

How to proceed?

Goal seemed unachieved, and unachievable
...what to do?

Established actionable performance
standard of $\geq 98\%$. Now we could act.

Built upon existing behavioral bypass
system to increase fish guidance past
turbine intakes (improved hydraulics
and 2nd bypass route), but...

...the but

- ✓ Also had to PROVE performance standards (survival and injury) were actually being met with the alternative bypass system.

Different than if Criteria Screens built (primarily centered on showing compliance with hydraulic criteria)

- ✓ Tim Shibahara will describe the “proving” part of our downstream passage system.



Willamette Falls Project Description



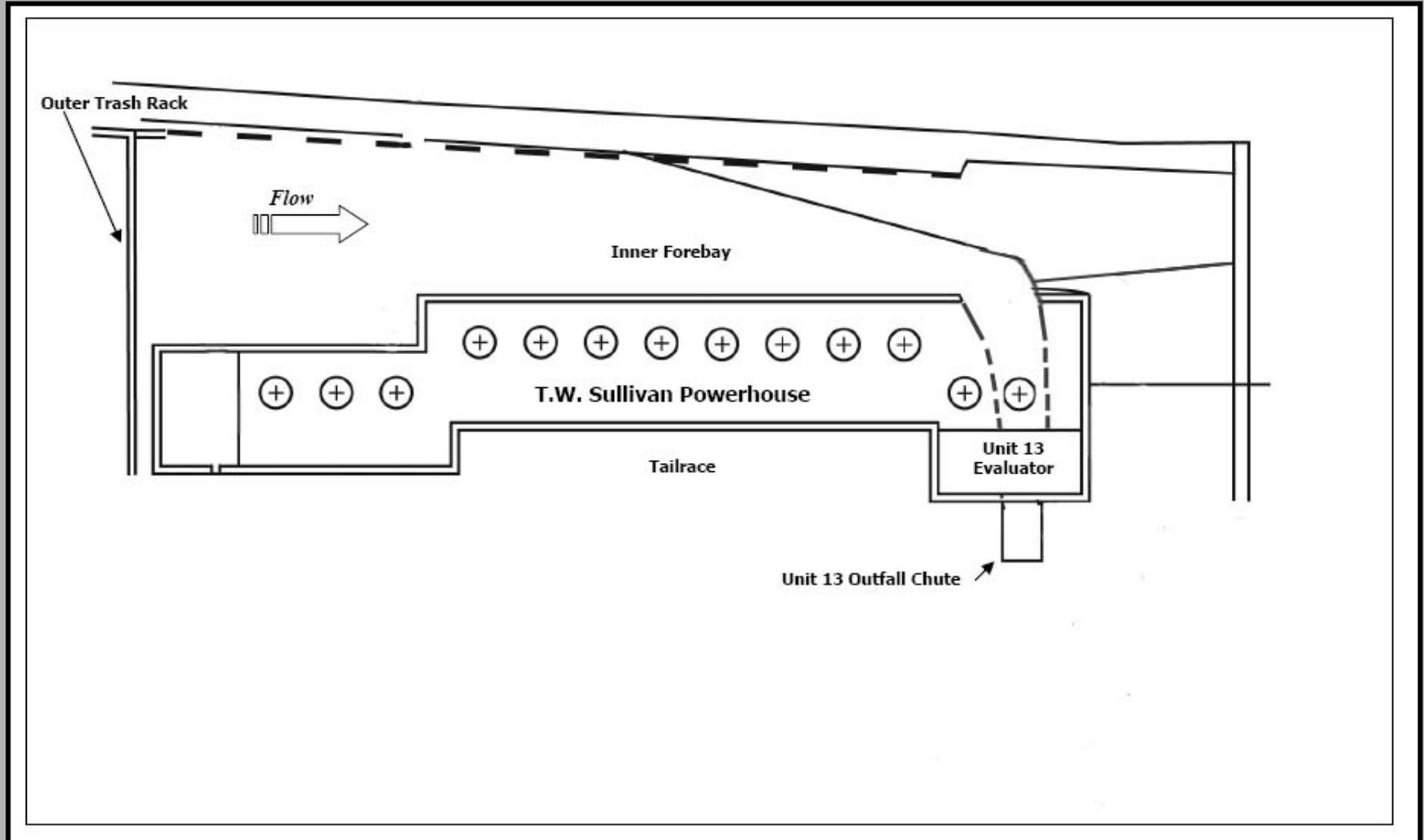
Project Details

- 1895
- Powerhouse Capacity
~ 6,000 cfs
- 13 units - 16 MW
- 40 ft head

T.W. Sullivan Forebay



- Fish Passage Prior to Recent License (2005)



T.W. Sullivan Powerhouse

- Pre-License Conditions



Fish Passage Methods

- Eicher Screen
- Louver Rack System
- Seasonal Shutdowns

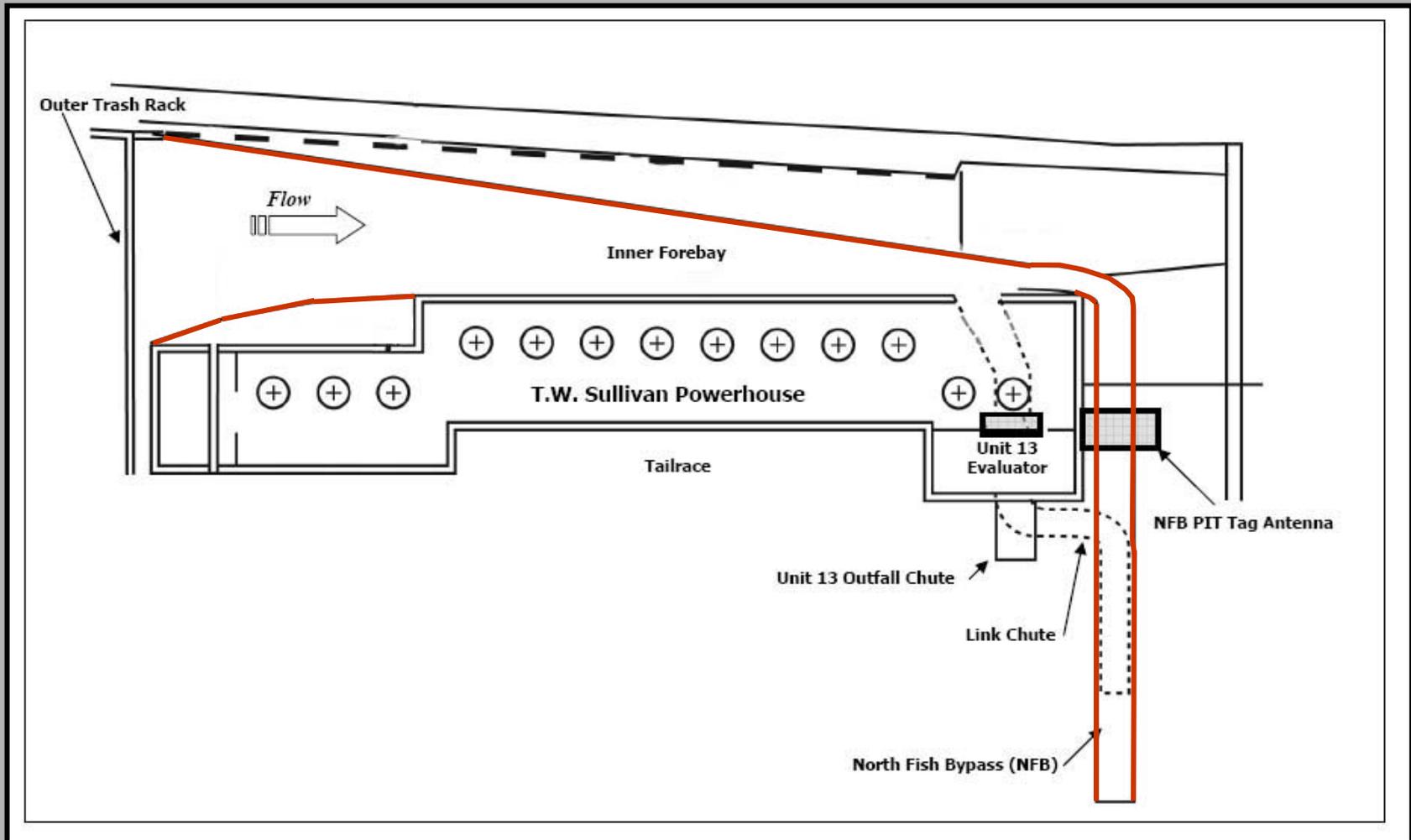
Fish Guidance Efficiency

- 84 % Chinook
- 76 % steelhead

Turbine Survival

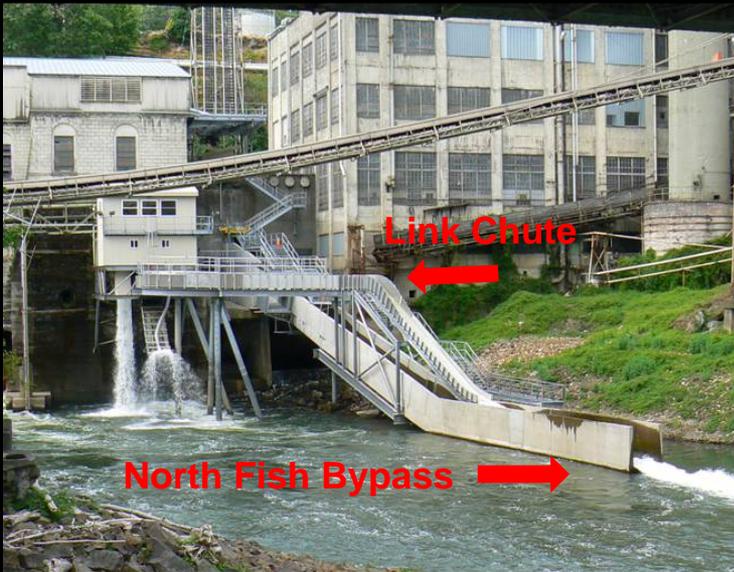
- ~88% Chinook
- ~90% steelhead

T.W. Sullivan Forebay Modifications





T.W. Sullivan Forebay Modifications



T.W. Sullivan Recent Modifications

- North Fish Bypass (NFB)



- Construction 2006
- Surface Flow Bypass
- 500 cfs design flow
- Velocity - 42 fps
- PIT Tag Antennae



T.W. Sullivan Fish Bypass

- Performance Evaluations



Fish Guidance Efficiency (FGE) Methods

- Run of River Hatchery Chinook and steelhead
- Spring and Fall Testing
- PIT Tags

Injury and Survival Methods

- Hatchery Chinook and steelhead
- Balloon Tag Fish (Hi-Z Turbine tags)
- Evaluate Two Flow Conditions and 3 bypass sections

Project Performance

Estimates based on:

- FGE
- Route based survival (Bypass vs. Turbine Passage)





T.W. Sullivan

- Fish Guidance Efficiency (FGE)



Chinook

n = 10,690

Spring and Fall

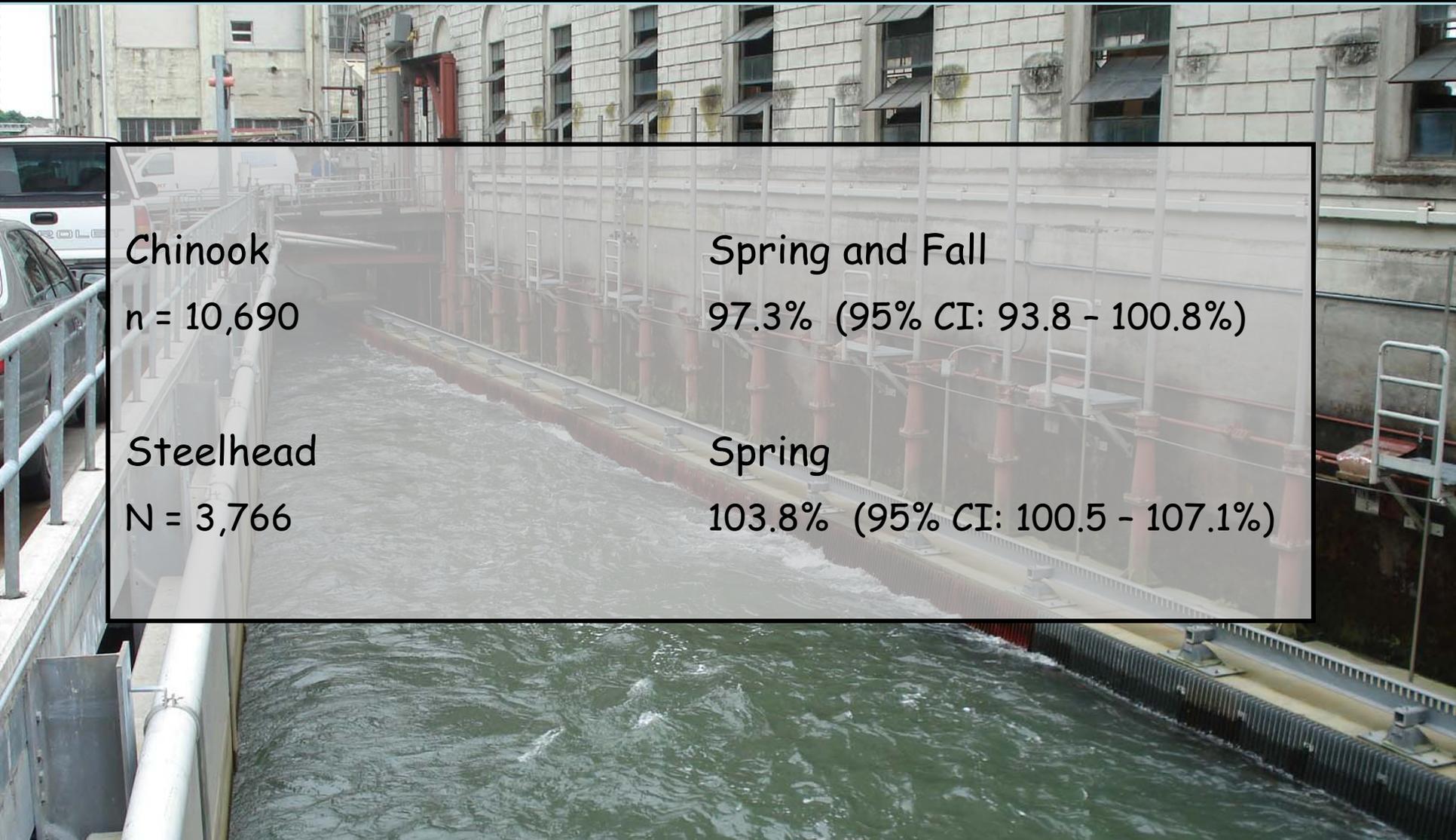
97.3% (95% CI: 93.8 - 100.8%)

Steelhead

N = 3,766

Spring

103.8% (95% CI: 100.5 - 107.1%)



T.W. Sullivan - 48 hr Survival Estimates

- NFB, Link Chute and Outfall Chute



Tested Conditions

- North Fish Bypass (250/400 cfs)
- Link Chute (250/400 cfs)
- Outfall Chute 40 cfs

2008 Survival Estimate

<u>Species</u>	<u>Estimate</u>	<u>CI</u>	<u>n</u>
Chinook	100%	+/- 2.5%	1,832
Steelhead	98.4% - 100%	+/- 2.5%	755

T.W. Sullivan Powerhouse

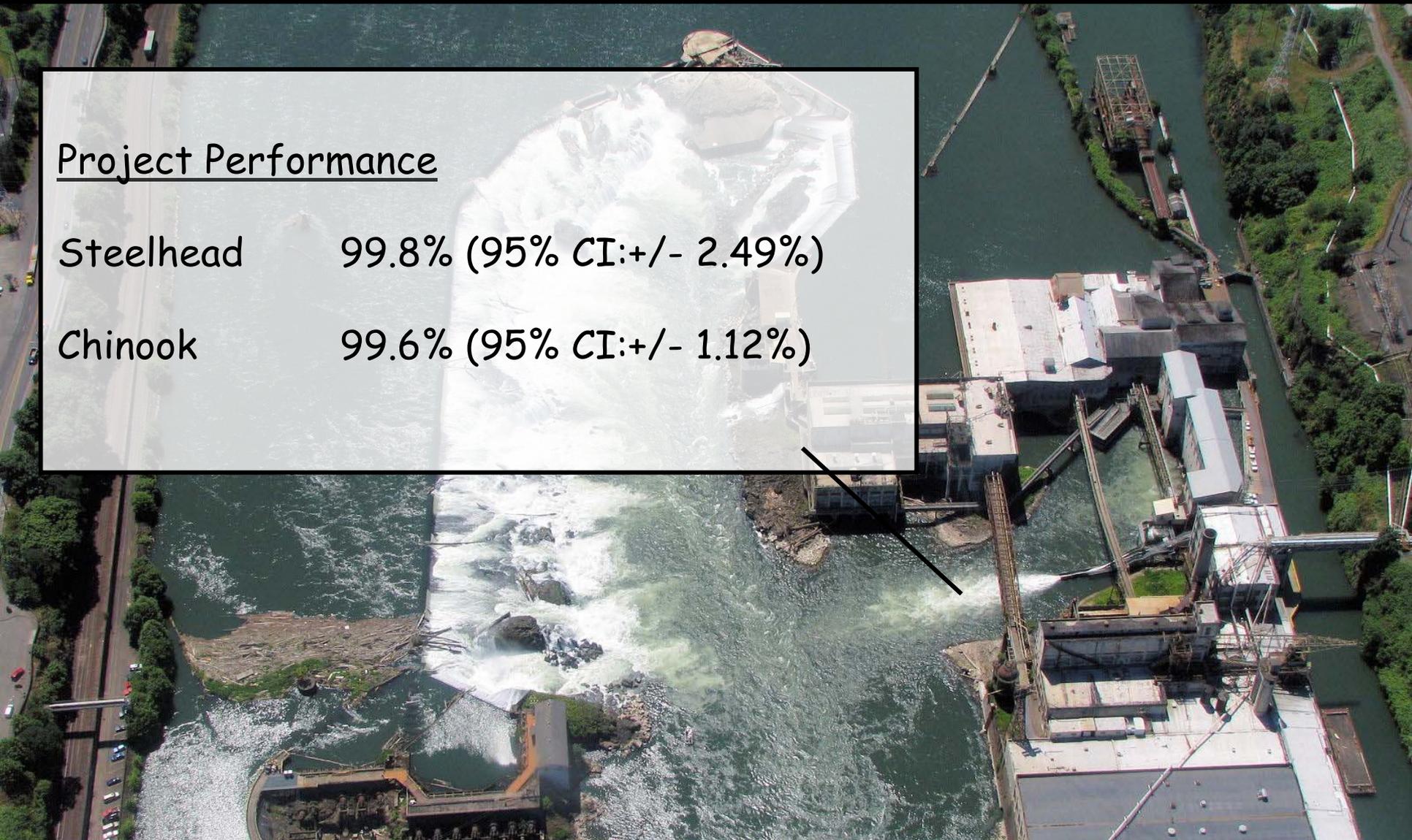


- Project Performance

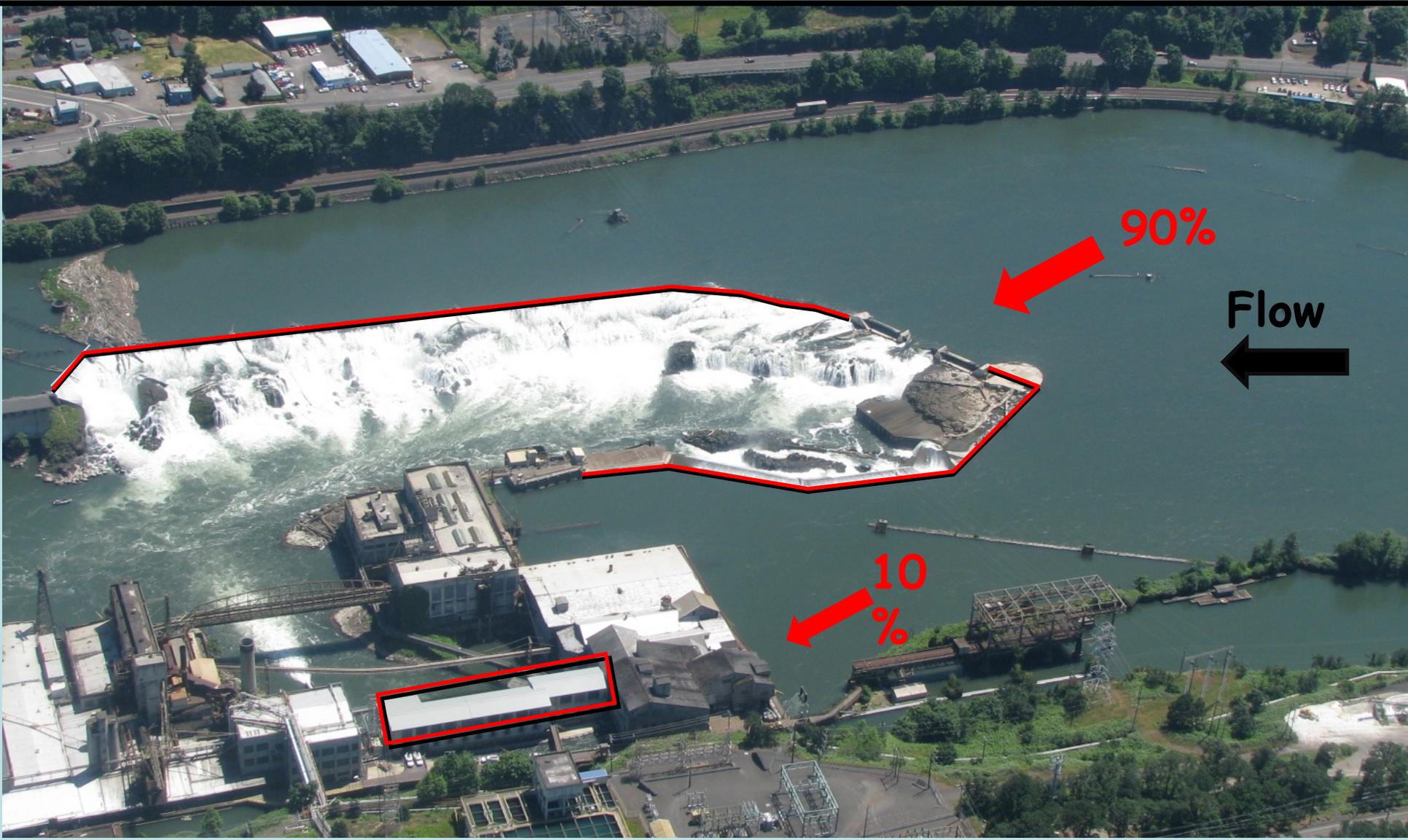
Project Performance

Steelhead 99.8% (95% CI: +/- 2.49%)

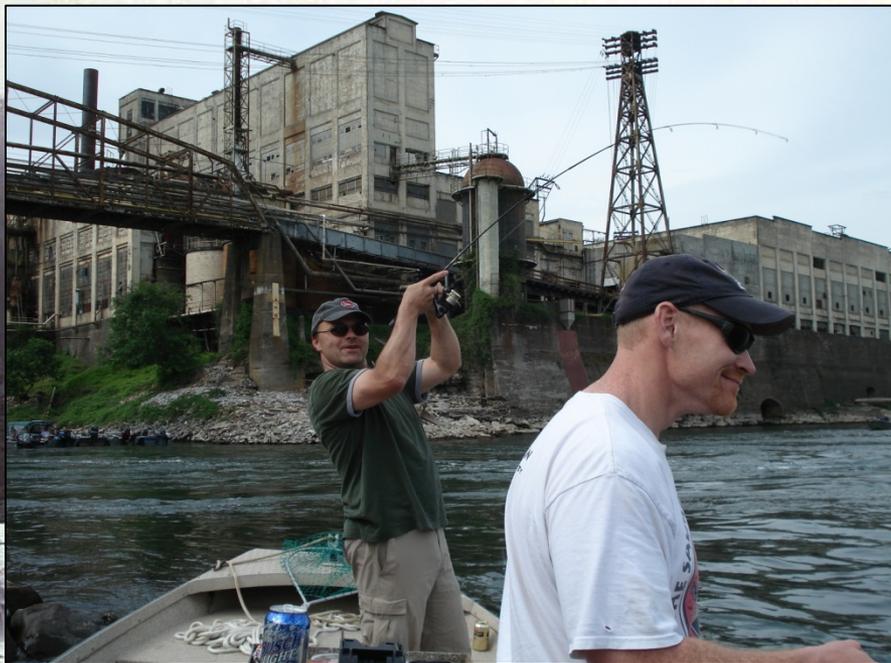
Chinook 99.6% (95% CI: +/- 1.12%)



Willamette Falls Verification Study



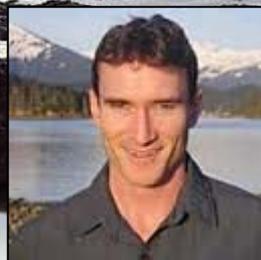
End



Chris Karchesky and Crew
at Normandeau Associates



Dan Domina

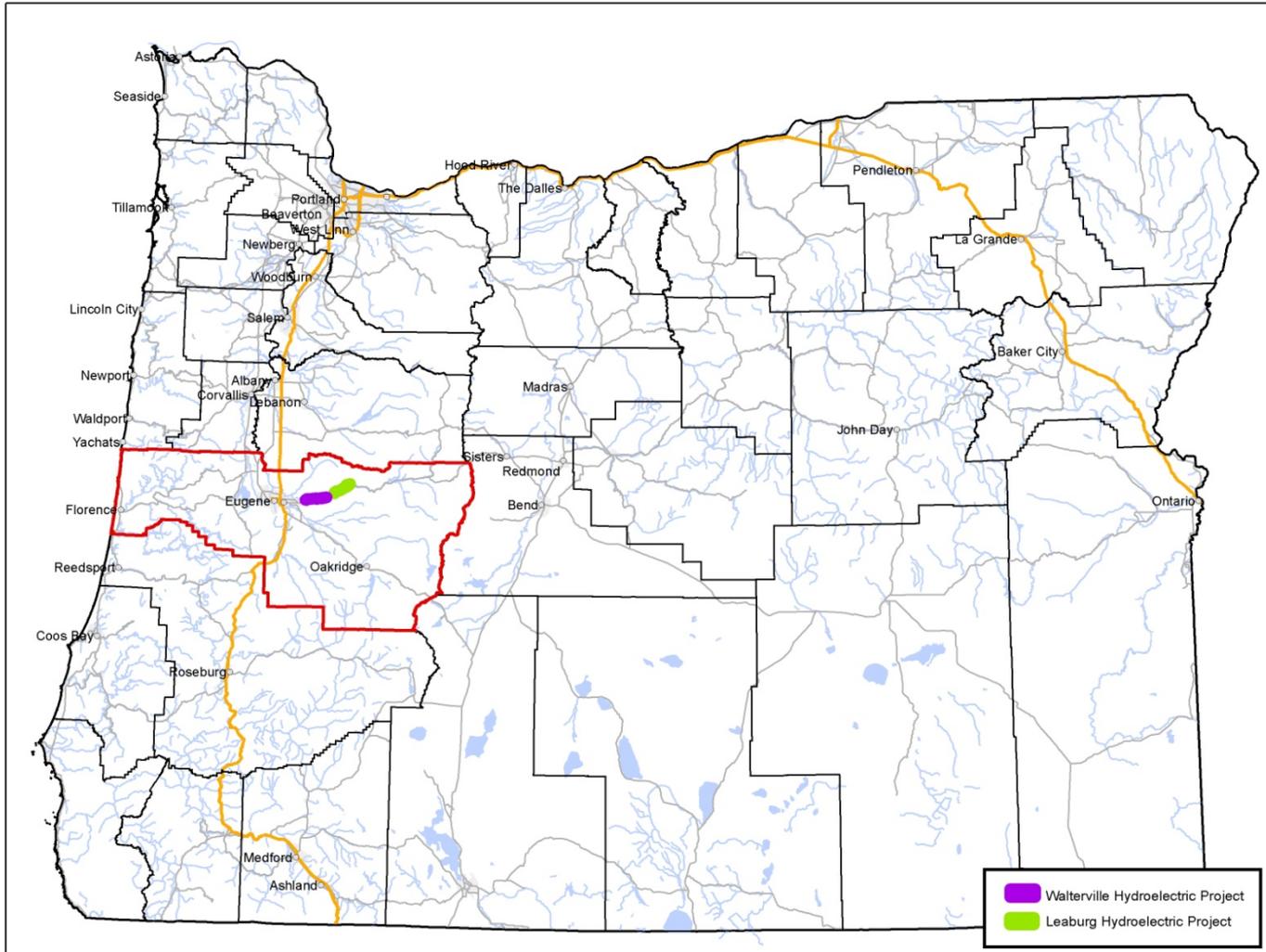


Brian Pyper of Fish Metrics



Mark Zinniker
Dan Olmstead
Lisa McLaughlin

Leaburg-Walterville Project





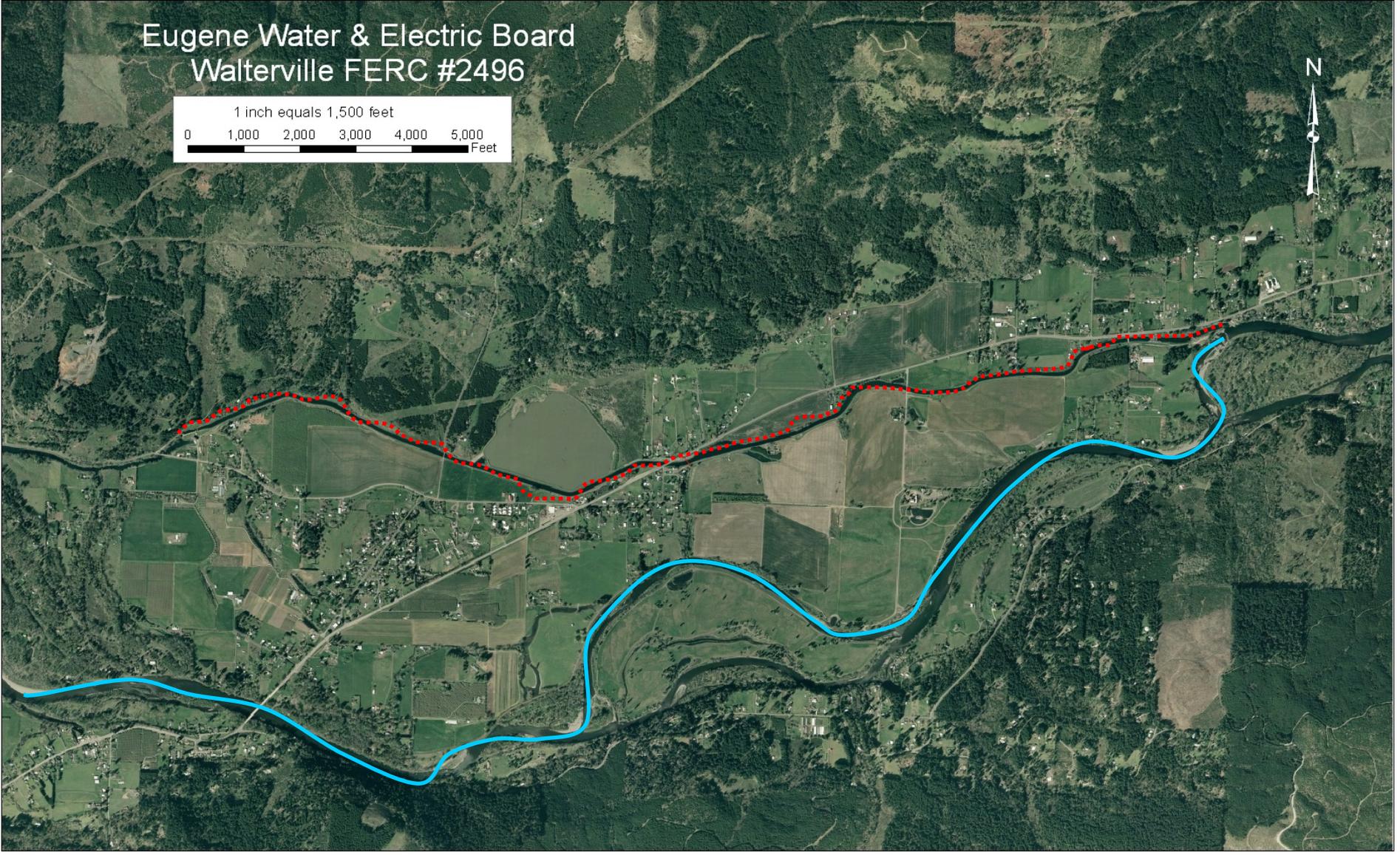
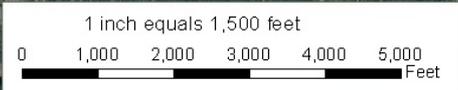
Federally Threatened
Bull Trout



Federally Threatened
Spring Chinook Salmon

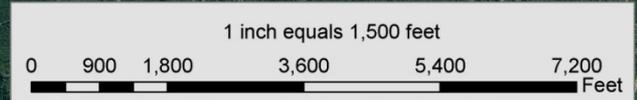


Eugene Water & Electric Board
Walterville FERC #2496



Walterville Canal

Eugene Water & Electric Board
Leaburg Canal



Leaburg Canal



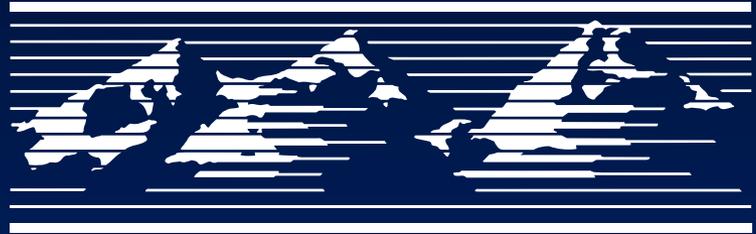
Waltherville Powerhouse – 1941
1 Kaplan Unit – 9MW







No. 1222 - Widening Walterville Canal - Looking down canal past Oscar
Millican rock point - Dec. 22, 1923 no negative



EWEB

Eugene Water & Electric Board

Walterville Return Channel Modifications

Fall 2010