National Park Service
U.S. Department of Interior

Elwha Wild & Scenic River

Eligibility Report
Final Draft

July 2004

Executive Summary

Purpose and Background of this Study

This draft study report evaluates the eligibility and classification of the Elwha River watershed, located on the Olympic Peninsula of Washington State, as a component of the National Wild and Scenic Rivers System (National System). This assessment makes no recommendation as to whether or not the river should be placed in the National System. It only addresses its eligibility and classification.

If a river segment is found to be eligible, policy requires that federal land management agencies do everything possible to ensure that the resource values, which are the basis of the eligibility, are protected. An eligibility study is the first step in a process that could result in a river eventually being designated into the National System. If a river is found eligible, typically the next step is to conduct a suitability study. A suitability study assesses whether or not eligible segments should be included in the National System. It is based on public input and an assessment of the ability of the river segment(s) to be managed to protect the river values. In most cases management alternatives are also developed in conjunction with or after a suitability analysis.

If eligibility and suitability studies contain favorable recommendations, designation of the river into the National System can happen through two ways: (1) By Act of Congress and (2) By the Secretary of the Interior through a recommendation from a State's Governor (Section 2(a)(ii)). The National Park Service would not move forward with recommending segments of the Elwha, either within or outside the Park boundary, for designation without consultation and support from the public and local, State, Federal, and Tribal governments. When a river segment is formally designated through Congress into the National System, a management plan is developed and adopted. In addition an evaluation of potential impacts to the river of any proposed federal water resource project is completed through an analysis under Section 7 of the Wild and Scenic Rivers Act (WSRA). The river segment also receives recognition for being part of the National System.

Under the WSRA, the river must meet physical requirements to be eligible as a component of the National System. These physical requirements are 1) the river must be free-flowing; and 2) the river must have at least one "outstanding remarkable value" (ORVs), a resource important or unique to the region or nation. If a river is eligible for the National System, there are three possible classifications of the river or river segment–"wild," "scenic," and "recreational." These classifications are based on the degree of human modification of the river and adjacent shorelands.

Findings of this Study

The entire length of the Elwha River and its tributaries possesses five outstanding remarkable values– wildlife, fish, prehistory, history, and scenery. For a more accurate analysis, the river was divided into two segments. All the Elwha River tributaries were also evaluated. Below are the results of the river's eligibility and preliminary classification under current and future conditions.

<u>Present Conditions.</u>

Elwha

Segment 1-Elwha River from its mouth to the backwaters of Glines Canyon Dam–This segment is not eligible because of the lack of free-flowing conditions created by Elwha Dam at river mile 4.9 and Glines Canyon Dam at river mile 13.5. A rock diversion structure also exists at river mile 3.3, but this structure alone would not bar this segment from inclusion.

Segment 2-Elwha River from the backwaters of Glines Canyon Dam to the river's headwaters–This segment is free-flowing and contains five ORVs. Due to its pristine character and limited non-motorized access, this segment would be classified as wild.

Tributaries

- *All tributaries, excluding Indian Creek and Little River* – Wild.
- *Indian Creek* for its entire length – Recreational – due to the presence of adjacent roadways.
- *Little River* from its confluence with the Elwha to RM 1.4 – Recreational – due to the presence of adjacent roadways; Remaining length–Wild.

Future Conditions.

Future plans include removing the Elwha and Glines Canyon Dams and restoring the river. In addition, the rock diversion structure at RM 3.3 will be replaced with an engineered riffle. The dam removal is scheduled to start in 2007. When these future plans are complete, the free-flowing character of segment 1 would be restored. The following would be the changes in the river's eligibility and preliminary classification:

Elwha

- *Segment 1-Elwha River from its mouth to the backwaters of the Glines Canyon Dam*– Recreational
- *Segment 2-Elwha River from the backwaters of Glines Canyon Dam to the river's headwaters*–No change

Tributaries

- No change

Elwha River Watershed – Eligibility and Classification

	Eligibility Criteria		**Recommendations**	
	1. Free-flowing	**2. Contains at least one ORV**	**Now**	**After Elwha and Glines Canyon Dams are Removed**
Segment 1: Mouth to RM 15.3				
Elwha River	Currently is not free-flowing, but will be once the dams are removed	Contains 5 ORVs	Not Eligible	Eligible - Recreational
Segment 2: RM 15.3 to Headwaters				
Elwha River	Free-flowing	Contains 5 ORVs	Eligible-Wild	Eligible - Wild
All Tributaries				
Indian Creek	Free-flowing	Contains 5 ORVs	Eligible-Recreational	Eligible-Recreational
Little River *Mouth to RM 1.4* *RM 1.4 to headwaters*	Free-flowing	Contains 5 ORVs	Eligible-Recreational Wild	Eligible-Recreational Wild
All other tributaries	Free-flowing	Contains 5 ORVs	Eligible-Wild	Eligible-Wild

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INTRODUCTION

Purpose

The purpose of this study is two-fold. Its first objective is to determine if the Elwha River and its tributaries meet the eligibility criteria for inclusion in the National System.[1] The second objective is to suggest appropriate classifications of any eligible segments. The study provides a basis for management decisions for the watershed as well as future management decisions should the river at some point be placed in the National System. In the interim, federal land managing agencies should do everything possible to ensure that the river retains its eligible status.

This assessment makes no recommendation as to whether or not the river should be placed in the National System. The report only addresses the river's eligibility for the National System.[2]

Wild & Scenic Rivers Act - Criteria and Process

Enacted in 1968, the Wild and Scenic Rivers Act (P.L. 90-542, as amended) (Act) establishes a framework to permanently protect selected free-flowing rivers in their natural condition for the public's present and future use and enjoyment. This alternative to dams, levees, and other river construction was intended to balance the nation's water resources development policies with river conservation and recreation goals. Designated rivers receive protection from water-resource projects, such as new hydropower facilities, that would alter the river's free-flowing characteristics or have a direct and adverse effect on the river's outstanding resources. Section 1(b) of the Act states in part:

> *It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.*

The Act immediately designated eight rivers into the National System[3] and specified how other rivers may be added. To be eligible for inclusion in the National System, a river or river segment must: 1) be free-flowing, as determined by standards set by the Departments of the Interior and Agriculture; and 2) possess one or more outstanding resource(s) of significance to the region or nation, such as exceptional scenery, recreational opportunities, geology, fisheries, wildlife, prehistoric or cultural heritage. These resource values must be directly related to, or dependent upon, the river.

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[1] Eligibility refers to the physical condition of the river. See the next page for an explanation of the eligibility requirements. A "suitability" study is also frequently conducted, especially if the study was initiated at the direction of Congress. Suitability refers to the socio-economic conditions associated with the river and addresses several questions. For example: Are there ways to protect the river other than wild and scenic river designation? Is wild and scenic river designation in the public interest? Are there other uses of the river that should be considered? A suitability study relies heavily on public involvement and input to reach its conclusions.

[2] Since this is not a congressionally directed study and is part of normal land planning processes, a suitability study was not conducted at this time.

[3] As of January 2003, 163 rivers or river segments totaling 10,955 miles have been included in the National System. Three are located in Washington State – the Klickatat, Skagit, and White Salmon Rivers, and some of the Skagit River tributaries.

Rivers that are found eligible are given preliminary classification according to the level of human impact along the river. Each classification carries with it different responsibilities in management and protection. A designated river may be divided into several different segments, with each segment having a different classification. As defined by Section 2(b) of the Act, the three classes of national wild and scenic rivers are:

> *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 primitive and shorelines 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.*

Study Area/Segments - Elwha River Watershed

Located at the extreme northwest corner of the contiguous United States and surrounded by ocean on three sides, the Olympic Peninsula is distant from major centers of human population. The Elwha River begins deep in the Peninsula's mountains. Fed by glaciers, snowmelt, and rainfall, the Elwha flows in a northerly direction through a series of steep, narrow, bedrock canyons that alternate with broad alluvial floodplains until it empties into the Strait of Juan de Fuca. During its journey, the river travels approximately 45 miles and loses roughly 6,000 feet in elevation as it passes through areas of dense and diverse vegetation and a valley sculpted by glaciers of the last ice age. Its major tributaries are the Hayes, Goldie, Lost, and Lillian rivers, and together they form a watershed of more than 300 square miles–the largest within Olympic National Park. The river has two major dams – the Elwha at RM 4.9 and the Glines Canyon at RM 13.5. There is also a small diversion structure at RM 3.3. The entire watershed, which includes the Elwha River and all of its tributaries, is assessed in this report.

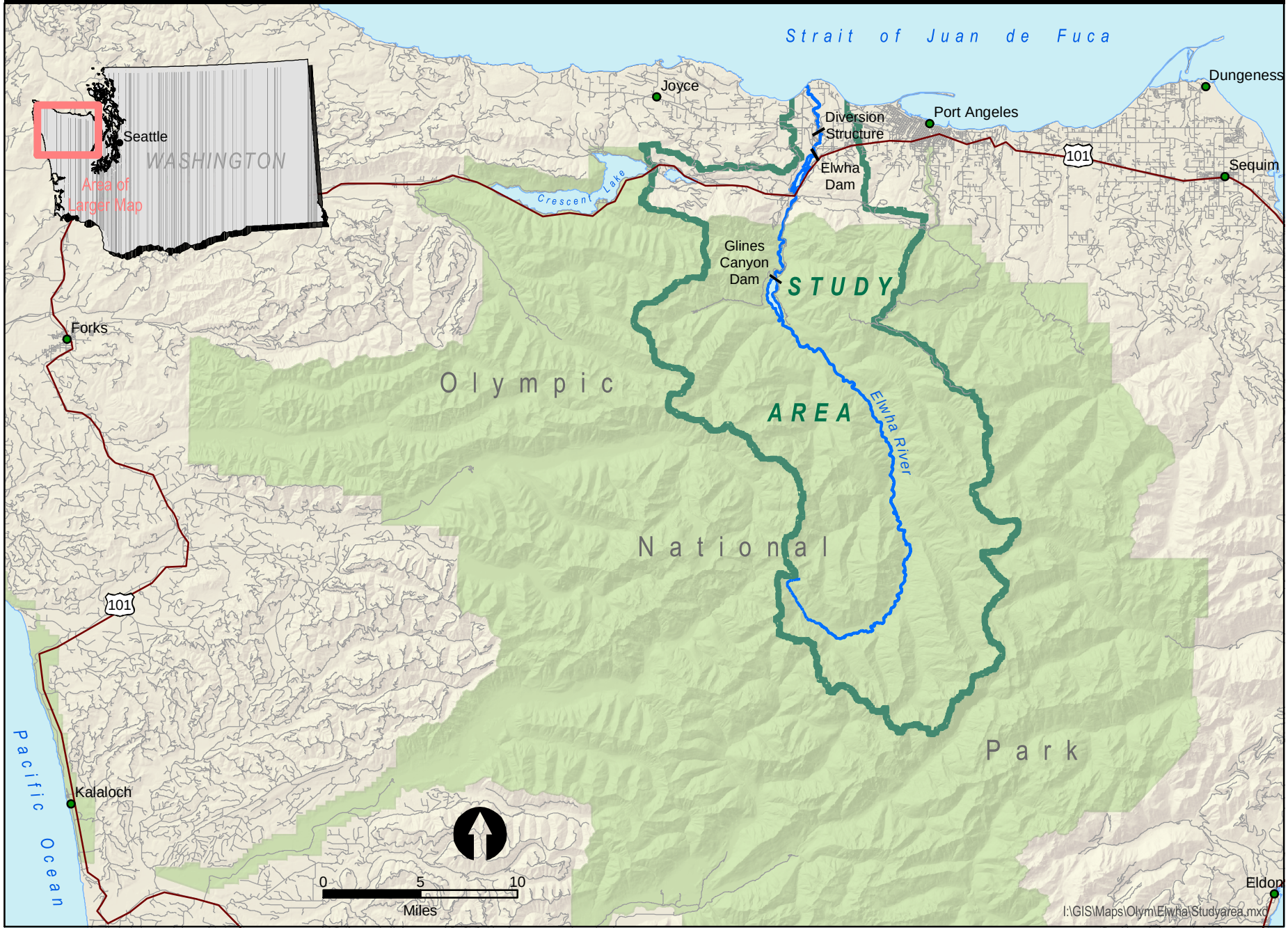
The river enters the Strait of Juan de Fuca approximately five miles west of Port Angeles, a timber, tourism, and shipping community. The lower Elwha Valley is a mosaic landscape of active logging, forest, pasture, quarries, small commercial enterprises, rural residential properties, and two fish propagation facilities (the Lower Elwha Klallam Tribe fish hatchery and the Washington Department of Fish and Wildlife rearing channel). The Lower Elwha Klallam reservation occupies 534 acres at and near the mouth of the Elwha River.

Existing Assessments and Reports

Because of issues related to dam relicensing, anadromous fisheries restoration, and dam removal, the Elwha River, particularly its lower valley, has been the subject of several reports. Within a period of ten years, four separate documents were released that address the river's future: *Draft Staff Report: Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) Hydroelectric Projects, Washington* by the Federal Energy Regulatory Commission (FERC)*; The Elwha Report* a joint study by the Department of the Interior (DOI)*,* Department of Commerce, and Lower Elwha Klallam Tribe; and DOI's *The Elwha River Ecosystem Restoration Final Environmental Impact Statement,* and *The Elwha River Ecosystem*

Elwha Wild and Scenic River
Eligibility Study Area

National Park Service
U.S. Department of the Interior



Restoration Implementation Final Environmental Impact Statement. In addition, a notice of intent to prepare a supplemental Environmental Impact Statement (EIS) was filed by DOI. Following is a brief description of these reports.

Draft Staff Report: Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) Hydroelectric Projects, Washington, Volume 1, March 1993

This report was prepared by FERC staff in connection with applications filed by James River II, Inc., for licenses to operate and maintain two hydropower projects on the mainstream of the Elwha River. The report evaluates the potential natural resource benefits, the economic costs, and the project-specific and cumulative environmental impacts associated with relicensing the Glines Canyon Hydroelectric Project and initial licensing of the Elwha Hydroelectric Project. Three primary resource objectives were developed on the basis of comments received during the scoping process: 1) restoration of wild, self-sustaining runs of anadromous fish; 2) restoration of natural Elwha River Basin conditions within Olympic National Park; and 3) provision of renewable hydroelectric energy. Alternatives and a comparative evaluation of impacts were made in this report to respond to these objectives.

The Elwha River Restoration Report, January 1994

The goal of the Elwha River Ecosystem and Fisheries Restoration Act, signed in October 1992, is the "full restoration of the Elwha River ecosystem and native anadromous fisheries" (Section 3c). Objectives of Elwha River restoration are to remove the Elwha and Glines Canyon dams, restore habitat inundated or otherwise degraded by the presence and operation of the hydroelectric projects, and restore natural physical and biological ecosystem processes. The act authorized the Secretary of the Interior to acquire the projects and remove the dams if it was determined that their removal was necessary to meet the goal. A team consisting of the National Park Service (NPS), U.S. Fish and Wildlife Service (FWS), Bureau of Reclamation, Lower Elwha Klallam Tribe, and National Marine Fisheries Service (now NOAA Fisheries) developed and evaluated strategies that would meet these objectives. The resulting report describes four options for dam removal, nine scenarios for managing the accumulated sediments, and a process for analysis of these alternatives consistent with full restoration of the ecosystem and native anadromous fisheries. As a result of these investigations, the Secretary of the Interior determined that removal of both the Elwha and Glines Canyon Dams is both feasible and necessary to achieve the goal of full restoration of the Elwha river ecosystem and native anadromous fisheries.

The Elwha River Ecosystem Restoration Final EIS, June 1995

The DOI found that there is a need to return the Elwha River and the ecosystem to its natural, self-regulating state, and proposed that removal of both dams would accomplish this purpose and fulfill the congressional mandate for full restoration of the ecosystem and native anadromous fisheries. Several alternatives for restoring native anadromous fisheries were examined in this programmatic EIS, including leaving the dams in place and installing fish passage facilities, removing each dam separately, and removing both dams. Only one alternative, the removal of both dams, was found to have the potential to fully restore Elwha native anadromous fisheries.

Elwha River Ecosystem Restoration Implementation Final EIS, November 1996

The action proposed in this EIS is the full restoration of the Elwha River ecosystem and its native anadromous fisheries as required by congressional mandate. The DOI proposed to implement the congressional mandate by removing both dams in a safe, environmentally sound, and cost effective manner. This document, which is procedurally connected to the EIS titled *Elwha River Ecosystem Restoration*, examined three alternatives for dam removal and their possible impacts on water quality, river morphology, flooding, native anadromous and resident fisheries, living marine resources, wildlife, threatened and endangered species, vegetation, cultural resources, land use, recreation, aesthetics, and socioeconomics. The proposed action calls for dam removal to occur over an eighteen month to two year period and includes implementing fisheries and revegetation plans. The Elwha Dam will be removed by controlled blasting, and the Glines Canyon Dam by a combination of controlled blasting and diamond-wire saw cutting. The sediments that have accumulated with the reservoirs would be allowed to erode downstream. No other alternative would fully restore the ecosystem or its native anadromous fisheries.

Notice of Intent to Prepare a Supplemental EIS, July 2002

This notice of intent announces the preparation of a supplemental EIS to the final Elwha River Restoration Implementation EIS. The primary purpose of the supplemental EIS will be to identify and analyze potential impacts of a new set of water quality and supply related mitigation measures.

Federal Management

The Olympic Peninsula is divided into several management areas that are directed according to the goals and requirements of different legislation. Most of the Elwha River watershed is managed by the NPS. The U.S. Forest Service (USFS) and the WDFW also control portions of the watershed in the lower valley. The Elwha River and/or its tributaries pass through the following management areas and are consequently affected by the practices and policies of the various administering agencies.

Olympic National Park (ONP)

First formed as Olympic Forest Reserve in 1897 and then becoming Mount Olympus National Monument in 1909, Olympic National Park was officially finally created in 1938. According to the National Park Service Organic Act, the goal of the NPS is to "conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." Eighty-three percent of the Elwha drainage lies within ONP, beginning upstream of RM 9.5, and is protected from timber harvest, agriculture, and other land-use disturbances.

The world scientific community has twice recognized the importance of ONP and the exceptional qualities of its existing natural environment. ONP was designated as a Biosphere Reserve in 1976, an international designation made under the Man and Biosphere Program directed by the United Nations Educational Scientific and Cultural Organization. The Biosphere Reserve designation is recognition of the Park's vast expanses of unmanipulated natural ecosystems. The 1981 World Heritage Site designation recognizes the global importance of the Park's ecosystems, including the natural beauty of the Park, its virgin temperate rain forest, wild herd of Roosevelt elk, and the

pristine coastal and mountainous features. The World Heritage Site designation is also recognized in the 1980 amendments to the National Historic Preservation Act.

Olympic National Park also manages 1,061 acres of land associated with the Elwha Hydroelectric Project since project acquisition occurred in February 2000. These lands lie outside the boundaries of Olympic National Park and are downstream of Glines Canyon Dam.

Olympic National Forest

National forests are administered by the USFS for the "management, protection, and use of the resources on these lands to benefit the American people." National forest resources provide significant public benefit, including water, forage, wildlife, habitat, wood, recreation, and minerals. These resources are managed under the multiple use concept-managing resources for the best combination of uses to benefit the public while insuring the productivity of the land and protecting the quality of the environment. The Olympic National Forest administers a two-mile wide strip adjacent to the Park as part of the Pacific Ranger District. The USFS land in this area, which borders the Elwha River, is managed to provide a variety of recreational opportunities in a pleasing scenic environment while maintaining or enhancing wildlife and fish habitat.

In Olympic National Forest's 1990 Land and Resource Management Plan, it was recommended that the Elwha River be studied for classification and eligibility by another agency since the USFS manages an insignificant percentage of the river corridor. Olympic National Forest lands within the corridor of the Elwha River will be managed to protect the existing attributes that make the river eligible for consideration as a wild and scenic river.

Olympic Peninsula Wilderness

The National Wilderness Preservation System was established by the Wilderness Act of 1964. The goal of this legislation is to manage areas designated as wilderness "in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness." Wilderness is defined to be "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain." Part of maintaining the element of wilderness is not allowing commercial development or permanent roads within the wilderness area. Over 95% of Olympic National Park was designated as wilderness under the Washington Park Wilderness Act of 1988. This wilderness area includes those portions of the Elwha watershed above and surrounding Lake Mills and the non-roaded areas above the middle reach.

Washington Department of Fish and Wildlife (WDFW)

The WDFW management goal is "to provide sound stewardship of fish and wildlife," and to maximize fishing, hunting, and non-consumptive recreational opportunities that are compatible with healthy, diverse fish and wildlife populations. The WDFW administers 109 acres located along the lower Elwha River below Lake Aldwell. This includes a rearing channel and a fishing access site along the east side of the river, accessible from the Elwha River Road. The WDFW also administers a boat ramp on the south end of Lake Aldwell. This agency manages non-tribal recreational and commercial fishing in areas outside of ONP.

Nonfederal Management

Lower Elwha Klallam Tribe

The Elwha Klallam Tribe has approximately 650 tribal members living on the reservation at the mouth of the Elwha River, eight miles west of Port Angeles. One of their primary economic resources is fishing, including commercial and subsistence. Tribal members also gather clams, oysters, crabs, and a number of other marine organisms. One of the leading issues for the Tribe is restoration of the Elwha's historic anadromous fish runs, and the Lower Elwha Klallam Tribe has been a major participant in the process of restoring the river to its natural condition. The Tribe operates a salmon hatchery and conducts enhancement programs.

EVALUATION OF ELIGIBILITY

The Act requires that, to be eligible for inclusion in the National System, a river or river segment must be free flowing and, with its immediate environment, must possess one or more outstandingly remarkable scenic, recreational, geological, fish, wildlife, historic, cultural, or other similar values.

Free-Flowing Condition

Free-flowing, as applied to "any river or section of a river," 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.*

Segment 1 – From the mouth of the Elwha River at the Strait of Juan de Fuca to the backwaters of Glines Canyon Dam, approximately 15.3 miles.

Segment 2 – From the backwaters of the Glines Canyon Dam to the river's headwaters, approximately 29.9 miles.

Tributaries – each of the Elwha's tributaries were evaluated in their entirety.

Conclusion

Existing Conditions

Segment 1

In its current state, Segment 1 was not found to be free flowing due to the presence of the Elwha and Glines Canyon Dams. A 15-foot rock diversion structure also spans the river at RM 3.3. This structure is currently partially washed out. This structure alone does not prevent the river from being eligible given that Section 16b of the WSRA states that low-head dams and other minor structures do not automatically bar a river segment for inclusion into the National System.

Segment 2

Segment 2 of the Elwha River contains no dams, major diversion structures, excessive riprapping, or significant channel or other modifications and was found to be free flowing for purposes of the Act.

Tributaries

The tributaries of the Elwha River contain no dams, major diversion structures, excessive riprapping, or significant channel or other modifications and were found to be free flowing for purposes of the Act.

Future Conditions

Segment 1

In the future, the Elwha and Glines Canyon Dam will be removed and the rock diversion structure will be replaced by an engineered riffle that will be designed to pass fish and sediment. In the future, the only structure left in this segment will be the engineered riffle. This structure would not bar the

river segment from inclusion into the National System and the segment would be considered free-flowing.

Segment 2
No change

Tributaries
No change

Outstandingly Remarkable Values

The second criterion that a river must meet to be eligible for inclusion in the National System is that it must possess one or more outstandingly remarkable values (ORVs). The term "outstandingly remarkable" is not precisely defined in the Act. In order to qualify as an ORV, a value must be unique, rare, or exemplary. The Olympic Peninsula and geographic region is described in the Introduction. As directed by the Department of the Interior and Agriculture "Interagency Guidelines for Eligibility, Classification, and Management of River Areas," published in the *Federal Register* (Vol. 47, No. 173; September 7, 1982, pp. 39454-39461); the determination of whether or not a river area contains ORVs is based on the professional judgement of the interdisciplinary study team.

The most current guidance on evaluating eligibility is found in The Interagency Wild and Scenic Council's technical report, "The Wild & Scenic River Study Process". This is the current guidance that is used by the four agencies that make up the council – the NPS, BLM, USFWS, and USFS. This report defers to this guidance as well.

Wildlife

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

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

From the forests' floors to their canopies, the myriad of plant species and forest cover types in the Olympics provide habitats for a rich assortment of invertebrates, amphibians, birds, and mammals. Several of these species are of popular interest, such as the Roosevelt elk. The nation's largest herd of wild Roosevelt elk currently lives within the Park, and is one of the prime reasons the Park was created. Some of the other animals found or not found inhabiting the Olympics are a result of the area's history of geographic isolation. Animals responded to the encroaching ice sheets of the

Pleistocene in three ways–migrate south, perish, or adapt to the extreme climate found on the mountain peaks above the ice. Black bear, black-tailed deer, and Roosevelt elk are examples of the first group. They were able to leave the Olympics, move south to more hospitable conditions, and then return after the ice receded. Mammals in the second category, found in nearby areas of Washington and British Columbia but are not native to the Olympics, include the grizzly, wolverine, mountain sheep, lynx, pika, golden-mantled ground squirrel, water vole, bog lemming, red fox, porcupine, and mountain goat. Animals that adapted to the cold climate and evolved into new species make up the third group, and consist of the Olympic marmot, Olympic short-tailed weasel, Olympic Mazama pocket gopher, Olympic snow mole, and the Olympic chipmunk. All of these species are only found in the subalpine or alpine zones of the Olympic Mountains.

The Elwha River, as it traverses from the center of the Olympic Mountains to the Strait of Juan de Fuca, passes through several forest cover types that provide important habitat to many species. With the majority of the watershed designated as wilderness, the habitat quality and quantity required by many wildlife species, some of which are species of special interest, are well provided. The terrestrial portion of this watershed provides habitat or potential habitat for three federally listed threatened or endangered species and twenty species of concern, as well as six state-listed threatened or endangered species, five candidate species, one sensitive species, one priority species, and three species listed for monitoring. Some of these species, such as the bald eagle and the Pacific fisher, may have been adversely affected when the dams blocked salmon and trout upstream migration. At least 22 species found in the Elwha Valley feed in whole or in part on salmon or their carcasses, and their populations probably decreased due to the presence of the dams.

Birds. The Elwha watershed provides excellent habitat for raptors; turkey vultures, red-tailed hawks, northern pygmy owls, and sharp-shinned hawks have all been observed in the Elwha drainage. Other raptors that utilize this watershed are of special interest, including bald eagles, northern spotted owls, ospreys, peregrine falcon, and northern goshawks.

Bald eagles. This federally and state-listed threatened species requires isolation, tall and mature trees for nesting, and clean water for foraging. Bald eagles on the Olympic Peninsula feed primarily on glaucous-winged gulls and other marine birds along the coast, chinook salmon carcasses in the lower river sections, and non-anadromous fish stocks and carrion in the middle and upper river reaches. This species has been observed year-round in the Elwha watershed. Surveys to document eagle use of the mainstem of the Elwha River, associated tributaries, and coastal areas were conducted from November 1989 to April 1990. Fourteen eagles were observed. The survey results and discussions with regional biologists and local landowners indicate that eagle densities upriver decreased with distance from the delta, with very low numbers above Lake Mills. Bald eagle density along the Elwha may be lower than elsewhere in the Park because of the lack of salmon carcasses that the species relies upon in other drainages. The loss of potential roosts, perch sites, and nesting habitat due to logging in the lower section of the river may also be a factor to this lower use.

Northern spotted owls. This state-listed endangered and federally threatened species relies on the large tracts of old-growth and late successional forests located throughout the watershed for nesting, roosting, foraging, and dispersal. Habitat requirements include moderate to high canopy closure, multi-layered and multi-species canopy with large overstory trees, and large accumulations of fallen trees or other woody debris. Researchers at ONP have located territorial spotted owls at 30 sites in the Elwha drainage, and spotted owl densities there are among the highest documented in the Park.

Nineteen of these sites are monitored annually, and rates of reproduction are generally comparable to or higher than those found elsewhere in the Park.

Osprey and northern goshawk. Both species are protected by the Migratory Bird Treaty Act (16 U.S.C. 703-712) and are known to be present in the watershed. Ospreys, which are a state monitored species, build large bulky nests near the top of large, mature trees that are located near water. Trees suitable for perching are snags, dead-topped trees, or open-crowned trees that allow easy access for take-off and landing. The osprey in the study area appear to forage primarily on resident fish in the reservoirs. The northern goshawk is known to breed in the Elwha River drainage, and occasionally has been observed year-round. This raptor is a candidate for state listing and a federal species of concern. It prefers coniferous or mixed forest for nesting, where it can build large structures in the upper portions of tall trees. Its ideal habitat includes open woodlands adjacent to these forests that support its primary prey–grouse, band-tailed pigeons, and hares.

Peregrine falcon. This federally listed species of concern and a state-listed sensitive species, usually nests in depressions dug on a cliff ledge but sometimes will nest in a tree cavity or an old stick nest. The peregrine's speed and size make it an excellent hunter, specializing in direct pursuit in the open; and thus favors non-forested areas in which to hunt, particularly shores, marshes, river valleys, open moors, and tundra.

A variety of marine birds and waterfowl utilize the Elwha Valley. Because of its proximity to the Strait of Juan de Fuca, the Elwha River provides forage habitat for several marine species. The glaucous-winged gull is a common year-round resident in the delta and is occasionally observed on Lake Aldwell. Thayer's and mew gulls are common on the delta during the fall and winter. California gulls are found along the river to Lake Mills in the late summer and fall. The double-crested cormorant is occasionally observed on the reservoirs, as well as the near-shore marine environment. Frequently seen waterfowl species include bufflehead, common goldeneye, and lesser scaup, which are winter residents on both reservoirs. Trumpeter swans have been routinely observed feeding and resting during the early winter months on Lake Aldwell with smaller numbers on Lake Mills. The Pacific Coast population of trumpeter swans does not have any federal status, although it is a state priority species. Common mergansers and mallards have been observed year-round on the lower and middle reaches of the Elwha River and may breed in the area. The American dipper breeds along the river and its tributaries. Several marine birds and waterfowl of special interest also utilize this watershed, including marbled murrelet, harlequin duck, cassin's auklet, and tufted puffin.

Marbled murrelet. A federal and state listed threatened seabird, nests within the Elwha River drainage. In the Pacific Northwest, the marbled murrelet generally nests in old-growth trees up to 50 miles or more from the coast. The habitat in the lower section of the Elwha watershed is only marginally suitable due to the absence of large stands of old-growth forests, but is used as a flight corridor between marine foraging areas and nesting stands in the upper valley. Murrelet surveys were conducted at numerous sites within the Elwha drainage during the 1990s. A number of murrelet detections were recorded, but it is not possible to know how many birds are nesting in a survey area. At several sites in the Elwha drainage within ONP, very high numbers of detections have been recorded. Based on observations of murrelet eggshells, and of murrelets flying subcanopy and circling the canopy, it is likely that these threatened birds nest in stands throughout the drainage within the Park.

Harlequin ducks. Federally listed as a species of concern, have been observed year-round on the lower and middle reaches of the Elwha River and may breed in the area. It nests in rocky nooks, under logs, or in hollow stumps along forest mountain streams with fast-flowing water. During the

summer and spring they feed on aquatic invertebrates. Wintering harlequins feed on snails, limpets, crabs, and chitons in nearshore saltwater areas. Relatively large numbers of the ducks were found near the river mouth during a 1994 survey.

Cassin's auklets. Federally listed as a species of concern, spend most of their lives on the open ocean. They come ashore to nest in remote locations that are removed from human activity. They have dull, gray-brown feathers year round. Cassin's auklets spend the daylight hours resting and feeding on the ocean. They have the ability to fly underway-using wings as flippers.

Tufted puffins. Federally listed as a species of concern and a state-candidate species, live in large colonies during breeding season and fish together in flocks of ten to twenty-five. They build their nests on shores with steep, grassy, sloping land with soil that allows them to burrow. During the remaining part of the year, puffins spend most of their time on the ocean. They primarily feed offshore on aquid, octopus, crabs, zooplankton, and jellyfish.

Old-growth and mature conifer forests of the Elwha watershed provide habitat for a variety of other species, such as the red-breasted nuthatch, golden-crowned kinglet, varied thrush, and chestnut-backed chickadee.

Other plant communities of the Elwha Valley provide habitat to many more bird species. The robin, Towsend's warbler, dark-eyed junco, winter wren, blue grouse, ruffled grouse, and band-tailed pigeon are common breeding residents of the conifer and mixed forests of the watershed. Violet-green swallows are common in open areas near dams, bridges, and other human-made structures. The hairy woodpecker, warbling vireo, and evening grosbeak have been observed in the deciduous forests in the riparian corridor along the river. Open habitat types support the MacGillivray's warbler, rufous hummingbird and white-crowned sparrow. Open habitat types also support two federally listed species of concern-olive-sided flycatcher and Oregon vesper sparrow. The olive-sided flycatcher nests in coniferous trees in the open. Their nests are made loosely of twigs and moss. They are aggressive and quickly drive away any bird passing too close to their nesting tree. They are known for their loud clear notes that sound like–"see hear." The Oregon vesper sparrow inhabits the open grassy fields. Their nests are made of grasses and located at the ground level; they are often hidden at the foot of a bush or under a branch that has fallen.

The bald eagle, osprey, northern goshawk, harlequin duck, Oregon vesper sparrow, and olive-sided flycatcher were determined to be river-dependant and ORVs.

Mammals. The Elwha drainage provides habitats that support a great variety and abundance of mammals. Small mammals, such as bats, shrews, hares, squirrels, mice and other rodents, provide an abundant prey base for both terrestrial predators and many of the raptors in the watershed. Four of these small mammal species–Townsend's big-eared bat, long-eared myotis, and long-legged myotis–are federally listed as species of concern. The Townsend's big-eared bat is also state listed as a candidate species.

A large number of furbearers are known to occur in ONP, but little is known of their habitats and densities. Raccoon, muskrat, mink, river otter, and beaver use the riparian, aquatic, and wetland habitats along the Elwha River. The Pacific fisher, a federally listed species of concern and state listed as endangered, is rare and may be extinct on the Olympic Peninsula. The last reliable sighting of a fisher in the Elwha River drainage occurred in 1975, just outside the ONP boundary near Herrick Road. Suitable habitat for this species includes components of old-growth structure, such

as large trees or snags for denning, as well as large areas of relatively contiguous habitat that is now found primarily in designated wilderness areas.

ONP is home to two large herbivores, Roosevelt elk and black-tailed deer. The east and west side drainages on the Olympic Peninsula support elk populations with different characteristics. Elk on the north and west side of the Peninsula primarily inhabit the park year-round (except for those herds whose home range includes the park boundary). There are 2 life history strategies for elk in the western drainages: year -round residents who use the lower elevation valley floors and lower slopes year round, and migratory herds, which summer in sub-alpine and alpine habitats and winter in the valley bottoms. Old-growth forests provide the preferred vegetation in all seasons except spring, when grasses are emerging in more open areas. The elk population on the west side of the Peninsula appears to be stable and at equilibrium with their food resource. Elk on the east side of the Peninsula are migratory and use low-elevation valley bottoms outside the Park during the winter and calving season. Riparian habitats provide migration corridors, and the Park's subalpine lands are preferred summer habitat. Elk on the east side of the Peninsula are much less abundant than on the west side. Subpopulations are considered vulnerable because of low numbers and increasing development on the winter range adjoining ONP. The Elwha Valley, which is intermediate between the east and west drainages, most likely supports both resident and migratory elk. Little is known about this elk's local distribution, density, and movements in this watershed. The open and park-like understory found in Sweets Bottom and other sites that were once homesteads are maintained by the browsing of cervids, indicating that Roosevelt elk may be common. Known important calving areas are located in the lower Elwha Valley above Lake Mills and near Altaire Campground.

There is currently ongoing research on black-tailed deer in the Elwha Valley. Preliminary information gives an estimate of five to six deer per square kilometer in the winter range of the lower Elwha Valley (between Whiskey Bend and Humes Ranch at elevations up to 2000 feet). Of the radio-marked deer in the study area, approximately half were year-round resident of the lower elevation bottomlands of the watershed, and the other half dispersed widely throughout the Park during the summer months. The east side of the Olympic Peninsula is considered to be high-quality deer habitat because the drier climate slows the rate of

forest succession, resulting in longer seral stages that usually have higher amounts of browse. On the west side of the Peninsula, deer and elk use the same habitats and have similar diets. Elk may have a competitive advantage during the winter when food resources are least available.

Several large predators found are on the Olympic Peninsula and in the Elwha drainage. Coyotes and bobcats rely on the considerable prey base of small mammals in the watershed. Black bear density in the Park is fairly high and they are found in the Elwha watershed. Mountain lions are considered relatively common in the watershed, and several observations are typically reported each year.

The following mammals were found to be river-dependant and wildlife ORVs: pale Townsend's big-eared bat, long-eared myotis, and long-legged myotis.

Reptiles & Amphibians. Because most reptiles prefer relatively dry areas, few species are found in the moist habitats provided by the forests in the Elwha Valley. The presence of the northern alligator lizard, common garter snake, and northwestern garter snake were confirmed in 1995 and 2000 surveys. The rubber boa also occurs in the area. The moist conditions of the Elwha watershed are ideal for many species of amphibians, and eleven species are expected to inhabit the Valley based on surveys conducted in the Park from 1995 through 2001, including the Olympic torrent salamander, rough-skinned newt, ensatina (lung-less salamander), western red-backed salamander, long-toed salamander, northwestern salamander, Van Dyke's salamander, western toad, tailed frog, Pacific tree frog, and the northern red-legged frog. The cascades frog is common in the higher elevations of the Elwha watershed. Six species–cascades frog, tailed frog, western toad, van dyke's salamander, and Olympic torrent salamander–are listed as a federal and/or state species of interest. Cascades frog, a FWS listed species of concern, lives in mountain meadows and streams above 3000 feet. It breeds in May through August and feeds on insects. The tailed frog is also a FWS species of concern, as well as a species that is being monitored for listing by the state of Washington. This species has no vocal sac and inhabits cold, swift-moving mountain streams feeding on invertebrates and algae. The western toad–both a federally listed species of concern and a state candidate species–lives in burrows near streams. The Olympic torrent salamander–a federally listed species of concern and on the monitoring list for the state of Washington, is unique to the Olympic Peninsula. This amphibian thrives in clear, clean and cold streams, and the Elwha's old-growth forests shade and filter snowmelt waters, providing suitable year-round habitat for this species. The western pond turtle–a federally listed species of concern and a state endangered species, inhabits slow-moving streams and lakes. They feed on insects, frogs, and frog eggs. The Van Dyke's salamander, a rare species of terrestrial lungless salamander endemic to the state of Washington, potentially occurs in the Elwha watershed as well. Though little is known about the habitat requirements for this federal species of concern and state candidate species, it may be restricted to streamside or seep habitats.

The following reptiles were found to be river-dependant and ORVs: tailed frog, western toad, and Olympic torrent salamander.

Conclusion

Several animal species that are unusual, threatened, endangered, or of concern are found in the Elwha River watershed. Many of these species are dependent on the river for some or all of their life cycle, or the river is a critical habitat component including the bald eagle, osprey, northern goshawk, harlequin duck, Oregon vesper sparrow, olive-sided flycatcher, pale Townsend's big-eared bat, long-eared myotis, long-legged myotis, tailed frog, western toad, and Olympic torrent salamander. Therefore wildlife is an outstandingly remarkable value of the Elwha Valley.

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.*
>
> *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 and sensitive species. Diversity of species is an important consideration and could, in itself, lead to a determination of outstandingly remarkable.*
>
> *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 outstanding remarkable.*

Past Conditions

Historically, the Elwha River was famous for the size and vitality of the fish returning to spawn in its waters, and it was one of the largest producers of salmon and steelhead on the Olympic Peninsula. The system provided habitat to ten stocks of anadromous and resident salmon and trout-winter and summer steelhead, coho salmon, summer/fall Chinook salmon, spring Chinook salmon, pink salmon, chum salmon, sockeye salmon, cutthroat trout, and bull trout. The river produced an estimated 380,000 migrating salmon and trout annually, including some Chinook salmon over 100 pounds.

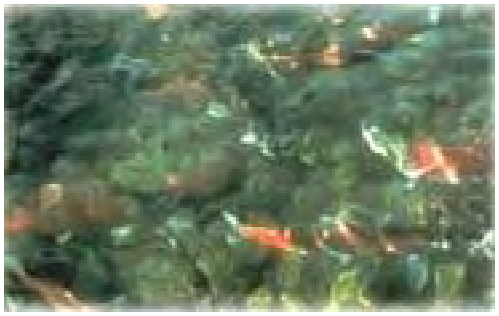
Approximately 70 miles of the Elwha's mainstem and its tributaries may have been available to anadromous species. Salmon, trout, and char (bull trout and Dolly Varden) utilized the entire river to its headwaters for spawning and rearing, except for perhaps the last two miles of the mainstem channel where they may have encountered impassible stretches. The carcasses of these fish fed more than twenty-two species of wildlife and supplied the entire aquatic ecosystem with organic material, phosphorous, carbon, and nitrogen.

The Elwha River also provided habitat for a number of other fish species, including resident rainbow trout, other anadromous fish such as white sturgeon, and many other species, including both fresh water and marine species. The intertidal area of the river supported hard-shell clams—specifically littleneck clams, butter clams, and horse clams. These marine shellfish were locally abundant.

Because Elwha Dam was constructed without providing passage for migrating fish, the historical runs of salmon and trout began to significantly decline soon after completion of the dam. The dams obstructed upstream fish migration beyond the first 4.9 miles of the Elwha River, making almost 93% of the Elwha River watershed inaccessible for anadromous fish. They not only restricted the distribution of anadromous stocks to below the Elwha Dam, they also reduced both the number of individuals and species present by altering the conditions of the river. The dams and the respective reservoirs reduced downstream movement of sediment, which negatively affected spawning habitat quality. The dams also modified the quality and quantity of the habitat both upstream and downstream of the dams. The presence of the reservoirs modified flow, temperature, and nutrient conditions of the river. This affected water quality conditions, which influenced the fish production.

Though dam projects were required by Washington State law to provide fish passage, a fish hatchery was constructed at the Elwha Dam in lieu of a fish ladder in 1915. The hatchery was unsuccessful and was abandoned in 1922. Other steps were taken to boost the declining fish populations. In the 1960's and 1970's, the Washington Departments of Fisheries and Game began hatchery supplementation of Elwha River fall chinook, coho, and summer and winter steelhead runs. From facilities outside the drainage. Hatchery production within the Elwha River basin began with construction of both a chinook salmon rearing channel and fish hatchery on the river. The lower Elwha Fish Hatchery, built in 1976, is one of 46 facilities operated by Indian Tribes in western Washington. This hatchery annually produces approximately one million coho, chum, and steelhead salmon for release into the Elwha River. Unfortunately, hatchery production has adversely affected Elwha wild stocks. Hatchery supplementation encouraged the decline of wild stocks through the effects of predation, overharvest, potential genetic dilution and manipulation, increased habitat competition, and disease.

By 1983, the Elwha River sockeye salmon were essentially extinct and the pink salmon population had severely declined. Chum salmon were in low numbers, as well as sea-run cutthroat and native char. The summer/fall chinook stocks were hatchery based, and return numbers were not meeting Department of Fisheries' mitigation requirement numbers. Status of the spring chinook was debatable. The stock either amounted to only low numbers or was extinct.



Other factors have also contributed to the decline of the Elwha's once superior fish runs. Commercial fishing became profitable after highway construction on the Olympic Peninsula was completed, which made it possible for fish to be transported to Seattle and Tacoma markets. This may have led to overharvest. Diversions of water from the lower reach of the Elwha for increased industrial and human consumption further decreased habitat for fish. The effects of logging, including the loss of large woody debris, may also have contributed to the decline of anadromous runs.

Present Stocks

Dam construction on the Elwha River eliminated a considerable amount of habitat for anadromous fish and began what became a precipitous decline in the native populations of all ten runs of Elwha salmon, trout, and char. Anadromous species currently returning to the Elwha River include chinook salmon, coho salmon, pink salmon, chum salmon, steelhead, cutthroat trout and bull trout. Of these species, chinook, coho and chum salmon are supplemented through artificial propagation and only cutthroat trout and bull trout are found in either the middle (between the dams) or upper (upstream of Lake Mills) reaches of the river. Resident rainbow trout and introduced eastern brook trout are also present in the river above the dams. Although Elwha River sockeye salmon are considered extinct by many, adult sockeye are observed in the river every year. These fish may be strays from other river systems or result from kokanee smolts that migrate from Lake Sutherland. Pink, chum, coho, and chinook salmon are all listed as state priority species. Puget Sound Chinook is also listed as federally threatened. Cutthroat trout, rainbow trout, Pacific lamprey, river lamprey and steelhead are also listed as state priority species. Bull trout is a federally threatened species, as well as a state candidate species.

Chinook salmon. Summer/fall Chinook arrive in the lower Elwha River from June through September. Puget Sound Chinook including the fall run in the Elwha River were listed as federally threatened in 1999. Adults require cold water and medium-size spawning gravel, and peak spawning occurs from mid-September through mid-October. Eggs are usually laid in the main channel of the river rather than its side channels or tributaries. Juveniles emerge in early winter and most migrate in their first year, primarily in May and June. A small portion of fish spend over a year in the stream before migrating in their second spring. All spend time in the estuary as they grow and adapt to salt water. The majority of Chinook returning to the Elwha River are of hatchery origin, although substantial numbers do spawn in the wild.

Coho salmon. The majority of coho salmon return to the Elwha River from mid-August to early December. Spawning occurs from October to December, with preferred spawning occurring in side channels. Coho salmon emerge from the gravel in early to late winter. Coho juveniles rear for over a year before migrating to the ocean the following spring. Overwintering habitat, which is critical for survival, is often associated with wooded off-channel areas such as ponds and side channels, though main channel pools are also used. Adults returning to the river are primarily hatchery fish, averaging about 3,000 fish per year in the early 1990's. Because of its hatchery program, the Elwha River is currently the largest producer of coho salmon on the Strait of Juan de Fuca. Side channel habitat improvements by the Lower Elwha Klallam Tribe have resulted in increased natural spawning of coho salmon in the river.

Chum salmon. Chum salmon migrate to the Elwha River from September through early December, with the majority entering in October and November. Spawning occurs in smaller-sized gravels in low-grade channels from October into January. Fry emerge from the gravel from March through early June and migrate directly to the estuary environment or ocean, where they spend their first few weeks in shallow waters before moving gradually offshore. In 1977, the tribal fish hatchery began stocking chum fry from the Quilcene hatchery in the Elwha River and used returning fish for broodstock beginning in 1980. This was discontinued in 1986 due to poor adult returns and low market value. Because of returns of typically less than 500 fish, the Tribe initiated a chum salmon supplementation program several years ago that involves incubating eggs and then placing them in egg trays that are buried in the gravel to simulate natural spawning. The Tribe has also developed engineered log jams to create and maintain salmon habitat in the lower river. Chum salmon have been observed spawning in these areas.

Steelhead. Winter run steelhead migrate into the Elwha River from November through early March, while summer run steelhead arrive from late April to October. Summer run steelhead may spend up to six months in the river before spawning. Both races spawn in the spring. Steelhead utilize a wide range of gravel sizes, but most likely utilize large mainstem areas of the Elwha River for spawning. Of the anadromous fish that utilize this watershed, steelhead have one of the longer rearing periods before migrating out to the ocean. Most spend two winters in the river before leaving in the spring months, primarily April through June. Rearing juveniles use both the mainstem and its side channels, with moderate-to high-gradient habitats being the most productive areas. The hatchery program for winter and summer steelhead helps the Elwha River to be the largest steelhead producer in the Strait of Juan de Fuca. The Lower Elwha Tribal Fish Hatchery is the primary source of winter steelhead stocking. This stocking has resulted in returns of some 3,100 fish in some years. The summer run used to be produced primarily from hatchery releases by the WDFW, but that program has been discontinued. Some naturally spawning steelhead exist in the river in low numbers.

Cutthroat trout. The presence of resident and sea-run cutthroat trout is low in the Elwha River watershed. West-slope cutthroat is listed as a federal species of concern. Anadromous cutthroat trout migrate upstream at least once before they are ready to spawn, usually from July to January. Spawning areas are typically low-gradient, small-to medium-size tributaries. Spawning occurs from December to March, and fry emerge in late spring. The fish rear in their natal streams for several years before migrating as smolts to the marine environment, where they typically remain within 30 miles of their stream origin. Stocking of hatchery fish has been limited to Lake Sutherland, stocked with roughly 10,000 resident cutthroat trout a year in the 1980's. Small numbers of resident fish have been found in Indian Creek.

Native char – bull trout. Bull trout is a federally listed threatened species and a state candidate species. Generally, these fish are widely distributed in the state, but not abundant. Anadromous forms typically migrate upriver from May to December and spawn in the fall, usually October. Fry emerge in April to mid-May. After rearing three to four years, they migrate to the ocean in the spring and return to the same stream in the fall, repeating the cycle annually. Anadromous forms are limited to the lower portion of the river. They have rarely been captured in the Lower Elwha Tribal Hatchery trap, and one or two a year have been observed in the WDFW Elwha River Chinook rearing channel. The Elwha watershed also supports non-anadromous forms of bull trout, which are primarily found upstream from the Elwha Dam. Resident forms remain in the tributaries, fluvial forms migrate from the mainstem of the Elwha to the tributaries, and adfluvial forms may undergo similar behavior as anadromous stocks and return to Lake Mills and Lake Aldwell annually. The population above Glines Canyon Dam is considered to be healthy and at no immediate risk. The status of the middle reach population is uncertain because of a lack of information.

Pink salmon. From July through October, pink salmon arrive and spawn in the Elwha River watershed, in odd-numbered years. Typically they seek out small gravel, which is limited to low-gradient channels and tributaries in the lower section of the river. Eggs incubate during the winter and hatch in early spring. Juveniles emerge from the spawning gravel and move downstream toward the sea within hours or days of hatching. They may spend up to two months in the nearshore and estuarine environment before migrating to deeper water. There has been no hatchery program for Elwha pink salmon since the 1920's. Peak runs and escapement were once in the thousands–nearly 40,000 individuals were recorded in 1963. Since 1979, estimated runs and escapement have only been in the hundreds or less. The 1979 decrease in pink salmon returns was a regional occurrence. This population crash corresponds to a year of heavy rains and flooding, though the lack of suitable riverine habitat caused a subsequent long-term decline. The pink salmon return has been increasing in size in recent years, up to as many as about 500. These fish are likely originally the result of strays from other river systems.

Sockeye salmon. All major stocks of sockeye require a river system that is connected to a lake for spawning and rearing, respectively. The only natural lake in the Elwha River drainage is Lake Sutherland, which is now inaccessible due to the Elwha Dam. Lake Sutherland drains into Indian Creek, which enters the Elwha at river mile 7.5, between the two dams. Records show an in-river harvest of only eight sockeye over a ten-year period (1982-1991). These fish were most likely strays and could have come from coastal, Puget Sound, or Fraser River runs. There are no hatchery operations for sockeye on the Elwha River.

Other species. Resident rainbow trout are the most abundant fish upstream of the Elwha Dam. These trout occupy the upper Elwha, as well as the reservoirs and middle reach of the river. Spawning occurs from April to June, with fry emerging in early to mid-summer, depending on temperature. Eastern brook trout, a non-native species, is found in the Elwha watershed in

wilderness lakes and some lower elevation tributaries of the Elwha River. Other fish found in the drainage include harbor dace, Pacific lamprey, river lamprey, sculpins, anadromous smelt, three-spine stickleback, anadromous white sturgeon, and marine species such as flounders. Sturgeon are a major commercial and recreational species in Washington.

The Future

Congress mandated the full restoration of the Elwha's ecosystem and its native anadromous fisheries through the Elwha River Ecosystem and Fisheries Restoration Act. The NPS completed two EISs. EIS-1 examined five alternatives to fulfill the congressional mandate and determined that both dams must be removed to meet the goals of the Elwha Act. Dam removal will allow anadromous fish to access the habitat upstream of Lake Mills, which has remained in near pristine condition because it is located within ONP. Chances for restoring nine of the ten runs of fish to pre-dam numbers are rated as either "good" or "excellent" if both dams are removed. Puget Sound Chinook, which are listed as federally threatened, are one of the species that would benefit from restoring the Elwha. Sockeye salmon suffer from potential stock limitations and habitat problems outside the Elwha watershed and have only a "poor" to "fair" chance of recovery. Removing both dams and allowing the ecosystem to restore will produce an estimated 390,000 salmon and steelhead in roughly 30 years.

Natural sediment transport conditions would be reestablished if the dams were removed. This would restore needed spawning gravel and woody debris for fish, as well as replace sand missing from the river's estuary, nearby beaches, and the nearshore environment. This would also greatly benefit the hardshell clam species that may have once been abundant in these environments. The estuary would grow to its pre-dam size and once again serve as an important transitional habitat between fresh and salt-water for many species of fish and other aquatic organisms. Draining the reservoirs and returning the river and surrounding land to pre-dam conditions would reduce downstream temperatures in the river, restore the lower five miles of stream habitat to its formerly productive condition, and provide access to over 70 miles of high-quality river, greatly benefiting fisheries and the ecosystem. The reintroduction of salmon and trout throughout the river's length would also benefit wildlife by providing a year-round, stable food source these fish once provided.

Conclusion

The Elwha River drainage provided essential habitat for ten stocks of anadromous and resident salmon and trout. These runs were recognized for the size, vitality, and sheer numbers of fish that returned to spawn in this watershed. The fish runs played an enormous role in the watershed–not only were they the primary food source for at least 22 animal species, they were also the economic and spiritual source for the Lower Elwha Klallam Tribe. Though dam construction and presence caused a decline in these populations, currently the Elwha River is the largest producer of winter and summer steelhead and coho salmon on the Strait of Juan de Fuca. When the Elwha and Glines Canyon Dams are removed, pre-dam numbers of 9 of the 10 runs of fish may very well be restored. This will also greatly help restore the ecosystem of the watershed. However, at this time, only bull trout and other resident fish exist in the free-flowing segments of the river (see the Free-Flowing section of this report); for these reasons, bull trout is determined to be an outstandingly remarkable value. When the river is restored, additional fish species may also be determined to be ORVs.

Fauna Species of Concern Found or Potentially Found Within the Elwha River Watershed.

	Species Status:	
	WA	**Federal**
Birds		
Northern spotted owl	E	T
Marbled murrelet	T	T
Bald eagle	T	T
Northern goshawk	C	SC
Harlequin duck		SC
Osprey	M	
Aleutian Canada goose	T	SC
Olive-sided flycatcher		SC
Cassin's auklet		SC
Oregon vesper sparrow		SC
Peregrine falcon	S	SC
Tufted puffin	C	SC
Mammals		
Pale Townsend's big-eared bat	C	SC
Long-eared myotis		SC
Long-legged myotis	SC	
Reptiles & Amphibians		
Cascades frog		SC
Tailed frog	M	SC
Western toad	C	SC
Van Dyke's salamander	C	SC
Olympic torrent salamander	M	SC
Fishes		
Resident cutthroat	P	
Searun cutthroat	P	
Pink salmon	P	
Chum salmon	P	
Coho salmon	P	
Rainbow trout	P	
Winter steelhead	P	
Summer & fall chinook salmon	P	T
Bull trout	C	T
Westslope cutthroat trout		SC
Pacific lamprey		SC
River lamprey	C	SC

ABBREVIATIONS USED IN THIS TABLE

E = Endangered Species T = Threatened Species S = Sensitive Species

C = Candidate Species SC = Species of Concern M = Monitoring

P = Priority

Prehistoric Resources [4]

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 NPS.*

The entire descriptions of the pre-historic, except the criteria and conclusion sections, are excerpts from the 1996 Elwha River Ecosystem Restoration Project Cultural Resources Survey by Schalk, R., L. A. Speulda, and D. Conca, Infotec Research Inc. Fresno CA. Permission to use the excerpts in this report was given by Dave Conca.

Introduction

The cultural history of the Olympic Peninsula region has been discussed in several previous studies (Bergland 1983; Evans 1983; Schalk 1988; Wessen 1990). In addition, a number of cultural resource efforts associated with the Elwha River Ecosystem Restoration either have been completed in the recent past or are nearly completed. These include ethnographic research on the Elwha Klallam (Lane and James 1995), a historical context statement for the Project area by NPS (1995), historical landscape inventories (Harris et al. 1991; Tolon 1995), and documentation of the Elwha and Glines Canyon Hydroelectric Powerhouses and Dams according to the standards of the Historic American Engineering Record. This section briefly characterizes the regional cultural historical sequence and previous cultural resource studies in the Project area to provide a background for understanding and evaluating the archaeological resources identified during Project surveys.

The prehistoric archaeological sequence in the Project area is considered first. This is followed by a short summary of nineteenth century Klallam settlement patterns as described in ethnography, a summary of the historical themes that have been developed for the Project area, and a discussion of previous cultural resource studies.

Regional prehistory

Because substantial temporal and geographic gaps exist in the archaeological record of the Olympic Peninsula, characterization of the regional cultural sequence requires extrapolation from surrounding regions. Radiometric dates from archaeological sites on the peninsula show a biased distribution in which very few predate the last 3,000 years (Schalk 1988:Figure 6.1). On the basis of artifact typology, however, numerous sites may be between 10,000 and 6,000 years old (Bergland 1983; Munsell 1971; Wessen 1990). Occasionally stratigraphic or geomorphological associations indicate ages in excess of 6,000 years (e.g., Gallison 1994). The interval between 6,000 and 3,000 B.P. is perhaps the most problematic part of the Holocene in this region inasmuch as neither radiometric nor typologically dated assemblages clearly are associated with this period.

[4] Prehistoric resources are associated with Native Americans and date before the time of contact with European settlers (AD 1850). Information about these resources are recovered primarily through archaeological investigations.

The first cultural sequence proposed specifically for the peninsula was presented by Bergland (1983) in the archaeological overview for Olympic National Park. This sequence includes three major periods: Early (12,000–6,000 B.P.), Middle (6,000–3,000 B.P.), and Late Prehistoric (3,000–200 B.P.). The latter is further subdivided into Early Maritime (3,000–1,000 B.P.) and Prehistoric Northwest Coast Pattern (1,000–200 B.P.).

The Early Prehistoric Period is represented by lithic assemblages comparable to those that are referred to as "Olcott" or "Old Cordilleran" in other regions of the Northwest. Although faunal assemblages are lacking, subsistence practices in the Early Prehistoric Period are believed to have focused on the hunting of large land mammals. Assemblages that can be confidently assigned to the Middle Prehistoric Period have not been reported on the peninsula; however, on the basis of developments in surrounding regions (e.g., the Gulf of Georgia), this interval is conjectured to have been one of major adaptive changes (Bergland 1983:32). Whether these changes actually occurred on the Olympic Peninsula is unclear, but unequivocal evidence for systematic exploitation of salmon and flatfish appears in the Late Prehistoric Period. The Early Maritime Period (3,000–1,000 B.P.) is best represented by sites near the mouth of the Hoko River (Croes 1976, 1992; Croes and Blinman 1980; Croes and Hackenberger 1988). Characteristic of this period are exploitation of marine resources, use of flaked stone lithics, and the apparent absence of cedar plank houses. The Prehistoric Northwest Coast Pattern (1,000–200 B.P.) is known largely from the Ozette Site where large-scale, multiyear excavations were undertaken (Daugherty and Kirk 1975; Friedman 1976, 1980; Friedman 1975; Gleeson 1973a, 1973b, 1973c, 1974a, 1974b, 1980a, 1980b, 1982; Gleeson et al. 1976; Gleeson and Fisken 1977; Gustafson 1968; Huelsbeck 1981a, 1981b, 1983a, 1983b, 1989; Kirk and Daugherty 1978; Mauger 1975, 1978, 1980a, 1980b; Wessen 1982, 1988). Hallmarks of this period are the appearance of villages of large cedar plank houses, the absence of flaked stone tools, and, on the northwestern Peninsula at least, major dependence on large sea mammals such as whales, fur seals, as well as offshore fish such as halibut. Adaptations of the Prehistoric Northwest Coast Pattern are considered equivalent to those described in ethnographies.

The cultural sequence presented in the research design for Olympic National Park (Schalk 1988) focuses on land-use systems and their ecological determinants. Three different land-use strategies are proposed for the region's prehistory. The earliest, a highly mobile foraging system, operated during the early Holocene when the peninsula was less densely forested and land mammals were abundant. With the closure of the forest after about 6,000 B.P. and reduction in the productivity of land resources, subsistence began a shift toward increased dependence on aquatic resources; a second strategy emerged around 3,000 B.P. that involved an interval of winter sedentism supported by stored salmon. The third strategy emphasizing marine resources, especially large sea mammals and pelagic fish, is characterized as a relatively late development (3,000–1,000 B.P.) limited to those areas where these resources are most abundant and where salmon resources were limited.

In a recent synthesis of Northwest Coast archaeology, Matson and Coupland (1995:81) include the Olympic Peninsula in a much larger cultural region extending from the mouth of the Columbia River to the northern end of Vancouver Island. In this chronological scheme, the "Old Cordilleran Culture" continues up to about 4,500 B.P., after which a strong orientation toward coastal resources is recognized. Interregional adaptive differentiation also first becomes apparent—relating particularly to differences in productivity of salmon resources (Matson and Coupland 1995:142). The arrival of the "Developed Northwest Coast Pattern" is recognized in the appearance of large multifamily houses, social stratification, and large scale storage between 3,500 and 2,000 B.P.

In general, the temporal and geographic gaps in archaeological data through the Holocene on the peninsula are substantial. Consequently, characterizations of the prehistoric cultural sequence of the

Olympic Peninsula are untested. Archaeological data for the lower Elwha River corridor and similar environmental settings in this region are exceedingly thin. Therefore, information from such settings eventually may prove important to understanding how the Late Prehistoric Period adaptations described by ethnographers evolved from early Holocene hunting patterns.

Ethnography

An ethnographic study, including historical research and informant interviews, has been conducted as a separate element of the Elwha River Ecosystem Restoration (Lane and James 1995). That study should be consulted for a comprehensive and in-depth treatment of Elwha Klallam ethnography. Discussion here, therefore, is limited to a few comments regarding Klallam settlement pattern that may have some relevance to archaeological survey activities along the Elwha River.

Gunther's (1927) ethnography of the Klallam reported 12 villages along the Strait of Juan de Fuca often located at the mouths of creeks or rivers. Gunther provides few details about the nature of inland or riverine sites, and mentions only one village along the Elwha River, which was estimated with some uncertainty to be about 20 miles upstream from the river mouth (Gunther 1927:186). Considering that the Elwha is one of the Olympic Peninsula's larger rivers, it is noteworthy that a riverine settlement pattern is not more strongly represented. It may be relevant here to note that the time-line of Gunther's study seems to be the late nineteenth century and, therefore, represents conditions following population reduction and possibly settlement changes as well.

Conclusion

The Olympic Peninsula has been inhabited by humans for at least 10,000 years. The Elwha River and salmon was and continues to be central to the culture of the Klallam Tribe. The Elwha River contains sacred spiritual sites to the Klallam Tribe. For these reasons, prehistoric resources of the Elwha River watershed were found to be an outstandingly remarkable value.

Historic Resources[5]

The Interagency WSR council's criteria:

> *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.*

The entire descriptions of the historic section, except the criteria, historical structures, and conclusion sections, are excerpts from the 1996 Elwha River Ecosystem Restoration Project Cultural Resources Survey by Schalk, R., L. A. Speulda, and D. Conca, Infotec Research Inc. Fresno CA. Permission to use the excerpts in this report was given by Dave Conca.

Historical background

Eight historic themes were identified in the historic context prepared by the Northwest Regional Office of the National Park Service (NPS 1995). The themes include (1) Native Americans: Pre-contact use and occupation; (2) Native Americans: Post-contact use and occupation; (3) Exploration in the Elwha River Valley, 1885 to 1907; (4) Settlement in the Elwha River Valley, 1861 to 1906; (5) Industry in the Elwha River Valley, ca. 1880s to 1949; (6) Recreation and Tourism in the Elwha River Valley, 1890s to 1930s; (7) Government/Politics in the Elwha River Valley, 1930 to 1938; and (8) Architecture of the Elwha River Valley, 1870 to 1945.

[5] Historic resources date after AD 1850 and are more than fifty years old.

Each of the eight themes furnishes a narrative overview of the relevant historical background material, identifies associated property types, and provides registration elements to evaluate the properties. The first two historic context themes refer to Native American use of the Elwha River drainage area and were discussed above in Sections 3.3 and 3.4. Six additional historical themes for the Elwha Valley are summarized in the following sections.

Exploration

The shoreline of the Olympic Peninsula was visited and mapped by sailors from Spain, Mexico, France, Russia, England, and the United States beginning in the 1700s. However, Euro-Americans did not explore the Elwha Valley until late in the nineteenth century. In 1885, Lieutenant Joseph P. O'Neil led the first party from Port Angeles into the Olympic Mountains and sent one party down the Elwha Valley from Hurricane Ridge. Perhaps the most celebrated exploration trip was that of the Press Party. Sponsored by the *Seattle Press* newspaper, the six-member team began its trip in December 1889. The unusually severe winter limited their progress, and they wintered in the Elwha Valley between Little River and Griff Creek until mid-February. Their journals, photographs, and sketches provide a firsthand view of the valley and its early settlers. The success of the Press Party in traversing the Olympic Mountains encouraged other groups to ascend the mountains. Parties interested in the mineral, timber, and natural resources of the mountains led successive waves of geologists, scholars, and miners into the region. In general, these organized expeditions were transitory activities and the participants left few traces of their passing.

Settlement

Settlement of the Elwha Valley by non-Indians occurred in two phases. The earlier phase between about 1861 and 1890 focused on the lower Elwha River valley, from the mouth up to about Indian Creek. Shoreline and river mouth localities were settled first because transportation was by water in the rugged, forested countryside. Settlers worked their way inland along major rivers and began the painstaking job of clearing the land for farming. Farther into the mountains where the river valleys narrowed, settlement occurred slightly later and more sparsely (NPS 1995:11).

The earliest documented Euro-American settlers were two Hudson's Bay Company employees who crossed the strait from Victoria in about 1850. A later settler, Marcellus Huntoon, may have been the first non-Indian to actually claim lands on the lower Elwha River, in about 1861. Shortly thereafter, a small community of settlers developed farms in the lower Elwha Valley.

While some Klallam families living near the mouth of the Elwha River during this initial period of settlement were displaced from traditional property, several other families settled claims under the Indian Homestead Act. Among these were Joe Sampson, Hunter John, Boston Charley, Charles Jackson, and Sea-et-cum (Lane and James 1995). For the most part, these claims were on terraces adjacent to the Elwha River and were valued as good fishing locations.

The upper Elwha Valley was not settled until the 1880s and 1890s when advertisements about the availability of free land drew families to the area. In 1888, two Norwegian brothers, Henry S. and Jake Hansen, were living in the upper Elwha Valley but soon traded their original land claim upriver for land near the confluence of Indian Creek and the Elwha. To the east of Henry Hansen's claim, William MacDonald built a cabin. In 1889, the Press Party spent several weeks with MacDonald. That same year, Warriner Smith built a cabin farther upriver near the mouth of Madison Creek. Dr. A. B. Lull had built a cabin near the mouth of Griff Creek, which was the last cabin on the Elwha River noted by the Press Party.

An influx of settlers beginning in the mid-1890s included Magnus Miller, Edwin Herrick, Charles Stringham, Ed and Inez Isbell, Gus Raull, Harry Coventon, Cadis Bowman, Jeremiah Griffiths, Christian and Kjerstine Lollick, Grant Humes, William Humes, Martin Humes, William Anderson, Ernst Krause, Gustave and Emiline Wolff, William Ware, Otto Seig, Carl Johnson, Dennis Freeman, and Addison Ludden. In many cases, the settlers cleared small parcels, planted gardens, and built log or wood frame houses. The farms were difficult to clear, and the growing season was short in the upper Elwha Valley. Most settlers were forced to seek alternate sources of income; many became pack guides, bounty hunters, or mill workers. Only a few buildings dating from the era of pioneer settlement have survived to the present (NPS 1995:13–14).

Industry

Industry in the Elwha Valley was initiated in the 1880s with a sawmill operated by Silas Goodwin. Goodwin built the first bridge across the lower Elwha River in 1887. The first sawmill in the upper valley was built on Indian Creek by E. B. Griffin. The sawmill was portable and was moved to several different locations between about 1896 and 1925. The lumber industry never gained a strong foothold in the upper Elwha Valley because of the rugged terrain and lack of roads. Small logging operations associated with sawmills cut a few acres around Little River, Indian Creek, and near the mouth of the Elwha River in the first half of the twentieth century (NPS 1995:16).

World War I demands for spruce, used in the construction of aircraft for the Allied countries, witnessed perhaps the greatest single attempt to secure valuable lumber from peninsula forests. In 1918 the U.S. Government selected Port Angeles as the location for its Spruce Production Corporation and constructed a huge spruce sawmill on Ennis Creek. However, just as the mill was ready for production, the armistice was signed and the mill stood idle from 1918 until 1929. The 36-mi mainline roadbed, which had been extended across the northern peninsula, opened the area's vast timber reserves for logging. In 1931, a new mill was started on Ennis Creek by Olympic Forest Products, which later became I.T.T. Rayonier Incorporated (NPS 1995:17).

Road access to the upper Elwha Valley was nonexistent until the mid-1920s when construction of the Glines Canyon Dam created a need for industrial transportation routes. Logging to supply the needs of this huge construction project stimulated timber cutting on the terraces and slopes of the Elwha River. Harold Sisson logged portions of a 400-ac parcel between Altair Campground and the park boundary on the west side of the river. Logs were skidded across the river and loaded onto trucks on the east side of the river. Campfire Girls replanted this area with trees in 1938.

Mining, despite many attempts, never proved sufficiently successful to encourage large-scale or long-term development. Activities by the Humes brothers focused on the exposed ledges of Hurricane Hill, approximately 325 ft above the Elwha River. A mining adit along Madison Creek is the closest activity to the valley floor. No placer mining ever occurred in the Elwha River (NPS 1995:21).

A more enduring peninsula industry was the production of hydroelectric power, which began at the turn of the century. Harnessing this power became attractive with the growth of the electrical industry in Washington in the 1880s.

> The first of the Elwha dams to be built was the Elwha River Project, a privately owned plant. The Elwha River Plant was constructed between 1910 and 1914 in order to spur development on the peninsula, namely in the Port Angeles area. Thomas T. Aldwell, an early settler in the northern peninsula, spearheaded the power project. Once completed, the project provided most of the electrical power from

Port Angeles to Bremerton for residential, commercial, and industrial uses [NPS 1995:16, 23].

In 1926, Northwest Power and Light Company built a second hydroelectric facility on the Elwha River. The Glines Canyon Dam, 7 miles upriver from Elwha Dam, doubled the company's generating capacity for the peninsula's inhabitants and industries. The Glines Canyon Dam was included within the boundaries of the Olympic National Park in 1940 (NPS 1995:23).

Recreation and Tourism

The recreational qualities of the Olympic Mountains were publicized by the exploration groups who wrote about their travels. Hiking and mountaineering groups organized regular hiking treks into the interior portions of the Olympics. "The arrival of both the automobile and the U.S. Forest Service on the Olympic Peninsula soon after the turn of the century played a significant role in the escalating development of the peninsula's and the forest's recreational potential" (NPS 1995:29).

Automobile tours and recreational pursuits led to an expansion of the road system and development of resort lodging. The U.S. Forest Service (USFS) contributed to the recreational trend by building spur roads into the interior, constructing trails and shelters, and encouraging commercial resort development. Early resorts in the Elwha Valley included the Waumila Lodge and cabins on the river bank, the Mountain View Summer Resort on Indian Creek, and the Cedarville resort with its small farm, store, gas station, and a few cabins near Madison Creek. Most commercial resorts maintained horses and guides for pack trips into the back country for hunters and fishermen. Herrick's Store and gas station on the corner of Herrick Road and the old state highway also ran pack trains to the Olympic Hot Springs between about 1910 and 1932 (NPS 1995:30).

Government/Politics

"Since 1897, when President Grover Cleveland set aside over two million acres of land (the largest portion of the peninsula) as a forest reserve, much of the Olympic Peninsula has remained in the public domain and under the jurisdiction of the federal government" (NPS 1995:36). The USFS began administering property by about 1900 and by 1906 was operating a station out of Jeremiah Griffith's homestead cabin. During the 1930s the Civilian Conservation Corps (CCC) was active in the Elwha Valley and had three camps along the upper Elwha River. The work activities included "the construction of administrative facilities, a network of roads and the improvement of existing roads and several campgrounds" (NPS 1995:39). The Elwha Ranger Station was established by the USFS in 1930 for fire protection and recreational reasons.

The National Park Service took over management of Mt. Olympus National Monument in 1933 and became responsible for the larger Olympic National Park created in 1938. Since that time, park boundaries have expanded and contracted in response to political pressures (NPS 1995:36).

During the 1930s, city and county officials requested that the federal government provide a reservation for the Lower Elwha Tribe of the Klallam who were living on Ediz Hook and along the waterfront of Port Angeles. By 1934, the federal government was moving forward with plans to purchase land on the west side of the Elwha River and to reestablish a reservation for the Klallam. Initially a few families were moved on to the land that was later to become the Lower Elwha Reservation, taking over established farms that had been purchased by the federal government. The Johnson, Hopie, and Charles families were the first occupants (Morrison 1939). By 1938, more families were moved to the locality and a small community was established that has continued to grow and, in 1968, was designated a reservation.

Historical Structures

The cultural activities significant to the Elwha Valley's history include exploration, settlement, commercial development, federal management, and recreation (Schalk et al. 1996). These activities are reflected in the watershed's log cabins, shelters, campgrounds, and other structures. Few structures survived the harsh climate and rapid revegetation of the lowlands, and all extant ones are from the twentieth century. The ones that have survived still convey the same qualities and associations today that they did historically. Seven existing structures located in the Elwha watershed are listed in the National Register of Historic Places. Many additional sites in the drainage are also eligible for listing.

Both dams located on the Elwha River are listed on the National Register of Historic places (NPS: National Historic Register 2000). The Elwha River Plant is historically significant as an example of an early twentieth century low-head hydroelectric system and as an early and rare example of a multiple buttress dam. The "blowout" and reconstruction of the original dam foundation is noteworthy as it represents a failure of early engineering and a successful response to that failure (NPS: National Historic Register 2000). The Glines Canyon Plant is significant for its association with the evolution of powerplant design and contribution to the development of the automation of hydroelectric installations. In addition, as one of the last dams within the State to be constructed solely for the purpose of power generation, it marks the closing of an era which characterized early hydroelectric development within Washington (NPS: National Historic Register 2000). A third listed site in the Elwha drainage is the Humes Ranch Cabin. The cabin was constructed around 1900 during a period of early homesteading activity in the mountainous interior of the Olympic Peninsula. It represents the efforts and spirit of the American pioneer in settling the "last frontier" of the contiguous United States. The Humes Cabin is significant as one of the few remaining intact homestead residences on the Peninsula, and it is the oldest extant homestead cabin in ONP (NPS: National Historic Register 2000) . The Elwha River Bridge, also listed on the National Register, was constructed by Clallam County in 1913 as part of an effort to link the Olympic Peninsula with the rest of the State by wagon roads. Later, it became part of State Highway Route 112. This bridge is significant as the oldest Warren truss (bridge configuration composed of diagonals that are placed alternately in tension and compression) in the State constructed for highway use. Both the Elwha and Altaire campgrounds are also listed (Schalk et al. 1996). Their community kitchens are significant for their associations with the nationwide work relief program of the CCC; they are visible expressions of the CCC's efforts to advance recreational development in Northwest forests. Architecturally, there are no duplicates of these community kitchens in the Pacific Northwest. The Elwha Ranger Station District, built in the 1930s, was established principally for recreation use and fire protection. The building group is listed for its associations with the USFS and later the NPS administration (Schalk et al. 1996). The buildings embody the distinctive characteristics of USFS-designed buildings constructed throughout forests in the Northwest in the 1920s and 1930s and possess a high degree of integrity of location, design, setting, materials, workmanship, feeling, and association.

Many other buildings located in the Elwha watershed are eligible for listing in the National Register of Historic Places. Several cabins are also eligible for listing on the National Register. The Botten Cabin, located in the upper Elwha Valley, is one of four known private vacation cabins constructed on the Elwha River (Evans 1983). Built by Grant Humes for outdoor enthusiast H.H. Botten in 1928, it is an excellent example of log cabin construction featuring fine handcrafted, tenon-shaped corner notching (Evans 1983). In 1926, Elk Lick Lodge was also built by Grant Humes as a private vacation and fishing cabin for Frederick Gordon Remann (Evans 1983). As Pierce County superior court judge, Remann was widely known for his stature in law and politics in the state of Washington and was the most prominent regular visitor to the Elwha River Valley (Evans 1983) . Both cabins

represent an earlier era of recreational use of the interior Olympic Peninsula. Dodger Point Fire Lookout is eligible for listing as the only fire lookout in ONP that was built originally for the purpose of fire detection, and it is very likely the oldest standing fire lookout on the Olympic Peninsula. It was one of dozens of fire detection stations built in the high mountains of the Pacific Northwest during the peak of the USFS's lookout construction (Evans 1983). It represents an era of forest management when fire was considered a deadly enemy to forests, and great effort was expended to prevent and contain forest fires. Other buildings constructed by the USFS are also eligible for listing. The Elkhorn Guard Station Residence was built by the USFS in the 1930s, using labor provided by the CCC, to serve as administrative buildings (Evans 1983). It includes the Elkhorn Shelter, the only shelter dating back to this time that remains standing on the Elwha River, as well as a barn, woodshed, and residence. All four buildings are eligible for listing as part of a total building ensemble.

As described above, there are a number of historic structures that are listed or eligible for the National Register of Historic Places, three of these sites are river-dependant - both the dams and the Elwha Bridge.

Conclusion

There are a number of sites that are listed and/or eligible for the National Register of Historic Places. Three of these sites are river-dependant: Glines Canyon & Elwha River Dams and powerhouses, and the Elwha Bridge. In addition the history of dam use on this river and the controversy of removing or retaining these dams, both of which have played an enormous role in this watershed, is of regional and national significance. For these reasons, history is an ORV.

Scenic Qualities

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.*

U.S. Forester Henry S. Graves, who completed a trip to the Olympic Peninsula in the fall of 1914, wrote:

> *The Olympic mountains have many distinct features that place them in the front rank of the scenic wonders of the country. It is the combination of many natural features, which all taken together, create an effect which is unique. The mountain mass with its glaciers, the rivers with their deep canyons, and a forest which can not be matched anywhere contribute to this result.*

Visitors can still travel to the Elwha Valley to find the scenic beauty and wonder of the Olympics that Graves experienced in the early 20th century. Due to its limited accessibility and its location within Olympic National Park, the Elwha watershed has undergone minimal disruptive human activity. Development that did occur in this drainage has been quickly obscured by the lush forest, or was removed by ONP. This has allowed the watershed to retain the beauty of a natural landscape, which has often been diminished or lost in other areas. Most signs of human activity and construction, including houses, roads, and trails, are located in the river's lower valley. Often these

are only visible along the river as a brief glimpse due to the lush riparian vegetation. Other evidence of human presence are from an earlier time, such as the few historic cabins and shelters along the Elwha, and enhance the landscape with their rustic simplicity.

Throughout the valley, visitors have breathtaking views in all directions. The river is extraordinary in all of its states, whether it is crashing down from its origins high in the Olympic mountains, churning as rapids through narrow canyons, or moving more slowly through the broad riverbed of the lower valley. The river is often a striking shade of turquoise, and the clarity of its waters enhances its beauty. The cobbled riverbed adds texture to the river scene, and areas of woody debris add even more variety to the landscape.

The vegetation found in the valley also greatly adds to the grandeur of the surroundings. Tall stands of red alder along the river's banks, dense forests of Douglas-fir, and the more sparse groves of subalpine fir and mountain hemlock give a sense of peace, as well as capture the eye. In many places the valley floor and the trunks of its trees are covered with epiphytes of a brilliant green. Wildflowers are abundant much of the year, adding color and variety to the forests and alpine areas.

Wildlife also adds to the beauty of the watershed. There is a sense of great excitement if one chances to see a large salmon leaping out of the river in the lower section. Deer, elk, and black bear are often seen in the clearings along the river, which were once homesteads. Salamanders may be spotted in damp and soggy habitats, and harlequin ducks and dippers are a common sight. Other, more elusive, creatures may be spotted by the lucky visitor.

The surrounding rugged and jagged Olympic Mountains are yet another component that add to the valley's beauty, especially in the upper reaches of the watershed.

Seasonal changes contribute to the ever-changing scenic character of the watershed. The alpine meadows are dramatic when their slopes are covered with the blooms of wildflowers. During the summer months, the varied shades of green of the forest's understory enhance time spent in the watershed. Deciduous trees and shrubs, such as vine maple, also contribute brilliant bursts of red and yellow to the landscape in the fall. Snow adds a blanket of white that starkly contrasts with the mountains' dark gray shades in the winter and throughout much of the year.

Another exceptional aesthetic quality of the watershed is the peacefulness and tranquility it holds. Although the Elwha valley receives many visitors, with its popular hiking trails, fishing opportunities, and availability to stock, most often one is alone, particularly in the middle and upper parts of the watershed. There is a chance to slow down and take time to appreciate the surrounding beauty with all of one's senses. This allows enjoyment of all the varied sounds of nature, such as wind through the trees, the crash of the river against its banks, the songs of birds; sounds that are often masked by the noise of traffic and crowds. The scents of the forest, such as the tangy scent of red cedar in the lower valley or the faint perfume of a wildflower, can also be appreciated when one is taking the day at a slower pace. Simple experiences that can be found here-the chill of a mountain

stream or the taste of a freshly picked huckleberry-can also increase one's aesthetic experience of the watershed.

Conclusion

The scenic qualities of the Elwha watershed meet and exceed all the criteria of the guidelines for this category. Because of the very low levels of human development, the landscape is essentially untouched, in the upper portions of the watershed. This allows visitors to experience the American wilderness as it once was and still is in only a few areas, in all its magnificence and grandeur. Many of the human constructions that still remain, especially within ONP, are from a much earlier time period, and their rustic qualities enhance their surroundings. The dramatic and glacially sculpted Olympic Mountains, the varied and diverse vegetation, and the clarity and color of the river all combine to create the beauty found in the Elwha drainage system. Visiting the watershed at different times of the year allows the visitor to appreciate the ever-changing character of the landscape as it changes with the seasons.

Other Values – Vegetation

While most river values of regional or national significance can be described under one of the other categories, sometimes there is a resource or traditional use of the river that is unique and does not fit any of the standard categories. Under the Interagency WSR Council's guidelines, the criteria for an outstandingly remarkable rating are:

> *While no specific national evaluation guidelines have been developed for the "other similar values" category, assessments of additional river-related values consistent with the foregoing guidance will be completed– including, but not limited to, hydrologic, paleontologic, ecologic and botanic resources.*

From rain forest valleys through upland forests of western hemlock and silver fir to the final reaches of dwarfed subalpine trees, the Olympic Peninsula encompasses the greatest remaining true wilderness forest in the contiguous United States. The ideal growing conditions found here–flat deep-soiled bottomlands, ample precipitation, and a mild, temperate coast climate–have combined to produce extraordinary forests with record-size specimens of several tree species. Some forest stands on the Olympic Peninsula have not been greatly disturbed in more than 1,000 years, which has resulted in an old-growth community of incredible diversity. The genetic wealth of these forests and the varied wildlife communities they support led to the selection of ONP as part of the World Biosphere Reserve Program and as a World Heritage Site by the United Nation's Educational, Scientific, and Cultural Organization.

Many factors affect the diversity and distribution of plants on the Olympic Peninsula. Fire, massive wind storms, and the moderating effect of the ocean on temperatures all play a role in influencing forest cover types. By creating a strong rain-shadow effect, the Olympic Mountains dramatically influence weather patterns, which in turn has a direct effect on vegetation patterns. The west side of the Olympics, which may receive over 200 inches of rain per year, supports different forest cover types and species than the Olympics' east side, which might receive as little as 20 inches of rain per year. The last ice age also played a key role in shaping the vegetation of the Olympic Peninsula. During the Pleistocene, massive ice sheets

surrounded the Olympics on all sides. These great walls of ice blocked off north-flowing rivers and created lakes that stretched southward. Organisms could react in three ways: some migrated south, many perished, and others remained and survived while trapped in the mountains. Some Olympic peaks extended well above the surrounding glaciers and provided snow-free environments for organisms that could adapt to the cold. A large number of "endemics" evolved in the Olympics due to this geographic isolation. Most endemic plants now occur in rocky, cold environments found near or above timberline. Many of these plant species are rare.

The Elwha River, located in the middle of the Olympic Peninsula, has a north-south orientation and is one of the longest drainages on the Peninsula. Because of its length and depth, the Elwha Valley is quite cold and experiences a climate transitional between the drier conditions to the east and the wetter climate to the west. As a result, the valley supports a mix of unique plant communities that are transitional between the vegetation of the east and the west side of the Olympic Peninsula.

The lower Elwha River Valley supports the *Tsuga heterophylla* zone (the lowland coniferous forest). The primary tree species include Douglas-fir, western hemlock, grand fir, western redcedar, and western white pine. Douglas-fir is dominant here, although western hemlock may also be prevalent. Pacific madrone is common in drier, well-drained locals. The understory composition is quite variable due to differences in microclimates. In moist to wet areas, skunk cabbage, salmonberry, devil's club, and lady fern are likely to be present. Mesic sites support sword fern, deer fern, Oregon-grape, red huckleberry, trillium, and vanilla-leaf. Salal and Oregon-grape are likely to be seen on drier sites.

Transition to the *Abies amabalis* zone (montane forest) occurs at approximately 1500 feet in the Elwha Valley. This zone is wetter than the lowland forest, and more precipitation falls as snow, which may accumulate in packs up to ten feet deep. This zone is characterized by the presence of Pacific silver fir, and western hemlock is frequently a co-dominant. Douglas-fir, western redcedar, and western white pine are regular constituents. Subalpine fir may dominate drier sites. These forests tend to have dense shrub layers when the canopy is relatively open. The more common understory species include oval-leaved blueberry, Alaskan blueberry, bunchberry, queen's cup, false azalea, and five-leaved bramble. Devil's club, kinnikinnick, western tea-berry, and Oregon oxalis are abundant in localized areas.

The *Tsuga mertensiana* zone (subalpine forest) begins at roughly 3,000 feet. Because of the more extreme climate, this zone is generally above the limits of continuous forest and is characterized by tree clumps and interspersed meadows. Dominant tree species include subalpine fir, Pacific silver fir, mountain hemlock, and lodgepole pine. Western white pine is also abundant. Pink mountain-heather, blue-leaved huckleberry, and showy sedge are seen in moist areas. Spreading phlox and Idaho fescue are more common on dry, open sites.

Conditions are too fierce for trees to survive above the subalpine zone. Though most of this zone is steep and rugged, alpine meadows often thrive above timberline. The plants here are perennials–the growing seasons are too brief for annuals–and the plants must blossom soon after the snow melts due to the short summers. Many have small tough leaves covered with hair or wax to help prevent moisture loss during high winds. Some commonly seen flowering plants include avalanche and glacier lilies, lupines, cinquefoil, and pink and yellow heathers, as well as many species of sedges and lichens.

Because the entire watershed of the Elwha River is a massive drainage (the largest in the park) and all vegetation zones (lowland, montane, subalpine, alpine) are represented, it is difficult to assess the presence of all special flora. As of June 2004, there are a minimum of 36 species of vascular plants classified as special reported from locations within the Elwha watershed. This total is subject to constant revision upwards.

The USFWS listed species of concern in the Elwha River drainage: Cotton's milkvetch (*Astragalus cottonii*), and tall bugbane (*Cimicifuga elata)*. The Olympic mountain milkvetch, an endemic to the Olympic Mountains and a member of the pea family, is listed by the State's Washington Heritage Program as threatened. It is limited to talus slopes and is known to occur in the Elwha watershed at elevations greater than 5,000 feet. Tall bugbane, which is State-listed as sensitive as well, is found in moist forests at lower elevations and may only occur in the Elwha River watershed. *Abronia umbellata ssp. acutalata* potentially inhabits the Elwha watershed, although it was recently believed to be extinct in Washington. It generally inhabits open sandy beaches at or below the zone of driftwood accumulation.

The Washington National Heritage Program listed eight other species (one threatened and seven sensitive,) for this watershed, as well as one species under review. ONP identified thirty-four locally rare species (plants with very limited distributions or very small population size) which receive special protection within the Park. These species of special interest reflect the transitional vegetation zone between the wet western side of the Olympics and the drier east side. Some species rely on moist, wet coastal habitats, such as several-flowered sedge (*Carex pluriflora*). Others require a dry, more inland climate, like Nelson's needlegrass (*Achnatherum nelsonii* var. *dorei*). Still others are found only on rocky crevices and talus slopes, such as lance-fruited draba (*Draba lanchocarpa* var. *vestita*) and fern-leaved lomatium (*Lomatium dissectum* var. *dissectum*).

Only three of the special species' habitat may be influenced by the river. These species are *Agrostis exarata var. exarata, Athysanus pusillus*, and *Crocidium multicaule.*

Conclusion

There are a high number of special plants found or potentially found in the Elwha drainage. However only three species may possibly occur in habitat affected by the Elwha River. These species are *Agrostis exarata var. exarata, Athysanus pusillus*, and *Crocidium multicaule.* Since the majority of the special plants are not dependent on the river, vegetation while a significant and important resource is not found to be an outstandingly remarkable value.

Threatened, Endangered, Sensitive and Rare Flora Found or Potentially Found Within the Elwha River Watershed.

Scientific Name	Common Name	Species Status:		
		Federal	WNHP	NPS
Achnatherum lemmonii var. *lemmnoii*	Lemmon's needlegrass			PR
Achnatherum nelsonii var. *dorei*	Nelson's needlegrass			PR
Agoseris heterophylla var. *heterophylla*	Annual agoseris			PR
Agrostis exarata var. *exarata*	Spike bentgrass			PR
Arnica cordifolia	Heart-leaf arnica			PR
Astragalus cottonii	Cotton's milkvetch	SC	T	PR
Athysanus pusillus	Athysanus			PR
Botrychium pinnatum	Northern grapefern		C	PR
Carex scirpoidea	Canadian single-spike sedge		S	PR
Cimicifuga elata	Tall bugbane	SC	S	PR
Clarkia purpurea ssp. *quadrivulnera*	Small-flowered clarkia			PR
Crocidium multicaule	Spring-gold			PR
Dodecatheon dentatum ssp. *dentatum*	White shooting-star			PR
Draba lonchocarpa var. *vestita*	Lance-fruited draba			PR
Elymus trachycaulus ssp. *trachycaulus*	Slender wildrye			PR
Epilobium mirabile	Surprising willow-herb			PR
Hedysarum occidentale	Western hedysarum		S	
Juncus orthophyllus	Straight-leaved rush			PR
Lewisia pygmaea ssp. *pygmaea*	Dwarf lewisia			PR
Lithophragma glabrum	Smooth prairiestar			PR
Lomatium dissectum var. *dissectum*	Fern-leaved lomatium			PR
Lotus denticulatus	Meadow lotus			PR
Melica harfordii	Harford's melica			PR
Montia diffusa	Branching montia		S	PR
Orobanche pinorum	Pine broomrape			PR
Oxytropia borealis var. *viscida*	Sticky oxytropis		S	
Platanthera hyperborea var. *hyperborea*	Northern green bog orchid			PR
Polystichum andersonii	Anderson's sword fern			PR
Polystichum kruckebergii	Kruckeberg's sword fern			PR
Saxifraga rivularis	Pygmy saxifrage		S	PR
Saxifraga tischii	Tisch's saxifrage		R	
Silene menziesii ssp. *menziesii*	Menzies' silene			PR
Synthyris pinnatifida var. *lanuginosa*	Olympic cut-leaf synthyris		T	
Thysanocarpus curvipes	Sand fringepod			PR
Tonella tenella	Small-flowered tonella			PR
Yabea microcarpa	California hedge-parsley			PR

ABBREVIATIONS USED IN THIS TABLE

T = Threatened Species S = Sensitive Species SC = Species of Concern

PR = Park rare R = Review

Other Exceptional Values

In addition to the five resource categories summarized above that are considered to be nationally or regionally significant, and therefore qualify the Elwha River for the National Wild and Scenic Rivers System, the river has other resources of note. While these other natural and cultural resources are not considered to be "outstandingly remarkable" for the purposes of designation, they contribute to the unique character of the Elwha River.

Geology

The criteria used by the Interagency WSR Council include:

> *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.)*

Along the west coast of North America, from Mexico to southern Canada, are mountain ranges of diverse character and origin collectively referred to as the Coast Ranges. The Olympic Mountains, located at the northwest corner of the conterminous United States, are a unique part of these ranges. Rather than developing as a portion of a long coastal mountain chain, as did the mountain ranges to their north and south, the Olympics uplifted as a tight circular cluster. Because of the Mountains' steepness, heavy vegetation, and inaccessibility, the story of their geology remained obscure until recent times. Newer theories of the earth's processes, such as plate tectonics, have also been crucial for understanding the geology of the Olympics.

What is now hypothesized is that most Olympic rocks were born in the deep waters of the Pacific Ocean, where tremendous amounts of sand and mud washed from the continent and accumulated in thick, nearly horizontal layers. Added to this were lava flows that issued from cracks in the sea floor or broad volcanoes on the ocean bottom. This build-up of sediments and lava on the Pacific Plate spanned a period of approximately 40 million years, from 55 to 15 million years ago. As the layers of sediment and lava collected, the increasing weight and pressure of the topmost beds cemented those below. Deep burial over millions of years transformed sand and mud to sandstone and shale. The lava flows created two types of basalt, depending on whether the lava originated underwater from a crack in the sea floor, or if it erupted from a volcano that protruded above the water surface as an island. Lava released underwater created globular masses known as pillow basalt. Lava flows that erupted above the water surface were not chilled as quickly as those in the water, so they did not form pillows. Instead, as they cooled and shrank, they developed cracks that broke the lava into polygonal columns, called columnar basalt.

Geologists puzzled for decades as to how flat-lying beds of sediments and lava could rise above the sea and become folded and compressed into the mountains that are seen today. The theory of plate tectonics offered an answer. According to the plate tectonic scheme, the earth's crust consists of plates, moving away from each other at the oceanic ridges and riding over or colliding with each other along continental margins. About thirty-million years ago, the Pacific Ocean Plate and the North American Plate collided just east of the present shore of Washington State. As the Pacific Plate subducted beneath the continent, the top stratum of basalt rafted onto the continent's margin. The sedimentary strata piled seaward against and beneath the basalt, and the once neatly layered ocean-bottom strata were pushed into a huge dome-like pile of jumbled rock–the Olympic Mountains. The basalt formation now rings the Mountains' perimeter, opening like a horseshoe toward the west. The thick, strong basalts resisted folding to some extent and broke in many places.

Within the perimeter, the sedimentary rocks folded, fractured, and faulted. Heat and pressure deep in the earth made the old minerals of sandstone, shale, and basalt react with each other and with solutions in the rocks. This metamorphism produced new minerals. The squeezing elongated sand grains, made pebbles into rods, and filled the shales with minutely spaced cracks. Some of the sandstone became semischist, shale became slate and phyllite, and basalt recrystallized to greenstone.

Erosional forces immediately began to sculpt the newly created mound of high country. As the dome rose, it began to received greater and greater amounts of moisture from the Pacific Ocean. Streams formed, radiating from the center of the dome like spokes of a wheel and carved a system of shallow valleys. During the ice ages, the most recent of which occurred during the Pleistocene Epoch beginning about two-million years ago, these valleys filled with glaciers, deepening them into U-shaped clefts and depositing tremendous amounts of outwash gravels around the west and south sides of the mountains. During this period, almost a third of the continent was covered by massive bodies of glacial ice. A vast sheet, known as the Cordilleran Ice Sheet, spread across Canada and extended into the northern United States. At least six times the Cordilleran Ice Sheet crept down into the Puget Sound area. The ice dammed up against the Olympics and split into two branches: one branch flowed out the Strait of Juan de Fuca to the sea, the other flowed toward the east and around the southern end of the Mountains. Loaded with rock debris picked up in Canada, the ice dropped foreign rocks or erratics, such as granite, gneiss, and schist, all around the northern, eastern, and southern sides of the range.

The world began to warm around thirteen thousand years ago. During this period, the northern ice sheets and most of the alpine glaciers disappeared, although the largest and highest–such as the Blue and Queets–survived. Most of the other Olympic's existing sixty or so glaciers probably formed approximately twenty-five hundred years ago and reached their maximum growth about two-hundred years ago. Since then they have been steadily retreating. Today, though the Mountains are still lifting due to collision of the two plates, they are also being worn down by the erosional forces of ice and water.

Evidence of the geologic forces that shaped the Olympic Peninsula is visible throughout the Elwha River watershed. Sedimentary and metamorphic derivatives of mud, sand, and submarine lava affirm that the Olympics had a watery beginning. The Elwha River flows through a notch in a thick mass of basalt just south of Highway 101, which is part of the north arm of the Olympic basaltic horseshoe formation, and outcrops in this vicinity reveal pillow basalt. Observation Point is a good spot to examine mica-rich sandstone beds. The small flakes of mica were carried into the ocean between 40 and 50 million years ago, and deposited in the layers of accumulating sand. The five miles along the river between Lake Mills and Lake Aldwell reveals sections of basalt, shale, and sandstone and represent about 10 to 15 million years of accumulation. Rica Canyon consists of steep sandstone cliffs, and the gorge between Rica Canyon and the Elwha's Grand Canyon reveals sandstone and slate. Low Divide separates a terrane composed predominantly of slate from massive sandstone beds.

Verification of the mountain building forces that created the Olympics is also prevalent throughout the Elwha watershed. When two plates collide, the rocks are often squeezed, distorted, and pushed upwards. Folding, faulting, and fracturing of rocks are some of the results of this collision. The Elwha River basin generally overlies heavily folded and faulted sedimentary and metamorphic rocks. The steep canyon of Crystal Creek, for example, contains black, contorted shales with broken slabs and blocks of gray sandstone and limestone. This is a small exposure of the Callawah Fault Zone, which separates the basalt of the basaltic horseshoe to the north from the southern sandstones and shales. The broken rock in the fault zone may provide channels for water to circulate deep into the hotter interior of the earth and give rise to the hot springs in the area. The thin and straight

uppermost valley along the Elwha River probably developed along a fault as well, where the rocks were more easily eroded. Although most of the Olympic rocks are highly folded, there are only a few places where the large folds are well-displayed. One such fold is seen on Mount Appleton in the Elwha watershed. The cliffs of coarse-grained sandstone and small-pebble conglomerate located on the north ridge of Mount Norton also provide evidence of mountain building in the Olympics. The pressure and squeezing that occurred during plate collision deformed these pebbles and sand grains into elongated rods. Another example of metamorphic activity is seen in the steeply dipping phyllite (basalt that has been transformed by heat and pressure) near Remann's Cabin.

The geology and topography in the Elwha watershed, like other areas of the Olympic Peninsula, were influenced by both alpine glaciers formed in the high Olympic Mountains and the Cordilleran Ice Sheet. The lower 3.5 miles of the Elwha River cuts into a thick deposit of erodible, unconsolidated glacial outwash and till that were deposited by this ice sheet. Alpine glaciers carved out wide valleys in weaker rock units, such as shale or slate, while canyons formed in more resistant lithologies. The characteristic broad U-shaped valley of the Elwha River is certainly the result of a glacier. Low Divide in the upper Elwha Valley, which also has a distinctive U-shape, is an excellent example of a pass carved by glaciers. Lakes filled many of the larger valleys on the north and east side of the Olympics when they were dammed by the Cordilleran Ice Sheet. Deposits of sand, gravel, and clay that washed into these lakes are still found along valley sides. There is a good deal of evidence that the Elwha River's drainage was blocked by a branch of this ice sheet and an ancient lake filled the valley. In the vicinity of Lake Mills, the river cuts into at least 600 feet of sediments that were deposited in a glacial lake. A set of eroding cliffs comprised of glacial deposits on the west side of Lake Mills, high bluffs of bedded gravels at Whiskey Bend, clay deposits at Wildrose Creek, and a glacier-cut terrace mantled with gravels near Idaho Creek all support the presence of a glacial Lake Elwha during the last ice age. Even-bedded layers of clays and silts on the tributary Hayes River represent lake deposits as well. Other evidence of glaciation in the Elwha drainage can be found in granite erratics and metamorphic rocks located as far upriver as Godkin Creek. Such rock, found nowhere in the Olympic bedrock, could only have been transported by ice.

Conclusion

Though the geological history of the Elwha River is of great interest, and there are examples of geological processes throughout the watershed, this same history and processes are found in other watersheds on the Olympic Peninsula and therefore are not unique or rare to the region.

Recreation

In order to be considered an "outstandingly remarkable value," 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.*

Impressive scenery, abundant game and fish, and challenging mountain slopes stimulated early interest in the recreational potential of the Olympic Peninsula. Irving M. Clark, a strong defender of

wilderness concepts and the value of wilderness to recreationists, described the Olympics as "surroundings of great beauty, in the deep forest, along a river or smaller stream, on the shore of a lake . . . . Here plain people enjoy the fishing, the hiking, the berry picking and the observation of wildlife, or just relax in the great outdoors, and go home refreshed in body and in spirit." The spirit of wilderness has been retained in much of the Olympic Peninsula, and wilderness is still a fundamental theme in the recreational use of the area. The most popular forms of dispersed recreational activity include sightseeing, wildlife observation, picnicking, backcountry hiking, camping, and fishing. Some hunting, horseback riding, skiing, and whitewater boating also occur in the region.

As one of the first areas explored on the Olympic Peninsula, the Elwha River drainage has long been recognized for its recreational opportunities. In the early years of development and expansion on the Peninsula, the Olympic Hot Springs Resort and the Waumila Lodge both offered comfortable accommodations to people wanting to fish, hunt, hike, or simply enjoy a quiet setting. During this period, the USFS and private development groups considered extending a road to the upper Elwha River basin to open up the valley's scenic beauty to automobile traffic. With the establishment of ONP (starting at river mile 9.5 on the Elwha), new perceptions of providing recreationists with a wilderness experience emerged, and commercialization of recreational facilities were discouraged and reduced over time. Wilderness designation of the middle and upper reaches of the Elwha River watershed further protected the values of wilderness and the recreation they provide.

Though it is difficult to get an accurate number, a 1995 visitor count for the Elwha River Valley, measured at the Elwha Ranger Station, was over 171,000 people. Most all of the recreational opportunities found in the Park can also be found in this watershed. Much of the recreational use of the Elwha River occurs in the lower portions of the river, where there are boat launches, picnic areas, numerous developed campgrounds and trailheads, equestrian trails, and several informal fishing pull-outs along Olympic Hot Springs Road. Hunting is allowed in some areas outside of ONP. In the middle and upper reaches of the Elwha River watershed, recreational opportunities are those that are more appropriate for wilderness management, such as hiking and camping.

Boating. The Elwha River between Glines Canyon Dam and upper Lake Aldwell is used for kayaking and rafting. Olympic Raft and Guide Service, the main concessionaire on the Elwha River, reports that an average of 700 to 800 rafters use the middle reach of the river annually. Altaire Campground is the primary put-in site for most commercial rafting trips. Several take-out sites are available, depending upon the length of trip desired. The furthest take-out is located 5.5 miles from the boat launch on Highway 101. This stretch of river is considered to be an intermediate trip in difficulty and is rated Class III. Gorge Rapids, the most difficult rapid, is approximately one-half mile north of the Elwha Campground and may be scouted from the road. The section of the Elwha River south of the Altaire Bridge to the powerhouse is rated a Class V. Only expert river runners should attempt this section. Optimal river levels usually occur from spring to early-mid summer (late April through July). Late summer and fall show a dramatic drop in river flow levels, making it difficult to impossible for rafts to maneuver through shallow sections. Because its swift currents and rocks require deliberate negotiation, canoes are not recommended for the river. Less experienced boaters have capsized in the Elwha River, causing serious injury and extensive damage to their canoe.

Hunting. Hunting for waterfowl, grouse, deer, bear, and cougar is allowed in the lower portion of the watershed on some private properties, lands managed by the USFS, and the Lake Aldwell project property. Elk hunting is also allowed, but few of these animals reside or pass through the lower reaches of the drainage outside of the Park.

Sightseeing and Wildlife Viewing. Throughout the watershed, there are many opportunities to appreciate the beauty of the Elwha River Valley. There are several scenic view pull-outs located along the roads in the lower reaches. The best way to see the area, however, is to follow one of the many trails in the watershed. Towering mountains and glaciers, turbulent water crashing through canyons, old-growth forests, and alpine valleys, are just a few of the views found in the Elwha River Valley. Many birds and mammals can be seen using the river, its reservoirs, or the lands adjacent to them. Eagles, osprey, and hawks reside in the area and can often be seen overhead or near one of the bodies of water looking for prey. The colorful and rare harlequin duck may be spotted in the churning waters of the river. Anderson and Sweets fields are good locations for viewing Roosevelt elk.

Fishing. People have been coming to the Elwha River for a chance to catch a remarkable fish since the turn of the century. A 1911 promotional pamphlet proclaimed "the ripples and pools of this splendid stream offer a hard-to-resist temptation to just stop for a minute to try a few casts". Today recreational fishing on the Elwha River focuses on resident trout in the upper river and hatchery-produced winter steelhead and coho salmon in the lower river. Non-treaty recreational fishing is managed by WDFW or NPS, depending on the stretch of the river. The upper Elwha River from the Elkhorn Ranger Cabin to the Hayes River is considered one of the best fishing rivers in the Park. Lake Aldwell and Lake Mills only receive limited use. Their relatively small size, poor accessibility due to steep terrain, and poor productivity limit recreational opportunities. The north ends of both reservoirs offer good fly-fishing. Though the size of the fish and the runs have diminished, the Elwha River is still a good choice for salmon fishing. Freshwater salmon sport harvest in the Elwha River in 1995 consisted of two-hundred and fifty coho, six jack, six coho, and three pink salmon. The 1996-1997 steelhead sport catch included one-hundred and one summer and four-hundred and eighty-five winter steelhead.

Hiking. Cross-park corridors such as the Elwha River, Quinault River, and Dosewallips River are the more popular backcountry hiking areas within ONP. The 45-mile Elwha-Quinault hike is the most popular cross-park hike. With over twenty designated trails in the Elwha River basin, hikers of all abilities can discover the resource values of the region. A few examples include the Elwha River Trail, which is 29-miles long and penetrates deep into the heart of ONP. Hikers get a sense of history as they follow the same path that the Press Expedition took in the late 1800's and pass by homesteads of the first settlers in the Valley, such as Remann's Cabin. Dodger Point Trail gives hikers a chance to experience all the diverse forest types of the region as they pass through the lower river valley to the montane forest, and finally arrive at alpine valleys with stunning vistas of the surrounding mountains. A day hike along Rica Canyon Trail takes one to an outcrop of bedrock that overlooks the Goblin Gate at the entrance of Rica Canyon–an interesting geological formation that is the result of the uplift of slate and sandstone. All of the many trails in the watershed provide excellent opportunities for exploring and discovering all the exceptional features of this region, whether it be by day or overnight hiking.

CLASSIFICATION

After determining a river's eligibility for the National System, the river is classified according to the category–wild, scenic, or recreational– that best fits each eligible segment. Classification is based on the degree of naturalness and extent of development of the river and its adjacent lands as they exist at the time of the study. The three classification categories for eligible rivers are defined in Section 2(b) of the Act 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.*

A wild river would be an undeveloped river with limited access by trail. The existence of a few inconspicuous roads leading to the boundary of the river area at the time of study would not, however, necessarily bar wild river classification. To qualify for scenic classification, the river segment should not show substantial evidence of human activity. The portion of the watershed within the boundary of a scenic river may have some discernible existing development. A recreational classification would be appropriate in developed areas, such as where a river runs parallel to roads or railroads or where adjacent lands have agricultural, commercial, or other developments, provided that the waterway remains generally natural and riverine in appearance.

Elements of Classification

The Interagency Guidelines provide guidance on how to classify rivers and this report defers to this guidance. Water resource development, shoreline development, accessibility, and water quality are the criteria that are considered when determining classification. Each criterion is important, but their collective intent is more important. Each classification permits existing development, and the criteria do not imply that additional inconsistent development is permitted in the future. Developments that are compatible with designation would be allowed, provided they are carried out in an environmentally sound manner.

In providing a preliminary classification for the Elwha watershed, NPS chose to divide the Elwha River into smaller units in order to consider different classifications for each segment. This is often done for rivers in the National System. For example, a river might be wild in its mountainous headwaters, scenic through multiple-use lands, and recreational in its more populous lower valley. Factors considered in deciding whether to classify the Elwha River in its entirety or to segment it included: 1) management strategies for administering the river area; 2) the effect of land ownership patterns on management strategies; 3) the current levels of development and access along the river. The Elwha drainage was divided into two main segments:

Segment 1 – From the mouth of the Elwha River at the Strait of Juan de Fuca to the backwaters of Glines Canyon Dam, a distance of roughly 15.3 miles.

Segment 2 – From the backwaters of the Glines Canyon Dam to the river's headwaters, approximately 29.9 miles.

Tributaries. The tributaries for each river segment were considered in their entirety.

Water Resource Developments

There are currently three impoundments on the Elwha River, all located within the lower 13.5 miles of the river. The Elwha Dam, located at river mile 4.9, and the Glines Canyon Dam, at river mile 13.5, historically supplied power to the Olympic Peninsula, primarily the Port Angeles area. Both dams impound reservoirs that are approximately 2.5 miles in length. Removal of both dams is currently slated to begin in late 2007. A rock diversion structure of approximate 15 feet in height spans the river at river mile 3.3 and diverts water for industrial and fisheries propagation use. The diversion dam will be replaced by an engineered riffle that would be designed to pass fish and sediment. There are no water resource developments in the Elwha's watershed above Glines Canyon Dam.

Shoreline Development

The river is predominantly natural in appearance. Most significant shoreline development has occurred in the lower portion of the Elwha Valley, outside of ONP. Though the Lower Elwha Klallam Reservation is located near the mouth of the river and there are scattered residents and small farms in the lower four miles of the Valley, there is very little development directly adjacent to the river. The few roads, homes, or buildings near the river are often screened by dense vegetation and are frequently not visible from the river. Areas managed by the USFS and the WDFW have retained their natural appearance near the river as well, with little evidence of disturbance. A levee is located on the east side of the mouth of the river, but it is set back approximately ½ mile away from the Elwha and is therefore not visible from the river. A short levee on the west side of the river mouth constrains the estuary and is clearly visible from the river. A spur dike is located between river mile 2.8 and 3.0, and is the location of the city of Port Angeles' municipal water supply diversion, a Ranney collector. A power line crosses the Elwha River near this location, and there is evidence of small amounts of bank hardening and pilings from an old building or dock. A small concrete diversion is located on the east side of the river by the rock diversion structure at river mile 3.3 to divert water for municipal and industrial use in Port Angeles, and water is also diverted to the WDFW fish rearing channel, which is located immediately below the diversion dam. A spur dike is located on the east side of the river just downstream of the diversion dam and the historic old Highway 112 Bridge. Other shoreline disturbances have occurred in selected areas in the form of bank hardening or riprap.

Within ONP, evidence of human intrusion is minimal, limited primarily to camp sites and trails. A few historical buildings are located along the Elwha, such as Elkhorn Ranger Station and Remann's Cabin. Only two camps along the Elwha are highly developed with parking areas, shelters, and restrooms -Elwha Campground at river mile 7.2 and Altaire Campground at river mile 8.7. Altaire Campground is located adjacent to the river and provides easy access, and its shoreline is hardened in several areas to prevent erosion. The other campgrounds along the Elwha are primitive in nature and are only accessible by foot or by stock, such as horses or lamas. Several of these campgrounds are located by the Elwha River and are visible from the river, such as Stony Point Camp and

Chicago Camp. Others are located in such a way that they are completely unobtrusive from the river, such as Mary's Falls, which is situated on a bluff overlooking the Elwha. Because the Elwha River Trail is open to stock, trail bridges that cross the Elwha or its tributaries are often very large structures, and the shorelines in these areas are often reinforced with rock gabions to prevent erosion. There are three vehicular bridges and three major footbridges along the Elwha. The vehicular bridges are: (1) the highway 112 Bridge, (2) the highway 101 Bridge, and (3) the Olympic Hot Springs bridge. The footbridges are located at: (1) a trail crossing near the mouth of Idaho Creek, (2) near the mouth of Buckinghorse Creek, and (3) near the mouth of State Creek.

Shoreline development along most of the Elwha's tributaries is also minimal, limited to trails and the occasional camping area. Where bridges for stock cross a tributary, they are often reinforced with rock gabions. Rock gabions were used, for example, at bridges crossing Lillian River, Hayes Creek, and Godkin Creek. Along Little River there are scattered residential homes and small farms. While most are located within ¼ mile of the tributary, many are screened from the river's view by dense vegetation. A rock quarry is located on the north side of Little River Road, which runs parallel to Little River for a few miles. While it is also within ¼ mile of the river, it is not visible. The road is only visible from the river in a few places, being mostly screened from view of the river by vegetation.

Accessibility

In the lower Elwha Valley, from the Elwha's mouth to the location of Glines Canyon Dam, several major roads cross the Elwha River and its tributaries. State Highway 112 crosses the Elwha at river mile 4.0, and Highway 101 crosses the Elwha and its tributary, Indian Creek, at several points. Because of steep embankments, however, the vehicular bridges at these crossings do not provide easy access to the Elwha River or Indian Creek. Access to the Elwha River area is primarily via local roads connecting to U.S. Highway 101 and State Highway 112. The old Highway 112 Elwha River crossing is an historic one-way bridge located just upstream of the WDFW rearing channel. Vehicular access to the river is only possible at specific locations along these roads, which include Lower Elwha Road, Crown Z Water Road, Lower Dam Road, and Olympic Hot Springs Road. The Lower Elwha Road provides access to the Elwha and an undeveloped parking area close to the river's mouth. Crown Z Water Road provides access to the WDFW hatchery. Lower Dam Road leads to Elwha Dam. US 101 crosses Indian Creek, but this vehicle bridge does not provide access. A boat launch at the dead-end of a spur road provides a boat access point to Lake Mills. Altaire Campground, another site located off Olympic Hot Springs Road, provides easy access to the Elwha River.

Other roads in the lower portion of the Elwha watershed lead to the scattered residential homes in the lower Valley and may travel near to the Elwha or one of its tributaries. These include the Elwha River Road, Sisson Road, Edgewood Lane, Bluff View Drive, Elwha Dike Road, Fox Point Road, Lower Dam Road (leads to the Elwha Dam), Lake Aldwell Road, and Little River Road. Little River Road provides access to the Little River. Many of the other roads provide access either to the mouth or other locations along the river

Above Lake Mills, the river is accessible by trails that may only be used by foot or by stock. Several trails run roughly parallel to the Elwha or its tributaries for at least a portion of their lengths, such as the Elwha River Trail, Lillian River Trail, Geyser Valley Complex Trails, and Happy Lake Ridge Loop Trail. Often, however, these trails move away from the river and frequently are located ½ mile or more away. Even in areas where the trails pass close to the river or its tributaries, the water bodies are still inaccessible in many places due to steep banks and deep gorges. In general, the Elwha River and its tributaries are not readily accessible outside of the lower few miles of the Elwha Valley, except for infrequent trail bridge crossings and limited areas where trails travel in close proximity to the river.

Water Quality

The Elwha River and its tributaries are classified by the Washington Department of Ecology as Class AA -Extraordinary Waters. This classification is given to surface waters having "extraordinary water quality" and is the highest classification level of four classes of water ranging from extraordinary to fair. Overall, the Elwha River has relatively low concentrations of dissolved and suspended sediment loads, nutrients, and organics. Because the entire headwater area is protected within ONP, the groundwater in the Elwha River watershed is of excellent quality. Dissolved oxygen values are very close to saturation at all times of the year, which is an excellent condition for coldwater fish. Water quality degradation is limited to non-point sources of pollution; including sediment input, bank erosion, and elevated water temperatures. These pollution sources are primarily the result of logging and agriculture activities occurring in the lower portion of the watershed outside of ONP. Non-point pollution from these sources has a minor influence in groundwater quality. The Elwha River is listed for polychlorinated biphenyl (PCB) contamination based on water and fish tissue samples collected between the two dams. The source of the PCB is unknown, although it is suspected that it may be atmospheric in origin.

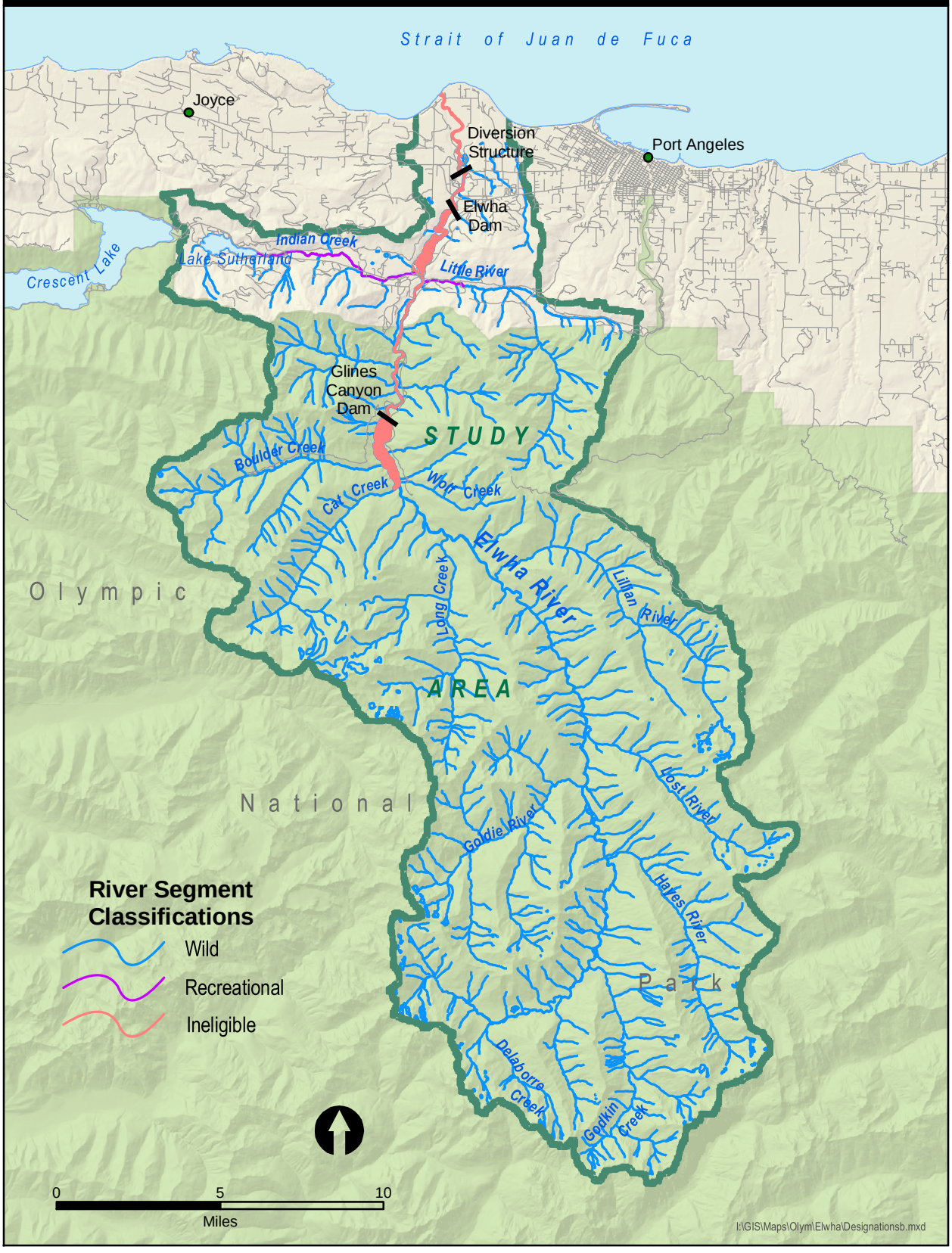
The presence of the reservoirs created by the two dams adversely affects water quality. Increased water temperatures occur in the lower Elwha River in late summer and early fall due to heat storage in Lake Mills and Lake Aldwell. This may severely degrade water quality for fish and other aquatic life in the river. From an ecological perspective, the lower and middle reaches of the Elwha River are significantly affected by loss of particulate organic matter (POM) due to the presence of the dams and the reservoirs they create. Because of the heavily forested nature of the upper Elwha River drainage, historically relatively large amounts of organic detritus were deposited in the upper river channel and eventually settled downstream. In the current situation, POM ultimately settles in Lake Mills and Lake Aldwell, lowering POM levels downstream. Low POM levels generally limit aquatic invertebrate diversity and production in the river below the reservoirs. Future removal of both dams will greatly improve the water quality of the lower thirteen miles of the Elwha River. Although, there may be an initial temporary state of degradation due to increased sediment loading.

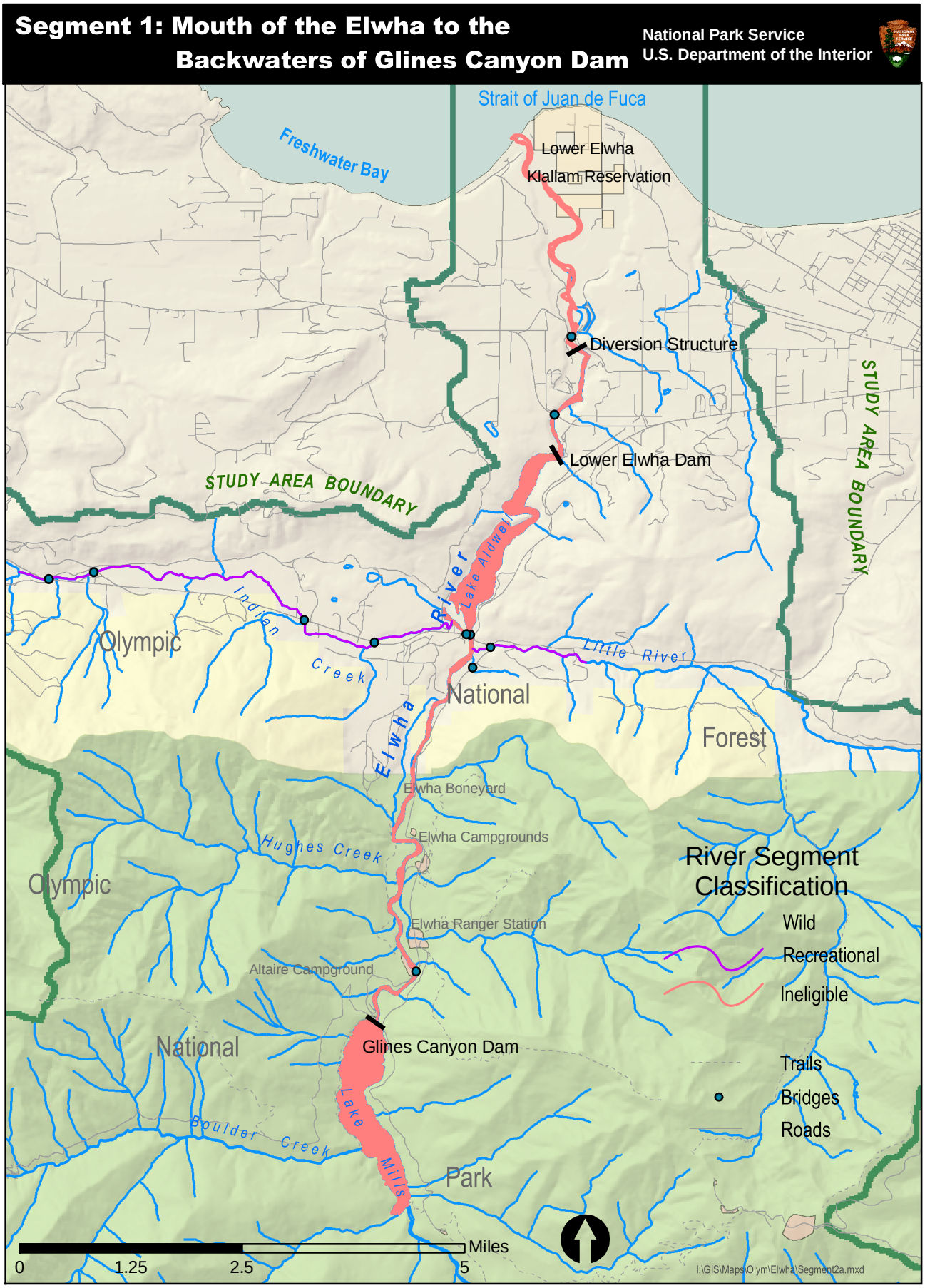
Elwha River Segment Classification – Present and Future

The lowest ranking for each segment of any one of the four factors determines the highest possible classification for that segment. For example, if a river qualified as scenic for water resource development, water quality, and accessibility, but qualified only as recreational for shoreline development, the highest possible classification in the National System would be recreational. Each of the two segments of the Elwha River was evaluated to determine what the appropriate classification is under present characteristics and what the appropriate classification will be when changes are made to the free-flowing character of the river in segment 1.

Existing River Classifications

National Park Service
U.S. Department of the Interior




Segment 1: Mouth of the Elwha to the Backwaters of Glines Canyon Dam
National Park Service
U.S. Department of the Interior
Strait of Juan de Fuca
Freshwater Bay
Lower Elwha Klallam Reservation
Diversion Structure
Lower Elwha Dam
STUDY AREA BOUNDARY
STUDY AREA BOUNDARY
Lake Aldwell
Elwha River
Indian Creek
Little River
Olympic National Forest
Elwha Boneyard
Elwha Campgrounds
Hughes Creek
Elwha Ranger Station
Altaire Campground
Glines Canyon Dam
Lake Mills
Boulder Creek
Olympic National Park
River Segment Classification
Wild
Recreational
Ineligible
Trails
Bridges
Roads
0
1.25
2.5
5
Miles
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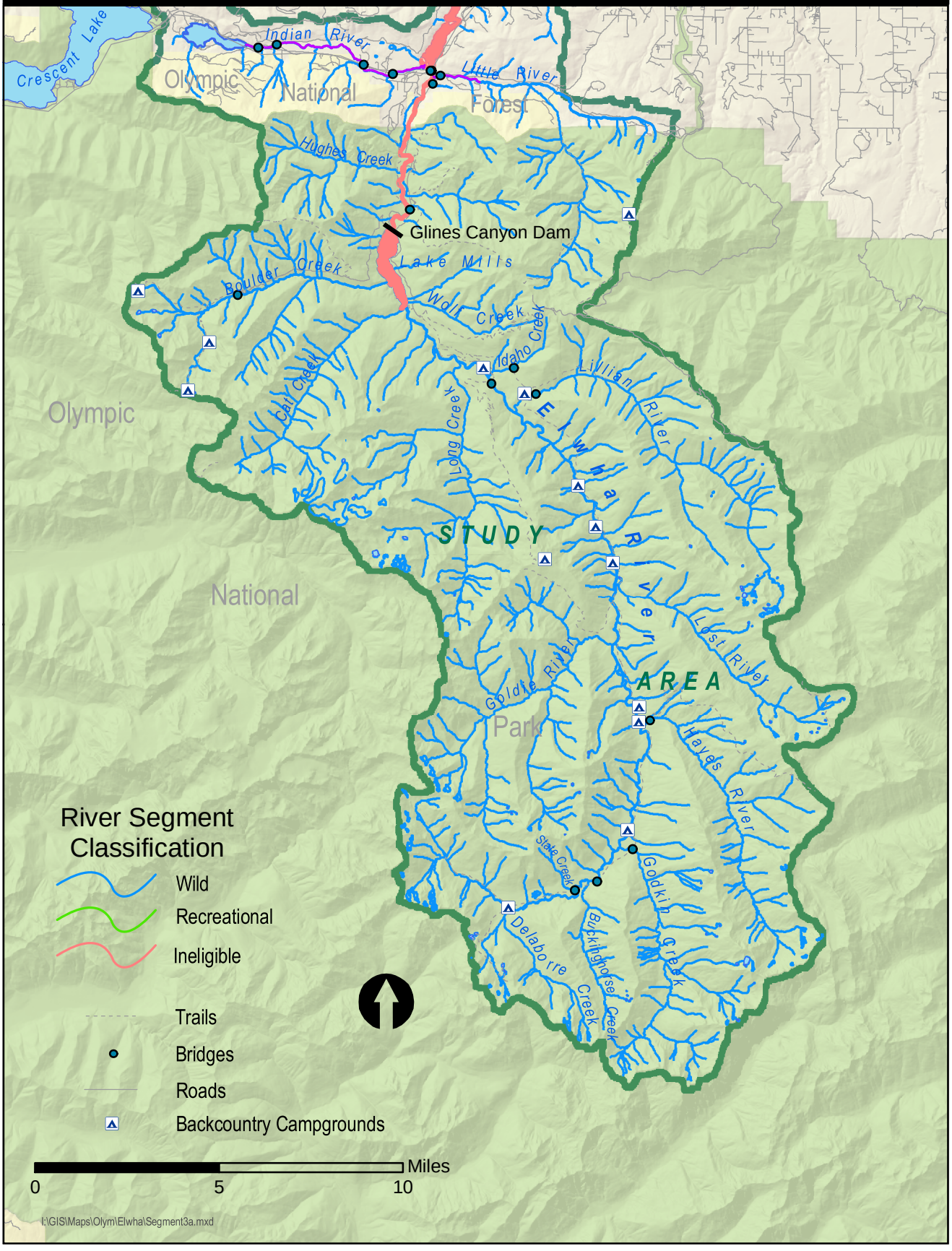
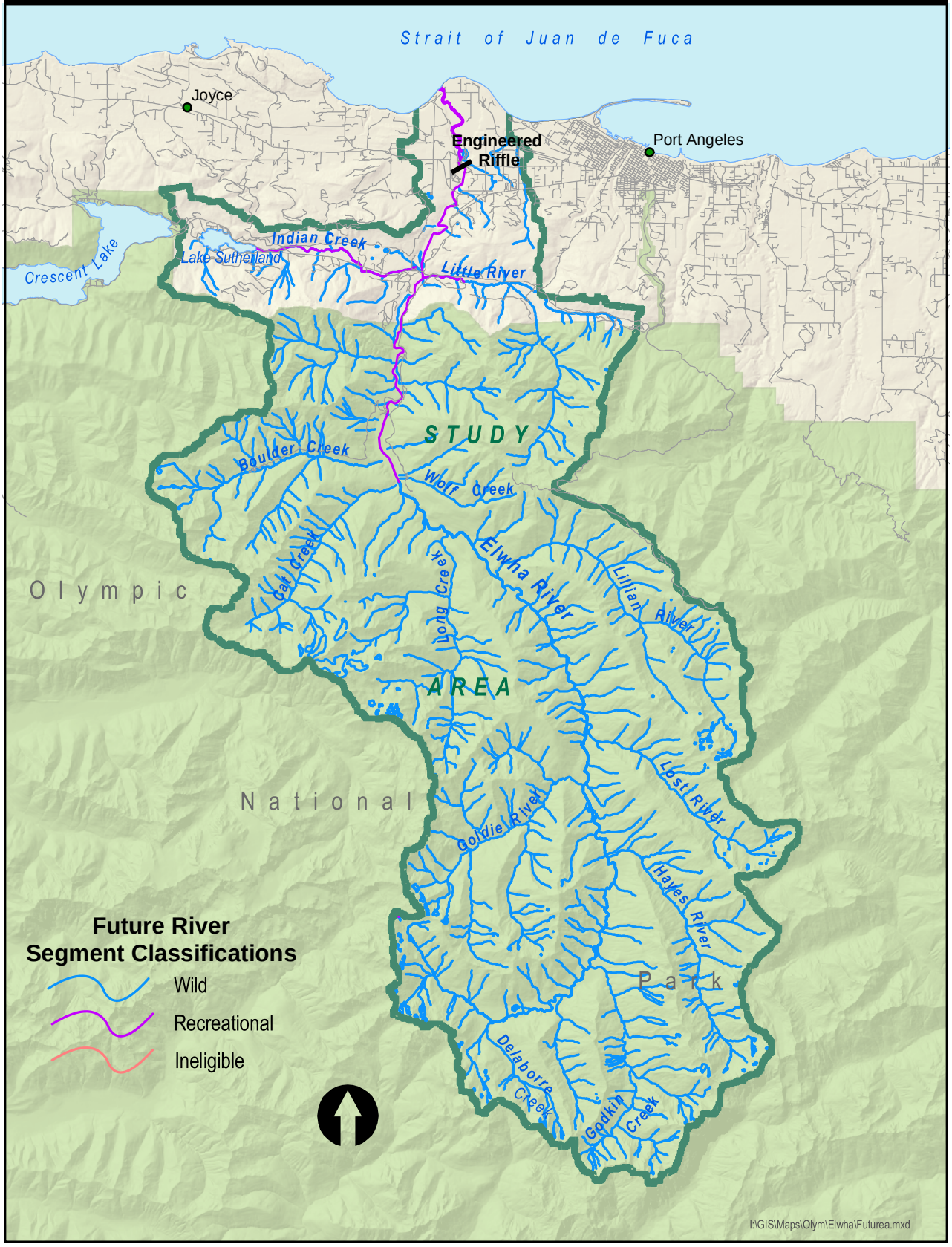
Segment 2: Backwaters of Glines Canyon to Elwha Headwaters

National Park Service
U.S. Department of the Interior



Future River Classifications

National Park Service
U.S. Department of the Interior



Classification under Present Conditions

Segment 1 – From the mouth of the Elwha River at the Strait of Juan de Fuca to the backwaters of the Glines Canyon dam, approximately 15.3 miles. This segment contains five ORVs. This segment is not eligible because of the lack of free-flowing conditions created by Elwha Dam at river mile 4.9 and Glines Canyon Dam at river mile 13.5. A rock diversion structure also exists at river mile 3.3, but this structure alone would not bar it from inclusion.

Segment 2 – From the backwaters of the Glines Canyon Dam to the river's headwaters. This segment is free-flowing and contains five ORVs–it is therefore eligible for the National System as defined by the Act. There are no water resource developments. There is little evidence of human activity, except for a few designated camp sites, glimpses of established trails, and bridges for foot and stock travel that are often reinforced by some form of bank hardening that is limited in nature. Access is quite limited and found at only a few select points along the river. The water is exceptionally clean and clear. This segment meets all the requirements needed for classification as "wild."

Tributaries
The tributaries were determined to be eligible for the wild river classification because of their unaltered and pristine character. The two exceptions to this are Indian Creek and Little River. Because Highway 101 closely parallels Indian Creek and crosses it several times, this tributary was found to be "recreational" for its entire length. Little River, which is paralleled by Little River Road and has scattered residential homes near the river, was found to be "recreational" from its confluence with the Elwha River to river mile 1.4. After this point, there are no major developments or human presence along the tributary, and it was found to be "wild."

Classification Under Future Conditions

The goal of the Elwha River Ecosystem and Fisheries Restoration Act, signed in October 1992, is the "full restoration of the Elwha River ecosystem and native anadromous fisheries" (Section 3c). The objective of Elwha River restoration is to emulate a natural functioning, self-regulating ecosystem. In the *Elwha River Ecosystem Restoration Final Environmental Impact* report, the Department of the Interior determined that only one alternative, the removal of both dams, has the potential to fully restore the Elwha River's native anadromous fisheries and meet the Act's objective, and removal of both dams is slated to begin in late 2007. The Elwha Dam will be completely removed. The concrete, gravity arch section of the Glines Canyon Dam will also be removed to restore free-flowing conditions, but the spillway and concrete abutments above the river will be retained for historical purposes. The river will be completely restored after an initial adjustment period. The diversion dam at river mile 3.3 will be replaced by an engineered riffle that will allow fish and sediment passage.

Future Conditions. When the dams are removed so that free-flowing conditions are regained, then classification of the Elwha's segments could be as follows:

Segment 1 – From the mouth of the Elwha River at the Strait of Juan de Fuca to the backwaters of the Glines Canyon Dam. This segment could be eligible for inclusion. Given, the existing access and development in this Segment, the classification would be recreational.

Segment 2 – From the backwaters of the Glines Canyon Dam to the river's headwaters. No change.

Tributaries – No change

Conclusions of Classification

The following preliminary classifications apply to the Elwha River and its tributaries under present and future conditions:

Present Conditions:
Elwha

- *Elwha River from its mouth to the backwaters of Glines Canyon Dam*–Ineligible
- *Elwha River from the backwaters of Glines Canyon Dam to the river's headwaters*– Wild

Tributaries

- *All tributaries, excluding Indian Creek and Little River*– Wild.
- *Indian Creek* for its entire length–Recreational.
- *Little River* for its first 1.4 miles from the confluence with the Elwha River–Recreational, Remaining length of Little River–Wild.

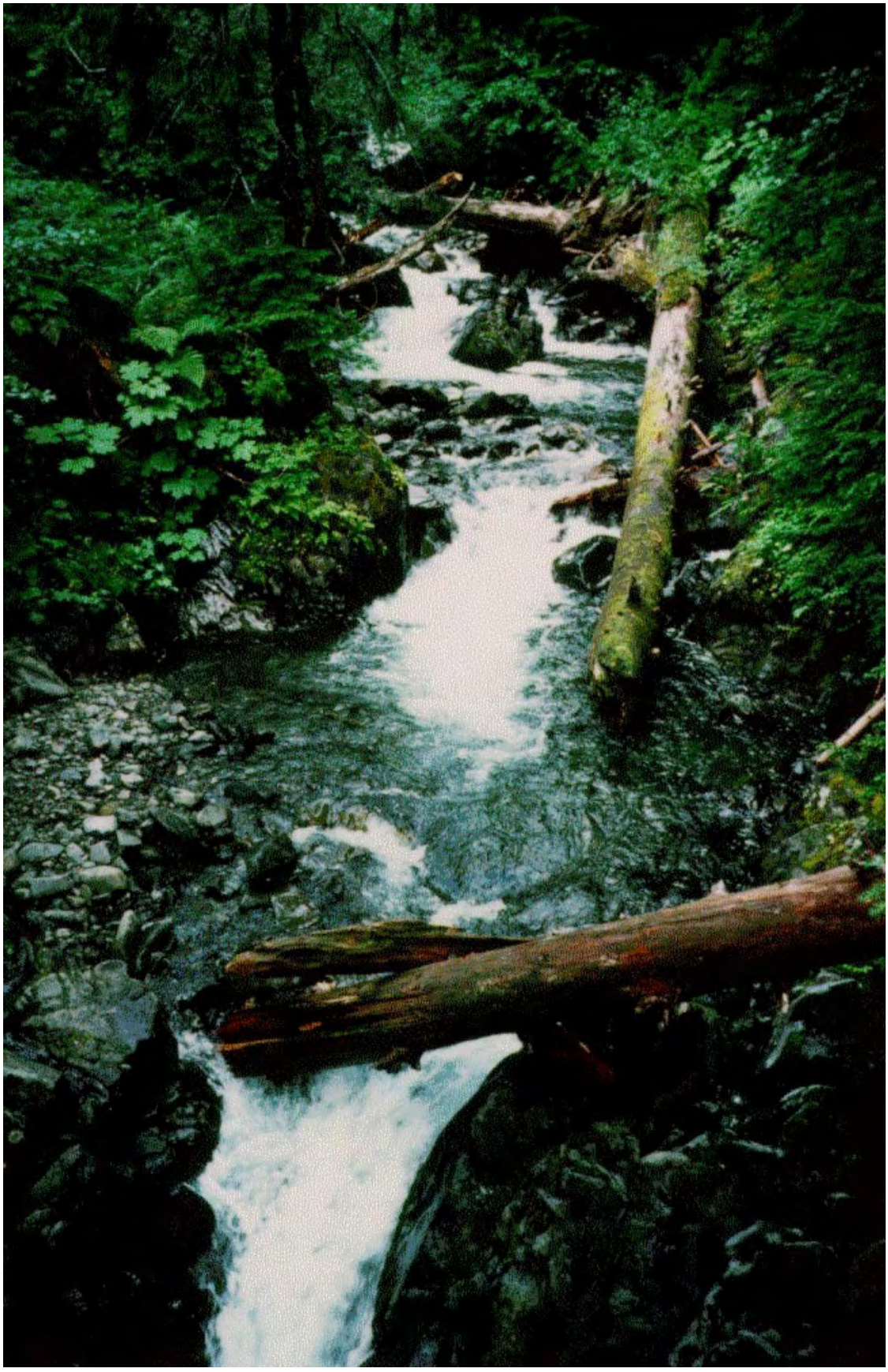
Future Conditions
The Elwha Dam and Glines Canyon Dam removed and the river is restored; rock diversion structure at RM 3.3 will be replaced by the engineered riffle:

Elwha

- *Elwha River from its mouth to the backwaters of the Glines Canyon Dam* – Recreational
- *Elwha River from the backwaters of Glines Canyon Dam to the river's headwaters*– Wild

Tributaries

- *All tributaries, excluding Indian Creek, Little River, and Boulder Creek*– Wild.
- *Indian Creek* for its entire length–Recreational.
- *Little River* for its first 1.4 miles from the confluence with the Elwha River–Recreational, Remaining length of Little River–Wild.



Appendix A - Acronyms and Abbreviations

Act	Wild and Scenic Rivers Act
BLM	Bureau of Land Management
CCC	Civilian Conservation Corps
EIS	Environmental Impact Statement
National System	National Wild and Scenic Rivers System
NPS	National Park Service
ONP	Olympic National Park
ORV	Outstanding Remarkable Value
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife
WSRA	Wild and Scenic Rivers Act

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- The National Park Service provided all other photos, with many of the photos being used from the Olympic National Park's webpage. Also, thanks to Kathy Jope and Leslie Finlayson for their photo contributions.