

Cowlitz Falls North Shore Collector Fish Collection 2017 - 2020

Cowlitz River Annual Program Review
and Science Conference

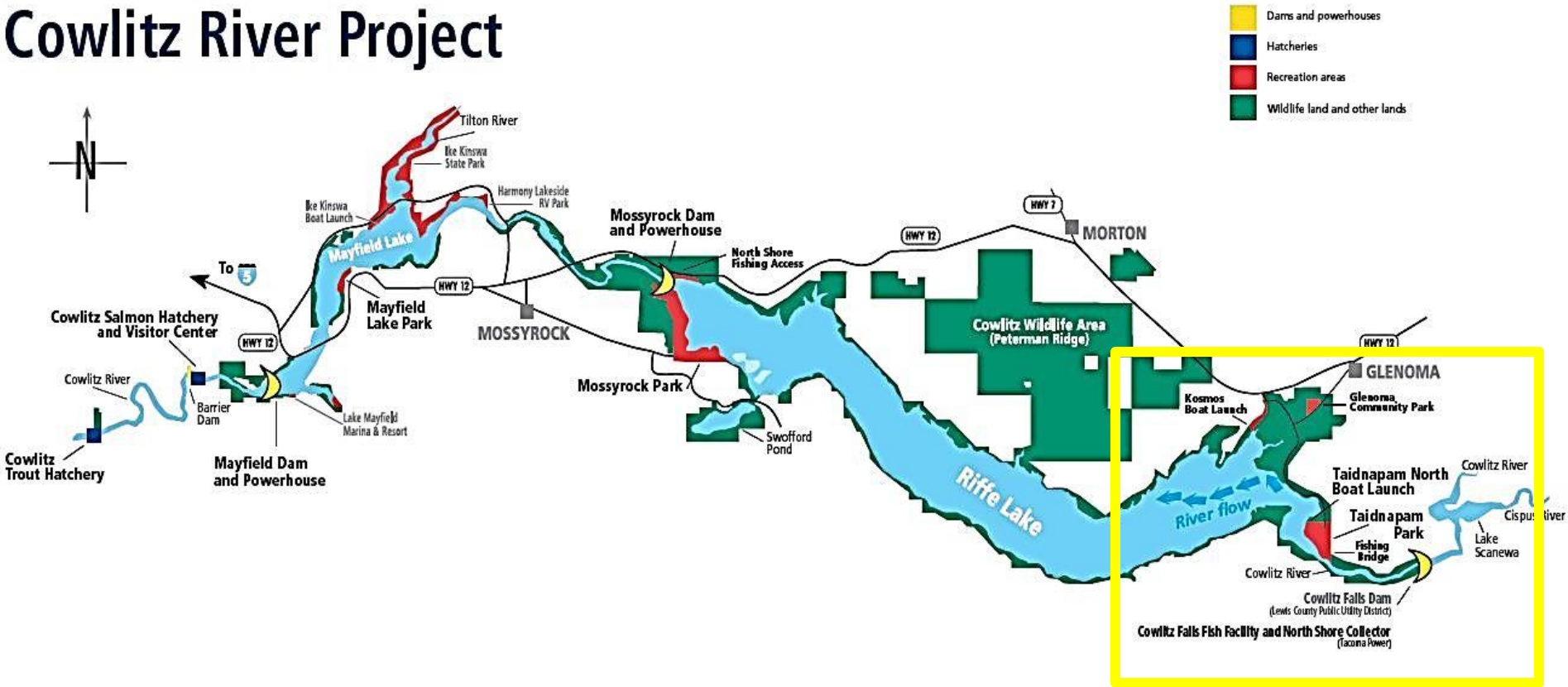
May 19, 2021

Chris Foster, Cowlitz Falls Fish Facility Manager

Outline

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

Cowlitz River Project



Cowlitz Falls Project



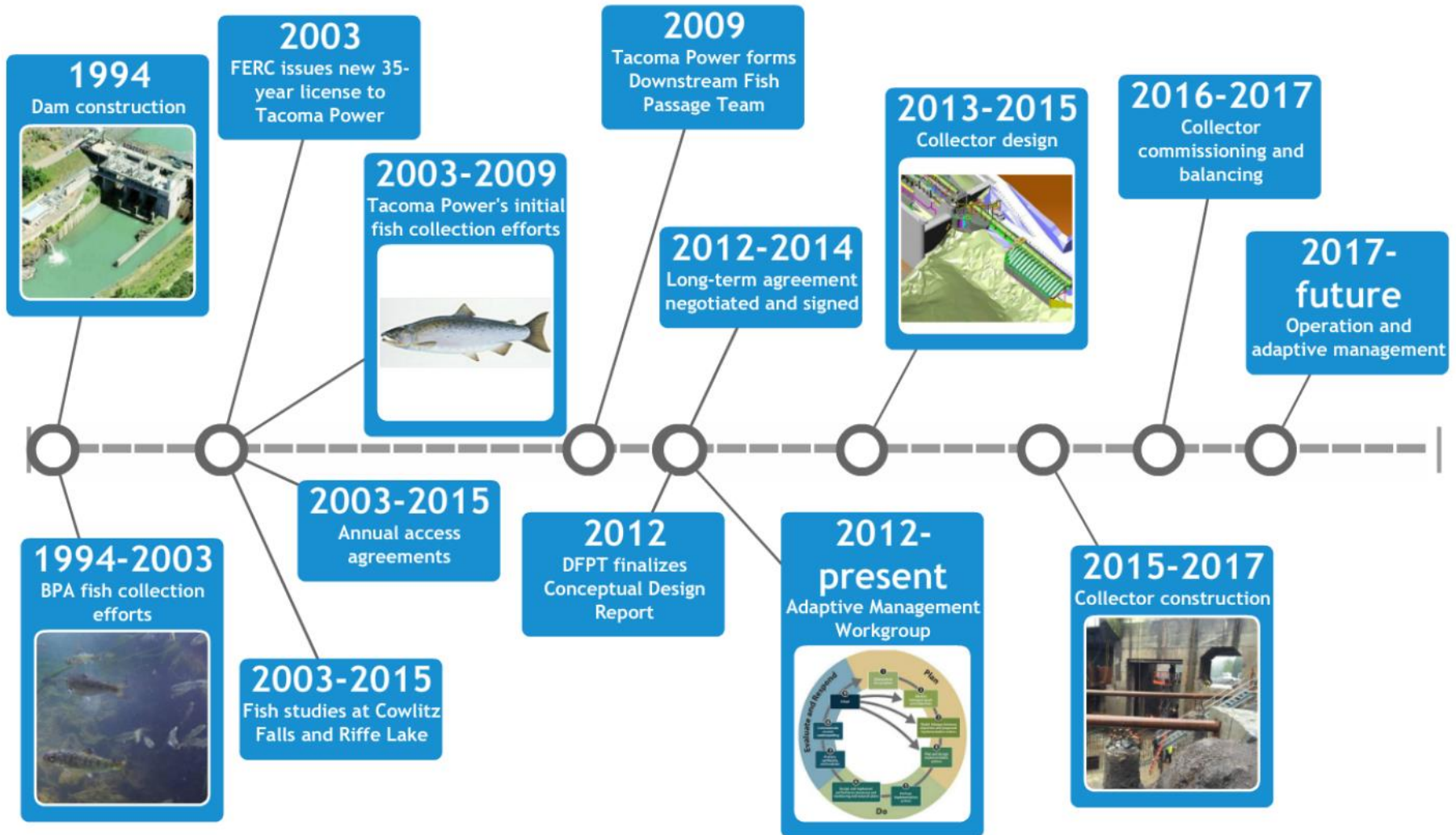
Dam Owner
Lewis County PUD

**Cowlitz Falls Fish
Facility Owner**

Tacoma Power

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

Cowlitz Falls Timeline

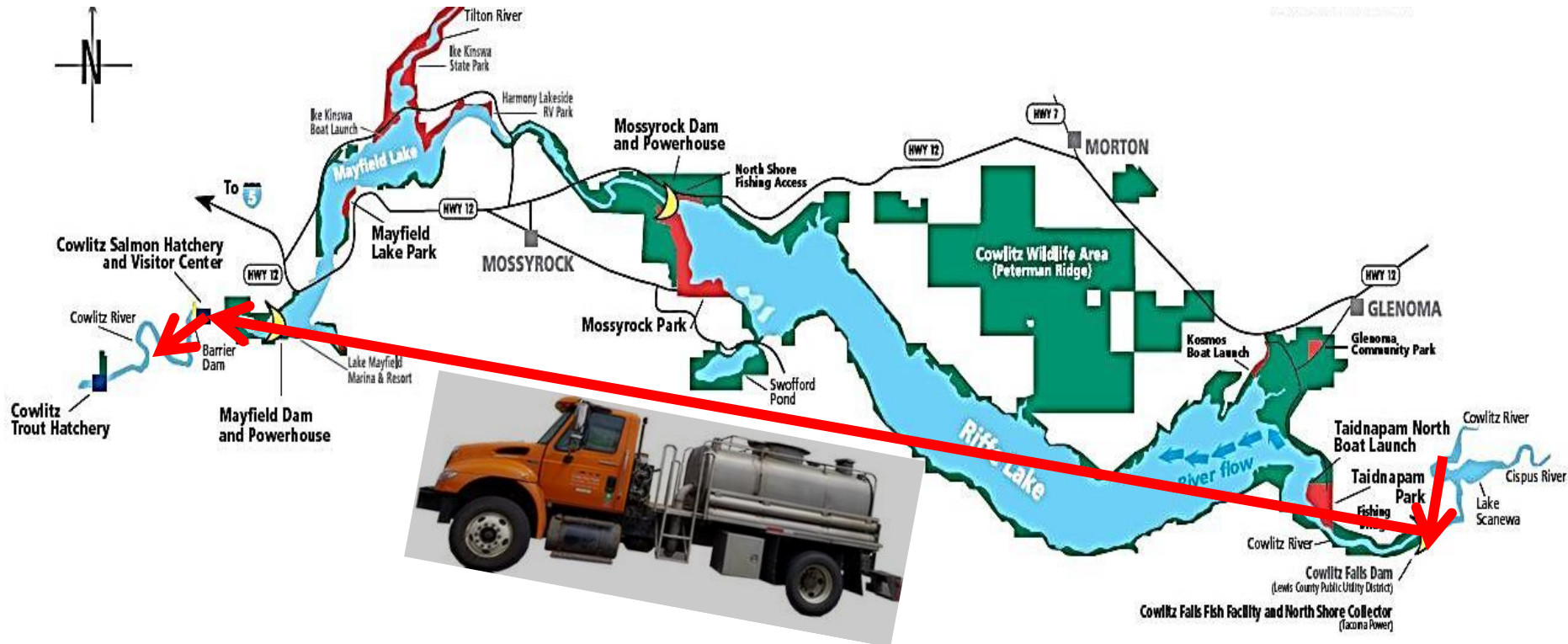


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Performance Goal

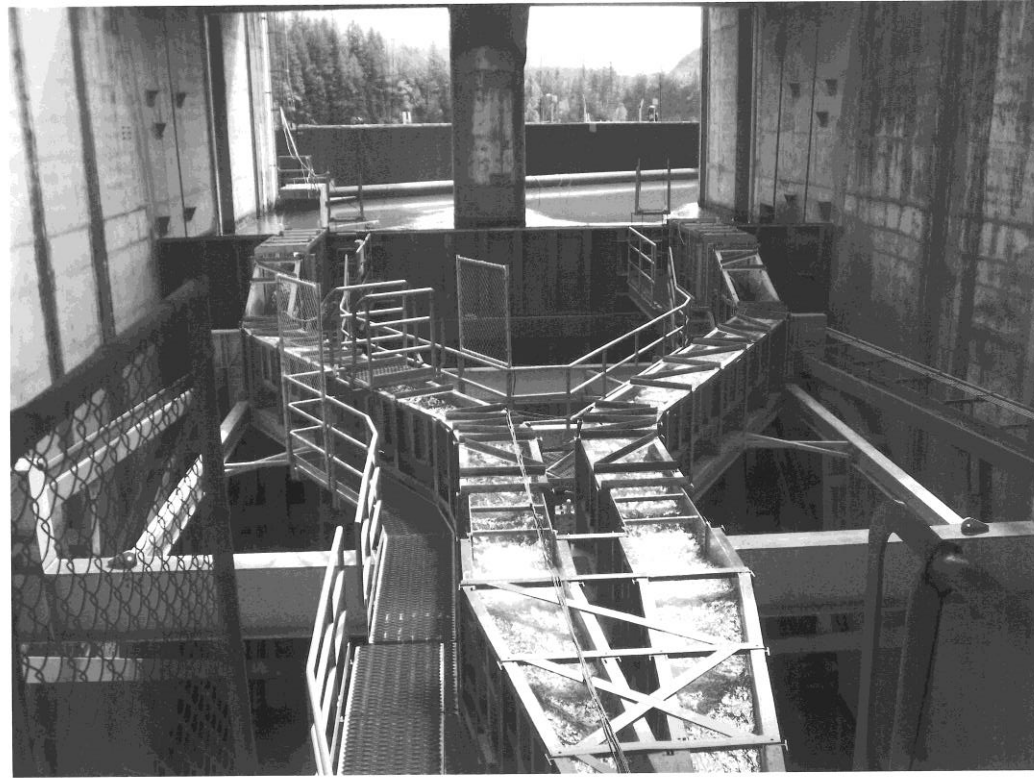
95% Fish Passage Survival (FPS)



Historic Fish Passage Survival

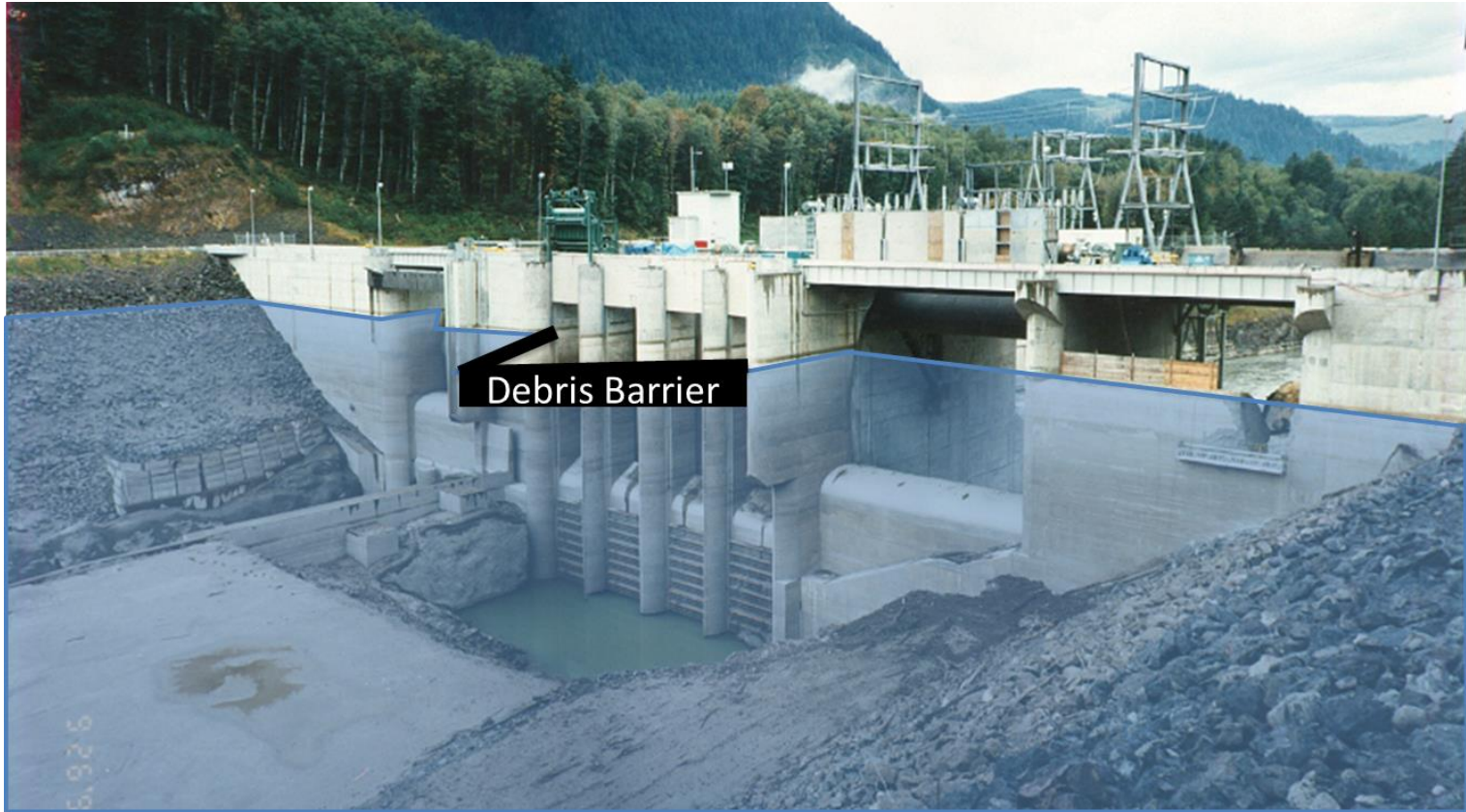
(Surface Collection System)

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

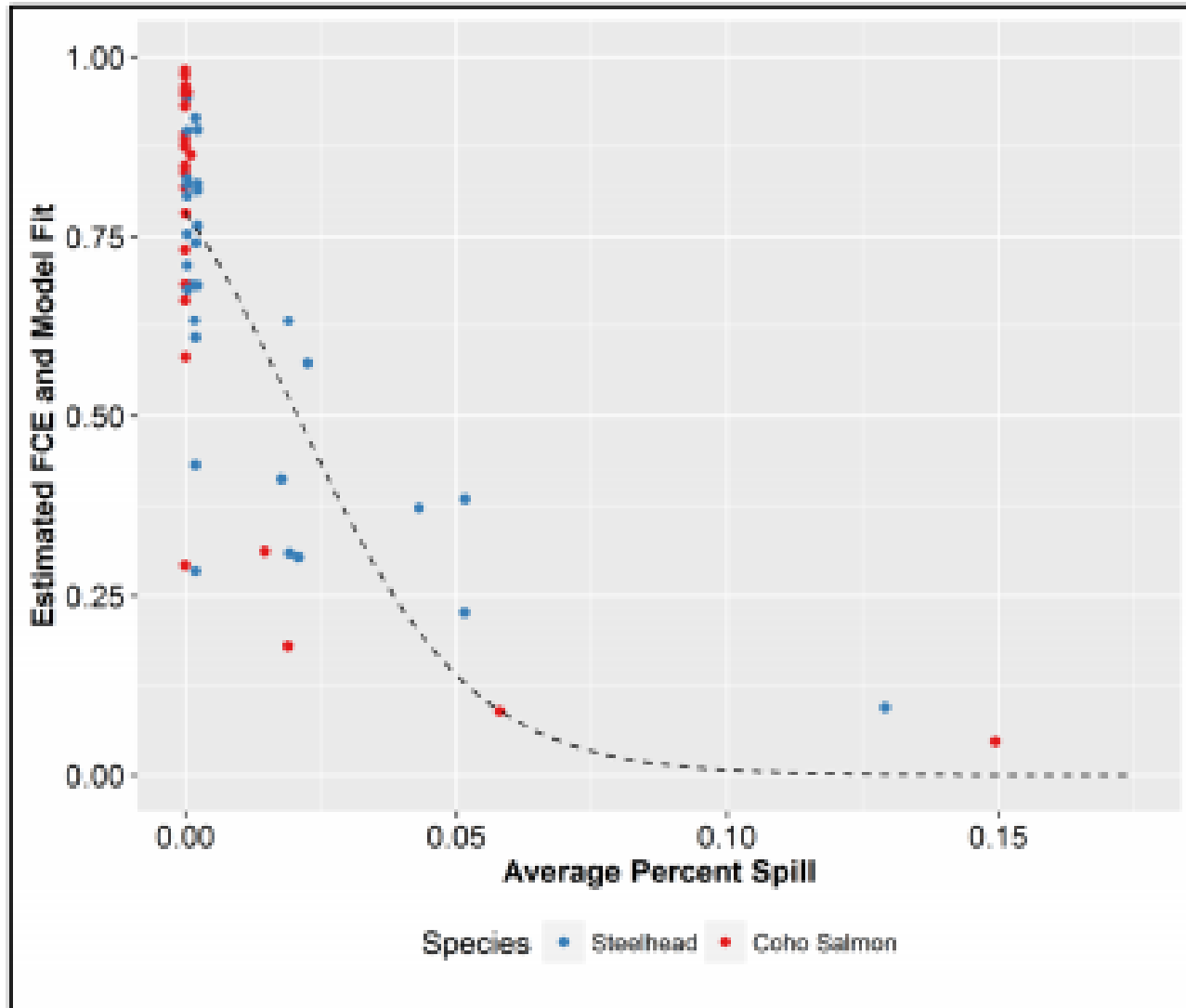


Low Entrance Efficiency

- Behavior near debris barrier



Spill vs Fish Collection Efficiency (FCE)



Outline

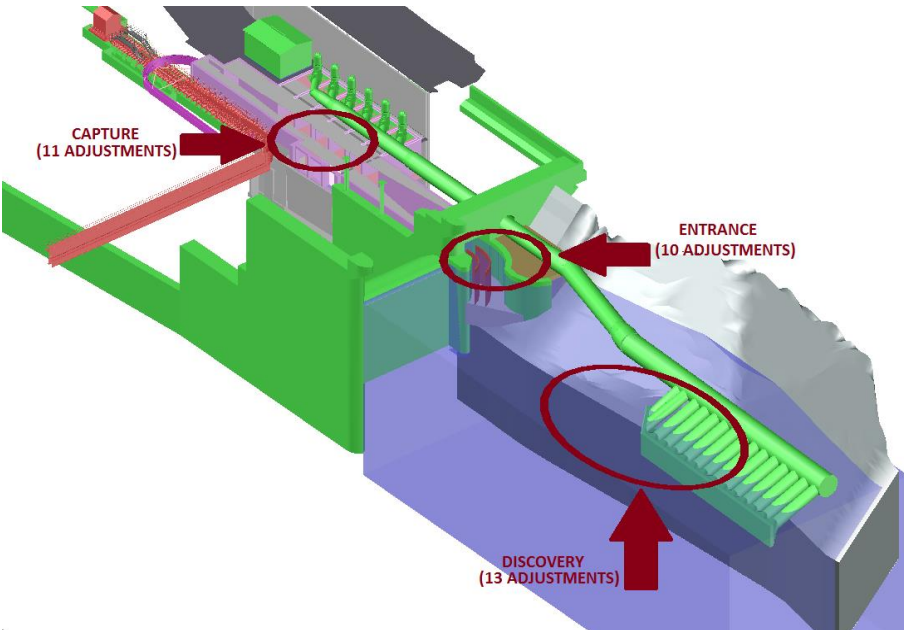
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Goals

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



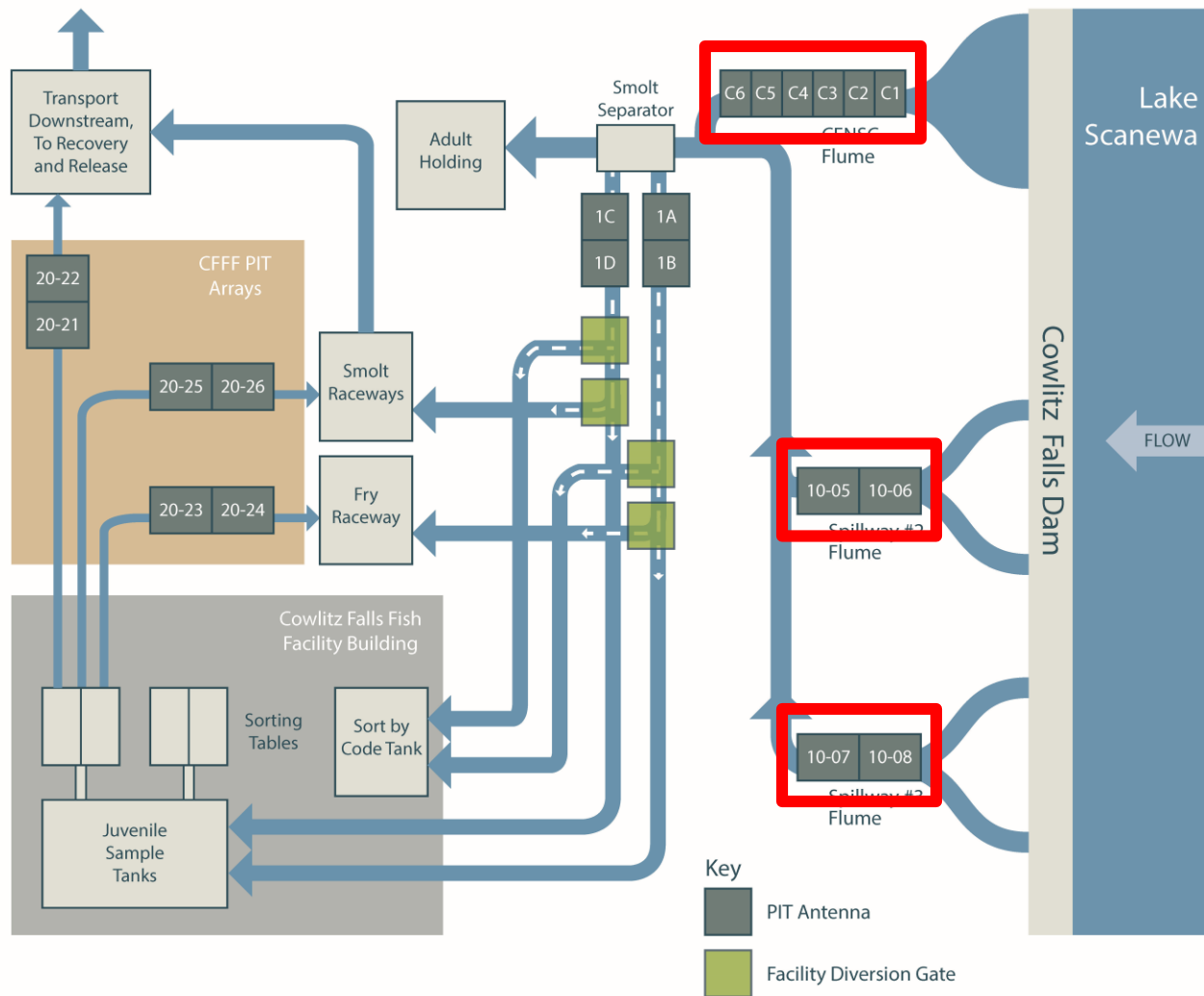
Cowlitz Falls North Shore Collector



Cowlitz Falls Project



Cowlitz Falls PIT System



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- **Monitoring Results**
- **Next Steps**

Run of River: Primary Operations

| | | | | | |
|------|---------------------------|---------|-----------|-----------|---------|
| 2017 | April 17 - August 31 | | | | |
| | Chinook | Coho | Steelhead | Cutthroat | Total |
| | 56,345 | 26,196 | 4,860 | 952 | 88,353 |
| 2018 | March 1 - August 31 | | | | |
| | Chinook | Coho | Steelhead | Cutthroat | Total |
| | 27,070 | 161,529 | 14,450 | 1,070 | 204,119 |
| 2019 | March 1 - September 13 | | | | |
| | Chinook | Coho | Steelhead | Cutthroat | Total |
| | 62,885 | 184,713 | 11,892 | 684 | 260,174 |
| 2020 | February 3 - September 30 | | | | |
| | Chinook | Coho | Steelhead | Cutthroat | Total |
| | 7,315 | 127,544 | 8,287 | 1,171 | 144,317 |

Smolts - all age classes



Run of River: Fall Migration

| | | | | | |
|------|---------------------------|-------|-----------|-----------|-------|
| 2017 | *October 24 - November 30 | | | | |
| | Chinook | Coho | Steelhead | Cutthroat | Total |
| | 327 | 747 | 186 | 25 | 1,285 |
| 2018 | *November 8 - December 21 | | | | |
| | Chinook | Coho | Steelhead | Cutthroat | Total |
| | 512 | 969 | 30 | 4 | 1,515 |
| 2019 | *October 22 - November 15 | | | | |
| | Chinook | Coho | Steelhead | Cutthroat | Total |
| | 1,905 | 1,223 | 112 | 18 | 3,258 |
| 2020 | *October 5 - October 30 | | | | |
| | Chinook | Coho | Steelhead | Cutthroat | Total |
| | 547 | 1,247 | 61 | 31 | 1,886 |

Smolts - all age classes

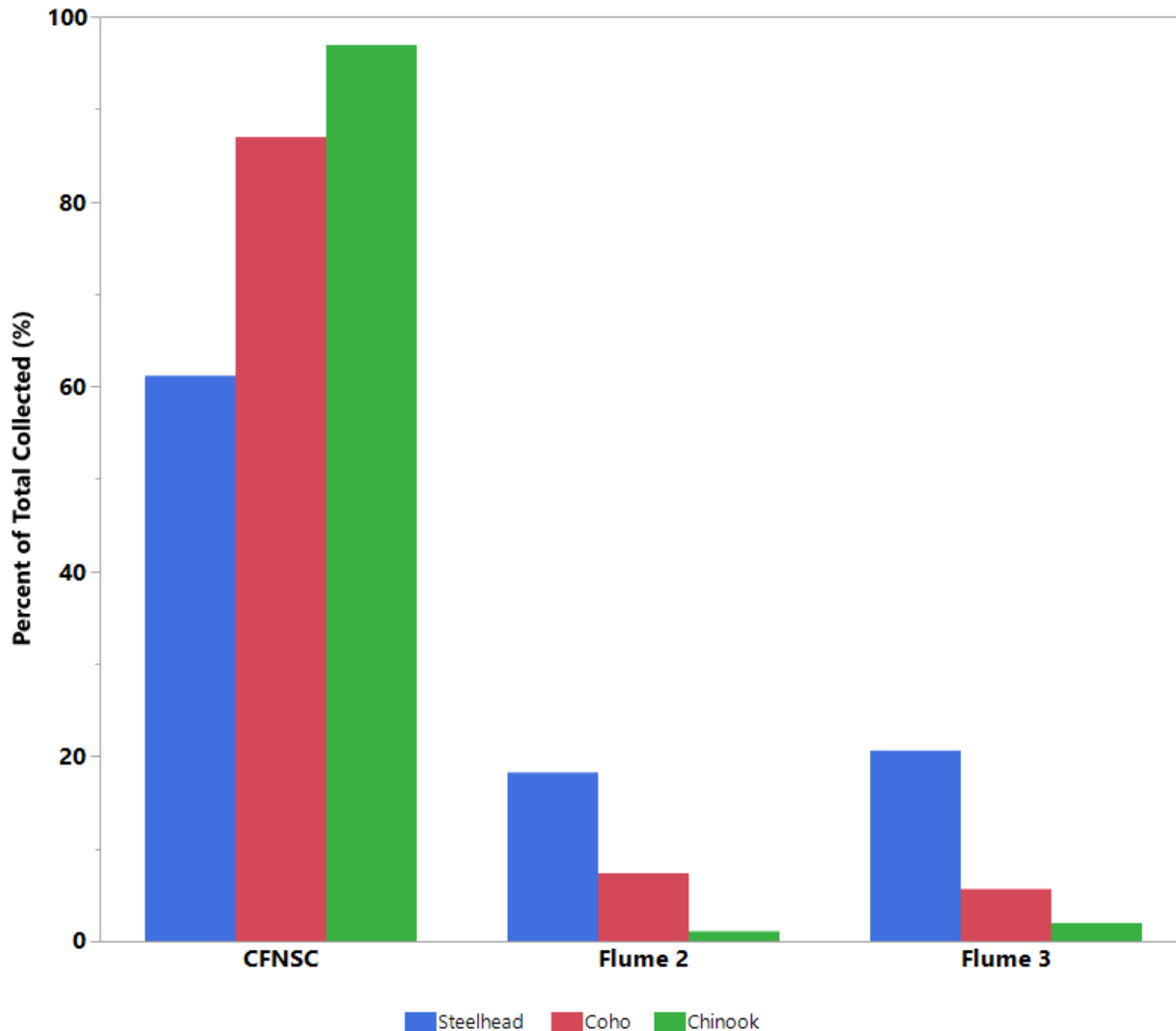
*Block schedule 3 days per week for four weeks



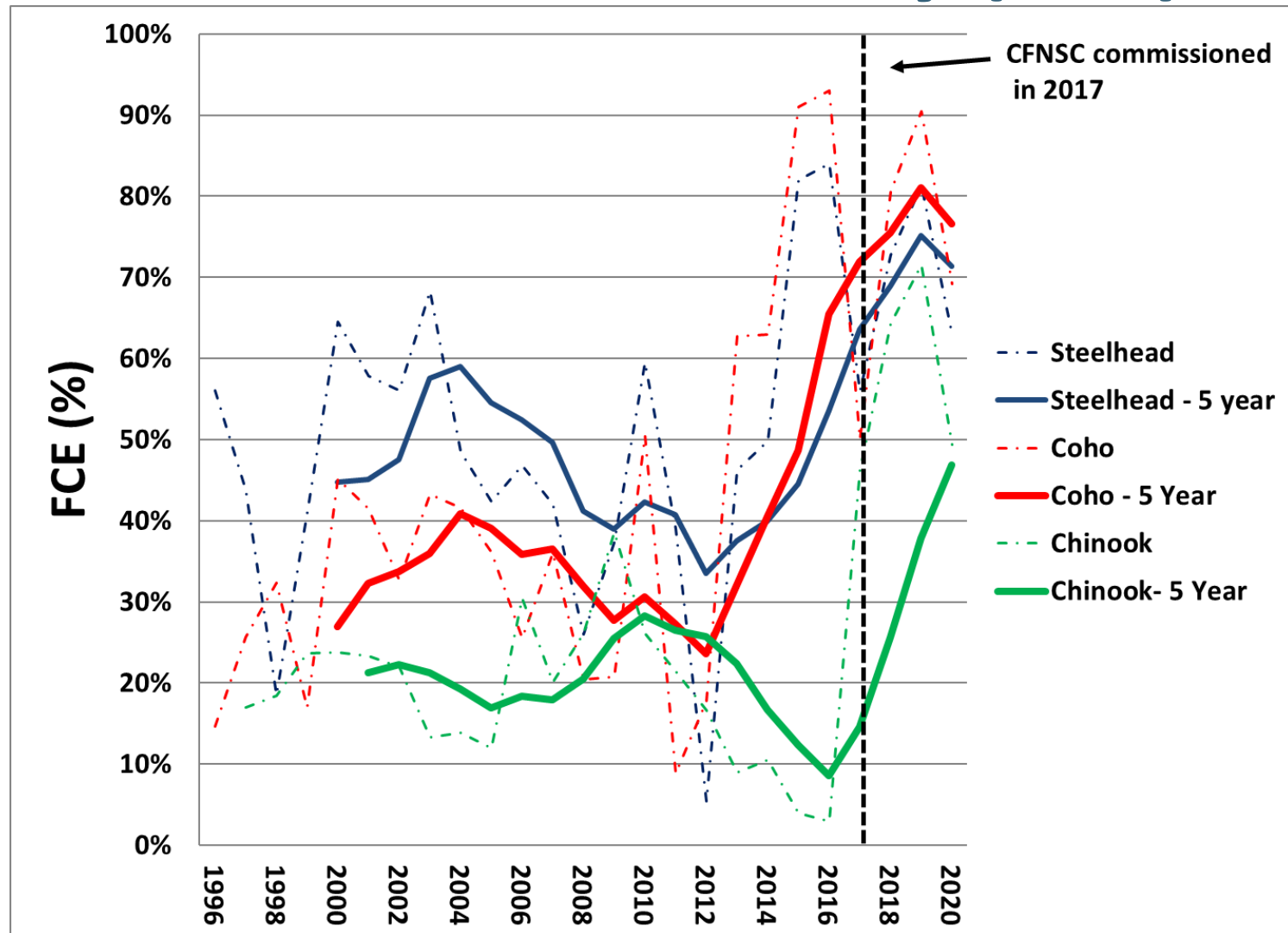
2017-2020 Study Fish Releases

| | Release Date Range | Annual Sample Size Range (Passive Integrated Transponder - PIT) | Annual Sample Size Range (PIT + Acoustic Tag) |
|------------------|-------------------------------|--|---|
| Steelhead | April 18 – June 15 | 476 - 837 | 150 |
| Coho | April 18 – July 12 | 601 - 1201 | -- |
| Chinook | June 20 – Aug. 16 | 399 - 900 | 158 - 172 |

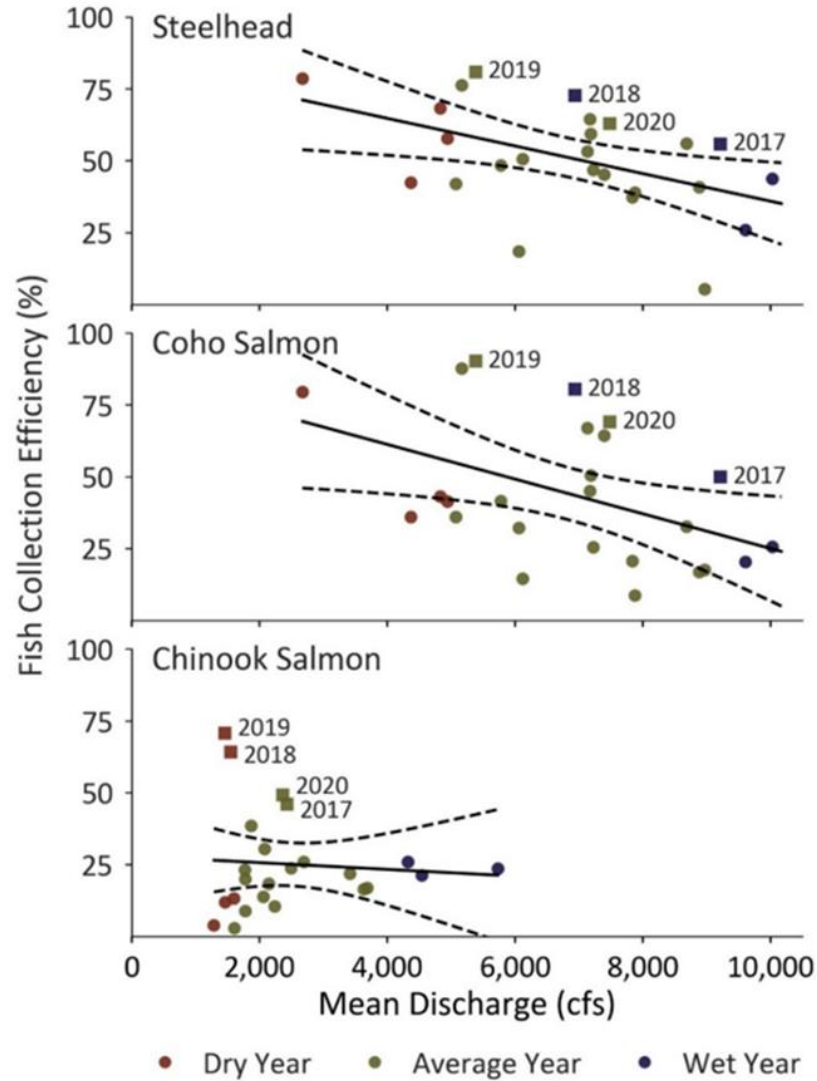
2017-2020 Route Selection



Fish Collection Efficiency (FCE)



Water Year Comparison



Fish Passage Summary

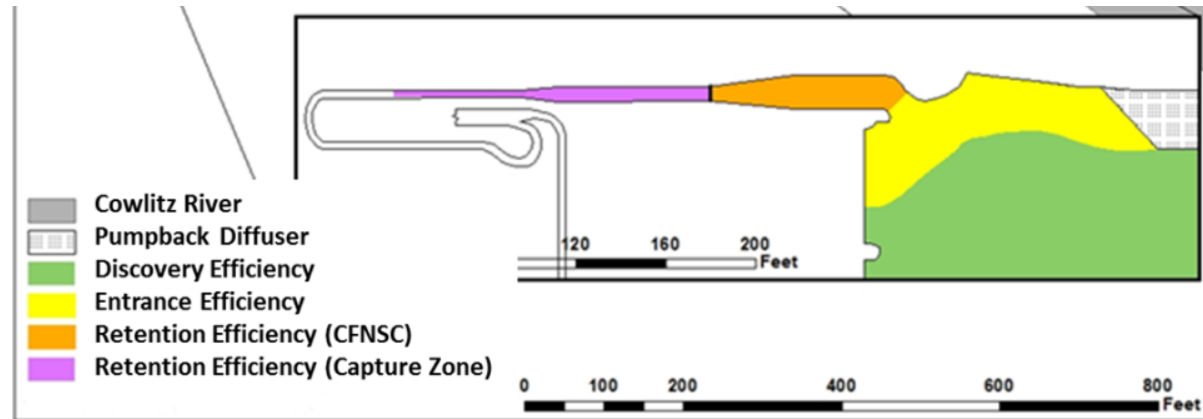
Fish Collection Efficiency

Fish Passage Survival

| Species | Fish Collection Efficiency | | | | Fish Passage Survival | | | |
|----------------|----------------------------|------|------|------|-----------------------|------|------|------|
| | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 |
| Steelhead | 56% | 73% | 81% | 63% | 57% | 75% | 83% | 65% |
| Coho Salmon | 50% | 81% | 90% | 69% | 52% | 82% | 93% | 72% |
| Chinook Salmon | 46% | 64% | 71% | 49% | 51% | 70% | 78% | 54% |

2017-2019 Acoustic Telemetry Results

Acoustic + PIT-
tagged Chinook
smolts



| | Number Released | Discovery Efficiency | Entrance Efficiency | Retention Efficiency | Capture Zone Efficiency | Fish Collection Efficiency |
|-------------|-----------------|----------------------|---------------------|----------------------|-------------------------|----------------------------|
| 2017 | | | | | | |
| Chinook | 158 | 100% | 70.7% | 93.0% | 96.8% | 46% |
| 2018 | | | | | | |
| Chinook | 172 | 98.1% | 81.6% | 88.8% | 99.0% | 64% |
| 2019 | | | | | | |
| Chinook | 166 | 100% | 75.1% | 96.4% | 96.4% | 70.8% |
| Steelhead | 150 | 100% | 96.5% | 80.0% | 81.4% | 81.0% |

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Next Steps

- Ongoing Monitoring
 - Baseline
 - Directed
 - Pumpback Diffuser Configuration
 - Capture Zone Floor Geometry
 - Chinook Life History Evaluation
- Implement Adaptive Management Plan

Mayfield Collection Numbers

| | Chinook | Coho | Steelhead | Cutthroat | Total |
|-------------|---------|--------|-----------|-----------|---------|
| 2016 | 13,662 | 20,808 | 6,659 | 623 | 41,752 |
| 2017 | 97,000 | 36,792 | 5,666 | 960 | 140,418 |
| 2018 | 23,555 | 38,431 | 7,720 | 758 | 70,464 |
| 2019 | 34,307 | 40,872 | 5,910 | 494 | 81,583 |
| 2020 | 7,658 | 36,374 | 5,881 | 803 | 50,716 |

Questions?

