

The Phase 2 Implementation Plan "P2IP"

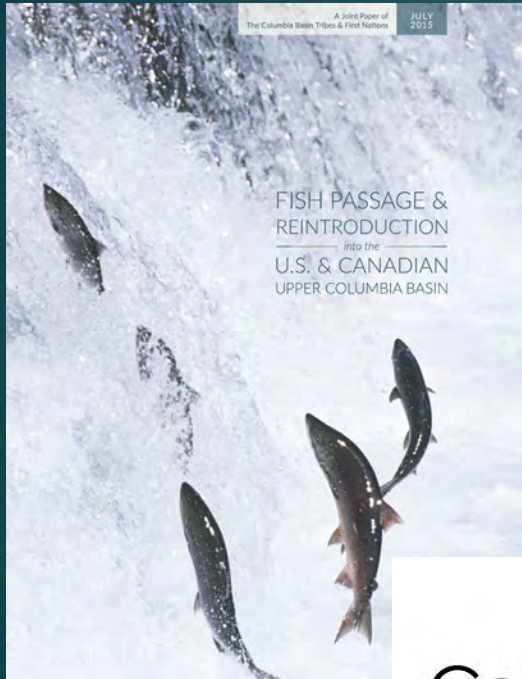
Casey Baldwin, Confederated Tribes of the Colville Reservation
Rick Raymond, Spokane Tribe of Indians

Spokane River Forum - April 26, 2023



Input, funding and participation from:
WDFW, USGS, PNNL, Kevin Malone Consulting,
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Fish & Wildlife Service, NOAA Fisheries, Army
Corps of Engineers, Bureau of Reclamation,
Avista Corporation

The “Phased Approach”



Columbia
River Basin
Fish and Wildlife
Program 2014

Phase 1: Completed in 2019

- Evaluate passage studies at hydroelectric projects, including CJD & GCD
- Investigate habitat availability, suitability and salmon survival potential in habitats above GCD
- Investigate possible cost of upstream and downstream passage options

Phase 2: Underway

- Design and test reintroduction strategies and fish passage facilities
- Reintroduction pilot projects
- Monitoring, evaluation, and adaptive management

Phase 3:

- Review results to determine implementation and permanent inclusion to the Program

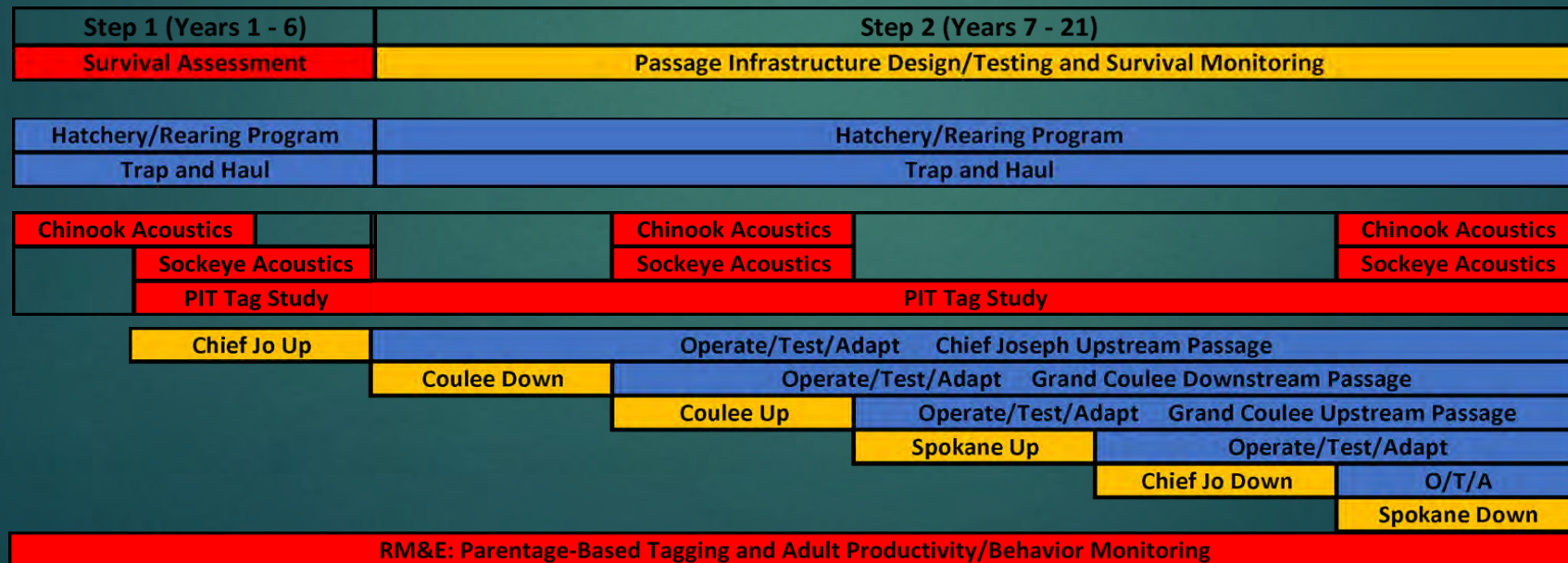


Fish Passage and Reintroduction: The Phase 2 Implementation Plan "P2IP"

A stepwise and scientifically adaptive approach to test the feasibility of restoring salmon to the Upper Columbia River basin that is focused on collaboration, cost effectiveness and benefits for the entire region.

P2IP: Objectives and Timeline

- Establish access to sources of non-ESA Chinook and Sockeye salmon donor stocks
- Develop interim hatchery facilities to produce fish for feasibility studies
- Test the key assumptions used in the Phase 1 Life Cycle Model
 - Fish behavior and survival
- Develop and test up and downstream interim passage facilities under current operations
- Provide the data necessary for full-scale reintroduction and permanent passage



Fish Production & Rearing Facilities

- Necessary to support Phase 2 Studies
 - 150k+ Chinook and 50k+ sockeye annually
- Preferred donor stocks identified in Phase 1
- Egg to Sub-yearling rearing
 - Finding space and options in existing facilities
- Sub-Yearling to Yearling rearing
 - Acclimation Facilities
 - Net pen rearing
 - Land-based acclimation



Juvenile Salmon Acoustic Survival Study

JSATS Telemetry (small #'s, detailed info)

- Passage survival across 5 dams
- Passage routing at GCD and CJD
- Reach survival throughout the blocked area
- Travel time from multiple release locations



Photo courtesy of USGS



Chief Joseph Dam, ACOE



Grand Coulee Dam, BOR



Little Falls Dam, Avista Corp



Long Lake Dam, Avista Corp



Nine Mile Dam, Avista Corp

PIT Tag Releases

Juvenile Chinook and Sockeye Survival

- 50k – 160k total of each species
 - Sample sizes refined with data from previous studies
 - Ensure sufficient adults return to meet research needs
- Release site to RRD/McNary Dam
- Smolt-to-Adult Return Rates



Adult Chinook and Sockeye Survival

- Bonneville Dam to Wells Dam Survival
- Evaluate Collection Efficiency of Returning Adults

Adult Chinook and Sockeye Behavior – Acoustic

- Evaluate Blocked Area Adult Migration and Homing
- Tailrace Behavior for Upstream Passage Planning



Trap and Haul from Downstream of Chief Joseph Dam

Initial Upstream Passage Option

- Trap-and-Haul from Chief Joseph Hatchery Ladder
- Release in Reservoirs Upstream



Step 2 – Interim Passage & Testing

Step 1 Continued Activities:

- Operation of interim rearing facilities
- PIT tag releases of Chinook and Sockeye
- Trap-and-Haul from CJD to upstream reservoirs

Incremental Installation of Interim Passage Facilities

Sequence will be informed by Step 1 survival studies

- Design & Installation
- Effectiveness Testing
- Operation

Research, Monitoring, & Evaluation

- Parentage-based Tagging (PBT), Adult Recruits per Spawner (AR/S), limiting factors & adaptive management

Step 2: Interim Downstream Passage Facilities

Juvenile Passage Options

- Spill and Turbines to Provide Initial Passage
- Minimize Impacts to Dam Operations
- Ability to Collect Juvenile Salmon Efficiently



Potential Collection Location @ GCD



Step 2: Interim Upstream Passage Facilities

Adult Passage Options

- *Minimize Impacts to Dam Operations, Leverage Existing Infrastructure*
- Trap-and-Haul Program from Chief Joseph Hatchery Ladder
- Adult Collection Considerations
 - Volitional vs Assisted Passage
 - Adult Sampling and Sorting



Photo Courtesy of Whooshh Innovations



Phase 2 is underway

Funding or in-kind support provided by Upper Columbia Tribes, State of WA, USBR, PCSRF (NOAA), USGS, USFWS, Dept. of Energy & PNNL, congressionally directed spending, and others.

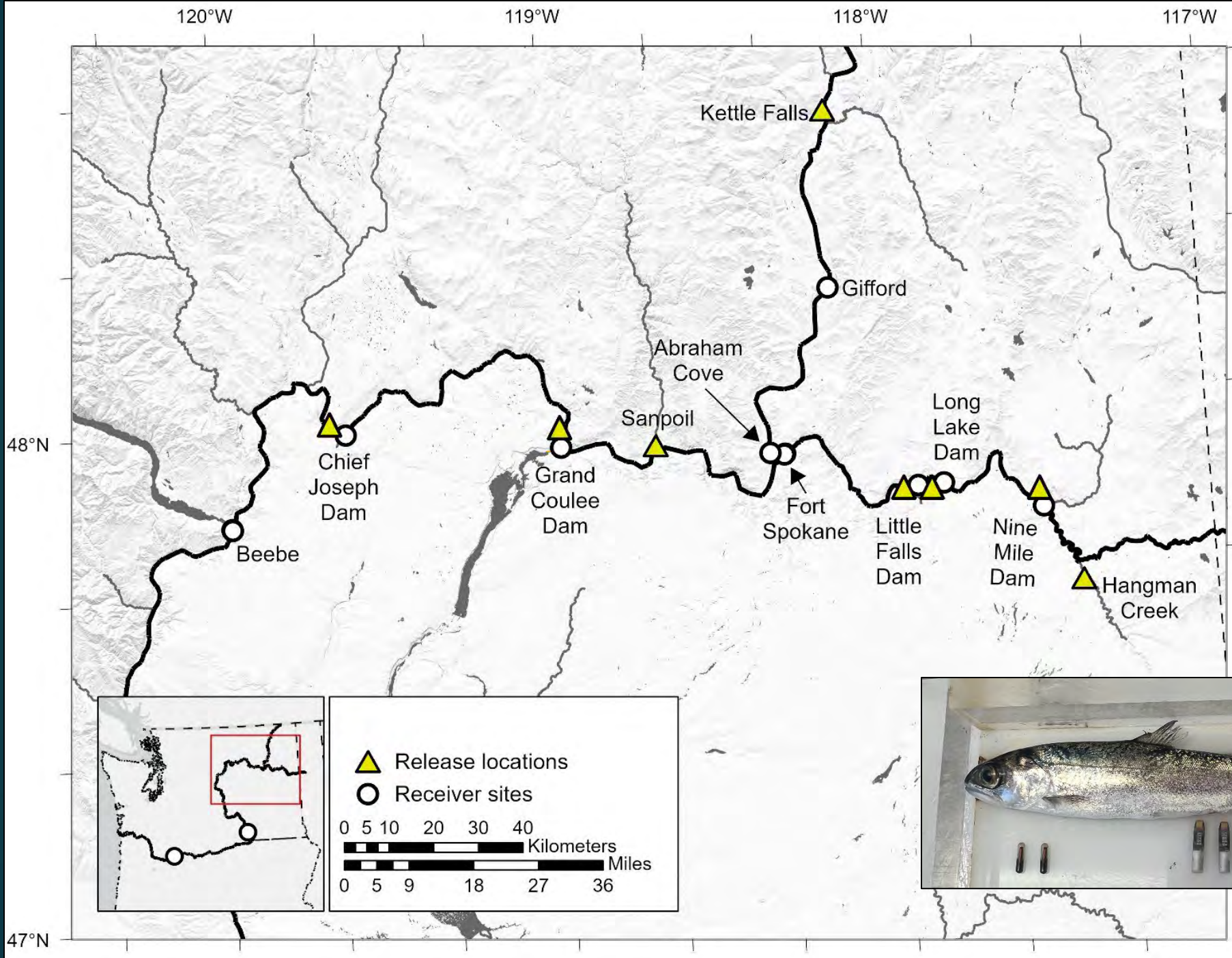
Support is growing and studies are underway, but all the pieces and commitments are not yet in place.

A Pilot Study to Evaluate Downstream Migration Behavior and Survival in the Blocked Area of the Upper Columbia River

Toby Kock¹, Casey Baldwin², Tom Biladeau³, Conor Giorgi⁴,
Rick Raymondi⁴, Laura Robinson⁵, and Scott Evans¹

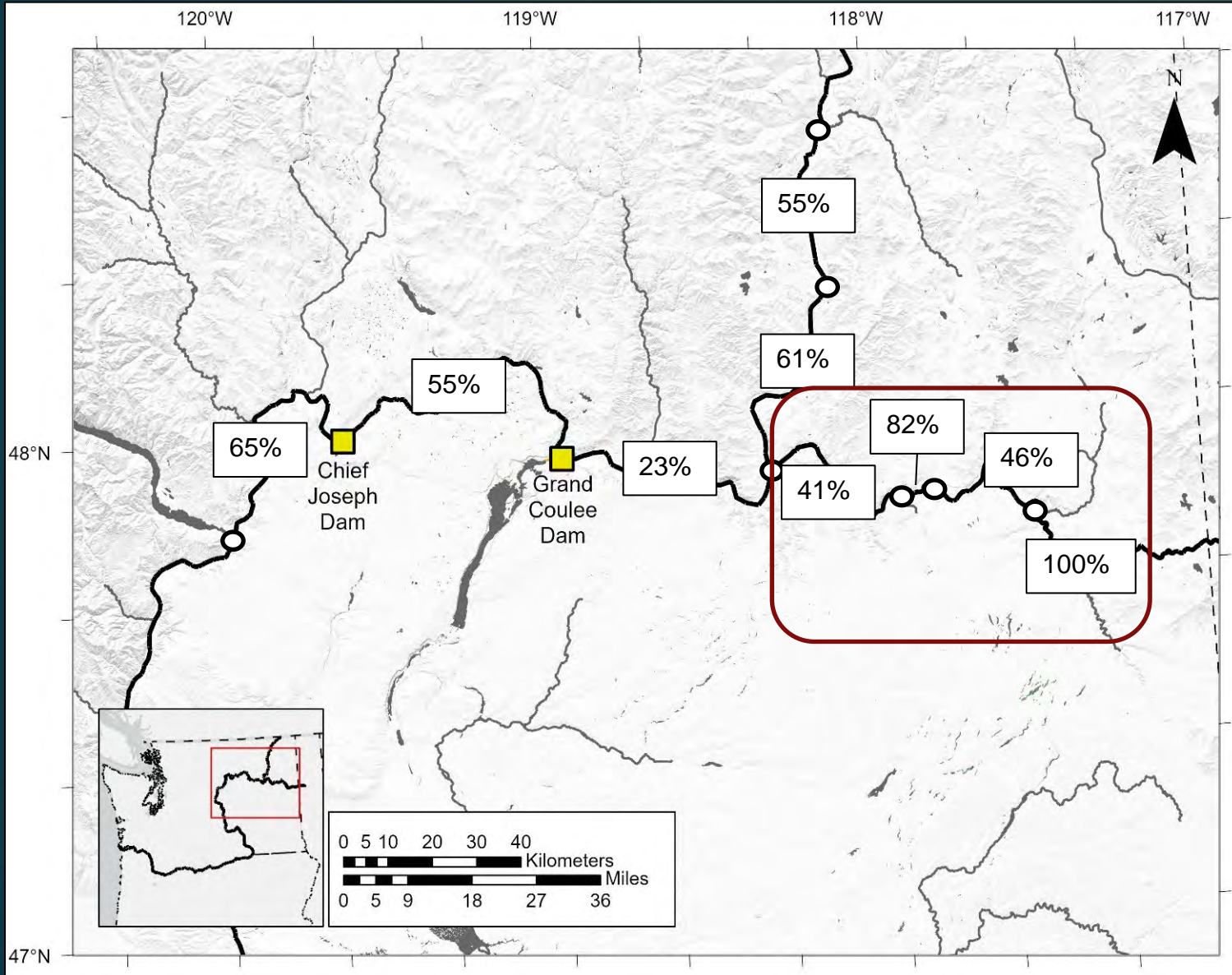
August 23, 2022

This information is preliminary and is subject to revision. It is being provided to meet the need for timely best science. The information is provided on the condition that neither the U.S. Geological Survey nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the information.



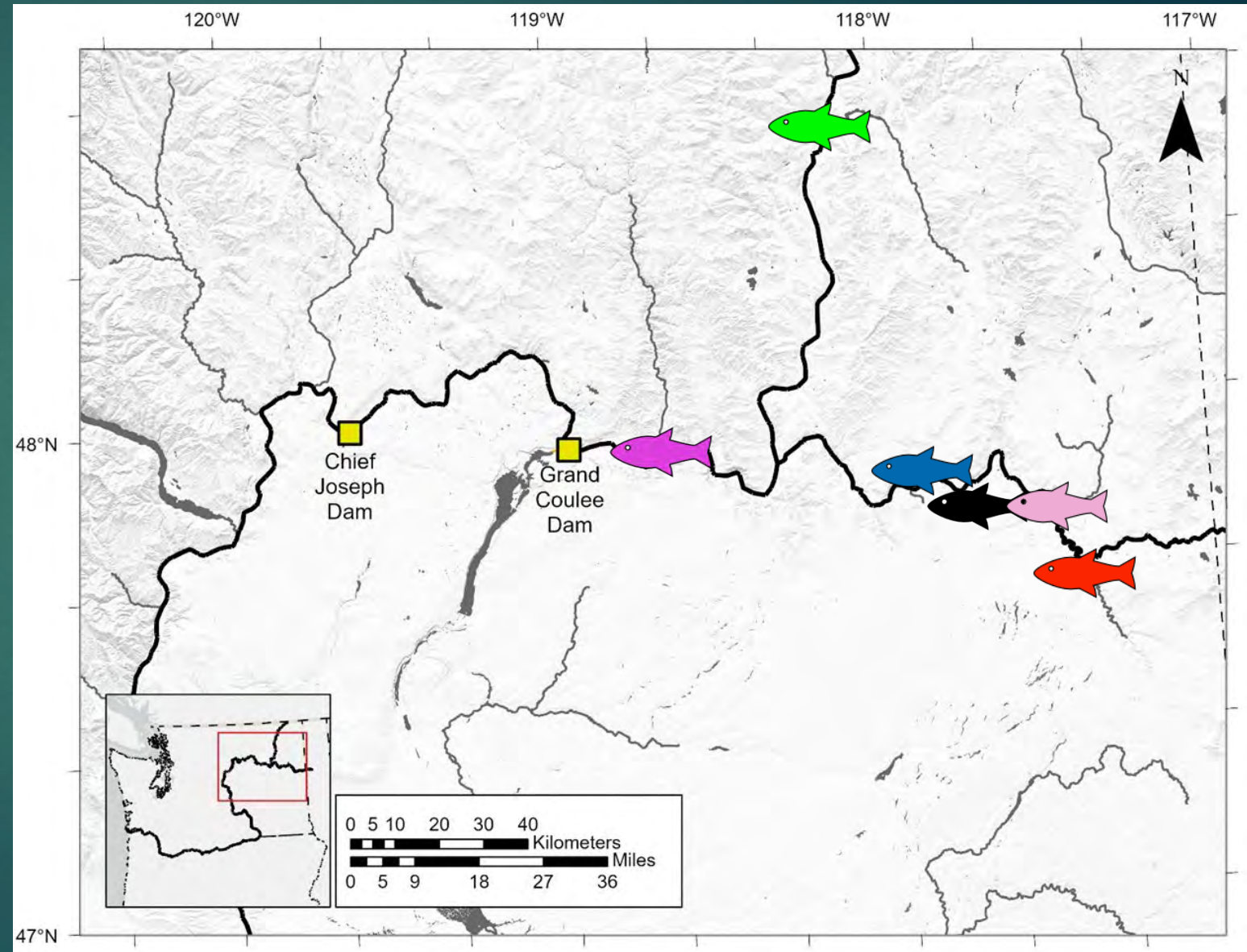
753 Acoustic tagged fish released with 4,588 PIT tagged fish at 8 locations March-May 2022





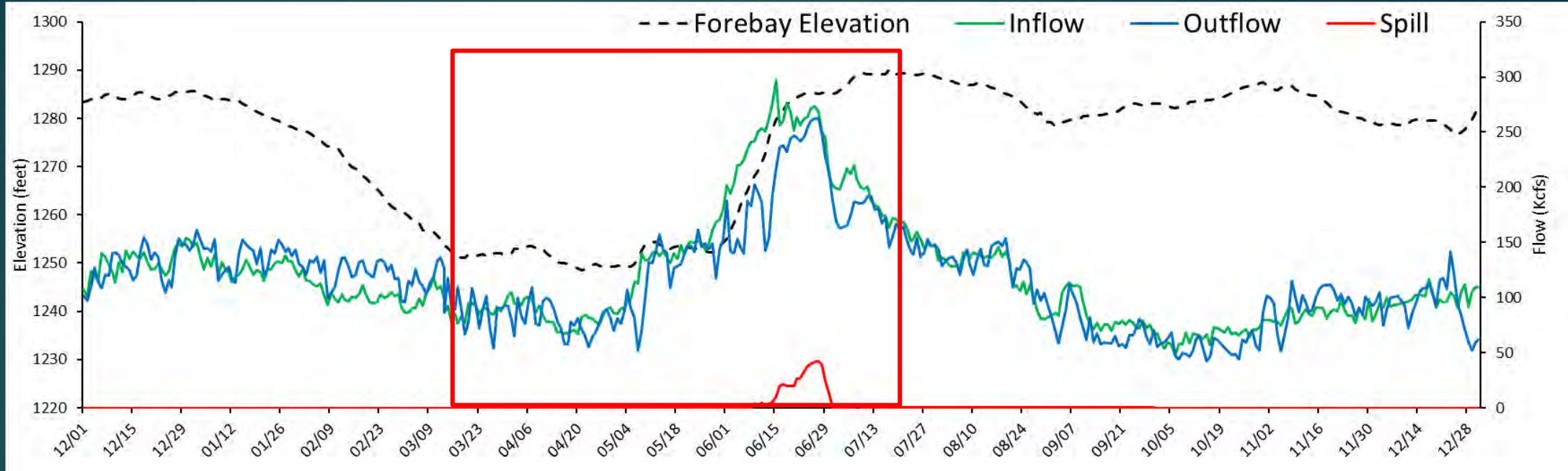
Travel Time To Grand Coulee Dam

Release site	Median travel time
Kettle Falls (n = 23)	91.1 days
Hangman Creek (n = 2)	107.5 days
Nine Mile Dam (n = 1)	54.4 days
Long Lake Dam (n = 7)	84.5 days
Little Falls Dam (n = 5)	70.9 days
Sanpoil River (n = 42)	61.0 days

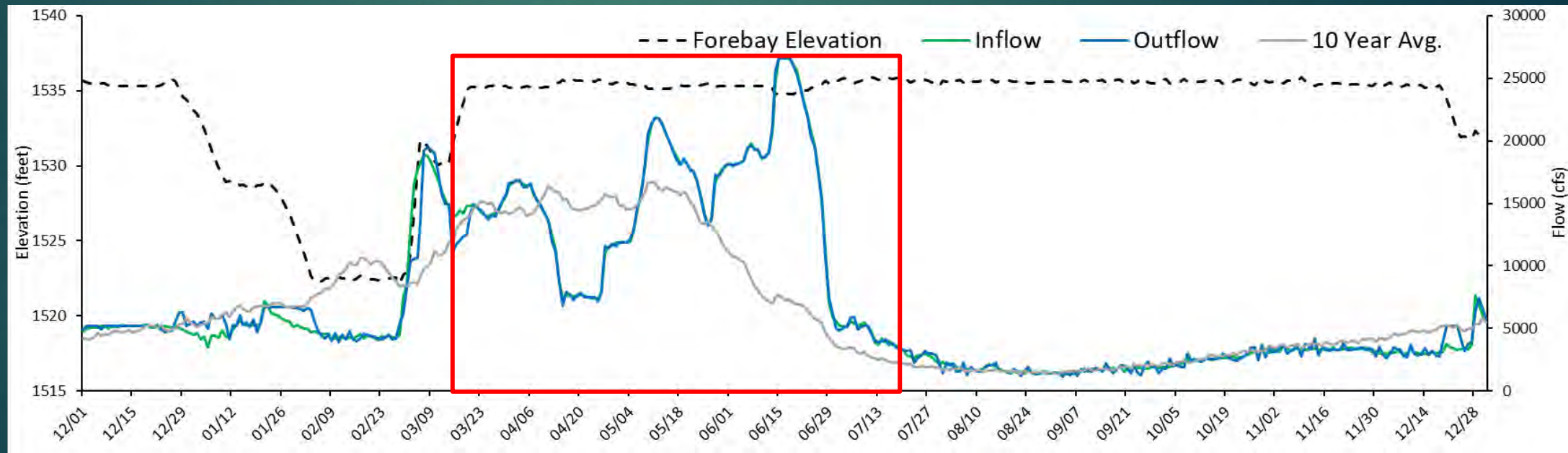




Grand Coulee Dam

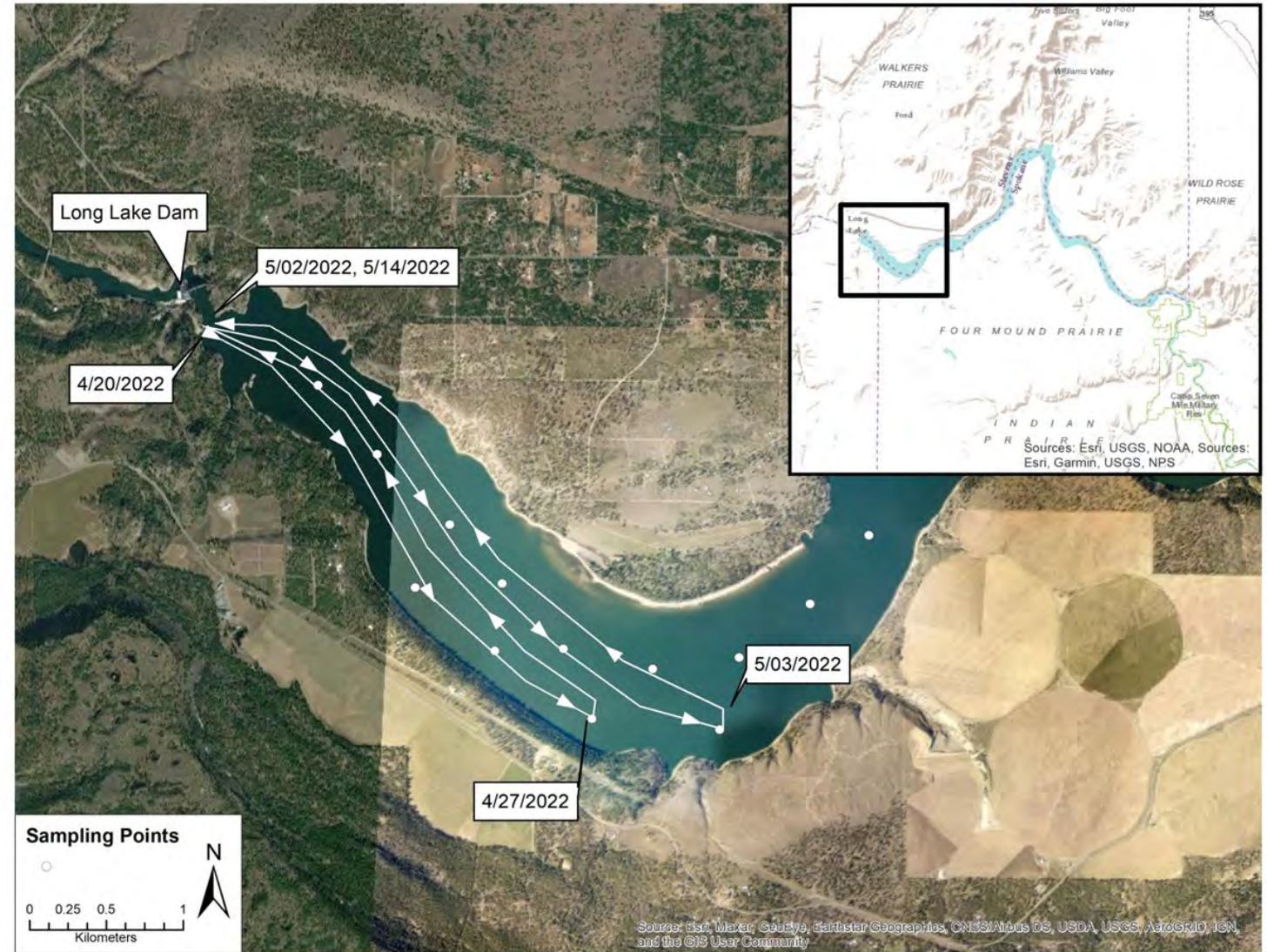
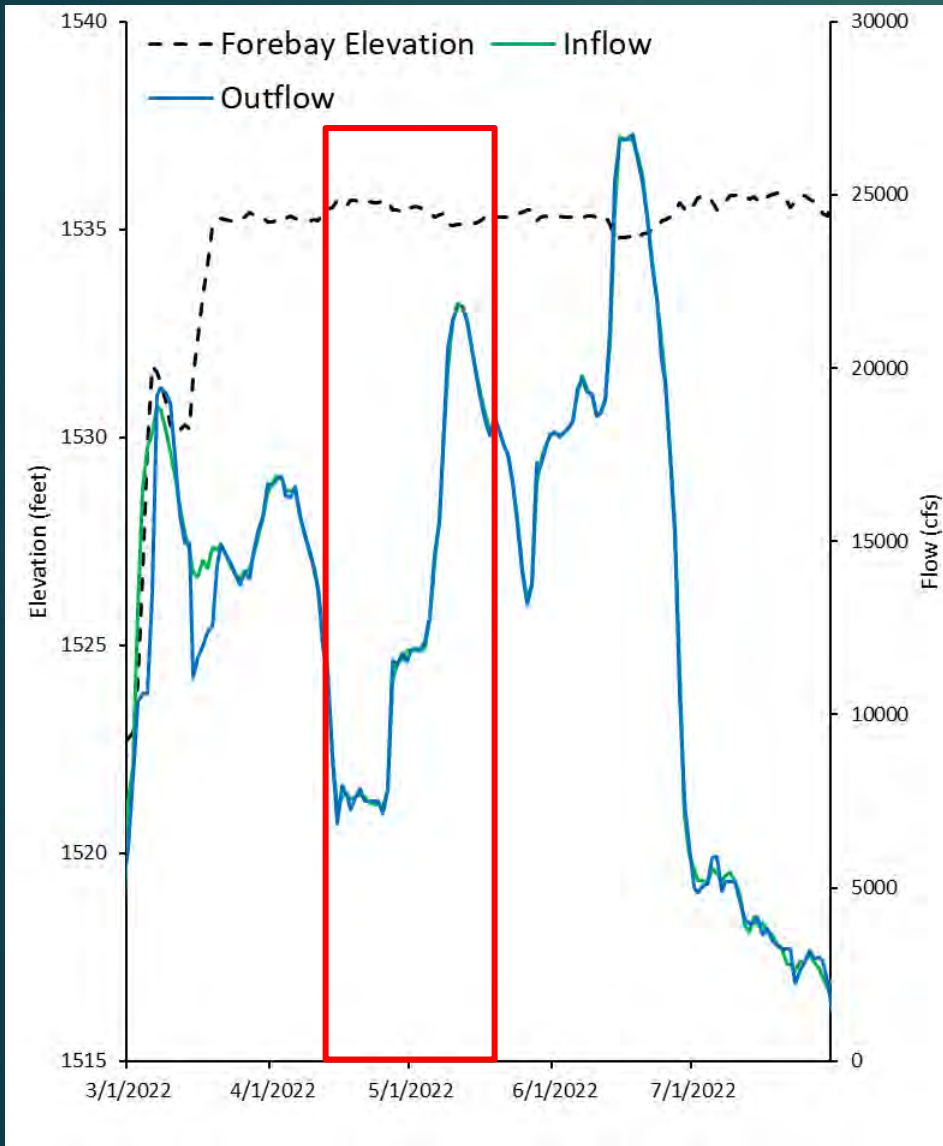


Long Lake Reservoir

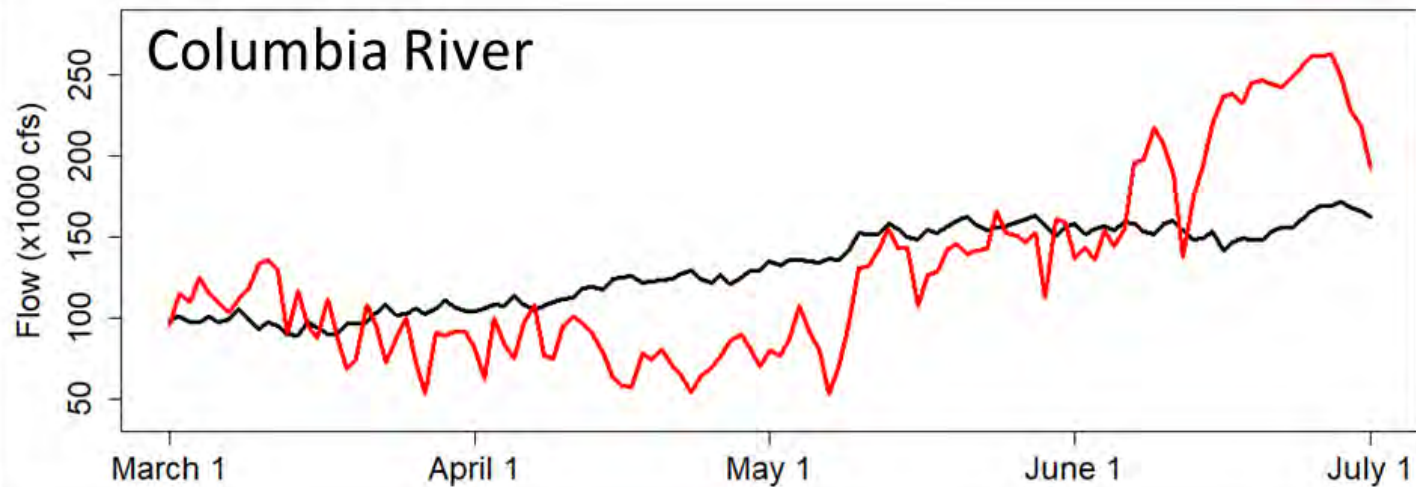
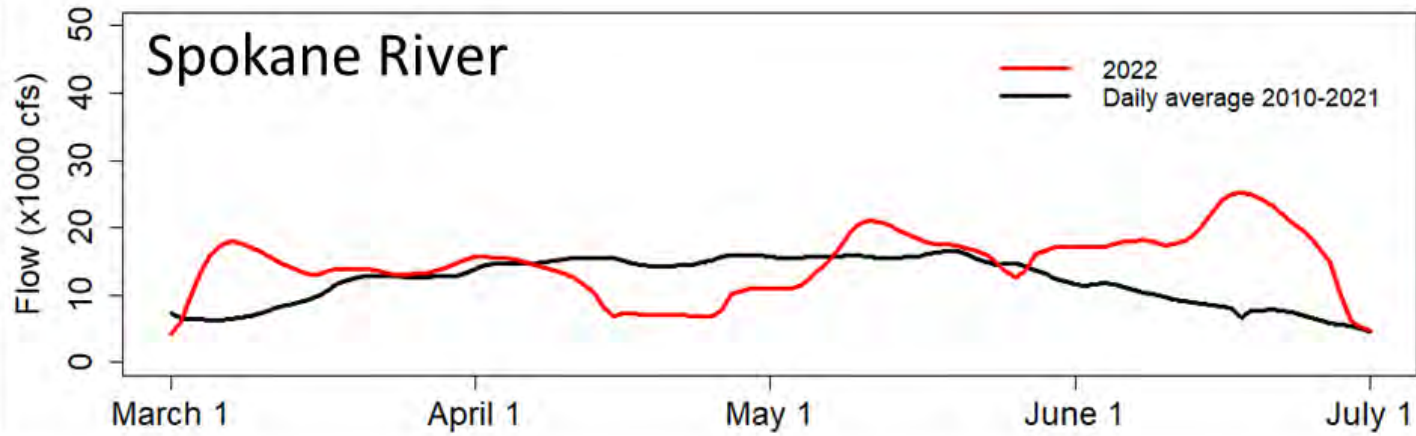


Travel Time: Hangman Creek 107 days, Long Lake Dam 84 days

Long Lake Reservoir Behavior



Final Thoughts



Juvenile Outmigration Studies:

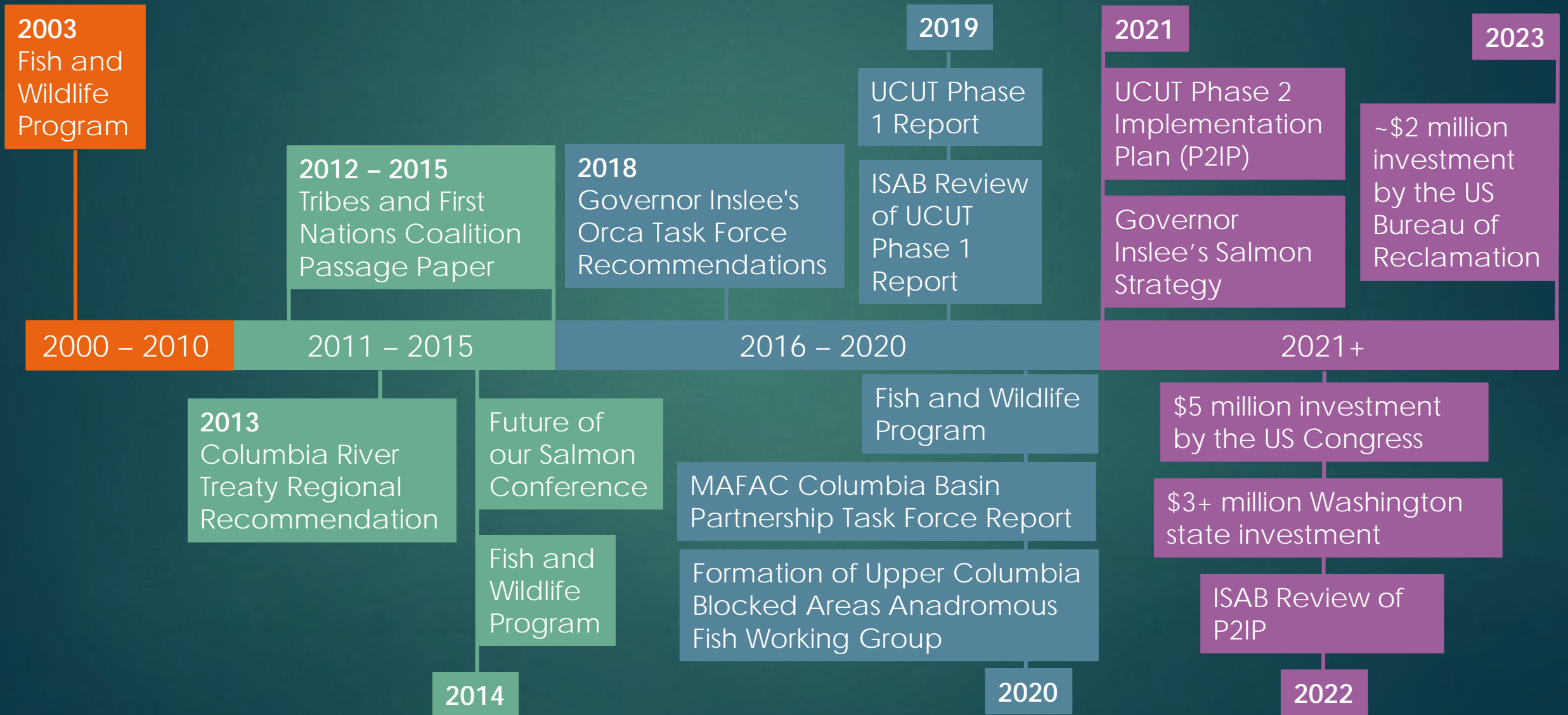
- 2023 is underway
- Increasing PIT tag groups using overwinter net pen
 - ~53k released spring 2023
 - ~170k being reared for spring 2024
- Working on funds and donor stocks for Sockeye studies
- PIT tagging wild emigrants from spawning tributaries
- Sanpoil and Tshimakain





Questions ?

Milestones

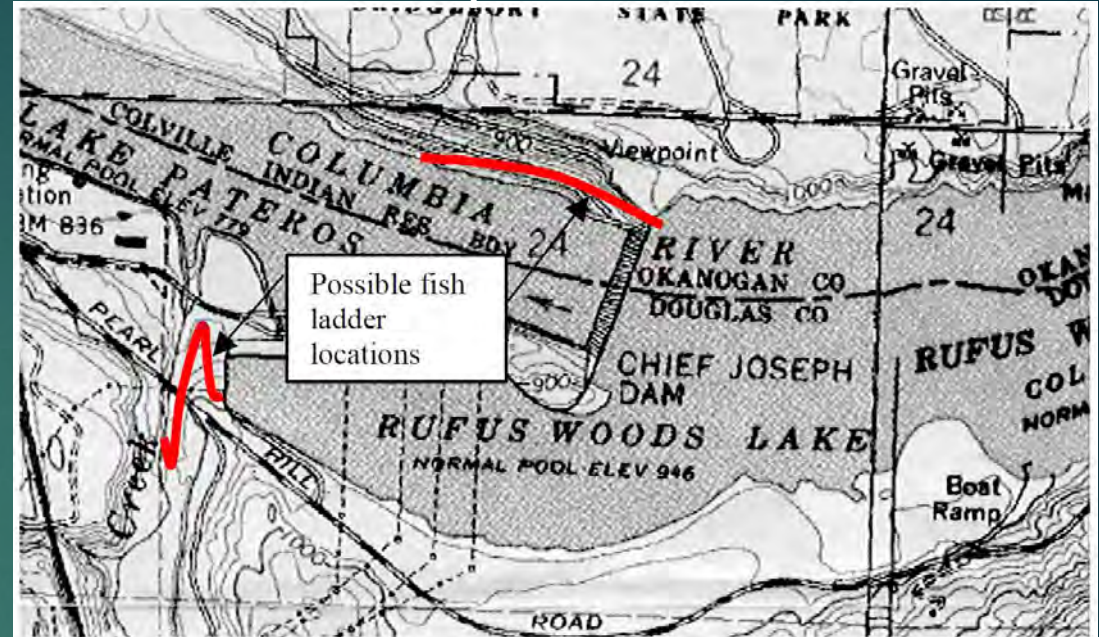


Preliminary Investigation of Fish Passage Alternatives (Corps 2002)

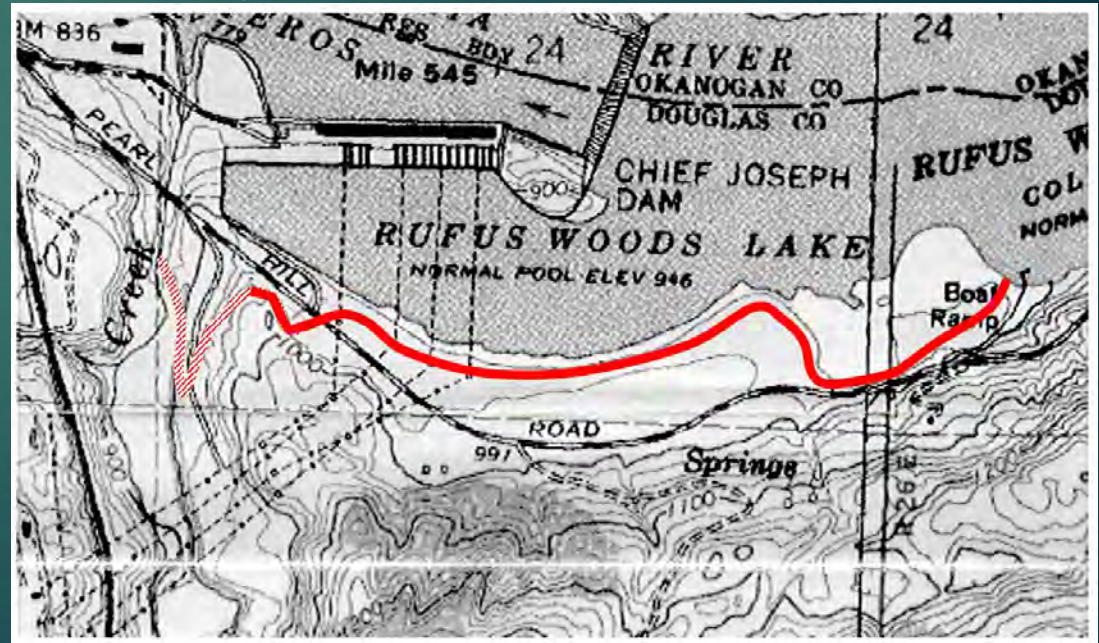
Upstream Passage Alternatives

- Fish Ladder – Pool and Weir, Vertical Slot or Hybrid Fishway
- Surface Bypass Channel – Simulated Natural Channel
- Fish Lock or Lift
- Surface Collector at Forebay or Sluiceway or Other Channel / Pipe Bypass.

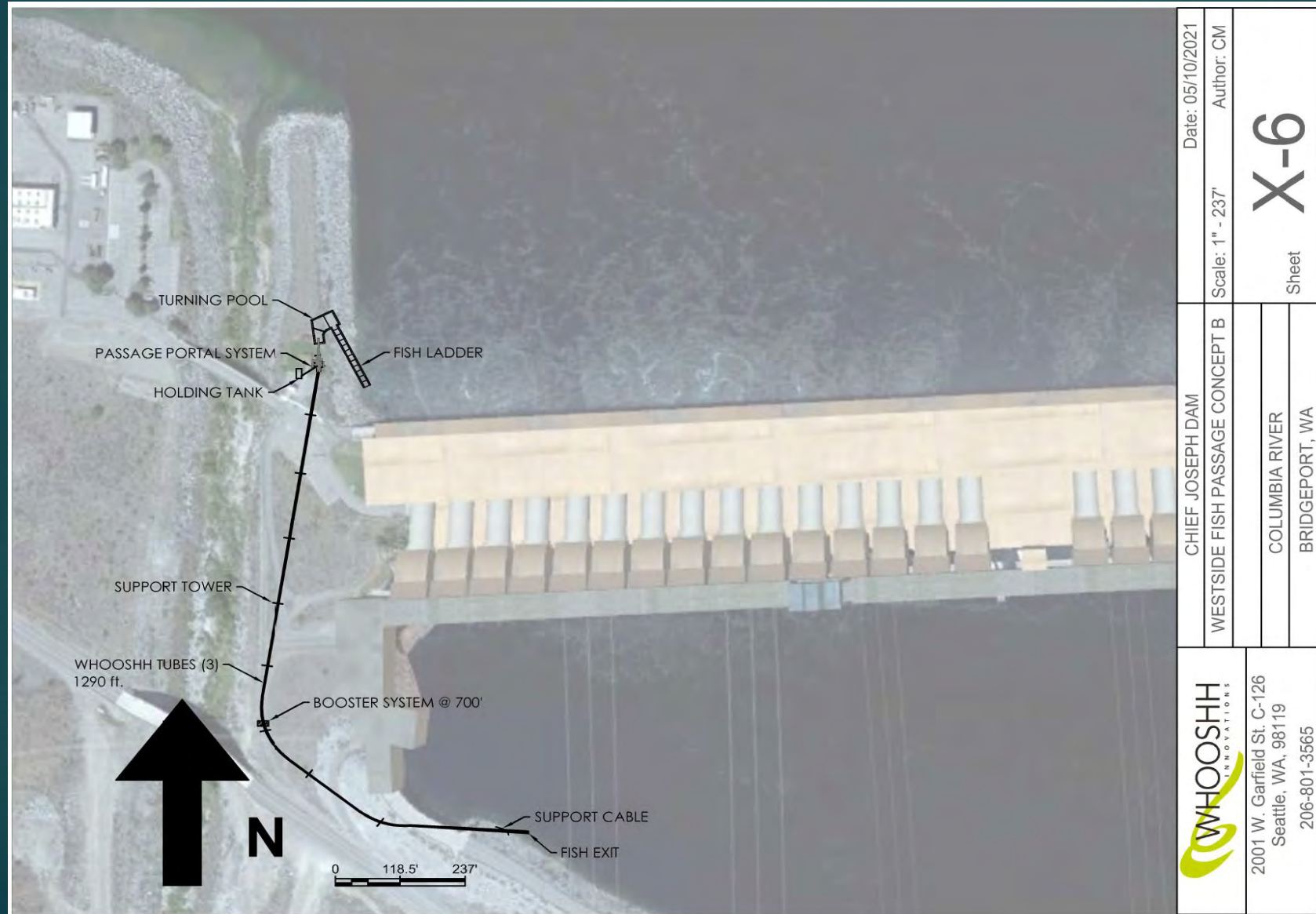
Fish Ladder Concept



Surface Bypass Channel Concept



P2IP Appendix E: An Adult Upstream Fish Passage Concept for Chief Joseph and Grand Coulee Dams



 <p>2001 W. Garfield St. C-126 Seattle, WA, 98119 206-801-3565</p>	<p>CHIEF JOSEPH DAM</p> <p>WESTSIDE FISH PASSAGE CONCEPT B</p> <p>COLUMBIA RIVER</p> <p>BRIDGEPORT, WA</p>	<p>Date: 05/10/2021</p> <p>Scale: 1" = 237'</p> <p>Sheet</p>	<p>Author: CM</p> <p>X-6</p>

One of 4 concepts presented in Appendix E for CJD.