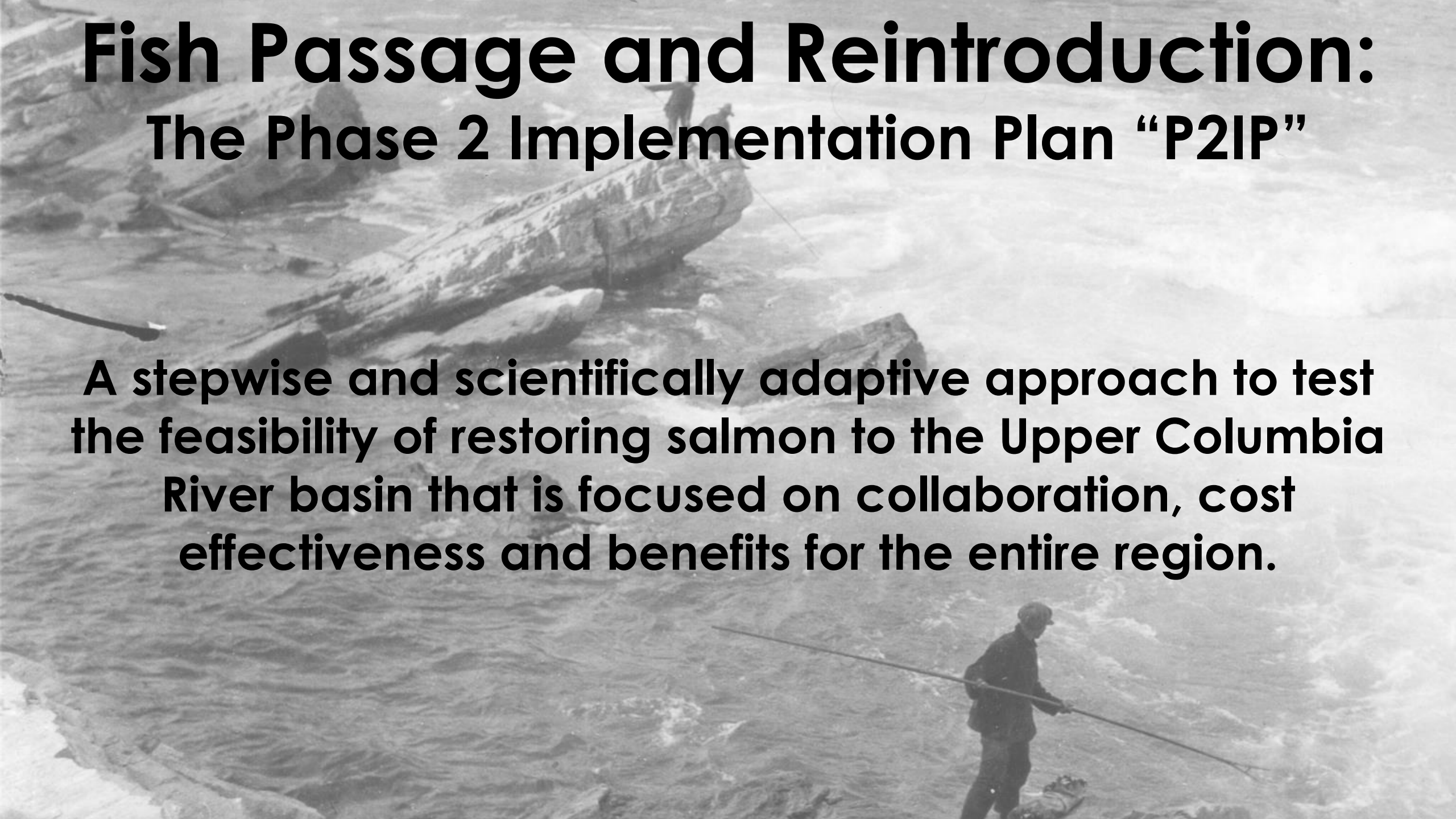
Fish Passage and Reintroduction:
The Phase 2 Implementation Plan

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

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: Test the Feasibility of Passage and Salmon Persistence

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

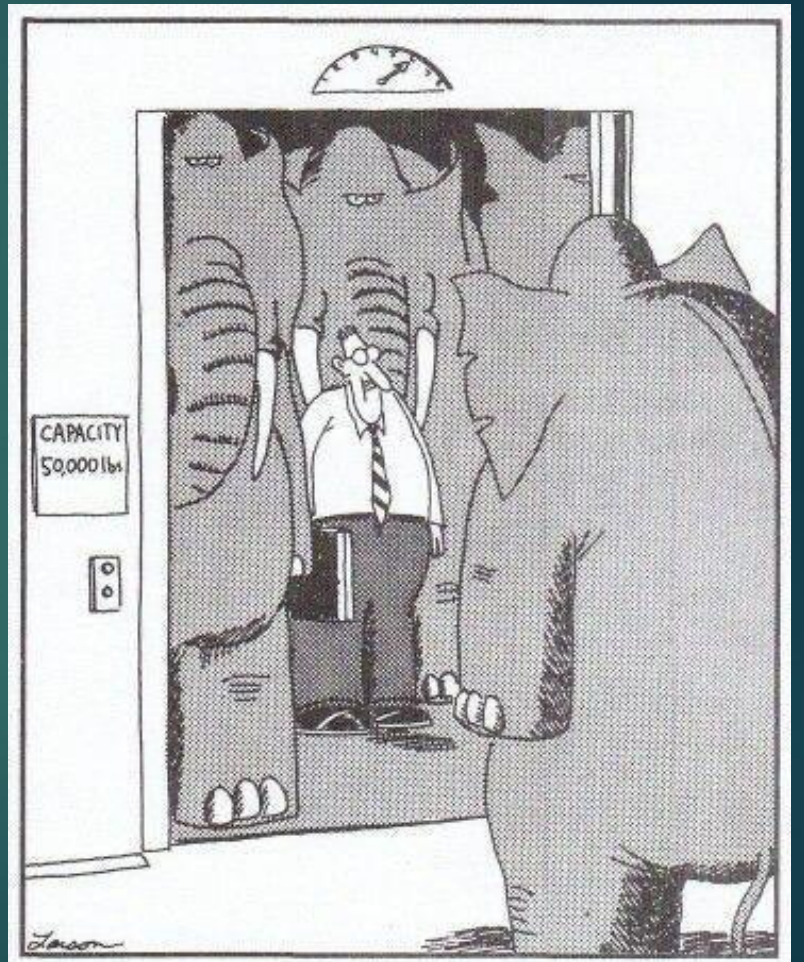
P2IP: Test the Feasibility of Passage and Salmon Persistence

Coordinated Approach

- States Agencies, Columbia River Tribes, Federal Agencies
  - 21 Managing Agencies in BAAFWG
- Coastal Tribes, Commercial Fisheries, Sport Fisheries, NGOs, Irrigators, River Users, Port Districts, Utilities
- Canadian Governments, First Nations, Provincial Governments, Canadian Hydro, International Fisheries

Regulatory Considerations & Constraints

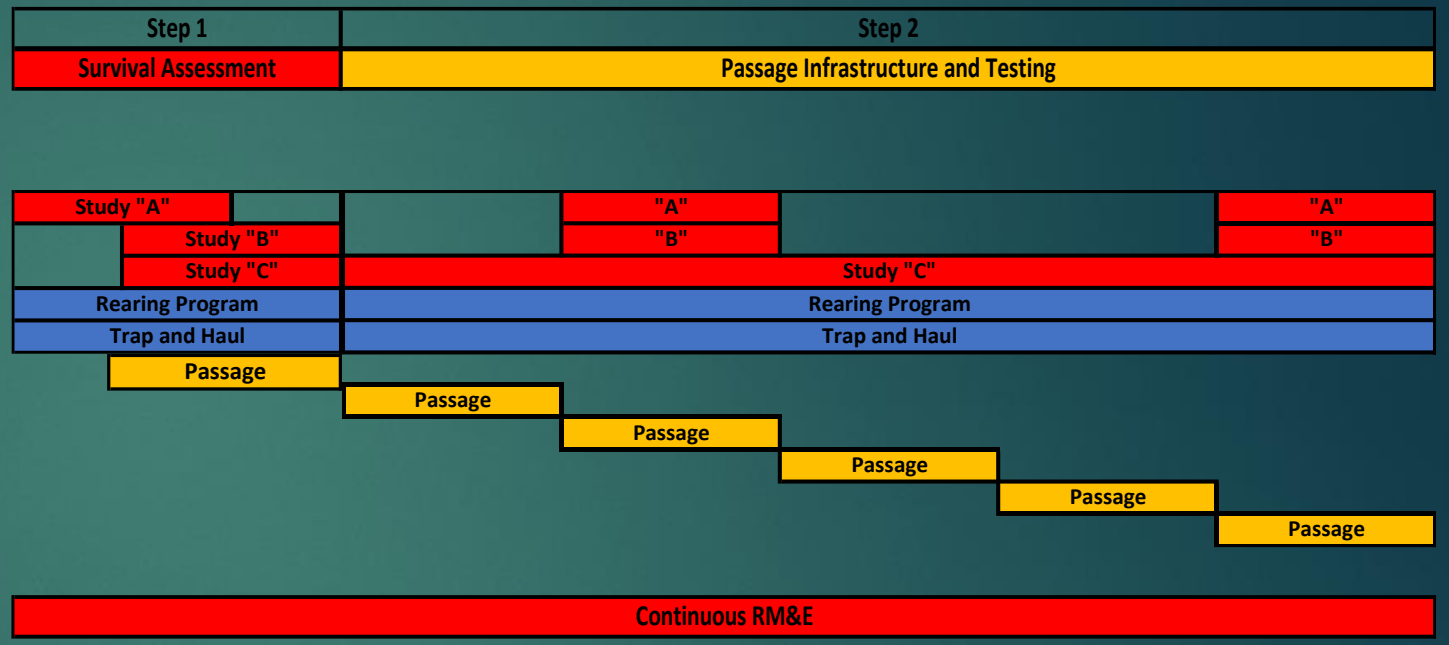
- Consultation & ESA Impacts
- Fish Health and Disease Management
- Access to Preferred Donor Stocks
- Access to Rearing and Adult Collection Facilities
- Lack of Funding/Support



Already concerned, Ernie watched in horror as one more elephant tried to squeeze on.

P2IP: Timeline and Structure

- 20+ Years, 2 Major Steps



- Step 1: Years 1 - 6
  - Initial Survival Studies
  - Donor Stock Access
  - Adult Trap and Haul Program
  - Rearing Facility Development
  - Passage Investigation Begins
- Step 2: Years 7 – 20+
  - Design and Testing of Fish Passage Systems
  - Continuation of Survival and Behavior Studies

Phase 2 Outlook

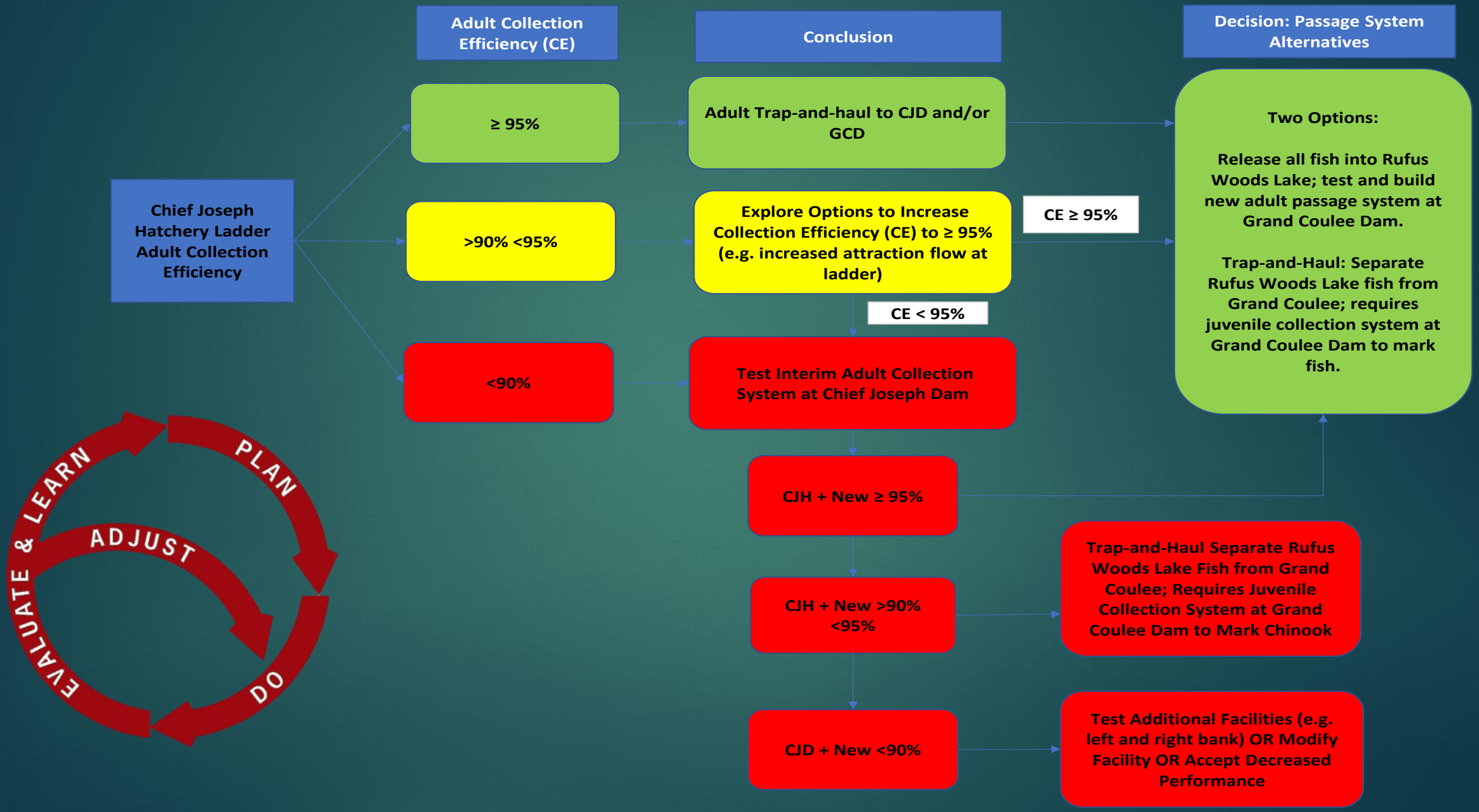
The Path to Reach the End Gets Hazier the Further Out We Try to See

PHASE 3

- 20+ years to implement the P2IP if the path is linear and there are no obstacles
- Multiple forks in the path that adaptive management may require us to take
- Obstructions in the path that could slow the journey
  - Regulatory, etc

Phase 1

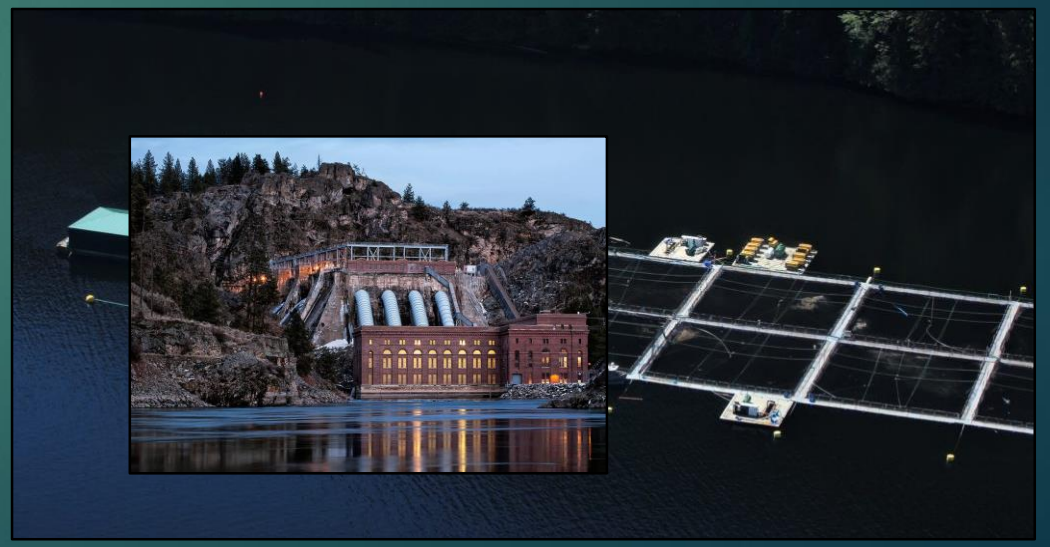
P2IP: Adaptive Management



Step 1 – Baseline Data & Infrastructure

Interim Fish Production Facilities

- Review current facilities & programs
- New or expanded early rearing facilities, net pens, acclimation sites



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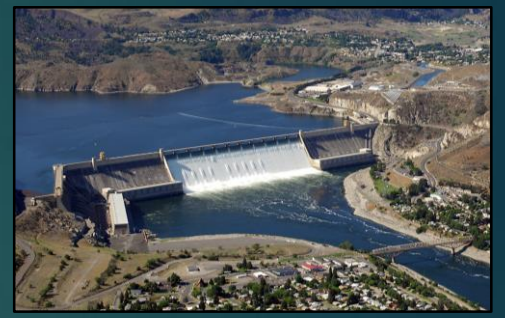
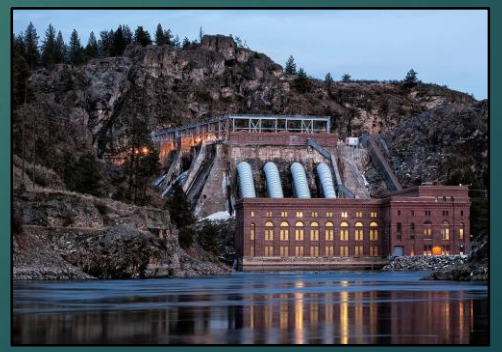


Downstream Behavior & Survival Studies

- Acoustic behavior and survival, yearling Chinook and Sockeye
- PIT tag releases, yearling Chinook and Sockeye

Upstream Survival & Behavior Studies

- Upstream survival using Adults from PIT releases
- Tailrace Behavior



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Interim Upstream Passage at Chief Joseph Dam

- Trap-and-haul from Chief Joseph Hatchery ladder
- CJH ladder expansion and additional interim facilities

Step 2 – Interim Passage & Testing

Step 1 Continued Activities:

- Operation of interim rearing facilities
- Moderate-sized 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

P2IP: Timeline and Structure

20+ Years, 2 Major Steps

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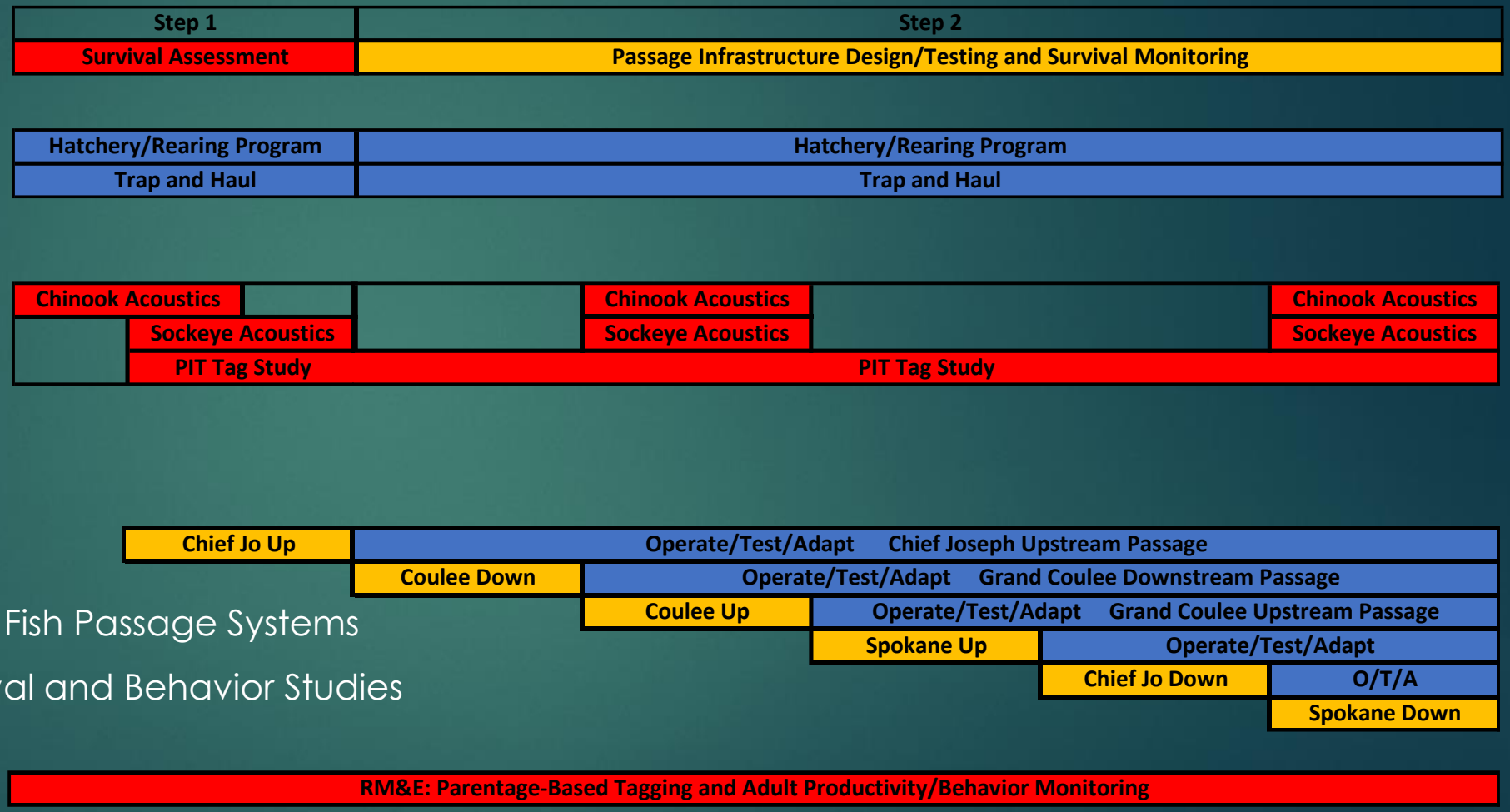
  - Adult Trap and Haul Program
  - Initial Survival Studies
- Step 2: Years 7 – 20+
  - Design and Testing of Fish Passage Systems
  - Continuation of Survival and Behavior Studies
  - PBT



P2IP Budget Estimates

1) Year 1-6 (Studies, Hatcheries, Chief Joseph Up)	$32.6	
2.1) Year 7-9 (Ongoing Studies, Grand Coulee Down)	$27.2	$59.8
2.2) Year 10-12 (Ongoing Studies, Grand Coulee Up)	$25.3	$85.1
2.3) Year 13-15 (Ongoing Studies, Spokane Up)	$24.9	$110.1
2.4) Year 16-21 (Ongoing Studies, CJD Down, Spokane Down)	$65.95	**$176.0**

Interim Facility Design and Construction	$75.6 million
Research, Monitoring, and Evaluation	$69.5 million
Operation and Maintenance	$30.9 million
Total Estimated Cost	**$176 million**

P2IP Highlights

- Projected costs estimated at $176 million, ~$8.5 million/year
- No operational changes to power, flood risk management, or irrigation
- Answers the fundamental feasibility questions around permanent salmon reintroduction
- Interim upstream and downstream passage at five hydroelectric dams
- Increased natural and hatchery-origin salmon throughout the Columbia River system
- More fish available for harvest
- Support for local and marine ecosystems
- Salmon in the UCR will add diversity and resiliency to climate change
- Health and economic benefits to all communities in the Upper Columbia Region
- A step toward restoring the cultural and spiritual heritage for the UCR tribes