Project Area 18.1 LWD Loading & Floodplain Reconnection

Floodplain reconnection driven by wood loading, levee removal, and beavers. Right image taken at winter base flow in March 2025

Constructed 49 LWD in-channel jams per mile and floodplain roughness LWD

- >100% increase in pool frequency
- 340% increase in perennial channel length
- > 450% increase in wetted area

Kris Fischer, CTUIR – KrisFischer@ctuir.org

Dave Karl, WDFW – Dave.Karl@wdfw.wa.gov

Kris Buelow, SRSRB – Kris@snakeriverboard.org

Tucannon River, Wooten Wildlife Area – Dayton, Washington

Quarry Park Side Channel Reconnection Project

A historic side channel had been blocked off by a historic bridge abutment. This project punched large diameter culverts through the abutment and reconnected flow through the side channel down to the 99% exceedance flow.

Jonathan Slaney, M.A.Sc., P.Eng.
River Engineering
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Bow River Watershed in the City of Calgary.

Fennel Creek Floodplain Restoration

Flood prone residential structures and (3) culverts removed. Portions of dredge-fill berm that separated Fennel Creek from its floodplain cut to engage right floodplain at 1-year flood. Channel grading to create multi-thread overbank flow channels. Habitat features such as Large Woody Material and Beaver Dam Analogs installed to increase floodplain roughness, connectivity, and address limiting factors impacting salmon.

Nina Biondolillo

nina.biondolillo@piercecountywa.gov

(253)878-2774

Fennel Creek, Puyallup River Watershed, Alderton Washington State

The sc̓e:ɬxʷəy̓əm Foodlands Corridor

Working across seven properties to create and restore important riparian and off-channel habitat that helps to increase local resilience to flooding.
This photo is of a series of marshes added to the floodplain to help hold water on the landscape while preventing flooding of space used by landholders.

Rivershed is working in collaboration with səýeḿ Qwantlen, Kwantlen Land Guardians, Langley Environmental Partners Society, Kerr Wood Leidal, Lower Fraser Fisheries Alliance, and multiple landholders along the river.

Rivershed Society of BC

Justine Nelson, ED - justine@rivershed.com

Miki Eslake, Program Manager - miki@rivershed.com

www.rivershed.com

sc̓e:ɬxʷəy̓əm (Salmon River) in Langley the shared territory of the Kwantlen, Katzie, Semiahmoo and Matsqui Nations.

Merritt Oxbow Reconnection

A restoration project to reconnect abandoned oxbows, improve floodplain connectivity, and create rearing habitat for ESA-listed juvenile salmonids. Project resulted in an increase of 2 acres of off-channel rearing habitat

Aaron Rosenblum

Senior Habitat Project Manager

Cascade Fisheries

aaron@ccfeg.org

Nason Creek, Wenatchee Watershed, Chelan County, Washington

Bonanza Creek Wetlands Restoration

Several short sections of abandoned railway corridor running through the middle of a floodplain were removed to restore active hydraulic connectivity between the creek and the floodplain.

Alan Thomson P.Eng.

Mountain Station Consultants Inc.

Nelson, B.C.

alan@mountainstation.ca

In conjunction with the Slocan Lake Stewardship Society

Bonanza Creek, south of Summit Lake between Nakusp and Rosebury in the Slocan River watershed

Upper Mill Creek Floodplains by Design

Floodplain connectivity project enhances water quality, bank stabilization, and salmonid habitat.

Alison Crowley alison.Crowley@wwccd.net

Walla Walla County Conservation District

Project Manger

Walla Walla Basin WRIA 32, Upper Mill Creek.

Bowmont West Side Channel Reconnection Project

A historic side channel had been blocked off by flood plain narrowing and subsequent sediment deposition. This project rebalanced the flow at the bifurcation point reconnecting permanent flow through the side channels.

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Bow River Watershed in the City of Calgary.

Xsi Tsihl Hlii Din (McCully Creek) Floodplain Restoration

Multiple year project to restore an active, alluvial fan to one vegetated main channel, with allowance for side channels during seasonal floods, to improve access for spawners in low flow conditions.

Project lead is the Gitxsan Watershed Authority, with partnership from Cattleman Association, landowners, Skeena Fisheries Commission, Fisheries & Oceans Canada and Pacific Salmon Foundation.

Alicia Fernando, Lead Biologist, and Brad Harris - Gitksan Watershed Authority
afernando@gitksanwatershed.com

Lana Miller and Natalie Newman - DFO
Lana.Miller@dfo-mpo.gc.ca

Drone view looking up the fan

Photo credit: GWA 2024

McCully Creek, Kispiox Watershed, Kispiox, B.C.

North Fork Snoqualmie River Confluence Revetment Removal Project

This companion project to the Mason Thorson Ells Levee Rehabilitation Project removed 700 feet of riprap revetment to:

- Avoid long-term costs of inspecting and maintaining facilities that no longer protect critical public infrastructure, private property, or farmland.
- Increase the connection between the North Fork Snoqualmie River and its floodplain.
- Improve habitat for fish and wildlife.

Seth Amrhein, Ecologist

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

Seth.amrhein@kingcounty.gov

North Fork Snoqualmie River, King County, Washington

Taylor Channel Floodplain Reconnection

A berm between the river mainstem and a constructed side channel was breached in two places to allow lateral connectivity. Trail camera monitoring showed spring flows through one of the two notches in 2025. Complete berm removal is slated for March 2026.

Skeetchestn Natural Resources
Melissa Hack (DFO)
Colin McGregor (DFO)
Colin.McGregor@dfo-mpo.gc.ca

Deadman River, BC Canada

Migliore Floodplain Reconnection Project

WDFW is working with a private landowner to reconnect ~100 acres of historical floodplain habitat in the Lower Columbia River estuary by identifying solutions for a failing tide gate that will work for the community.

Ashley Smithers, Washington Department of Fish and Wildlife, Ashley.smithers@dfw.wa.gov

Laura Brown, Washington Department of Fish and Wildlife, laura.brown@dfw.wa.gov

Skamokawa Creek, Lower Columbia River Estuary, Washington

Deroche Creek Recovery Solution

- Sediment basin with low flow woody debris channel.
- Restore alluvial fan with complexing.
- Nature based large engineered log jams to support alternative habitats missing in system.
- Overflow flood channel in alluvial fan, with woody debris bracing at terminus.

Rick McKamey, Leq'á: mel First Nation rick@leqamel.ca
Des Goold, NHC, dgoold@nhcwater.com
Patrick Lilley KWL, plilley@kwl.ca
Carter McNaught, WSP, carter.mcnaught@wsp.com
Amy Vallarino, ENV, amy.vallarino@gov.bc.ca

Lekahamen, Deroche, Fraser Valley British Columbia. 49.183820, -122.073666

North Bank Working Landscapes

This 33-acre tidal wetland project on an active agricultural property was completed in 2022-2024 to restore overwinter refugia and rearing habitat for juvenile coho and chinook:

- Reconstructed half-mile of eroded and failing dike to protect the pasture from flooding
- Replaced an undersized 1.0’ diameter top hinge tidegate with a 7.0’ diameter side-hinge aluminum tidegate and muted tidal regulator
- Reconstructed over 4000’ of sinuous tidal channels, including a 2-acre tidal “pond”
- Planted over 5000 native willows

Contact: Caley Sowers, District Manager,
Coos Soil and Water Conservation District
info@coosswcd.org

Lower Coquille River Estuary, near Bandon, Coos County Oregon

zis a ba Phase 2 Estuary Restoration

The site restores tidal estuarine flows to 250 acres of formerly diked marginal farmlands. Project features include wave protection for surrounding infrastructure, new setback living levee, flood relief gates, excavated river distributary connections and blind tide channels.

Daniel I Elefant, PE

Environmental Science Associates (ESA)

delefant@esassoc.com

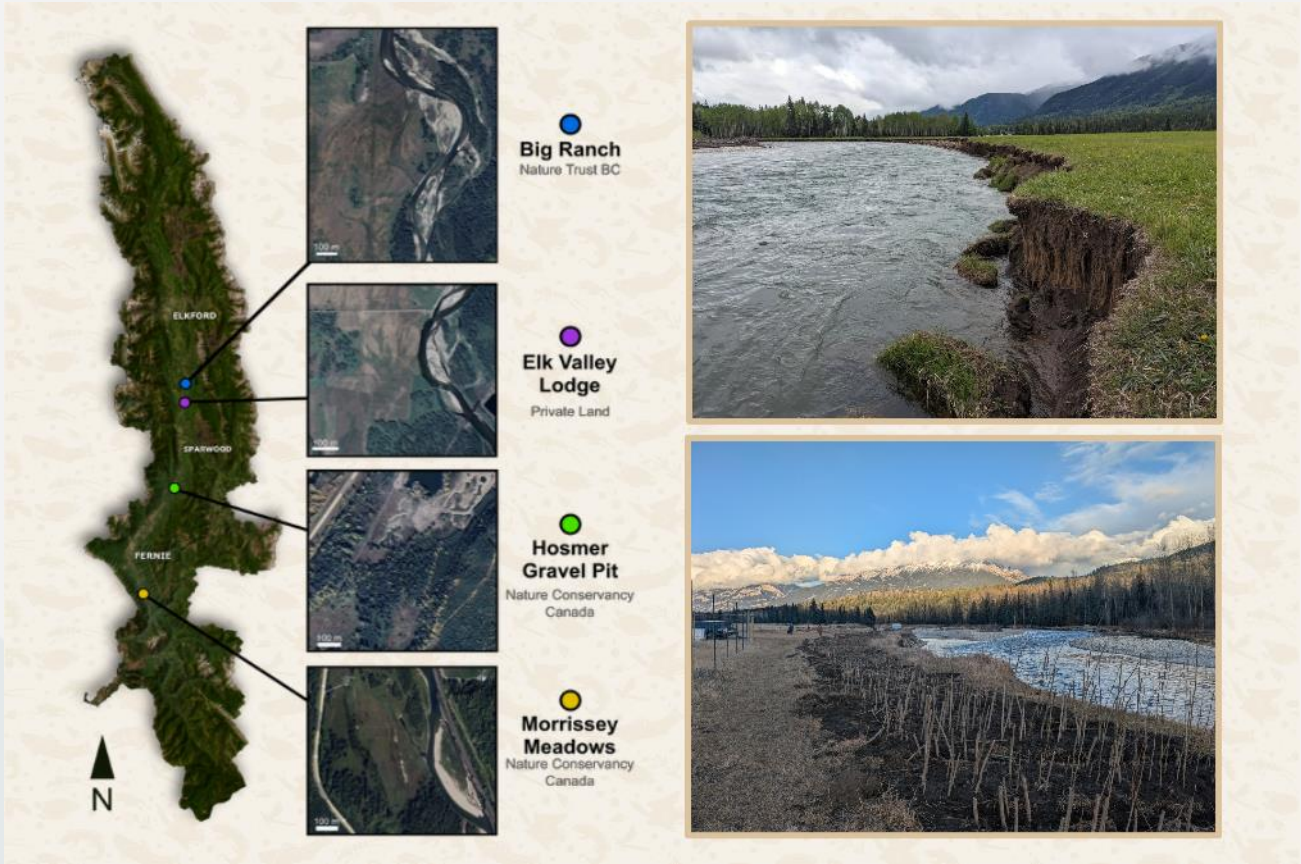
Stillaguamish River near Stanwood, WA

Elk River Floodplain Restoration Program

Qukin ʔamakʔis (Elk Valley), British Columbia

Restoring Elk River riparian & floodplain deciduous vegetation to naturally defend against flooding and erosion while restoring vital wildlife habitat values and protecting community infrastructure.

- Four active sites on conservation and private properties
- Cuttings nursery
- Knowledge transfer



Program Contact: Chad Hughes, Executive Director
chad@elkriveralliance.ca

Partners & Funders

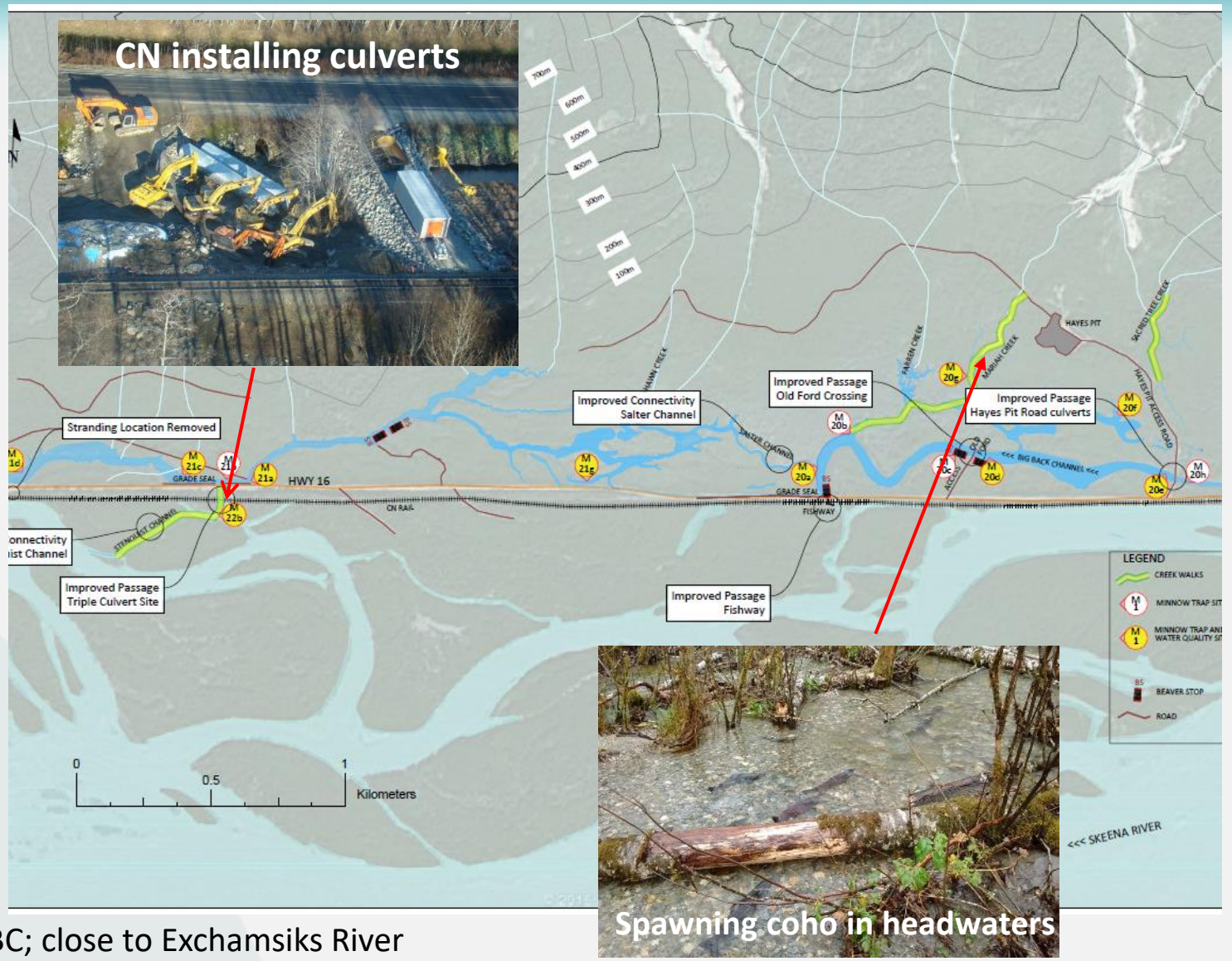
Skeena (Exchamsiks Back-channel) Reconnection

Multi-year project to reconnect ~5km of Skeena side-channels and wetlands with mainstem Skeena River. Adult access to the back channel area was cut off by CN Rail in ~1914 and by Highway 16 in the 1940's.

No adult salmon access through the grade prior to fishway and culvert installations in 2007-2008.

Ongoing maintenance and monitoring to present.

Sandy Devcic – sandra.devcic@dfo-mpo.gc.ca;
Lana Miller – lana.miller@dfo-mpo.gc.ca



Location: Skeena mainstem, ~30km west of Terrace, BC; close to Exchamsiks River

Partners: Kitsumkalum FN, Skeena Fisheries Commission, PSC Northern Fund, CN Rail, BC Ministry of Transportation, Cdn Wildlife Fed, +

Kris Fischer

CTUIR - Tucannon Basin Habitat Project Leader

Tucannonriver.org

krisfischer@ctuir.org

Rewetting the Sponge - Tucannon River (PA 18) – 2020 (~25-year event)

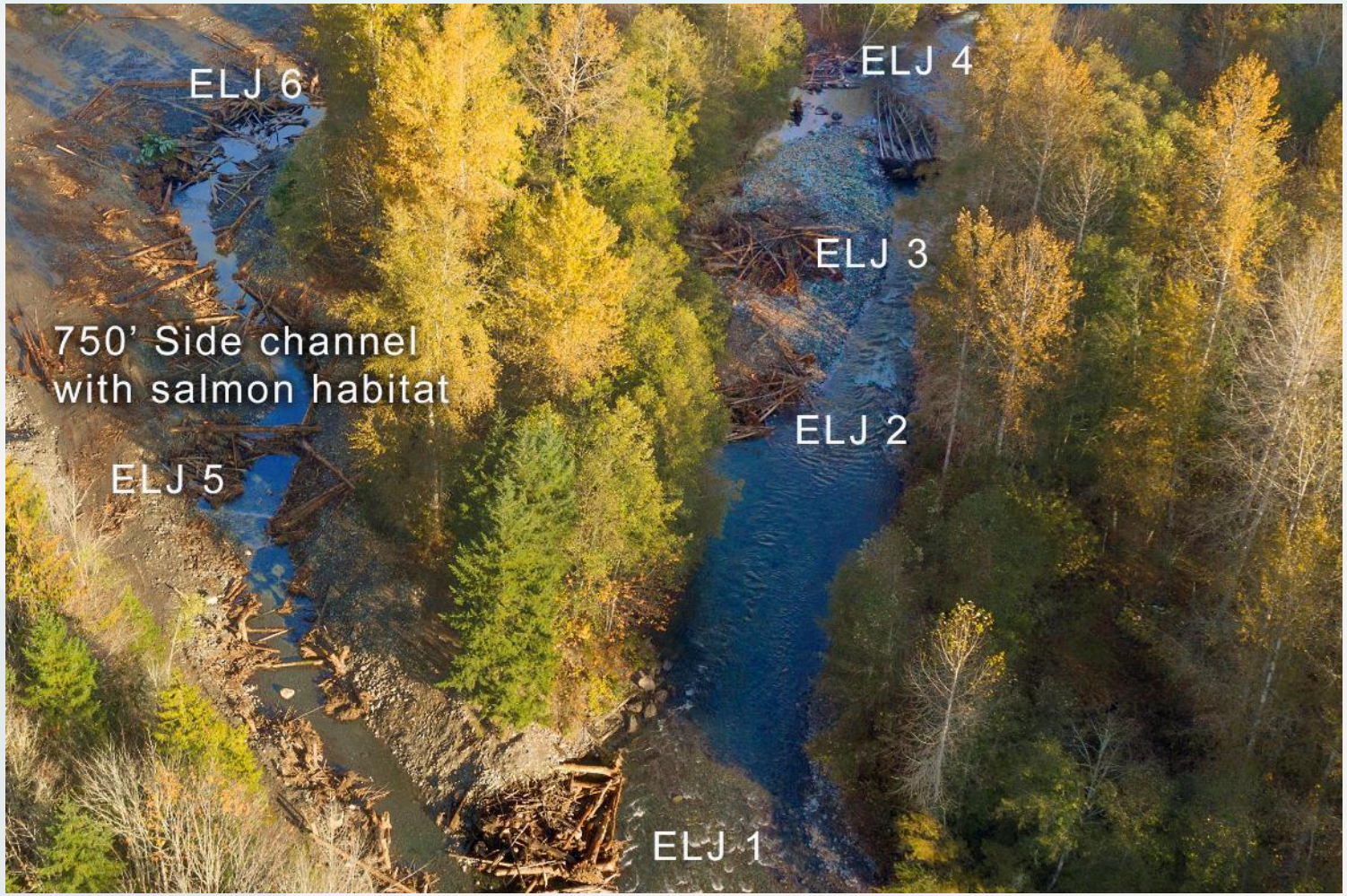
Caldero Reach Restoration

Engineered Log Jams (ELJs) and Salmon Side Channel at Jamestown S'Klallam Tribe's Caldero Property.

Hilton Turnbull

Jamestown S'Klallam Tribe

hturnbull@jamestowntribe.org



Dungeness River Sequim, Washington USA

Factors Affecting Spring Chinook Use of Floodplains, Skagit River

Stream type Chinook are an important life history strategy in the Skagit River Basin. We evaluated several factors affecting the density of juvenile Chinook in floodplain habitat across several restored channels including depth, velocity, cover, substrate, temperature, and distance to mainstem to determine optimum ranges for each factor.

Jen O'Neal

Natural Systems Design

jen@naturaldes.com

425-785-0510

Skagit River Floodplain Channel, Newhalem, WA

Riverbend Levee Setback and Floodplain Restoration Project

Removal of levee, construction of setback revetment and floodplain channels, and installation of large wood

Constructed: 2022

Will Mansfield

Will.Mansfield@kingcounty.gov

King County, WA

Cedar River (WRIA 8), Renton WA

Foster Falls Streamflow Enhancement Project

Project objectives include capturing sediment, aggrading channels, and promoting hydrological conditions that can increase riparian vigor and extent. Beaver dams reinforced with wooden posts, and 55 additional structures constructed throughout 3 acres/1,400 stream feet. Planting will occur in fall 2026.

Foster Creek Conservation District

Jordan Gerhard (Natural Resource Specialist)
jgerhard@fostercreekcd.org

Foster Creek, WRIA 50 (Foster Watershed), Bridgeport, WA.

Kodama Farm Creek and Wetland Restoration

Kodama Farm is an operational family farm located near a complex of ditched agricultural channels, currently overrun with reed canary grass and beaver influence. This project seeks to restore the stream and floodplain back to its historic forested wetland state, with stream regrading and riparian restoration.

Adam High, Project Manager
North Olympic Salmon Coalition
360-316-6699
ahigh@nosc.org

East Fork Chimacum Creek, near Port Ludlow, WA

South Fork Nooksack River Fobes Phase 2

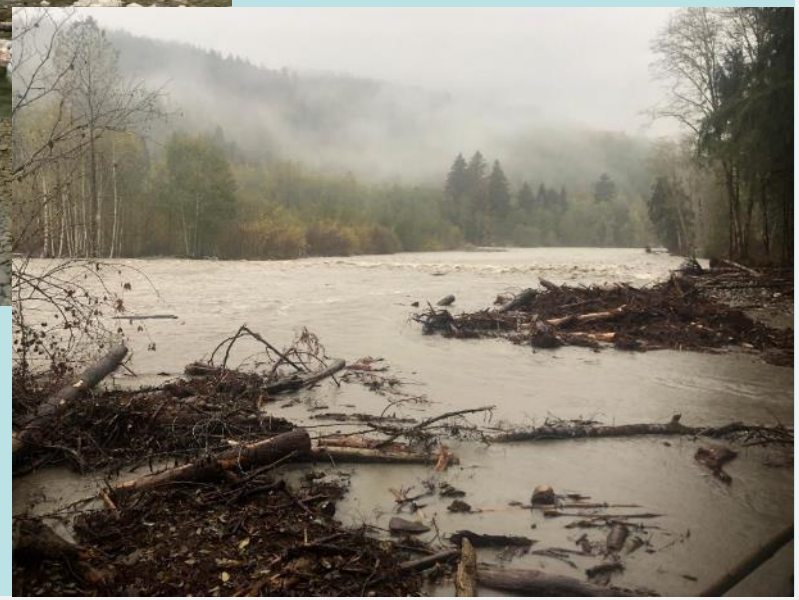
- Low-lying channel-spanning log jams were used to aggrade the channel, raise water surface elevations and engage the floodplain.
- We've documented gravel bar development and engagement of floodplain channel.
- Research study found reduced seasonal groundwater fluctuations in the floodplain, which can enhance groundwater contributions to the river during low-flows, providing vital baseflow for migrating and spawning salmon

Kelley Turner, Lummi Nation Natural Resources Watershed Restoration Manager, KelleyT@lummi-nsn.gov

Alex Levell, Lummi Nation Natural Resources Deputy Watershed Restoration Manager, AlexL@lummi-nsn.gov

Low-lying channel-spanning log jam during project construction

River engaging with floodplain channel during high flow event



South Fork Nooksack River Watershed, Skagit County, Washington State

Inglewood Bird Sanctuary Reconnection Project

The Inglewood Bird Sanctuary Lagoon, a historic Bow River Channel, faced a range of challenges including poor water quality resulting in fish kills.

Permanently reconnecting flow to the historic channel addressed multiple flood/erosion and habitat goals.

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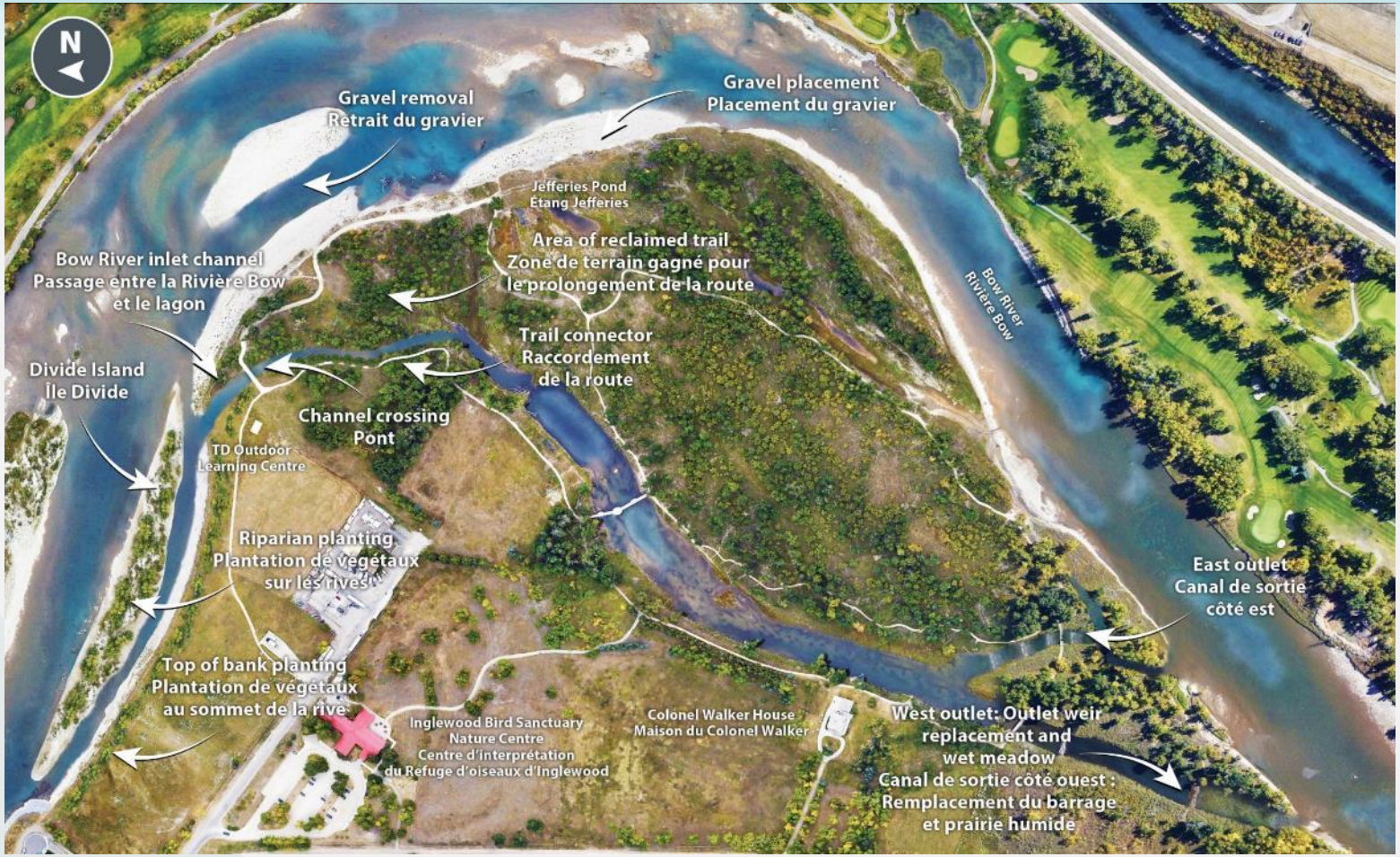

Bow River Watershed in the City of Calgary.

Juvenile Coho salmon flow velocity refugia via floodplain connectivity

Several projects within the basin combine to provide secondary channel and wetland features with efficient drainage. Projects will provide overbank shelter from high flows in the channelized creek while also promoting food web production for juvenile salmonids.

Matt Meyers, PhD, PG (TAC member)
Fluvial Geomorphologist
California Department of Fish and Wildlife
Conservation Engineering Branch

Matthew.Meyers@wildlife.ca.gov

Green Valley Creek downstream of confluence with Atascadero Creek, Russian River Watershed, near Graton, California

Upper Wenatchee RM 37-38 Floodplain Reconnection

Boulder-ballasted large wood structures, pilot channel, boulder clusters

Wenatchee Basin, Chelan County, Washington

Scott Bailey, Sr. Natural Resources Specialist

Chelan County Natural Resource Department

Scott.bailey@co.chelan.wa.us

Peshastin Creek
RM 4.3 Side-Channel

Pool-Riffle Complexes, large wood, 9-acre floodplain reconnected

Scott Bailey, Sr. Natural Resources Specialist

Chelan County Natural Resource Department

scott.bailey@co.chelan.wa.us

Wenatchee Basin, Chelan County, Washington

South Prairie Creek Preserve Floodplain Reconnection

This project acquired 129 acres and restored anastomosing channel form, floodplain connectivity, and native vegetation on 50 acres on South Prairie Creek.

South Prairie Creek is the primary producer of Fall Chinook, Coho Salmon, Pink and Chum Salmon, and steelhead in the Carbon River Basin in the Puyallup Watershed.

Steve Winter, Natural Systems Design

Kristin Williamson, South Puget Sound Salmon Group

Char Naylor, Puyallup Tribe

Heather Green, Pierce Conservation District

Kathleen Berger, Pierce County

South Prairie Creek, Tributary to the Carbon River in the Puyallup Watershed near Orting, WA in east Pierce County.

Lones Levee Setback and Floodplain Restoration Project (Čakwab)

Removal of levee, construction of setback revetment and pilot channels, reconnection to oxbow, and installation of large wood

Constructed: 2021

Will Mansfield

Will.Mansfield@kingcounty.gov

King County, WA

Green River (WRIA 9), Auburn, WA

Englishman River Estuary Restoration Project

Restoring tidal connectivity and salt-marsh habitat by removing outdated berms and dikes, re-establishing natural tidal channels, and improving estuary function and climate resilience.

Tom Reid

West Coast Conservation Land Manager

The Nature Trust of British Columbia

info@naturetrust.bc.ca

Englishman River Estuary – Parksville, Vancouver Island, British Columbia

Hatzic Valley Legacy Creek

- Sediment removal.
- Creation of glide-riffle pool sequences, as well as thalweg realignment.
- Bank repair a mix of riprap for erosion protection as well as nature-based bioengineering to support bank stabilization.

Durieu, Hatzic Valley, Fraser Valley British Columbia. 49.216872, -122.243156

Paul Hague, AE, haguep@ae.ca
Andrew Wiens, AE, wiensa@ae.ca
Amy Vallarino, ENV, amy.vallarino@gov.bc.ca

Chimacum Creek

2000 feet of Chimacum Creek, formerly straightened and drained for farming, was re-aligned to benefit coho.

It was designed to inundate the floodplain 60 to 90 d/y by carefully creating a naturalistic size, shape, slope and roughness. Beaver recolonization has further wetted the landscape.

Smayda provided investigation, design, permitting, and construction related services. Wood was installed to be stable without anchors, reed canary grass removed, and 18 acres planted.

Chimacum Creek, Jefferson County, Washington, USA

The former ditch was naturalized and the floodplain re-engaged for coho, beaver and vegetation.

Tom Smayda PE
SEA Inc.
tomsmayda@aol.com

haich ikt’at’uu Tidal Wetland Restoration

Restoring 217-acres of former dairy farm to the Siuslaw River through dike removal, tidal channel excavation, and wood additions. Protecting adjacent highway and private properties with a setback dike and Muted Tidal Regulator tide gate system. Restoring native plant communities and culturally-significant plant species.

Hunter White, P.E. – Civil and Water Resources Engineer – Environmental Science Associates

Hwhite@esassoc.com

Project Partners: Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians; McKenzie River Trust; Siuslaw Watershed Council

Siuslaw River Estuary near Florence, Oregon

Rivermile 32: Confluence Phase

One of the main goals of this project was to activate the floodplain and provide more over wintering and summer rearing habitat for Chinook and steelhead.

Gavin Aguilar, Idaho Governor's Office of Species Conservation,
gavin.aguilar@osc.Idaho.gov

Lemhi River, Salmon, Idaho

Cottonwood Log Trench Planting Project

Locally harvested Cottonwood, Willow, and Red Osier Dogwood stakes were planted along a buried log. This planting technique was used in a very dry area. We expect that the log will hold moisture to give the stakes a better chance of survival.

Skeetchestn Natural Resources

Kyla Roorda (DFO)

Tony Rathbone (DFO)

Fisheries and Oceans Canada | Pêches et Océans Canada

Live stakes arranged in a trench ready to be back filled.

Deadman River, BC Canada

Elbow Island Side Channel Reconnection Project

A historic side channel had become blocked off due to a range of anthropogenic and natural reasons. Some realignment of the sediment has reconnected the channel for the full range of flows and created a prolific Brown Trout spawning site.

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River Engineering
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W www.calgary.ca

Elbow River Watershed in the City of Calgary.

Fall City Floodplain Restoration Project

Removal of levee and revetment, construction of setback revetment and floodplain and side channels, and placement of large wood along two riverbanks

Constructed: 2022-2023

Will Mansfield

Will.Mansfield@kingcounty.gov

King County, WA

Snoqualmie River (WRIA 7), Fall City, WA

Rainbow Bend Levee Removal and Floodplain Reconnection Project

Removal of obsolete levee, construction of pilot channels, and installation of large wood

Constructed: 2013

Will Mansfield

Will.Mansfield@kingcounty.gov

King County, WA

Cedar River (WRIA 8), Renton WA

North Bummers Flats Restoration

Work involved wetland excavations, upland habitat creation with spoil, river dike removal, internal dike breaches, removal of an outlet and re-construction to an open outlet, seeding and erosion control

Matthew Wilson, Ducks Unlimited Canada,

m_Wilson@ducks.ca

Wasa, British Columbia

Squamish River Central Estuary Restoration Project

Large scale reconnection project between Squamish River and its estuary. Natural connections (~ 1 km of infrastructure removed) and engineered connections (box-culverts)

Stephanie Lingard – Squamish River Watershed Society & University of British Columbia – steph_lingard@hotmail.com

Squamish River- Squamish, British Columbia, Canada