodell Creek and its tributaries is one of the approaches for climbers accessing the remote Picket Range. The roaring sound of the flowing water is enjoyed from the campsites and trail

Hikers along the Goodell Creek route.

along-side the creek, contributing to the aesthetic experience. Creek modifications, due to human impacts, are limited and concentrated in the lower half mile.

A cascading aesthetic waterfall, located about three-quarters of a mile from Newhalem Creek's mouth, is rated as one of the top 100 waterfalls in the northwest by the Northwest Waterfalls website and is one of the most scenic waterfalls in North Cascades NPS Complex.

The other tributaries in the study area have a high gradient, many beginning in the mountain ranges and then draining steep valleys before reaching the Skagit River. A number of waterfalls are found in the tributaries including Big Devils Falls, Granite Gorge Falls, Thornton Falls, Ladder Creek Falls, Ladder Creek Glacier Falls, and Newhalem Creek. While very scenic, these tributaries and waterfalls are similar to numerous other waterfalls and creeks found in the North Cascades NPS Complex and surrounding area.

Conclusion
The Skagit River is a beautiful scenic river with breathtaking views of mountains, forests, fish, wildlife, and clear water. The beautiful clear water, riparian vegetation, waterfalls, mountain views, and wildlife viewing all contribute to make scenery an ORV for the Skagit River. Goodell Creek begins on the vertical steps of the wilderness Picket mountain range, one of the most rugged, scenic and remote massifs in the lower 48 states. The mountain views, numerous cascades, wildlife and fishery resources, and limited human-made features make scenery an ORV for Goodell Creek. The Newhalem Creek waterfall, one of the best waterfalls in the North Cascades NPS Complex and rated as one of the top 100 waterfalls in the northwest, was found to be regionally unique and led to scenery being an ORV for Newhalem Creek.

Ladder Creek Falls.

Other tributaries were found to possess locally scenic features such as waterfalls, but these features were not found to be nationally or regionally unique, rare, or exemplary and thus not ORVs.

Eligibility Determination

The Skagit River from Gorge Powerhouse to the Ross Lake NRA boundary, Goodell Creek, and Newhalem Creek were found to be eligible. They all are free-flowing and possess at least one ORV.

Ineligible River Segments

The Skagit River segment from Gorge Dam to Gorge Powerhouse does not meet the free-flowing requirement and therefore is ineligible. While meeting the free-flowing requirement, the remaining tributaries were not found to possess any ORVs. This assessment was based on available information through staff knowledge and literature research. Varying information was available for these creeks, with most creeks lacking thorough surveys of natural and cultural resources. Creeks located on the south-side of the Skagit River are very difficult to access and in most cases little information was available for these creeks. Therefore, this assessment would be updated in the future if new information is found leading to a change in the analysis. The following streams were not found to possess any ORVs, and therefore are not eligible.

- Afternoon Creek
- Alma Creek
- Babcock Creek
- Copper Creek
- Damnation Creek
- Falls Creek
- Martin Creek
- Thornton Creek
- Sky Creek

and unnamed creeks

- #1826
- #1843

- #1849
- #1851
- #1853
- #1854
- #1857
- #1860
- #1865
- #1965
- #1966

Ladder Creek was also not found to be eligible. This creek is free-flowing and while Ladder Creek Falls is a contributing factor in the historic district of the Skagit River Hydroelectric project, a nationally unique historic resource, the falls is located near the mouth of the Skagit and is associated with the main-stem history ORV determination.

Classification

After determining the river's eligibility for inclusion in the WSR System, the next step is classifying the river into the appropriate category – wild, scenic, or recreational. Classification is largely based on the extent of human development at the time of designation. The three classification categories are defined in Section 2(b) as:

Wild river areas -Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Scenic river areas - Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely undeveloped, but accessible in places by roads.

Recreational river areas - Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Elements of Classification

The Interagency WSR Council's guidelines identified water resource development, shoreline development, accessibility, and water quality as the criteria used to determine classification. Classification is an important distinction because it has a direct effect on how each designated segment is administered and whether certain activities on federally owned land within the boundaries are permissible. Classification grandfathers-in existing development, unless these land use activities are degrading the river's ORVs or water quality. Each classification permits existing development. Future developments that are compatible with the classification and carried out in an environmentally sound manner are also allowed.

Water Resource Developments

There are three hydroelectric projects on the Skagit River at Ross, Diablo, and Gorge Dams. All of these are upstream of the eligible segment (Gorge Powerhouse to Bacon Creek). There is also one small diversion dam located on Newhalem Creek that feeds the Newhalem powerhouse. The Newhalem project consists of a ten foot diversion dam, penstocks, and powerhouse. Flows are diverted from Newhalem Creek to the powerhouse and then returned to the Skagit River. The project has been in place since 1921 and was relicensed in February 1997. Minimum flows and ramping rates vary by different times of the year to protect fishery resources.

Shoreline Development

North Cascades Highway parallels the Skagit River and is a dominant feature on the landscape. Outside the road corridor, the lands surrounding the river are largely undeveloped, with most of the development concentrated above Goodell Creek (See Figure 4). There is only one small town along its banks, Newhalem, with approximately a dozen homes facing the river. There is also a sewage treatment plant that services the town of Newhalem located on the rivers' bank on the west side of the town site. Two powerlines operated by SCL parallel the river, crossing the north-side tributaries and main-stem three times. There are also four bridges spanning the river:
(1) a vehicle bridge right below the powerhouse (RM 94.2),
(2) a pedestrian bridge directly below the powerhouse (RM 94.12),
(3) a pedestrian bridge in Newhalem (RM 93.75), and
(4) a vehicle bridge to the NPS Visitor Center (RM 93).
An old bridge abutment is located at RM 86. The two primary boater access sites on the main-stem are Goodell Creek Campground and the Copper Creek take-out. There is also a boat-in only access

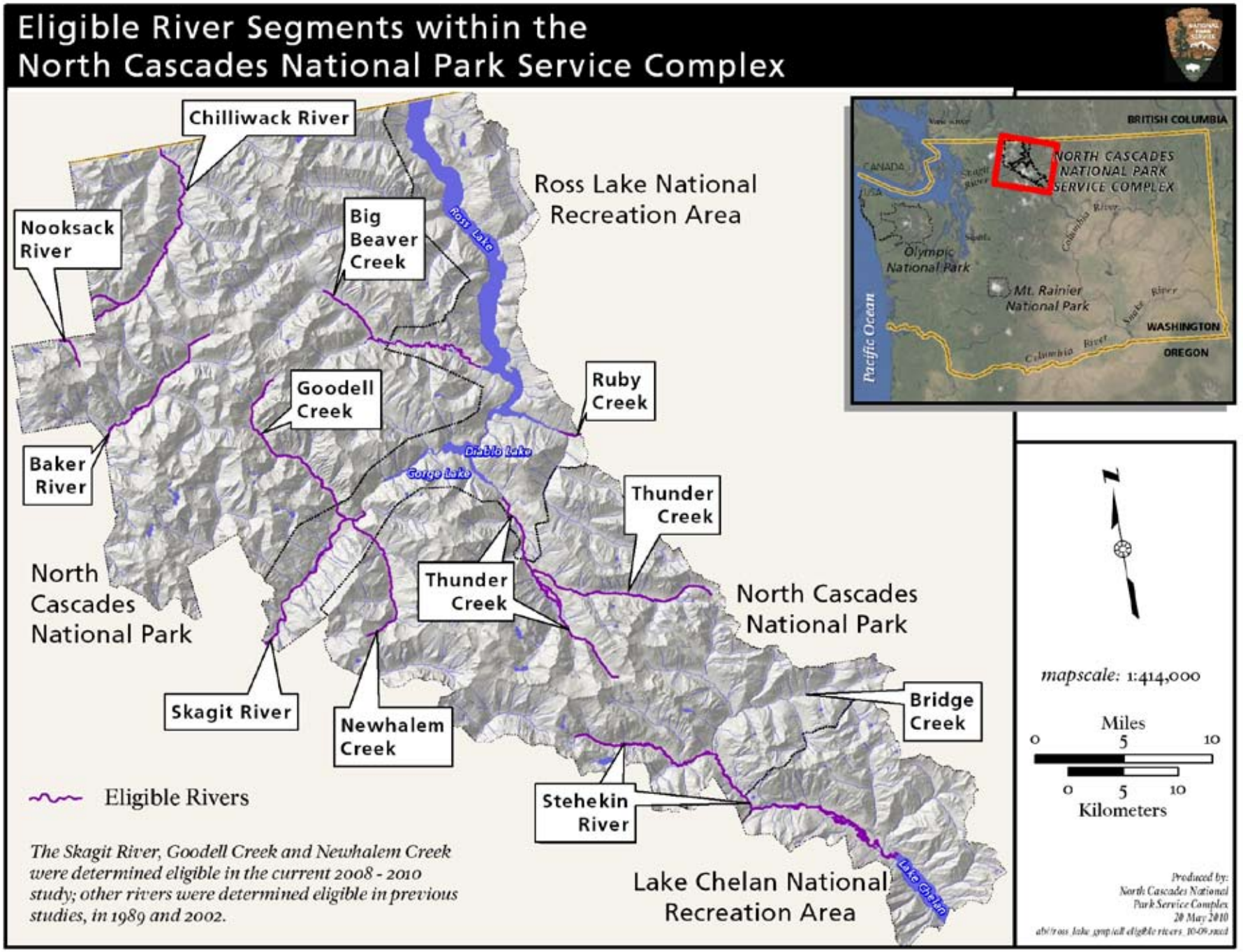

Figure 2. Eligible River Segments within the North Cascades NPS Complex

site at Damnation Creek. Trails concentrated near the town of Newhalem follow the river for short distances. Two main campgrounds are also located along the river – Goodell and Newhalem. Goodell offers 21 river-side campgrounds; while the 130 Newhalem sites are primarily located away from the edge of the Skagit River. In this segment of the Skagit approximately 15-percent (three miles) of the shoreline is modified. This includes rip-rap along the north-side of the river.

The tributaries beginning in the rugged wilderness of the North Cascades Mountains are pristine, with limited shoreline modification concentrated in the lower portions. The North Cascades Highway does cross the north-side tributaries. Access roads also follow Newhalem Creek and Goodell Creek providing access to the lower stretches (See Maps 5 and 6). Two group campsites are located along-side Goodell Creek. Trails also follow Goodell Creek, Newhalem Creek and Thornton Creek. Shoreline modification of Goodell Creek is concentrated in the lower one-half mile. Shoreline modification of Newhalem Creek is concentrated in the lower one mile. There is also an old bridge crossing Newhalem Creek at river mile three.

Accessibility

As mentioned above, the North Cascades Highway follows the Skagit River on its north-side and provides access to the river corridor following it the entire segment. Boat-in access is the primary way to get to the south-side of the river. The south-bank is undeveloped and represents the closest the wilderness boundary comes to the Skagit River. The main river/boating access sites are the Goodell Creek Campground put-in and the Cooper Creek take-out. The river can also be easily accessed in the Newhalem area. There are a few smaller spur roads that provide additional vehicle access to the north side of the river from the highway. In addition, one road crosses the Skagit to provide access to the Newhalem Hydroelectric project, Newhalem campground, and NPS visitor center on the south-side of the river. Established trails in the Newhalem area also provide access to the Skagit River and Newhalem Creek.

While the main-stem Skagit River can be readily accessed by vehicle, reaching its tributaries requires other means of travel. The North Cascades Highway does cross the north-side tributaries providing access to the mouth. A few spur roads and trails provide additional access to the lower portions of the tributaries. Access to south-side tributaries is limited to boat-in and walk-in, with the exception of the area around Newhalem Creek. Goodell Creek spur road provides access to two group campsites located in the lower half mile and an informal trail travels along-side the creek for approximately four and one-half miles. A trail on an old abandoned road also follows Newhalem Creek for about 4.5 miles.

Water Quality

The glacier-fed Skagit River watershed is known for its beautiful clear blue-green water and is often referred to as the "Emerald Skagit" and the "Magic Skagit." Its tributary's headwaters are high in the rugged mountains and glaciers of the area. In late summer these streams carry glacial rock flour that cloud the water and give it a blue-green color. The three hydroelectric dams upstream do have some impact on water quality by warming water and modifying nutrient loading processes; however, SCL manages the project and instream flow rates in a manner to meet the needs of fishery resources. In addition, SCL manages two sewage treatment plants for the towns of Diablo and Newhalem. These treatment plants are operated under the Washington Department of Ecology (DOE) "better than secondary" standards, which represents a high water quality level. Overall, the Skagit River study segment has a relatively low nutrient level, low bacterial content, relatively cool temperatures, and high dissolved oxygen content which contribute to its high water quality.

DOE monitors the Skagit River's water quality, with a station at Marblemount. In the DOE's old classification system, the Skagit River was classified as AA – "extraordinary waters." Under DOE's new classification system, the Skagit River is protected for core summer salmonid habitat and extraordinary primary recreation contact. The core summer salmonid protection includes managing the water quality for salmon spawning, juvenile rearing, and adult-holding during the months from June 15 to September 15. The temperature is monitored to ensure the seven day average temperature does not exceed 16 degrees Celsius (60.8 degrees Fahrenheit). The extraordinary primary recreation contact is the highest standard under the DOE's recreation standard. Under this standard fecal coliform levels must not exceed 50 colonies/100 ml.

Water quality for Goodell Creek is not monitored. The upper watershed is fed by glaciers and is considered pristine. The only impacts are from

air-borne pollutants that fall as snow in the winter. Minor impacts from human features are concentrated in the lower half mile of Goodell Creek. Due to the natural condition of Goodell Creek, the water quality condition is considered to be high. The DOE listed Newhalem Creek as impaired in the 1990's due to inadequate stream flow from the small diversion dam operated by SCL. However, upon relicensing in 1997, the operation was changed and the project is now subject to minimum instream flow requirements to protect fishery resources and is only operated about half of the year. The water quality of the creek is no longer considered impaired and the lower reach supports salmon and bull trout. Since the diversion is fairly small, water quality impacts downstream of the diversion are likely to be minor. Therefore Goodell Creek's water quality is considered high with only minor impacts from the diversion, air-borne pollutants, and erosion from the road and trail use.

Preliminary Classification

Based on the criteria described above, the following classifications apply to the Skagit River and eligible tributaries (See Figure 3):

Skagit River
- recreational – Below the Gorge Powerhouse to Ross Lake NRA boundary

Goodell Creek
- wild – Headwaters to the north-end of the Upper Goodell Campground (river mile 0.5)
- recreational – North-end of the Upper Goodell Creek Campground (river mile 0.5) to the mouth

Newhalem Creek
- wild – Headwaters to upstream of the diversion dam (river mile one)
- recreational – Upstream end of the diversion dam (river mile one) to the mouth

Suitability Evaluation

The WSR Act defines suitability as an assessment of whether eligible river segments should be recommended for inclusion into the National WSR System. It provides the basis for an agency's recommendation to Congress. This suitability analysis utilizes guidance from the Interagency WSR Council and is primarily based on the following four factors:

- The characteristics that make the river segments worthy of designation.
- The ability of NPS and its non-Federal partners to manage the river segments to protect their ORVs, water-quality, and free-flow.
- The compatibility of wild and scenic river designation with other potential uses of the river segments.
- The public's support for designation.

The report also outlines how the National Park Service intends to manage the river system.
The scope of this analysis includes the Skagit River below Gorge Powerhouse to the Ross Lake NRA boundary and its two eligible tributaries in this reach Goodell Creek and Newhalem Creek.

Characteristics that Make the River Segments Worthy of Designation

The Skagit River is a unique and exemplary river system both regionally and nationally. It was found to have a number of ORVs including: fish, wildlife, geology, pre-history, history, scenery, and recreation. In addition Goodell Creek and Newhalem Creek also are exemplary and posses a number of ORVs. Designation of this 11-mile main-stem segment and key tributaries would extend the Skagit WSR System from the downstream end of the Skagit Hydroelectric Project to the town of Sedro-Woolley and would provide more opportunities for holistic watershed management of this river system.

Land Ownership, Uses, Zoning, and Restrictions

Land Ownership and Management

This segment of the Skagit River is located entirely within the Ross Lake NRA, which is managed by the NPS. The majority – 79 percent of the lands within the likely wild and scenic boundary – is owned by the NPS and the other 21 percent are owned by SCL. WSDOT also has a right-of-way for the North Cascades Scenic Highway. Goodell and Newhalem Creek corridors are nearly entirely owned by the NPS. The area is primarily used for recreation, natural resource protection, and hydroelectric operations.

SCL purchased their lands along the Skagit River when constructing the Skagit Hydroelectric Project and when considering development of the proposed

Copper Creek Dam, which would have flooded this reach. The majority of the eligible river segments are outside of SCL's Federal Energy Regulatory Commission's (FERC) boundary. Today, SCL manages these lands primarily for wildlife and fishery management. In addition some of the lands are used for routine maintenance. SCL intends to keep these lands and continue to manage them as they are today. SCL's current management focuses on fish and wildlife resources which would be compatible with the WSR Act.

Since the Skagit River is navigable, Washington State also asserts jurisdiction and ownership over approximately 480 acres of the bed of the Skagit River below the ordinary high water mark.

County Zoning and Shoreline Management

The study area spans both Skagit and Whatcom Counties. The majority of the area in Skagit County is zoned as open space, with small sections between Copper Creek and the Ross Lake NRA boundary zoned as industrial forest or mineral resource overlay. However, mining and logging are prohibited in the Ross Lake NRA to protect its scenic character. Most of the shoreline in Whatcom County portion of the study area is zoned as conservancy land. In both counties, any non-federal development projects within 200 feet of the shoreline need to undergo shoreline review and obtain a permit or exemption.

Goodell Creek was found to be eligible for inclusion into the National WSR system.

Opportunities and Limitations on Hydropower Development

The Federal Power Act prohibits FERC from licensing hydropower projects in National Parks or National Monuments. New hydropower projects licensed by FERC are allowed in National Recreation Areas, including Ross Lake NRA, unless adverse effects on federal lands would occur. The North Cascades NPS Complex's 1968 enabling legislation allows continued operation of the Skagit and Newhalem Hydroelectric Projects within Ross Lake NRA and any other projects authorized by FERC.

The Washington Park Wilderness Act of 1988 (Public Law 100-668) created Stephen Mather Wilderness, consisting of 642,332 acres of wilderness in the North Cascades Complex, of which 80,043 acres lie within Ross Lake NRA. This legislation also limited hydropower facilities in the Ross Lake NRA to the existing Skagit River and Newhalem Creek Hydroelectric Projects, as well as proposed Copper Creek, High Ross, and Thunder Creek projects. Thus, all other hydroelectric projects are prohibited in the North Cascades NPS Complex.

Mining & Logging Restrictions

Currently, mining and logging are prohibited in the North Cascades NPS Complex. These prohibitions were in place to protect the scenic character of this area. These restrictions will continue to protect the proposed Skagit WSR Corridor.

Projects and Plans that are Enhanced, Curtailed, or Foreclosed Due to WSR Status

Suitability studies must assess the potential effects of WSR designation on the goals of tribes, non-governmental organizations, other local, state, and federal agencies, and the public. This determines what other potential uses of the river may occur in the foreseeable future and if WSR designation would benefit or conflict with these uses. This helps planners and managers decide which management

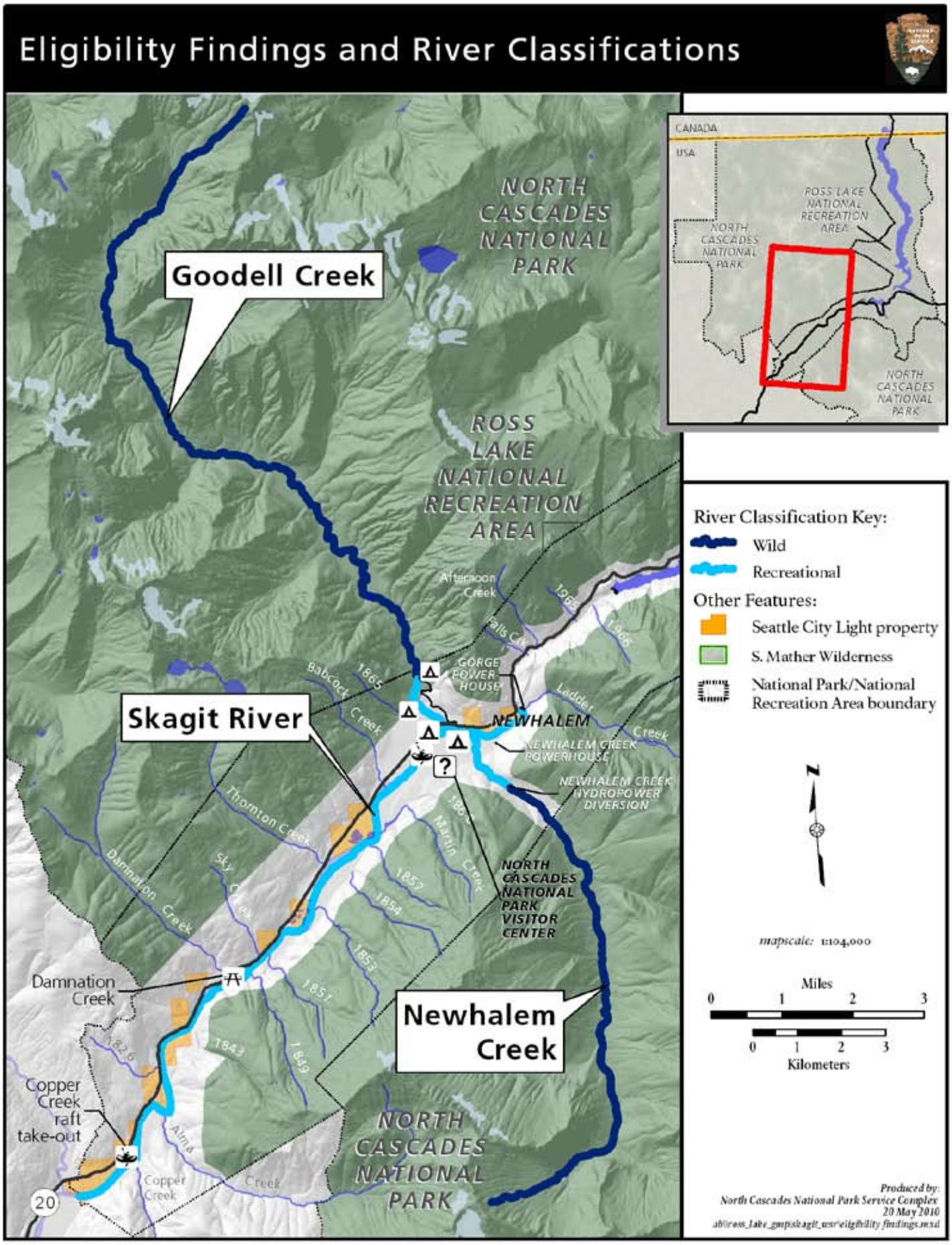

Figure 3. Eligibility Findings and River Classifications

action is best suited for the river and the public. This section discusses other relevant plans and projects and their compatibility with WSR designation.

WSR Water Resource Project Evaluation (Section 7)

The intent of the WSR Act is to preserve rivers from harmful effects of water resource projects. The WSR Act prohibits any new federally licensed hydropower dams on designated river segments. It also creates a process for evaluating/determining if other water resource projects have adverse impacts to the river and its special resources. This section describes that evaluation process, types of projects subject to this evaluation, and any known or likely projects in the foreseeable future that could be affected.

Projects that are subject to a Section 7 evaluation under the WSR Act have to be:

- federally assisted projects (undertaken, permitted, or funded by a federal agency) and
- located within the high water mark of a river bed

The baseline condition for all such analysis is the condition of the river and its resources at the time of designation. Continued operations of existing water resource projects would not trigger a Section 7 evaluation/determination. Generally, best practices involve conducting a river corridor reach analysis to understand the channel geomorphology before implementing site-specific water resources projects. The following is a sample of the types of water resource projects that could potentially be affected by designating the Skagit River, Goodell Creek, and Newhalem Creek as wild and scenic rivers.

Dams and Hydropower Projects

In the 1970s, SCL had proposed to build a dam near Copper Creek that would flood the study reach section. These plans have since been abandoned. No other proposals of dams or hydropower facilities are known to exist in the foreseeable future. As mentioned above, the Washington Wilderness Act limited potential hydropower projects in this stretch of the upper Skagit River to include the existing Skagit River and Newhalem Creek Hydroelectric Projects as well as the proposed Copper Creek Dam. While there are no current proposals for dams in this reach, a wild and scenic river designation would prevent any new dams, hydroelectric projects, and related project facilities from being constructed in the study area in the future.

The continued operation of the existing hydroelectric projects would not trigger an evaluation/determination under the WSR act. Relicensing or amendments of these projects that involved changes to the operation or facilities would trigger this analysis. The baseline for this analysis would be the conditions of the river and its resources at the time of designation which includes the current operation of the hydroelectric projects. For projects upstream or on a tributary to a designated reach, the standard used in the evaluation is if the project would 'invade' (encroach upon or intrude) or 'unreasonably diminish' the rivers' resources. SCL is pursuing an amendment of the Skagit River Hydroelectric Project to develop a new Gorge tunnel. This project is not expected to affect the flows in the Skagit River.

Bank Stabilization

There are no known bank protection projects proposed in this reach. In designated WSR segments, federally assisted water resources projects need to be evaluated to ensure there are no adverse effects on the free-flowing character, water quality, and ORVs of the river segment. It is likely that bank stabilization projects will be proposed by the NPS, WSDOT, and/or SCL in the future to protect current infrastructure, fishery resources, recreation resources, or cultural resources. These projects would need to be evaluated to ensure no adverse impacts occur. Corridor reach analyses that evaluate the geomorphology of the river would help inform location, size, and type of appropriate bank stabilization for the river segments. Bioengineering and natural protection methods are encouraged in WSR reaches. Guidance on important resources to protect, process for determining bank stabilization, and type of acceptable methods would be outlined in the Comprehensive River Management Plan.

Road and Bridges

The NPS proposes to replace the existing bridge over the Skagit River, near Newhalem Creek and providing access to the visitor center, with an expanded bridge that would accommodate two-way vehicle traffic, pedestrian access, and interpretive platforms. An analysis of the bridge replacement would be conducted to ensure it had no effects on the free-flowing character, water quality, and ORVs of the river. Consideration could be given to modifying the bridge without adding to the existing footing and columns in the river corridor. Any other bridge and/or road projects that are located with the high water mark of the river corridors would also need

to undergo a Section 7 analysis to ensure adverse impacts do not occur.

Habitat Restoration

There are no known proposals for water resource habitat restoration projects within the proposed WSR corridors. However, potential projects could include habitat enhancement structures, such as wood or boulders in the river corridors or construction of salmon side channels. A Section 7 evaluation/ determination would need to occur for these projects and this evaluation would identify any adverse effects to the free-flowing character, water quality, and ORVs of the river. The need and goals for fish habitat restoration can be identified in the Comprehensive River Management Plan which would help guide implementation of in-river habitat enhancement structures.

Waste Water Treatment Plant

SCL owns and operates waste water treatment plants for their town sites in Diablo and Newhalem. Continued operation of these plants would not need to undergo a Section 7 evaluation. If the plant undergoes construction within the bed and banks of the river, then this would trigger a Section 7 analysis. Baseline conditions would include the existing operation of these facilities. These facilities are operated to a high standard by Washington State DOE and adverse effects are not anticipated at this time.

Other Non-Water Resource Projects

Other projects and developments that are located outside the high water mark of the river corridors do not need to undergo a Section 7 evaluation/ determination. However, effects of the project should be evaluated to assure that the river values are protected. These types of projects could include transmission lines, vegetation management, and trails.

Salmon Restoration Goals

Salmon are a very important resource for the people in the Pacific Northwest and Puget Sound. The Skagit River is one of the most important river systems in Washington State for natural salmon stocks. It contains the largest and healthiest runs of wild Chinook and pink salmon in Puget Sound. Tribes; conservation organizations; recreation groups; local, state, and federal government; and utilities are all working towards shared goals for salmon recovery. The Skagit Watershed Council was created in 1997 and includes 40 diverse organizations who share the mission to "understand, protect and restore the production and productivity of healthy ecosystems in order to support sustainable fisheries."

Many reports and plans from organizations, tribes, and government agencies have been developed to support salmon recovery. Notably, the 2005 Skagit Chinook Recovery Plan developed by Swinomish Indian Tribe, Sauk-Suiattle Indian Tribe and the Washington State Department of Fish and Wildlife, comprehensively outlines recovery goals and strategies. The plan focuses on Chinook populations, but is also anticipated to benefit other salmon species and fishery resources. This plan was widely deferred to for the Skagit River section of the 2007 Puget Sound Salmon Recovery Plan adopted by the National Marine Fishery Service and by the Skagit Watershed Council. The goal of the recovery plan is to restore Skagit Chinook to optimum levels. The studies found the Skagit River system still retains significant amount of ecological function and high quality habitat which results in healthy populations in Puget Sound. However, the populations are at 50-percent of their historic abundance. The Skagit Recovery plan identified the following factors as limiting Chinook production including: seeding levels (density of spawners and juveniles), degraded riparian zones, poaching, current hydroelectric operations, sedimentation and mass wasting, flooding, high water temperatures, hydromodification or bank modification, water withdrawals, loss of delta habitat and connectivity, loss of pocket estuaries and connectivity, and illegal habitat degradation. For the upper Skagit reach, the plan identified restoring floodplain function and natural banks as very important since this reach has a narrow floodplain with limited opportunity for off-channel habitat. Restoring floodplain function at Bacon Creek and near the town of Newhalem were specifically mentioned. For the rest of this reach, softening existing bank modification with the use of wood and complex structures was recommended as well as protecting existing floodplain habitat free of roads and developments. Previous studies have found that salmon use natural banks five times more often than hardened banks.

The proposed WSR designation would help enhance salmon recovery goals for this reach by creation of a Comprehensive River Management Plan focusing on the river segments and its values. A WSR designation

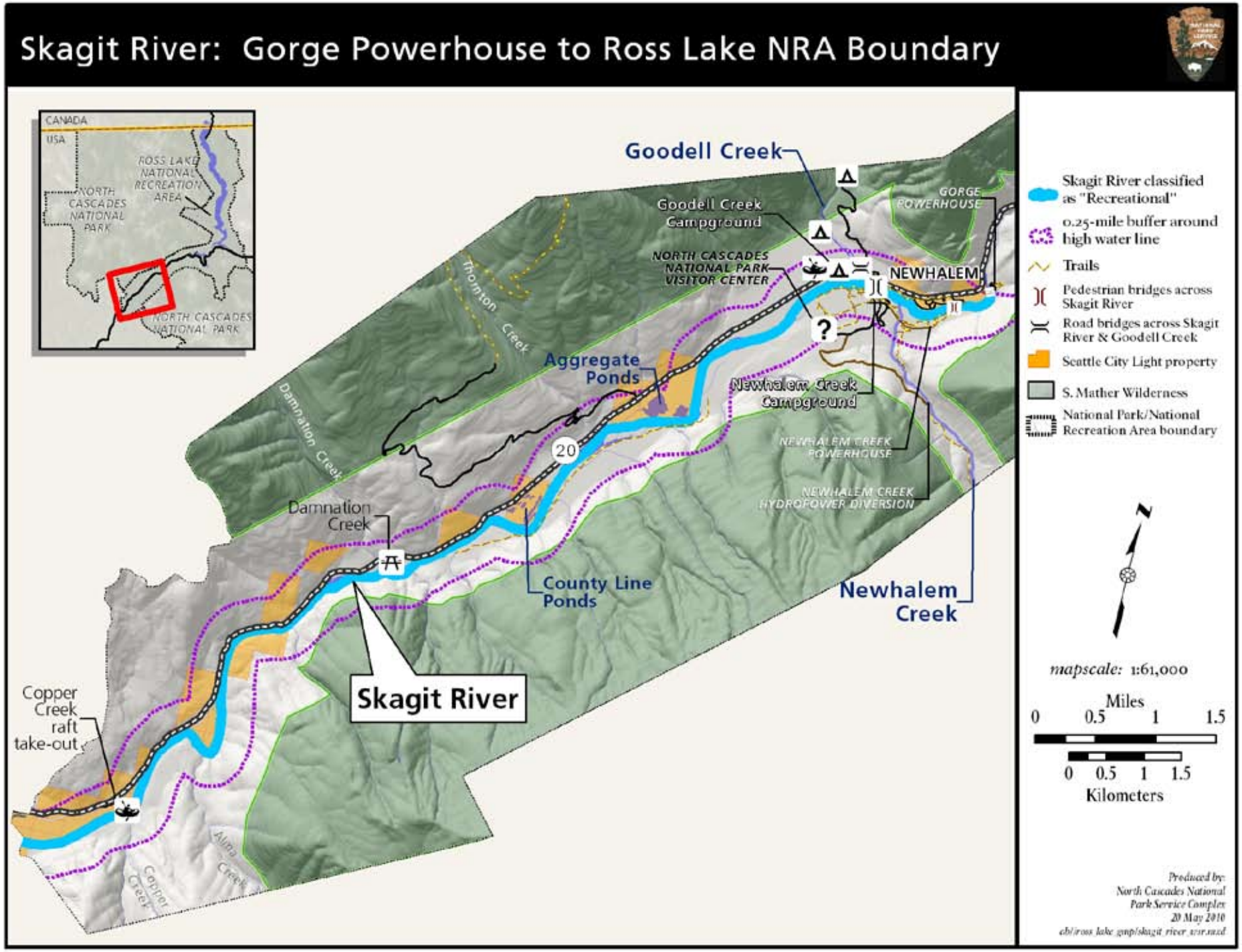

Figure 4. Skagit River from Gorge Powerhouse to Ross Lake NRA Boundary

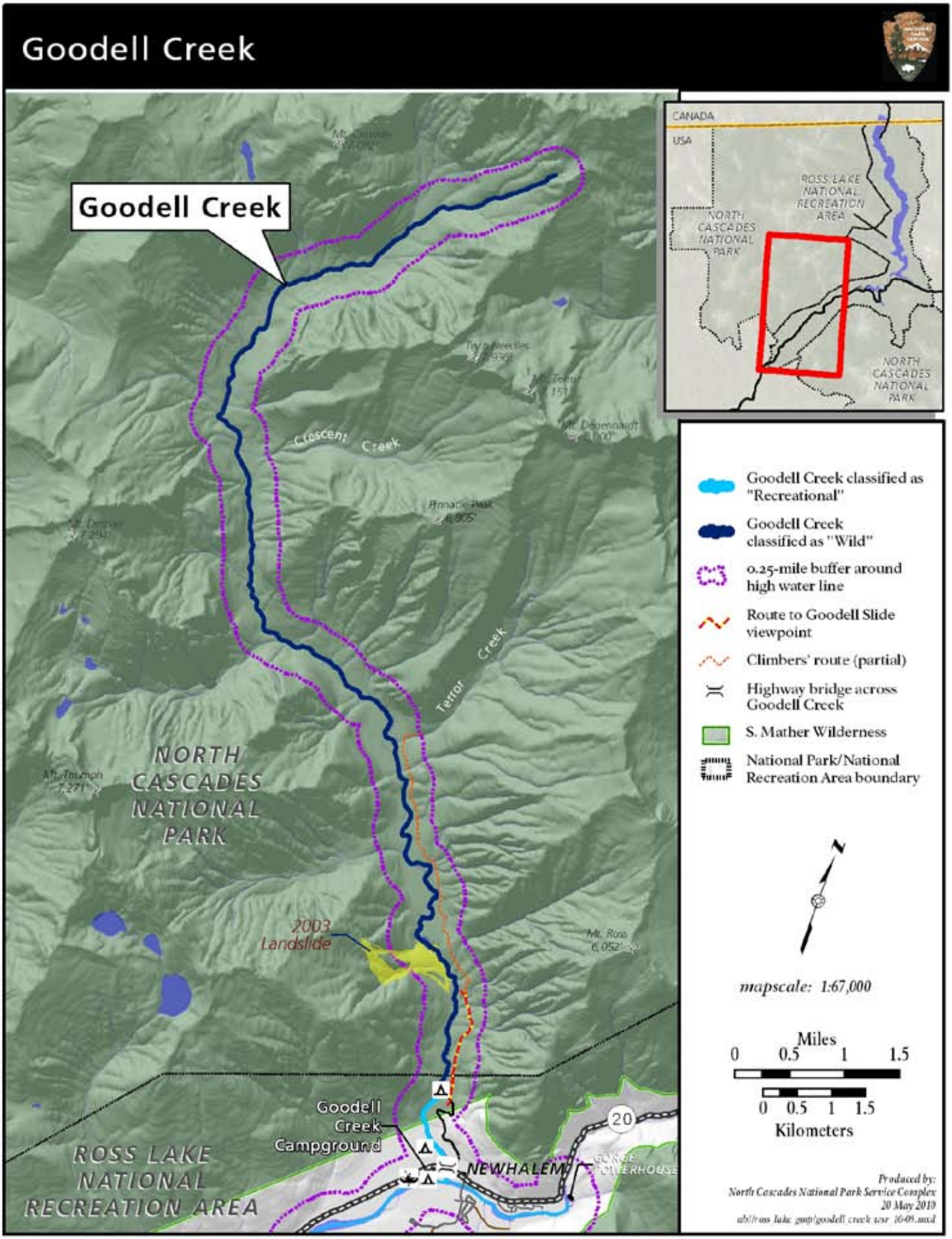

Figure 5. Goodell Creek

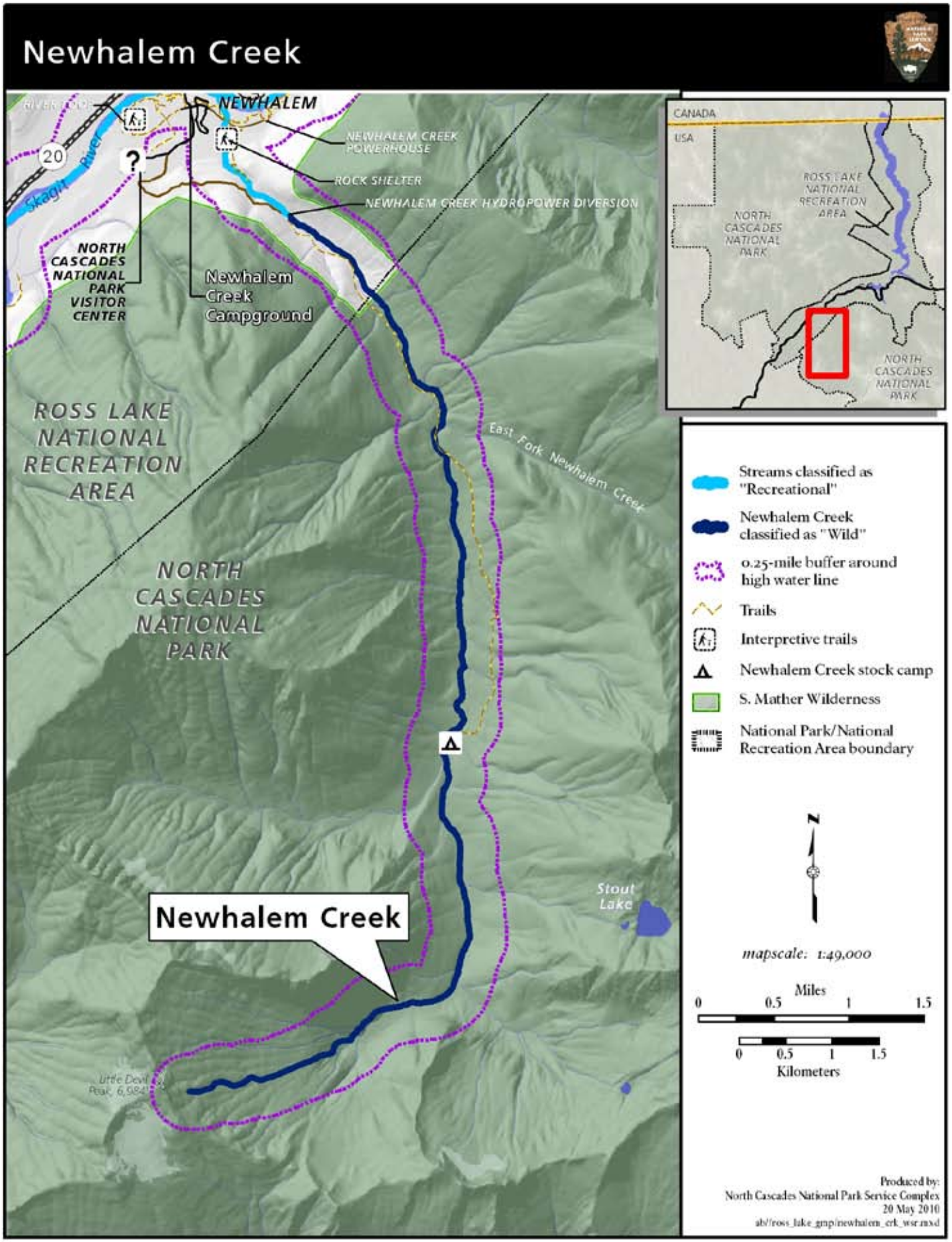

Figure 6. Newhalem Creek

would direct protection and enhancement of salmon fishery as an ORV, prevent further loss of habitat through dam construction, and protect the free-flow character and natural banks of the river segments.

Bald Eagle Protection

The bald eagle was delisted from its threatened status under the Endangered Species Act in 2007 in the lower 48 states. Its primary legal protection is now covered under the Bald and Golden Eagle Protection Act (BGEPA). "Disturbance" of bald and golden eagles is prohibited under the BGEPA. Disturb means to agitate or bother a bald eagle to a degree that causes, or is likely to cause, injury to an eagle, a decrease in its productivity, or nest abandonment." Specific management recommendations were developed to help prevent disturbance and protect bald eagles. In regards to recreation, two measures are recommended. The first advises managers to avoid recreational and commercial boating and fishing near critical foraging areas during peak feeding times. The second requires a 330-foot buffer during breeding season for non-motorized recreation activities (such as hiking, camping, kayaking, and hunting) that will be visible or highly audible from the nest.

The Skagit River, and to a lesser extent Goodell Creek, provide nationally significant habitat for bald eagles. This allows wildlife to be an ORV for these segments and WSR designation would seek to protect and enhance this value. Thus, WSR designation is consistent with bald eagle protection plans and laws.

Skagit Wild and Scenic River

The Skagit River downstream of the Ross Lake NRA boundary near Bacon Creek to Sedro-Woolley is designated as a recreational river in the National WSR System; its ORVs are fish, wildlife, and scenery. Some of the main tributaries in this stretch including the Cascade, Sauk, and Suiattle are also part of the National WSR system and designated as scenic rivers. Together, these river segments make-up the Skagit WSR segment which was designated in 1978; a river management plan was completed in 1983. The Mt. Baker-Snoqualmie National Forest manages the Skagit WSR System. The ownership of the Skagit WSR System is a mix of Mt. Baker-Snoqualmie National Forest (46%), other public entities (4%), and private ownership (50%). Partnerships are an important component of managing this river system and the Mt. Baker-Snoqualmie National Forest outlined their management and partnership goals in their 2001 Beyond Boundaries document. Some of the key management aspects include: watershed and resource restoration, monitoring and protection; demand for recreation opportunities and community education; and intersection with other needs including floodplain management, hydropower production, and infrastructure protection. The Mt. Baker-Snoqualmie National Forest Plan also recommended that two additional Skagit tributaries be added to the National WSR System including Diobsud Creek and Illabot Creek. These creeks have not yet been designated.

The current WSR study area ends at the Ross Lake NRA boundary near River Mile 83.1 while the existing WSR designation on the Skagit River managed by the Mt. Baker-Snoqualmie National Forest begins at the mouth of Bacon Creek, approximately 0.2 miles downstream. This study report focuses on the area within NPS jurisdiction, however, it is anticipated and recommended that any WSR designation of the Skagit River system by Congress would include a continuous stretch from below the Gorge Powerhouse to Bacon Creek.

Designation of the upper Skagit River would complete the main-stem Skagit River designation

Skagit River Hydroelectric Project.

from Sedro-Woolley to the beginning of the Skagit Hydroelectric Project near the town of Newhalem. This would allow for opportunities for holistic management of the river system.

Cultural Resources

The studied waterways have a number of significant cultural resources. The Skagit and Newhalem hydroelectric projects are designated as historic districts on the National Register of Historic Places. These designations include the dams and associated facilities as well as the two company towns of Newhalem and Diablo. In addition, a number of pre-historic resources exist in the study area including the Goodell Creek and Newhalem Rockshelter sites, which are also on the National Register of Historic Places. Since the entire area has not been thoroughly surveyed, it is possible that additional regionally or nationally significant sites will be found in the future.

Pre-history, and in particular the Goodell Creek and Rockshelter sites, were identified as an ORV. History is also an ORV. NPS will continue to manage the lands to protect these resources. Since these resources were found to be ORVs, WSR designation would also seek to protect and enhance these resources.

Public Involvement

In the fall 2008, the NPS released a summary newsletter and held two public workshops on the preliminary findings of the WSR designation. Through the workshops and in written format, the majority of the public comments have expressed strong support for WSR designation. Several organizations including American Rivers, American Whitewater, Blue Sky Outfitters, Downstream River Runners, League of Northwest Whitewater Racers, Washington Kayak Club, North Cascades Conservancy Council, U.S. Forest Service, The Nature Conservancy, National Park Conservations Association, The Wilderness Society, North Cascade Institute, and SCL expressed support at the public workshops and/or through written comments. In addition, several members of the general public also came to the public meetings and submitted written comments. The primary reasons why people were supportive of designation included permanent protection of the ORVs of these exceptional river systems, completion of the Skagit WSR designation from Sedro-Woolley to the Skagit Hydroelectric Project and opportunities for holistic watershed management, and prevention of new hydropower facilities and dams in this stretch.

Many comments received stated that the timing was ideal for WSR designation and expressed a sense of urgency in accomplishing this. Only one public comment was received opposing designation. This citizen expressed concerns that opportunities for dam development would be limited by WSR designation.

NPS also met independently with the two other land managers in the river corridor - SCL and WSDOT. Both of these entities were generally supportive of WSR designation. SCL shared some concerns about potential effects on hydropower operations and relicensing, potential new salmon restoration projects, potential new transmission lines, and existing waste water treatment plants operations. SCL also expressed tentative support for designation and continues to manage their lands within the proposed Skagit WSR corridor for protection of fishery and wildlife resources consistent with the intent of the WSR Act. WSDOT shared concerns that WSR designation could add some compliance related work when WSDOT is pursuing road projects, but were not opposed to WSR designation. NPS also met independently with the Upper Skagit Tribe who expressed concerns that WSR designation could limit potential future projects involving in-stream and bank manipulation to enhance salmon restoration and protect cultural resources. The majority of the concerns mentioned above are related to the effects of WSR designation on existing operations or potential new projects in the river corridor. The WSR evaluation/determination process and potential effects on new water resource projects are described in the section above. There are no known projects in the reasonably foreseeable future that would be prohibited by WSR designation.

Management Intent

This section outlines how the National Park Service currently manages the eligible river segments, changes that would occur upon implementation of the Ross Lake NRA's General Management Plan, and potential changes that would occur if the river becomes designated. It also identifies a proposed WSR boundary and additional costs associated with designation.

NPS is required by the WSR Act to manage eligible and suitable river segments in a manner that protects

their free flowing character, water quality, and ORVs until such the river segments become designated as part of the National WSR System or are found unsuitable.

Current Management and Direction in the Ross Lake NRA's GMP

Regardless of WSR designation, in accordance with the WSR Act and NPS management policies, the eligible river segments would be managed by NPS to protect their free-flowing condition and ORVs. The GMP outlines the vision and management actions for the Skagit River as well as other areas of Ross Lake NRA. The vision for the Skagit River zone is continued preservation of the shoreline environment, enhancement of fisheries along the Skagit River, and preservation of high quality day-use river recreation experiences. The Skagit River, Goodell Creek, and Newhalem Creek's free-flowing character, water quality, and ORVs would be protected and preserved. All management actions will be evaluated to avoid adverse effects on the river segments and their resources.

The entire list of GMP actions can be found in the alternatives section of the GMP. The most significant GMP actions and goals affecting the river segments are summarized below:

- Develop a park-wide vegetation management plan to preserve the ecological integrity of the riparian zone. Components could include monitoring and management of exotic species, planting native vegetation, and improving bank stabilization and erosion control methods.
- Expand monitoring of wildlife species and focus actions to protect wildlife from disease or human disturbance during critical seasons.
- Develop a park-wide fishery management plan. Work collaboratively with SCL to protect and enhance fishery resources and flows in the Skagit River. Consider a variety of measures to protect spawning habitat on the Skagit River including maintaining side channels and minimizing impacts from the North Cascades Highway and park infrastructure.
- Protect cultural resources and monitor sites to ensure degradation is not occurring.
- Protect the scenic character of the river corridors.
- Preserve the existing non-motorized whitewater boating opportunities on the Skagit River. Monitor recreation use

Much of the south-side of the Skagit River within the Ross Lake NRA is only accessible by boat.

and number of boat encounters per trip. Eliminate recreational motor boat use on the Skagit River. Administrative use of NPS, SCL, and WDFW would continue.
- Reconfigure and formalize the parking areas at Goodell launch site, Copper Creek take-out site, and Upper Goodell Creek Campground as appropriate.
- Consider developing new trail opportunities including Goodell Land Slide Trail, Newhalem Boardwalk Trail, Newhalem Falls Loop Trail, Skagit River portage trail at the S curves, and Newhalem Spawning Channel Trail.
- Replace bridge over the Skagit River to the Visitor Center with an expanded bridge that can accommodate two-way traffic, pedestrian access, and interpretive platforms.
- Work pro-actively with WSDOT to develop solutions to channel aggregation where the North Cascades Highway crosses Skagit tributaries including Goodell, Damnation, Thornton, and Rhode.
- Locate additional sites, should Goodell Creek Campground be impacted by flooding debris flow and certain sites have to be abandoned.
- Improve and expand interpretation opportunities as appropriate in partnership with North Cascades Institute and SCL.

Facilities and projects that are expected to continue from other entities include:

- The Skagit and Newhalem Hydroelectric Projects and associated transmission lines would continue to be operated in a similar manner.
- The North Cascades Scenic Highway would continue to be maintained by WSDOT and provide access to the Skagit River and Ross Lake NRA.
- The Newhalem and Diablo waste water treatment plants would continue to be operated and maintained by SCL.
- Salmon side-channels would continue to be maintained by SCL.

Any entities pursuing future federally-assisted projects that have the potential to affect the eligible river segments should consult with NPS in an attempt to avoid or mitigate adverse effects. Consultation is required according to a directive from the Council on Environmental Quality. If the river segments are designated then a water resource evaluation/determination would be required per the WSR Act as described in the Water Resources Evaluation Section above.

Comprehensive River Management Plan

If the river segments are designated as WSRs, then a comprehensive river management plan would be developed. The comprehensive river management plan would further outline goals and management actions that would be acceptable and encouraged. For example, the need for salmon restoration through in-channel enhancements and side-channels or the desire for natural bank stabilization methods could be described. As described above any future water resource projects that are federally-assisted would need to undergo an evaluation/determination to ensure adverse effects do not occur. In addition to protections and guidance offered in the WSR Act, the Act also directs the NPS to use its general statutory authorities and the Wilderness Act where appropriate to protect the ORVs, water quality, and free-flowing character of the river segments. When conflicts arise, the more protective law would be applied.

The WSR Act directs the river management plan to:

- describe the existing resource conditions including a detailed description of the ORVs
- define the goals and desired conditions for protecting river values
- address development of lands and facilities
- address user capacities
- address water quality issues and instream flow requirements
- reflect a collaborative approach, recognizing the responsibilities of, and opportunities for, partnership with all stakeholders
- identify regulatory authorities of other governmental agencies that assist in protecting river values
- include a monitoring strategy to maintain desired conditions

Boundaries

If the river segments are designated, detailed boundaries would be determined. These boundaries are limited to an average of 320 acres or less per river mile, which equates to about one-quarter of a mile on either side of the river. It is recommended that the preliminary boundaries of the Skagit River, Goodell Creek, and Newhalem Creek be one-quarter of mile from the high water mark on either side of the river segments. NPS recognizes its responsibility to use its existing authorities to protect the ORVs that are found both within and outside the preliminary WSR boundaries.

Costs

The NPS is already managing the Skagit River, Goodell Creek, and Newhalem Creek. Additional costs related to managing the river system, if designated wild and scenic, would include the cost associated with developing and implementing a comprehensive river management plan. Minimal additional compliance work is also anticipated to comply with Section 7 of the WSR Act.

Conclusion

The upper Skagit River and the two eligible tributaries in this reach – Goodell and Newhalem Creeks - were found to be suitable for WSR designation. The addition of this 11-mile upper Skagit River segment and its key tributaries would complete the Skagit WSR system from the downstream end of the Skagit Hydroelectric Project to Sedro-Woolley and create more opportunities for holistic watershed management. The public support for this designation from the general public and two other land managers, SCL and WSDOT, was overwhelming positive. Only one comment was received opposing designation. A pair of comments also expressed concerns about the potential effects of WSR designation on new water resource projects, but there are no known proposals in the reasonably foreseeable future that would be prohibited by the WSR designation. SCL is committed to managing their lands to protect fishery and wildlife resources in compliance with the WSR Act. NPS owns the majority of the lands in the study area and manages the river system in a manner consistent with the intent of the WSR Act. Existing protections are in place prohibiting logging and mining, as well as limiting hydropower development. WSR designation would add further protections from additional hydropower development and encourage natural bank protection, thus furthering regional and national goals for recovery and protection of salmon and bald eagles. Designation would require the development of a comprehensive river management plan which would enable better stewardship of the river segments and their special resources. WSR designation would also direct further protection and enhancement of natural, geological, cultural, scenic and recreational resources.

Therefore the NPS recommends that Congress extend the Skagit WSR designation to include this 11-mile upper Skagit segment and the two largest tributaries flowing into this reach.

Selected References

Altman, Bob. 2003. Inventorying black swift populations at waterfalls in the northern pacific rainforest bird conservation region. American Bird Conservancy.

Aubrey, K.B., and D.B. Houston, 1992. Distribution and status of the Fisher (Martes pennanti) in Washington. Northwestern Naturalist 73:69-79.

Bjorklund, J.E. 1984. Identifying and evaluating monitoring areas in potential peregrine falcon habitat. Miscellaneous Research Paper NCT-23.

Cassidy, K.M., C.E. Grue, M.R. Smith, and K.M. Dvornich, eds. 1997. Washington State Gap Analysis – Final Report. Seattle, WA: Washington Cooperative Fish and Wildlife Research Unit, University of Washington. Volumes 1-5.

Department of Commerce. 2005. Designation of Critical Habitat for 12 Evolutionarily Significant Units of West Coast Salmon and Steelhead in Washington, Oregon, and Idaho; Final Fule. Washington, D.C.

Diedrich, Jackie and Thomas, Cassie. 1999. The Wild and Scenic Rivers Study Process. Interagency Wild and Scenic Rivers Coordinating Council. http://www.rivers.gov (accessed February, 2008).

Diedrich, Jackie. 2004. Wild and Scenic Rivers Act: Section 7. Interagency Wild and Scenic Rivers Coordinating Council. http://www.rivers.gov (accessed February, 2008).

Diedrich, Jackie. 2002. Wild and Scenic River Management Responsibilities. Interagency Wild and Scenic Rivers Coordinating Council. http://www.rivers.gov (accessed February, 2008).

Dunwiddie, P.W., and R.C. Kuntz II. 2001. Long-term trends of bald eagles in winter on the Skagit River, Washington. Wildlife Management 65:290-299.

Federal Energy Regulatory Commission, 1997.

Newhalem Hydroelectric Project License Order. Washington, DC

Kuntz II, R. C. and R. G. Christophersen. 1996. A survey of Northern Spotted Owls in North Cascades National Park Service Complex, Technical Report. Sedro-Woolley, WA: North Cascades National Park Service Complex.

Luxenberg, Gretchen. 1986. Historic Resource Study. Sedro-Woolley, WA: North Cascades National Park Service Complex.

Mierendorf, R.R. 1998. National Register of Historic Places Registration Form for Goodell Creek No. 2. Sedro-Woolley, WA: North Cascades National Park Service Complex.

National Marine Fisheries Service. 2005. Status review update for Puget Sound steelhead. Seattle, WA: National Marine Fisheries Service, Northwest Fishery Science Center.

National Marine Fisheries Service. 2007. Puget Sound Salmon Recovery Plan. Seattle, WA: National Marine Fisheries Service, Northwest Fishery Science Center..

Pitzer, Paul. 1966. History of the Upper Skagit Valley 1880-1924. Seattle, WA: University of Washington.

Post, A., Richardson, D., Tangborn, W., and Rosselot, F.L. 1971. Inventory of Glaciers in the North Cascades, Washington. U.S. Geological Survey Professional Paper 705-A.

Riedel, Jon & Weisberg, Saul. 1991. From Mountains to the Sea: A guide to the Skagit River Watershed. Newhalem, WA: North Cascades Institute.

Riedel, J. L., Schuster, R. and Pringle, P. 1999, Deposition of Mount Mazama tephra in a landslide dammed lake on the upper Skagit River, Washington. IAS Special Publication Lacustrine Volcaniclastic Sedimentation.

Riedel, J.L, Haugerud, R.A., and Clague, J.J. 2007. Geomorphology of a Cordilleran Ice Sheet drainage network through breached divides in the North Cascades Mountains of Washington and British Columbia. Geomorphology V. 91, 1-18.

Romain-Bondi, K.A., R.B. Wielgus, L. Waits, W.F. Kasworm, M. Austin, and W. Wakkinen. 2004. Density and population size estimates for North Cascade grizzly bears using DNA hair-sampling techniques. Biological Conservation 117:417-428.

Seattle City Light. 1995. Settlement Agreement, Federal Energy Regulatory Commission Project #553. Seattle, WA: Seattle City Light. http://www.ferc.gov (accessed February 2008).

Skagit River System Cooperative and Washington Department of Fish and Wildlife. 2005. Skagit Chinook Recovery Plan. La Conner, WA: Skagit River System Cooperative. http://www.skagitcoop.org (accessed March 2008).

Skagit River System Cooperative. 1998. Juvenile Salmonid Use of Natural and Hydromodified Stream Bank Habitat in the Main stem Skagit, Northwest Washington. La Conner, WA: Skagit River System Cooperative. http://www.skagitcoop.org/documents/EB217_Beamer_and_Henderson_1998.pdf (accessed March 2008).

Swan, Bryan. 2009. Northwest Water Survey. http://www.waterfallsnorthwest.com/ (accessed July 2008).

Tabor, R.W., and Haugerud, R.A., 1999. Geology of the North Cascades: A Mountain Mosaic. Seattle, WA: The Mountaineers.

The World Bank. 2003. Water Resources & Environment Technical Note C.2. Environmental Flows: Case Studies. Washington. D.C: The World Bank. http://www.iwlearn.net/publications/courses/environmental-flows-case-studies-david-hirji (accessed March 2008).

United States Fish and Wildlife Service, Puget Sound Management Unit. 2004. Draft Recovery Plan for the Coastal-Puget Sound Distinct Population Segment of Bull Trout (Salvelinus confluentus). Portland, OR: Puget Sound Management Unit.

United States Fish and Wildlife Service. 2005. Designation of Critical Habitat for the Bull Trout; Final Rule. Washington, DC.

United Stated Fish and Wildlife Service. 2007. Draft Post-Delisting Bald Eagle Monitoring Plan. Washington, D.C.: United States Fish and Wildlife Service http://www.fws.gov/pacific/ecoservices/BaldEagleDelisting.htm **(accessed on January 2009).**

Untied States Forest Service. 2001. Beyond Boundaries: Resource Stewardship in the Skagit River Basin. Sedro-Woolley, WA: United States Forest Service.

United States Forest Service. 1977. The Skagit Wild and Scenic River Study Report. Sedro-Woolley, WA: United States Forest Service.

United States Forest Service. 1983. River Management Plan (Final) Skagit River. Sedro-Woolley, WA: United States Forest Service.

Washington Department of Fish and Wildlife. 2002. Washington State salmon and steelhead stock inventory. Olympia, WA: Washington Department of Fish and Wildlife.

Washington Department of Fish and Wildlife. 2008. Washington State Fishing Rules. Olympia, WA: Washington Department of Fish and Wildlife. http://wdfw.wa.gov/fish/regs/2008/2008sportregs.pdf (accessed August 2008).