Streams & Fish — a Family's Journey

By:
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OTFS Annual Meeting

November 15, 2025

What we will cover:

- Our family's journey with water as part of a working forest
- Our microhydroelectric facility
- Culverts (why they can sometimes be a problem) & how we addressed them
- Engineered log jams – how we built them
- Spawning gravels – how we placed them
- Trees, water quality & stream temperatures – what we do
- Funding sources & costs for restoration projects – how we paid for all this
- References for further reading & viewing

Examples drawn from Suter Creek, a Medium/Large (very common size in our basin), type SSBT stream

Fish habitat restoration

Water quality assessing

Power production

Wetland restoration

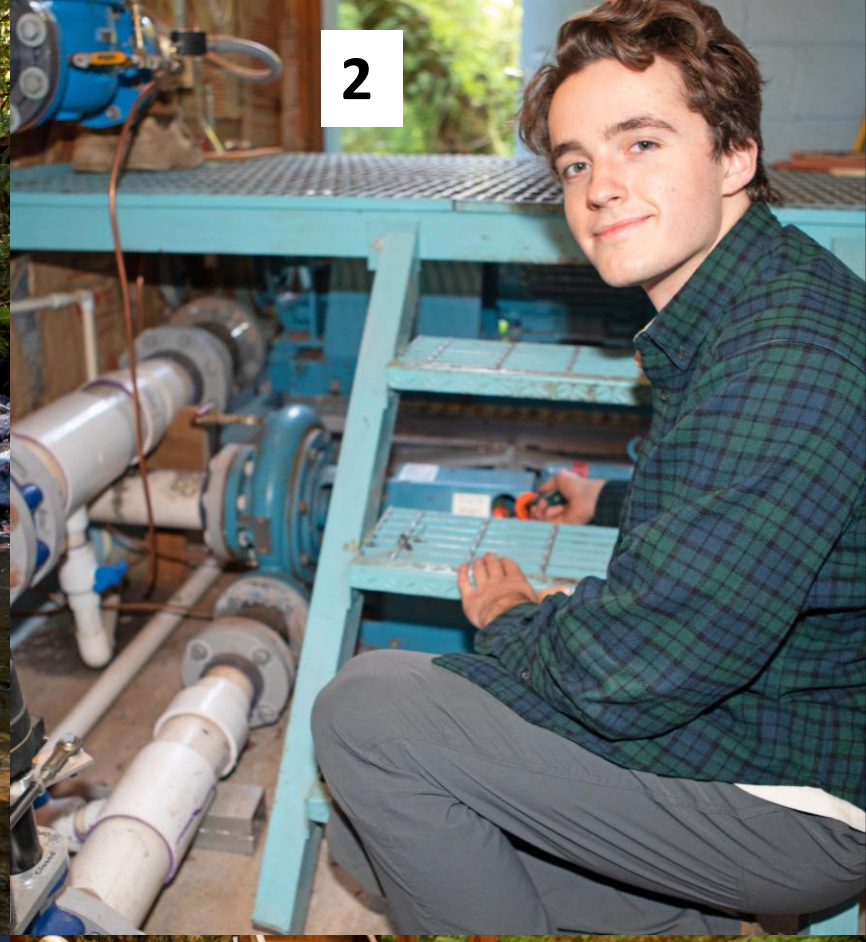
Stream temp monitoring

Nutrient enrichments

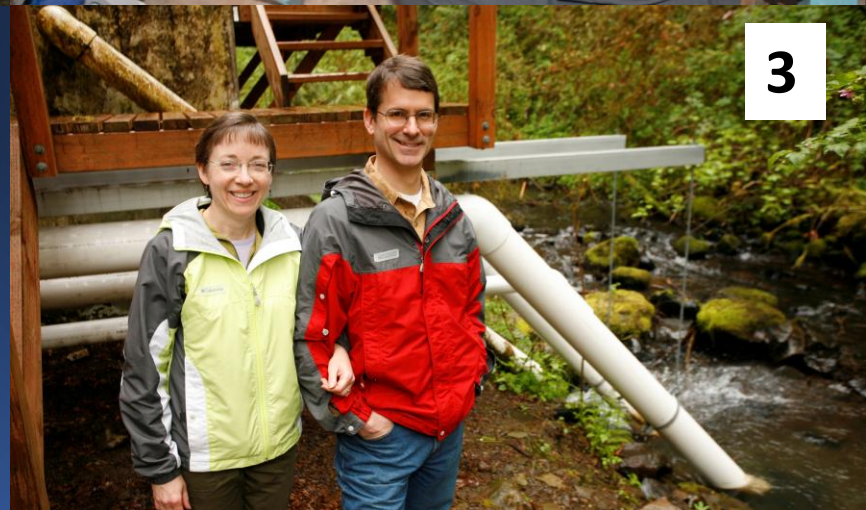
Our family's journey with water

Friends of the Eagle Creek Watershed

Clackamas River Basin Council



More about our microhydroelectric operation: 1.5 kW & 4.4 kW induction machines (pumps as turbines), 46’ head, 10” dia. x 750’ penstock, since 2008



Why do we do fish habitat restoration projects?
To keep our waters connected, complex, cool & clean, via:

1) Providing fish passage (Connected)

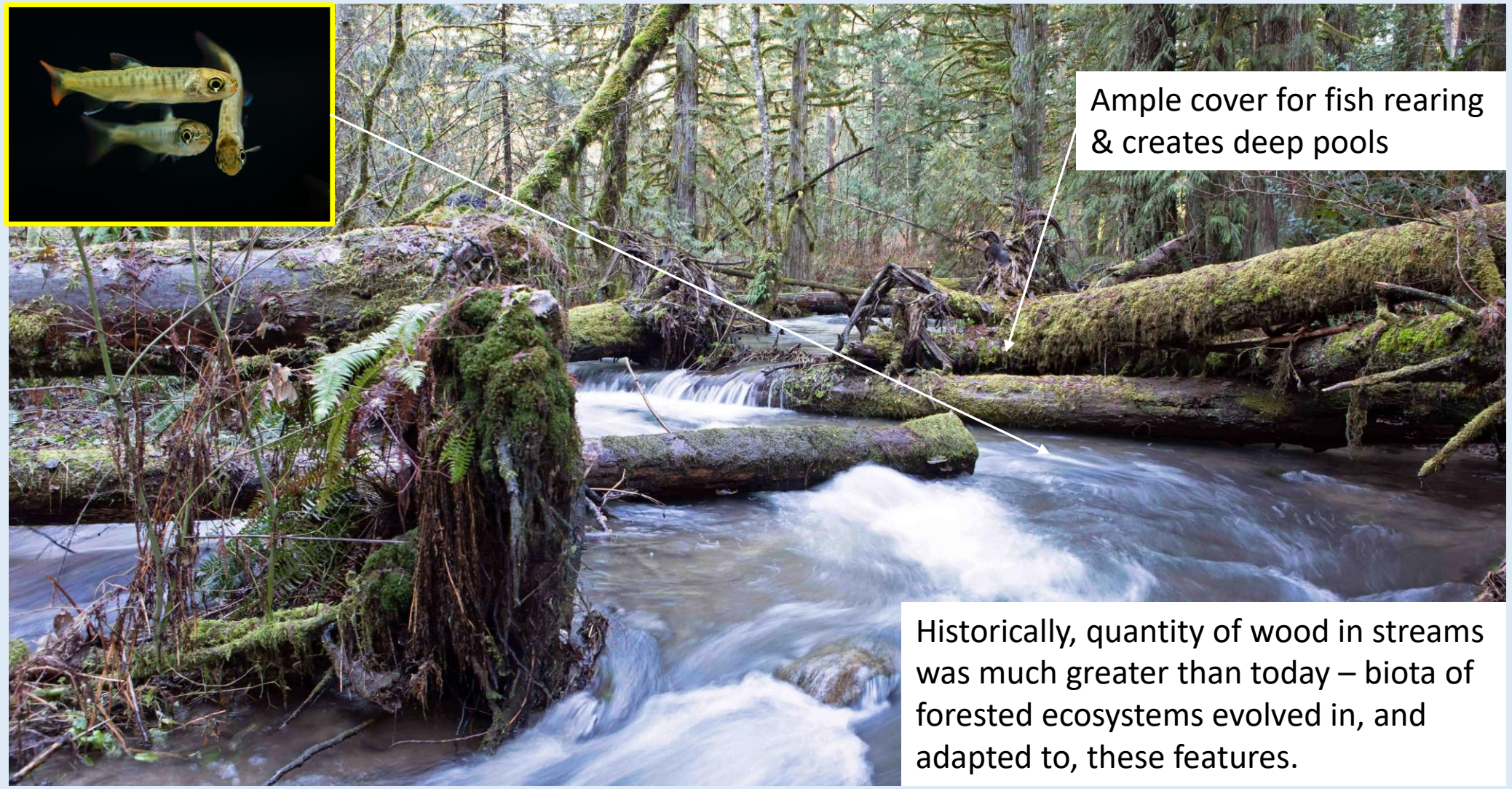
BEFORE

AFTER

Over 5 miles of stream opened to anadromy.

(2) – 6’-0” dia. culvert replacement with new bridge along Clausen Rd. at Suter Creek,
August 2016, Contractor: Pacific Bridge & Construction, Funder: Portland General Electric

2) Creating complexity (e.g. pools, alcoves, diverse flows & currents) & dissipating hydraulic (kinetic) energy in an otherwise simplified reach



Suter Creek – log placements in 2014, photo January 2022

3) Cool waters: Why are trees & tree canopies important?

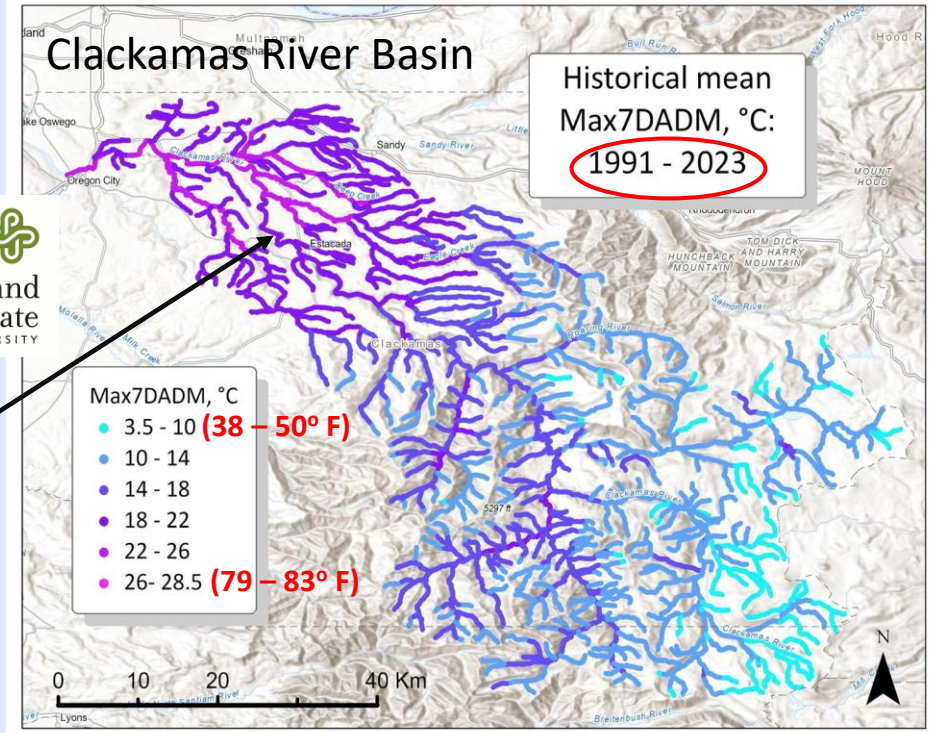
It's all about stream temperatures, bank stabilization, cover, future large wood and nutrients for aquatic insects (falling leaves, down wood, etc.)

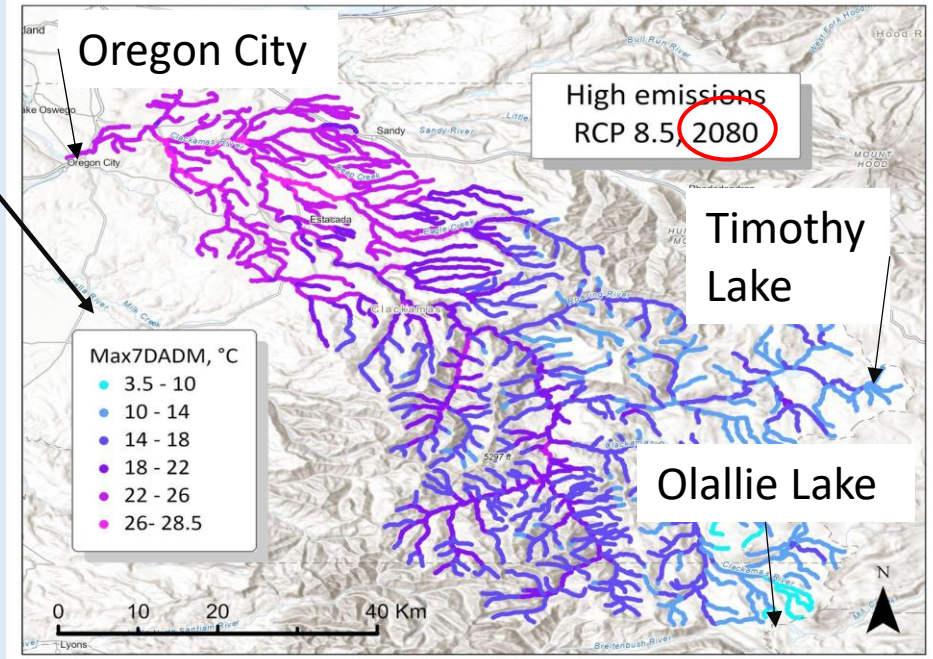
Where practicable, we must do what we can to increase tree canopy coverage of creeks to minimize summer stream temperatures.

Clackamas River

Stream temperatures: 7-day average of daily maximums (°C)

Salmonids begin to become stressed above about 20° C (68° F) and temperatures become lethal above about 25° C (77° F)





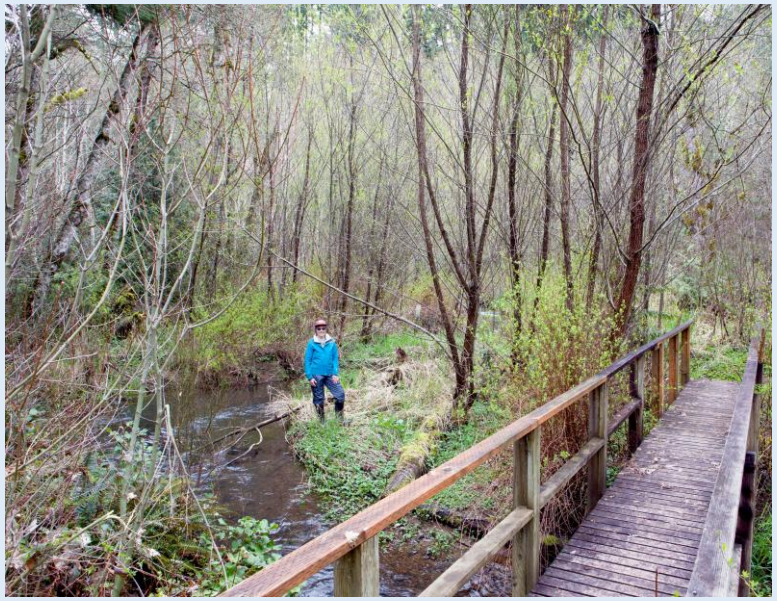
Tree Canopy Restoration

Extensive patches of invasive reed canary grass & blackberry initially treated in 2015

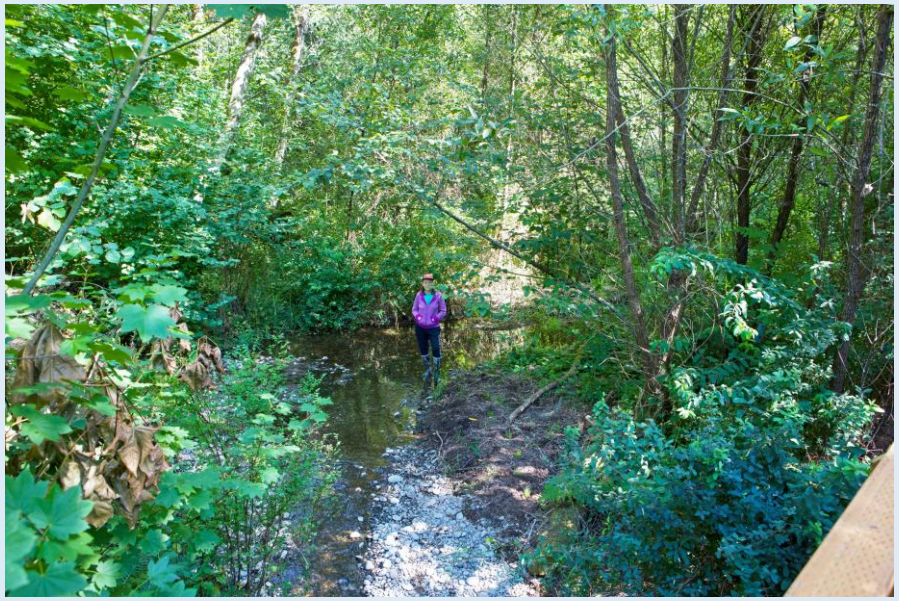
Flora species diversity:

17 species of native trees & shrubs (5,750 total) planted over a stream length of 1,866’ & 2.18 acres planted (Suter Creek) in 2016, several thousand more planted since, including sedges, rushes and grasses (ongoing work by our family).

April 2016 (planted February 2016)



April 2024



August 2025

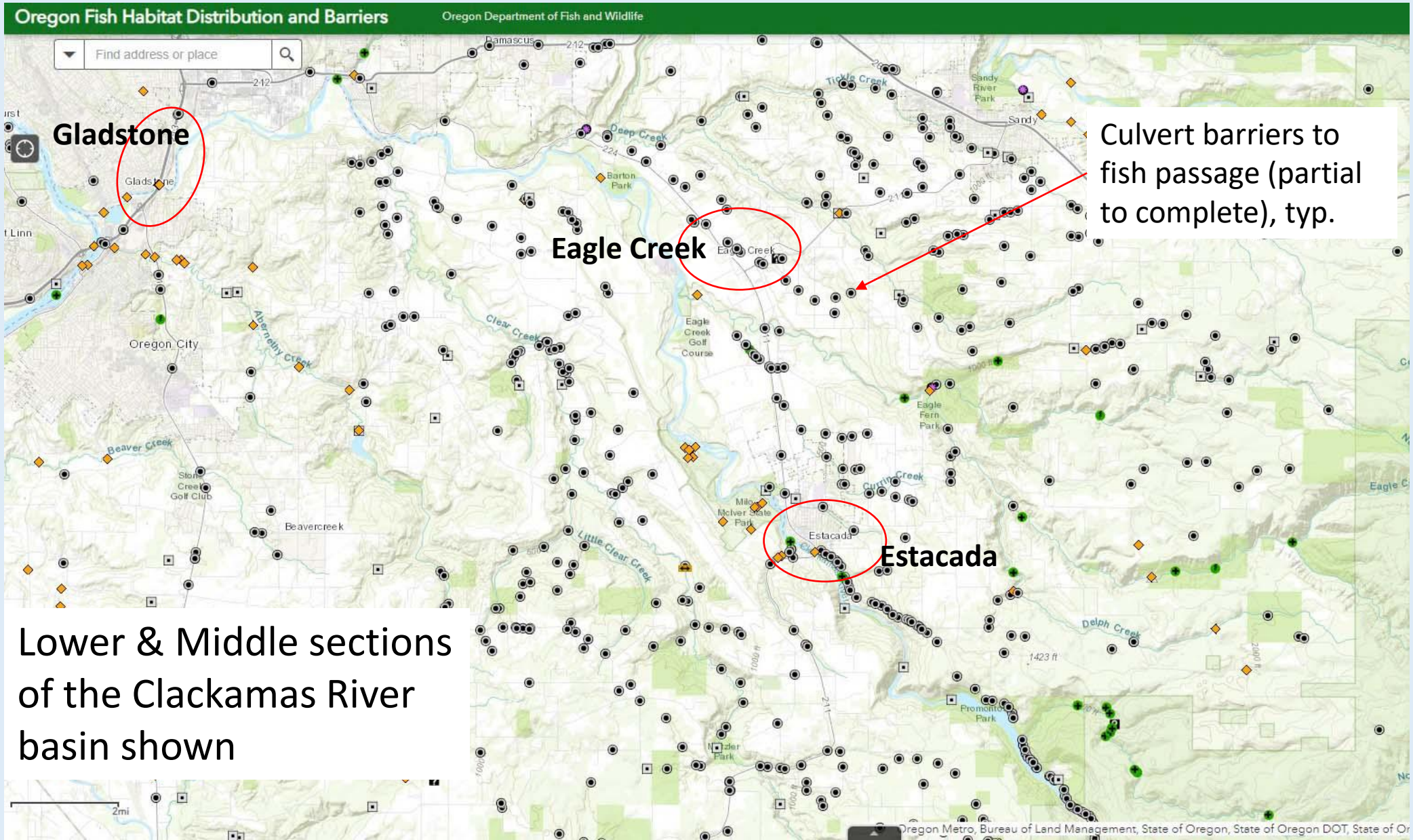
Suter Creek

Clackamas River Basin Council

Clackamas River Basin Council’s “Shade Our Streams” program, funded by Portland General Electric

Portland General Electric

Fish Passage Barriers (Culverts, mainly)



Culverts (temporary or permanent)

Perched about 2 feet

OLD

6’-0” diameter complete barrier to fish passage, installed ≈ 1972

Little Eagle Creek Culvert Upgrade per Private Forest Accord (PFA)

Coho redd found within culvert gravels November 2024

NEW

Design & construction cost about $304,000, 17’-0” clear span, 11’-2” rise (pipe-arch culvert) with stream simulation, PFA design criteria, permanent, private timber company logging road (completed in 2022)

How Nature does large wood jams :

Lookout Cr., HJ Andrews Exp. Forest, Willamette NF, 2011

Diamond Cr., Willamette NF, 2019

Lowe Cr., Mt. Hood NF, 2019

Eagle Cr., Salmon-Huckleberry Wilderness, 2019

Engineered Log Jams (to mimic Nature):

Suter Creek Large Wood Project – 2014 [50 logs in 8 log jams]; 2016 [15 logs in 3 log jams]; 2017 [25 logs in 4 log jams]; 2020 [100 logs in 22 log jams]; 2023 [20 logs in 4 jams] — 210 logs, total

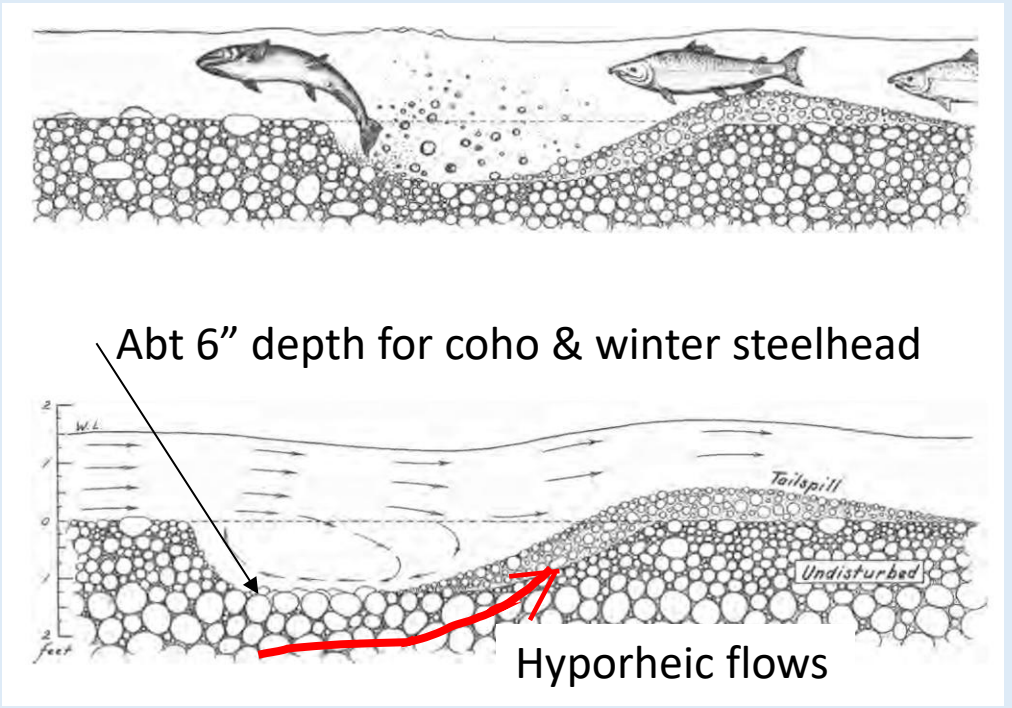
July 2014 (BEFORE)

October 2014 (AFTER)

Why are Gravels Important? It's where salmon make their nests (redds)

Probable location of eggs buried beneath gravels

Female building her redd



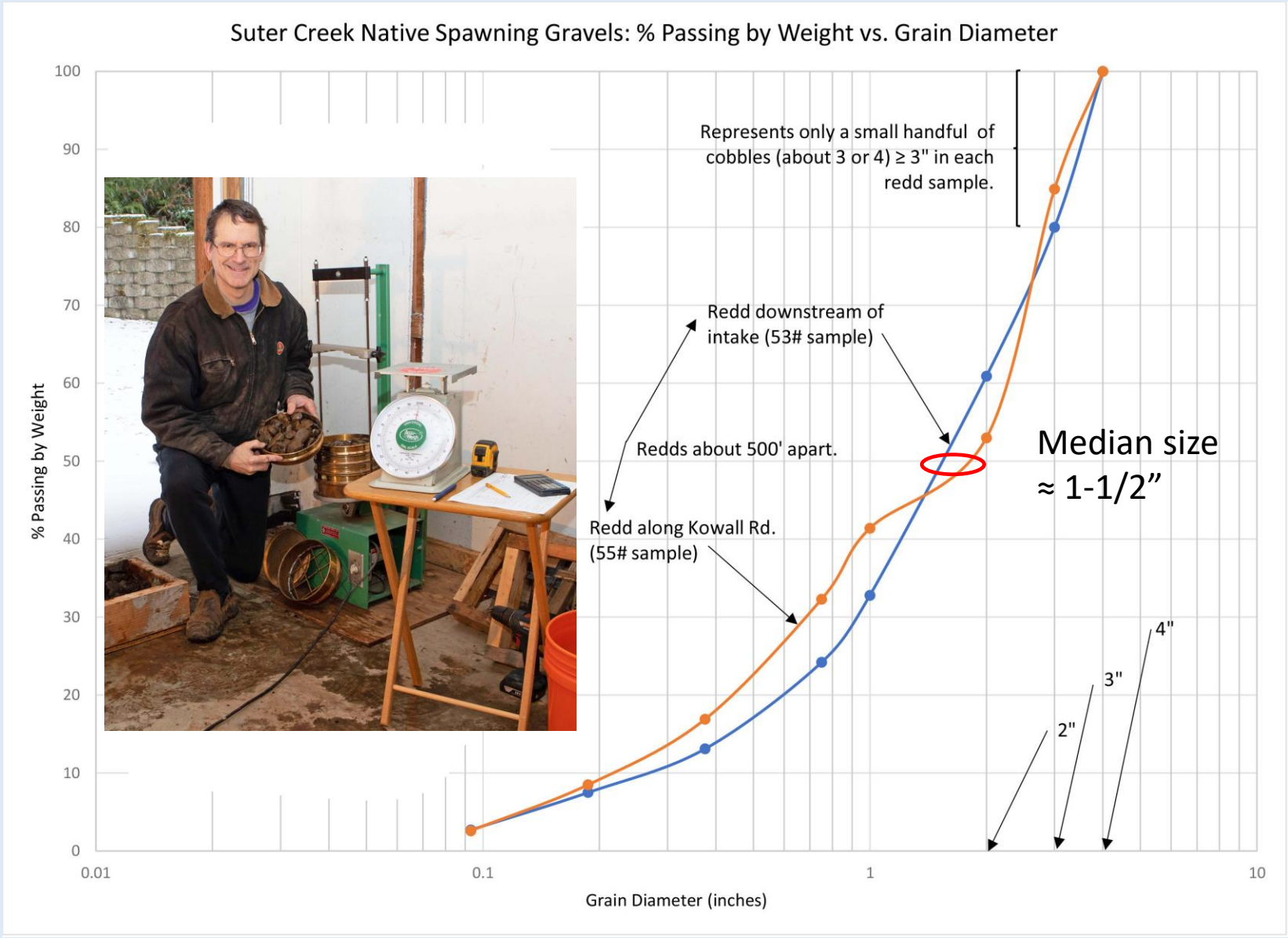
Currents within a redd

(Source: Burner, 1951)

Gravel sizing:

Purchase drain rock sizes you need from local quarry (e.g. 3/8”, ¾”, 1-1/2”, 3”) and either mix them yourself or see if they can do it at the quarry.

Since 2017, we have added over 200 tons of gravels.



On your next logging project consider:

- Minimize stream crossings.
- Check your road drainage system. (Minimizes runoff & sedimentation into your stream.)
- Identify & remedy active/inactive roads that are barriers for fish passage. Vacate inactive roads.
- Place large wood, boulders and gravels (with consultation with ODFW & ODF, add to NOAP) in your creek. Donate some trees, boulders or gravels to the cause. Utilize the services of your logger & their equipment already onsite.
- Increase RMA plant diversity (forbs, shrubs & trees)
- Work with your consulting forester and/or stewardship forester for additional advice.

RMA = Riparian Management Area (are locally specified and have requirements for retaining trees, snags & understory vegetation, and for limited or modified forest practices)

Potential Outside Funding Sources

- Consult your local watershed basin council, soil & water conservation district, ODF (stewardship forester & SFISH), ODFW (PFA Mitigation Grant), ODA or NRCS office (technical assistance, grant programs, tax incentives, cost shares, etc.), & Port Blakely (within their area of operations)
- New programs are being created almost every day!

OWEB

CLACKAMAS SOIL AND WATER CONSERVATION DISTRICT
Good dirt. Clean water.

OREGON DEPARTMENT OF AGRICULTURE
Protect. Promote. Prosper.

Clackamas River Basin Council

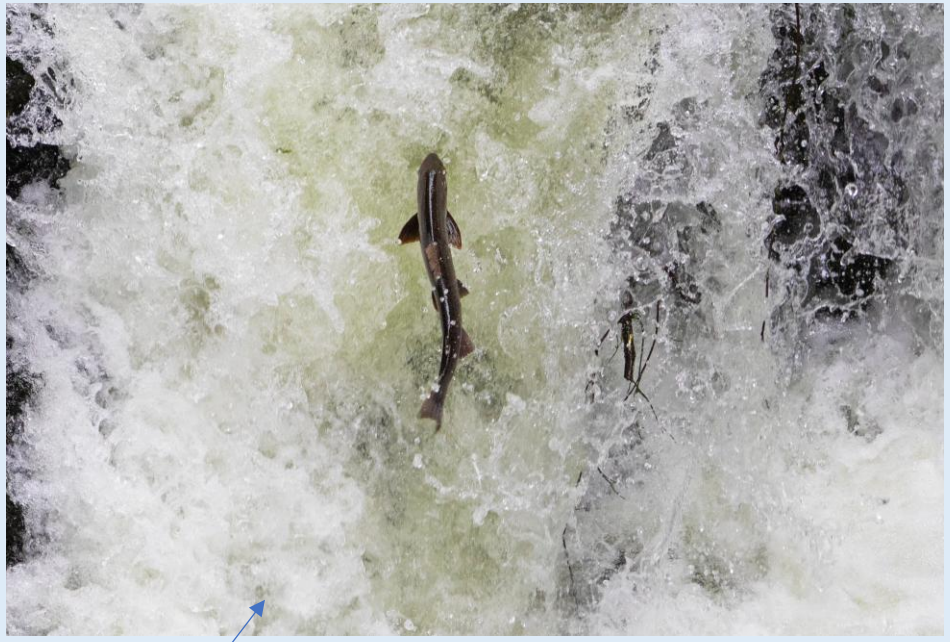
OREGON DEPARTMENT OF FORESTRY

State of OREGON Fish & Wildlife

USDA NRCS
U.S. Department of Agriculture
Natural Resources Conservation Service

Summary

- Landowners, while working with the appropriate state/county offices and nonprofit organizations, can seek funding to restore streams and riparian areas within their properties.
- Many of these projects can be done with just a good amount of common sense and working with the right agencies – they want you succeed!
- For those areas with sparse or no tree canopies, implement a tree-planting program. Increasing stream temperatures are becoming a major concern. Also, trees provide a source of future, in-stream large wood.
- Tinker with caution, know your limits (seek design guidance as required) and realize that Nature will always be testing your efforts.



Migrating – Fall 2020

Suter Creek

Rearing – Summer 2021

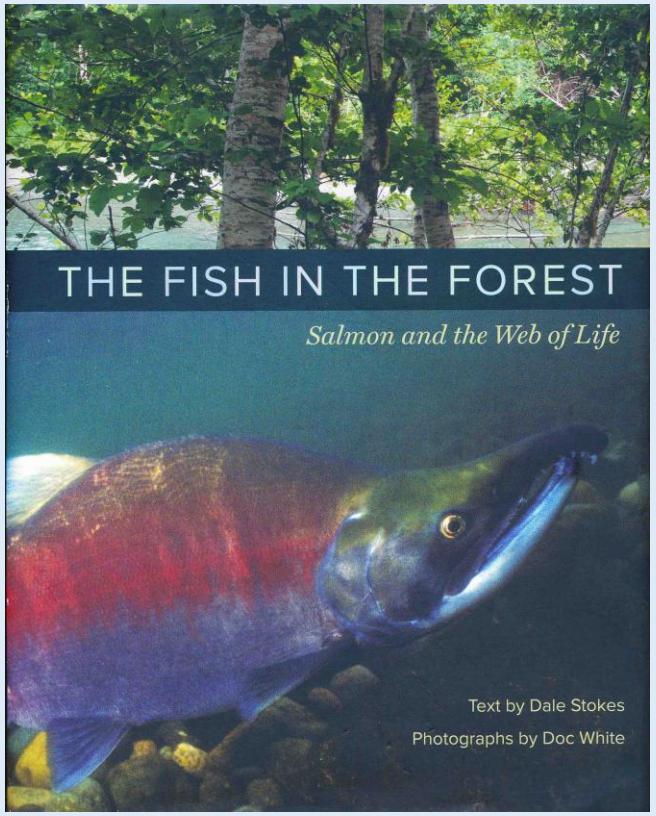
Spawning – Fall 2020

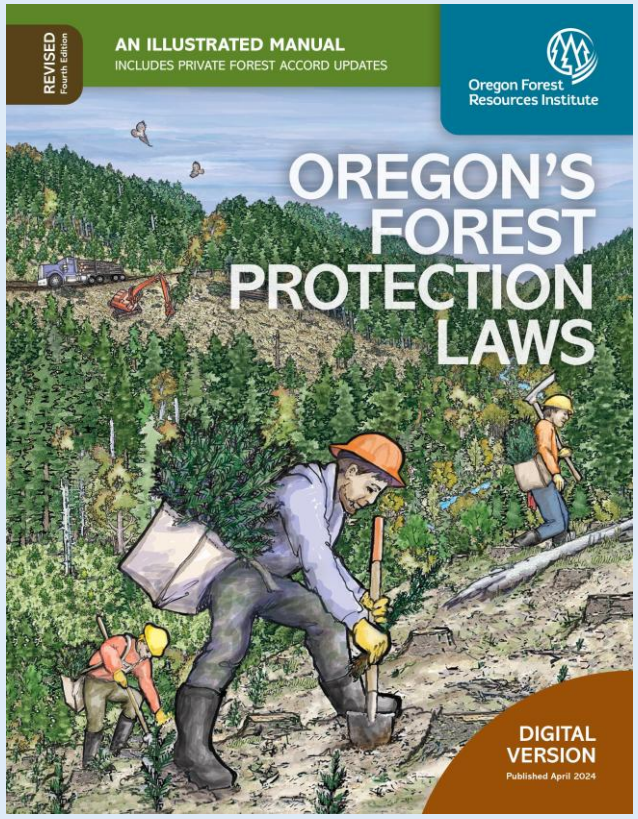
References for further reading:

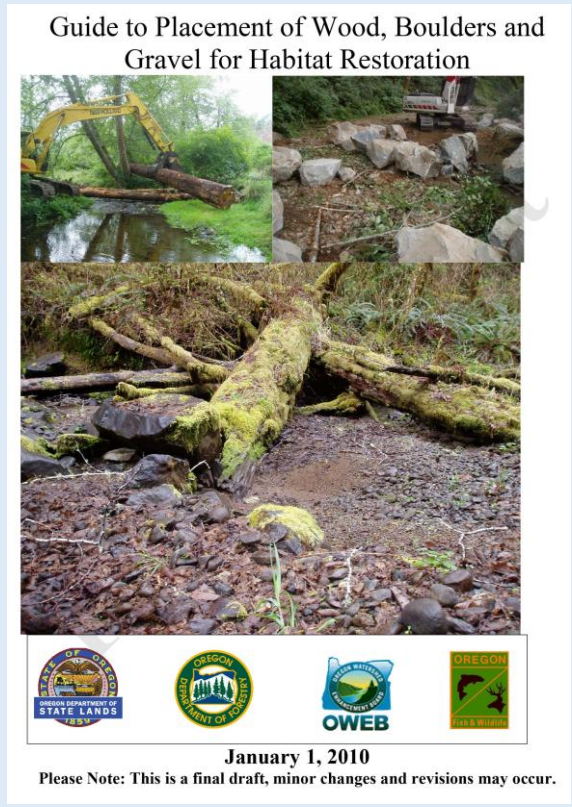
Just to name a few, there are many more! Visit the OFRI website and your local public library.

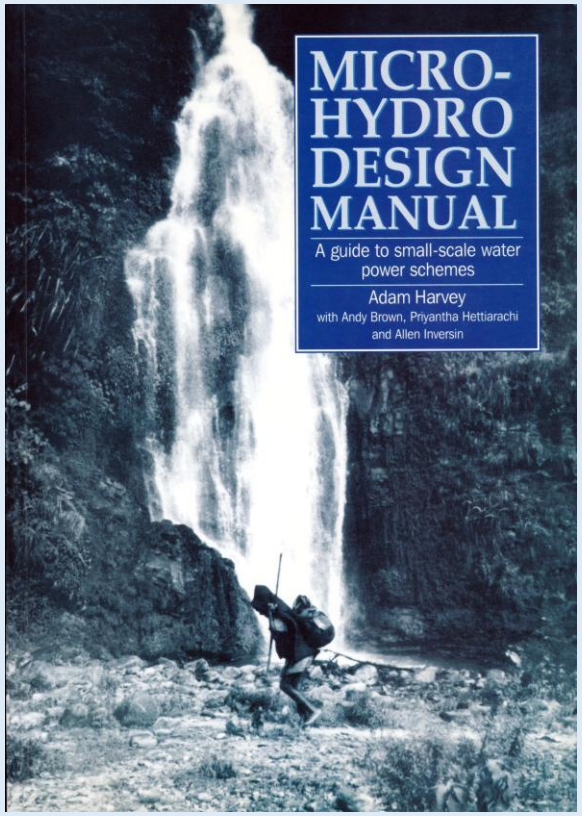
Fish & Forests:

Microhydro:





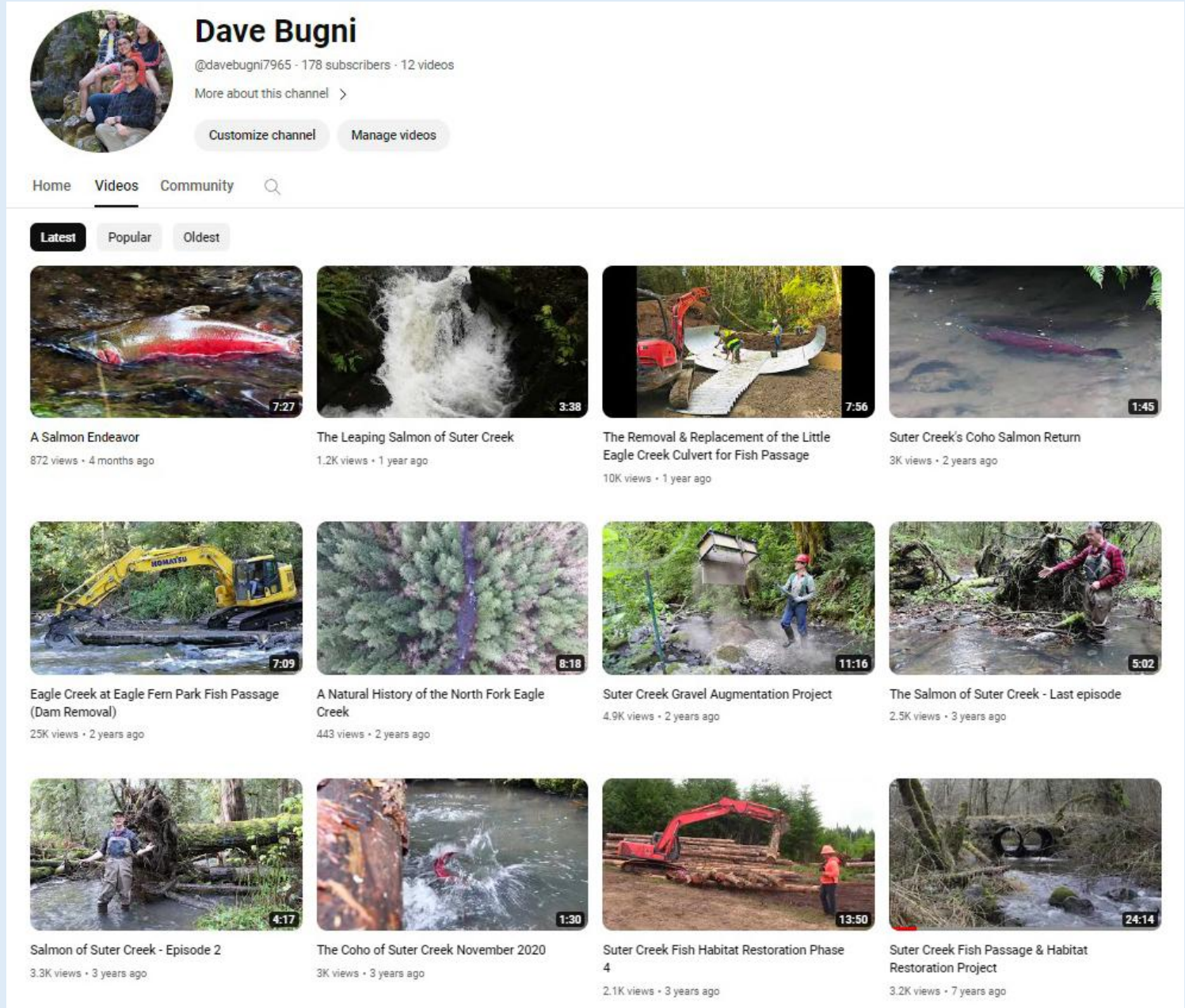




For some informational videos about much of this work:

Check out some of the videos on my YouTube channel:

https://www.youtube.com/@davebugni7965/videos









The End

... in nature nothing exists alone.

Rachel Carson, *Silent Spring*: chapter 4