

Skokomish Watershed Action Plan Update 2016





Preface

In December 2006, representatives of the newly-formed Skokomish Watershed Action Team (SWAT) met with Congressman Norm Dicks in Tacoma to discuss their hopes to restore the Skokomish watershed. At the end of that meeting, Congressman Dicks nodded approvingly and said, “Give me a three-year plan.” Four months later, the SWAT released its first detailed proposal – “Restoring the Skokomish Watershed – A Three-year Action Plan.”

Since then, the Skokomish watershed has been the center of a remarkable collaborative effort involving many dedicated organizations and individuals. After nearly a decade of planning, fund-raising, contracting, educating, and monitoring, the SWAT decided it was time to take stock of its many accomplishments and identify the next steps forward.

With funding support from the Laird Norton Family Foundation, the SWAT began to update its action plan in early 2015. A five-member subcommittee co-authored the update and oversaw the project. The Skokomish Tribe hired a contractor, Robin Stoddard, to compile information about project accomplishments and planned activities. Robin was extremely knowledgeable about the topic, having ably led the U.S. Forest Service’s road restoration work in the Skokomish watershed for over a decade.

The co-authors would like to thank Allen Gibbs, Jayni Kamin, Rebecca Wolfe, and Glen Wood for providing information, editing, or commenting on various parts of the document. Lydia Wagner and Ron Figlar-Barnes provided photos and maps, and Mary K Johnson was the graphic designer.

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Table of Contents

Section	Page
Preface	2
Executive Summary	4
Introduction	6
Overview of the Skokomish Watershed	10
Accomplishments 2005-2015	14
South Fork Skokomish/Upper Watershed	18
North Fork Skokomish/Lake Cushman	22
Skokomish Valley	28
Skokomish Estuary	33
Coordination, Education, and Outreach	36
Action Plan 2016-2021	38
South Fork Skokomish/Upper Watershed	39
North Fork Skokomish/Lake Cushman	46
Skokomish Valley	47
Skokomish Estuary	56
Economic Vitality	57
Conclusion	58
Appendix – Skokomish Watershed Action Team	60

Executive Summary

Through the outstanding collaborative efforts of many partners, major restoration progress has occurred in the Skokomish River Watershed since 2005. However, crucial recovery work remains to be completed, especially in the Skokomish Valley.

Restoring the health of the Skokomish River watershed is vital to recover multiple endangered fish and wildlife species and to heal our impaired Hood Canal marine ecosystem within Puget Sound, a water of national importance. For the revitalization of local communities menaced by substantial and recurrent floods, as well as rising ground-water levels, it is imperative that the Skokomish watershed function well.

The Skokomish Watershed Action Team (SWAT) – a diverse, informal partnership of governments, land managers, and others working collaboratively to restore a healthy Skokomish watershed – has prepared this Skokomish Watershed Action Plan Update to showcase projects accomplished during the past decade and to guide future restoration work, focusing on the next five years.

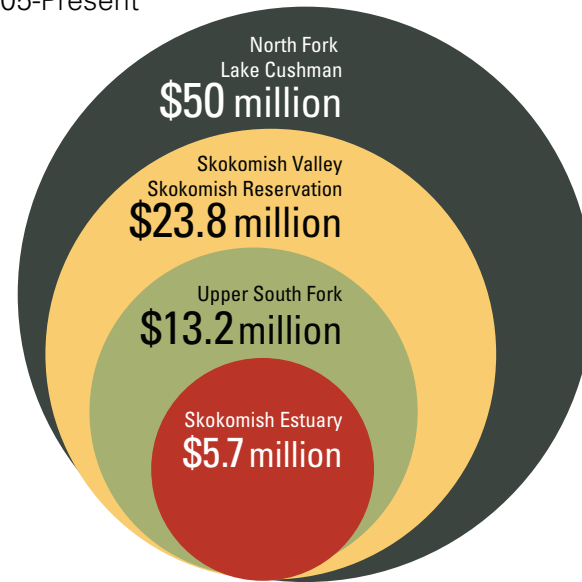
This action plan updates the 2007 SWAT Action Plan, which identified 42 projects totaling \$48.6 million aimed at recovery of threatened fish species, improving water quality, and reducing flood hazard within local communities. Substantial gains have been made to restore degraded conditions throughout the Skokomish since the SWAT collaboration began in 2005, with approximately 50 projects completed or underway.

Key successes to date include:

- Comprehensive remediation of Forest Service roads in the upper South Fork watershed
- Rapid preparations to recover multiple salmon species in the North Fork watershed and Lake Cushman pursuant to the historic Cushman Settlement
- Completion of a thorough General Investigation study of the Skokomish Valley
- Extraordinary restoration of the Skokomish Estuary

Total watershed restoration investments

2005-Present



In moving forward, two key initiatives will determine the overall effectiveness of the Skokomish watershed restoration:

1. Implementation of the Skokomish General Investigation Study (GI) projects – both those selected by the U.S. Army Corps of Engineers for implementation and those to be implemented by local parties.
2. Habitat restoration and recovery of anadromous fish (spring Chinook, summer chum, coho, and sockeye salmon; steelhead; and bull trout) through intergovernmental salmon recovery plans and watershed action plans.

On lands in the South Fork Skokomish watershed within or adjacent to the Olympic National Forest, the plan outlines nine projects totaling \$4.1 million during the next five years. Funding of \$1.8 million has already been secured for two projects, leaving \$2.3 million of funding needed for the other eight projects. Forest Service work will concentrate primarily on

As detailed in this report, watershed restoration investments since 2005 have amounted to \$13.2 million in the upper South Fork, \$23.8 million in the Skokomish Valley and Skokomish Reservation, and \$5.7 million in the Skokomish Estuary. The City of Tacoma has invested approximately \$50 million in North Fork and Lake Cushman salmon recovery projects that were not anticipated in the 2007 Action Plan. In addition, Green Diamond Resource Company has worked to improve water quality through careful management of roads on its lands. Volunteers have contributed many hundreds of hours of time and effort.

road maintenance, but will also include in-stream, riparian, wildlife enhancement, and other projects. Green Diamond Resource Company intends to replace several road culverts, as well as continuing to maintain its road system to minimize water quality impacts. Work in the North Fork Skokomish/Lake Cushman emphasizes fish habitat improvements, production, and utilization associated primarily with Cushman Hydropower Project operations that the City of Tacoma has committed to fund.

In the Skokomish Valley, the action plan update highlights 11 projects totaling \$24.0 million during the next five years. Funding of \$2.3 million has already been secured for six projects, leaving \$21.7 million of funding needed for five projects. Additional restoration projects may be identified based on monitoring, adaptive management, and feasibility studies. Work within the Skokomish Valley will focus on implementation of Army Corps and local projects identified within the Skokomish GI Study, including restorative actions such as levee removals, side channel reconnection, in-stream large wood placement, and tributary restoration. In the Skokomish Estuary, one project costing \$1.7 million (with all funding secured) remains to be completed of the multi-phase restoration work implemented in the past decade; future work will be based on an adaptive management approach.

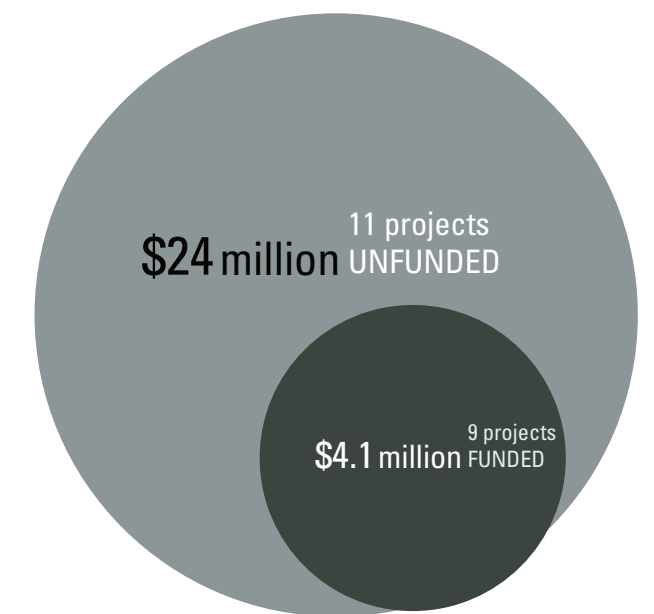
Pursuant to the SWAT's collaborative goal to enhance the economic and environmental sustainability of the Skokomish watershed, the action plan update includes a section on economic vitality. Focusing mostly on the needs of the Skokomish Valley, the update identifies opportunities to (1) preserve the watershed's unique cultural and historical resources, (2) enhance the existing fisheries and agricultural industries, (3)

promote recreation and tourism in the watershed, and (4) build healthy and safe communities.

In total, the SWAT action plan update specifically identifies 20 projects in the upper South Fork and Skokomish Valley during the coming five years costing an estimated total of \$28.1 million and with a funding need of \$24.0 million. Several additional projects will be undertaken by Green Diamond and Tacoma Power. Collectively, work throughout the Skokomish watershed will build on past efforts and provide long-term benefits to the environment and quality of life in the watershed, Hood Canal, and Puget Sound.

Total SWAT Action Plan

Projects identified to date



TOTAL 5 Year BUDGET **\$28.1 million**

Introduction

The Skokomish River watershed is a vital part of the Hood Canal marine ecosystem and the nationally significant Puget Sound. However, degraded watershed conditions pose a threat to multiple species of fish and wildlife. Furthermore, substantial and recurrent floods and rising ground-water levels menace local communities. Restoration of a well-functioning watershed is necessary for species recovery and community revitalization.



Olympic Peninsula of Northwest Washington

The SWAT action plan laid out an ambitious set of **42 restoration projects** costing an estimated total of **\$48.6 million**. Remarkably, as of 2016, virtually all of these projects – and more – have been completed or are nearing completion.

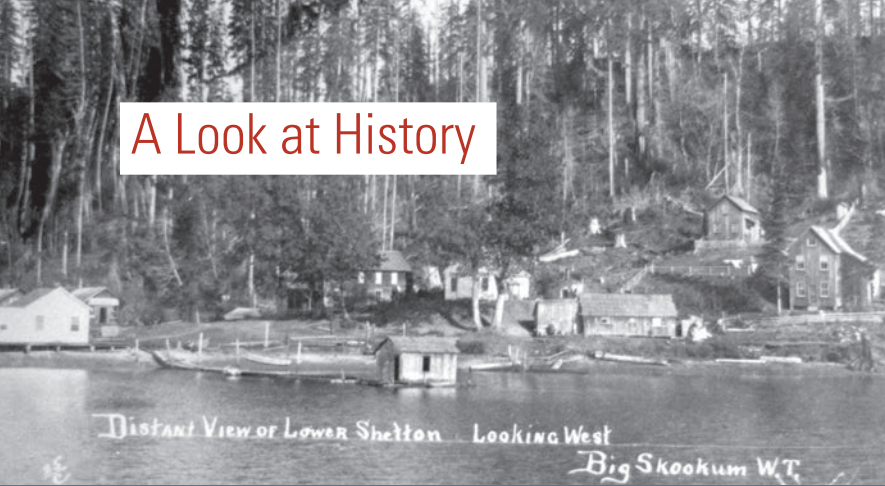
The Skokomish watershed can be divided into four regions:

- 1 The Upper South Fork, primarily Olympic National Forest and Green Diamond Resource Company forest lands;
- 2 The Upper North Fork and Lake Cushman, including the City of Tacoma’s Cushman hydropower project;
- 3 The Valley, mostly agricultural lands that have been severely affected by flooding;
- 4 The Estuary, located at the mouth of the river on the Skokomish Tribe’s reservation.

In 2007, the SWAT finalized a “road map” that enveloped these collaborative efforts in the Skokomish: Restoring the Skokomish Watershed, A Three-Year Action Plan. The SWAT action plan laid out an ambitious set of 42 restoration projects costing an estimated total of \$48.6 million. Remarkably, as of 2016, virtually all of these projects – and more – have been completed or are nearing completion.

1. Upper South Fork Skokomish Watershed. Trail Conversion photo. Photo credit: US Forest Service
2. Fish Collector Lake Cushman. Photo credit: Tacoma Power
3. Chum salmon in the Skokomish Valley. Photo credit: US Forest Service
4. Skokomish Estuary Restoration Phase I. Photo credit: Mason Conservation District

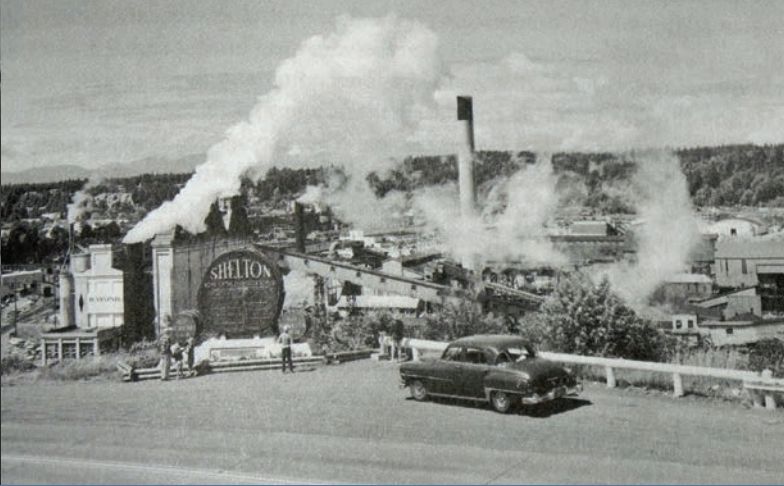
A Look at History



Shelton, ca. 1885 from the Mason County Historical Society



FILLING AND PLANKING LOG CRIB DAM FROM EASTERN EXTENT OF DAM, FACING WEST. December 1926 - Cushman No. 1 Hydroelectric Power Plant, Spillway, North Fork of Skokomish River.



Sawmills in Shelton, Washington that benefited from the Shelton Cooperative Sustained-Yield Unit circa 1950. The Forest Service: Fighting for Public Lands by Gerald W. Williams



Flooded Road by Purdy Creek Hatchery. Photo from Flickr user: Srosenow 98

During the past decade, strong, durable partnerships have formed and collectively made major advances in planning and implementing strategic solutions that target recovery of the degraded Skokomish. The Skokomish Watershed Action Team (SWAT) is an informal collaborative group consisting of major landowners and more than 20 organizations (see Appendix).

In recognition that important, substantive work has been accomplished, yet critical actions must continue to restore the impaired Skokomish, the

SWAT has moved forward with development of this Skokomish Watershed Action Plan Update. The SWAT's update showcases the array of restoration actions completed during the period 2005-2015 that span multiple ownerships from the headwaters to the estuary, and outlines future actions needed in the next five years to recover healthy watershed conditions. Details about the Skokomish watershed, the completed projects, and the plans and policies that underlie the restoration activities are available in a 30-page Supplement to this action plan update.

The update is divided into two main sections. The first summarizes accomplishments since 2005, focusing on several key projects. Major successes to date include:

- Extensive remediation of Forest Service roads in the upper South Fork watershed,
- Preparations to restore fish passage and productive fisheries in the North Fork and Lake Cushman
- Completion of the Skokomish General Investigation Study in the Valley
- Restoration of the Skokomish Estuary

The second part identifies restoration actions proposed for the coming five years. The future actions are primarily distilled from four different planning frameworks that target recovery within the Skokomish:

- Upper and Lower South Fork Skokomish Watershed Restoration Action Plans (2011)
- Cushman Settlement Agreement (2009) and Amended Cushman Project License (2010)
- Skokomish GI Study (2015)
- Skokomish Chinook Draft Recovery Plan (2010)

These future actions target recovery of endangered salmonid species, improved water quality, and reduced flood hazards.

As with the 2007 plan, success of this 2016 action plan update will require focus and commitment from SWAT members and shared funding from local, state, and federal sources. Maintenance, monitoring, and adaptive management are increasingly important parts of the restoration process. Public involvement and educational outreach are also necessary elements that will provide important feedback.



Salmon alevin protected in the gravel bed. Photo credit: © Alaska Department of Fish and Game.



Ron Gold, Jim Hunter, Tom Strong, Jayni Kamin, Ross Gallagher, Bob Dick, Stephen Bernath, Jason Ragan, Robin Stoddard, Dale Hom, Allen Gibbs, Michelle Ackermann, Joseph Pavel, Rich Geiger, Mike Anderson, Norm Dicks, Richard Brocksmith, Maimie Brouwer, Alex Gouley, Sara Crumb, Pete Modaff, Kristen Kerns, Dean Yoshina



Overview of the Skokomish Watershed

Summer run Chum salmon. Photo credit: Mike Hovis

Principal landowners are the Olympic National Forest (50%), Olympic National Park (18%), Green Diamond Resource Company (15%), City of Tacoma (6%), State of Washington (3%), Skokomish Tribe (2%), and other private owners (8%).

The Skokomish watershed supports four anadromous fish species listed as threatened under the federal Endangered Species Act (ESA): Chinook salmon, summer chum salmon, steelhead, and bull trout. Restoration of the Skokomish is vitally important to recovery and de-listing of these imperiled fish in Hood Canal and Puget Sound. Coho and fall chum salmon also inhabit the Skokomish.

The Skokomish River floods earlier and more frequently than any other river in Washington State. Flooding impacts have worsened in recent decades due to aggradation (filling with gravel and sediment) of the river bottom. Flooding and water quality degradation have harmed the economy, health, and quality of life of the Skokomish watershed and Hood Canal.

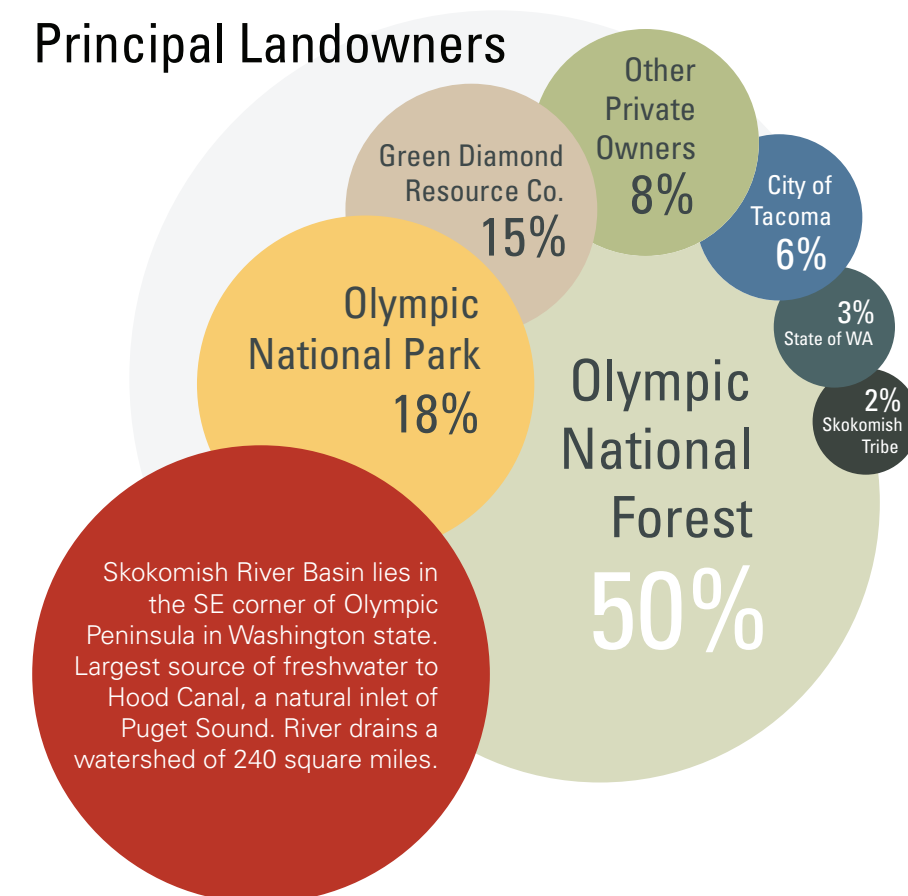
- Decreased channel capacity has raised groundwater levels, greatly reducing the agricultural productivity of the Valley.
- For the past dozen years, heavily aggraded portions of the river have temporarily gone dry and become impassable for migrating fish.
- Degraded water quality conditions contribute to the low dissolved oxygen levels in Hood Canal, contributing to fish kills.

These problems stem in part from a range of resource management activities in the watershed during the 20th century. In the upper South Fork, extensive clearcutting and road construction on steep, unstable slopes triggered landslides that dumped tons of sediment into streams. The North Fork was transformed by hydropower development that involved construction of two dams and diversion of most of the river's water to a powerhouse located outside of the watershed. In the Valley, the river was modified and floodplains were reduced by dikes to protect homes and farmland. The estuary was diked and filled for agricultural development.

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By the 1990s, the cumulative effects of these and other development activities, along with the need for corrective actions, were becoming increasingly evident. Following are some of the changes in land-use plans and policies that have guided a major shift in management of the watershed from commodity development to ecological restoration.

Skokomish River Basin Principal Landowners



Skokomish River Basin lies in the SE corner of Olympic Peninsula in Washington state. Largest source of freshwater to Hood Canal, a natural inlet of Puget Sound. River drains a watershed of 240 square miles.

Chronology of Key Developments:

1994

Northwest Forest Plan changed Forest Service management direction from timber production to ecosystem restoration.

2000

Green Diamond Resource Company's Habitat Conservation Plan required timber and road management to protect water quality.

2005

Skokomish Watershed Action Team (SWAT), an informal collaborative group of diverse stakeholders, formed to restore the Skokomish watershed.

2006

Skokomish General Investigation Study (G.I.) was initiated by U.S. Army Corps of Engineers in partnership with Mason County and Skokomish Tribe to conduct an in-depth study of the Skokomish River.

2007

SWAT Action Plan focused mainly on upper Skokomish watershed restoration.

2008

Legacy Roads and Trails Program was a new Congressional funding source for Forest Service road decommissioning and stabilization to protect water quality.

2009

Cushman Settlement Agreement was a pact between Tacoma Power, Skokomish Tribe, and multiple agencies regarding the Lake Cushman Hydroelectric Project and salmon recovery in the North Fork Skokomish River.

2010

Federal Energy Regulatory Commission issued the amended Cushman Project License to the City of Tacoma/Tacoma Power

2010

Draft Recovery Plan for the Skokomish Chinook Salmon was developed by the Skokomish Tribe and Washington Department of Fish and Wildlife to guide salmon recovery efforts.

2012

Upper and Lower South Fork Skokomish Watershed Restoration Action Plans identified remaining watershed restoration projects needed on National Forest System lands.

2015

Skokomish G.I. completed – comprehensive plan to improve river functions and fish habitat in lower watershed.

For more information about the Skokomish Watershed, see Section I of the Action Plan Supplement.

Aerial photo of the mouth of the Skokomish River.
Photo credit: Mason Conservation District



Accomplishments 2005 – 2015



Upper South Fork Skokomish

Restoration project areas. Road system restoration occurs throughout most of this map.

1. South Fork Skokomish/ Upper Watershed

FEATURED PROJECT

Legacy Roads & Trails Remediation

Based on an inter-disciplinary assessment of roads to determine risk and access needs, the Olympic National Forest adopted an Access and Travel Management Plan in 2003 and updated it for the South Fork Skokomish in 2007. As of 2016, all of the high priority road decommissioning, road closure, and conversion-to-trail work identified in the plans has been implemented. The success of this program of work is largely due to the strong support by the SWAT and the Skokomish Tribe and receipt of \$6.6 million in Legacy Road and Trail funds targeted for the South Fork Skokomish watershed.



2013 North Fork Skokomish road decommissioning. Photo credit: Robert Metzger, US Forest Service



South Fork road decommissioning, after stream crossing restoration at culvert, and road fill removal. Photo credit: Robert Metzger, US Forest Service

Forest Service projects have included road decommissioning, road closures, conversion-to-trail, storm damage risk reduction, individual culvert upgrades, fish passage improvements, and road maintenance. The overarching goal is to reduce the potential for mass wasting, surface erosion, and road-related delivery of coarse and fine sediment to fish habitat and to improve and protect water quality in the South Fork Skokomish River and its tributaries.

Helicopter placing large wood in Skokomish Estuary. Photo credit: Mason Conservation District

Roads and Trails Accomplishments (2008-2015):

- 91 road miles decommissioned, closed, or converted to trails
- 85 miles stabilized or improved drainage - storm damage risk reduction
- 4 resident fish passage barriers corrected or removed
- 1 mile of road paved
- 4 trail bridges replaced

Contractors:

- R.G. Forestry Consultant
- Neilton Landscaping, Inc.
- Arris Kollman Trucking
- Westek Forest, Ltd
- Seaton Construction, Inc.
- Sam Bickle Logging
- LK&E Corporation
- YRU Contracting, Inc.
- JX Construction, LLC.
- Washington Conservation Corps
- Sound Native Plants

Key Partners:

- Skokomish Watershed Action Team
- Skokomish Tribe
- United States Environmental Protection Agency
- Hood Canal Salmon Enhancement Group
- Wolfree, Inc.
- Ecotrust
- Washington State Department of Ecology
- Tacoma Urban League
- Great Old Broads for Wilderness
- Olympic Forest Coalition
- U.S. Forest Service Rocky Mountain Research Station

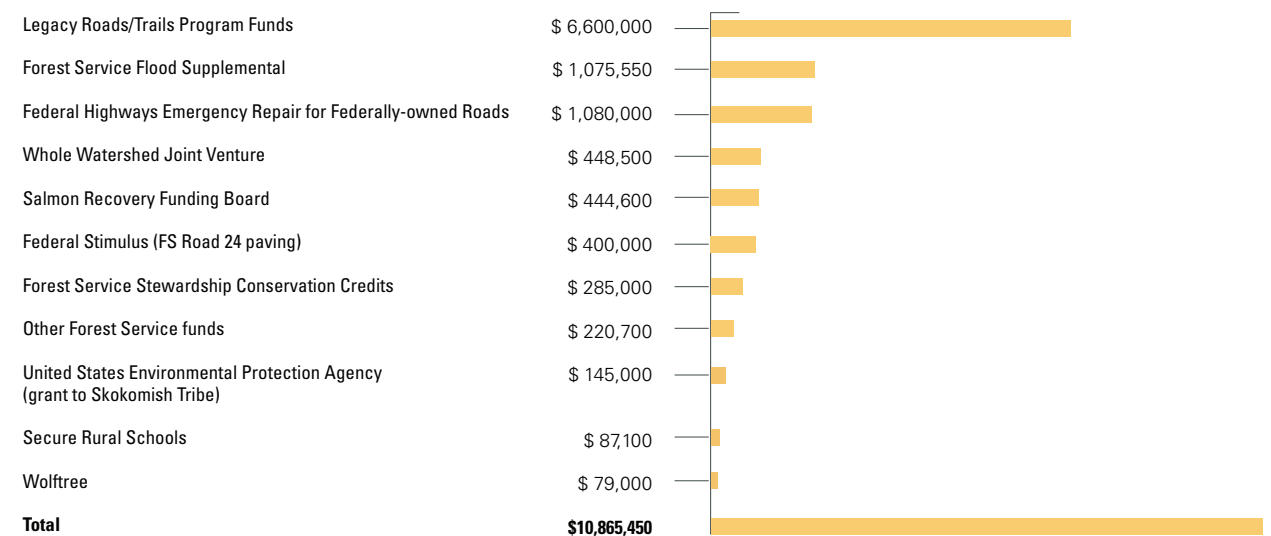
Church Creek Road Decommission.
Next page: Road Decommission.
Photo credit: US Forest Service



Monitoring: The Rocky Mountain Research Station and Pacific Northwest Region of the Forest Service monitored some of the road decommissioning and stabilization projects in the South Fork Skokomish watershed to assess their effectiveness in reducing impacts and risks to key watershed processes. They evaluated the following road impacts and risks: road-stream hydrologic connectivity, fine sediment production and delivery, shallow landslide risk, gully initiation risk, stream crossing failure risk, and drain point condition.

Overall, the Forest Service’s research monitoring results indicate that the decommissioning work should be effective in greatly reducing many of the negative impacts and risks that these roads posed to aquatic ecosystems. Key results show an 81 percent reduction in fine sediment delivery to streams and a 100 percent reduction in culvert failure risk. Similarly, initial monitoring results indicate that the road stabilization work should be effective in reducing non-mass wasting impacts and risk that these roads posed to aquatic systems.

In addition, volunteers with the non-profit group, Great Old Broads for Wilderness, completed three field seasons of citizen road survey and monitoring projects in the South Fork Skokomish watershed, in collaboration with the Olympic Forest Coalition (OFCO) and the Olympic National Forest. Results of the citizen surveys were summarized in annual accomplishment reports.



FEATURED PROJECT

South Fork Skokomish Large Wood Enhancement Phase I

Completed in 2010, this large-river restoration project involved constructing a series of 30 log jam structures along one mile of the mainstem South Fork Skokomish River that extends from River Mile 12 to 13. This stretch was part of a four-mile reach called Holman Flats that had been the site of a proposed reservoir in the 1950's. The goal of the project was to restore channel processes and improve aquatic habitat and fisheries production by stabilizing the river channel, banks and terraces, increasing floodplain roughness, and reestablishing riparian vegetation. Trees with intact root wads were obtained from nearby ONF lands and flown by helicopter to the river, where they were assembled into different-sized logjams and firmly embedded in the river channel.

Funding Sources:

\$729,000	Washington Salmon Recovery Funding Board and U.S. Fish and Wildlife Service
\$525,000	U.S. Forest Service (in-kind contributions of wood)
\$1,254,000	Total

Contractors:

- U.S. Forest Service TEAMS Enterprise (survey, design, contract administration for construction)
- Arris Kollman Trucking (tree felling and staging)
- Columbia Helicopters (tree transport by helicopter)
- Aquatic Limited, LCC (logjam structure construction)

Monitoring: In 2011, following the first winter storm period that occurred since installation of large wood complex structures, Forest Service TEAMS Enterprise specialists conducted preliminary monitoring within the one mile restored reach.

Initial monitoring results concluded that:

- Gravel bars increased 2.4 feet on average
- Channel depth increased an average of 2 feet
- Estimated sediment storage is 43,000 cubic yards
- Bankfull and low flow channel width-to-depth ratios decreased 49% and 36%, respectively
- Total number of pools with greater than 5-foot residual pool depth doubled from 3 to 6
- Wood complexes endured the 6-7th highest flow on record, with no loss of wood structure pieces
- Wood accumulated, including a large old-growth tree



Implementation 2010.



Thalweg depth decreased over 2 feet on average through the project reach. Scour at this structure was 7.2 feet. Photos credit: US Forest Service



Green Diamond's Rick Schmeling presenting mid-project. Photo credit: Washington State Department of Ecology

FEATURED PROJECT Gibbons Creek Fish Passage

Gibbons Creek is a tributary to McTaggart Creek in the North Fork Skokomish watershed on Green Diamond Resource Company land. A road crossing at Gibbons Creek had a 6-foot diameter by 108-foot long corrugated metal culvert covered by 10,000 cubic yards of road fill 35 feet deep. A 10-foot drop at the culvert outlet prevented upstream fish migration and completely blocked anadromous fish passage.

In 2009, Green Diamond partnered with Mason Conservation District, Skokomish Tribe, and others to replace the existing culvert with a 65-foot span bridge on elevated abutments and rehabilitate the stream adjacent to the new bridge. Stream restoration included construction of a 25-foot-wide stream bed under the new bridge, installation of large wood, and construction of rock grade controls within the 350-foot stream reach immediately adjacent to the project site.

Replacement of the culvert with a bridge restored access to 1.2 miles of upstream fish spawning and rearing habitat for anadromous fish species. Removal of the culvert and road fill eliminated the risk of catastrophic failure and potential delivery of sediment downstream. The project successfully eliminated a substantial anadromous fish passage barrier in the North Fork Skokomish watershed and connected isolated freshwater in-stream habitat to increase the range and distribution of salmon.

Funding Sources:

\$173,500	Salmon Recovery Funding Board
\$ 22,500	EcoTrust
\$108,500	Green Diamond Resource Company (labor)
\$504,500	Total



During



After

Photos credit: Washington State Department of Ecology

Other South Fork/Upper Watershed Projects

Collaborative Stewardship Thinning

Flat Stewardship -- 104 acres commercially thinned; stewardship receipts were used for road decommissioning, which included restoration of a stream crossing nicknamed the "Big Dig" that involved removal of 35,000 cubic yards of road fill material.
Contractor: Sam Bickle Logging.

Flat 2 Stewardship – 96 acres commercially thinned; stewardship receipts were used to complete 17 acres of pre-commercial thinning.
Contractor: Columbia Helicopters.

Pine Stewardship – 69 acres commercially thinned; stewardship receipts were used to complete a road-to-trail conversion project. A professional forester from Conservation Northwest contributed significantly to development of the prescription for this thinning project.
Contractor: Westek Forest, Ltd.



Forest Service Botanist
Cheryl Bartlett.
Photo credit US Forest Service

Pine Lake Restoration

Implemented in 2011-2014, the aim of this project was to eradicate the invasive weed reed canary grass and restore native plants along three miles of Pine Lake shoreline. Volunteers with Backcountry Horsemen of Washington were key partners in completing this project.

Total cost: \$38,000 (including \$4,800 of in-kind contribution)

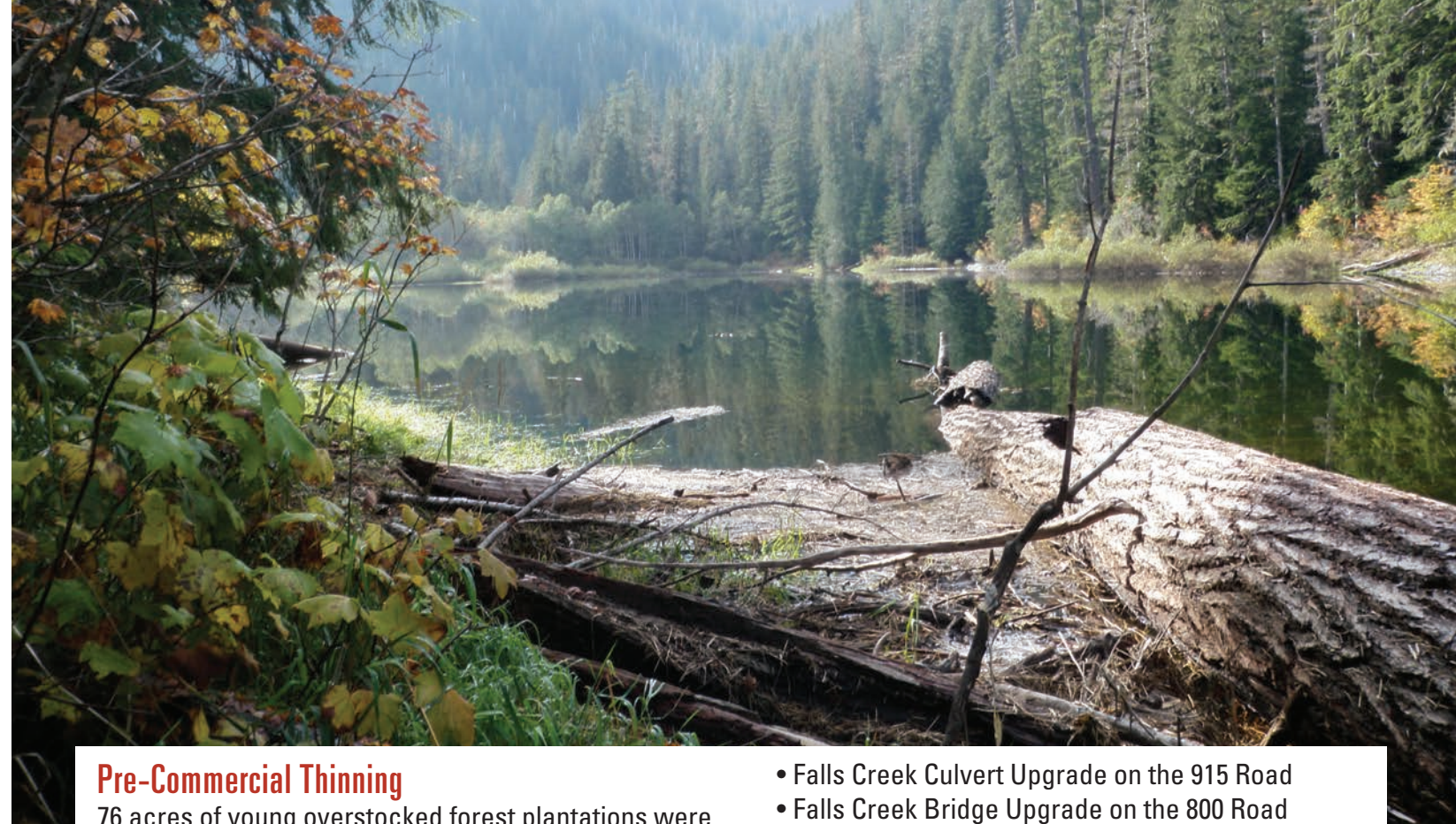
Skokomish Prairie Restoration Phase I

16 acres of prairie habitat were treated with prescribed fire in 2015 to maintain and enhance the cultural and ecological values within a much larger area that had historically been maintained as native beargrass savanna by Native American burning. The project was accomplished with Forest Service funds and personnel.

Riparian Nutrient Enhancement – Annual Salmon Carcass Placement

5,000-10,000 excess hatchery salmon carcasses were transported upriver to bring nutrients from spawning salmon carcasses to the upper reaches of the South Fork watershed.

Total cost: \$10,000 per year.



Pre-Commercial Thinning

76 acres of young overstocked forest plantations were pre-commercially thinned to enhance wildlife habitat and species diversity. Rocky Mountain Elk Foundation contributed \$7,000.

Elk Forage Enhancement

Native plant species were planted within the understory of 31 acres to enhance elk habitat. The Skokomish Tribe contributed \$6,000 and Washington Conservation Corps provided manpower.

McTaggart Creek Diversion Removal & Bridge Upgrades

Tacoma Power partnered with Green Diamond Resource Company to remove a diversion dam, replace two culverts with bridges, and restore water flows and the stream channel on McTaggart Creek. Tacoma Power provided funding as part of its commitment to restore habitat in the North Fork Skokomish River.

Green Diamond Road Management and Abandonment Plans, Road Projects

Green Diamond Resource Company has addressed approximately 90 percent of identified road hazards within the South Fork/Vance Creek region through implementation of road upgrades, abandonment, or maintenance work. Completed projects include:

- Falls Creek Culvert Upgrade on the 915 Road
- Falls Creek Bridge Upgrade on the 800 Road
- 900/866 Road System Upgrades in Haven Lake area

Vance Creek Restoration Assessment – U.S. Bureau of Reclamation

The Skokomish Tribe contracted with the Bureau of Reclamation and Mason Conservation District to study Vance Creek, a major tributary to the South Fork. The study identified near-term restoration projects designed to improve stream habitat. Funding sources for the \$183,919 study were Puget Sound Acquisition and Restoration (PSAR) Fund (\$123,919), Bureau of Reclamation (\$40,000), and Skokomish Tribe (\$20,000).

South Fork Skokomish Canyon Fish Passage Assessment

The goal of this project is to determine the ability of spring Chinook salmon to migrate over the cascades in the South Fork Skokomish River Canyon, and explore feasible corrective actions to restoring appropriate spring Chinook passage if necessary. Initiated in 2015, the study is funded by a \$175,437 grant from the Salmon Recovery Funding Board and \$30,960 in matching funds.

Helicopter photo credit: Mason Conservation District
Pine Lake Headwaters photo credit: US Forest Service
Photo credit: Washington State Department of Ecology

2. North Fork Skokomish/ Lake Cushman

FEATURED PROJECT

Fish Passage and Flow Restoration for Salmon Recovery

Background: In 2009 Tacoma Power reached an historic agreement with the Skokomish Tribe and other entities regarding operation of the Cushman Hydroelectric Project. The following year the Federal Energy Regulatory Commission issued the amended Cushman Project license to the City of Tacoma/Tacoma Power. The license includes numerous articles relating to restoration of water flows, anadromous fish runs, and other watershed values in the North Fork of the Skokomish River and Lake Cushman. Tacoma Power coordinates with a Cushman Fisheries and Habitat Committee that includes representatives of the National Marine Fisheries Service, U.S. Fish and Wildlife Service, Bureau of Indian Affairs, U.S. Forest Service, Olympic National Park, Skokomish Tribe, Washington Department of Fish and Wildlife, and Washington Department of Ecology.

The Cushman Settlement's multi-faceted water flow and salmon recovery project includes the following key elements:

North Fork Stream Flow Enhancement

Water flow releases from the Cushman dams mimic the timing, duration, and frequency of natural flow events and enhance healthy conditions in the river system. The new flow regime has four categories based on a 160,000 acre-feet annual water budget:

- 115,835 acre-feet are released as the minimum flow into the lower North Fork Skokomish River.
- 44,165 acre-feet are released to improve conditions for fish.
- Other flows are designed to establish and maintain habitat in the lower North Fork and to flush sediment in the mainstem downstream after storm events.



North Fork Hatchery for fish supplementation.
Photo credit: Tacoma Power

Upstream Fish Passage -- Little Falls Modifications

Located on the North Fork Skokomish River approximately 2.5 miles downstream of Cushman Dam No. 2, Little Falls was a partial barrier to restoring adult fish passage to Lake Kokanee, Lake Cushman, and the upper North Fork. Modification to the falls, substantially completed in 2014, involved micro-blasting the bedrock channel to create small steps that serve as resting pools for fish on their migration upstream, while also taking care to protect the beauty of this culturally significant site. Since completion of the project, adult salmon and steelhead have been observed upstream of the falls. Project managers will continue to assess fish passage over the falls and make adjustments as needed.



Little Falls Modifications. Photo credit: Tacoma Power

Upstream Fish Passage -- Adult Fish Collection Facility at Cushman No. 2 Dam

In 2011-2013, Tacoma Power built a new powerhouse and innovative fish collection and transportation system at Cushman Dam No. 2. The unique facility uses water discharged from turbines to attract migrating adult fish into a collector at the bottom of the dam. Once in the collector, fish are moved into a transport hopper and lifted to the top of the dam on a tram. The new fish handling system is used to count, sort by species, and, as necessary, mark the fish. Fish are then transported by truck to their final destination – either to a hatchery to be used as brood stock, upstream of the two Cushman dams and released into upper Cushman Lake where they can find their way into the upper part of the North Fork or other lake tributaries, or returned to the lower North Fork Skokomish River.



Adult fish collection facility.
Photo credit: Tacoma Power

Downstream Fish Passage: Floating Juvenile Fish Collection Facility

In 2013-2014 Tacoma Power built and installed a new floating fish collection facility for Lake Cushman to help migrating juvenile fish move past the dams. This large floating device is attached to Cushman No. 1 Dam. Water flowing into the floating facility carries the fish into a fish trap. Once collected, the young fish will then be transported to the sorting facility at the lower dam. After a portion of the smolts are counted, measured, and marked, they are released in the North Fork Skokomish River at the base of Cushman No. 2 Dam to continue their migration.

Hatcheries for Fish Supplementation

Tacoma Power constructed two salmon hatcheries at the Cushman Project: Saltwater Park Hatchery for sockeye salmon and the North Fork Hatchery for spring Chinook, coho, and steelhead. Construction of both hatcheries began in 2014 and was completed in 2015.

- Located next to Saltwater Park at Potlatch on the Hood Canal, the sockeye hatchery eventually will release 2 million sockeye fry into Lake Cushman. Sockeye eggs will be obtained from the Baker Lake Hatchery in northern Puget Sound. After spending a year in Lake Cushman, the young sockeye will be captured in the downstream fish collection facility and released into the lower North Fork Skokomish River where they will head out to sea.
- The North Fork salmon and steelhead hatchery will raise up to 375,000 spring Chinook each year, initially using eggs from the state's Marblemount Hatchery in northern Puget Sound. The hatchery will also supplement native runs by annual releases of up to 15,000 steelhead smolts and 35,000 coho smolts.

Fish Habitat Enhancement and Restoration Projects

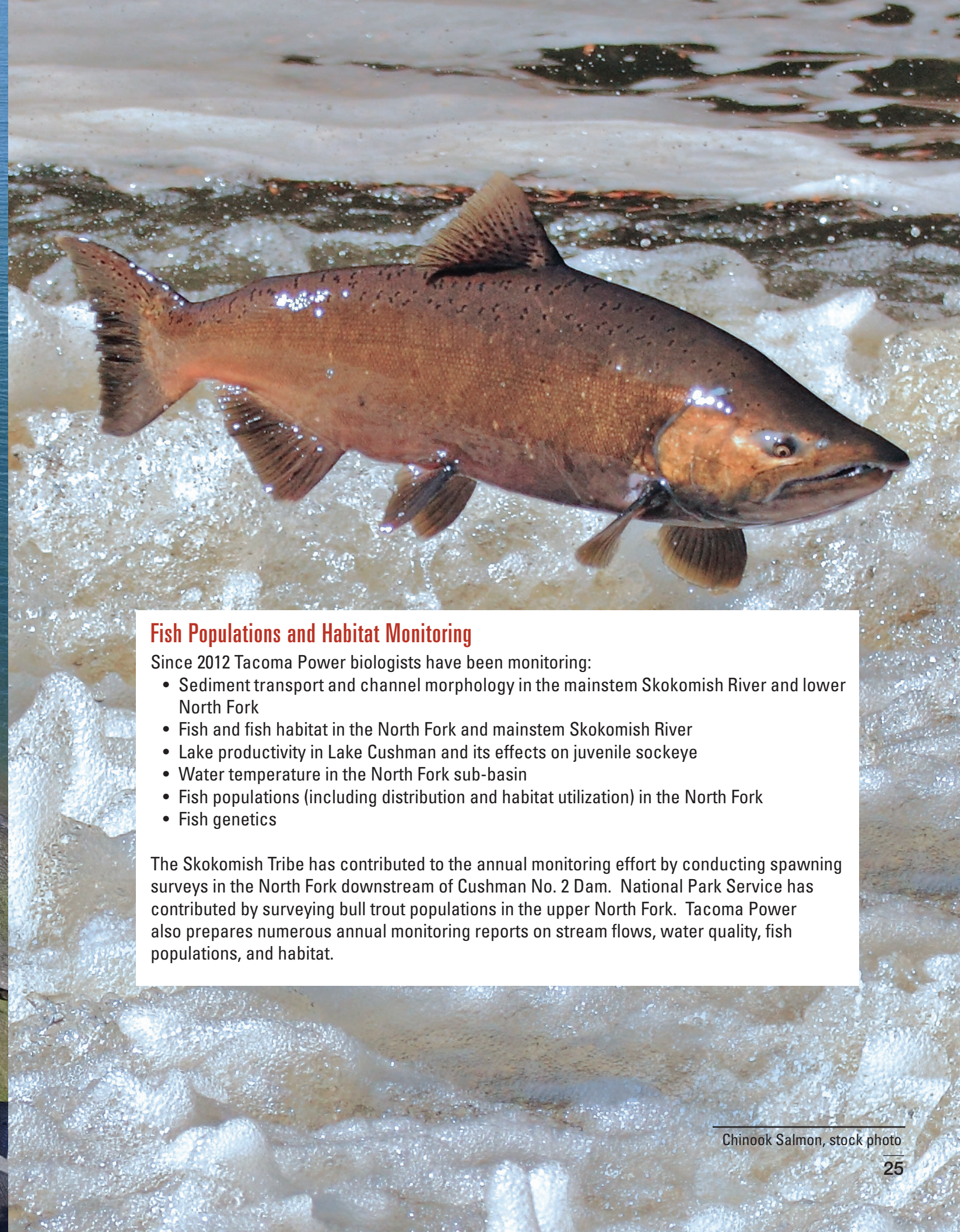
The Fish Habitat Enhancement and Restoration fund will be used for fish and aquatic habitat restoration projects primarily within the North Fork sub-basin, including --

- In-stream structure enhancements
- Side channel habitat development
- Removal of existing barriers to upstream migration in North Fork tributaries
- Gravel augmentation

Tacoma Power paid \$3.5 million into the Habitat Restoration Account in 2010, added another \$300,000 in 2015, and will annually deposit \$300,000 into the account for the term of the amended license (to 2048). All deposits are based on 2008 dollars adjusted annually for inflation.



Saltwater Park Fish Hatchery.
Photo credit: Tacoma Power.



Fish Populations and Habitat Monitoring

Since 2012 Tacoma Power biologists have been monitoring:

- Sediment transport and channel morphology in the mainstem Skokomish River and lower North Fork
- Fish and fish habitat in the North Fork and mainstem Skokomish River
- Lake productivity in Lake Cushman and its effects on juvenile sockeye
- Water temperature in the North Fork sub-basin
- Fish populations (including distribution and habitat utilization) in the North Fork
- Fish genetics

The Skokomish Tribe has contributed to the annual monitoring effort by conducting spawning surveys in the North Fork downstream of Cushman No. 2 Dam. National Park Service has contributed by surveying bull trout populations in the upper North Fork. Tacoma Power also prepares numerous annual monitoring reports on stream flows, water quality, fish populations, and habitat.



The Net Transition Structure (NTS) flipping over in Lake Cushman in preparation for connecting it to the Floating Surface Collector (FSC).



The two structures were joined to make up the juvenile fish collection facility used to capture juvenile salmon as they try to leave Lake Cushman on their way to the ocean.



The FSC is connected to Cushman No. 1 Dam, and the NTS is connected to, and funnels fish from the reservoir into, the FSC. Captured fish are removed and released into the North Fork Skokomish River downstream of Cushman No. 2 Dam.



Aerial view of the Juvenile Fish Collection Facility.
Photo credit: Tacoma Power

Other North Fork/Cushman Projects

Lake Kokanee Rainbow Trout Release:

To improve sport harvest of rainbow trout, Tacoma Power releases rainbow trout annually into Lake Kokanee and other lakes in the vicinity. In 2014 Tacoma Power released 54,488 rainbow trout into lakes in Mason, Jefferson, and Kitsap counties, including approximately 10,400 fish into Lake Kokanee.

Land Management and Acquisition for Wildlife:

Tacoma Power recently acquired 750 acres of land -- 430 acres in the North Fork Skokomish basin and 320 acres in the South Fork basin -- for the purpose of enhancing native plants and wildlife populations near the Cushman Project. Tacoma Power now manages a total of 2,800 acres of lands in the Skokomish basin for the maintenance and enhancement of wildlife populations, including osprey, eagles, wood ducks, bats, elk, and deer.

Recreational Improvements:

As part of the Cushman settlement agreement and amended project license, Tacoma Power has made improvements to the U.S. Forest Service's Big Creek Campground on Lake Cushman and other recreational sites along the Staircase Road. To improve Big Creek Campground, Tacoma Power constructed new recreational vehicle and tent campsites, constructed and widened road segments, installed underground utilities, and built new picnic shelters. Work on the other sites included improvements to Mount Rose trailhead, Bear Gulch day-use site, Dry Creek trailhead, and Lake Cushman Viewpoint.



Lake Cushman on the way to the Staircase Campground.
Photo credit: Mary K Johnson



Chum crossing the road, in the Skokomish River Valley.
Photo credit: US Forest Service

3. Skokomish Valley FEATURED PROJECT

Purdy Creek Bridge Replacement – U.S. Highway 101

The U.S. Highway 101 Purdy Creek Bridge, which was built with timber trestles in the early 1930s, was subject to frequent flooding, caused dangerous conditions for drivers, and resulted in frequent closure of the highway. Completed by the Washington Department of Transportation in 2009, the new Purdy Creek Bridge has wider lanes and shoulders, is 12.5 feet higher and more than three times the length of the old structure.

The 350-foot pre-stressed concrete girder bridge allows floodwaters to pass freely under the bridge, improves public safety, and ensures highway traffic remains open during flood events. The new bridge has also helped to alleviate flooding impacts in the Valley by reducing the barrier effect of Highway 101 during floods. The total cost of the state-funded transportation project was \$9.5 million. Quigg Brothers Construction was the general contractor for the bridge project, and Malcolm Drilling was the subcontractor for building shafts.



John Quigg, Tim Sheldon, Joseph Pavel, Guy Miller, Ross Gallagher, Sara Crumb, Fred Finn, Kevin Dayton.
Photo credit: Washington State Department of Ecology

FEATURED PROJECT

Five Mile Creek Large Woody Debris Placement

Excess sediment along the South Fork right bank at the mouth of the creek has blocked fish into the South Fork. The blockage prevents fish from escaping the overly warm river water into the cool, spring-fed water of Five Mile Creek.

Five Mile Creek is a perennial, spring-fed tributary that flows into the South Fork Skokomish River about one mile upstream of its confluence with Vance Creek. This stream offers pristine spawning and rearing habitat, cool spring waters, and high-flow refuge to spawning and juvenile salmon, including Puget Sound Chinook, Hood Canal summer-run chum, steelhead, and bull trout. Over the past several years, excess sediment along the South Fork right bank at the mouth of the creek has blocked fish into the South Fork. The blockage prevents fish from escaping the overly warm river water into the cool, spring-fed water of Five Mile Creek.

The goal of this project was to maintain stream connectivity between Five Mile Creek and the South Fork Skokomish River, providing cool, covered habitat for endangered salmon, steelhead and bull trout, especially during summer low-flow periods. This project placed a series of four logjams totaling 320 feet of large woody debris along the right bank adjacent to the Five Mile Creek and Skokomish South Fork confluence. Log structures were placed strategically to cause channel scour in order to maintain summer low-flow access from the South Fork Skokomish to Five Mile Creek. After the project was completed in March 2015, post-construction monitoring found that large wood placed at the stream mouth has caused scour and pool formation, effective in maintaining stream connectivity between Five Mile Creek and the South Fork Skokomish during summer low flows.

Mason Conservation District engineered and designed the project under contract with Natural Resource Conservation Service. Landowner Charles Toal contributed labor and equipment. Funding for the \$66,000 project included \$30,304 from the PSAR Fund and \$35,499 from project sponsors.



FEATURED PROJECT

Lower Skokomish Car Body Removal and Riparian Restoration

This project site is on a 1,800-foot section of the right bank of the mainstem Skokomish River at River Mile 4.4, downriver of Hwy. 101. In past years, the bank was armored with car bodies in order to stabilize it, and was void of riparian vegetation. Car body armoring prevented natural channel migration and flooding along the banks and in the channel of the Skokomish. The Weaver Creek/Skokomish River floodplain was previously cleared for agricultural uses.



Vintage automobile hood.

The goal for this project was to restore natural channel migration in the mainstem Skokomish and restore riparian function. The project involved removing 39 vehicles and their associated parts totaling 48.7 tons of scrap metal along 1,800 linear feet from the right bank and channel of the mainstem Skokomish River. In addition, native riparian vegetation was planted within the entire 22.5-acre Weaver Creek/Skokomish floodplain.

The Salmon Recovery Funding Board provided a \$129,710 grant, matched by \$64,000 from Mason Conservation District. The contractor is James C. Pro, Inc.



Extracting the undercarriage of a vehicle.



A pile of auto-scrap being collected.

Other Valley Projects

East Bourgault Road Bridge Removal and Habitat Restoration:

- Enhanced riparian and wetland habitat along East Bourgault Road through removal of a timber bridge and road to allow floodwater to flow across and into wetlands.
- Completed in 2009 for \$99,140. by R.W. Rhine, Inc.

River Road Abandonment and Habitat Enhancement:

- Removed culverts to help restore the natural hydrologic functions of the lower Skokomish Valley area by reconnecting remnant flood channels to the Skokomish River and providing unimpeded access to fish movement.
- Completed in 2009 with funding from the U.S. Fish and Wildlife Service and Skokomish Tribe.

State Route 106 Skabob Creek Bridge Fish Passage Restoration:

- Replaced an undersized culvert at the State Route 106 Skabob Creek crossing with a 120-foot bridge.
- Succeeded in improving fish passage and creek flow capacity under the highway during storm events, as well as reducing flood impacts and lowering ground water levels on the Skokomish Reservation. Hood Canal Salmon Enhancement Group partnered with state and federal agencies and the Skokomish Tribe to complete the project in 2005 with \$1.8 million in gas tax funding.

Potlatch Wastewater Treatment Plant

Completed in 2013, this project was designed to improve water quality in Hood Canal by eliminating pollution from existing septic system drain fields located close to the canal's shore, including some that lie within the Skokomish watershed. The Skokomish Tribe's new community wastewater treatment system has removed 17 septic systems to date, and will serve many other homes and businesses in the future. Funding sources for the \$8.5 million treatment plant came from federal and state clean water grants.

Skokomish Reservation Septic System Management

Starting in 2007, the Skokomish Tribe has undertaken a comprehensive program to inventory, maintain, and repair or replace septic systems on the reservation. Since 2007 the Tribe has pumped 46 systems and repaired or replaced 24 systems, significantly reducing the amount of effluent and nitrate pollution entering the watershed and Hood Canal. Funding sources include \$400,000 from Indian Health Service.



Skokomish Reservation Road Paving and Stormwater Project

In 2014, the Skokomish Tribe reconstructed 4,600 feet of Reservation Road serving the core reservation area in order to address flooding problems, as well as fix potholes and provide a safe sidewalk for pedestrians. The \$1.3 million project received \$1 million from Public Lands Highway and \$278,000 from Bureau of Indian Affairs Indian Reservation Roads. SCJ Alliance conducted engineering and project management, and Active Construction, Inc. completed the project.

Southern Hood Canal Riparian Enhancement Project Phase I

Mason Conservation District contracted with a Washington Conservation Corps crew from 2010 to 2013 to control knotweed and other invasive plants on numerous riparian areas in the Skokomish Valley and elsewhere in the Hood Canal area. The project entailed planting native conifers, shrubs, and hardwood species in high priority areas to restore natural streamside vegetation, improve stream temperature, reduce erosion, and recruit large woody debris. Funding sources included \$28,466 from PSAR Fund and \$394,044 from Salmon Federal Projects.

Skokomish River Floodplain Acquisition and Restoration

This project targets unusable properties in the Skokomish River floodplain for acquisition and implementation of site-specific habitat conservation

and restoration efforts. Restoration efforts to be implemented include building demolition and road prism removal. This project will be completed by the end of 2016. PSAR has provided \$425,950 in funding, matched by \$77,500 from Mason Conservation District and Skokomish Tribe.

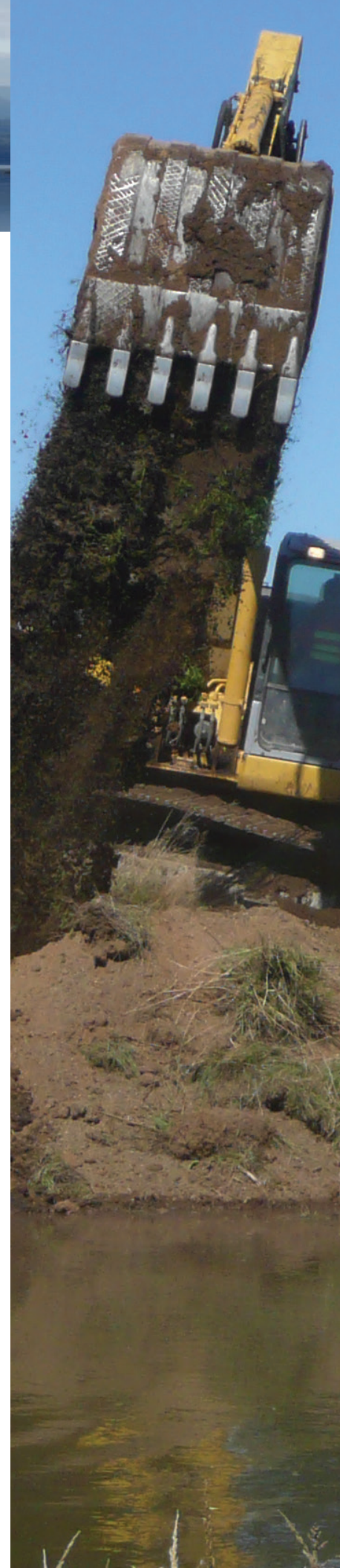
“Dips” Land Transfer

In 2011, Cascade Land Conservancy (now Forterra) purchased two land parcels totaling 160 acres of mostly forested floodplain land and a portion of the Skokomish River Road along the south bank of the Skokomish River. Now owned by the Skokomish Tribe, the site, known as the “Dips,” is usually the first to flood, closing the road and isolating the community. The land purchase will enable future creation of significant off-channel and floodplain habitat beneficial for all salmonid species as well as for floodwater retention and reducing flood impacts downstream.

Funding for the \$444,000 land acquisition came from the Salmon Recovery Funding Board (\$371,744.) and Washington Department of Fish and Wildlife Landowner Incentive Program (\$72,278.).

Skokomish Confluence Reach Restoration Design

Conducted in 2007-2013, in concert with the Skokomish River General Investigation, this project examined the complex confluence of the North and South forks of the Skokomish River. The project gathered information needed to help select and design restoration projects that have a high likelihood for beneficial outcomes. Sponsored by the Skokomish Tribe in partnership with Mason Conservation District and U.S. Army Corps of Engineers, the study was funded by a \$445,126 PSAR grant.



4. Skokomish Estuary

FEATURED PROJECT

Skokomish Estuary Restoration – Phases 1, 2, and 3

Phase I

The first stage of the project, conducted between 2005 and 2007, involved restoration of inter-tidal wetlands on the former Nalley Farm property located on the Skokomish Indian Reservation, within the Skokomish Estuary. Work focused on the main shore and involved removal of dikes surrounding the property on the west side of the West Channel, formerly known as Nalley’s Slough – Kwakwachalko (qWaqWachahlqWu) to the Skokomish people in the Twana* language. Borrow pits just landward of the dikes were refilled and leveled in order to allow even tidal flows and promote the natural formation of tidal sloughs. The elevated road network inside the restoration area was removed and replaced with an elevated boardwalk to allow even tidal inundation. The boardwalk allows access to accommodate continued maintenance of the Tacoma Public Utilities high-voltage transmission towers, and to maintain Tribal access to treaty-protected and culturally significant sites.

Please see page 48 for a map of original Twana names for the Skokomish Valley.

Specific accomplishments include:

- 115 acres opened to tidal processes
- 1 mile of dikes removed
- 2 culverts modified or removed to allow for fish passage
- 3 tide gates altered or removed to allow fish passage
- 110 yards of channel modified or created

Phase I resulted in 115 acres becoming available to salmonids through dike or berm modification or removal, and opening another 40 acres to fish passage through tidegate alteration or removal. Salt marsh vegetation has also recolonized. Funding for the \$1.3 million project came from the Estuary Salmon Restoration Program (\$990,296), Salmon Recovery Funding Board (\$130,439), and local match (\$220,293).

* The Twana language, also known as Skokomish from one of the tribes that spoke it, belongs to the Salishan family of Native American languages. The name “Skokomish” comes from the Twana, also spelled sqWuqWu’b3sH, and meaning “river people” or “people of the river.” - Wikipedia

Rectangular culverts allow for fish passage



Before

Photo credit: Mason Conservation District



During

Photo credit: Mason Conservation District



After

Photo credit: Mary K Johnson

Phase 2 (Nalley Island/ Sweeplachub)

Implemented in 2010-2011, Phase 2 aimed at restoring natural estuarine functions by removal of agricultural dikes and seawall. This project focused on the Skokomish River's lower island, formerly referred to as "Nalley Island," known as "Sweeplachub (swiPLi7cH3B)" in the Twana language. The purposes of the project were to (a) restore intertidal wetlands, shellfish habitat, and natural river geomorphology; (b) improve sediment transport; (c) restore critical habitat for endangered salmon; (d) reduce flood severity; and (e) improve dissolved oxygen conditions in Hood Canal. The project involved construction of a 224-foot temporary bridge used to access removal of interior dikes and soils, followed by its subsequent deconstruction; reinforcement of Tacoma Power transmission towers; reconstruction of a PUD power line; restoration of the interior of Sweeplachub/Nalley Island; removal of culverts and roads; filling of ditches and restoration of natural drainage channels; and removal of dikes and reconnecting historic channels.

Specific accomplishments include:

- 215 acres opened to tidal processes
- 2.5 miles of dike removed
- 12 culverts modified or removed to allow for fish passage
- 3 tide gates altered or removed to allow fish passage
- 823 yards of channel modified or created

Implemented by Quigg Brothers Construction, phase 2 resulted in 213 acres becoming available to salmonids through dike or berm modification or removal, and opening another 93 acres to fish passage by altering or removing culverts or tide-gates. Funding for the \$2.6 million project was provided by Estuary Salmon Restoration Program (\$90,000), Salmon Recovery Funding Board (\$193,647), and Recreation and Conservation Office (\$2,263,397).

Phases 3A & 3B (Skokomish Flats)

Skokomish Estuary Restoration Phase 3, a continuation of Phases 1 and 2, has restored wetland and channel connectivity within the Phase 1 site and additional salt marsh in the western edge of the Skokomish Estuary. Completed in 2012 and 2013, phases 3A and 3B treatments included recreating and reconnecting tidal channels in historic locations, removal or replacement of partial barrier culverts, installation of three bridges, and restoration of man-altered channels. (As described in the Future Projects section, Phase 3C will address hydrologic continuity from a forested wetland complex by opening barriers to stream flow and anadromous salmonids.)

Specific accomplishments of Phases 3A and 3B include the following:

- 33.5 acres opened to tidal processes
- 1.3 acres of estuary treated through fill material removal
- 11 culverts modified or removed to allow for fish passage
- 6 culverts and one bridge added to reconnect fish passage
- 1,012 yards of channel modified/created
- 8.02 riparian acres and 0.5 miles of streambank planted

The project has resulted in opening 56 acres to fish passage through culvert alteration or removal, benefiting ESA-listed Puget Sound Chinook, Hood Canal summer chum, coastal bull trout and coastal steelhead, as well as coho and pink salmon and cutthroat. It has also improved habitat for migratory waterfowl and shellfish and increased native vegetation in the Estuary. Contractors for the project were Quigg Brothers Construction (Phase 3A) and Jansen Construction (Phase 3B).

Funding for the \$1.8 million project has come from a number of sources:

\$539,951	Estuary and Salmon Restoration Program
\$326,139	Salmon Recovery Funding Board
\$405,688	NOAA – Estuary Restoration Act Grant
\$100,000	NOAA – Community Restoration Center Grants
\$301,090	PSAR
\$85,253	US Environmental Protection Agency

Other Estuary Projects

Skokomish Estuary Tidelands Shellfish Enhancement

Since 2013, the Skokomish Tribe has planted approximately 18 million seed oysters and about 150,000 seed clams in the Skokomish Tidelands, which have been an important foraging area for tribal members for generations. The Tribe also has removed over 100 pounds of invasive Japanese oyster drills and large amounts of debris, and has monitored oyster and clam populations and water quality conditions.

Supporters of the Tribe's tidelands restoration efforts include Hood Canal Oyster Company, Taylor Shellfish, University of Washington, PSP's "A&R Fund," Washington Department of Health, and U.S. Fish and Wildlife Service.

Top right: Boardwalk allows access to the Skokomish Tribe and Tacoma Public Utilities

Middle right: An example of modified tidal channel, excavated to match the natural flow as captured in a 1938 aerial photo. Salmon reportedly returned to the channel immediately, as though no time had passed. Photos credit: Mason Conservation District.

Bottom: Skokomish Estuary. Photo credit: WA State Department of Ecology





Boardwalk in-progress with the tide in.
Photo credit: Mason Conservation District

5. Coordination, Education, and Outreach

Skokomish Watershed Action Team

Since its formation in 2005, the SWAT has made it a priority to keep people informed about restoration activities in the watershed through various kinds of coordination, education, and outreach.

The SWAT has coordinated and communicated internally through monthly conference calls of its steering committee, semi-annual general meetings of the full collaborative, regular email updates, and field trips. Semi-annual meetings have been held either at the historic Skokomish Grange Hall or at the Mason County Public Works conference room, often with lunch provided by Green Diamond Resource Company, Olympic Mountain Ice Cream provided by local resident Ron Gold, and additional foods and beverages provided by other SWAT members.

Two or three times each year, SWAT has organized field trips to view and discuss future, on-going, or completed projects. Field trips have generally been open to the public, with transportation often provided by Green



Dean Yoshina, Robin Stoddard, Congressman Norm Dicks, Joseph Pavel, Jayni Kamin, Mamie Brouwer, Kristen Kerns, Stephen Bernath, Dale Hom, Jason Ragan, Rich Geiger, Ron Gold, and Sara Crumb.

Diamond, the Forest Service, and Tacoma Power. Some field trips have been organized specifically for key government officials, such as local Congressmen Norm Dicks and Derek Kilmer and Forest Service Regional Forester Mary Wagner.

SWAT has enjoyed excellent media coverage of major restoration projects in the Kitsap Sun, Olympian, and Mason County Journal newspapers. The Hood Canal Coordinating Council has maintained a SWAT webpage that contains summaries of the semi-annual meetings, lists the SWAT's collaborative goals and participants, and provides links to news articles (www.tinyurl.com/group-swat).



In 2014, a grant from the Laird Norton Family Foundation to the Skokomish Tribe enabled the SWAT to produce a 14-minute video, **Coming Back: Restoring the Skokomish Watershed**. Produced by 40 North Productions and coordinated by Tiffany Royal with the Northwest Indian Fisheries Commission, the video has been shown at several regional film festivals and received nearly 3,000 views during its first year on YouTube (<https://www.youtube.com/watch?v=KeOce9ENHm0>). The Tulalip Tribe awarded the film "Best Documentary" in their 2014 Environmental Film Festival.

Some of the SWAT's outreach has been international. In 2009, the Skokomish watershed restoration was featured in the United States' exhibit at the World Forestry Congress in Buenos Aires, Argentina. In 2010 through 2014, the Forest Service's Robin Stoddard presented SWAT's collaborative restoration efforts at U.S. Forest Service International Programs sponsored watershed management seminars held in Arizona. These seminars are designed for mid-career professionals who desire to take part in an interactive and intensive training and exchange program on integrated watershed management.

Students at local and regional schools have learned about the Skokomish watershed and restoration issues. The Skokomish Tribe has organized a "Skokomish Estuary Earth Day" event each year since 2010. This popular event engages students from Hood Canal School and others in a variety of hands-on educational activities, with assistance from Taylor Shellfish, Mason Conservation District, and

other groups. Bellevue, WA science teacher, Allison Snow, developed a curriculum called the "Skokomish Challenge," in which students analyzed options to provide housing for residents in the watershed's floodplain. The curriculum is now included in science programs throughout the Bellevue district where Ms. Snow provides professional development for other science educators.

2014 and 2015 Skokomish Watershed Monitoring Conferences

In September 2014 Tacoma Power led in organizing the first annual Skokomish Watershed Monitoring Conference. The goals of the conference were to facilitate long-term cooperation and coordination of monitoring efforts, introduce all monitoring work, review on-going work in the watershed, and begin sharing ideas and exchanging information. The conference targeted individuals interested in and professionals and students actively monitoring, assessing, and studying the natural resources, ecology, biology, and water quantity and quality of the Skokomish River watershed. The agenda included presentations and break-out sessions to discuss various monitoring topics in fisheries, restoration, forest roads, wildlife, estuaries, shellfish, stream flow, ground water and water quality. The conference was attended by a diverse representation of 40 individuals.

The second annual monitoring conference focused on three topics: Lake Cushman, Skokomish Valley, and endangered salmon recovery. In addition to the day-time conference for agency professionals, an evening public meeting was held at which summaries of the monitoring information were presented and the audience was able to ask questions. **Conference proceedings and presentations are available on Tacoma Power's website:** <http://www.mytpu.org/tacomapower/fish-wildlife-environment/cushman-hydro-project/skokomish-river-watershed.htm>.

For more information about Accomplishments, see Section II of the Action Plan Supplement.

Aerial photo of the Skokomish River Valley
Photo credit: Mason Conservation District

Action Plan 2016-2021

As noted in the Introduction, four key planning frameworks will guide future restoration work within the Skokomish watershed:

- Olympic National Forest Watershed Action Plans for Upper and Lower South Fork Skokomish Watersheds (2012)
- Cushman Settlement Agreement (2009) and Cushman Hydroelectric Project License (2010)
- Skokomish General Investigation Study (2015)
- Draft Recovery Plan for the Skokomish Chinook Salmon (2010)

The following action plan consists of restoration projects that build on past accomplishments and implement the above planning guidance.

Chinook Salmon Restoration:

The Skokomish Chinook Draft Recovery Plan analyzed habitat limiting factors and made conclusions regarding priority and sequencing of geographic areas and restoration treatments for both early-timed (spring) and late-timed (fall) Chinook populations.

For **early-timed Chinook**, the highest priority areas and habitat factors for restoration are –

- Passage over obstructions at the Cushman dams, South Fork gorge cascades, and dry channel in the lower South Fork
- Channel stability in the upper South Fork
- Water temperature in several areas
- Key habitat amounts (spawning gravel, pools, etc.)

For **late-timed Chinook**, all of the highest priority factors relate to the aggradation and flooding issues occurring in the lower river valleys, including –

- Passage through the dewatered channel in the lower South Fork
- Channel stability
- Sediment load
- Flow characteristics
- Key habitat amounts

The draft recovery plan outlines a framework for addressing habitat-related issues, and identifies a total of 26 strategies grouped according to the habitat threats they address. Collectively, these strategies have the potential to restore watershed processes and habitat functions to normative levels that would achieve the recovery goals.



Joseph Pavel speaking at the Purdy Creek Ribbon Cutting. Photo credit: Washington State Department of Ecology

1. South Fork Skokomish/Upper Watershed

Olympic National Forest Projects

Since 2012, the Forest Service and partners have already completed or made progress on many of the projects identified within the upper and lower South Fork Skokomish River Watershed Restoration Action Plans. Completed projects are covered within the Accomplishment section of this document. The remaining projects and road maintenance needs identified by the Forest Service are summarized in the table and action plan section below.

Restoration Work Remaining on National Forest Lands

Project Type	Work Remaining		Cost	
	Lower	Upper	Lower	Upper
Storm Damage Risk Reduction	36.5 miles	5.8 miles	\$100,000	\$485,000
Road Maintenance (5-year total)			\$460,000	\$515,000
Trail 872.1 Stabilization		4 miles		\$223,000
Trail 873.1 Reconstruction & Bridge Replacement		2 miles		\$450,000
Commercial Thinning	4,800 acres	400-800 acres	FS funded	FS funded
Pre-commercial Thinning	2,000 acres	2,000 acres	FS funded	FS funded
Skokomish Prairie Restoration	33 acres		FS funded	
Combined Total			\$560,000	\$1,673,000



Road Decommissioning, Closure, Storm Damage Risk Reduction, and Maintenance

Due to the tremendous amount of road work accomplished in past years, all of the high priority road decommissioning, road closure, and conversion-to-trail work on Olympic National Forest lands in the South Fork Skokomish watershed has been completed. Storm Damage Risk Reduction work to stabilize remaining roads and make them more resilient to storm events is continuing. Proposed road work includes various Storm Damage Risk Reduction treatments on 42.3 miles, along with continued road maintenance of the entire open road system.

The previous road decommissioning work has greatly reduced the risk of catastrophic failure at stream crossings and removed unstable fill slope material that was prone to failure and delivery to adjacent streams. Implementing the remaining Storm Damage Risk Reduction treatments will effectively reduce the potential for sediment delivery to fish habitat due to road failures resulting from major storm events. Road drainage improvement and regular maintenance are focused on roads that are to remain open on the ONF transportation system. Treatments will emphasize work that prevents road failure due to plugged or undersized culverts, plugged ditches, and inadequate road surface drainage.

Storm-proofing coupled with diligent maintenance of these roads will help ensure continued access for long-term stewardship of the road network. Adequate road maintenance is essential to protect the substantial investments already made to minimize water quality impacts from the remaining road system.

Trail 872.1 Stabilization

Trail 872.1 was a former road that was decommissioned and converted to a trail. Several stream crossings make access difficult or impossible for some users such as equestrians. In some cases access through the stream crossing sites is unsafe. Stabilization of Trail 872.1 would involve construction of stable stream crossings at several locations to meet management standards. Project work would include installation of drainage structures, trail realignment in areas of chronic erosion, and revegetation with native plant species.

Trail 873.1 Tread Reconstruction and Bridge Replacement

The Upper South Fork Skokomish trail is managed for hikers and stock users. This trail provides access to various long distance backcountry experiences as it continues into Olympic National Park at 4.9 miles. The trail is also linked to the Lower South Fork Skokomish trail 873, creating opportunities for a long distance

equestrian/hiker trail on National Forest lands which can be accessed much of the year. This project calls for reconstruction and maintenance of the tread prism in areas that no longer meet stock standards as well as reconstruction of three stock fords to make the trail once again suitable for equestrian use. Also needed is the replacement of a handrail on a major bridge structure located at 1.1 miles. Additionally, two single log stringers (located at mile markers 1.2 and 2.2) are in need of replacement and likely relocation. Planning, survey, design and construction are needed in order to complete this project to make it safe for hikers and stock users.

Upper South Fork Skokomish Vegetation Management

The ONF completed the planning phase of this project in 2013. The project will commercially thin approximately 880 acres in the Upper South Fork Skokomish River watershed, using variable-density thinning to accelerate the development of late-successional forest characteristics within previously managed stands. Forest stand plantations contain trees that are currently between the ages of 37 and 66 years old that are in a structurally simplified stage, with only one canopy layer and little understory vegetation, and low plant species diversity. Variable density thinning is designed to manage stand density and restore forest diversity, incorporating skips, gaps, and areas of heavy thinning.

Lower Skokomish Vegetation Management Project

The planning phase for this project will likely be completed by the ONF in 2016. This project proposes to commercially thin approximately 4,700 acres within second-growth forest stands. Riparian areas that once supported large conifers now have a predominance of small-diameter conifers and hardwoods, diminishing

recruitment of large wood to streams, an important fish habitat component. The majority of the stands within the proposed project units are single-storied, second-growth stands that are experiencing a slowing of growth due to overcrowding, and have little understory or groundcover. The project would accelerate growth of conifers in riparian areas to provide future large wood for recruitment into streams to maintain and enhance instream habitat conditions and connectivity.

Pre- Commercial Thinning

This project proposes to pre-commercially thin an estimated 4,000 acres of forest stand plantations that contain trees measuring less than 8 inches in diameter and are less than 35 years of age. Pre-commercial thinning of overstocked plantations is designed to enhance wildlife habitat and species diversity by moving stands more rapidly toward attainment of late-successional conditions, creating structural diversity and reconnecting wildlife corridors.

Skokomish Prairie Restoration II

This project will restore prairie habitat to maintain and enhance the cultural and ecological values that existed historically. It involves conducting prescribed burns in a 33-acre unit that is part of a much larger area that had historically been maintained as native beargrass savanna by Native American burning. Project activities are expected to enhance deer and elk, and increase the quality and availability of native plants that have cultural significance, including beargrass and huckleberry. Phase I, covering about half of the unit, was completed in 2015. Phase II of the project will be implemented when there are suitable weather conditions for prescribed fire.

Other Upper Watershed Projects

South Fork Skokomish Large Wood Enhancement Phase II

This project is the second phase of a large-scale restoration effort within the two-mile-long Holman Flats area of the South Fork Skokomish River. Phase I involved construction of a series of 30 log jam structures along the one mile of the mainstem South Fork Skokomish River that extends from River Mile 12 to 13 on ONF lands (see Accomplishments section). Phase II spans one mile of the mainstem South Fork Skokomish River that extends from River Mile 11 to 12, located on Tacoma Power lands. Project goals include restoring channel and riparian processes such as vegetation cover, flood plain resiliency, resistance to flow, in-channel and bank stability, and restoration of fish habitat and fisheries production within the project area. Work will involve construction of a series of 16 log jam structures. Over time the strategically placed log jams and plantings will reduce stream bank and terrace erosion, increase flood plain roughness and sediment storage, promote and protect healthy riparian vegetation, restore pool depth and frequency, and increase habitat complexity for aquatic organisms and threatened fish species.

Proposed Accomplishments:

- 0.85 miles of stream treated for channel structure placement
- 2.6 acres of streambed treated for channel structure placement
- 16 structures placed in channel
- 16 pools created through channel structure placement

Key Results/Benefits to Resources:

- Improved spawning, rearing, and migration habitat conditions for ESA-listed Chinook, steelhead, and bull trout
- Long-term benefit will be reduced sediment transport and bank and channel stabilization through the reach, which will help alleviate flooding in the lower Skokomish River valley related to bed aggradation and excess sediments

Timeline: Active since March 20, 2015. Planned completion date is December 4, 2017.



Funding Sources (secured):

\$ 586,788	Salmon Recovery Funding Board
\$ 900,000	Floodplains by Design
\$1,486,788	Total

Project Sponsors: Skokomish Tribe and Mason Conservation District
Key Partner: Tacoma Power

Upper South Fork Skokomish Channel and Floodplain Assessment

This project will take place in the upper South Fork Skokomish where past forest practices have altered sediment loads, sediment transport, channel stability, and associated habitat characteristics. The combined effects of these alterations destabilized the main channels, increased amounts of exposed sediments within the active channels, and increased sediment transport rates to the lower river valleys, all of which continue to the present.

This project will assess channel and floodplain conditions along approximately 12 miles of river channel within the South Fork mainstem from the mouth of Brown Creek to approximately 1 mile upstream of the mouth of Church Creek, along with the lower mile of both Brown and LeBar creeks. The assessment will guide identification of prioritized treatments that address degraded habitat conditions. Preliminary designs will be produced for the top 1-3 priority treatments. This work will direct appropriate large wood placement in response to a loss in structural and habitat diversity by facilitating sediment storage, sediment processing, normative channel patterns, and stable vegetated islands, where appropriate.

Funding Sources (secured):

\$305,213	Salmon Recovery Funding Board/PSAR
\$53,900	Sponsor Match
\$358,113	Total

Project Sponsors: Mason Conservation District and Skokomish Tribe



Green Diamond Road Management

In 2016 and beyond, Green Diamond will continue to manage its roads in the middle watershed to address the remaining 10-15 percent of identified hazards and execute on-going maintenance and wet weather haul programs, consistent with its Road Maintenance and Abandonment Plan (RMAP) and Habitat Conservation Plan (HCP). Some of the restoration projects described below are scheduled during the next five years, while others will likely occur later, subject to available funding.

In the South Fork/Vance Creek watershed:

Restoration work will involve addressing four culvert fish passage barriers and two non-fish passage culverts. Preliminary engineering indicates that four fish passage barriers exist in the immediate area of Camp Govey Road. Three of the crossings are on Camp Govey Road and the Green Diamond 1000 Road (Forest Service Road 23) and involve Fir Creek and one of its tributaries, Wood Creek. The remaining crossing is a 24-inch diameter concrete culvert at mile 0.5 of the Green Diamond 8000 Road. Removing these fish passage barriers is expected to restore 4.6 miles of fish habitat. Since the four fish passage culverts are still structurally sound, work on those is not scheduled

for implementation until 2035, but could occur sooner if funding is available. Green Diamond also plans to replace two other, non-fish passage culverts in the next few years.

In the North Fork watershed:

Green Diamond HCP requirements will involve addressing one fish passage barrier and a suite of nine other road hazards. Preliminary engineering indicates that one fish passage barrier exists on the 8000 Road at the Little Horseshoe. This culvert stream crossing has a very large road fill measuring at least 30 feet deep, and will require additional engineering for crossing relocation or large woody debris placement for channel stability. This structure would be quite large, to the extent that a bridge may be appropriate. Implementation is currently scheduled for 2022. Green Diamond will also address a suite of nine hazards through implementation of a 1.75-mile road decommissioning project that targets mid-slope road grades on slide-prone terrain. This project is ready for implementation in 2016 pending completion of harvest activities on the west side of Lake Cushman.

In addition, during the coming decade Green Diamond plans to address two other fish passage barriers that are not specified in the company's HCP.

Preliminary engineering indicates that one fish passage barrier exists on the 8000 Road at the Big Horseshoe on Frigid Creek (see detailed project proposal below). The second location is an outflow for a 15-acre wetland on the 8700 Road, with a sizeable fill depth, which will likely need a fairly large replacement structure.

Green Diamond also will continue its important road maintenance and wet weather haul mitigation programs. On-going road maintenance will occur based on a 5-6 year cycle to ensure functionality of infrastructure and road surface drainage. Wet weather haul mitigation will involve implementation of best practices on timber haul routes that prevent or reduce sediment delivery to aquatic systems.

Frigid Creek Fish Passage Restoration

Frigid Creek is a tributary to McTaggart Creek, in the North Fork Skokomish watershed. A culvert crossing on Frigid Creek, referred to as the Big Horseshoe, was established prior to 1946. The current culvert is 60-inch diameter corrugated metal pipe with a 30-foot deep road fill, and has a outfall drop at the culvert outlet that measures greater than 6 feet. The outfall drop is a total barrier to anadromous fish passage, which prevents upstream fish migration of coho salmon and cutthroat trout. Road management is regulated under Green Diamond Resource Company's Habitat Conservation Plan, which does not require fish passage in all situations. The Forest Service has an administrative use easement, and significant public use of the road has occurred for decades.

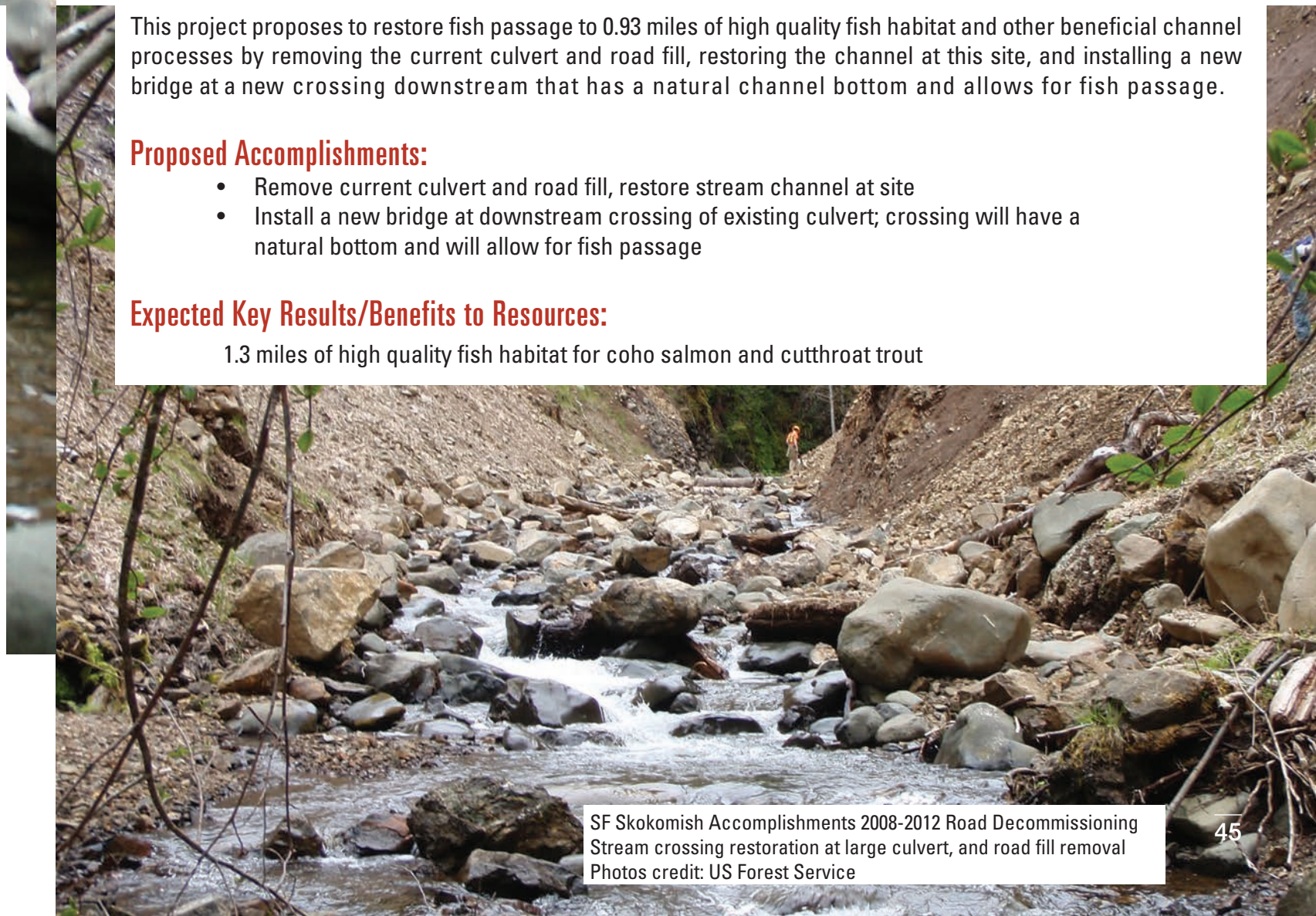
This project proposes to restore fish passage to 0.93 miles of high quality fish habitat and other beneficial channel processes by removing the current culvert and road fill, restoring the channel at this site, and installing a new bridge at a new crossing downstream that has a natural channel bottom and allows for fish passage.

Proposed Accomplishments:

- Remove current culvert and road fill, restore stream channel at site
- Install a new bridge at downstream crossing of existing culvert; crossing will have a natural bottom and will allow for fish passage

Expected Key Results/Benefits to Resources:

1.3 miles of high quality fish habitat for coho salmon and cutthroat trout



SF Skokomish Accomplishments 2008-2012 Road Decommissioning Stream crossing restoration at large culvert, and road fill removal Photos credit: US Forest Service



2. North Fork/Lake Cushman Tacoma Power – 2010 Cushman Hydropower Project License

Since issuance of its amended license by FERC for the Cushman Hydroelectric Project on July 15, 2010, Tacoma Power has already initiated or completed several of the actions required under the terms of the amended license. The 50-year license is retroactive to the 1998 license issued by FERC, and grants Tacoma Power operations of the Cushman Hydroelectric Project through 2048. Actions completed by Tacoma Power under the terms of the amended license are summarized in the Accomplishments section of this document. In many cases, work identified in this action plan is a continuum of projects initiated in prior years.

2010 Cushman Hydropower Project License Projects

Tacoma Power will continue to implement actions required under the terms of the amended license. Some key projects that will carry forward from prior years are listed below. Refer to the information provided in the Accomplishment section of this document for project details.

- Minimum Flows – License Article 407
 - o North Fork Streamflow Enhancement
- Fish Habitat Enhancement and Restoration Plan – License Article 412
 - o Habitat Restoration Projects
- Fish and Habitat Monitoring Plan – License Article 413
 - o Fish Habitat and Population Monitoring
- Downstream Fish Passage – License Article 414
 - o Floating Juvenile Fish Collection Facility at Cushman Dam No. 2
- Upstream Fish Passage – License Article 415

- o Little Falls Fish Passage Modification Remediation (potential project for 2016)
 - o Adult Fish Collection Facility at Cushman No. 2 Dam
- Fish Passage Monitoring Plan – License Article 416
- Fish Supplementation Program– License Article 417
 - o Saltwater Park Sockeye Hatchery
 - o North Fork Salmon and Steelhead Hatchery
 - o Lake Kokanee Rainbow Trout Release
- Comprehensive Wildlife Habitat Enhancement Plan – License Article 421
 - o Land management for Wildlife
- Recreation Plan – License Article 425

Proposed Accomplishments:

Implement work under the license agreement that addresses river restoration, instream flows, fish habitat, fish passage improvements, restoration of fish populations, wildlife habitat, and recreation.

Expected Key Results/Benefits to Resources:

- Improved habitat conditions for multiple aquatic and terrestrial species, including ESA-listed species
- Reintroduction of sockeye and spring Chinook in the North Fork Skokomish River
- Improved fishery for ceremonial and subsistence by the Skokomish Tribe
- Improved recreation opportunities in the North Fork Skokomish

Timeline: Many projects will be implemented during 2016 – 2021, and will continue through 2048, the end of license period.

Above photo credit: Wikimedia user: The Interior
Next page, an aerial photo of the Skokomish River Valley.
Photo credit: Mason Conservation District

3. Skokomish Valley

With completion of the Skokomish General Investigation Study (see sidebar below), numerous restoration projects in the Skokomish valley will soon be ready to move forward from planning to design and implementation. The Army Corps of Engineers' selected plan identifies five major projects that would be eligible for Corps funding, all of which are described briefly below as "Corps Projects." In addition, the GI study identified approximately 40 other potential projects that would also help to solve watershed problems in the Valley but that do not meet the Corps' eligibility standards. Some of these other projects are described below as "Local Projects," since they will need to be undertaken by local governments, agencies, and other stakeholders.

The five "Corps Projects" are presented first, followed by five "Local Projects" that are highest in priority and feasibility for implementing by 2021. Locations of the projects are given by River Miles, starting at the mouth of the river and moving upstream (west) through the valley.

Skokomish General Investigation:

The Skokomish River General Investigation Study (GI) was a multi-year effort conducted by the U.S. Army Corps of Engineers in partnership with the Skokomish Tribe and Mason County. Completed in 2015, the GI team developed conceptual designs and cost estimates for an array of alternatives identified in early planning activities. Additional analysis and evaluation led the team to identify five projects that will be carried forward for design and ultimately be recommended for construction.

Projects included in the final plan are:

- Confluence Levee Removal
- Upstream South Fork Large Woody Debris Installation
- Side Channel Reconnection
- Grange Levee Setback
- River Mile 9 Levee Setback

The five GI projects will restore approximately 227 acres of spawning, rearing, and refuge habitats at an estimated project cost of \$21.7 million.

Specific beneficial effects of these projects include:

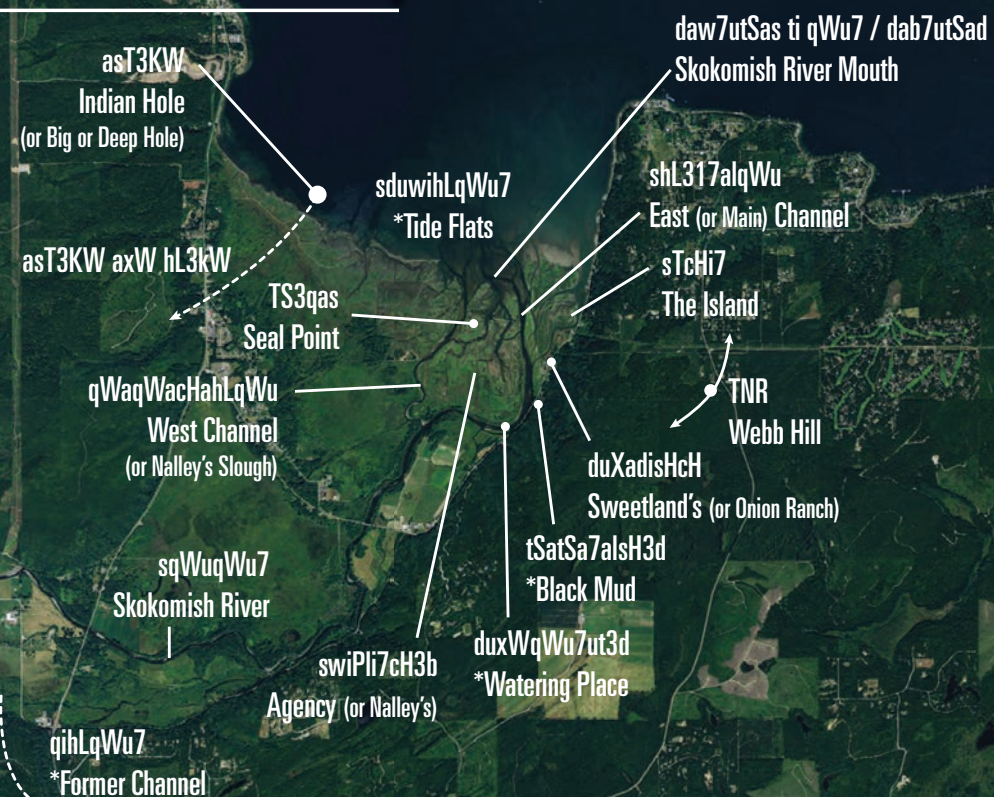
- Providing year-round access to spawning habitat in the South Fork
- Increasing the number and size of in-channel pools
- Placing enough large woody debris to mimic quantities in nearby more natural rivers
- Reconnecting aquatic habitats in the adjacent floodplain
- Greatly increasing the acreage of functional riparian zones along the river

The cumulative effect will be to provide substantial benefits to fish and wildlife habitat, especially for salmon species.

Restoration Projects in Skokomish Valley

Corps Projects	Local Projects	Cost
Side Channel Reconnection		\$2,108,000
Grange Levee Setback		\$4,005,000
River Mile 9 Levee Setback		\$3,972,000
Confluence Levee Removal		\$4,727,000
Upstream Large Wood Debris		\$6,900,000
	Subtotal	\$21,712,000
	Lower Skabob Creek Design	\$47,060 (funding secured)
	Reconnect Weaver/Purdy Creeks	\$352,359 (funding secured)
	Lower Mainstream LWD	\$312,302 (funding secured)
	Confluence Levee Design	\$549,712 (funding secured)
	Skokomish Valley Road Design	\$427,165 (funding secured)
	Riparian Enhancement Phase II	\$631,696 (funding secured)
	Subtotal	\$2,320,294
	Grand Total	\$24,032,294

Original Twana Names for the Skokomish River Valley



General Investigation Corps Projects

Side Channel Reconnection

Rearing and migration opportunities are significantly limited in the remnant river channel that lies between River Mile 4 and 5.6 of the mainstem Skokomish River. This side channel currently has poor connection to the mainstem. The project would reconnect the abandoned channel to the mainstem Skokomish to provide 45 acres of high flow refuge and rearing habitat for fish. Restorative treatments would be made to the channel inlet and outlet, and the remainder of the channel would be left undisturbed. During most of the year, the channel would provide pond habitat for fish rearing. This project would include planting of native vegetation.

Estimated Cost and Funding Needs: \$2,108,000 (65% Corps, 35% Local Sponsors)

Grange Levee Setback

The connection to riparian habitat is restricted by the Grange Levee near the mainstem river bank. This Grange Levee Setback project, located at River Mile 7.5 to River Mile 8.0, is intended to provide additional floodplain habitat and to reduce the stranding potential for fish. The levee would be moved landward (south) up to 1,200 feet. This would place about 40 acres of riparian habitat, forest, and floodplain ponds on the riverward side of the levee. The existing levee would be breached at two strategically selected sections, for a total breach length of around 800 feet. These breaches would allow flood waters to flow freely within the levee setback area, providing salmon access to the riparian habitat. The new setback levee would be around 2,900 feet long and would provide a similar level of flood risk reduction as the existing levee. Therefore, the setback levees would allow continued inundation to occur, and provide controlled access to additional floodplain, shallow-water, and riparian habitat without exacerbating flooding to the residents in the Valley.

Estimated Cost and Funding Needs: \$4,005,000 (65% Corps, 35% Local Sponsors)

River Mile 9 Levee Setback

The connection to riparian habitat is restricted by a levee near the mainstem Skokomish River bank. The River Mile 9 Levee Setback, located at RM 8.3-9.2, is intended to provide additional floodplain habitat and reduce the stranding potential for fish. The levee would be moved landward (south) varying distances, generally around 200-300 feet. This would place more riparian forest and floodplain ponds on the riverward side of the levee. Four strategically located sections totaling approximately 950 feet of the levee would be removed. These breaches would allow flood waters to flow freely within the levee setback area, reconnecting the riparian zone to the aquatic habitat for the benefit of salmon and many other species. The entire levee would be designed for shallow overtopping. This project would include planting of native vegetation.

Construction of a setback levee is required to ensure there will be no induced flooding upstream or downstream of the site. The proposed setback levees are low and would provide the same level of protection as currently exists for the structures located in the area. The setback levees would allow continued inundation to occur, and provide controlled access to additional floodplain, shallow-water, and riparian habitat without exacerbating flooding to the residents in the Valley.

Estimated Cost and Funding Needs: \$3,972,000 (65% Corps, 35% Local Sponsors)



South Fork Large Woody Debris Project.
Photo credit: US Forest Service

Confluence Levee Removal

The Confluence Levee Removal removes approximately 1,625 lineal feet of levee and includes enlarging an existing breach to 300 lineal feet in the vicinity of River Mile 9. The existing levee starts on left bank of the Skokomish North Fork, runs south to the North-South Fork confluence, and then runs west along the left bank of the old mainstem/current South Fork.

This levee was breached during an avulsion of the North Fork in 2003. The North Fork turned west through the breach and formed a new channel, which moved the confluence of the North and South Forks downstream by 1.25 miles. Since this event, the old mainstem and old confluence area have gone dry during low flow seasons, as excess sediment aggradation in the river bed has allowed low flows to go subsurface.

Removing the levee and creating a new connection channel from the South Fork into the North Fork will bypass the old mainstem and maintain fish passage for spawning salmon upstream into the South Fork. Engineered log jams will be placed in the vicinity of the connection channel to guide the flow and maintain the depth of the new channel connection and recruit additional wood. The old mainstem/current South Fork would reactivate at higher flows, allowing flood flows to spread across an undeveloped floodplain. Combined with the setback levee at River Mile 9, this project will reconnect the channel to forested floodplain, providing high flow refuge for fish during flood events and will generally lower flood elevation.

This new channel and surrounding riparian area will evolve over time, restoring natural geomorphic function to an area currently constrained by levees and allowing natural formation of improved fish and wildlife habitat.

Estimated Cost and Funding Needs: \$4,727,000 (65% Corps, 35% Local Sponsors)

Upstream Large Woody Debris Installation

Spawning, rearing, and refuge habitats (including pools) are limited in River Mile 9 to 11 due to a lack of large woody debris in the upstream reaches of the Skokomish River valley. This project proposes to place and install large woody debris (6-12 log jams or 30 to 40 single logs) within this two-mile reach of the river to increase meandering and gravel bar formation and provide cover for salmon.

Estimated Cost and Funding Needs: \$6,900,000 (65% Corps, 35% Local Sponsors)

General Investigation Local Projects

Lower Skabob Creek Restoration, Feasibility & Design

The proposed project is located on lower Skabob Creek, downstream of State Route 106 and Tribal Center Road. Lower Skabob Creek was historically a low-energy, meandering wetland channel complex, but human alterations to the creek degraded the available habitat quality within the stream channel. The historic alignment was straightened, the outlet was relocated downstream of its historic location, and the channel geometry was simplified when the drainage was dredged.

Mason Conservation District and the Skokomish Tribe are working together to develop a restoration or enhancement strategy to improve the habitat conditions within lower Skabob Creek for ESA-listed Chinook salmon and chum salmon. The project will affect one-half mile of stream and encompass 25 acres downstream of the Skokomish Reservation. The project objectives are to investigate the feasibility of fully restoring the channel alignment of Skabob Creek to its historic location and outlet, and to develop a 30% engineered design of the preferred alternative selected by the Skokomish Tribe for improving habitat complexity in lower Skabob Creek. This project was completed in early 2016. The next step will be to develop a proposal for project implementation.

Cost and Funding Source (secured): \$47,060 PSAR

Reconnecting Weaver Creek to Purdy Creek

This project is located on Weaver Creek near its confluence with the Skokomish River. Weaver Creek is a low-gradient tributary that flows from springs in the mid-Skokomish Valley and joins the Skokomish River approximately 1.3 miles downstream of the U.S. 101 bridge. Weaver Creek is generally characterized by cold, clear spring waters that flow into the Skokomish River near River Mile 4.0, providing critical habitat to federally listed species including Puget Sound Chinook salmon, Puget Sound steelhead, and bull trout.

Man-made alterations to Weaver Creek and streambed aggradation in the Skokomish River have combined to create a sediment plug in the lower reaches of Weaver Creek. In the 1940's, an oxbow straightening project

involved cutting a channel that extended Weaver Creek 2,000 feet. The new channel alignment was a lower gradient compared to the historic alignment. The sediment plug resulting from changes in the length and alignment of Weaver Creek, combined with the extreme streambed aggradation in the Skokomish River, has resulted in stagnant flows in lower Weaver Creek, creating water quality conditions that are harmful and sometimes lethal to juvenile and adult salmon.

The goal for this project is to reduce the negative impacts of low dissolved oxygen levels on juvenile and adult Puget Sound Chinook in a 2,900-foot-long treatment reach in lower Weaver Creek. The objective of the project is to restore a free-flowing outlet for Weaver Creek that will alleviate the degraded water quality conditions that currently characterize this reach. The free-flowing outlet will be created by installing a 750-foot channel to connect the stagnant section of Weaver Creek to the free-flowing waters of Purdy Creek located immediately south of the project site. The in-stream and riparian habitat of the newly created reconnection channel will be enhanced by installing 25 habitat logs along the meander beds of the channel and creating a 100-foot native riparian buffer on both banks, totaling 4 acres. The Skokomish Tribe will continue to monitor dissolved oxygen levels in the project area to ensure that the post-restoration water quality conditions reflect the restoration goals and objective.

Cost and Funding Sources (secured):

\$199,574	PSAR/Salmon Recovery Funding Board
\$152,785	Sponsor Match
\$352,359	Total



Chinook Salmon (Male) in the fresh-water phase.
Image credit US government - Office Pamphlet 1996-792-501:
Lake Washington Ship Canal Fish Ladder

South Fork Skokomish Large Wood Enhancement



Lower Mainstem Skokomish Large Woody Debris, Highway 101

This project, encompassing 26.8 acres, will take place in the lower Skokomish River mainstem between River Mile 4.1 and 5.7. This reach has lost its structural and habitat diversity, resulting in changes in channel and substrate stability and loss of pool habitat. The goal for this project is to develop final designs that direct appropriate large wood placement in response to a loss in structural and habitat diversity by facilitating sediment storage, sediment processing, normal channel patterns, and stable vegetated islands, where appropriate. The project will analyze the entire 1.6-mile reach of river to determine the most appropriate size, frequency, and location for large woody debris installations to achieve this goal. Design alternatives will be discussed amongst project stakeholders, and the most appropriate alternative will be selected based on landowner support and benefit to fish. Final designs will be developed for the selected alternative.

Cost and Funding Sources (secured):

\$265,302 PSAR/Salmon Recovery Funding Board
\$ 47,000 Sponsor Match
\$312,302 Total

Skokomish Confluence Levee Design and Acquisition

This project is in support of the Confluence Levee Removal project proposed by the US Army Corps of Engineers (USACE). It covers local sponsor responsibilities to provide non-federal match funding for design and to provide the underlying real estate for the USACE project. (See description of the USACE project on page 50). The entire project is proposed at the original confluence downstream to the new confluence between the North and South forks of the Skokomish River. The North Fork has a dike on the left bank that extends all the way to its old confluence with the mainstem Skokomish. The dike wraps around from the North Fork Skokomish and continues approximately 3,500 feet along the left bank of the mainstem Skokomish. At the old confluence, the dike is made up of old car bodies installed in past years as bank armor. The remaining dike downstream is deteriorating, but does effectively block the left bank of the South Fork from the adjacent floodplain.

Photos credit US Forest Service



In 2003, floodwaters penetrated the left bank dike on the North Fork, about 550 feet upstream of the original North & South Fork confluence. This diverted the North Fork through 1,700 feet of open farm land and then through 3,700 feet of forested wetland. In the summer 2003, the South Fork went dry for a distance of 2,000 feet upstream of the old confluence. This blocked the South Fork fish passage during the late summer spawning season. The blockage occurred again for the next two years. The current condition of the North Fork habitat is poor for the first 1,700 feet through farmland, with a silty clay channel and no mature riparian area along the left bank. The downstream 3,700 feet of the North Fork flows through an excellent riparian area and has a very good channel with excellent stream habitat features.

The goal for this project is to support the USACE in designing an engineered restoration plan to restore and improve fish habitat along both the North Fork and South Fork between their historic and present confluences and to acquire property easements or ownership to construct the restoration project. The objectives for this project include:

- Restoring 1,700 feet of the North Fork channel and riparian belt through upstream agricultural area
- Preserving the downstream 3,700 feet of the North Fork by acquiring conservation easements or ownership
- Restoring floodplain connectivity between the current North and South Fork channels
- Preventing the channels from going dry during late summer salmon spawning by constructing engineered log jams and other features to maintain channel depth

Work involves removing approximately 3,500 feet of river dike, placing 50 engineered log jams, and restoring 150 acres of floodplain to properly functioning conditions. This project has been identified by the U.S. Army Corps of Engineers' General Investigation for ecosystem restoration and will use information and preliminary designs developed by the Corps to develop the final design. This project will be completed by the end of 2016.

Cost and Funding Sources (secured):

\$438,755 PSAR
\$110,957 Sponsor Match
\$549,712 Total

Photo credit Mary K Johnson 53



Skokomish Valley Road Realignment Conceptual Design

This project is located in the Skokomish floodplain, along the right bank of the South Fork Skokomish in the vicinity of River Mile 9, between Vance and Swift creeks. Historically, this area had meanders, side channels, and oxbow channels providing channel complexity and off-channel habitat, but these habitat features were demolished for the construction of the West Skokomish Valley Road in the early 1900s. The county road separates approximately 60 acres of floodplain from the South Fork Skokomish River. The South Fork has been migrating against the right bank for many years, continuing to erode the thin riparian area between the channel and the road. The right bank of the South Fork Skokomish is hard-armored for a distance of 800 feet to protect the county road, and the riparian area is non-existent for a distance of 1,000 feet. With the channel artificially held to a straight alignment, the channel has been aggrading significantly, lacks shade in areas devoid of riparian area, and has very little habitat complexity. The South Fork has been migrating against the right bank for many years, continuing to erode the thin riparian area between the channel and the road.

Furthermore, access to upstream spawning habitat in the Skokomish South Fork and Vance Creek has been blocked during late summer in the vicinity of River Mile 9 for endangered salmon and other fish species. This is due to aggradation caused by the artificial straightening given the presence of the county road. During late summer low flows, this aggradation causes flows to go subsurface. During high flows, this is one of the first areas to flood. The disconnection of the river from the floodplain results in significant numbers of fish that are stranded in the roadside ditch after flooding.

The goal of the project is to determine the feasibility of relocating the West Skokomish Valley Road away from the South Fork Skokomish River through development of conceptual design to restore the floodplain connection and river channel salmon habitat in the South Fork Skokomish between Swift and Vance creeks. Work would involve relocating the (West) Skokomish Valley Road outside of the South Fork Skokomish riparian area, restoring up to 0.98 miles of Vance Creek and South Fork Skokomish, restoring the right bank and riparian area of the South Fork Skokomish to include removal of 800 feet of rock bank armor, and reconnecting up to 60 acres of South Fork Skokomish floodplain.

Cost and Funding Sources (secured):

\$362,990	Salmon Recovery Funding Board
\$ 64,175	Sponsor Match
\$427,165	Total

Photo from the West Skokomish Valley Road
Photo credit Mary K Johnson

Other Valley Projects

South Hood Canal Riparian Enhancement Project Phase II

The Southern Hood Canal Riparian Enhancement Project Phase II builds on work completed in Phase I (see Accomplishments section). The goal of this project is to restore natural riparian function within the Skokomish watershed. Project objectives are to:

- Improve the quantity of riparian habitats available by expanding existing riparian buffers and planting riparian areas that are currently unvegetated;
- Improve the quality of riparian habitats by controlling invasive species and replanting with native vegetation
- Move riparian areas toward a later seral stage by implementing riparian conifer under-plantings.

Project tasks include tree planting, maintenance of riparian plantings, and inventory and control of invasive, non-native vegetation. Phase II will take place in the mainstem Skokomish River from the Estuary up to approximately River Mile 12.5, the North Fork Skokomish River up to around River Mile 2.5, and in Vance Creek up to about River Mile 2. Knotweed control work will also take place on any tributary containing knotweed.

Mason Conservation District is working with multiple landowners on this project, which began in August 2014 and is scheduled to be completed in December 2017. Proposed accomplishments of the project include:

- 150 acres and 4.25 miles of streambank planted in riparian vegetation
- 60 acres and 6.0 miles of streambank treated for plant removal or control.

Funding Sources (secured):

\$344,212	PSAR
\$287,484	Sponsor Match
\$631,696	Total



Mike Anderson, Rich Geiger and Alex Gouley discussing plans during the July 2009 Field Trip.
Photo credit: Washington State Department of Ecology

4. Skokomish Estuary

Between 2007 and 2014, work was completed on Phases 1, 2, 3A, and 3B of the Skokomish Estuary Restoration Project. In 2016, work is underway on Phase 3C (see below). Following completion of Phase 3C, the Skokomish Tribe and partners will continue to evaluate the effectiveness of the treatments and determine what further actions are needed, based on an adaptive management approach.

Skokomish Estuary Restoration – Phase 3C

Phase 3C of Skokomish Estuary restoration centers on the mouth of the Skokomish River, immediately east of the river along the shore of Annas Bay in Hood Canal. The goal of this project is to restore the natural habitat forming processes, functions and connections that characterized this landscape prior to conversion to agriculture. It will restore connectivity between the saltmarsh and the adjacent freshwater forested wetland complexes by opening barriers to stream flow and anadromous salmonids. The project will result in significant improvements of both the quantity and quality of available estuarine habitat in the Skokomish estuary and mid-Hood Canal area.

Specific components of the project include the following:

- Install 17 new water crossing structures (15 culverts and 2 bridges) at locations where historic channel connections were truncated during road building and conversion to agriculture. These sites are associated with the two access roads necessary for utility line maintenance that are located within the project site.
- Remove and abandon six existing tide gate structures that are part of the agricultural drainage system installed at the site in the 1940's. Currently, the tide gates prevent the adequate mixing of fresh and salt waters that creates the brackish water conditions that characterize intertidal wetlands.
- Enhance 1900 feet of degraded wetland channel by using fill material to narrow the channel width to mimic nearby natural tidal channels, reconnecting the channel to the historic sources of freshwater that have been diverted into drainage ditches.
- Fill existing borrow features on the site that were utilized to construct dikes and build roads when the land was converted to agricultural use. The site contains over 1500 linear feet of borrow ditches which will require approximately 25,000 cubic yards of material to fill.

Implementation of Phase 3C began in August 2015 and is expected to be completed by the end of 2016. Total secured funding for the project is \$1,695,000 from PSAR and the Washington Department of Fish and Wildlife's Estuary and Salmon Restoration Program.

5. Economic Vitality

Revitalizing the local communities in the Skokomish watershed will require that landowners and agencies take a holistic approach to ecosystem restoration and economic sustainability. In addition to directly creating many local jobs, watershed restoration projects are providing long-term opportunities for improved community well-being. Opportunities for a "whole watershed" approach exist to:

- Preserve and enhance the watershed's unique cultural and historical resources,
- Enhance the existing fisheries and agricultural industries through the encouragement of entrepreneurship and development of new cottage and value-added industries,
- Increase and promote the recreational and tourism opportunities in the watershed,
- Focus on healthy and safe communities

Reducing the Valley's vulnerability to flooding and lowering the water table are key to enabling economic recovery. The current Mason County Flood Ordinance prohibits any building or replacement buildings in the floodplain. This discourages investment by farmers, business owners (such as Olympic Mountain Ice Cream, Hunter Farms, and others). Farming is a lifestyle and those who would wish to start new businesses or farms in the Valley need to be able to live and build or replace old substandard homes, barns, and or shop structures with newer structures in line with current livability standards. Unless the flood elevation is lowered these ordinances cannot be removed.

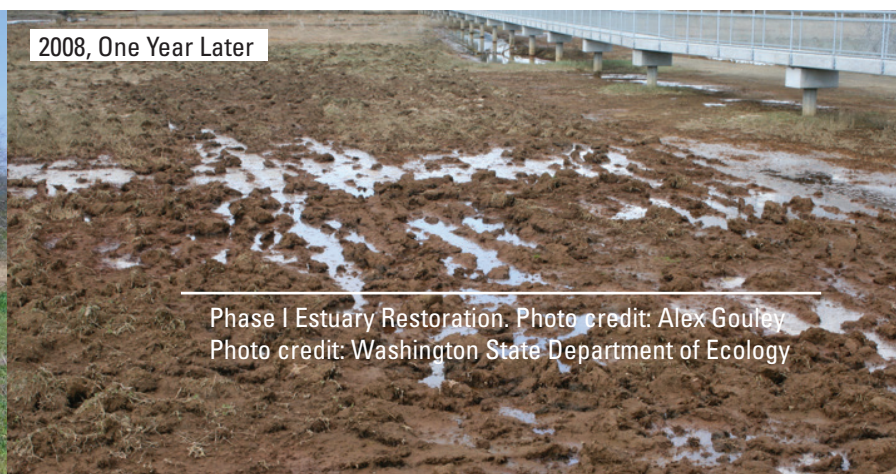
The following economic objectives are compatible with ecological restoration and should be pursued to improve the quality of life for local residents:

- 1. Reduce Skokomish Valley flood elevation.**
 - Restore river channel capacity.
 - Reconnect and improve tributaries.
- 2. Make the Valley viable for agriculture.**
 - Lower elevation of water table.
 - Install soil conservation Best Management Practices (BMPs).
 - Install agricultural improvements such as irrigation where appropriate.
- 3. Develop cottage & value-added industries in the Valley.**
 - Allow building where consistent with safety and health requirements.
 - Seek technical assistance grants to boost economic opportunities for local farmers and business, improve access to healthy local food, promote childhood wellness, and create economically vibrant neighborhoods.
- 4. Make the watershed a destination for recreation,** such as biking, hiking, camping, fishing, roadside stands, farmer's market, geocaching, shell fishing and virtual tours.
- 5. List any historical building such as the historic Skokomish Valley Schoolhouse/Grange Hall on the Mason County Historical Preservation list.**

Procure funding to restore Grange building and grounds and install a commercial kitchen to enable local community activities and events.
- 6. Create a working group** to develop goals, strategies, and tactics for planning and requesting grants or other sources of funding.
- 7. Coordinate with other local planning groups** such as Skokomish Tribe, Hood Canal Coordinating Council, and Mason County Economic Development Council.



2007, Prior to Restoration



2008, One Year Later

Phase I Estuary Restoration. Photo credit: Alex Goufey
Photo credit: Washington State Department of Ecology



2010



2013

Conclusion

During the 20th century, the Skokomish watershed produced extraordinary amounts of timber and hydropower, but that production took a huge toll on the river, the fish and wildlife, and the residents of the watershed. The first part of the 21st century is a time of healing for the Skokomish, aided by collaborative partnerships that are dedicated to restoring the watershed's environmental health, fisheries, and quality of life. While tremendous progress has been made over the past decade, particularly in stabilizing the upper watershed and the Skokomish Estuary, much work remains ahead to recover severely degraded fisheries and improve conditions in the Valley.

This Action Plan Update is intended to help lead the way to continued restoration of the Skokomish watershed. It also tells the story of what can be accomplished in a decade's time when the key stakeholders in a watershed are able to work together thoughtfully on projects that are mutually beneficial.

Mission Statement

The Skokomish Watershed Action Team will work towards common ecological and economic goals in the Skokomish River watershed through collaborative basin restoration projects.

Principles and Goals

- The group will recognize and support projects throughout the basin.
- We will concentrate our action on Forest Service lands above the floodplain while ensuring collaboration throughout the basin.
- Forest Service employees and the Skokomish Tribe participate in the group in an ex officio, informational role.
- The group recognizes and respects the sovereign rights of the Skokomish Tribe.
- The group further recognizes and respects the land management rights and responsibilities of the US Forest Service and other basin landowners; our job is to work within tribal sovereignty and other landowner responsibilities to accomplish common goals.
- We will work to enhance the economic and environmental sustainability of the Skokomish watershed recognizing best available science, technology, community values and other means as appropriate.
- The group will seek, coordinate and disseminate information about ongoing restorations projects in the basin.
- The group will examine all appropriate funding mechanisms to accomplish the restoration projects.
- We will maintain a broad perspective as to how Skokomish basin projects affect Hood Canal and the Olympic Peninsula, and vice-versa.
- The group will be inclusive of all interested parties; we will identify common ground, using a consensus-based process.
- The group at all times will respect individuals and the interests they represent. No interest group will be penalized if they don't agree on any given decision; no one interest group may veto a project.
- The collaborative group will work with the US Forest Service and other landowners to identify, review, fund and accomplish appropriate restoration projects.
- The group will work with basin landowners to identify appropriate monitoring methods and funding.



Skokomish Watershed Action Team Participant List



Photo from 2009, when the Skokomish Watershed Action Team was honored at the Skokomish Grange Hall.
 Left Back: Ron Gold, Bob Simmons, Jayni Kamin, Ross Gallagher, Alann Krivor, Sara Crumb, Richard Brocksmith, Valley Resident, Charles Toal, Shelley Spalding, Valley Resident, Dean Yoshina, Bob Dick, Allen Gibbs.
 Left Middle: Karen Ragan, Lydia Wagner, Rebecca Wolfe, Mali Krivor, Patti Case, Valley Resident, Alex Gouley, Dusty Watz, Keith Dublanica, Rich Geiger, Mike Marsh, Ron Figlar-Barnes.
 Left Front: Robin Stoddard, Rich Carlson, Nicole Hill, Mike Anderson, Billie Howard, Shannon Skinner.

Participants:

Mason County Commissioners: Terri Jeffreys and Tim Sheldon
 U.S. Congressman Derek Kilmer
 Jayni Kamin, local landowner
 Brian Matthews, Mason County
 Marty Best, Mason County Emergency Management
 Charles Toal, local resident
 Lydia Wagner, Washington Department of Ecology
 Colleen Bryan, Office of Senator Patty Murray
 Nicholas Carr, Office of Congressman Derek Kilmer
 Rosa McLeod, Office of Senator Maria Cantwell
 * Rich Geiger, Mason Conservation District
 John Bolender, Mason Conservation District
 Keith Dublanica, Governor's Salmon Recovery Office
 * Patti Case, Green Diamond Resource Company
 * Shelley Spalding, Olympic Forest Coalition and Great Old Broads for Wilderness
 John Woolley, Olympic Forest Coalition
 Brent Davies, Ecotrust
 Dave Wertz, Conservation Northwest
 Michael Marsh, Washington Native Plant Society
 Scott Brewer, Hood Canal Coordinating Council
 * Mike Anderson, The Wilderness Society and SWAT Coordinator

Dusty Watz, JX Construction, LLC
 Ron Gold, RG Forestry (retired) and local resident
 Jordan Rush, Forterra
 Katie Briggs, Laird Norton Family Foundation
 Paul Hickey, Tacoma Power
 Jason Ragan, Taylor Shellfish Farms and local resident
 Bill Dewey, Taylor Shellfish Farms
 Alann and Mali Krivor, Skokomish Farms
 Jeff Chapman, Backcountry Horsemen of Washington
 *Rebecca Wolfe, Sierra Club
 *Allen Gibbs, Audubon Society
 Tiffany Royal, Northwest Indian Fisheries Commission
 Stacy Vynne, Puget Sound Partnership
 Marlies Wierenga, WildEarth Guardians

Ex-Officio Participants:

Skokomish Tribe: Dave Herrera, *Alex Gouley, *Joseph Pavel, Ron Figlar-Barnes
 Olympic National Forest: *Marc McHenry, *Michael Hutchins, *Dean Yoshina, Rita Laford

(* indicates Steering Committee Members)

