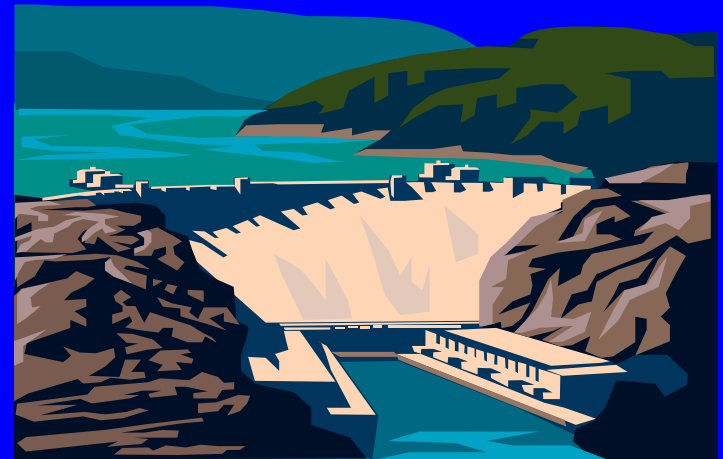


QUESTIONS?



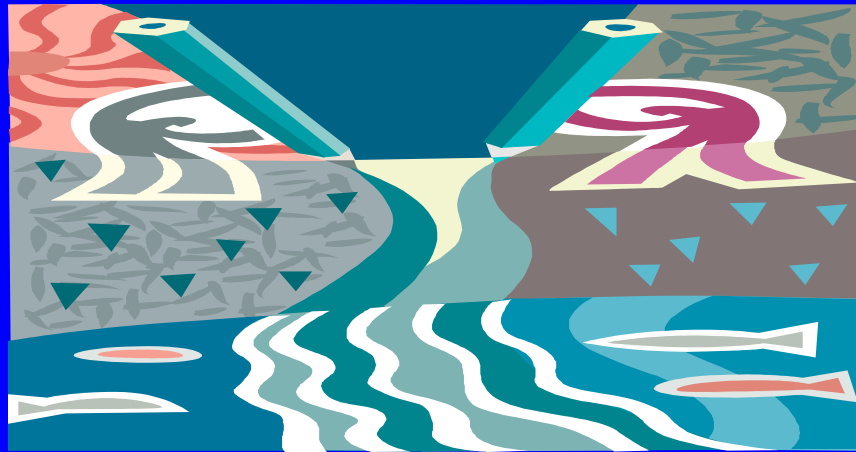
Cle Elum Dam Fish Passage

- Presented by David Fast
- **Cooperative Study**
- Bureau of Reclamation
- Yakama Nation
- WDFW
- NOAA Fisheries
- Forest Service

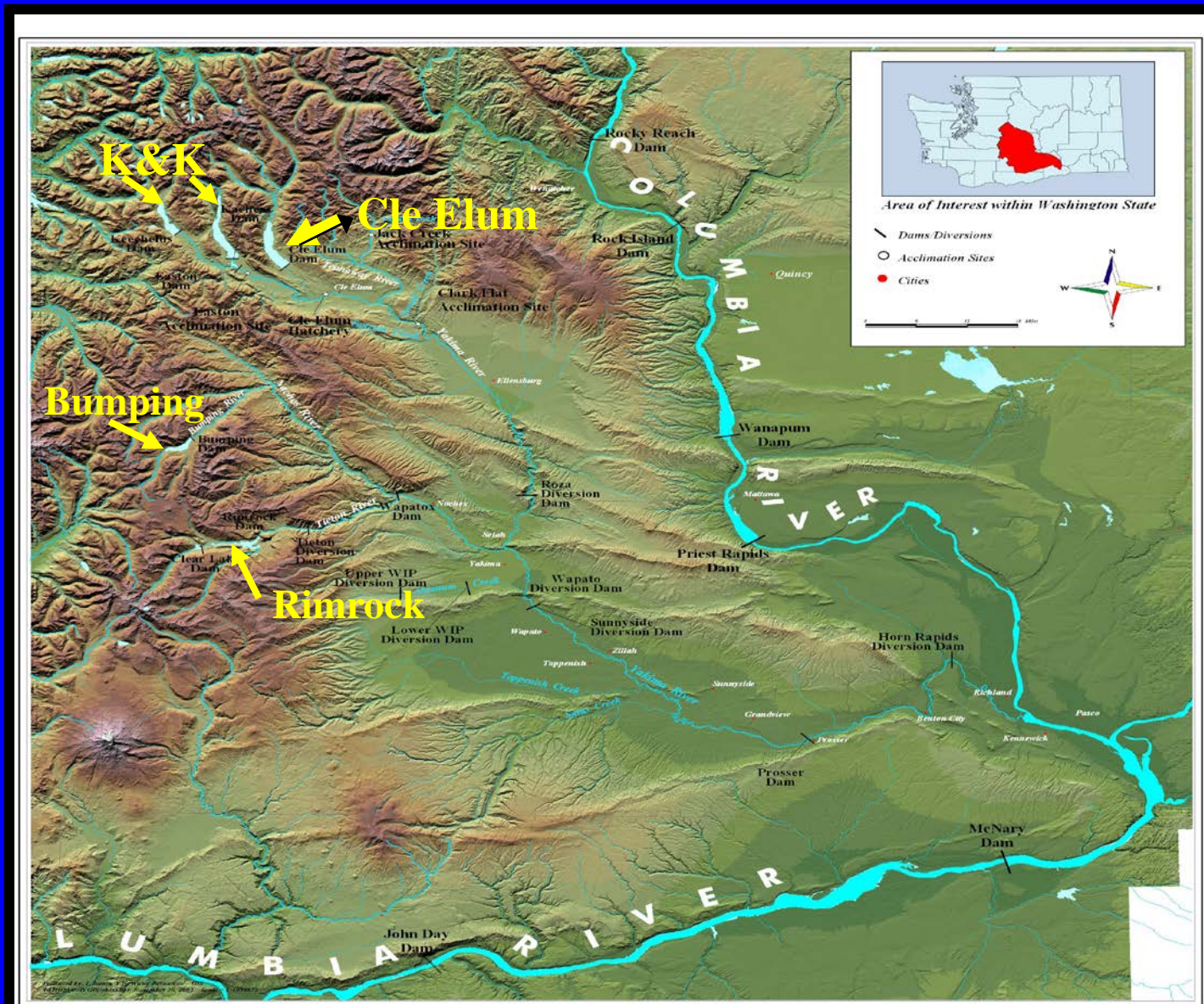


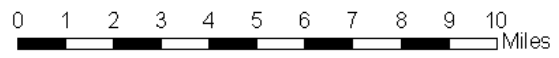
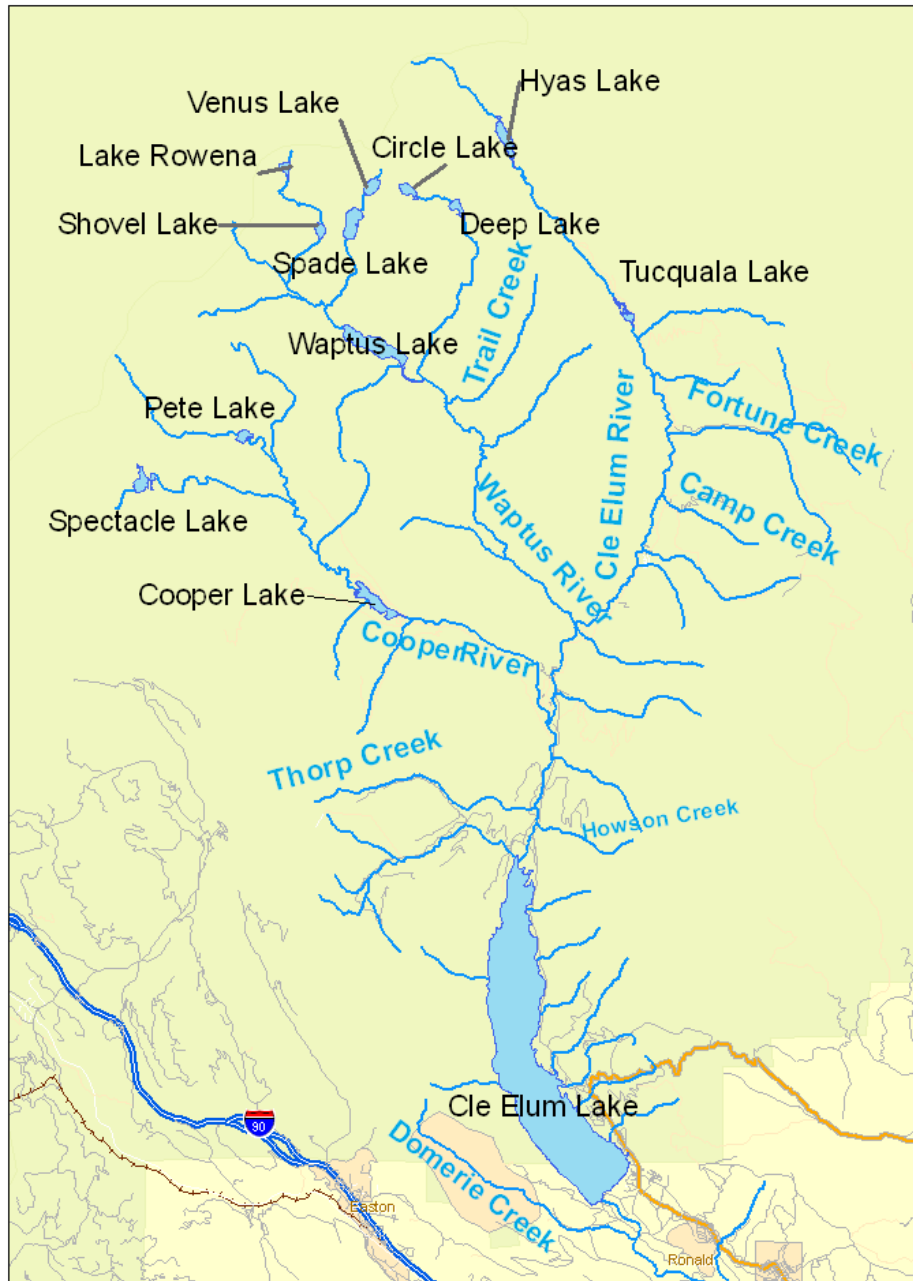
Fish Passage Study Objectives

- Evaluate Production Potential of Species above Dams
- Determine Interim Smolt Outmigration Success using coho salmon as surrogate for all species
- Evaluate sources of Mortality
- Design Long Term Passage Solution
- Evaluate Adult Upstream Passage Options



Yakima Basin Irrigation Storage Reservoirs





Potential Anadromous Fish Reintroduction

- **Coho Salmon**
- **Sockeye Salmon**
- **Steelhead**
- **Spring Chinook**
- **Also could help Bull Trout movement**

Coho Salmon Potential

- **Used Two Methods to estimate coho smolt production**
 1. **Available Spawning Habitat Approach**
From 248,250 to 568,500 total smolts
 2. **Juvenile Overwintering Habitat Approach**
From 23,995 to 95,975 smolts

***From Preliminary Report by Steve Grabowski, BOR**

Sockeye Salmon Potential

- **Sockeye juveniles use lake for rearing**
- **Four methods used to evaluate sockeye production potential**
 1. **Smolts per Lake Surface Area**
 2. **Euphotic Volume Method**
 3. **Spawners per Hectare**
 4. **Available Spawning Habitat**
- **From Preliminary Report by Steve Grabowski**

Sockeye Salmon Potential

Lake Surface Area	1,514,250 smolts
Euphotic Volume	1,627,715 smolts
Spawners per Hectare	788,940 smolts
Available Spawning Habitat	379,926 – 741,852

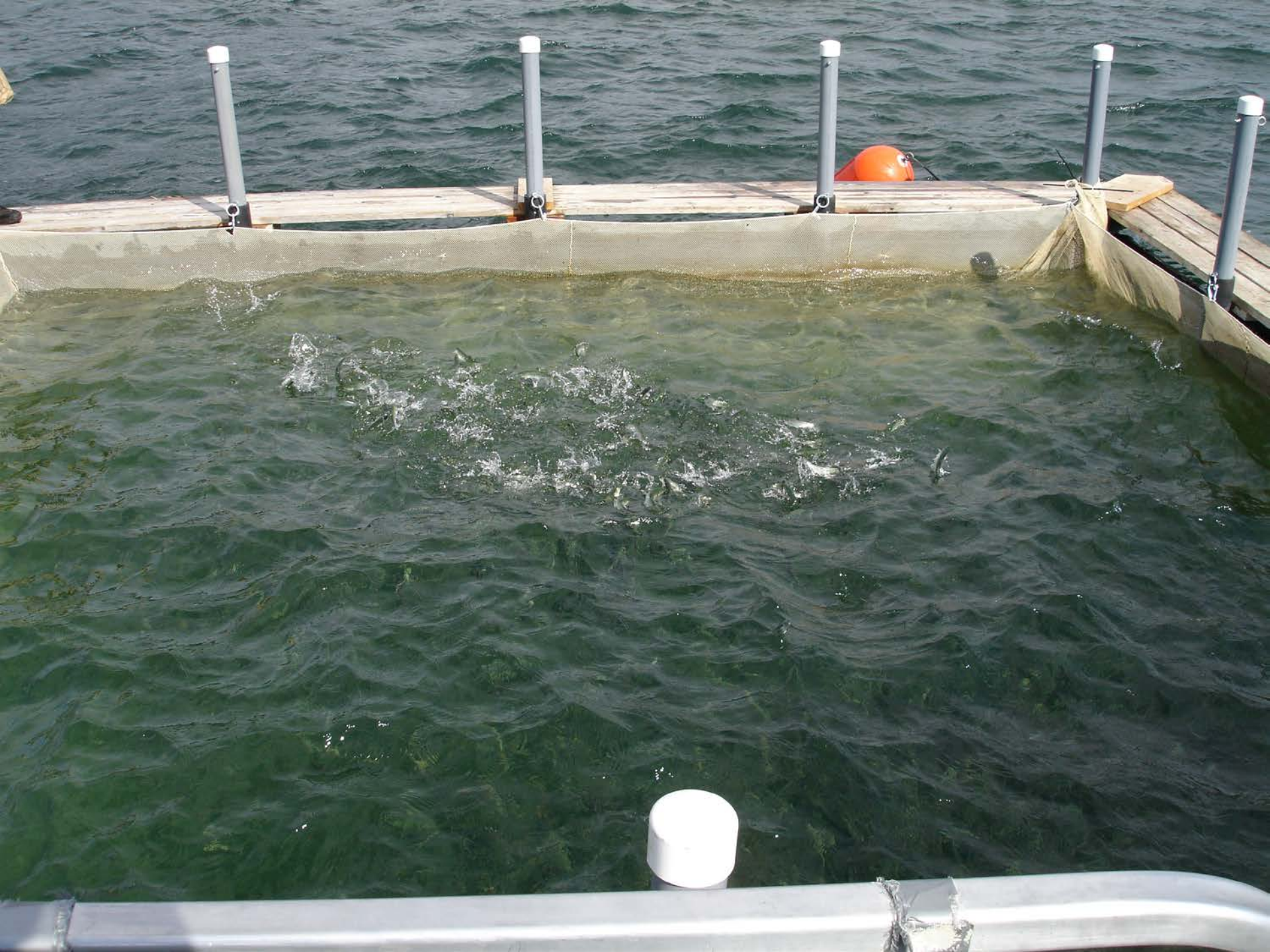
* From Preliminary Report by Steve Grabowski, BOR

Coho Reintroduction Research

- **2005 Plan (Revised Due to Low Water)**
- **Coho used as research fish**
- **Release 10,000 PIT tagged coho from Net Pens ~one half mile from dam**
- **Release 1000 below dam for comparison**
- **Release 1000 directly into outlet flume (this was the only goal accomplished)**







Releasing PIT Tagged Test Fish

- PIT Tagged Coho Salmon into Flume



Release Pipe Into Flume



Fish Flume Down Face of Dam



PIT Tag Detectors
300 feet apart

Outfall of Flume into River



Preliminary Results of Flume Tests

- Study Done over Two Days
- Total of 1831 Tagged Fish Released
- Releases of from 1 to 61 Fish per Group
- Detections for Upstream and Downstream PIT Tag Detectors Recorded Separately
- Total Combined Detections Calculated

*Results Provided by Sean Casey from BioMark

Cle Elum Fish Tag Detection Test

Day 1 and 2 Combined

<u>Group</u>	<u>Total # of Fish</u>	<u>Misses on Upstream Antenna</u>	<u>Read % on Upstream Antenna</u>	<u>Misses on Downstream Antenna</u>	<u>Read % on Downstream Antenna</u>	<u>Misses on Both Antennas</u>	<u>Combined Upstream and Downstream Read %</u>
Single	736	40	94.57	53	92.80	11	98.51
Groups of 5	272	28	89.71	40	85.29	7	97.43
Groups of 10	280	76	72.86	74	73.57	23	91.79
Groups of 15	280	103	63.21	80	71.43	31	88.93
Groups of 20	99	49	50.51	49	50.51	28	71.72
Groups of 25	103	46	55.34	45	56.31	20	80.58
Groups of 61	61	40	34.43	41	32.79	30	50.82
Overall	1831	382	79.14	382	79.14	150	91.81

Preliminary Conclusions

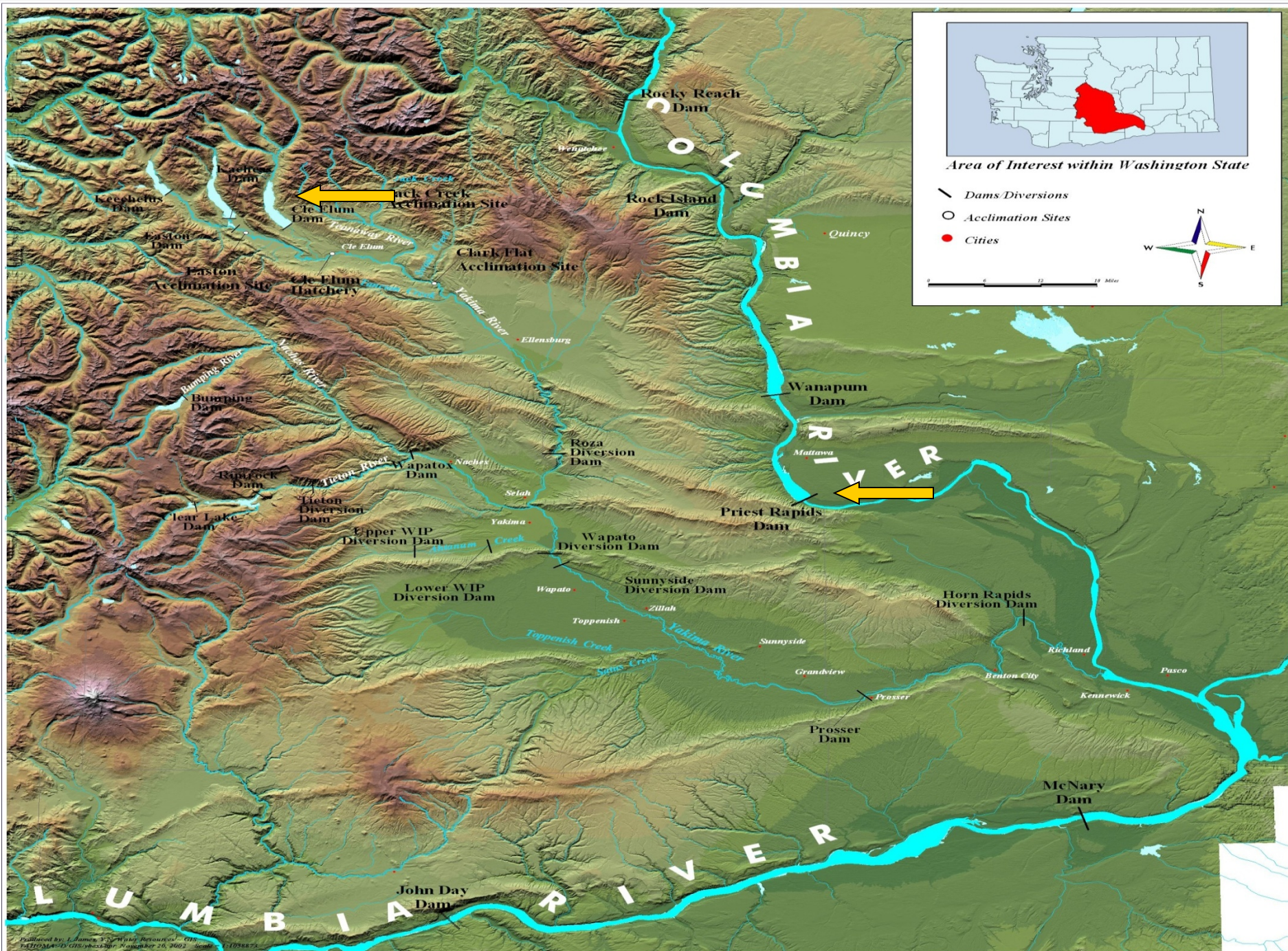
- **Detection Accuracy Over 98% for Single Fish in 2005, currently lower in 2006 ~85%**
- **Detection Accuracy High (>91%) for Groups of 10 or less for '05, again, not yet in '06**
- **Detection Accuracy Decreases with Increasing Number of Fish per Group**
- **Overall Detection Remains Over 80%**

Sockeye Reintroduction

- **Letter to Grant County Public Utilities District to use Adult trap at Priest Rapids Dam**
- **Received a transport permit from Washington Department Fish & Wildlife**
- **Notified all interested Agencies on our intensions**
- **Contacted local land owner on accessing his property to release sockeye and to hold Sockeye Ceremony**

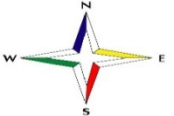
Sockeye Reintroduction Plan

- **Release adults in reservoir to monitor location and timing of spawning**
- **Release smolts (when available) to monitor outmigration success and survival**
- **Collect returning adults at Roza Dam as brood stock**



Area of Interest within Washington State

- Dams Diversions
- Acclimation Sites
- Cities



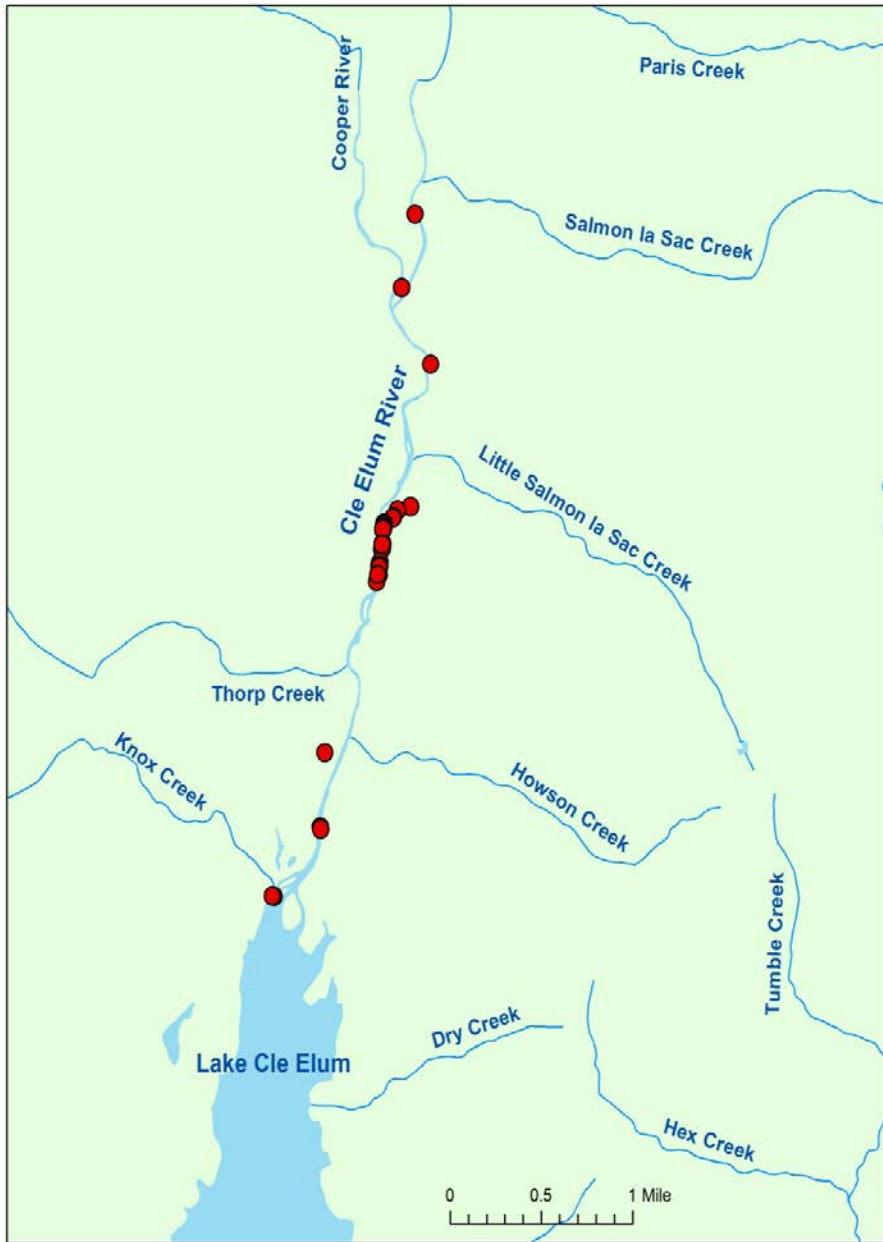
0 6 12 18 Miles

Sockeye Reintroduction

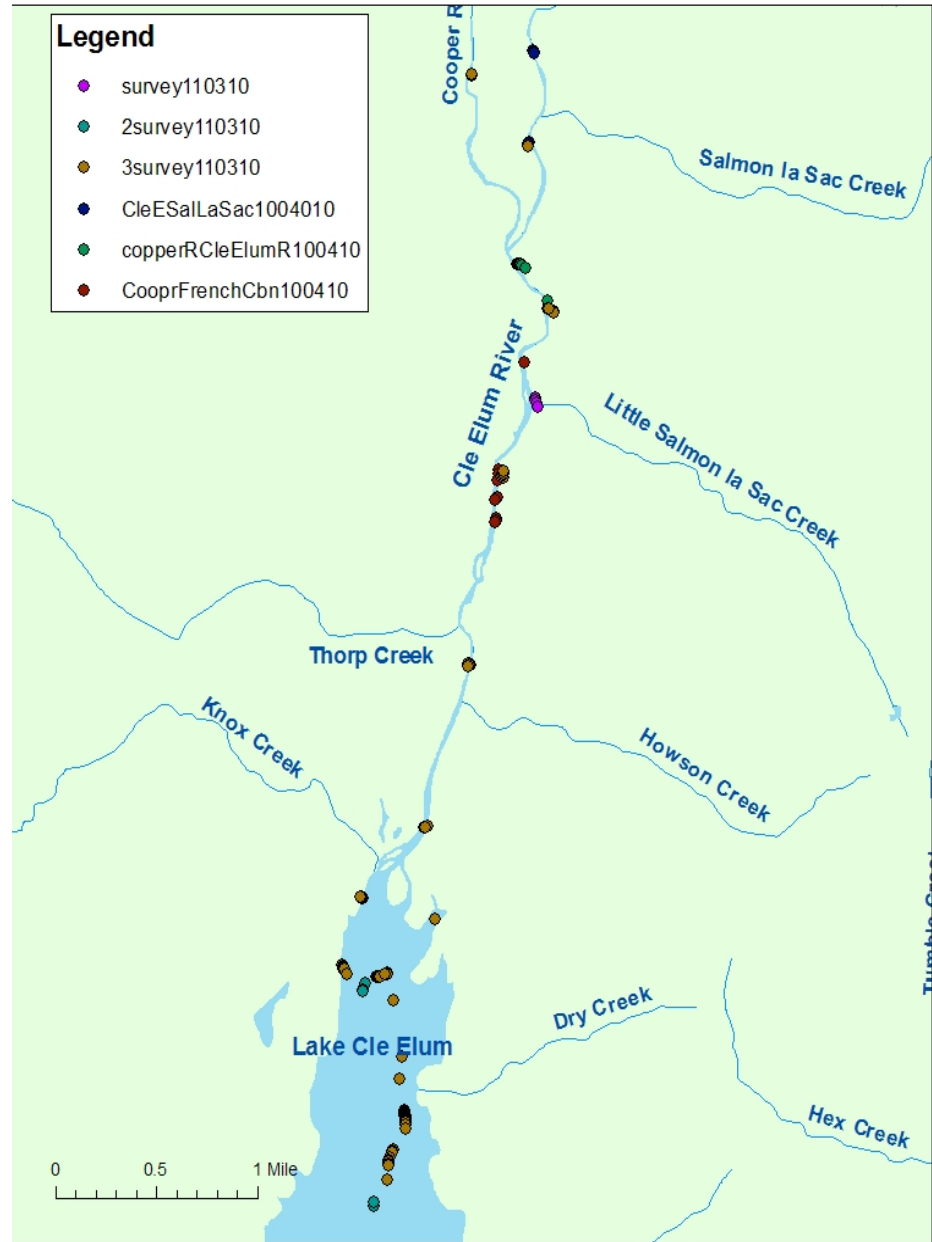


2010 Sockeye Reintroduction

- **After escapement approached 95,000 at Bonneville Dam 2500 returning sockeye adults were collected at Priest Rapids Dam**
- **The Adult take number was increased from 1000 to 2500 on a recommendation by WDFW**
- **2000 to Cle Elum Lake and the other 500 to Cooper Lake**
- **27 radio tagged adult sockeye used in Cle Elum Lake and 7 in Cooper Lake**



2009 GPS Redds 1000 Sockeye



2010 GPS Redds 2500 Sockeye

Sockeye Observation

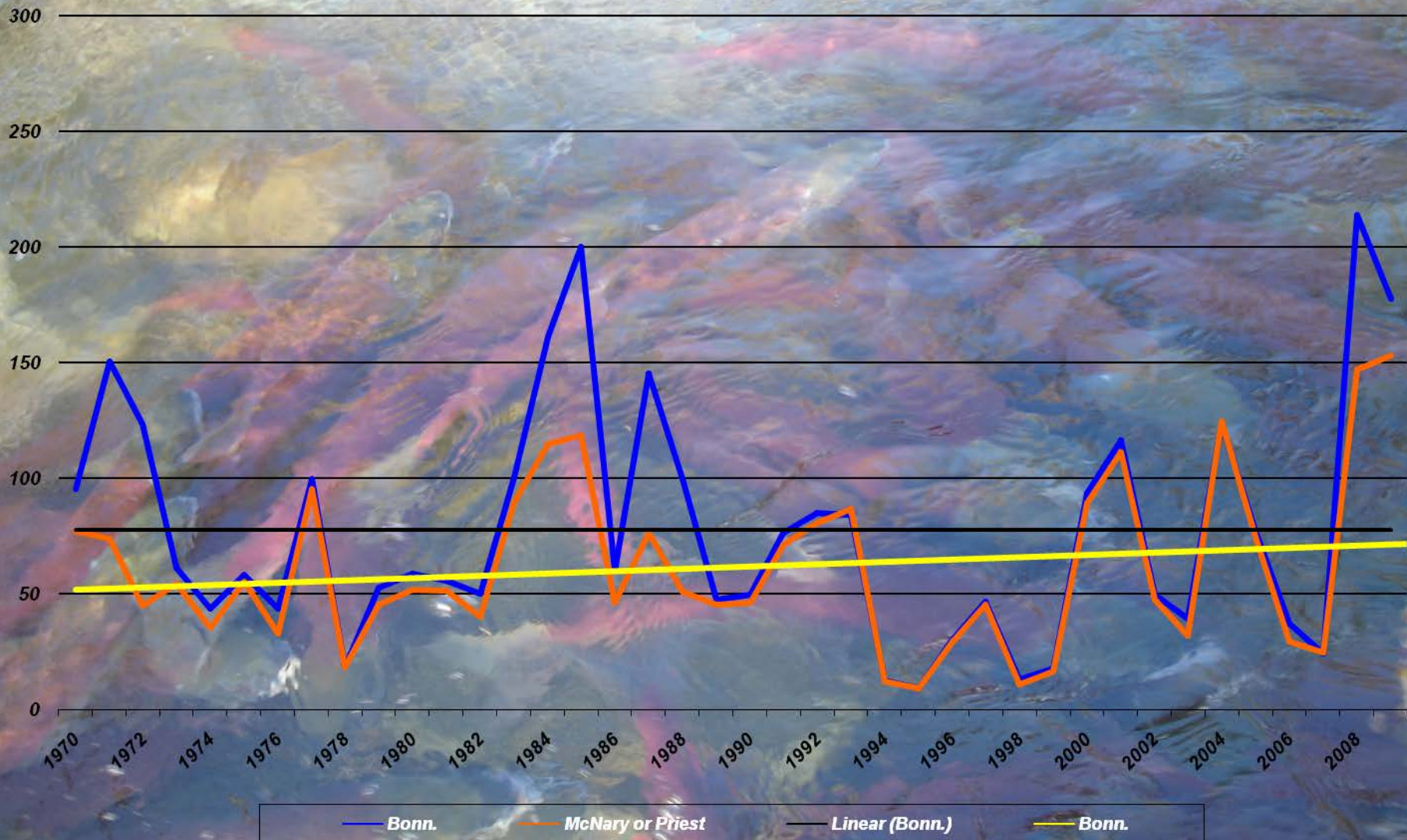
- **1843 sockeye were counted on the spawning grounds**
- **17 of the 27 radio tags were recovered, 4 of the 7 radio tags placed in Cooper Lake were located back down in the Cle Elum River**
- **Over a month period we counted a total of 80 sockeye adults below the dam**
- **More habitat area utilized and with a consistent migration**

PAC Approved Sockeye Take Sliding Scale

Sockeye Count @ Bonneville	OLAFT Collection and Incremental of Increases (% of Bonneville count)
80,000	1000 (1.25 %)
+ 20,000	+ 500
160,000	3,000 (1.9 %)
+ 10,000	+ 500
200,000	5,000 (2.5%)
300,000 or greater	10,000 (3.3%)

Columbia Basin Sockeye Counts, 1970-2010

Thousands of Fish









Working with the ONA

- Continue to help with their broodstock collection
- Bilateral Okanagan Basin Technical Working Group (BOBTWG)
- Agreed to form a Memorandum of Union (MOU)
- ONA started their reintroduction in 2003 and they had over 150,000 sockeye adults on spawning grounds in 2010



Sockeye Outmigration







VPE ~ 80,000 SMOLTS AT PROSSER



Spring Chinook Reintroduction

- First generation (S-Line) hatchery spring chinook adults have been transported to Cle Elum Lake
- 15 a day can be transferred from Roza Dam to the lake daily
- These Chinook will spawn naturally in the wild and supply more nutrients to the system
- They are also turning over substrate that has not been moved for over a hundred years



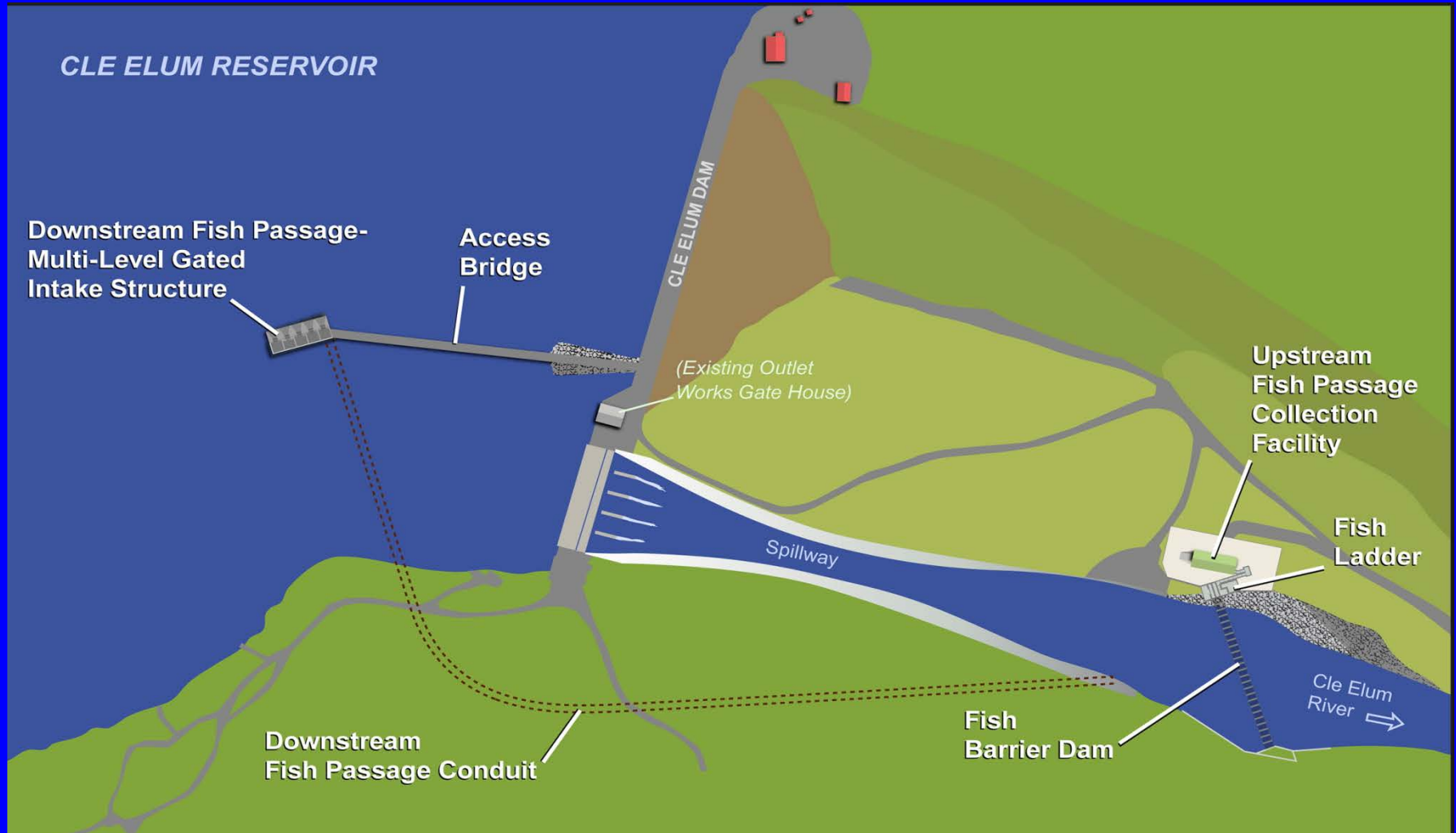
Moving Forward

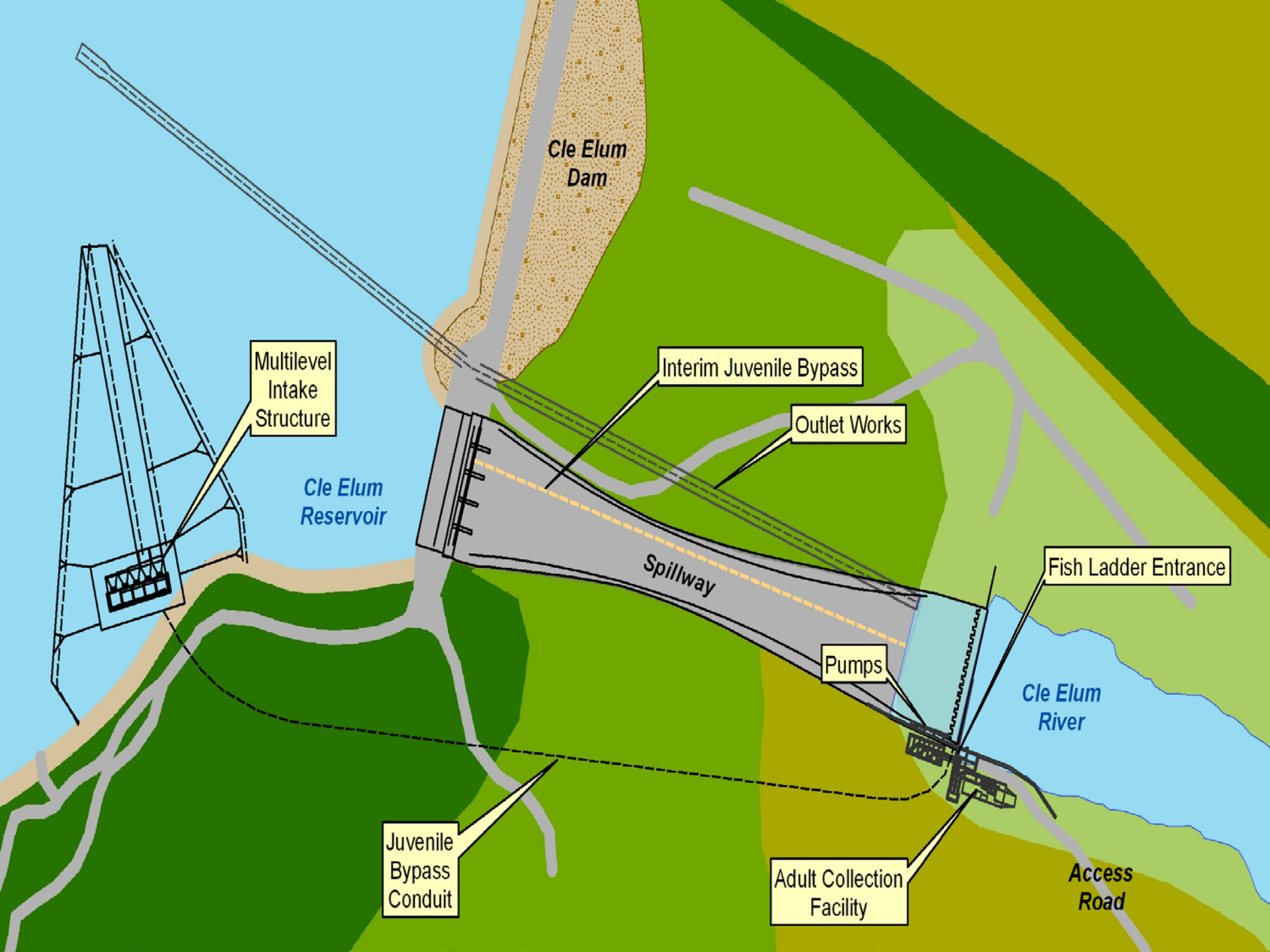
A pink salmon is shown swimming in clear, shallow water over a rocky riverbed. The fish is positioned horizontally across the middle of the frame, facing right. The water is transparent, revealing the brown and grey stones on the bottom. The lighting is bright, creating ripples and reflections on the water's surface.

- **Continue with reintroductions**
- **NEPA is Complete**
- **Baseline Data Collection**
- **Search for funding sources for:**
 - I. Acoustic surveys**
 - II. Genetic Sampling**
- **Pit tag out migrating smolts**

Cle Elum Fish Passage

- Downstream juvenile passage
 - Multi-level intake structure; conduit to below dam
- Upstream adult passage
 - Collection and transport facility





Cle Elum Dam

Multilevel Intake Structure

Cle Elum Reservoir

Interim Juvenile Bypass

Outlet Works

Spillway

Pumps

Fish Ladder Entrance

Cle Elum River

Juvenile Bypass Conduit

Adult Collection Facility

Access Road

Mackinaw Fish Derby Cle Elum Lake 2011

- This was the second annual for this event, with 75 participants.
- 28 fish were caught by anglers. John Easterbrooks placing 3rd, Gabriel Temple placing 5th.
- WDFW and YN took bio samples.
- Stomach samples produced 4 sockeye smolts, 2 prey skeleton and fish bones.

	F. Length	Weights
Low	43.5	2.15
High	85.5	17.40
Average	63	6.43
Females	16	57%
Males	12	43%



Acknowledgements

- **Dr. Dave Fast**
- **Mark Johnston**
- **GCPUD**
- **Paul Huffman**
- **John Easterbrooks (WDFW)**
- **Eric Anderson (WDFW)**
- **Pat Monk US Fish & Wildlife Service**
- **Yakama Nation Tech's**

Access Reports and Documents

- Yakima Dams Fish Passage Study web page located at:
http://www.usbr.gov/pn/programs/ucao_misc/fishpassage/index.html
- My email: passagebio@qwestoffice.net

**ISLAMIC TERRORISTS ARE
LIKE KING SALMON
LIFE IS GOOD UNTIL THE
SEALS SHOW UP**



Columbia Basin Sockeye Counts, 1970-2007

Thousands of Fish

