# Cowlitz Falls North Shore Collector Fish Collection 2017 - 2018

Chris Noyes

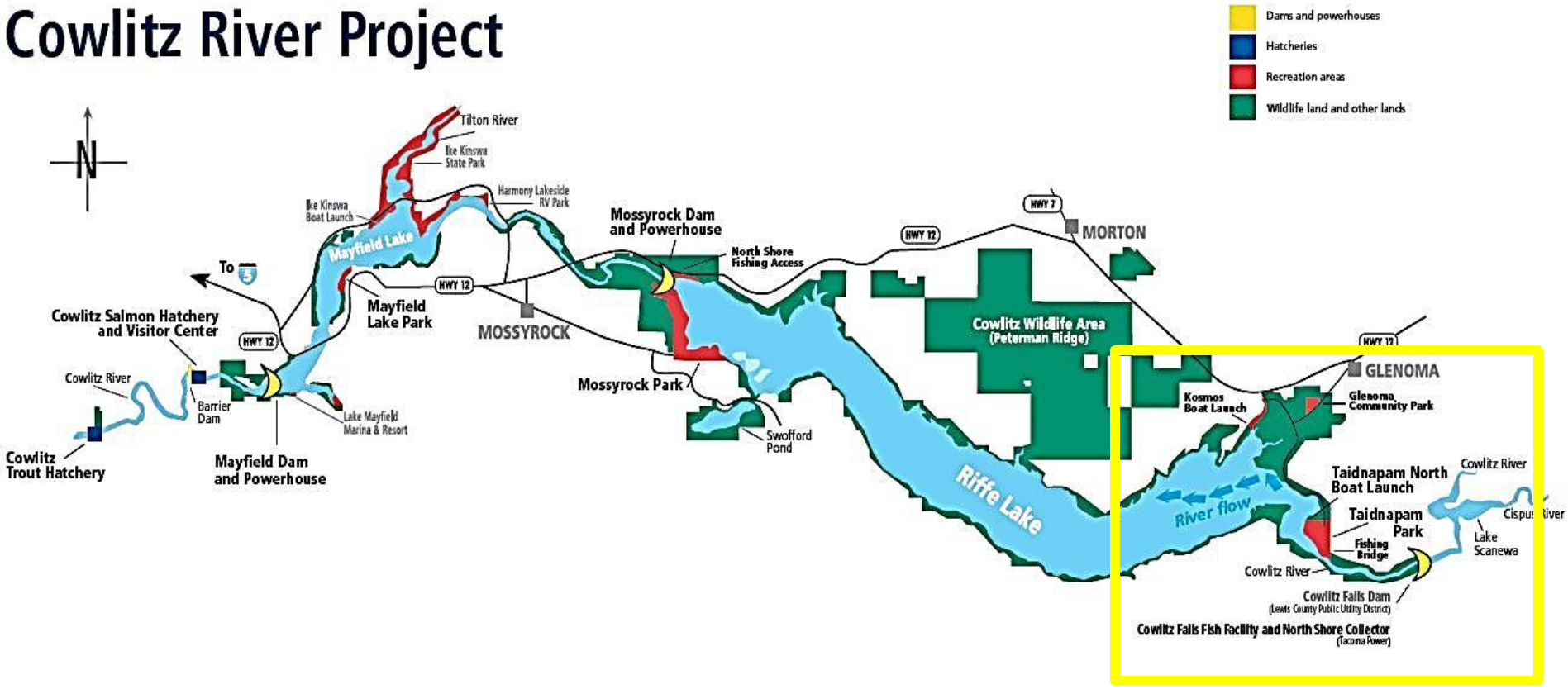
Cowlitz River Annual Project Review and Fisheries Science Conference

July 10, 2019

# Outline

- Cowlitz Falls Overview
- Fish Collection History
- Cowlitz Falls North Shore Collector
- 2017 - 2018 Monitoring Results
- Next Steps

# Cowlitz River Project



# Cowlitz Falls Project

**Dam Owner**

**Lewis County PUD**

**Cowlitz Falls Fish Facility Owner**

**Tacoma Power**

- **Formerly owned by the Bonneville Power Administration**
- **Formerly operated by WDFW**

# Cowlitz Falls Timeline

**1994**
Dam construction

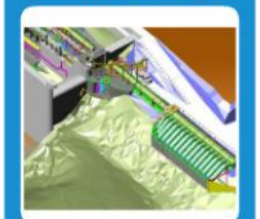
**2003**
FERC issues new 35-year license to Tacoma Power

**2003-2009**
Tacoma Power's initial fish collection efforts

**2009**
Tacoma Power forms Downstream Fish Passage Team

**2012-2014**
Long-term agreement negotiated and signed

**2013-2015**
Collector design



**2016-2017**
Collector commissioning and balancing

**2017-future**
Operation and adaptive management

**1994-2003**
BPA fish collection efforts

**2003-2015**
Annual access agreements

**2003-2015**
Fish studies at Cowlitz Falls and Riffe Lake

**2012**
DFPT finalizes Conceptual Design Report

**2012-present**
Adaptive Management Workgroup

**2015-2017**
Collector construction

# Cowlitz Falls North Shore Collector

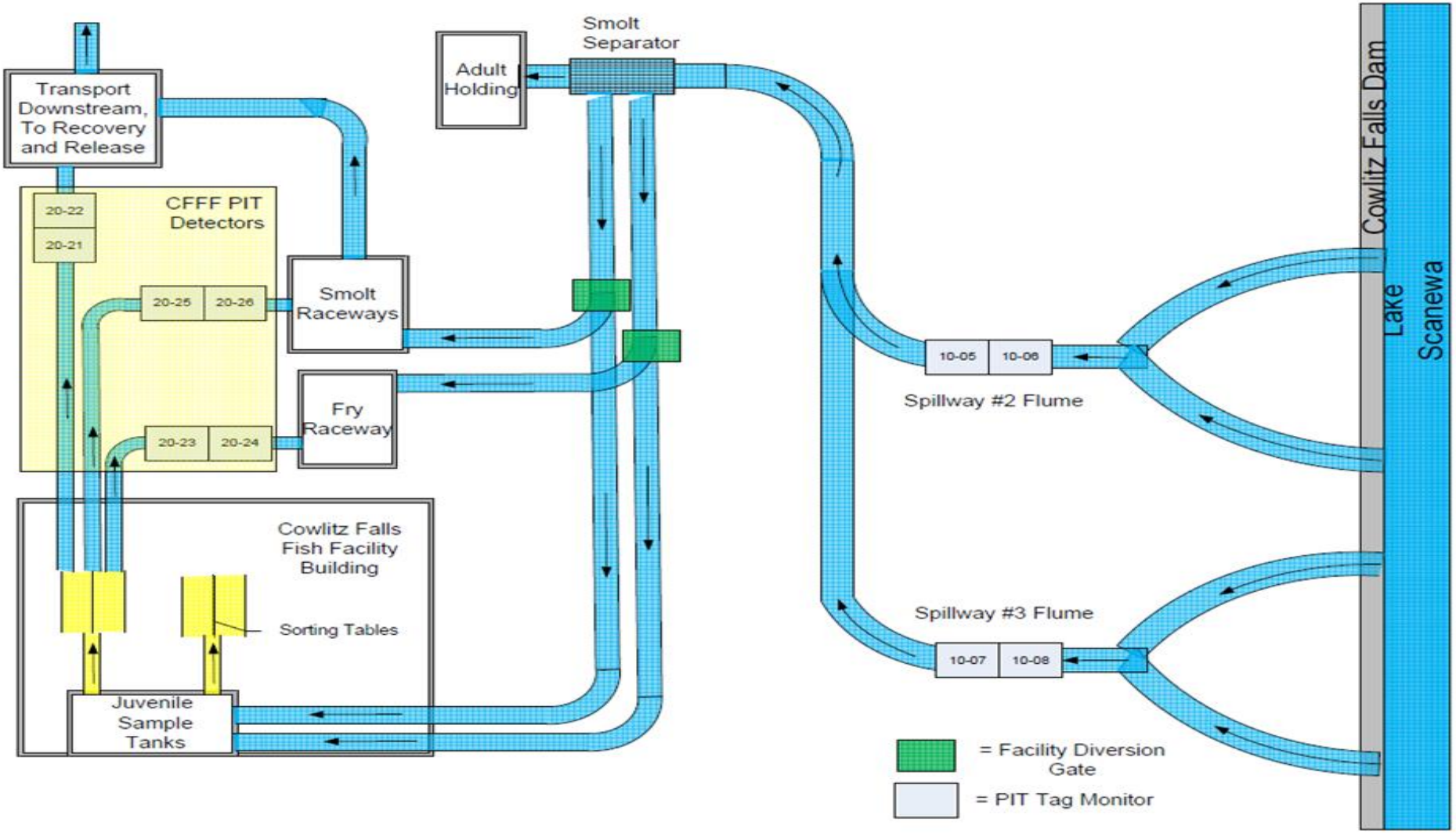
- Promote recovery of upper Cowlitz salmon and steelhead
  - Access to high-quality habitat

- Remove passage bottleneck

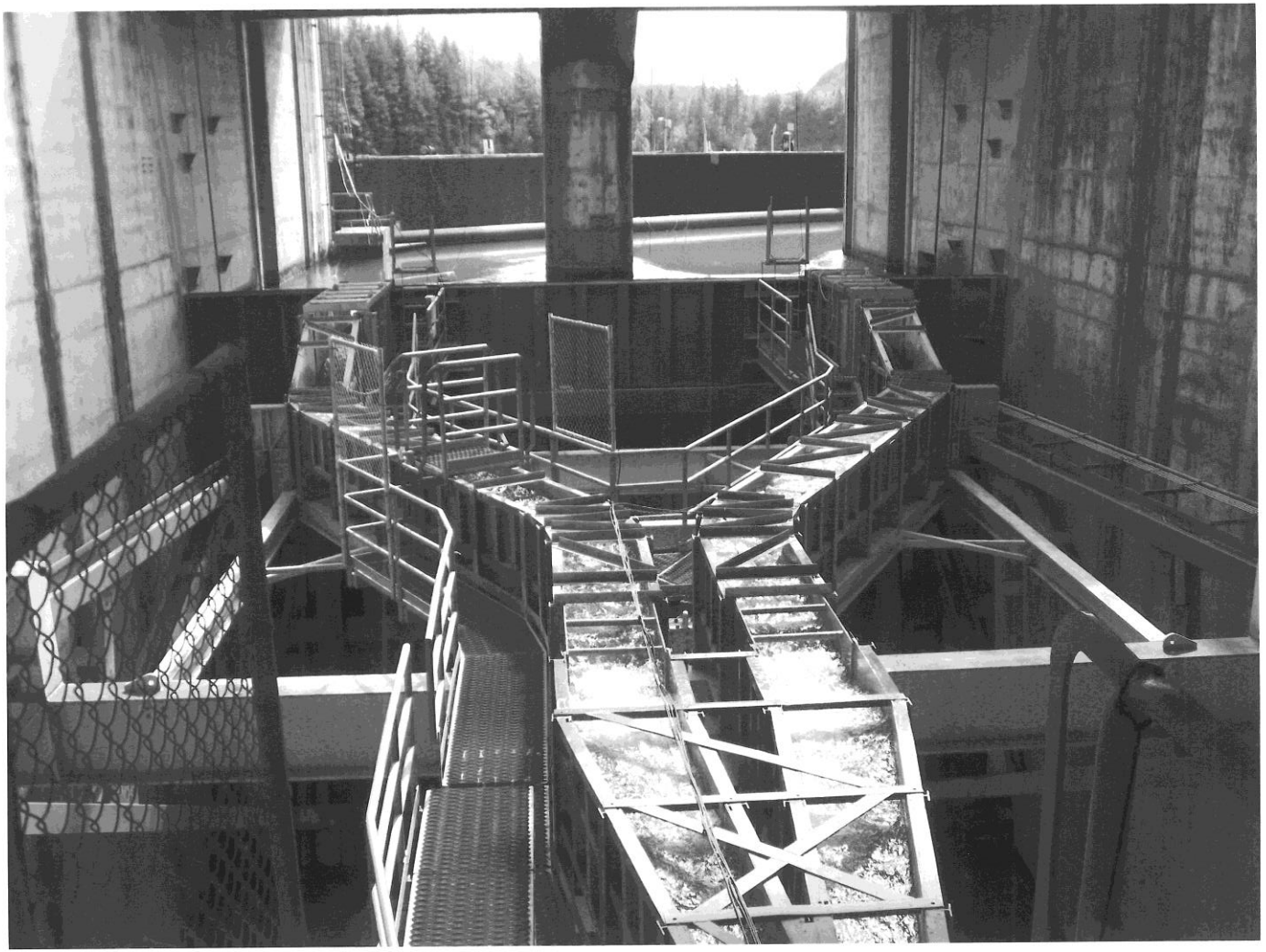
# Outline

- Cowlitz Falls Overview
- Fish Collection History
- Cowlitz Falls North Shore Collector
- 2017 - 2018 Monitoring Results
- Next Steps

# Surface Collection System

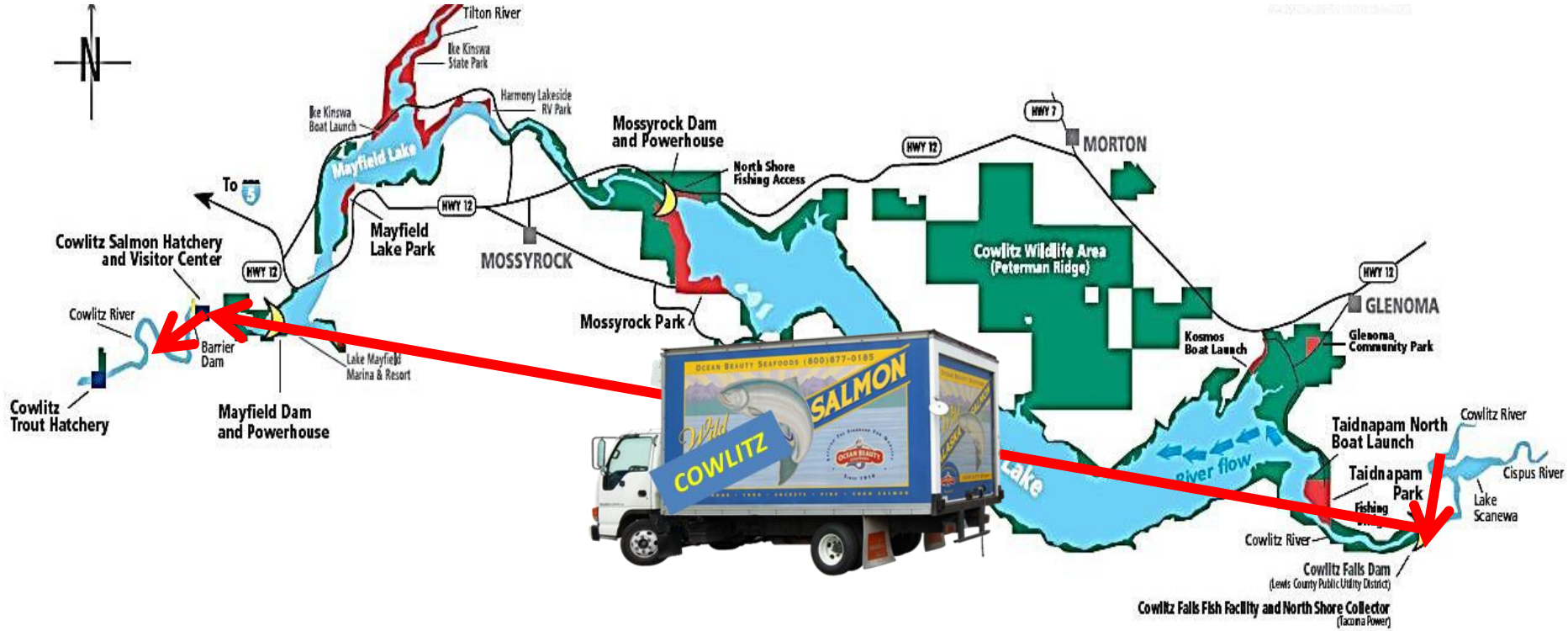


# Surface Collection System



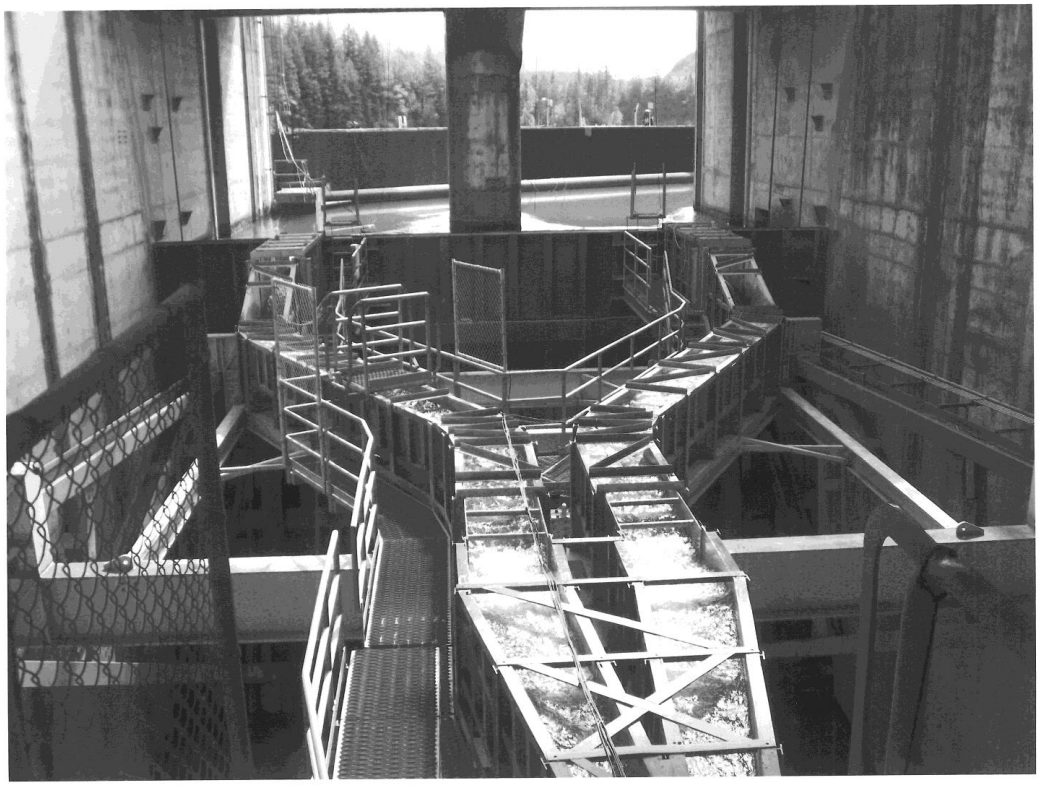
# Performance Goal

## 95% Fish Passage Survival (FPS)

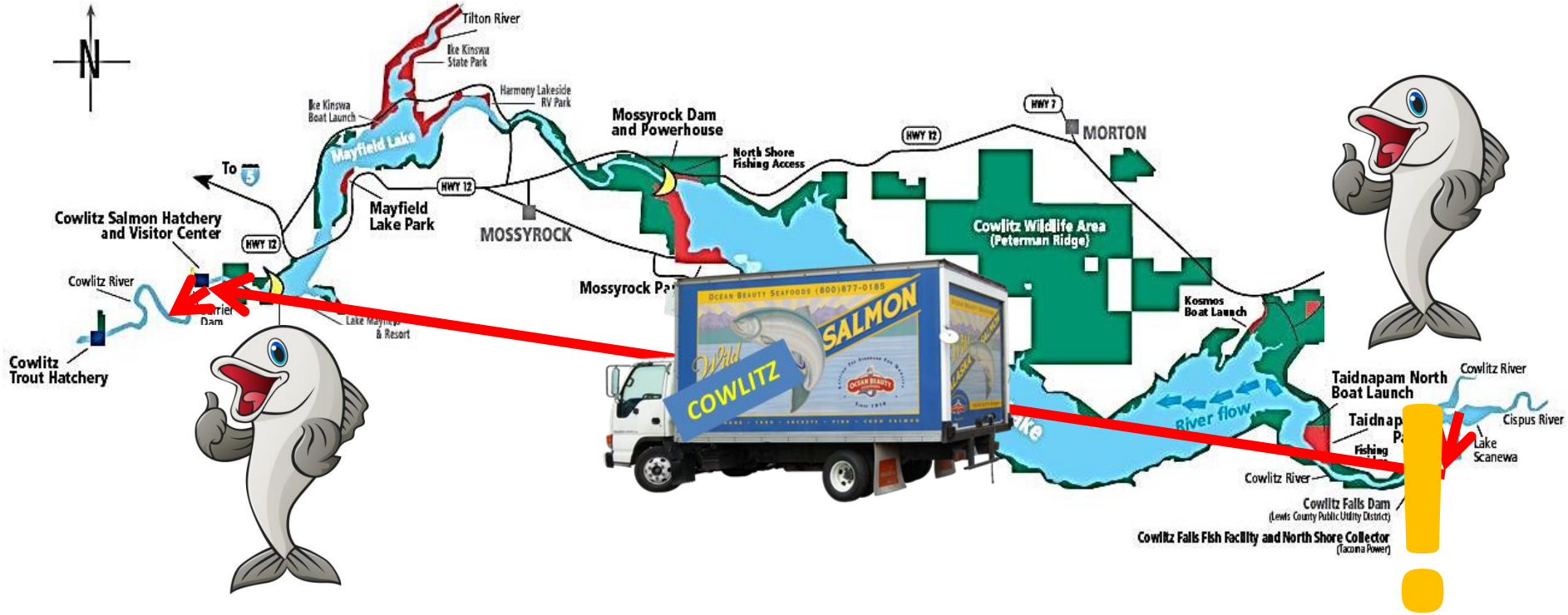


# Historic Fish Passage Survival

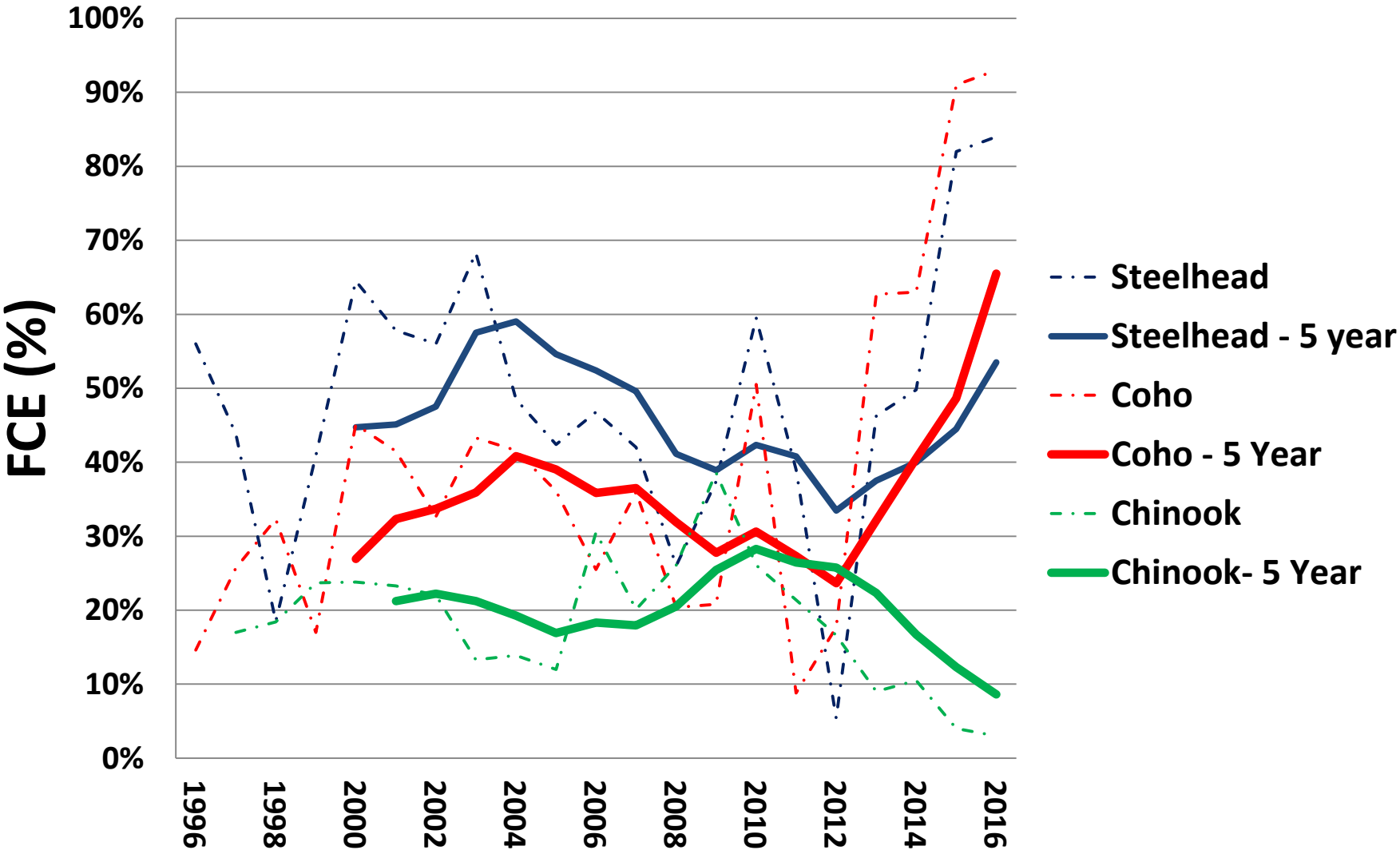
- ~45% Steelhead
- ~50% Coho
- ~12% Chinook



# Fish Passage Survival

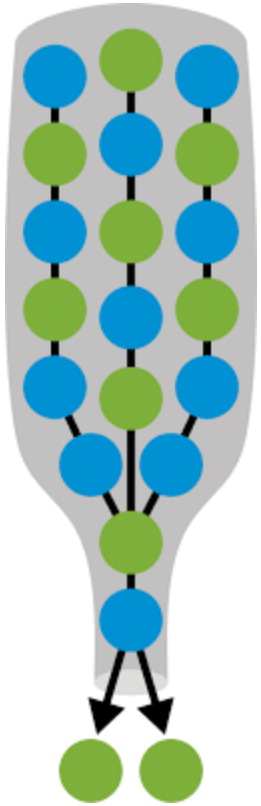


# Fish Collection Efficiency (FCE)



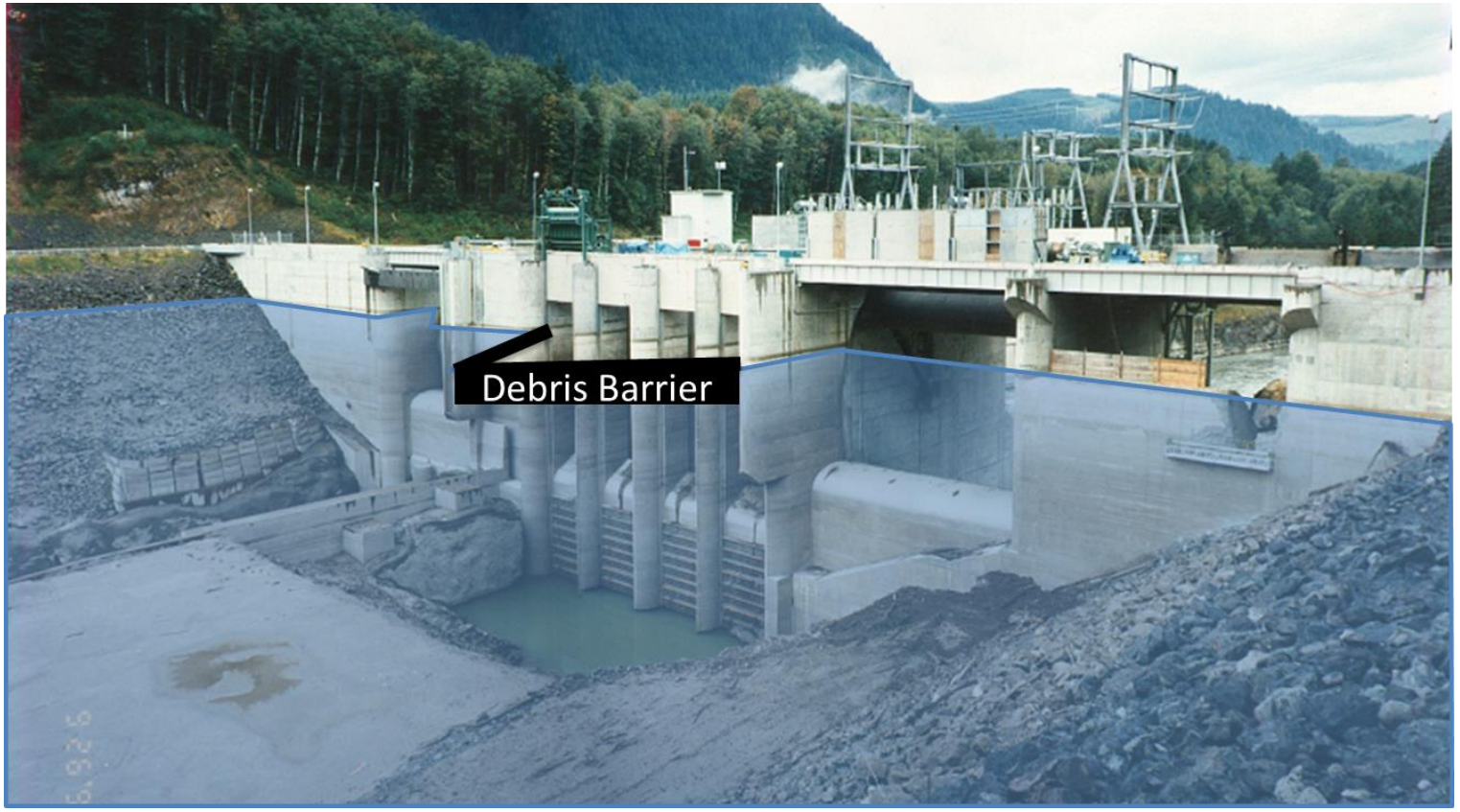
# Bottleneck Effect

- Poor Entrance Efficiency
- Unattractive front door

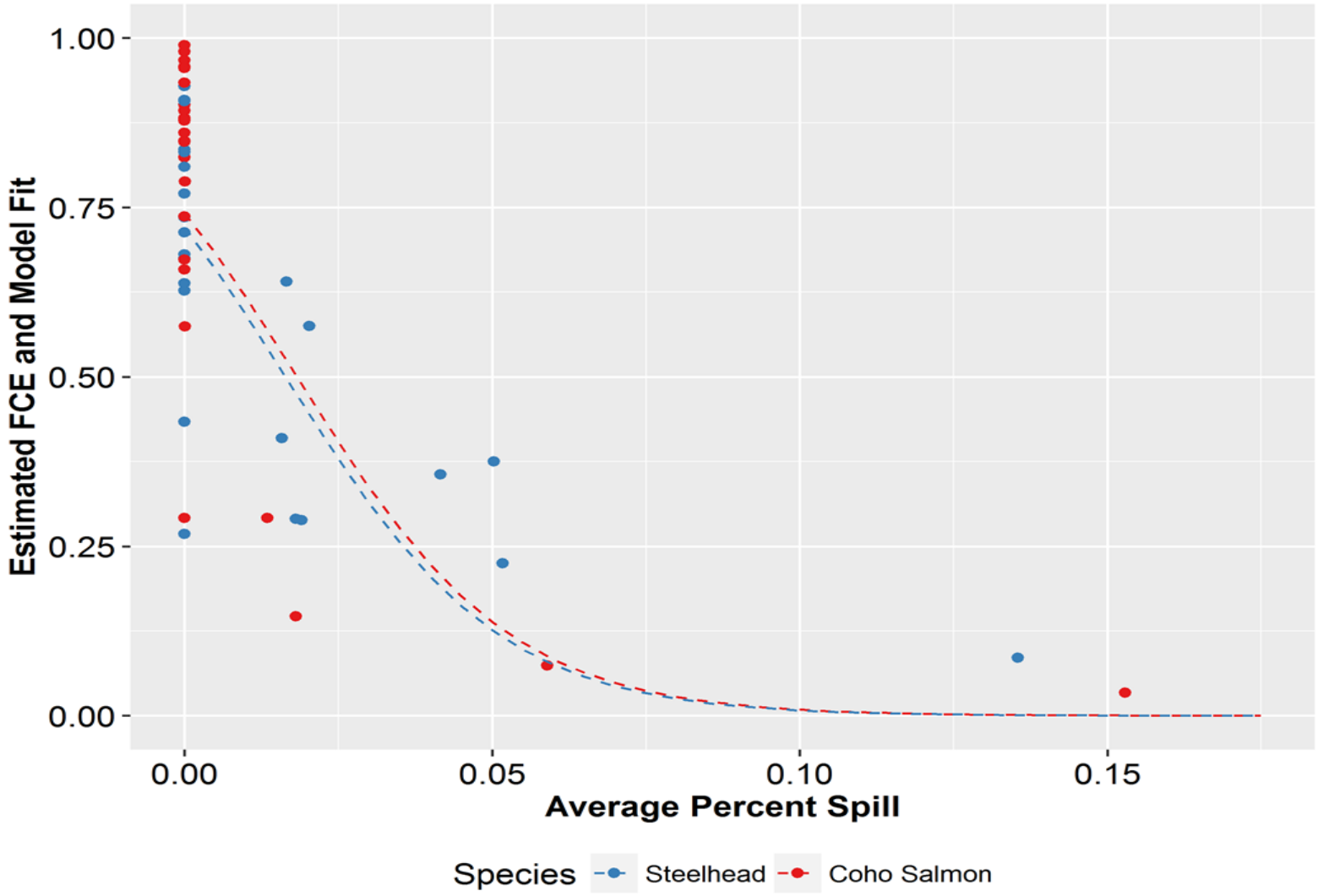



# Low Entrance Efficiency

- Behavior near debris barrier



# Spill vs FCE


1.00
0.75
0.50
0.25
0.00
Estimated FCE and Model Fit
0.00
0.05
0.10
0.15
Average Percent Spill
Species
Steelhead
Coho Salmon

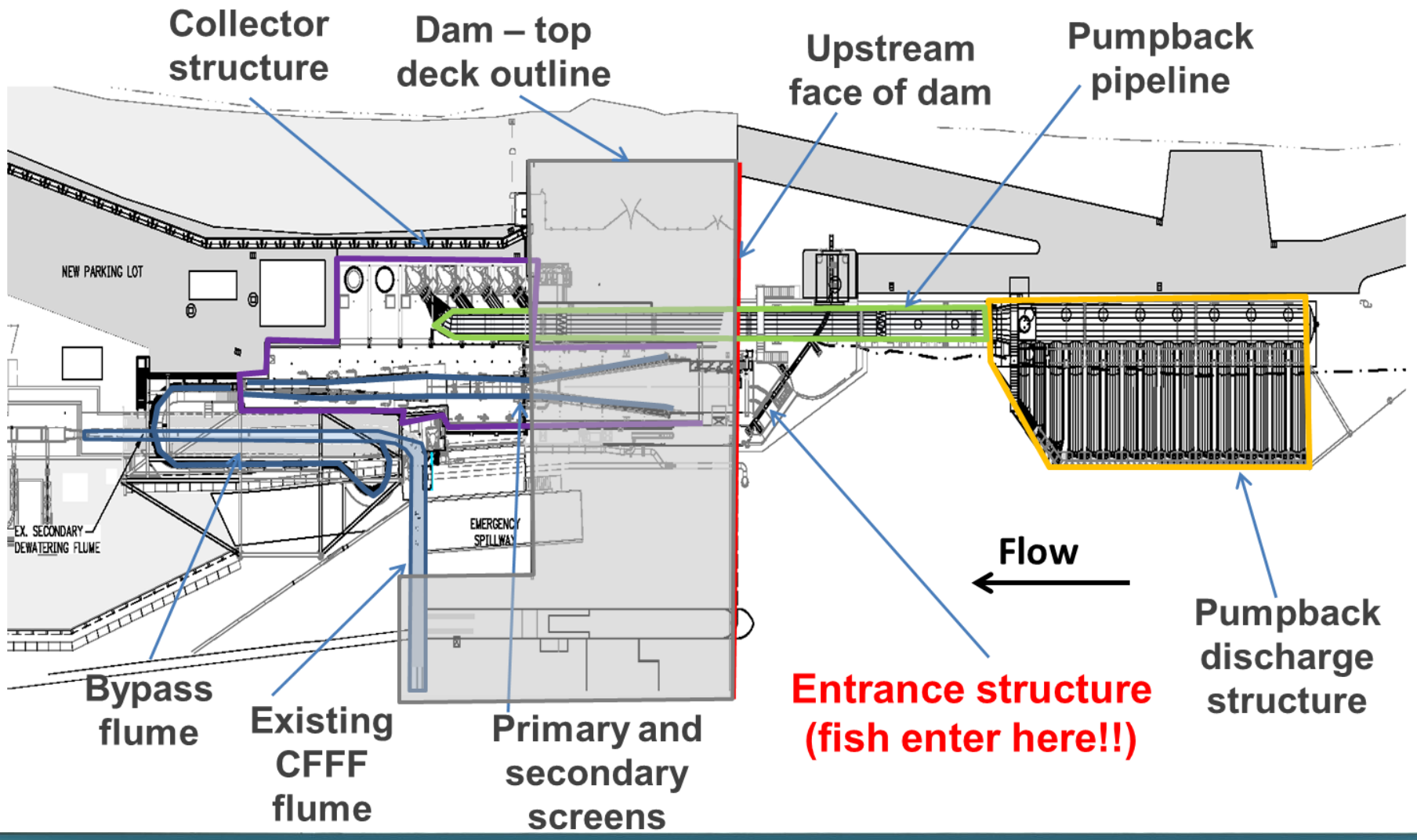
# Goals

- 95% Fish Passage Survival
- Improve Fish Collection Efficiency
- Improve Entrance Efficiency

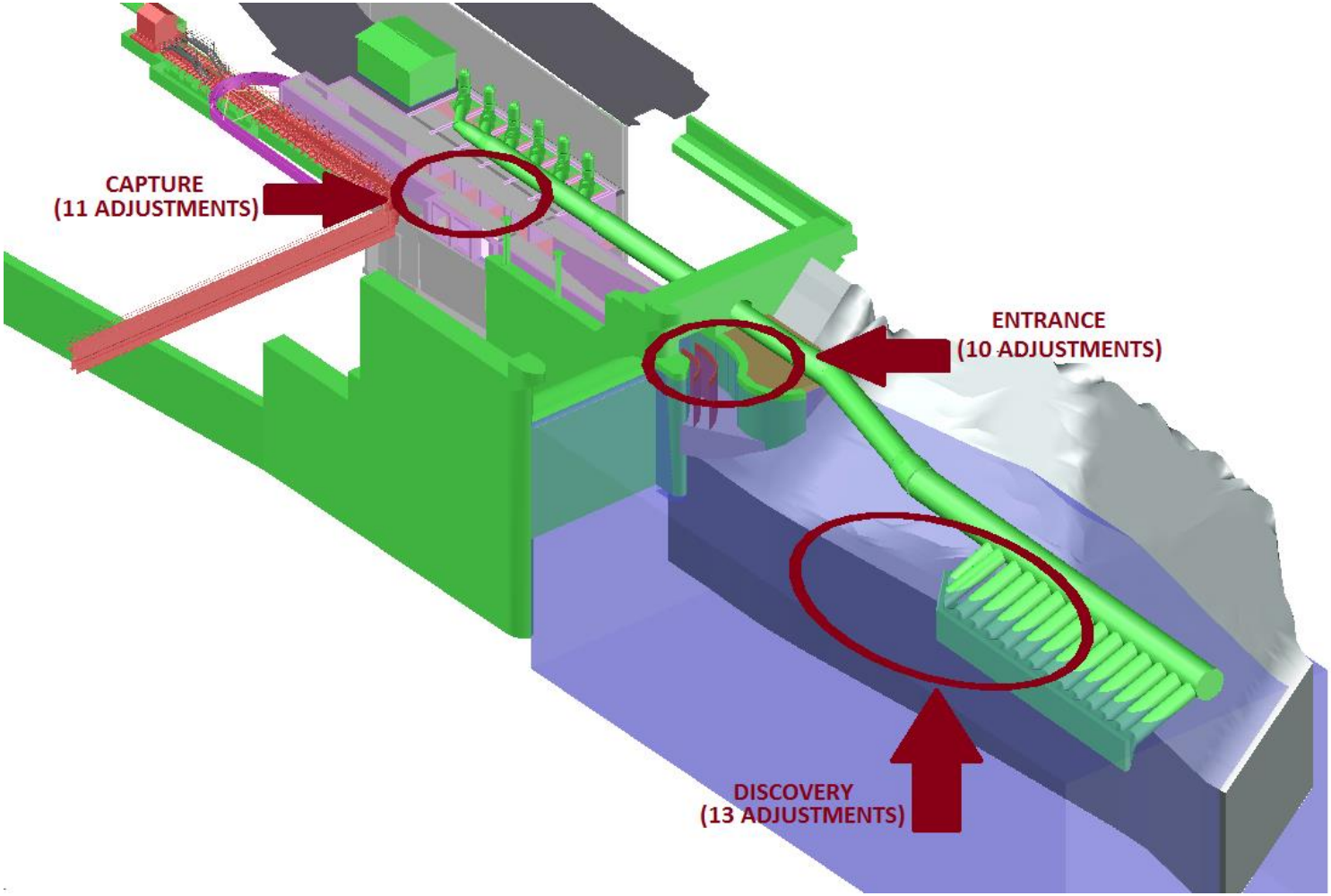
# Outline

- Cowlitz Falls Overview
- Fish Collection History
- Cowlitz Falls North Shore Collector
- 2017 - 2018 Monitoring Results
- Next Steps

# Cowlitz Falls North Shore Collector



# Cowlitz Falls North Shore Collector



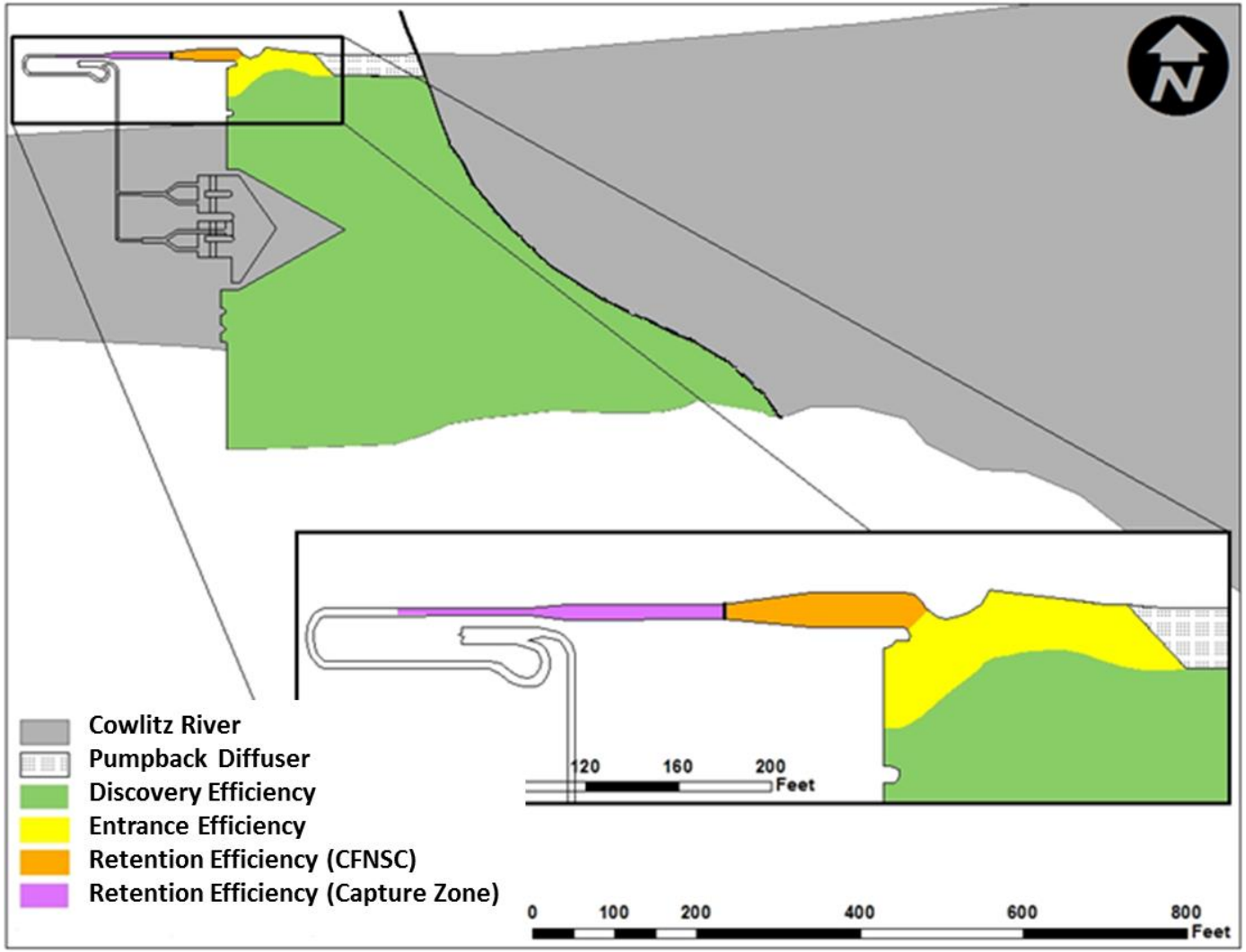
# Outline

- Cowlitz Falls Overview
- Fish Collection History
- Cowlitz Falls North Shore Collector
- 2017 - 2018 Monitoring Results
- Next Steps

# Study Fish Releases

| | Release Date Range | Baseline (PIT-only) | Directed (PIT + Acoustic) |
|---|---|---|---|
| **2017** | | | |
| **Steelhead** | April 27 - June 1 | 476 | |
| **Coho** | May 10 - June 21 | 601 | |
| **Chinook** | June 21 – Aug. 16 | 900 | 158 |
| **2018** | | | |
| **Steelhead** | April 19 - June 15 | 837 | |
| **Coho** | May 3 - July 12 | 1,098 | |
| **Chinook** | June 28 – Aug. 15 | 696 | 172 |

# Acoustic Telemetry Metrics

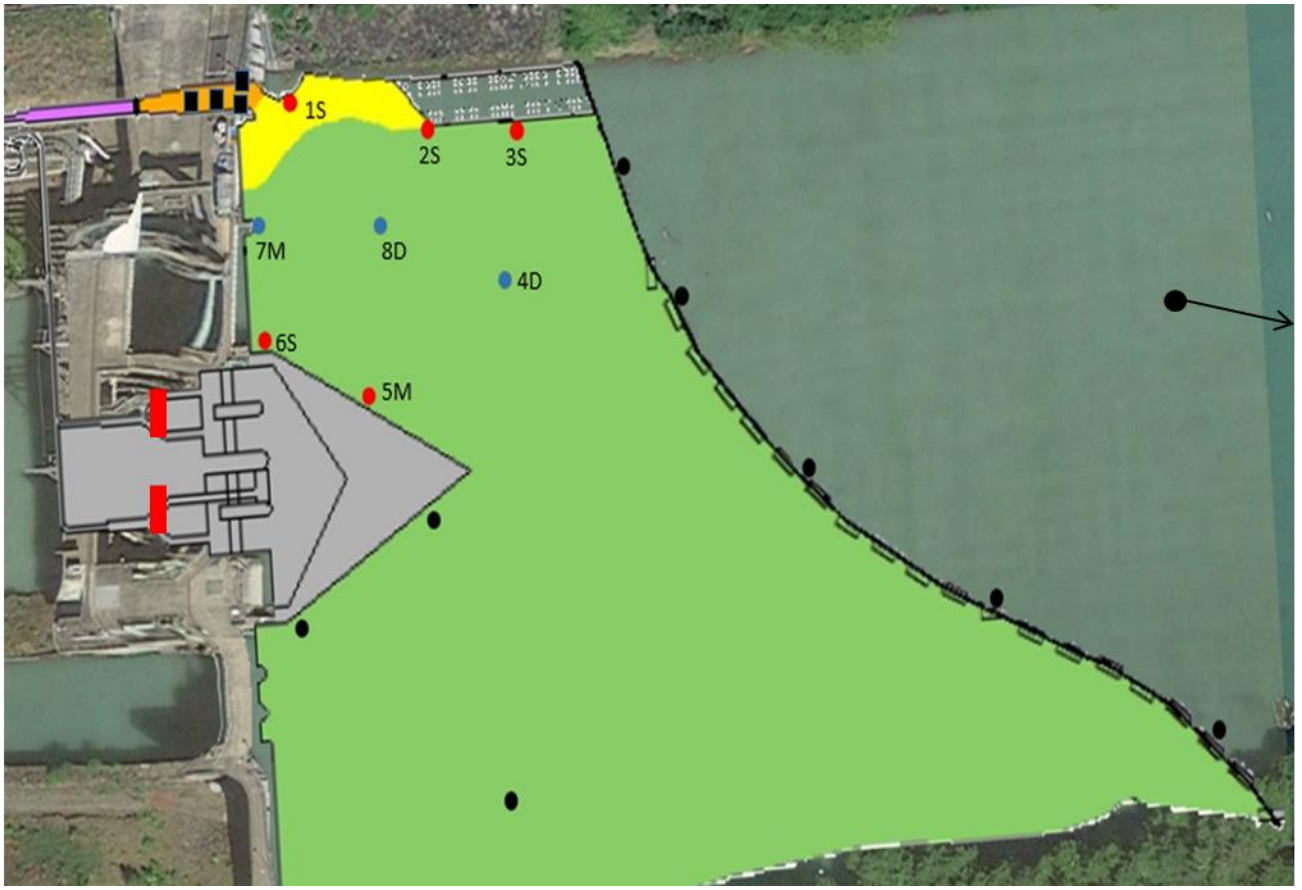


# Acoustic Telemetry Monitoring

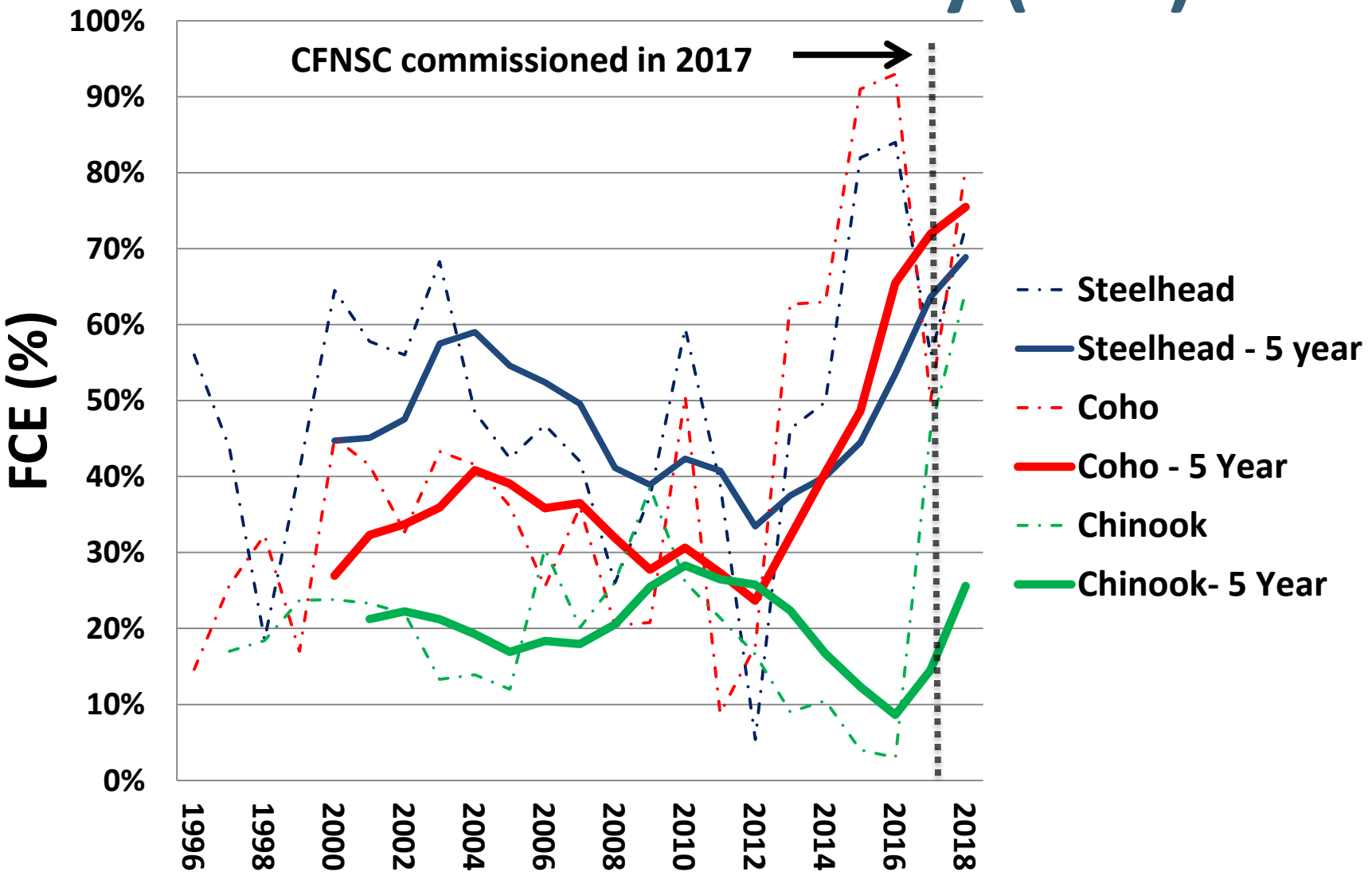
- PIT antennas
- Cabled Receivers
- Autonomous Receivers

Several additional PIT antennas not pictured

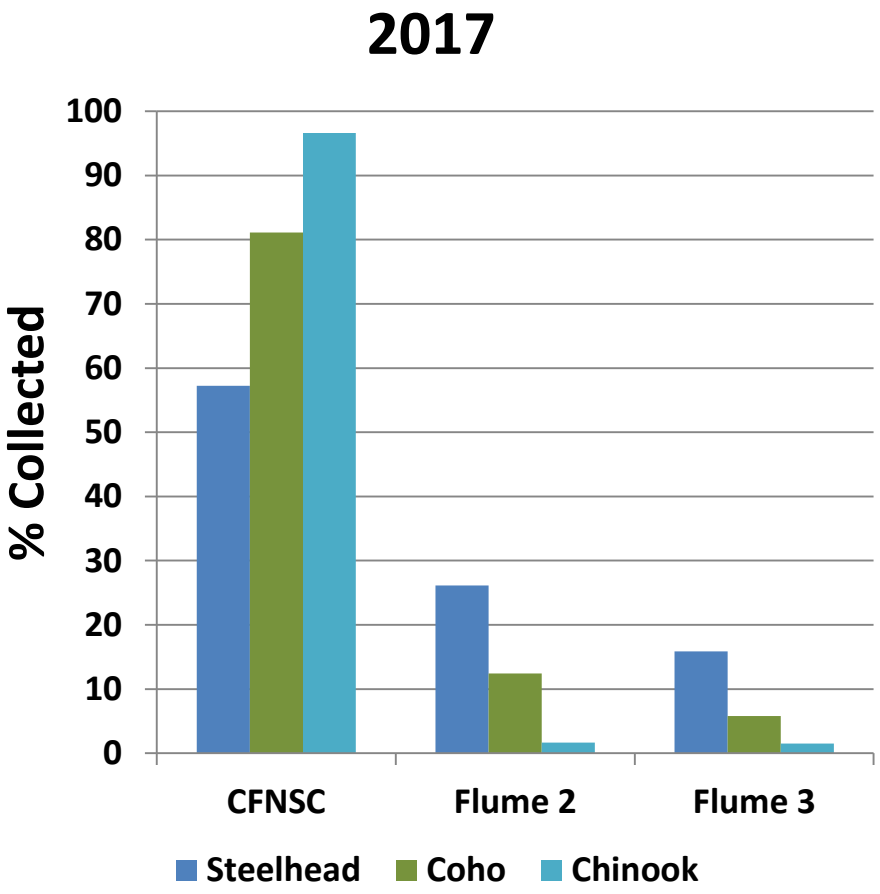
Effectively 100% detection efficiency

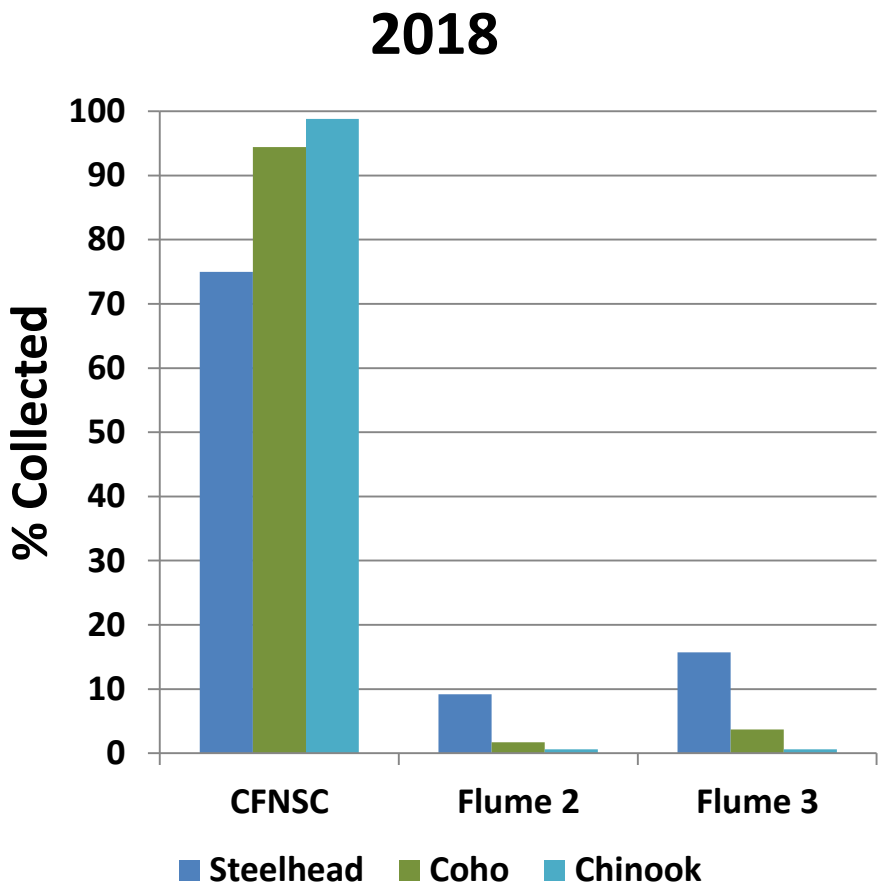


# Fish Collection Efficiency (FCE)

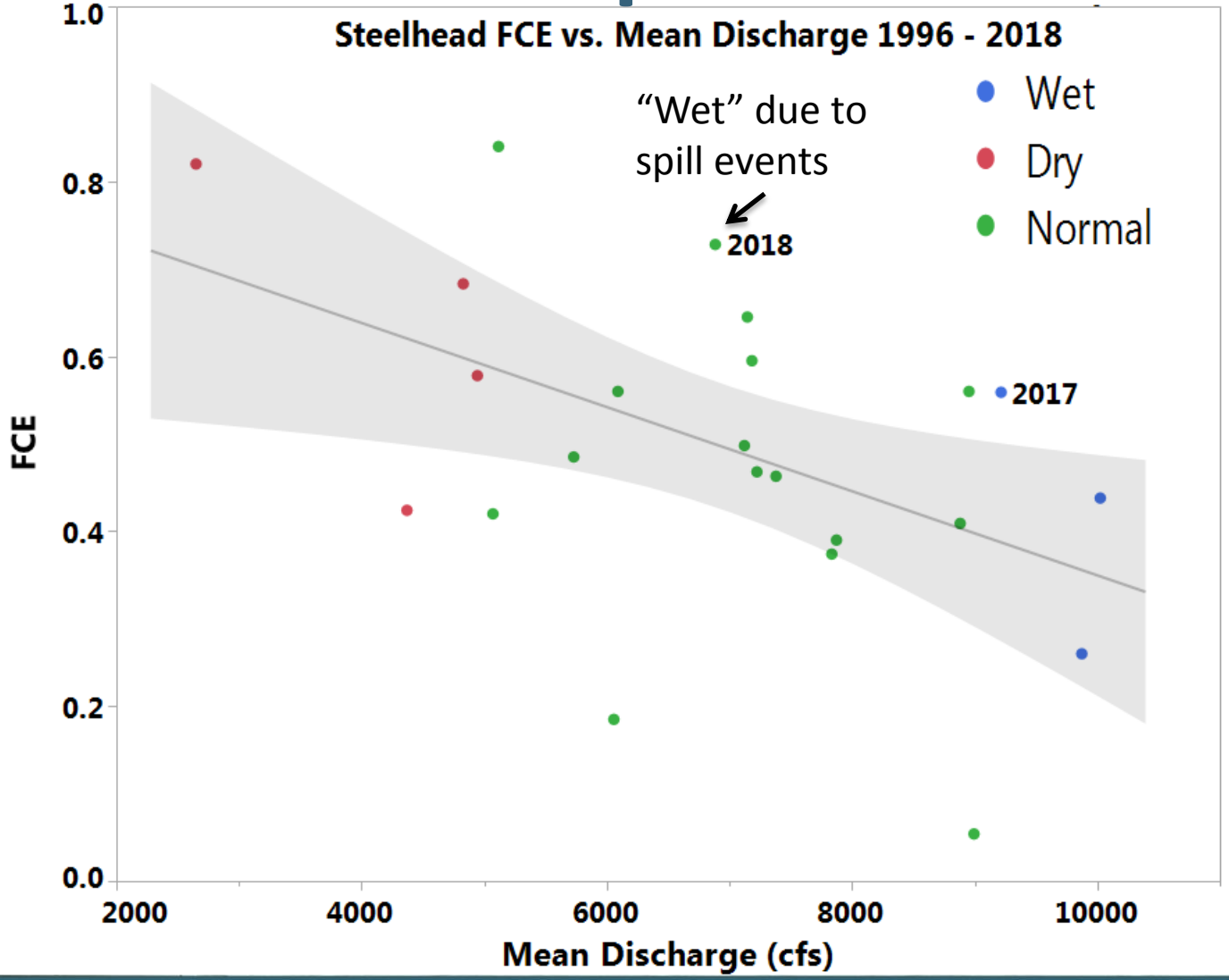


# Route Selection

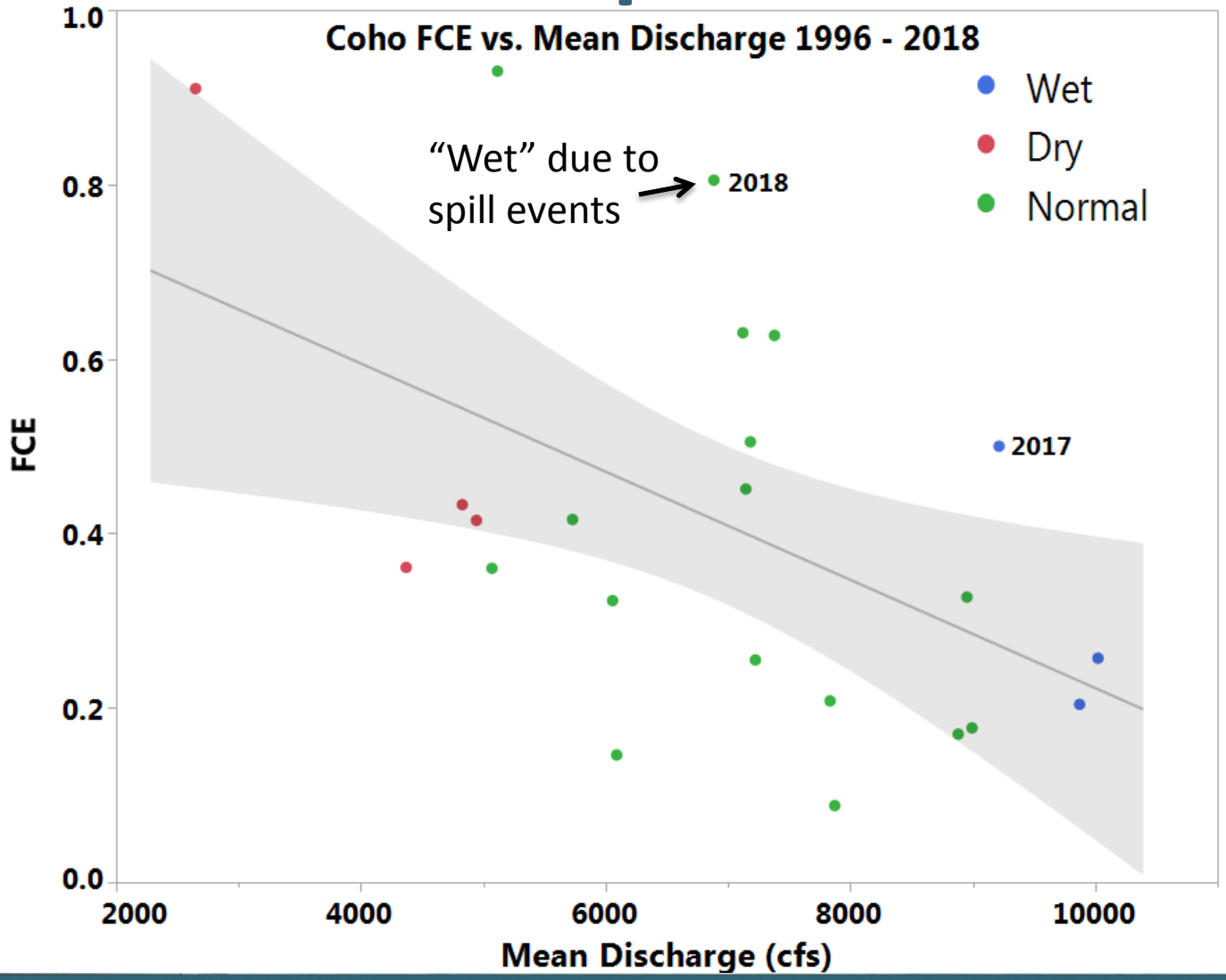


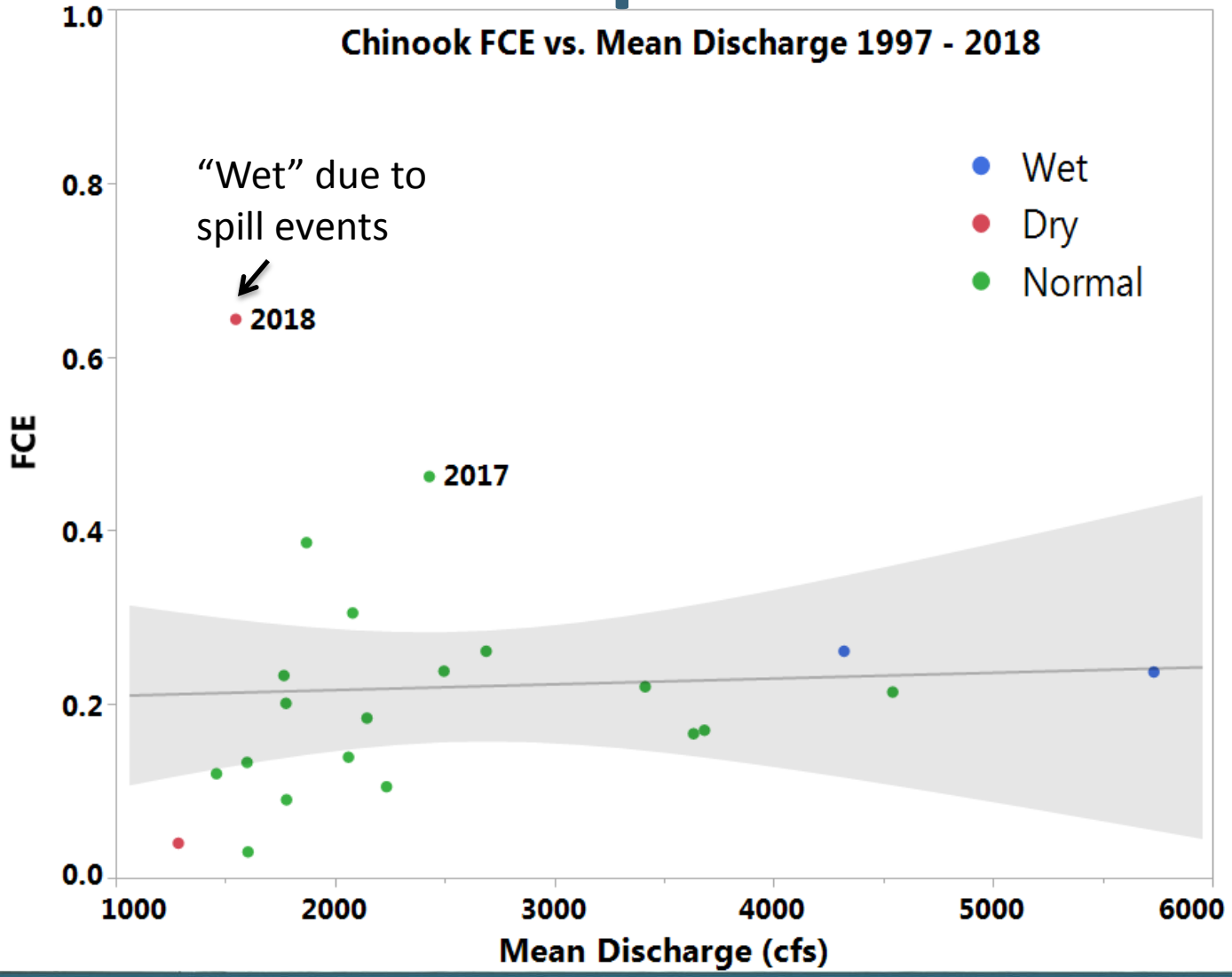
# Water Year Comparison



# Water Year Comparison

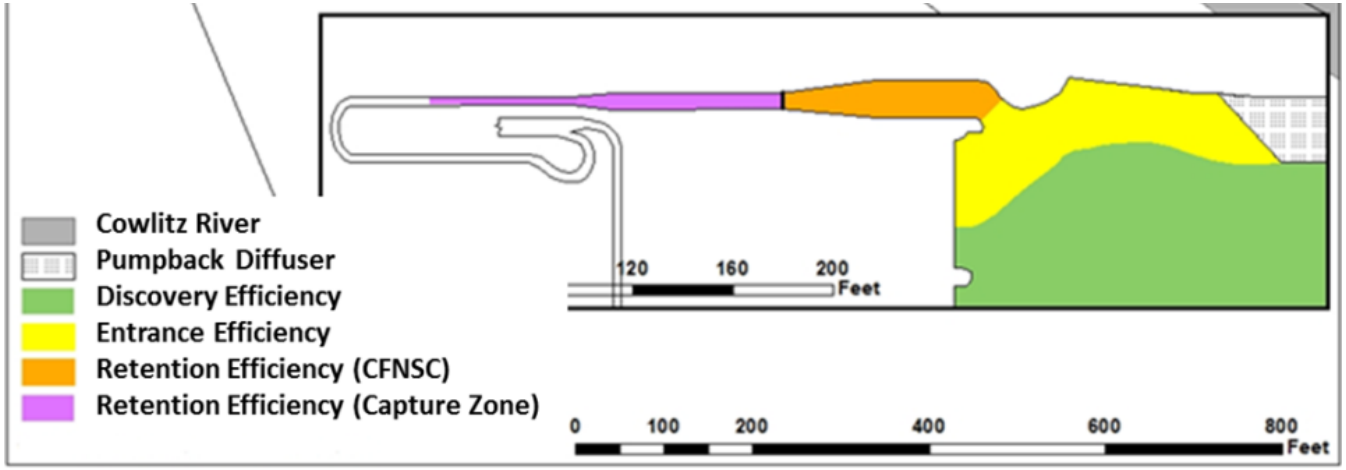


# Water Year Comparison



# 2017-18 Acoustic Telemetry Results

Acoustic + PIT-tagged Chinook smolts




| | Number Released | Discovery Efficiency | Entrance Efficiency | Retention Efficiency | Capture Zone Efficiency | Fish Collection Efficiency |
|---|---|---|---|---|---|---|
| **2017** | 158 | 100% | 70.7% | 93.0% | 96.8% | 46% |
| **2018** | 172 | 98.1% | 81.6% | 88.8% | 99.0% | 64% |

# Fish Passage Summary

| | Fish Collection Efficiency | | Fish Passage Survival | |
|---|---|---|---|---|
| **Species** | **2017** | **2018** | **2017** | **2018** |
| **Steelhead** | 56% | 73% | 57% | 75% |
| **Coho Salmon** | 50% | 81% | 52% | 82% |
| **Chinook Salmon** | 46% | 64% | 51% | 70% |

# FHMP Decision Rules

Current steelhead average FPS = **66%**

- Five-year average FPS >50% triggers local adaptation phase

Current coho average FPS = **67%**

- Five-year average FPS >60% triggers 30% pHOS standard

Current Chinook average FPS = **61%**

- Five-year average FPS >60% triggers integrated hatchery program

# Outline

- Cowlitz Falls Overview
- Fish Collection History
- Cowlitz Falls North Shore Collector
- 2017-2018 Study Results
- Next Steps

# Next Steps

- Ongoing Monitoring
  - Baseline
  - Directed
- Implement Adaptive Management Plan

# Questions?