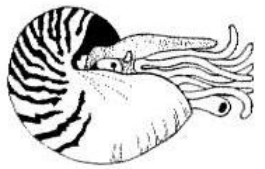


Greenhead Slough

A tide gate was replaced with a slough and bridge to benefit salt marsh and salmon. Field measurements of hydraulics and plant communities were collected; design calculations, reports, and drawings completed; and construction related services provided. Tidal exchange was increased by more than 1 million cu ft/d to 100 acres of marsh, opening 25 miles of creek. Salt marsh vegetation was established to reduce scour along US 101.



Tom Smayda PE
SEA Inc.
tomsmayda@aol.com



Greenhead Slough in the Bear River Estuary
Willapa National Wildlife Refuge, Pacific County, Washington, USA

before and after construction

Nithi River Weir:

Fisheries enhancement via hydrologic stability

Dam stores water and moderates discharge
in a “flashy” nival-regime spawning stream

Prevents stream-dewatering fish kill events

Provides drought and climate resilience

Located ~5 km upstream of impassable
falls, still an intermittent trout barrier

Aaron Zwiebel, Aquatic Ecosystems Biologist
Luc Turcotte, Regional Aquatics Specialist

BC Ministry of Water, Land and Resource
Stewardship, Omineca Region

aaron.zwiebel@gov.bc.ca
luc.Turcotte@gov.bc.ca



Nithi River, tributary to François Lake, Nechako system, Upper Fraser West catchment
Near Fraser Lake, BC

Deer Creek Culvert Replacement

(Part of King County Tolt Pipeline Protection Project)

Replaced a fish-impassable crushed 42" flap-gated culvert with a 10' x 10' side-opening culvert activated by a muted tidal regulator that now provides fish passage approximately 96% of the time

Matt Knox

Water and Land Resources Division

Department of Natural Resources and Parks

King County

maknox@kingcounty.gov



Snohomish River Basin (WRIA 7), Snoqualmie River (RM 13.05), Duvall, WA

Black River Pump Station Improvements

Multi-benefit project at 50-year-old flood containment facility

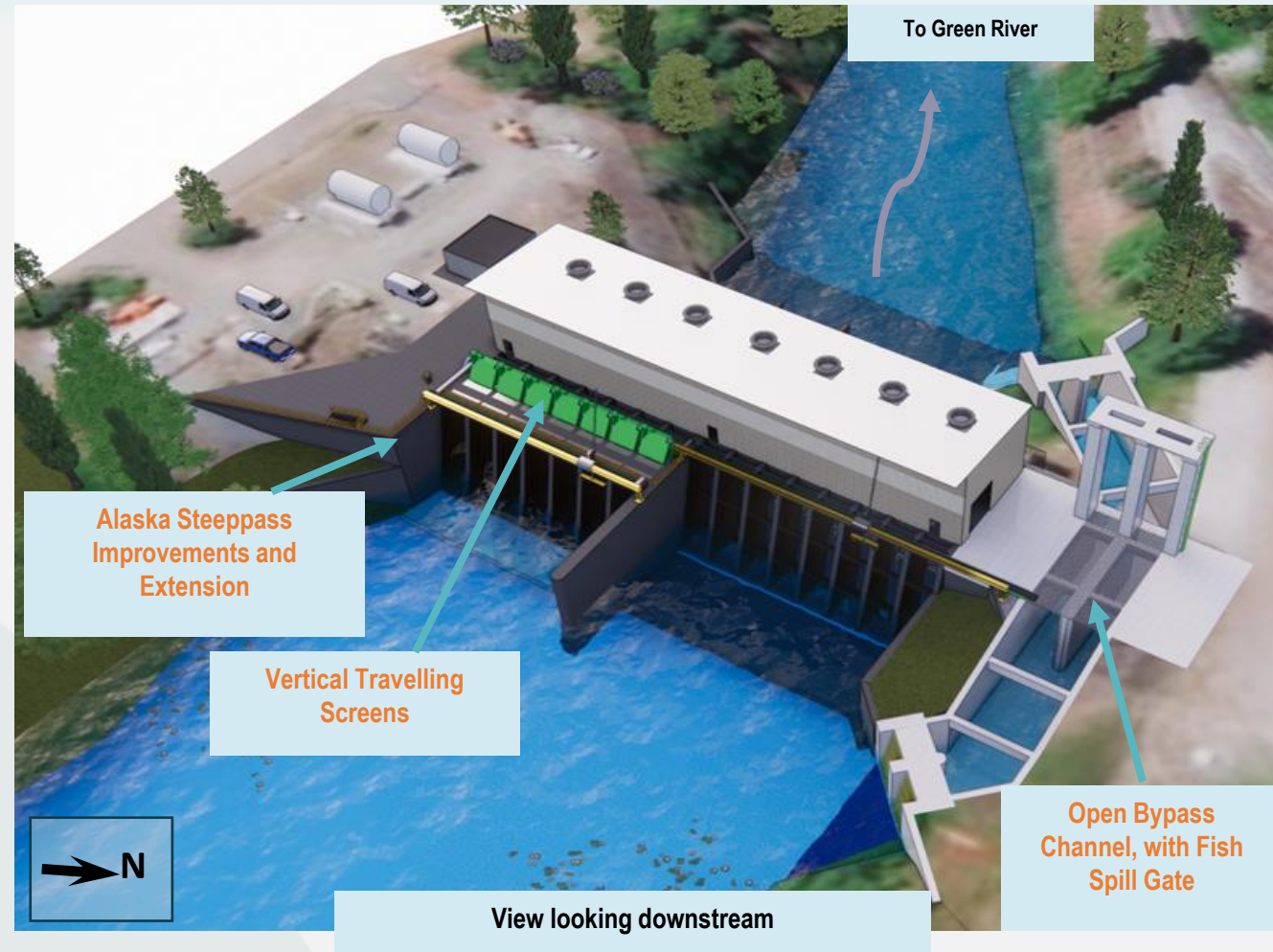
- New fish passage bypass channel
- Seismic retrofit including deep ground improvements
- New control building, systems

Tom Bean, P.E.

Engineering Special Projects Lead

King County, as service provider to the King County Flood Control District

Tom.bean@kingcounty.gov



Green/Duwamish River Basin, Renton WA

Fishtrap Channel Restoration

In August 2025, Seabird Island Band, Fisheries & Oceans Canada, and Stqó:ya Construction worked to complete the works on Phase 2 of the Fishtrap spawning channel to benefit our population of endangered Chinook salmon (DU 6 as per COSEWIC). Rock weirs and woody debris will retain more water throughout the warmest months of the year and provide cover to juveniles after they emerge.

Jillian Stewart, PBiol – Biologist – Fisheries Advocate & Habitat Lead

jillian.stewart@seabirdisland.ca

778-684-1574



Sqémelech (Maria Slough), Chaplin Road, Agassiz, British Columbia. Photo inset is the box culvert that was installed in 2024 to restore fish access to the upper slough.

Tuck Creek Confluence - Fish Passage Program Culvert Replacement

This project will replace a failing gated culvert and fishway carrying Tuck Creek under the West Snoqualmie River Road immediately upstream from its confluence with the Snoqualmie River with a WDFW-compliant fish passable culvert, with new gates and without a fish ladder.

John Velimesis, Capital Project Manager
King County Water & Land Resources Division
Fish Passage Restoration Program Capital Unit
jvelimesis@kingcounty.gov



**Failing Culvert, Gates
& Fish Ladder**

April 12, 2024
(Snoq R @ Duvall 23.6'-3,300 cfs)

Lower Snoqualmie River Watershed, Duvall WA

Chinook River, WA

Retractable tide gates improve hydro-connectivity to a 1500-acre salt-marsh on the lower Columbia River

Alex Uber PE

WA Dept of Fish and Wildlife

Alex.uber@dfw.wa.gov



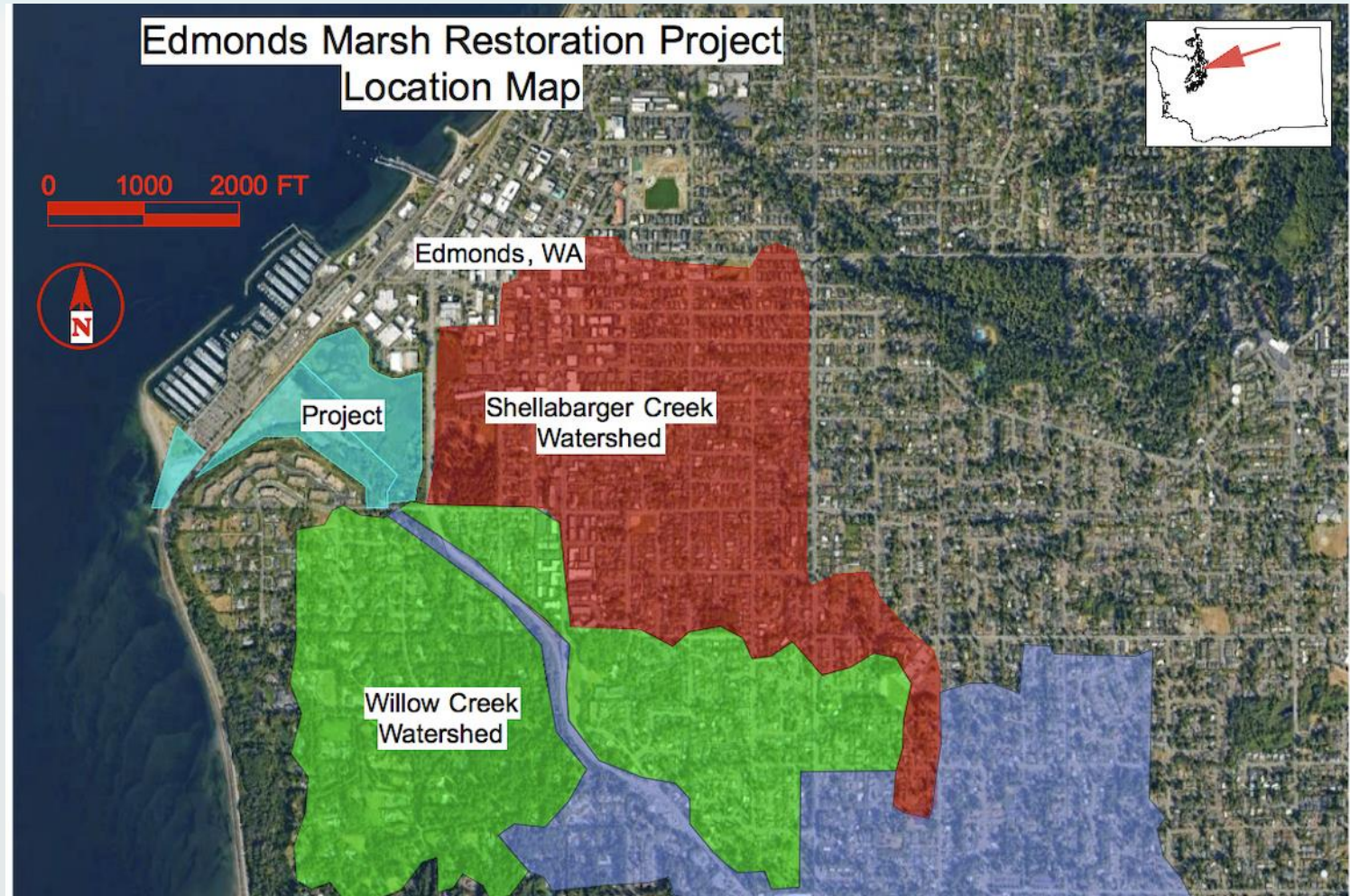
Lower Columbia River, Pacific County, WA

Edmonds Marsh Estuary Restoration

Opening the Marsh to Puget Sound exposes the developed Edmonds waterfront to coastal flooding. Solution options are berms, a muted tide gate, and a small, permanently open, passable orifice that limits tidal flow.

Greg Ferguson, Edmonds Marsh Estuary Advocates.

kisutch13@gmail.com



Edmonds, WA

Greening the Salish Sea:

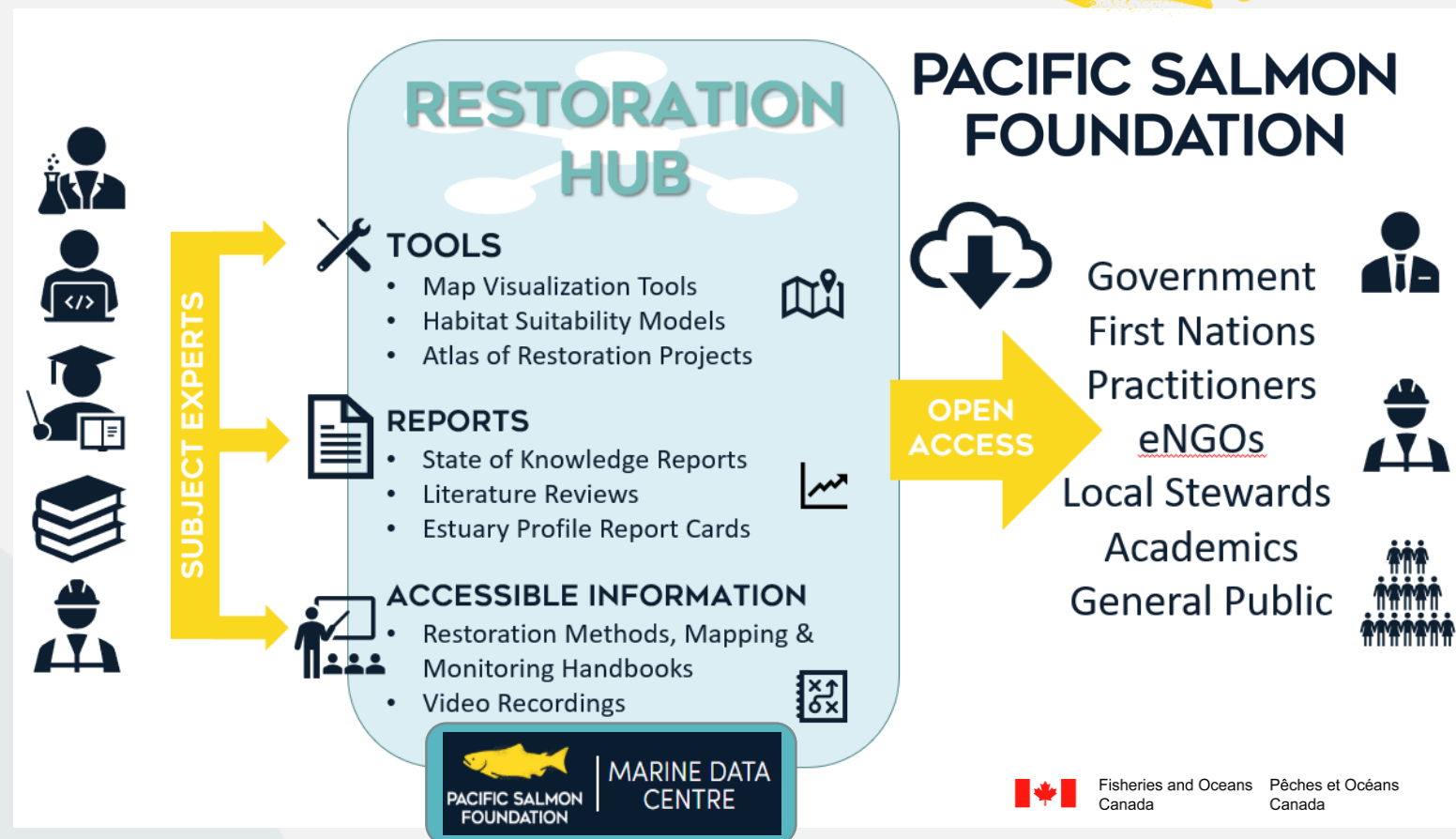
Decision Support Tools for Successful Pacific Salmon Habitat Recovery

This project is creating a Restoration Resource Hub of open-access informative resources and decision-support tools to guide and help coordinate adaptive nearshore habitat restoration approaches and strategies.

Nicole Christiansen, Project Manager

Pacific Salmon Foundation

nchristiansen@psf.ca



An online resource hub for restoration practitioners that is accessible to all!

Key products include State of Knowledge and practitioner guidebooks for kelp, salt marsh, and eelgrass, habitat suitability maps and more to foster better informed restoration.

Monitoring of the Morrison Creek Tributary Barrier Removal Project

The Monitoring and Evaluation of Salmonid Habitat Restoration team conducted pre-treatment and post-treatment (3 years post-project) monitoring at Rawson Creek, tributary to Morrison Creek, tributary to the Smith River. A culvert was replaced with a bridge with natural channel bottom. Juvenile Coho Salmon were observed above the project after construction validating successful passage.

Christine Ramsey, California Department of Fish and Wildlife ChrisRamsey@wildlife.ca.gov



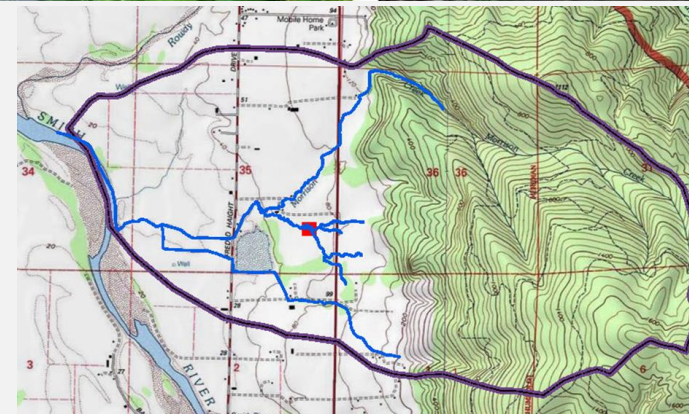
Before: Undersized culvert blocking Coho Salmon passage.

Photo Credit: N. Harris, Fishery Biologist, Pacific States Marine Fisheries Commission



After: Thirty-foot spanning bridge with a natural channel bottom.

Photo Credit: K. Roberts, Fishery Biologist, Pacific States Marine Fisheries Commission



Map from Smith River Alliance

Smith River, Crescent City, California

Lower Fraser Centre for Collaboration and Cooperation

The Fraser River Estuary is in **crisis** because of major industrialization and urbanization in the last century, and current restoration efforts amount only to a managed decline of what's left. **The only way to bring the ecosystem back to the way it was is by establishing a coordinated, fully-funded, regional management model** that brings together First Nations, all levels of government, NGOs, industry, stakeholders and academia.

Contact:

Murray Ned, Executive Director, Lower Fraser Fisheries Alliance.

Murray.Ned@lffa.ca



For more information go to: lffa.ca/centre-for-collaboration

New Zealand Tide Gate Projects

Project examples of fish-friendly tide gate installation projects

Contact:

Kelly Hughes

ATS Environmental

ats-environmental.com



Tauranga, Timaru, Nelson – New Zealand

Duckabush Estuary Restoration Project

This project will reconnect the Duckabush River to adjacent wetlands by replacing the US 101 causeway with an elevated bridge, and restoring estuarine habitat.

Combining a major infrastructure project with habitat restoration involves a complex partnership between Federal, State, and local agencies.

Jill Grbavac

Hood Canal Salmon Enhancement Group

jill@pnwsalmoncenter.org

www.pnwsalmoncenter.org/duckabush-restoration-project



Duckabush River, Hood Canal - Brinnon, WA, USA

Port Susan Bay Restoration Project

Project improves connectivity between river and tidal marsh, access to habitat for juvenile salmonids, and establishment of a diverse set of brackish estuary plant species.

Contact:

Haley Tupen, PE

Environmental Science Associates

Htupen@esassoc.com



Active delta of Stillaguamish River (Hat Slough) at Port Susan Bay, near Stanwood, WA

Three Crabs Estuary Restoration Project

In 2014 project partners performed a massive restoration project in the Dungeness River and Meadowbrook Creek estuary. By removing a shoreline restaurant, a derelict creosote pier, realigning a County Road, replacing and undersized County Bridge, and restoring tidal prism, the project restored fish access and tidal hydrology to 55 acres while reducing the duration of storm driven flooding on adjacent properties.



Kevin Long, Project Manager

North Olympic Salmon
Coalition

Projectmanager@nosc.org



Meadowbrook Creek Estuary, Sequim, Washington