Illabot Creek Habitat Restoration Project

Devin Smith

Skagit River System Cooperative

Working On Behalf of

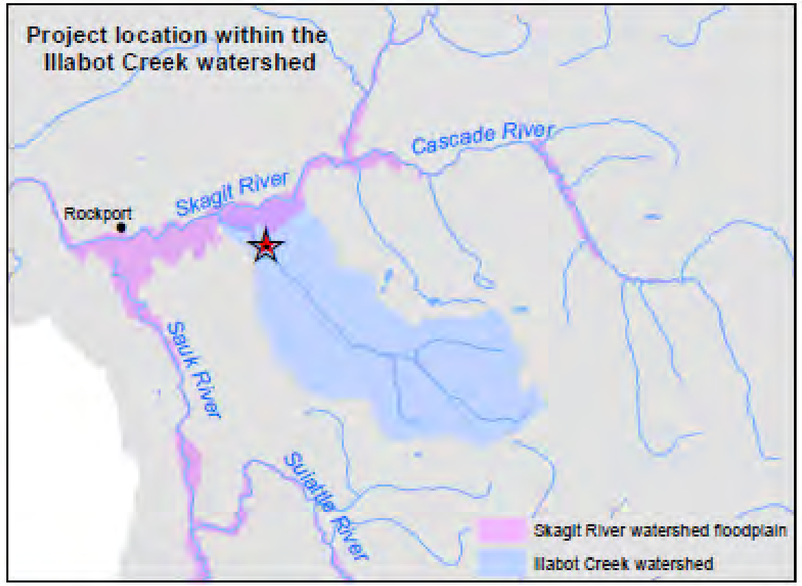
Sauk-Suiattle Indian Tribe &

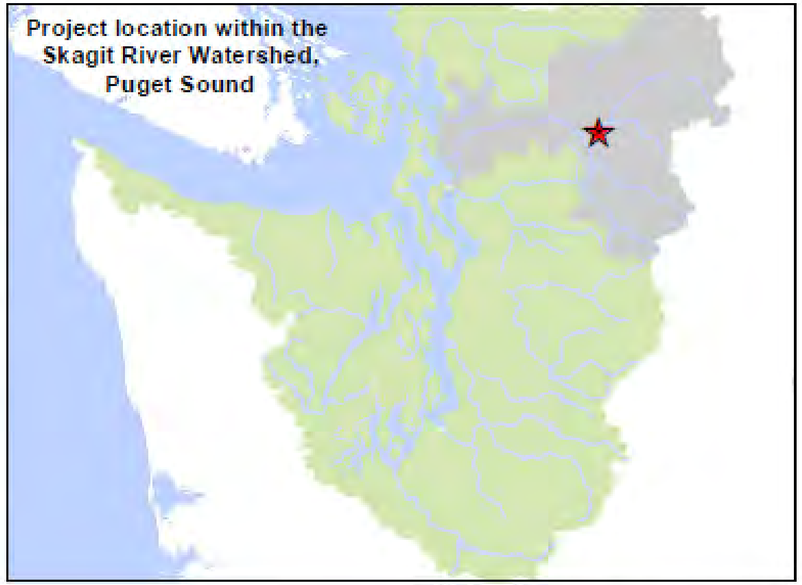
Swinomish Indian Tribal Community

&

Paul DeVries

R2 Resource Consultants





Illabot Creek Alluvial Fan Restoration
Location & Ownership

Project area

Skagit County parcels (2012)

0 500 1,000 Feet

2011 Air Photo: USDA-NAIP

Prepared by Kate Ramsden, August 29, 2012
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Watershed

48 sq mi

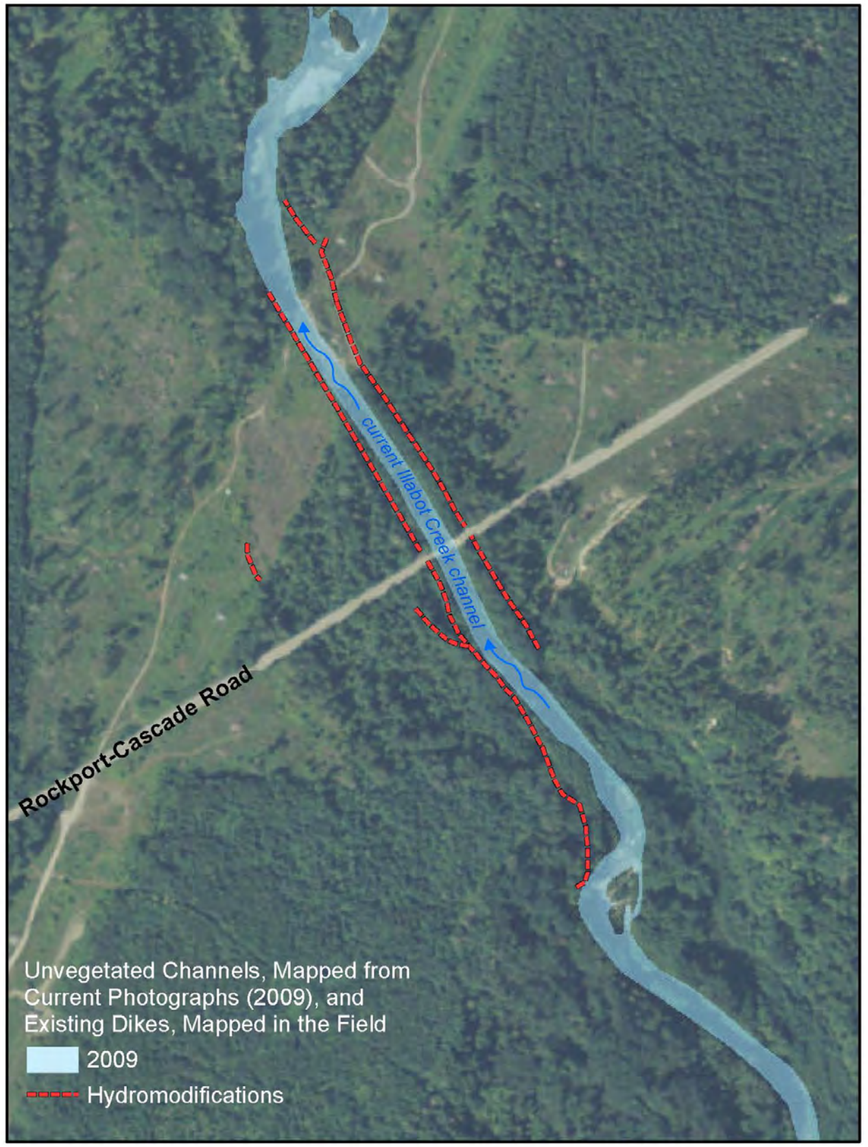
BF Width

130 ft

2-Yr flood

3,000 cfs

CMZ Width 630 ft



Illabot Creek Alluvial Fan Restoration
Historic & Current Channel Locations

0 500 1,000 Feet

2009 Air Photo: USDA-NAIP

Prepared by Kate Ramsden, May 26, 2011
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CMZ Width 176 ft

Potential Benefits

	Diked Reach	Restored Reach
Main channel length	1900 ft	2,350 ft
Main channel gradient	2.0%	1.5%
Channel area	84,223 ft^2	198,613 ft^2
Pool habitat	6%	30%
Coho parr		+ ~11,000/yr
Chinook spawners		+ 23 redds/yr
Chinook parr migrants		+ ~8,000/yr

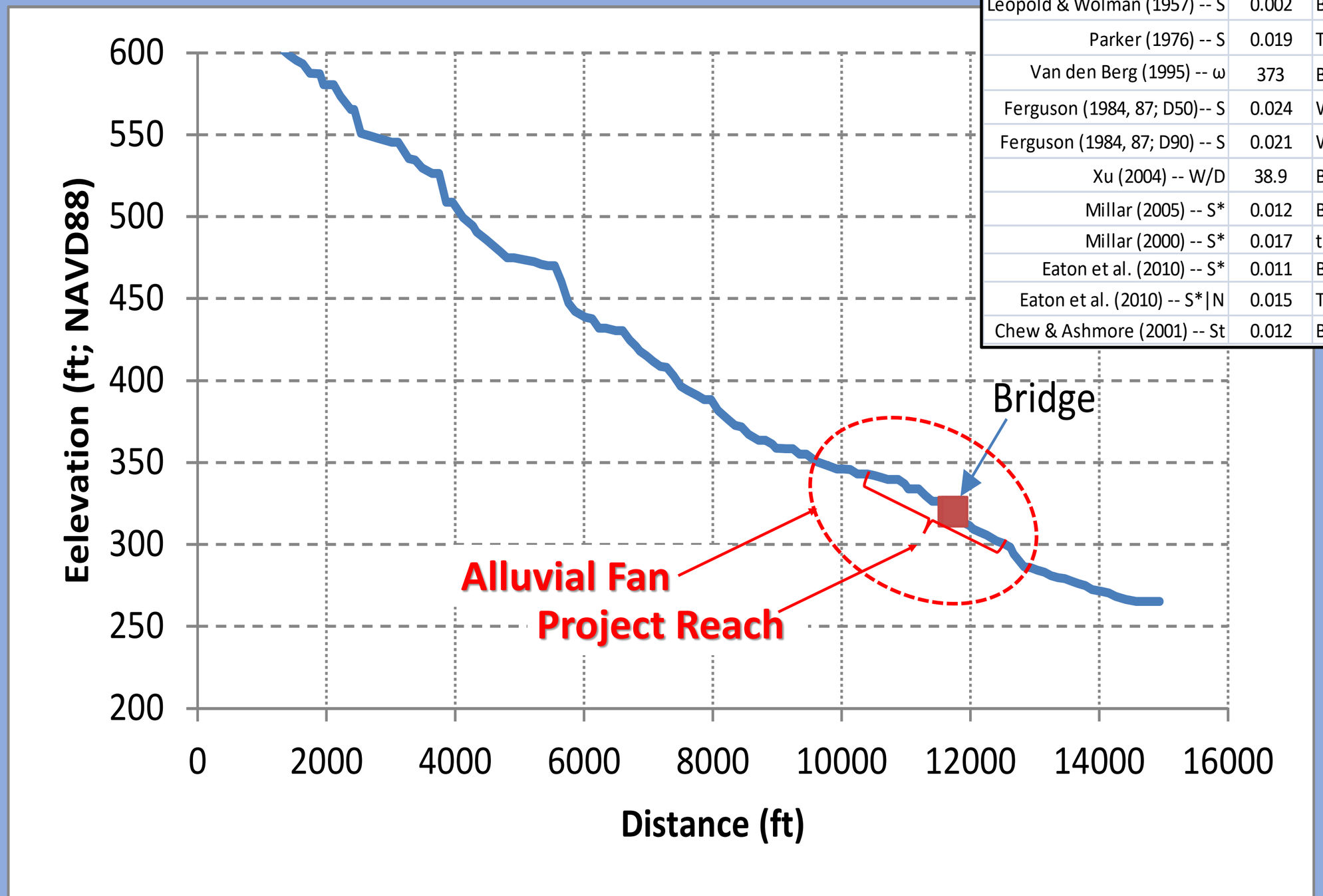
Conceptual design – How much is enough?

- Goal: Restore habitat and channel processes while protecting existing infrastructure
- Remove rip-rap dike from left bank
- Use existing bridge and add additional crossings on existing roadway to support channel migration
- Retain most of right bank dike
  - *Relatively limited gain*
  - *Protecting most at-risk power towers*
  - *Protecting access to power towers*
- Average CMZ width 523 feet (compared to 630 feet historic)

New Bridge Crossings

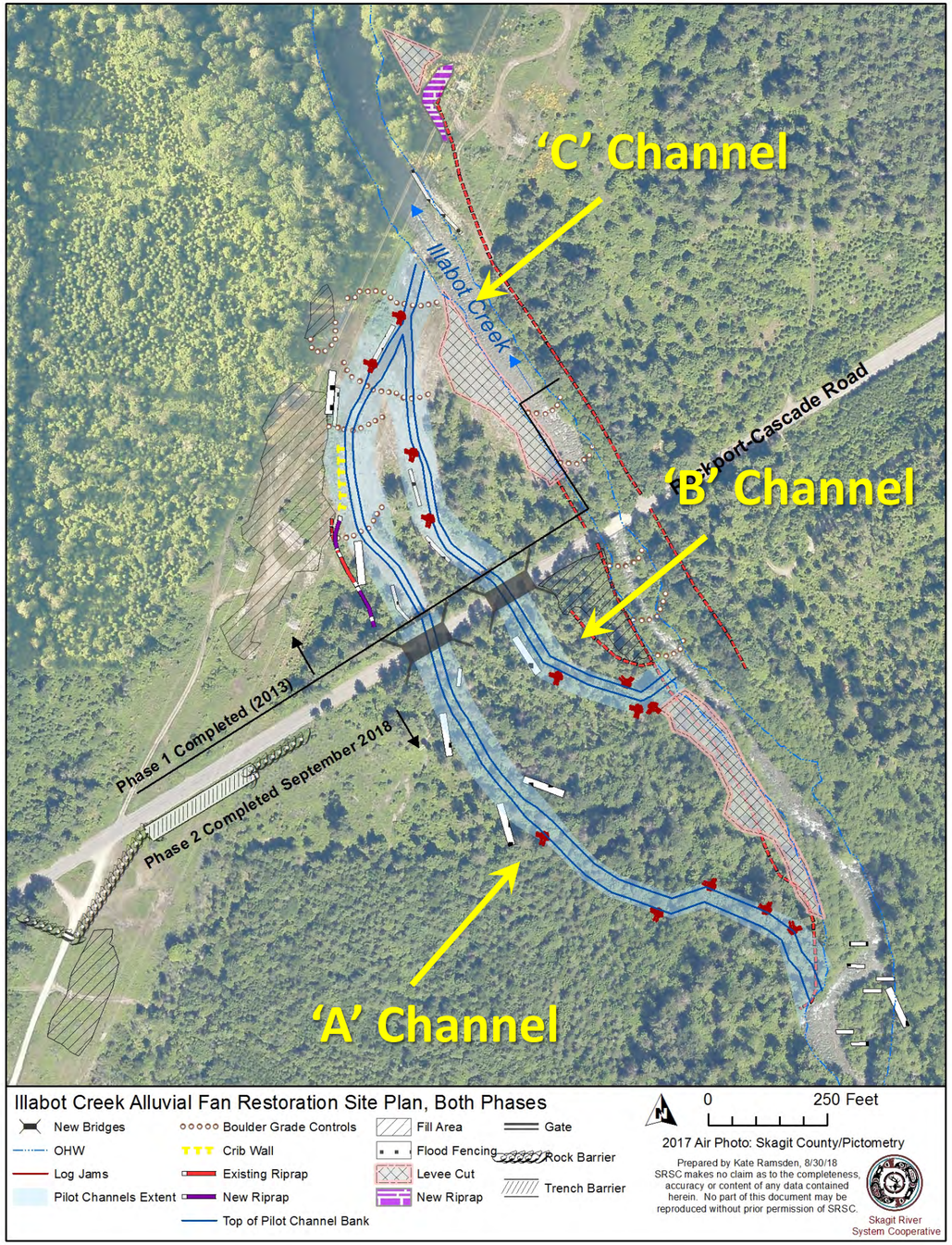
- Considered three alternatives
  - *One new 150 foot bridge*
  - *Two new 100 foot bridges*
  - *Three new 60 foot bridges*

- Two new 100 foot bridges selected
  - *Three total bridges each convey 100-yr flow*
  - *Multiple channel pathways*
  - *Largest total span length*
  - *Similar in cost to 150 foot bridge*



Meandering Braided Threshold Evaluation

Reference	Criterion	Classification
Leopold & Wolman (1957) -- S	0.002	Braided
Parker (1976) -- S	0.019	Transition, 1-2 braids
Van den Berg (1995) -- ω	373	Braided
Ferguson (1984, 87; D50)-- S	0.024	Wandering
Ferguson (1984, 87; D90) -- S	0.021	Wandering
Xu (2004) -- W/D	38.9	Braided
Millar (2005) -- S*	0.012	Braided
Millar (2000) -- S*	0.017	transition
Eaton et al. (2010) -- S*	0.011	Braided
Eaton et al. (2010) -- S*|N	0.015	Transition
Chew & Ashmore (2001) -- St	0.012	Braided



Design

- Remove 1,500 linear feet of dike/rip-rap
- Pilot channels excavated in relic channels
- Boulder fields for grade control
- Log jams for habitat improvement
- Flood fences to rack wood, encourage deposition and channel movement, protect roads and towers
- Native vegetation and grass seed in disturbed areas

Design For Adjustability…

- **Multiple Channel Possibilities**
  - *Channels free to migrate with floods over time*
  - *Multiple bridges reduces flood and erosion risks*
  - *Each Bridge Can Convey 100 Year Flood*

- **Gradient Changes Away From Bridges**
  - *Deposition & Greater Channel Movement U/S, D/S*

- **Adjustable Boulder Fields For Grade Control**
  - *Fish Passage Between Boulders*
  - *Long Term Bed Adjustment OK, Avoid Undermining Risk*
  - *↑ Local Roughness, ↓ Local Slope → Future Spawning Habitat*

- **Protect Transmission Line Towers and Roadway**
  - *Flood Fences, Log Jams in Depositional Setting*

Project Timeline

- 2006 Feasibility Study Completed
  - SRSC
- 2011 Alternatives/Conceptual Design
  - R2/Trantech
- 2013 Phase 1 Project Construction
  - Harkness Construction
- 2017/18 Phase 2 Final Design
  - R2 (Channels)
  - KPFF (Road and Bridges)
- 2018 Phase 2 Project Construction
  - Tiger Construction (Channels)
  - Interwest (Road and Bridges)

Success Based on Strong Partnerships

- Nexus of private property, public property, infrastructure
- Strong partnership with landowners contributed to project success
  - *Ryan Tree Farm LLC*
  - *Skagit County Public Works*
  - *Seattle City Light*
  - *Sierra Pacific Industries*

- Collaborative project management for construction
  - *Skagit County completed work in ROW*

Funding and in-Kind Contributions

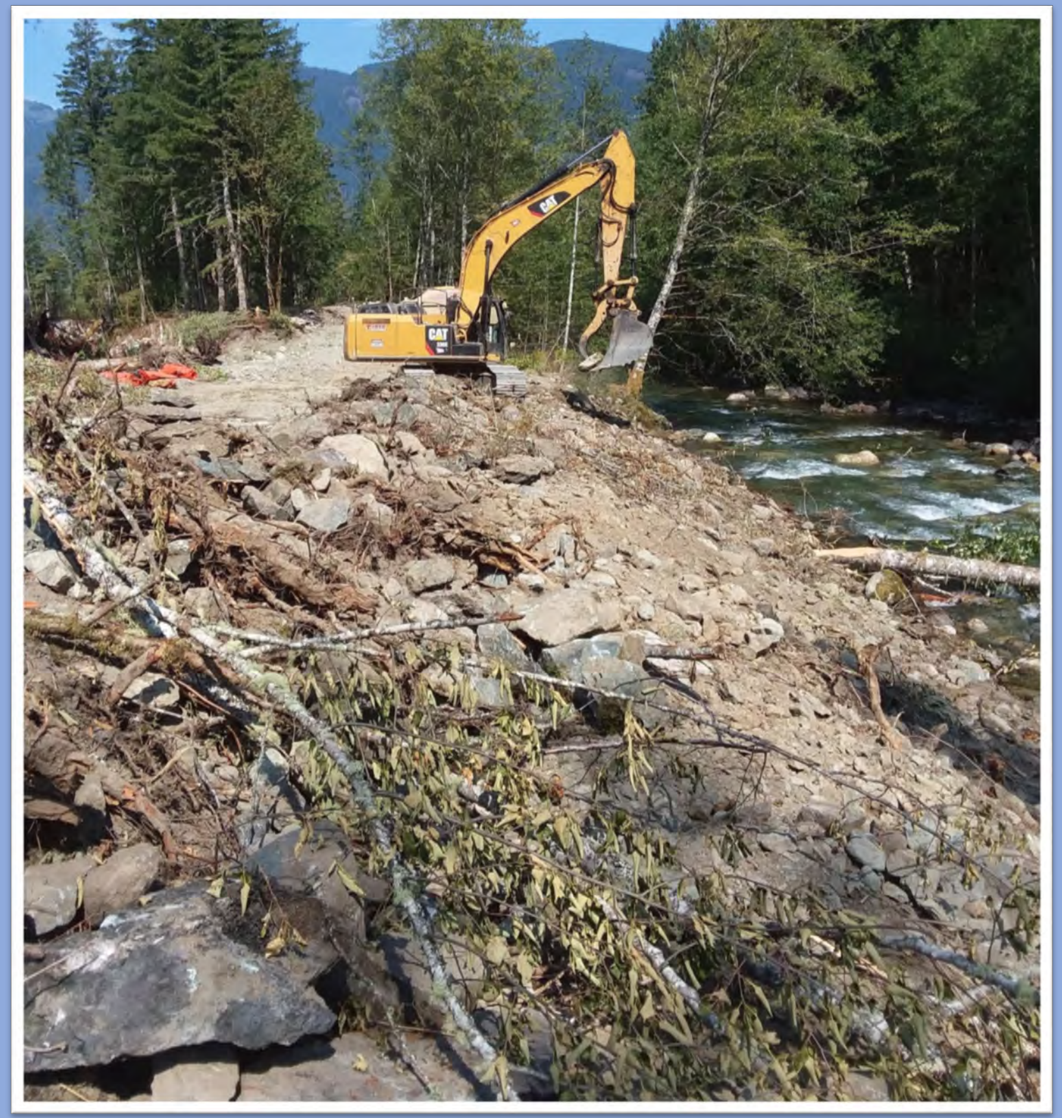
Puget Sound Acquisition and Restoration Fund	$ 3,829,814
NOAA Fisheries Restoration Center	$ 491,705
Washington State RCO Salmon Recovery Funding Board	$ 465,186
Seattle City Light	$ 195,620
Pacific Salmon Commission	$ 148,500
US Forest Service	$ 95,000
Skagit County	$ 75,000
US Fish and Wildlife Service	$ 25,000
Total Funds:	$ 5,325,825

- Came in Significantly Under Budget ☺
  - *Total actual project cost = $4,225,825*
  - *$1,050,000 returned to PSAR, $50,000 returned to SCL*

Girder installation 8/6/18

Pilot Channel Excavation/ Spoils Disposal

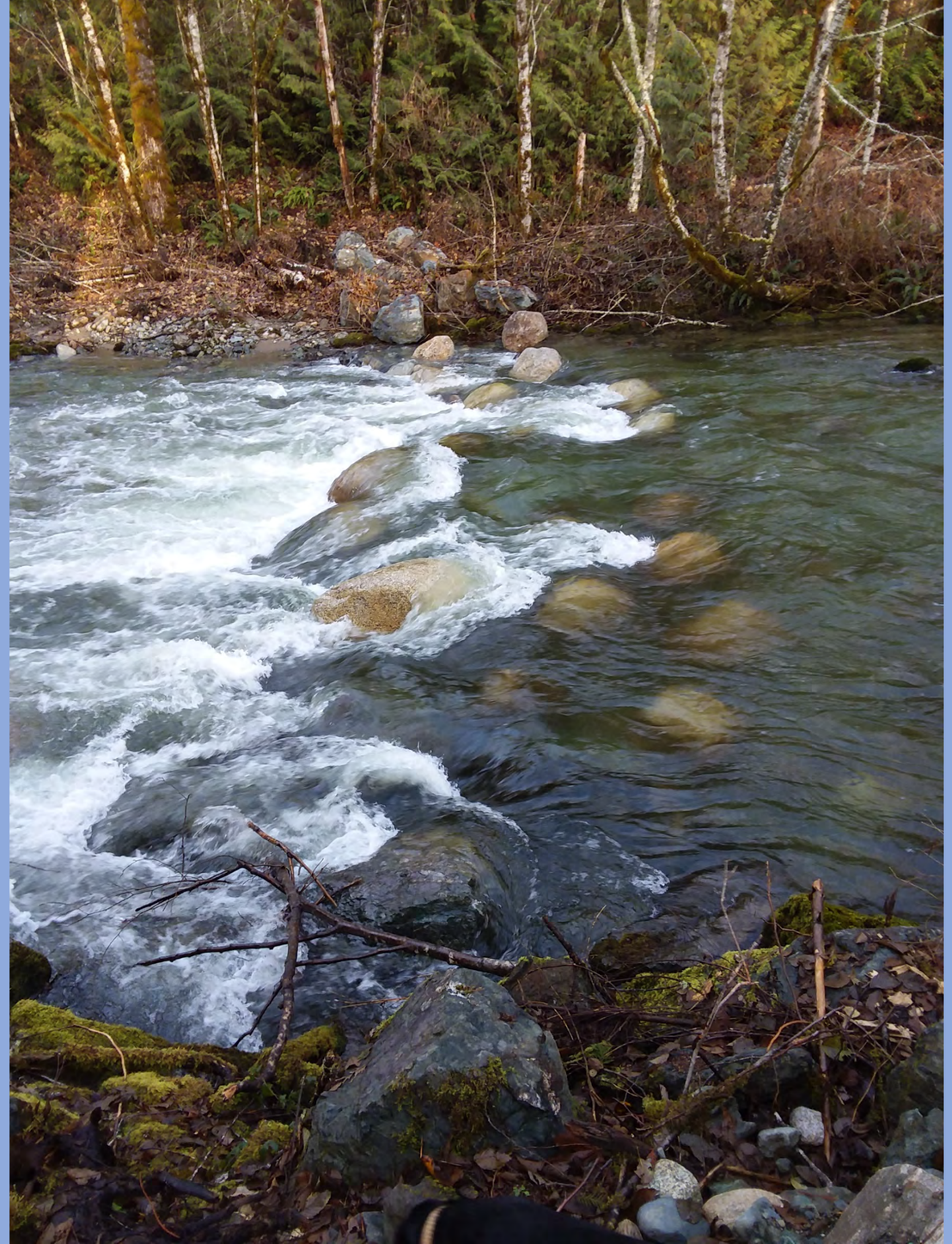
Dike/Rip-rap Removal



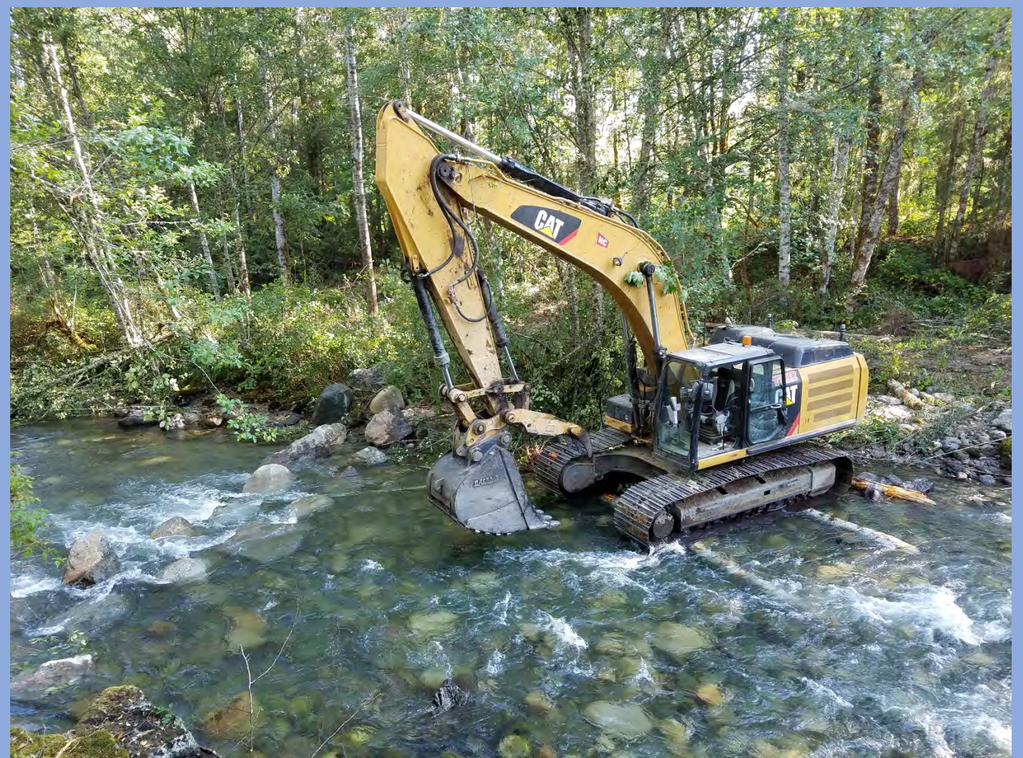
Habitat Log Jams

Fish Exclusion

Flood Fence Installation



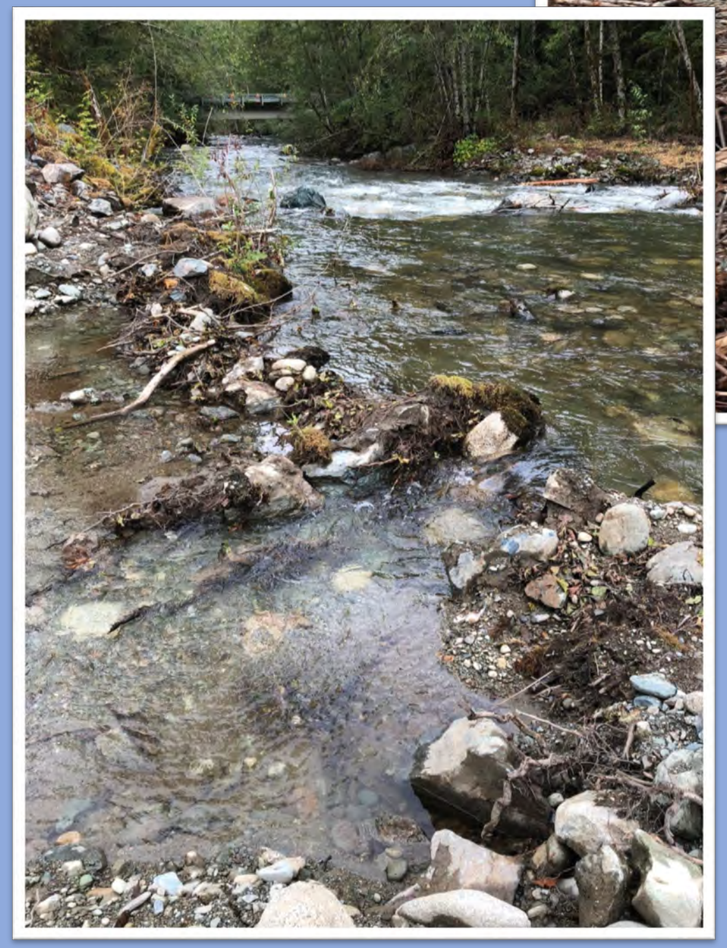
Adjustable Boulder
Grade Control


CAT

Ribbon Cutting 9/5/18

Starting to Take on Water….

9/22/2018



2019-01-16 13:40:00
T
59°F
HYPERFIRE 2 COVERT
RECONYX

2018-12-11 14:05:00 T
37°F
HYPERFIRE 2 COVERT
RECONYX

Drone Flight
2/26/2019
Jacob Tully