



## Priest Rapids Coordinating Committee Policy Representative Meeting

Wanapum Heritage Center  
 Thursday, July 20, 2023  
 9:00 a.m. to 2:00 p.m.

### Meeting Minutes

#### Meeting Attendees

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Facilitator	Bryan Nordlund
Anchor QEA (Facilitation Support)	Larissa Rohrbach
BioAnalysts (Subcommittee Facilitator)	Tracy Hillman
BPA	Tony Norris
CTCR	Rebecca Hunt
CTCR	Kirstin Brudevold
FERC	Erich Gaedeke
Grant PUD	Tom Dresser
Grant PUD	Curt Dotson
Grant PUD	Ross Hendrick
Grant PUD	Erin Harris
Grant PUD	Chris Mott
Grant PUD	Todd Pearsons
Grant PUD	Tim Taylor
Grant PUD	Dave Duvall
Grant PUD	Rod O'Connor
NOAA Fisheries	Ritchie Graves
Umatilla (CRITFC)	Brett Hall
USFWS	Jim Craig
USFWS	Bill Gale
Wanapum	Tanu (Tyler) Buck
Wanapum	Clayton Buck
WDFW	Brock Hoenes
WDOE	Mark Peterschmidt

#### I. Welcome

Bryan Nordlund, the PRCC Facilitator, welcomed the PRCC Policy representatives and described the purpose of the meeting, to introduce members to the work, past and future, and that is being done by Grant PUD and its partners to meet the obligations of their settlement agreements. He noted that it had been many years (since 2013) since the PRCC Policy representatives had met, so many programs and projects have progressed in the intervening time, and there are many members that are new to PRCC Policy representative roles.

Clayton Buck, representative for the Wanapum People, welcomed the Policy representatives to the homelands of the Wanapum. He introduced the history of the relocation of the Wanapum people due to the construction of the Priest Rapids project, and the importance of the Wanapum Heritage Center which was built in 2015 through their relationship with Grant PUD. The Wanapum are a State-recognized band, and so are included in management processes that pertain to their traditional resources. Their aboriginal lands extend from mouth of the Snake River to mouth of the Wenatchee River to the north, and to the Moses Lake area in the east. Their traditional spring salmon harvest occurred in the Horn Rapids area, fall harvest for deer and other animals extended to the Colockum Range and Stampede Pass areas. He introduced the exhibits in the cultural center and encouraged attendees to take time to visit them after the meeting. He introduced Tanu (Tyler) Buck who is currently in charge of fishing gear and one of the next generation for Wanapum participation in natural resources policies.

Tom Dresser also provided a safety briefing.

## **II. Opening Remarks**

Ross Hendrick, Grant PUD's Senior Manager of Environmental Affairs, gave opening remarks focused on the guiding principles for Grant PUD's Environmental stewardship. He has been in his current role for the past 3 years. His past experience was focused on water quality for many years, then Wanapum fish passage, the Nason Hatchery, and the Wanapum Dam fracture, which was a watershed event where all partners worked together to achieve emergency solutions.

R. Hendrick reviewed the four relevant principles that are included in Grant PUD's strategic plan, which shows these are supported at the executive level. These principles are as follows:

- To operate responsibly to achieve environmental, cultural resources compliance.
- To provide affordable rates for members, which can sometimes compete and needs to be balanced with the first principle.
- To achieve this balance by making biologically-sound and scientifically-sound decisions.
- To recognize that nothing can be done without the coordination with partners.

The importance of this PRCC Policy Group is to provide a life-line to help bring PRCC and sub-committees to consensus.

## **III. Overview of Programs**

Tom Dresser, Grant PUD's Fish, Wildlife, and Water Quality Manager, gave an overview presentation of the Priest Rapids stewardship requirements driving the need for Policy representative awareness and engagement (Attachment A). He noted that the Policy group has only met 3 times over the past 15 years. Today's meeting is intended to be an opportunity to provide introductions and open dialogue.

T. Dresser introduced focus areas for Grant PUD's stewardship work within Environmental Affairs, tied to the specific agreements and regulatory guidance. Stakeholder and partner involvement is at the core of consensus-based decision-making. At the base of the stakeholder involvement triangle is participation in the PRCC and subcommittees. The meaning of the 'Standard of Care' for Grant PUD is to apply the best available science using a high level of care to build and manage facilities and programs. Adaptive management using that standard of care can mean different things; the Priest Rapids Salmon and Steelhead Settlement Agreement lays out the step-by-step process for evaluating more than one alternative.

T. Dresser provided an overview of the No Net Impact (NNI) concept, whereby the project does not produce unmitigated project-related mortality of Covered Species and the achievement standards of 91% combined adult and juvenile survival rate of Covered Species, 2% mitigation in the form of habitat restoration and conservation funding, and 7% mitigation in the form of hatchery supplementation.

T. Dresser listed the approaches taken to achieve those standards, which are directed by the PRCC Subcommittees. The Wanapum Dam fracture was highlighted as a major event that showed the importance of collaborative decision making. The Wanapum Dam fracture was identified in February 2014, leading to a 30-foot reservoir drawdown as directed by FERC dam safety, which caused dewatering of the upper portion of the fishway and a major drop from the fishway exit to the surface water elevation in the Wanapum Dam forebay. Rapid and creative development of fish passage solutions was necessary within 2 months to achieve spring fish passage obligations. In addition, an historic and extremely high sockeye run was predicted (approximately 600,000 fish). Grant PUD started plotting a list of issues and ideas to present to stakeholders and engaged the Priest Rapids Coordinating Committee and the Fish Forum in problem solving for passing adult salmon, steelhead, and lamprey. Ultimately, creative solutions included lamprey traps at Priest Rapids Dam fishway, a false weir at the upper end of the fishway at Wanapum Dam, and a fish slide over Wanapum Dam into forebay. There were near daily calls with over 70 stakeholders included to problem-solve and answer questions. Ultimately over 900,000 adult salmonids were successfully passed over the dam in 2014.

T. Dresser thanked everyone for attending today and concluded that Grant PUD and the partners attending today have achieved the successes described with a lot of trust between partners, and reiterated the importance of a Policy group that meets annually to be ready to work collaboratively when issues do arrive.

#### **IV. Priest Rapids Coordinating Committee (Hydro)**

C. Dotson gave an overview of hydro project actions entitled Juvenile Fish Passage Programs (Attachment B). He presented the performance standards for the Priest Rapids Project, which combined for both dams and reservoirs is 86.5%, calculated as an average of three consecutive years of survival studies.

The Wanapum Dam fish bypass system was constructed to replace previous tainter gate spill and put into operation in April 2008. A Fish Passage Survival study was implemented to evaluate performance of the bypass in 2008-2010. Chelan PUD was at the same time implementing a sockeye survival study, so Grant PUD used those tagged

fish to evaluate survival, and included tagged steelhead in the study. It was, therefore, not a paired release with both study species, which would be more typical of a survival study, but it was an opportunity to obtain additional data from a study group already in the river. 2008 was a high-water year and more fish used the tainter gate spill than in the subsequent years. Survival was high, ranging from 90 to 100% percentiles. The fish bypass has higher survival rates and better fish attraction compared to the turbines and tainter gates; it was designed to skim the top of the water column and lessened the plunging action which reduced damaging total dissolved gas levels. Flow through the bypass is 20,000 cfs as compared to 80,000 to 90,000 cfs through the spillway. Use of the bypass also allows more water to be used for power generation.

The Priest Rapids Dam fish bypass was constructed to create similar improvements as Wanapum Dam in smolt survival, reductions in spill and total dissolved gas, and improvements in generation potential compared to the previous spill methods through the tainter gates.

The PRCC has funded predation management research and actions focused on study and dissuasion of avian predators, northern pike removal, and other predator control projects.

C. Dotson concluded by showing how hydro project operations and funds contribute to achieving NNI.

## **V. PRCC Fall Chinook and Hanford Reach Working Groups (Hanford Reach Fall Chinook)**

Rod O'Connor provided an overview of fall Chinook salmon and Hanford Reach programs, entitled, "Hanford Reach Fall Chinook Salmon Protection Program" (Appendix C).

R. O'Connor described fall Chinook salmon use of the Hanford Reach, which supports a large number of spawners. He reviewed the agreements and committee involvement used to manage Hanford Reach fall Chinook salmon habitat. The mechanics of the Priest Rapids Dam agreements are tied to supporting the different life-stages of the fish with targeted flows for spawning, pre-hatch incubation, fry emergence and juvenile rearing and outmigration. Using redd surveys, redd counts are assigned by river elevation. Protection of the redds and incubating eggs is balanced with power generation, achieved with reverse load factoring. Flows are controlled to deter spawning in elevations with greatest water level fluctuations. During emergence and rearing, rapid drops in river flow are avoided to minimize stranding. Environmental cues were used to design a resilient flow program for salmon and power generation.

R. O'Connor noted that language in agreement to allow for less than 100% flow target compliance, however it is Grant PUD's goal to achieve 100% compliance. In the early years following implementation of the Hanford Reach Fall Chinook Protection Program (2004), lessons were learned around achieving management targets; in more recent years, flow targets have been met for 90% to 100% of the time.



R. O'Connor concluded by showing the Hanford Reach Fall Chinook Salmon contributions to ocean harvest, and said that escapement goals are typically met by a combination of hatchery-origin and wild spawners in the reach.

## **VI. PRCC Habitat Sub-Committee**

David Duvall provided an overview on the PRCC Habitat Sub-Committee's activities to approving habitat restoration funding, entitled "Habitat Update" (Appendix D). He noted that decisions are made using a consensus-based approach and the partners involved in the process have been involved for many years.

Project sponsors bring proposed projects to the PRCC Habitat Sub-Committee, which are discussed, accepted or rejected, and funded through Habitat Funds/Accounts.

Between 2006 to 2010, 17 projects were approved; through 2022, 141 projects have been approved. Award sizes ranged from \$500 to sponsor a conference up to over \$1 million for a large project.

Tracy Hillman was brought on 3 years ago as facilitator of the group, and he brought ideas from other subcommittees, one of which was to work toward categorizing the projects by type and location as an approach to better communicate outcomes and future needs.

D. Duvall summarized project statistics for the top three most-frequently funded types of projects: acquisition and land protection; water conservation and fish passage; and assessment, monitoring and evaluation (AME). Projects have been distributed throughout the mainstem Columbia River and the Wenatchee, Entiat, Methow and Okanogan Subbasins. Example projects were described for each major subbasin.

### **Okanogan Subbasin**

Fish passage into Okanogan Lake has been a major habitat action for sockeye salmon, in partnership with the Okanogan Nation Alliance.

Fish passage over McIntyre Dam into Okanogan Lake was blocked since the 1950s. Passage was restored with installation of new overshot gates at McIntyre Dam. Initial discussions occurred in 2000, followed by risk assessment and processes with agencies in Canada. Many biologists believed it would require many decades to observe fish returning to Okanogan Lake, however fish were returning to Okanogan Lake decades earlier than what people thought was feasible. AME funds were used to test overshot gate operation to optimize fish passage into the lake.

Erich Gaedeke asked why overshot gates were chosen rather than a fish ladder for volitional passage. D. Duvall said, for Skaha Lake downstream, the fish ladder existed but was previously not in operation; it was an easy fix to make the Skaha ladder operational. In contrast, McIntyre Dam was never designed to include a fishway; addition of a fishway would have been very expensive.

Richie Graves asked what bureaucratic and other challenges there were for working in Canada. D. Duvall said there have been fewer opportunities for acquisition; actions are less focused on land acquisition or land ownership.

T. Dresser said, regarding the political environment in Canada the ONA have done a very good job to build the relationships and work through the issues and Grant PUD generally follows their leadership in dealing with the Canadian agencies.

D. Duvall said Penticton Dam is the next target for design to installation of a fishway on the left bank, better located with the attraction flow. Passage over Penticton Dam will add over 80 miles of habitat.

R. Graves asked, regarding sockeye abundance, there is a see-saw pattern showing relatively high abundance in even years and lower abundance in odd years. There is a similar pattern in Canadian rivers, and investigators hypothesize this results from a reduction in ocean productivity due to competition with massive numbers of hatchery-reared pink and chum released from Asian countries. (Sockeye are predominately a fish that returns at age-4 fish; pink salmon return at age-2).

### **Methow, Entiat, and Wenatchee Subbasins**

D. Duvall summarized acquisitions and restoration in the other subbasins, which included the following:

- The Buckley Acquisitions which improved habitat in the Twisp River and worked with the Methow Valley Irrigation District to better protect fish at the intake.
- The Entiat-Enlow Acquisition and restoration which moved a home out of the flood zone, added log jams, and restored side-channel, wetland, and riparian vegetation.
- The Icicle Creek Boulder field correction (tributary to the Wenatchee River) to restore fish passage above the barrier. Passive Integrated Transponder (PIT) tag antennas have documented tagged steelhead passing upstream of reconnected boulder field area.

D. Duvall concluded his presentation by showing the number of PRCC Habitat Funded projects or acres restored by category. He noted that habitat reconnection projects have opened many miles of habitat. The future outlook depends on whether habitat restoration projects can keep up with habitat degradation, climate change, and determining whether more monitoring will be needed to evaluate successful or unsuccessful projects.

## **VII. PRCC Hatchery Sub-Committee**

Todd Pearsons provided an overview of the PRCC Hatchery Sub-Committee activities to meet NNI entitled, "Hatchery Mitigation Programs" (Attachment E). He emphasized the importance of Sub-committee participation and partnerships for decision-making and implementation of the mitigation programs.

T. Pearsons reviewed facilities in place to produce all of the Grant PUD hatchery mitigation requirements. Production targets have been met by rebuilding the Priest Rapids Hatchery facility, and maximizing use of facilities owned by other PUDs already on the ground. Grant PUD and Chelan PUD were early adopters of using dual drain circular tanks for water conservation purposes and evaluating early success of using

that type of infrastructure. Hatchery production targets are recalculated every 10 years based on the numbers of adult fish that are passed over the dams and the survival of juvenile fish passing downstream through dams. The hatchery programs use robust reporting and adaptive management of a monitoring and evaluation plan, which provides opportunities for internal and external review.

T. Pearsons summarized the current and future challenges for hatchery mitigation obligations for Policy representative awareness.

T. Pearsons summarized successes for both ESA-listed and unlisted species. Fall Chinook salmon, Lake Wenatchee Sockeye and, Okanogan Sockeye productivity is stable or improving. Reintroduced species using hatchery production are now being observed transitioning to natural production (e.g., Okanogan sockeye, upper Columbia Coho Salmon programs). Additional benefits of the PRCC hatchery sub-committee directed mitigation programs are exported science (e.g., the upper Columbia River data collection a source for understanding other populations outside the basin); exported fish to other reintroduction and hatchery programs (e.g., Cle Elum hatchery sockeye salmon program); and exported facility design concepts.

## **VIII. Priest Rapids Fish Forum**

Chris Mott provided an overview of the activities of the Priest Rapids Fish Forum (PRFF; Attachment F).

White sturgeon management is a major focus of the PRFF, guided by a White Sturgeon Management Plan. C. Mott described Grant PUD's efforts to support white sturgeon hatchery production, tagging, telemetry and population assessment. Annual monitoring of survival, fish size and growth shows that the oldest hatchery-origin fish released in 2016 are getting large.

Pacific Lamprey is another major focus of the PRFF, guided by a Pacific Lamprey management Plan. Improvements and evaluation of fish passage for Pacific Lamprey since 2010 has shown fish passage efficiencies of 86.6% at Priest Rapids Dam and 89.4% at Wanapum Dam. During the 2014 Wanapum Dam fracture, the PRFF and PRCC rapidly responded to evaluate emergency lamprey alternatives; emergency design of volitional passage and traps maintained high fish passage efficiency during the drawdown period. A statement of agreement signed in 2018 outlines the 10-year consensus agreement for trap and transport of lamprey to upstream areas in the Columbia Basin as part of meeting Grant PUD's NNI obligations.

E. Gaedeke asked what survival rates have been observed in juvenile sturgeon. C. Mott said there is a big difference between their first and second years at large; survival rates are approximately 30% in first year, but increase to near 100% after that.

T. Dresser said the adult lamprey transport SOA is an example of collaboration on NNI; there was ongoing verbal jousting for a 5 to 6-year period on how to detect or determine project impacts on adult lamprey. All agreed that there probably were some, but to determine whether 1% or 50% of the population was being impacted was not possible. There are challenges with attributing mortality to the projects due to variable life-history strategies; many studies could be implemented, and survival would never be

measurable. The PRFF took a step back to reevaluate how to benefit the resource and refocus on removing one of the project impacts, which was passage through the projects.

## **IX. Discussion**

### **Lessons Learned**

E. Gaedeke asked broadly, what has been learned that have helped improve survival basin-wide? C. Dotson said examples include predation issues that have been exported to other areas in the lower Columbia Basin; the juvenile fish bypass using a simple fish slide; fish mode on turbines which is being considered by Chelan PUD and Douglas PUD. B. Nordlund said, for instance, at Bonneville Dam since 1995 they have been managing spill to shift the excess spill from June to early April, and there has been an improvement in survival system-wide beyond the Grand PUD projects.

R. Graves said what is known about survival in the Upper Columbia Basin is relatively limited compared to the Snake Basin. The lack of ability to detect fish after release or initial marking if trapped in tributaries until re-detection at McNary Dam. One challenge is that with additional spill, detection at McNary Dam has been poorer; the confidence intervals around survival estimates have become larger. NOAA Fisheries is looking into improving detection technologies. Early on there were discussions and decisions made to avoid additional handling; when building the Rocky Reach bypass for instance, the decision was made not to put in a system that would require additional handling for PIT tag detection. It's only recently that that additional large-scale detection options have been investigated, for instance at Lower Granite Dam, where a 75% detection rate is now achieved in the spillway. That was a big project that pushed the limit on the technology.

Todd Pearsons some of the hatchery monitoring and evaluation work to further investigate natural origin stray rates was a challenge, but filled a gap in the literature for a long time. It was only possible due to arrays placed around the upper Columbia Basin tributaries, understanding that some of those lessons learned informed some of the stray monitoring in the lower Columbia River tributaries. Additionally, work done on precocious males, some of which is published, is available for other parties operating hatcheries as well.

### **Upcoming Challenges**

B. Nordlund asked for general feedback on how organizations see themselves fitting into the PRCC and Sub-committees' work, that is, what might be coming up in the future that might concern your agency or committee members? B. Nordlund reiterated that this should always be an open discussion, and to reach out to the facilitators (himself and Tracy Hillman) or T. Dresser.

B. Nordlund noted that a topic that all are concerned about will be climate change and global warming. R. Graves said NOAA Fisheries is really concerned about climate change in terms of how it will change these species and the habitats they depend upon. NOAA Fisheries is working on how to provide advice to the region and ourselves on

what actions can be taken, and asking what can be done to make these populations more resilient. These are animals that can't thermoregulate, for example, as winter temperatures increase they will start migrating earlier, and without the monitoring there is a need to be able to provide the help they need. In the Snake River, some of the gravity-fed fishway entrances have warmer water fed from the project forebay that may cause fish to reject the entrance. In the Columbia River, those problems may not be observed now, but we should be on guard for similar problems emerging 10 to 15 years in the future.

B. Nordlund said it is a good time to start thinking about fish passage solutions around dams; as an engineering group, NOAA Fisheries discusses how to address these problems. The fish passage correction example from McIntyre Dam was an innovative solutions that was a fix for not only the adults but also likely for juveniles.

T. Dresser said ultimately it comes down to the people at the tables in the committees. There are examples in the committees of issues that are not moving forward. There has been a large amount of work to build trust, which has allowed for the verbal jousting, but also allow people to remain civil inside and outside of the meetings.

Bill Gale said much of the progress made in the PRCC Hatchery Sub-committee has been due to the facilitator and facilitation team, which has allowed the Sub-committee to move in a positive direction.

### **Feedback and Takeaways**

T. Pearsons asked if anything that caught people's attention, was surprising or anything that attendees didn't know much about before today's meeting.

Brock Hoenes said he has been with WDFW for 15 years, but all his experience was based terrestrial and big game prior to taking his current position as the North Central Region Director. He said the amount he has learned about aquatic issues and the complexity of the issues in 2 years has been astounding. The number of partners involved with salmon recovery touches everyone in the committees. He said he found nothing surprising in today's presentations, but it was another learning experience. There are still conflicts and they are not all easy conversations, but the lines of communication are open. For instance, he is engaged with monthly meetings with PRCC representatives and Grant PUD representatives.

Mark Peterschmidt said last week he traveled for site visits with the Methow Restoration Council to observe projects the Washington Department of Ecology (WDOE) has funded, including property acquisitions. He said WDOE is overtly connected in meetings like this, but we also have interconnecting supplementary projects. Elevated water temperature is the most common water quality violation we have in this state and region.

B. Nordlund concluded by explaining that he sat on the PRCC for nearly 20 years, which is a group made up of engineers and biologists. He said that one of the real strengths of the PRCC is the spectrum of expertise across agencies and tribes, an example being the opportunity to observe and participate in turbine design and spillway

deflector design to inform the decision-making direction. Bringing all partners together is a strong approach for managing the resources in the upper Columbia Basin.

## **X. Future Policy Meeting Plans**

B. Nordlund asked for opinions on holding an annual meeting, and the appropriate time of year. M. Peterschmidt, B. Hoenes, and R. Graves agreed that an annual meeting is valuable to establish and maintain relationships within Policy committee members. R. Graves said many staff are experiencing meeting fatigue, but he is committed to rebuilding new relationships due to past turnover in PRCC Policy representation.

T. Hillman suggested that creating a joint day to hold this Policy meeting with the HCP Policy meetings as there is likely a lot of overlap between membership. B. Hoenes said he is not opposed to the idea, but then the agenda might become quite large. B. Nordlund said the hydro projects are each unique, so it might be difficult to combine meetings. In the HCPs, the approach was taken to make an initial annual meeting a broader overview of programs, but that subsequent annual meetings would be topic-driven. This year's HCP Policy Committee meeting was cancelled due to lack of discussion topics. B. Gale said an example of a topic that may require a joint meeting would be questions around hatchery production recalculation.

All agreed to tentatively hold July 20 for an annual PRCC Policy representative meeting.

Ross Hendricks thanked everyone for the learning opportunity. B. Hoenes thanked Grant PUD and the Wanapum for hosting and presenting.

## **XI. Attachments**

Attachment A: Priest Rapids Policy Meeting Overview

Attachment B: Juvenile Fish Passage Programs

Attachment C: Hanford Reach Fall Chinook Salmon Protection Program

Attachment D: Habitat Update

Attachment E: Hatchery Mitigation Programs

Attachment F: Priest Rapids Fish Forum

**PRCC, Hatchery and Habitat Sub-committees- Policy Representatives**

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CTCR	Joe Peone
GPUD	Tom Dresser
NOAA Fisheries	Ritchie Graves
USFWS	Jim Craig / Bill Gale
Umatilla	Brett Hall
WDFW	Brock Hoenes
YN	David Blodgett III

**PRFF, HRWG, FCWG - Policy Representatives**

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CTCR	Joe Peone
GPUD	Tom Dresser
Umatilla	Brett Hall
USFWS	Jeff Krupka
Wanapum	Clayton Buck
WDFW	Brock Hoenes
WDOE	Mark Peterschmidt
YN	David Blodgett III

**HRWG, FCWG - Policy Representatives**

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ADFG	Dani Everson
BPA	Leah Sullivan
CPUD	Alene Underwood
DPUD	Shane Bickford
GPUD	Tom Dresser
Wanapum	Clayton Buck



# Priest Rapids Policy Meeting

July 20, 2023

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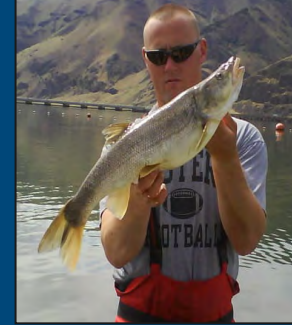
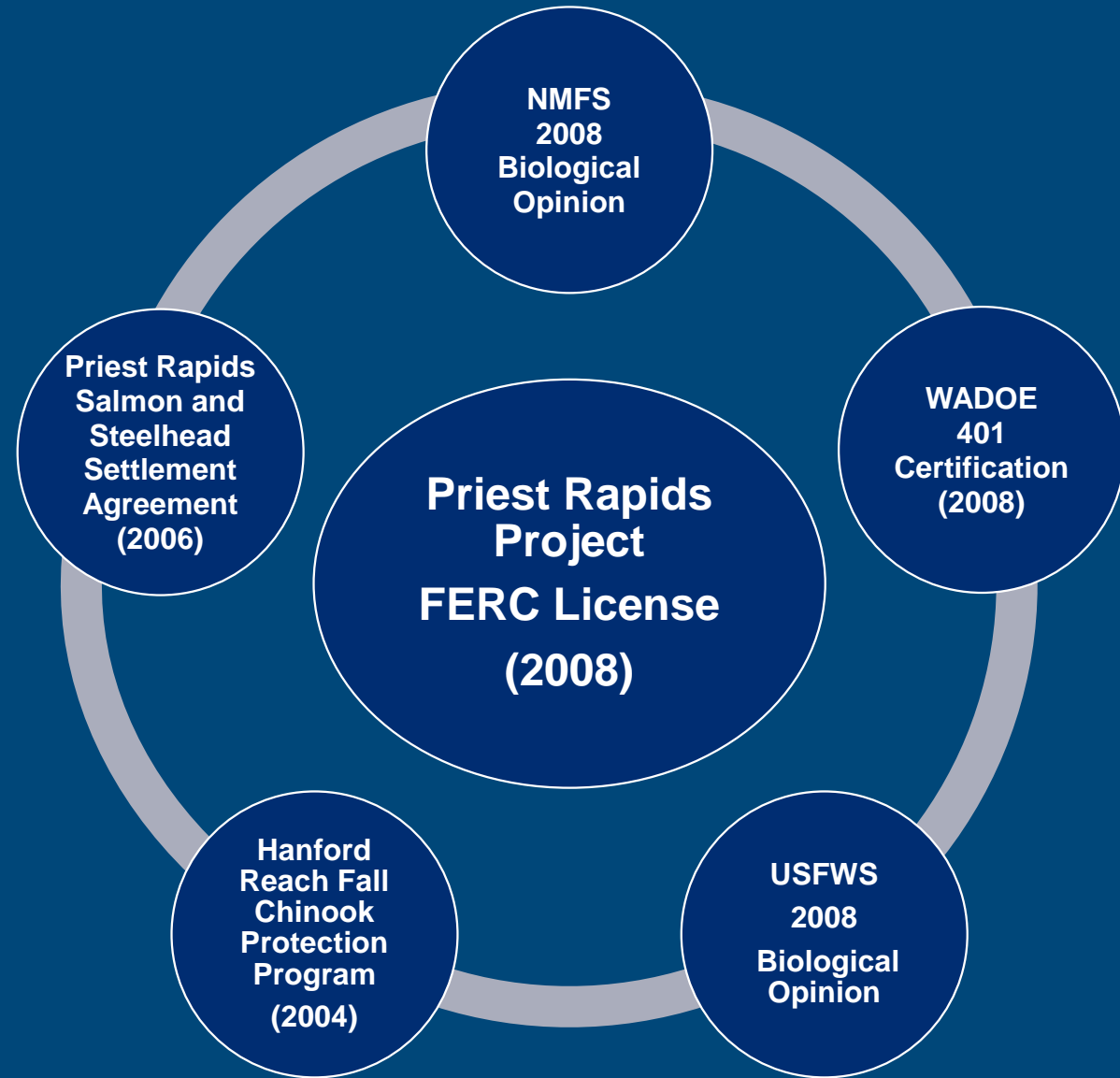
Operate Responsibly by Attaining Environmental, Cultural Resource and Regulatory Compliance



Powering our way of life.



# Stewardship Requirements



# Extensive Stakeholder Involvement

FERC  
NOAA Fisheries  
USFWS  
WA - Ecology

Policy Committee's

Priest Rapids Coordinating Committee, Priest Rapids Fish Forum,  
Hanford Reach Working Group, Tribal Representatives

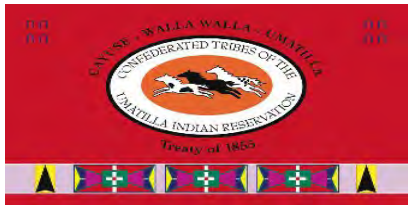
and Non-Governmental Organizations

Hatchery & Habitat Subcommittees

and/or other subcommittees as necessary

Consensus Based  
Decision Making

Standard of Care  
Adaptive Management



Grant County  
**PUBLIC UTILITY DISTRICT**



# Three-Pronged Approach to Reaching No-Net Impact

NNI is the condition whereby the Project does not produce unmitigated project related mortality of Covered Species”. It is achieved when there is a minimum of 91% combined adult and juvenile survival rate for each Covered Species, 2% mitigation in the form of funding habitat restoration and conservation work in mid-Columbia tributary streams and 7% mitigation in the form of hatchery supplementation is implemented.



**7% Hatchery  
Production**



**91% Combined  
Adult or Juvenile Survival  
or  
93% Juvenile Survival**



**2% Tributary Projects**



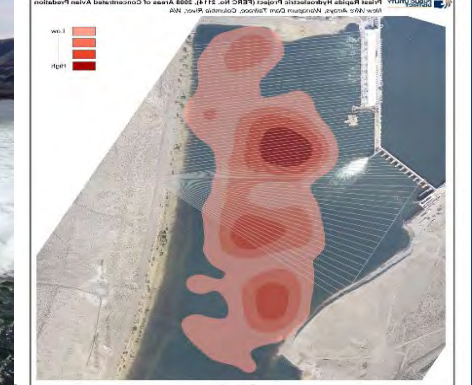
# Hydro Stewardship

## ✓ Achieve standards for Juvenile Salmon

- ❖ Wanapum Advanced Turbine System (2004-2013)
- ❖ Wanapum Future Unit Fish Bypass (2008)
- ❖ Priest Rapids Top-spill Fish Bypass (2014)
- ❖ Priest Rapids/Wanapum “Fish Mode”
- ❖ Priest Rapids Turbine (*in Progress*)
- ❖ Avian Wire Arrays – Tern and gull deterrents
- ❖ Fish Predator Control/Removal

## ✓ Achieve Standards for Adult Salmon

- ❖ Fish ladders
- ❖ Video fish counting/PIT Tag Detection
- ❖ Off-Ladder Adult Fish Trap





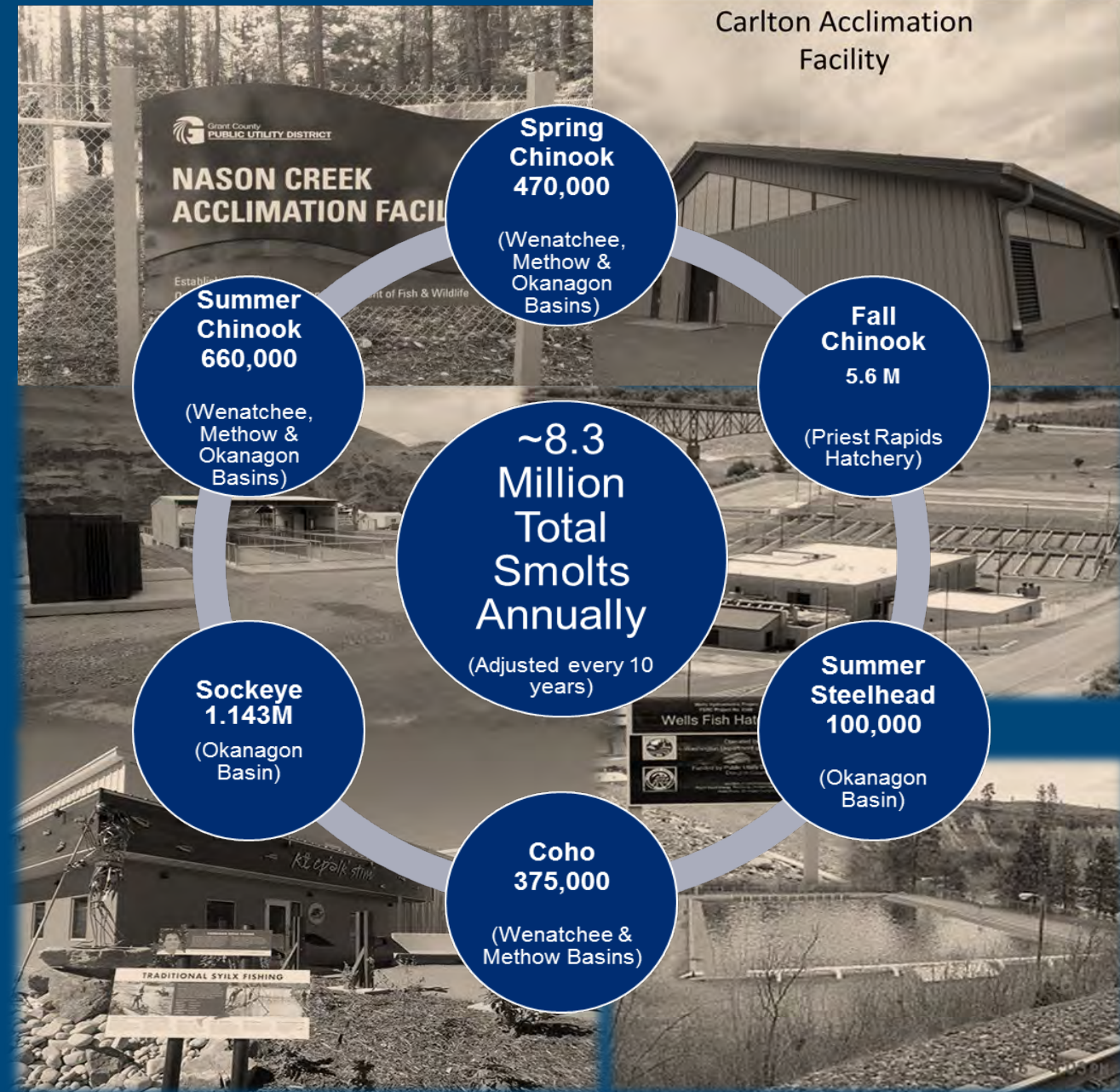
# Hatchery Stewardship

## ✓ District Owned

- ❖ Priest Rapids Hatchery
- ❖ Nason Creek Acclimation Facility (Nason Creek)
- ❖ Carlton Acclimation Facility (Methow River)

## ✓ Partnerships

- ❖ Eastbank Hatchery (Chelan PUD)
- ❖ Dryden Pond (Chelan PUD)
- ❖ Wells Hatchery (Douglas PUD)
- ❖ Methow Hatchery (Douglas PUD)
- ❖ Chief Joseph Hatchery (Colville Tribe)
- ❖ Omak Creek Acclimation (Colville Tribe)
- ❖ Penticton Hatchery (Okanagan Nation)
- ❖ Columbia Basin Hatchery (WDFW)
- ❖ Marion Drain (Yakama Nation)
- ❖ Leavenworth (USFWS)
- ❖ Winthrop (USFWS)



# Habitat Stewardship

- ✓ The District contributes ~\$2.3 million annually into three separate accounts for habitat restoration, protection and enhancements projects and to achieve no-net impact.
  - ❖ Priest Rapids Conservation Account - Provides habitat funding for all covered species included in Salmon & Steelhead Settlement Agreement.
  - ❖ BiOp Account - Provides habitat funding for UCR spring Chinook & steelhead.
  - ❖ No-Net-Impact Fund - Terminates once standards are achieved.
- ✓ A total of 141 separate projects have been approved by the various committees for funding since 2006.





# Resident Fish & Water Quality

- ✓ White Sturgeon Program
- ✓ Pacific Lamprey Program
- ✓ Native Resident Fish Program
- ✓ Columbia Basin Hatchery (Rainbow Trout)
- ✓ Bull trout Monitoring Program
- ✓ Water Quality Monitoring Program
  - ❖ Temp, pH, Turbidity, total dissolved gas & Dissolves Oxygen
  - ❖ Aquatic Invasive Species
  - ❖ 10-year Temperature Compliance
  - ❖ 10-year Total Dissolved Gas Compliance
  - ❖ Fish Ladder Temperature Compliance
  - ❖ Aquatic Vegetation Monitoring



# Fracture and the Frantic at Wanapum Dam: Developing an Emergency Plan and Infrastructure for Fish



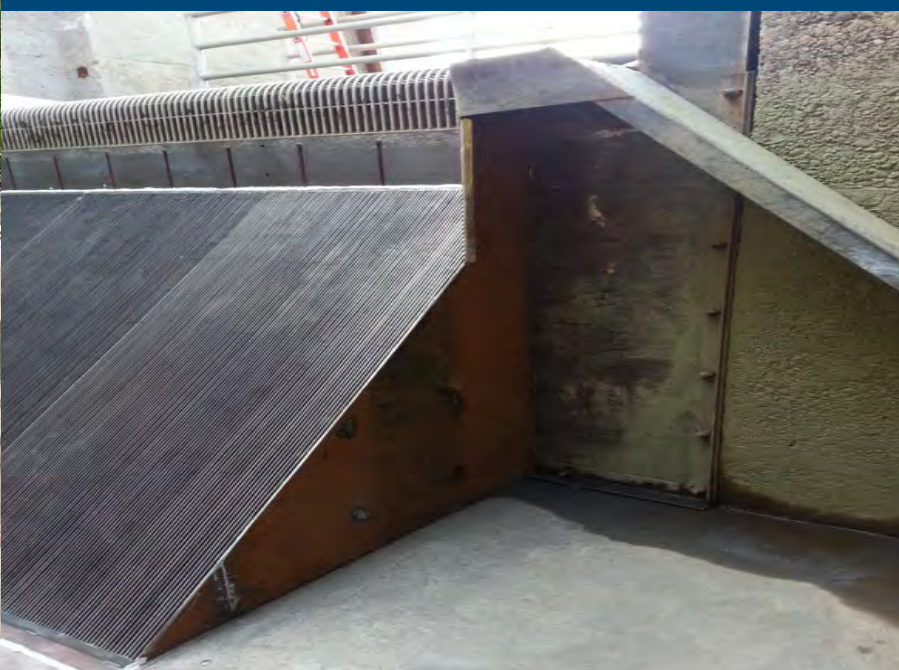




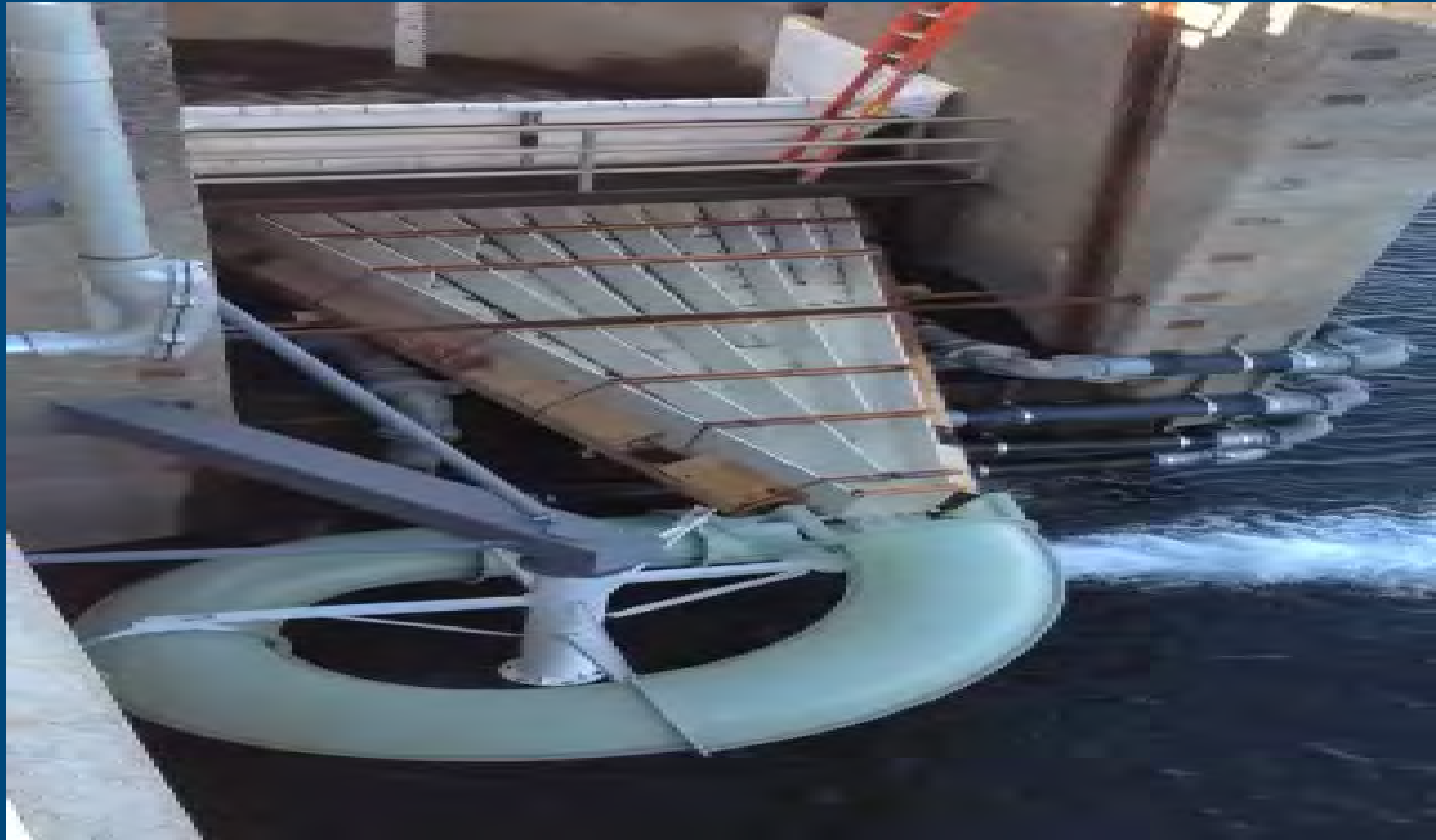














**Powering our way of life.**



# Grant PUD Juvenile Fish Passage Programs

*Presentation to Policy Group, 2023*

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*Our commitment to generating low-cost, reliable energy while caring for the environment*



**Powering our way of life.**



# Performance Standards

An aerial photograph of a large dam and reservoir. The reservoir is a deep blue color, and the dam is a long, low structure with a spillway. Water is flowing over the spillway, creating white rapids. The surrounding landscape is dry and brownish, with some green patches. The sky is clear and blue.

93% survival thru  
the reservoir and  
past the dam  
(combined)

**Priest Rapids Project**  
survival standard is **86.5%**  
(93% X 93%)

Ave. of 3 consecutive  
years of survival studies



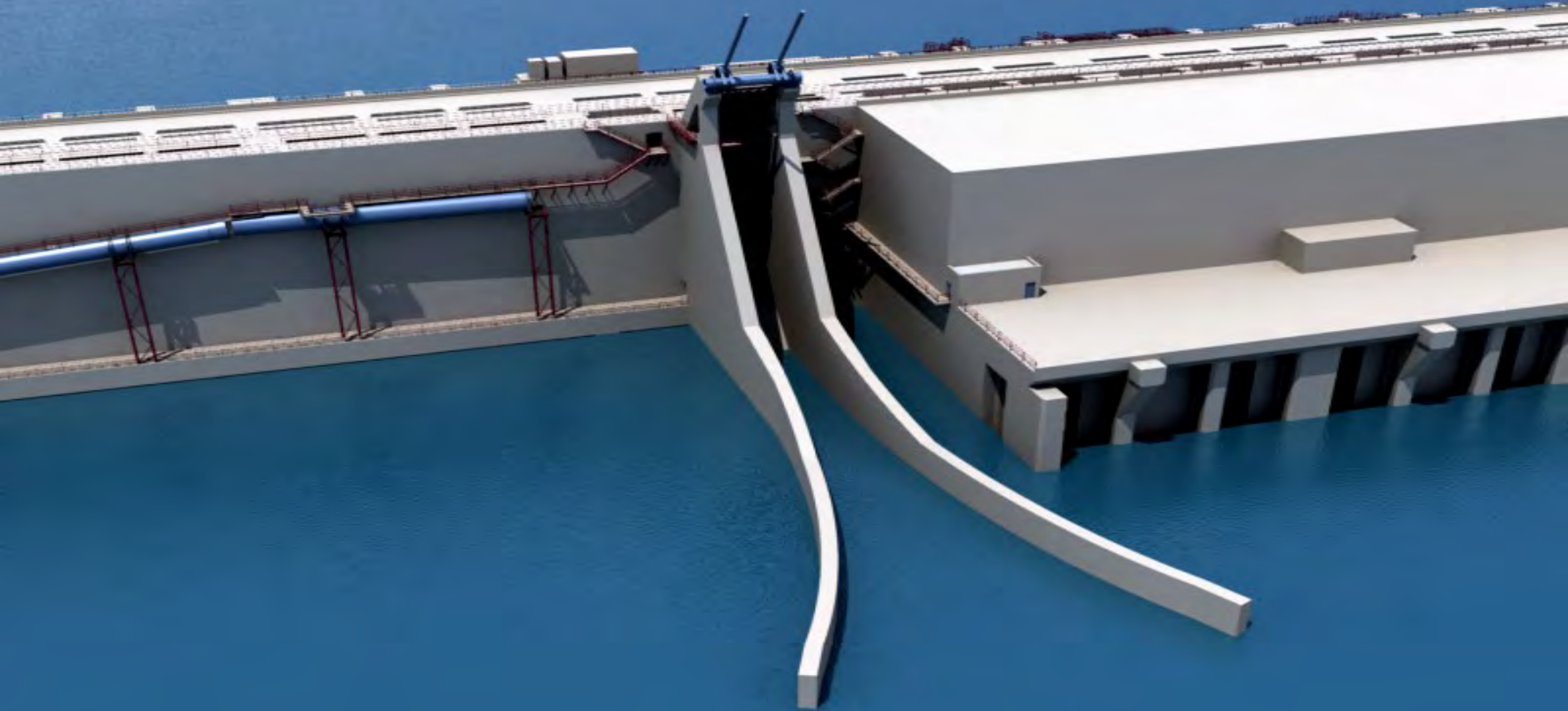
# Bypass Collaboration – Wanapum Bypass Design Options - (University of Iowa)







# Downstream View of (future) WAN fish bypass











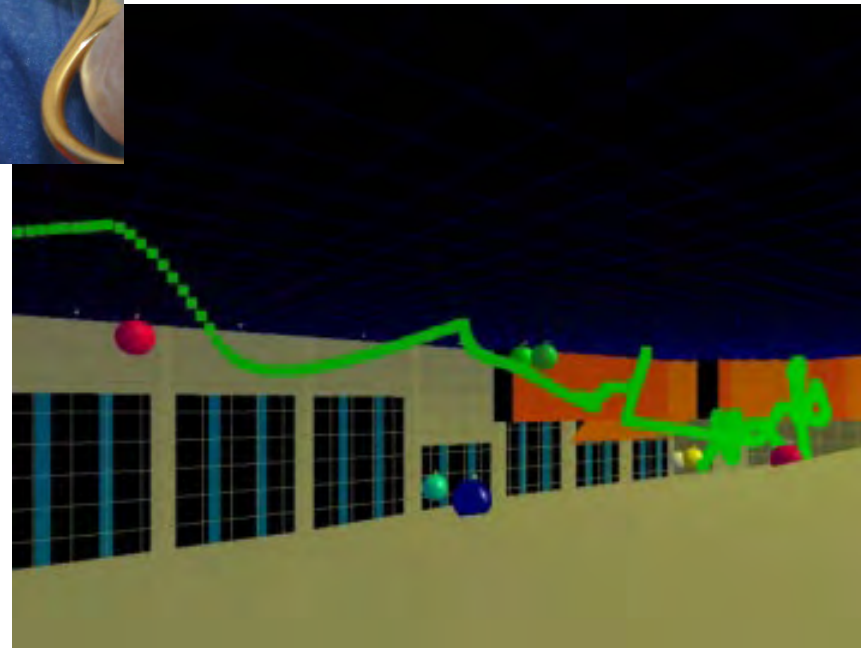
April 30, 2008

**April 2008**



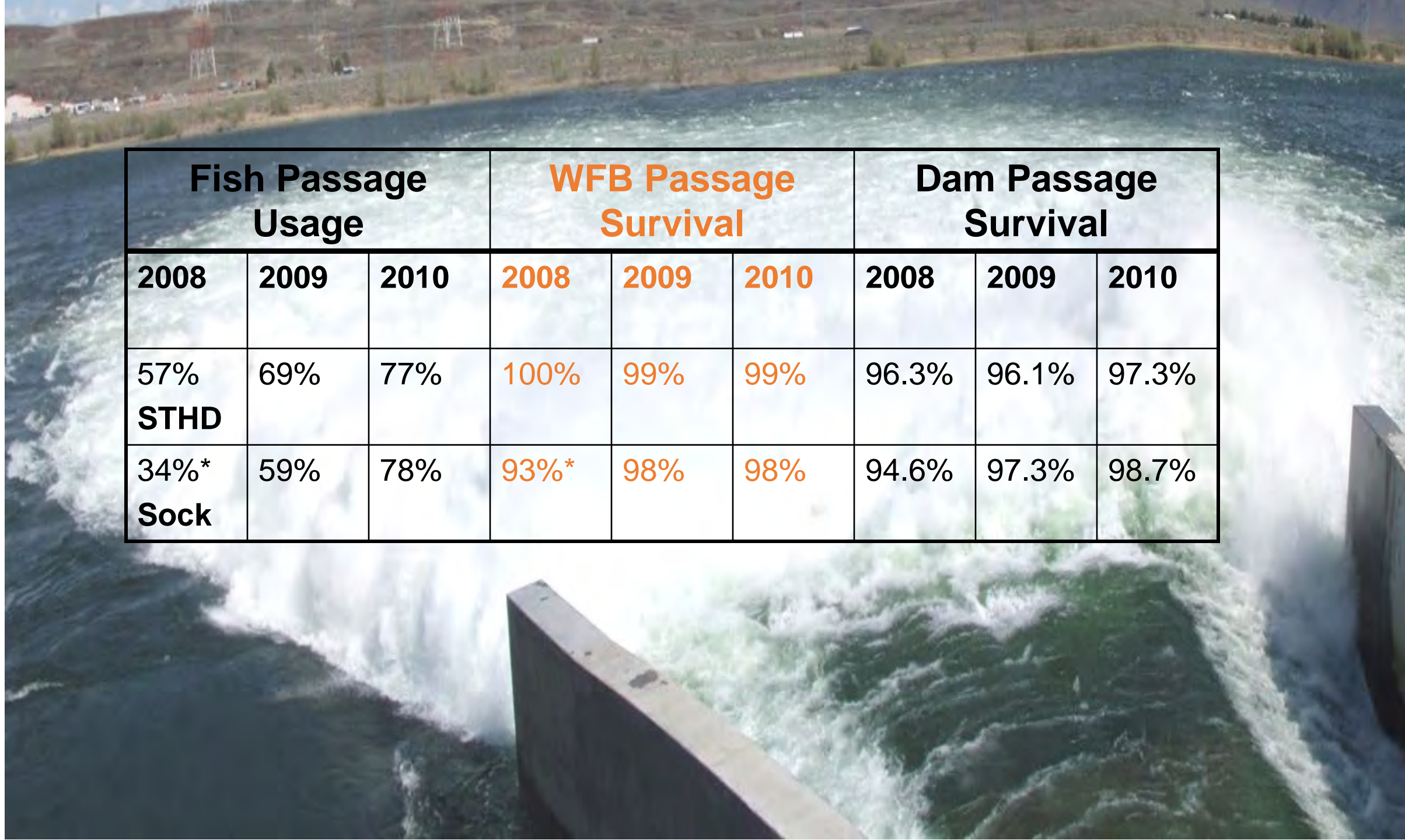


# Tracking and Evaluation





Fish Passage Usage			WFB Passage Survival			Dam Passage Survival		
2008	2009	2010	2008	2009	2010	2008	2009	2010
57% <b>STHD</b>	69%	77%	100%	99%	99%	96.3%	96.1%	97.3%
34%* <b>Sock</b>	59%	78%	93%*	98%	98%	94.6%	97.3%	98.7%



# **Benefits of the WFB**

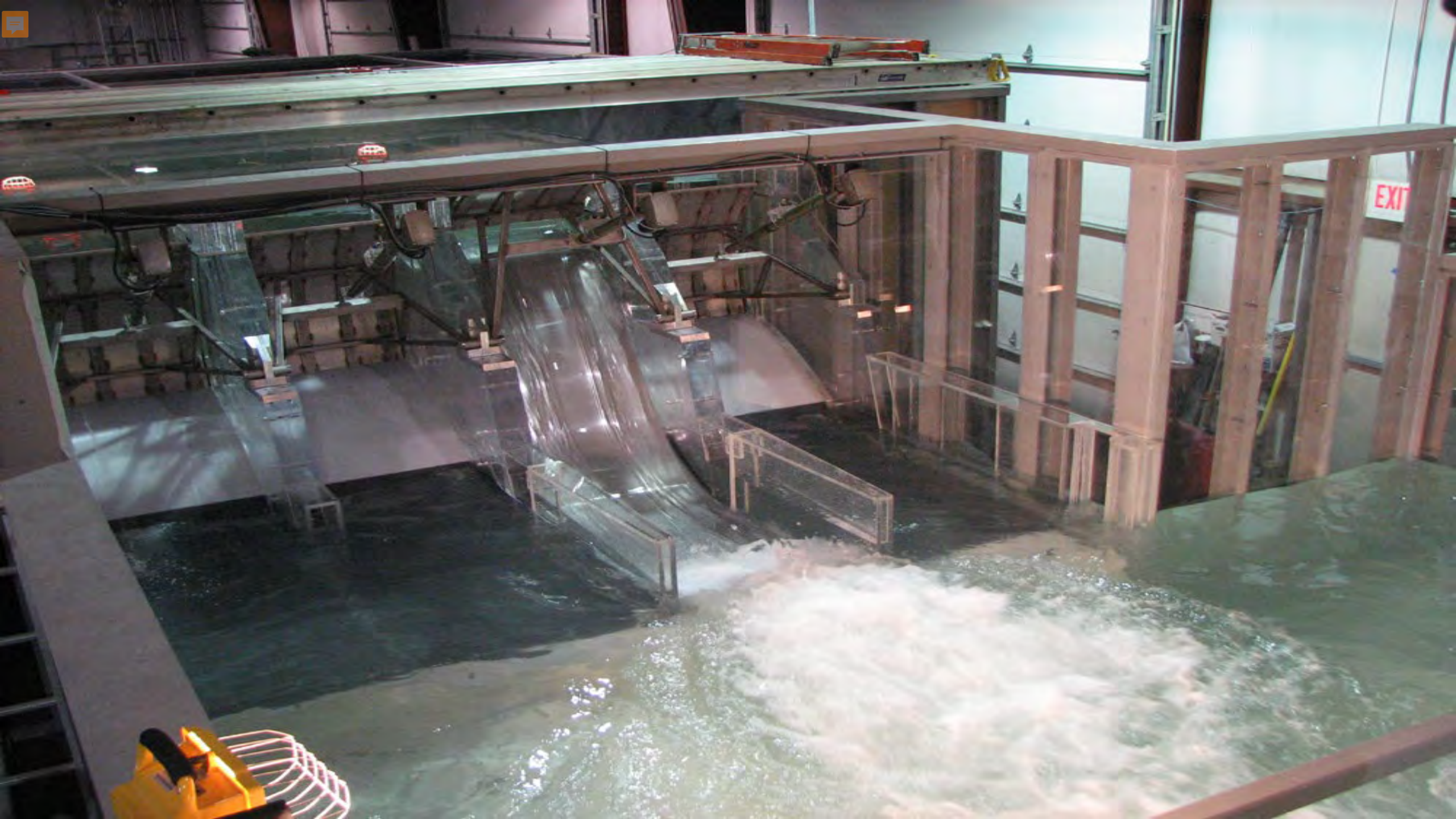
- **Increased survival rates for juvenile salmon past Wanapum Dam**
- **Fulfils requirements of the License and its associated mandates and obligations**
- **Lower TDG levels when fish spill is taking place**
- **More water available for power generation during the salmonid smolt out-migration**



# Priest Rapids Dam Fish Bypass

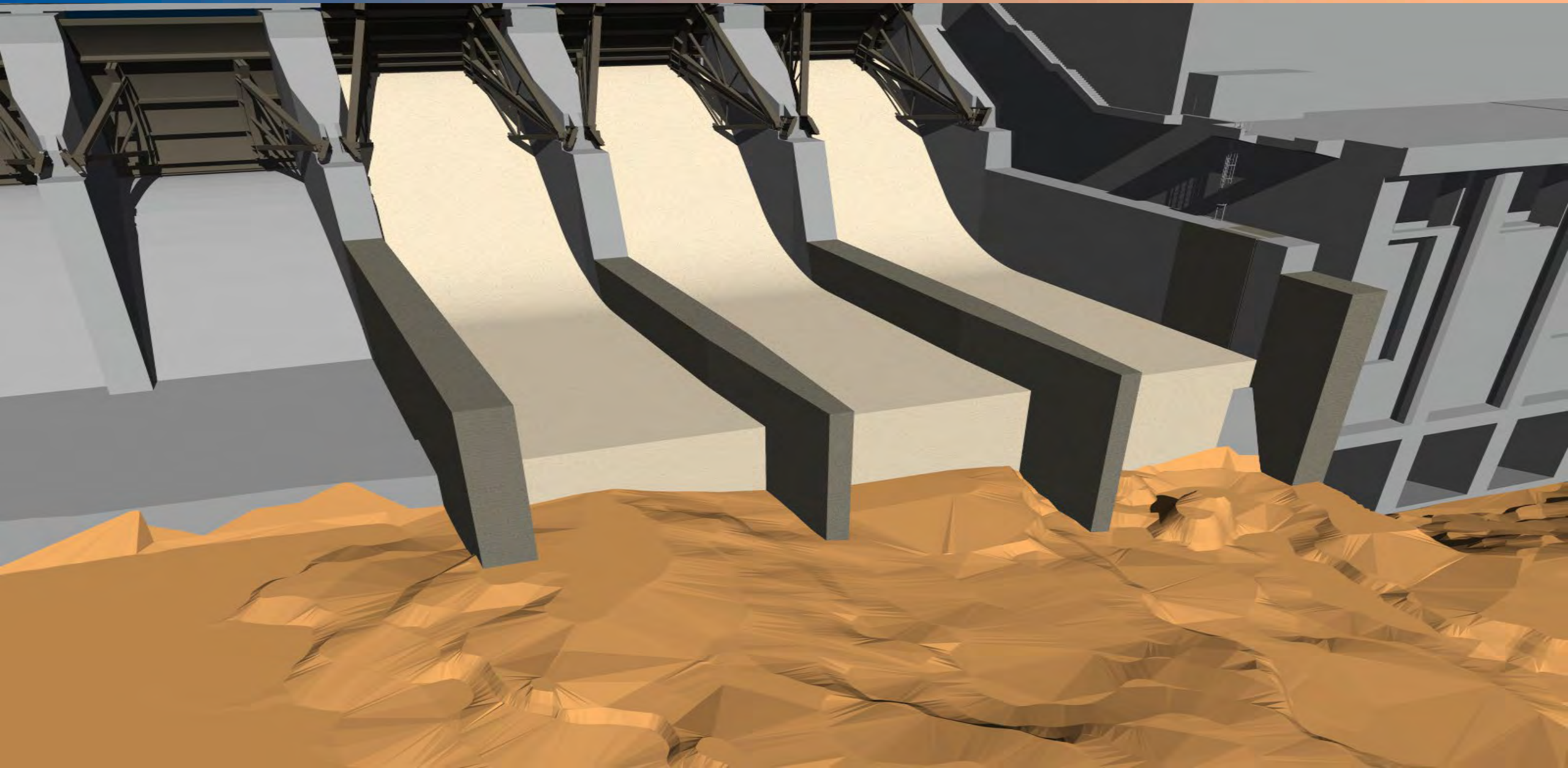








# Priest Rapids Fish Bypass





# Priest Rapids Dam Fish Bypass Construction





# Priest Rapids Fish Bypass Objectives

- Assist Grant PUD in meetings the requirements of the NMFS 2008 BIOP, which were included in the FERC License Order
- Increase smolt survival, reduce spill, increase generation potential, reduce total dissolved gas.





# Predation Issues



# PRCC Funded Tern Behavior Research





PRCC funded Tern colony (passive) dissuasion work on Goose Island – started 2014



# Caspian tern colony size and predation rates on juvenile steelhead for Goose Island, Potholes Reservoir and Priest Rapids juvenile steelhead survival rates

Year	Colony Size	UCR Steelhead	UCR Spr Chinook	Priest Rapids Juvenile Steelhead Survival Rates	Snake River Steelhead
2007	282	15.3% (9.8-27.7)	N/A		0.1% (0-0.2)
2008	293	11.1% (8.6-16.4)	N/A	82.80%	<0.1%
2009	487	22.6% (17.2-33.7)	5.5% (2.7-10.7)	83.10%	0.1% (0-0.2)
2010	416	14.6% (11-21.8)	2.0% (0.7-4.4)	77.30%	<0.1%
2011	422	12.9% (9.6-19.6)	0.6% (0.1-1.9)	.	<0.1%
2012	463	18.4% (13.5-28.5)	2.6% (1.2-5.4)	.	0.2% (0.1-0.4)
2013	340	14.8% (11.4-21.6)	2.5% (1.1-5.2)	.	0.1% (0-0.3)
2014	159	2.9% (1.9-5.1)	0.6% (0.1-2.2)	.	<0.1%
2015	2	--	--	83.70%	--
2016	0	--	--	86.60%	--
2017	0	--	--	90.80%	--
2018	0	--	--	.	--
2019	0	--	--	.	--
2020	6	--	--	.	--
2021	22	3.9% (2.4-6.3)	0.3% (0.1-1.5)	.	<0.1%
2022	16	0.1% (0.1-1.5)	N/A	.	<0.1%



A large northern pike is being held by a person on a boat. The fish is long and slender with a dark, patterned back and a lighter belly. The person's hands are visible, supporting the fish. The background shows the blue water of Lake Roosevelt and a concrete dock.

**PRCC is a funding partner with the northern pike removal program on Lake Roosevelt - \$750K.**

---

# Hydro Operations Achieving NNI ( $\geq 86.5\%$ )



**Yearling Chinook**  
90.8%



**Juvenile Steelhead**  
87.0%



**Juvenile Sockeye**  
91.7%



**Coho**  
Hatchery Production



**Adult Spring Chinook**  
99.6%



**Subyearling Chinook**  
NNI Contributions &  
Hatchery Production



# Hanford Reach Fall Chinook Salmon Protection Program

Policy Group Meeting  
July 20, 2023

---

Operate Responsibly by Attaining Environmental, Cultural  
Resource and Regulatory Compliance



Powering our way of life.

# Grant PUD & The Hanford Reach

**Chief Joseph Dam**  
(River Mile 541.1)  
Capacity 2,614 MW  
Corps of Engineers

**Wells Dam**  
(River Mile 515.1)  
Capacity 840 MW  
Douglas PUD

**Rocky Reach Dam**  
(River Mile 473.0)  
Capacity 1,300 MW  
ChelanPUD

**Rock Island Dam**  
(River Mile 453.4)  
Capacity 624 MW  
Chelan PUD

**Bonneville Dam**  
(River Mile 145.5)  
Capacity 1,227 MW  
Corps of Engineers

**The Dalles Dam**  
(River Mile 191.5)  
Capacity 2,160 MW  
Corps of Engineers

**John Day Dam**  
(River Mile 215.8)  
Capacity 2,480 MW  
Corps of Engineers

**McNary Dam**  
(River Mile 292.0)  
Capacity 980 MW  
Corps of Engineers

**Grand Coulee Dam**  
(River Mile 596.6)  
Capacity 6,809 MW  
Bureau of Reclamation

**Wanapum Dam**  
(River Mile 415.8)  
Capacity 1,185 MW



**Priest Rapids Dam**  
(River Mile 397.1)  
Capacity 953 MW





















- **1961: Priest Rapids Dam Completed**
- **1970s: Grant PUD funds studies on flow controls**
- **1983: Experimental flow protections**
- **1988: Vernita Bar Settlement Agreement (VBSA) formalizes protections for spawning Chinook**
- **2004: Hanford Reach Fall Chinook Protection Program (HRFCPPA) signed expanding VBSA protections to include emergence and rearing**
- **2012: Productivity assessments begin on protection flow outcomes**

# Hanford Reach committees

## Hanford Reach Work Group (2004)

- Included signatories to the 2004 HRFCPPA (PUDs, BPA, NMFS, WDFW, CCT)

## Fall Chinook Work Group (2007)

- A consultation requirement described in the 2007 401 Certification
- Expanded participation: all members of the PRCC, signatories to the 2004 HRFCPPA, and other interested parties



# GPUD and Committee Collaboration

## Accomplishments

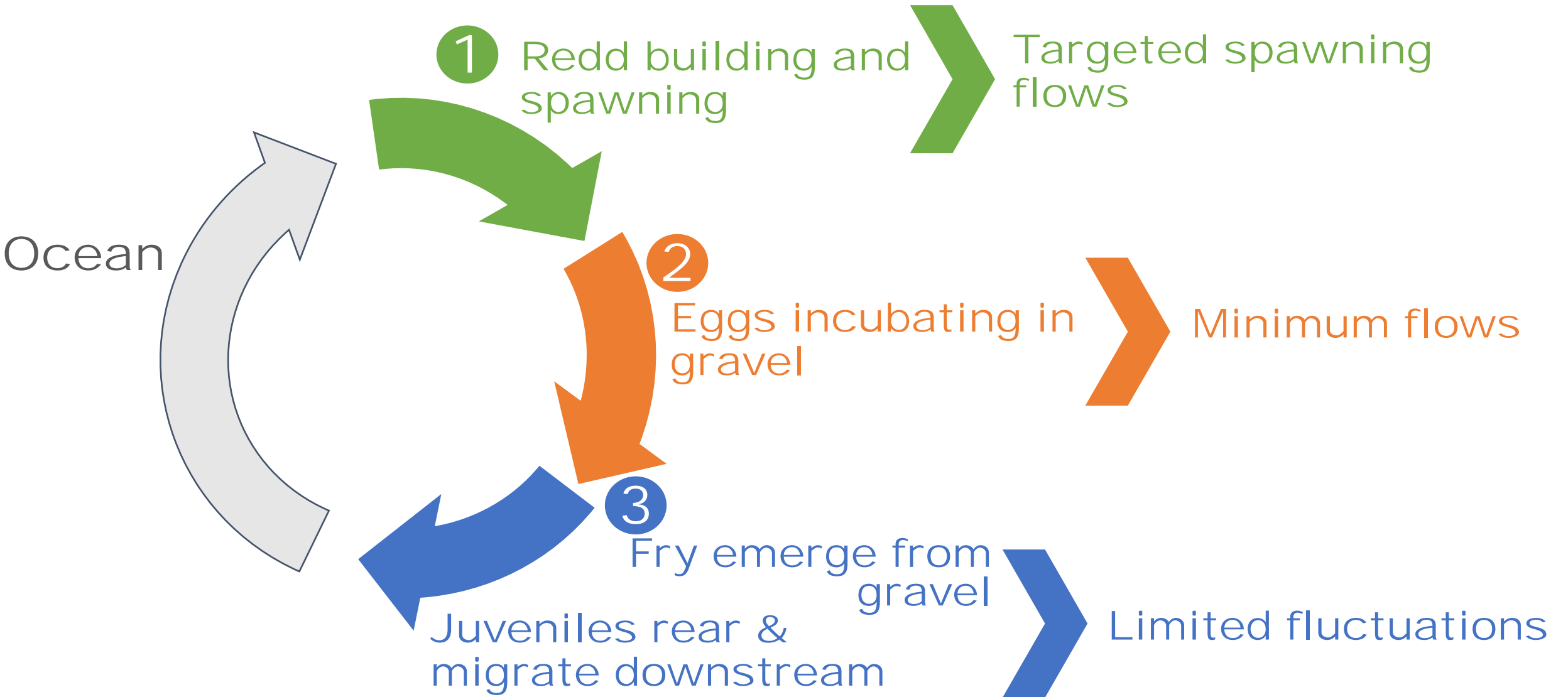
- Critical studies on flow fluctuation, stranding & entrapment, productivity
- Ongoing rigorous M&E

## NNI for fall Chinook

- HRFCPPA
- Upgrades to Priest Rapids Hatchery
- Additional supplementation 1M fry -> 274k smolts



# Flow protections guided by salmon life-cycle





# Targeted Spawning Flows & Hydrosystem Balancing





# Targeted Spawning Flows & Hydrosystem Balancing

36-50 kcfs

50-70 kcfs

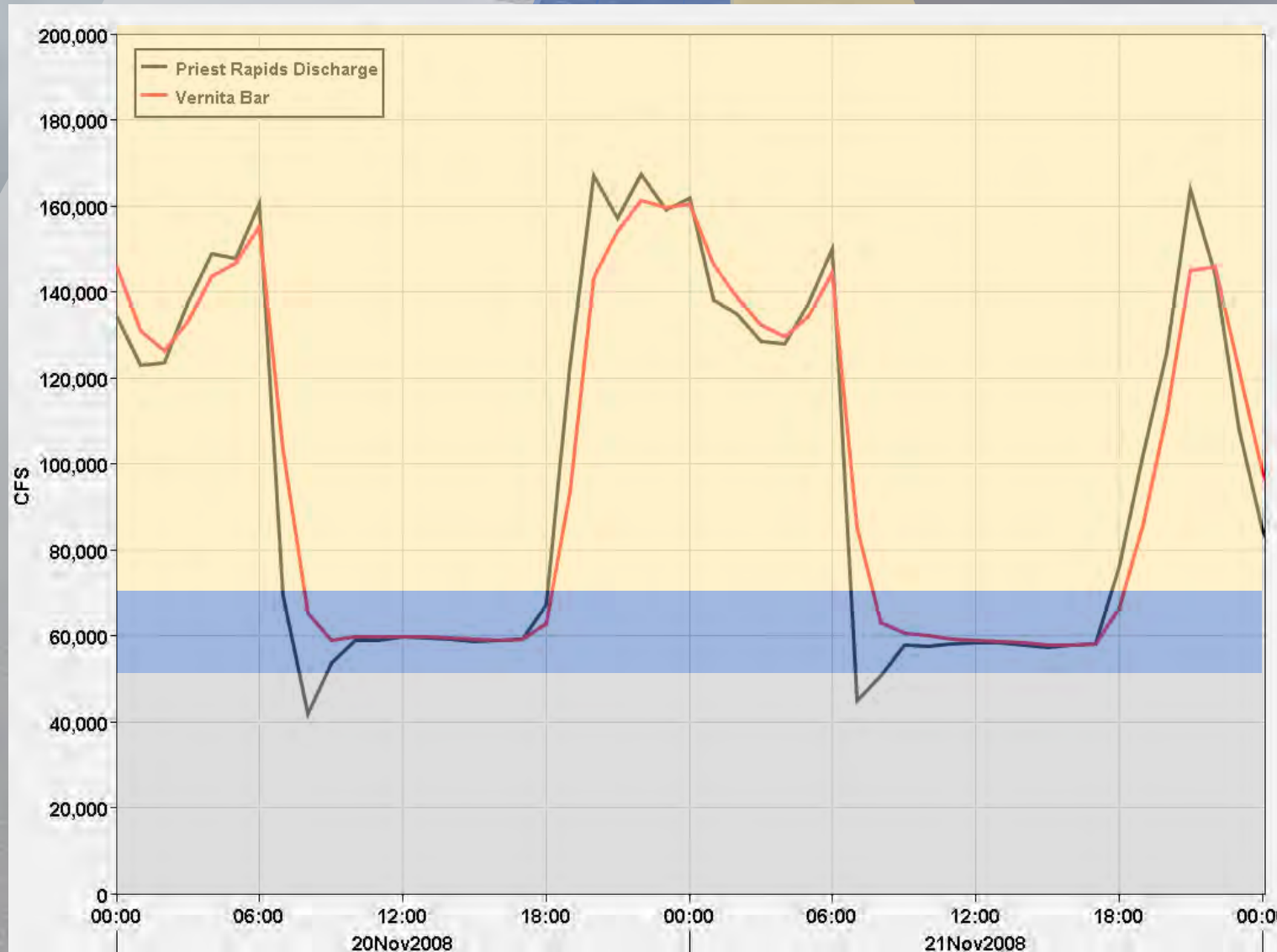
70+ kcfs





# Spawning & Pre-Hatch

Reverse Load Factoring target 55 -70 kcfs during daylight





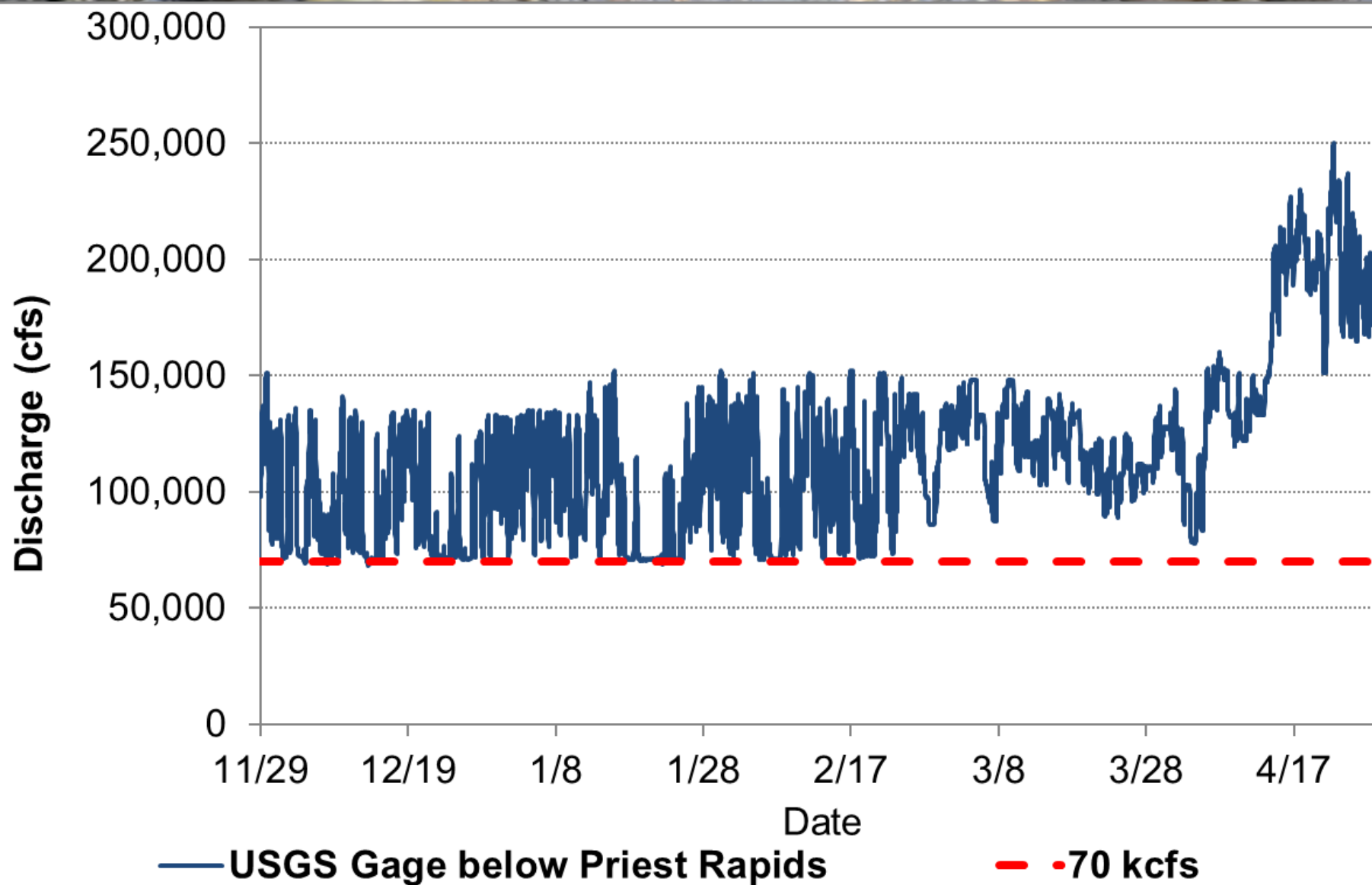


# 2 Egg Incubation





# 2 Egg Incubation



# 3 Emergence and Rearing

## Fish Behavior:

**Juveniles emerging, rearing, feeding along shoreline**

## Flow Protections:

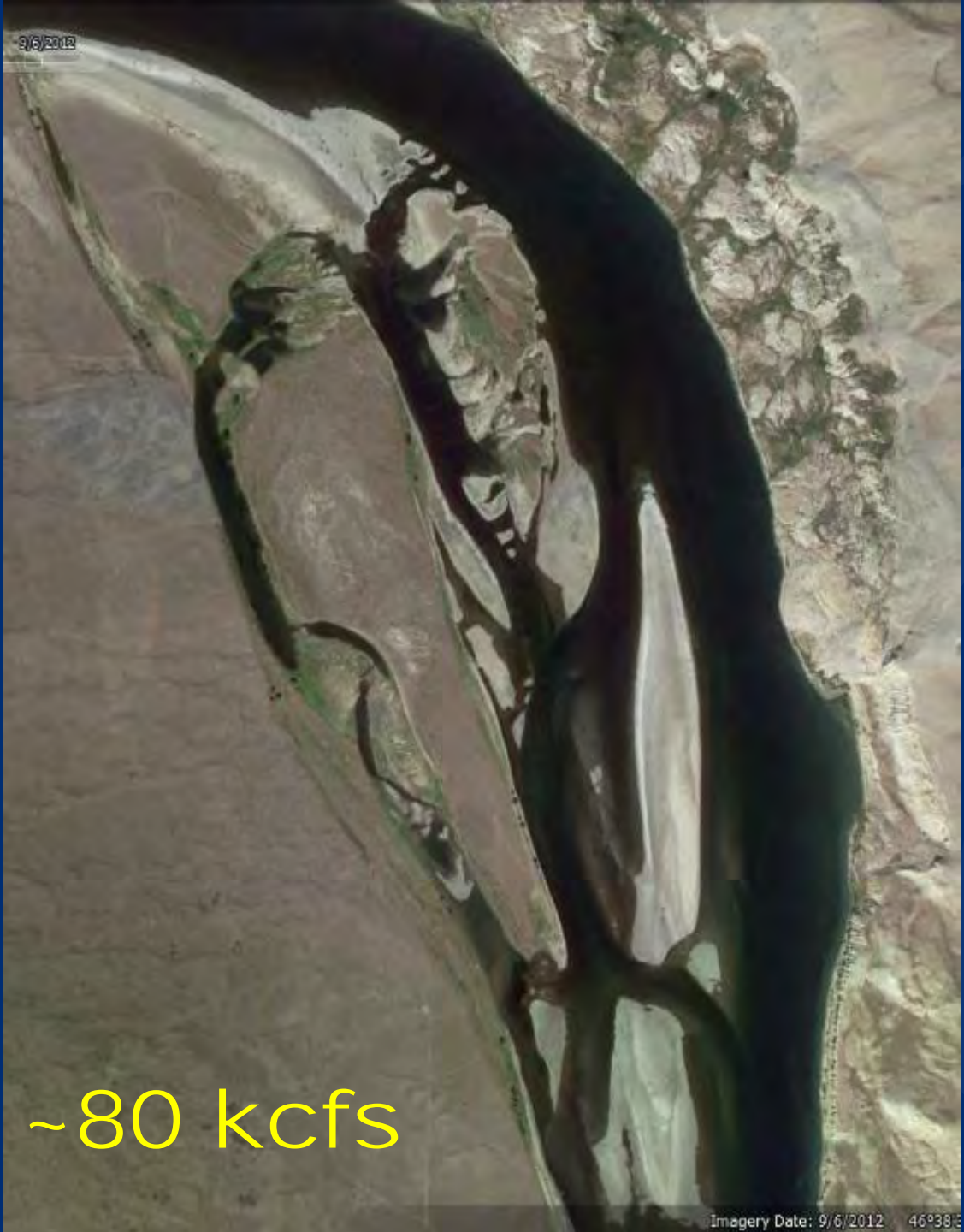
**Minimum flows**

**Flow fluctuation constraints**





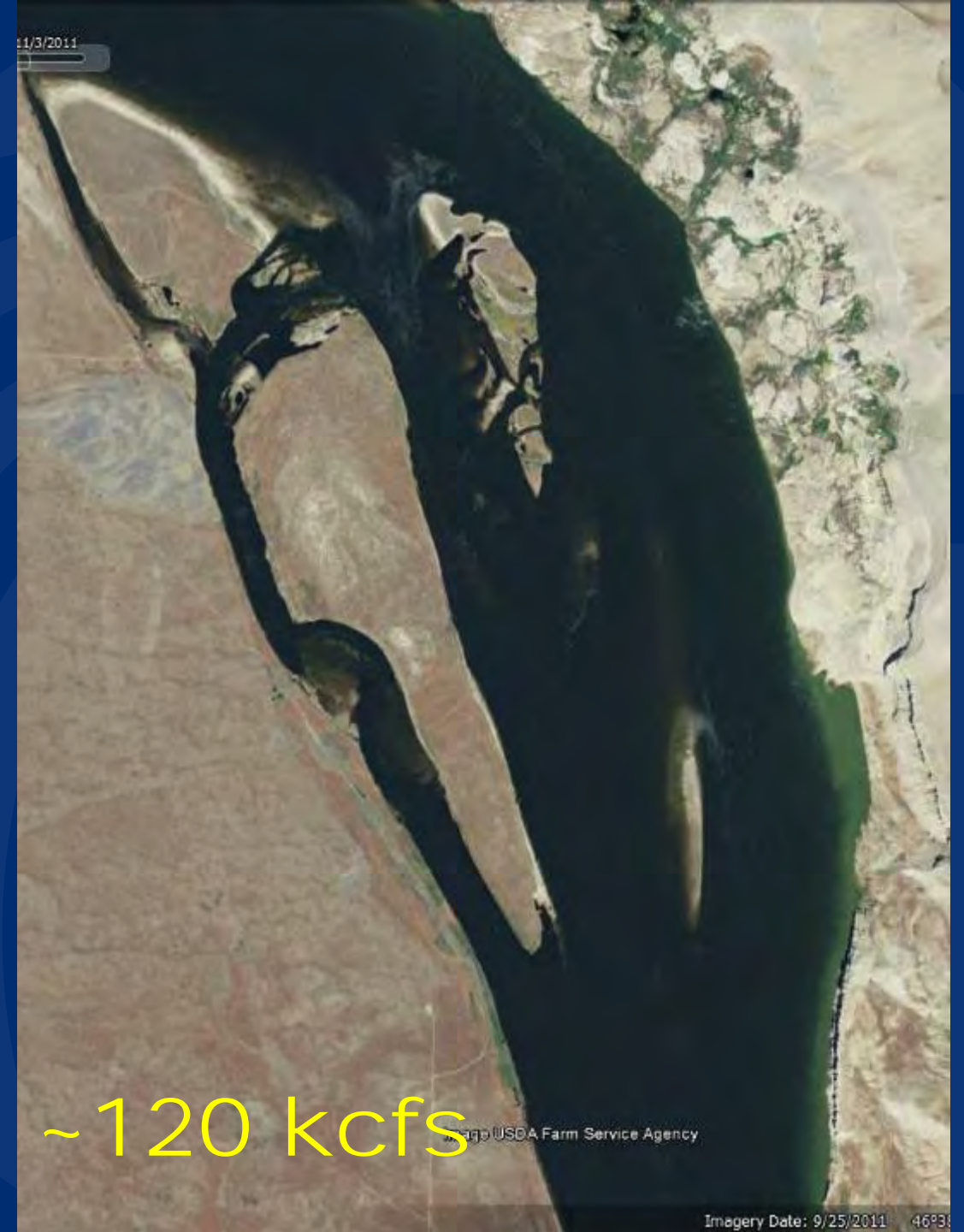
9/6/2012



~80 kcfs

Imagery Date: 9/6/2012 46°38'N

9/25/2011

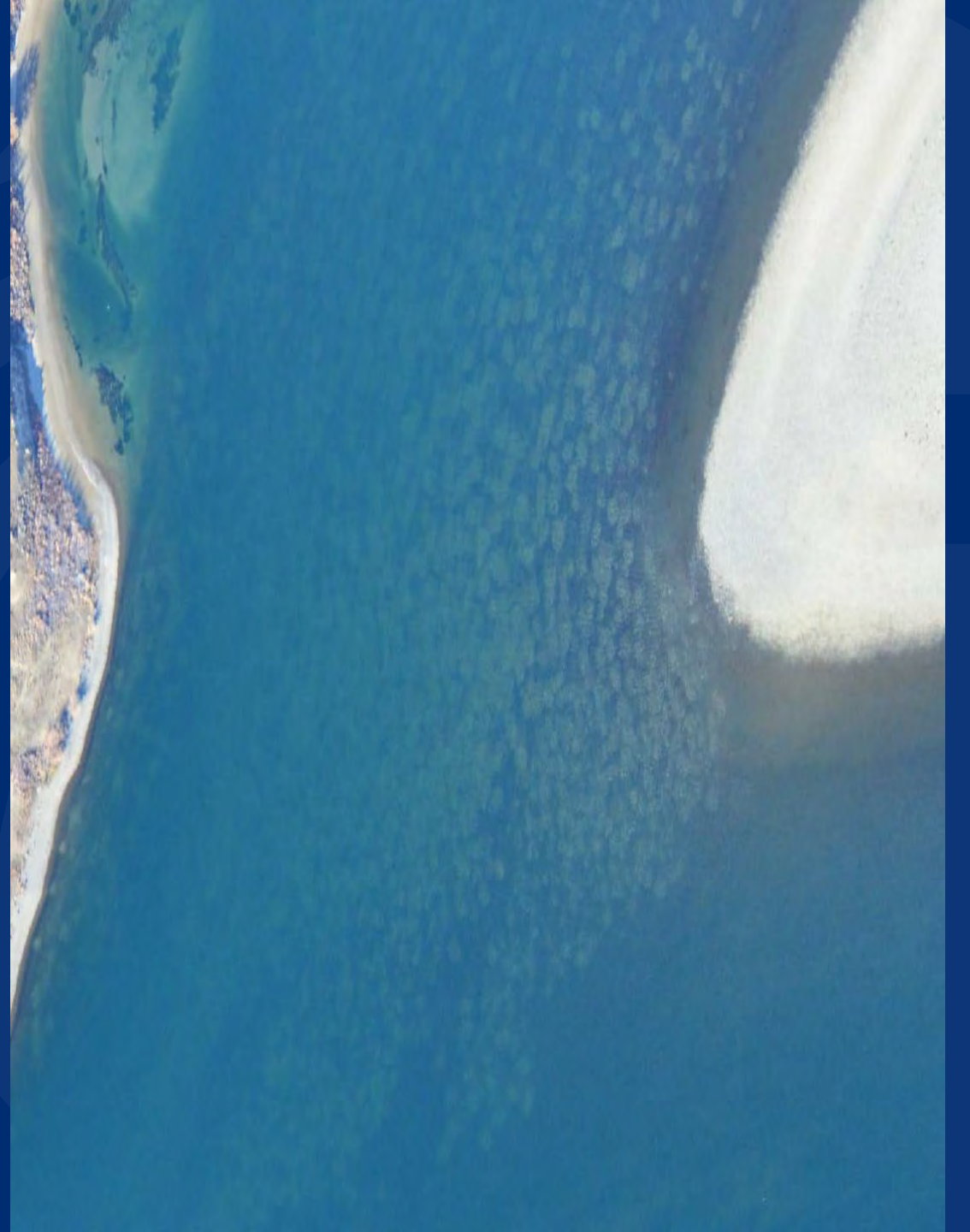


~120 kcfs

USDA Farm Service Agency

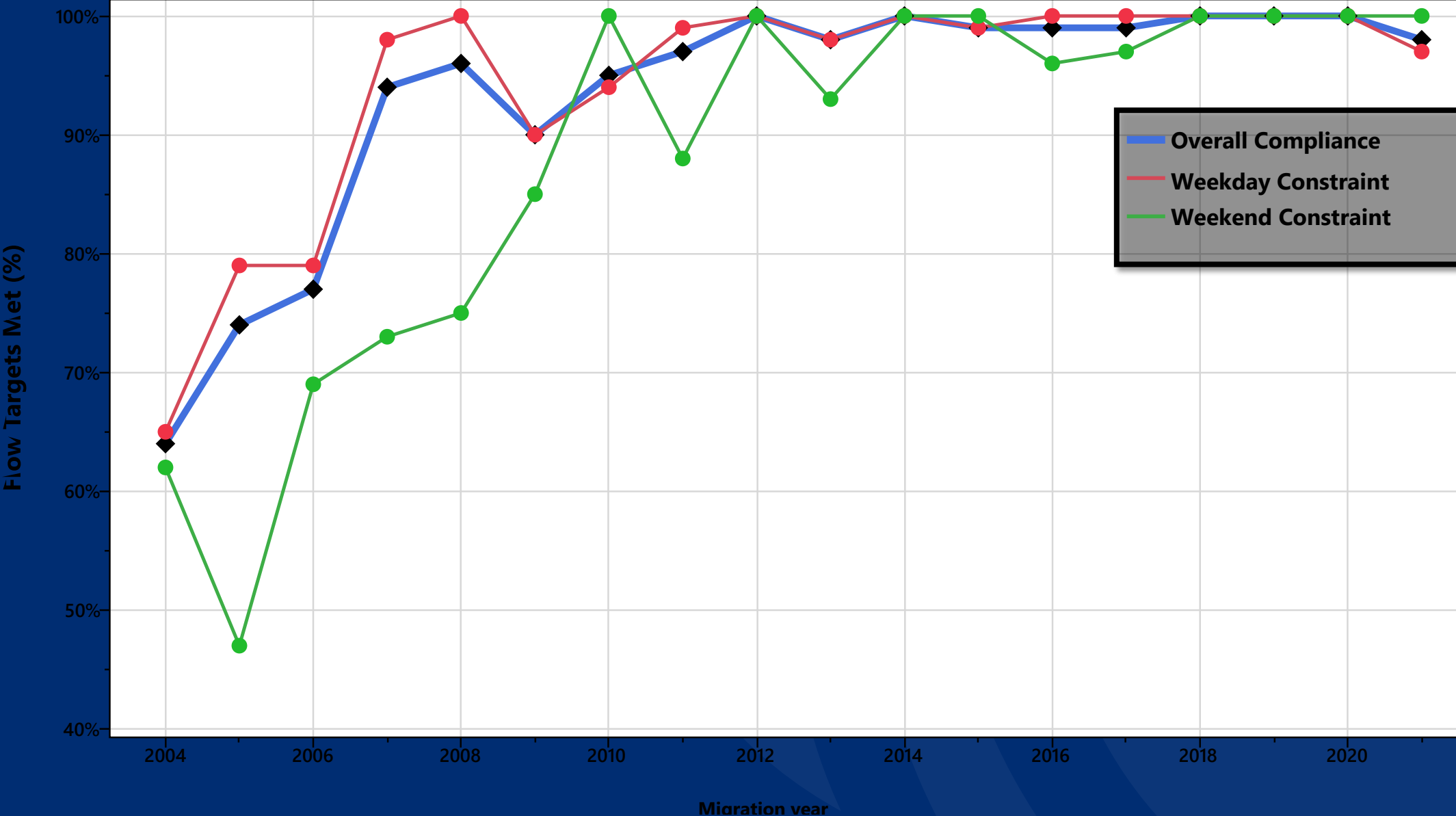
Imagery Date: 9/25/2011 46°38'N

# Outcomes and Compliance





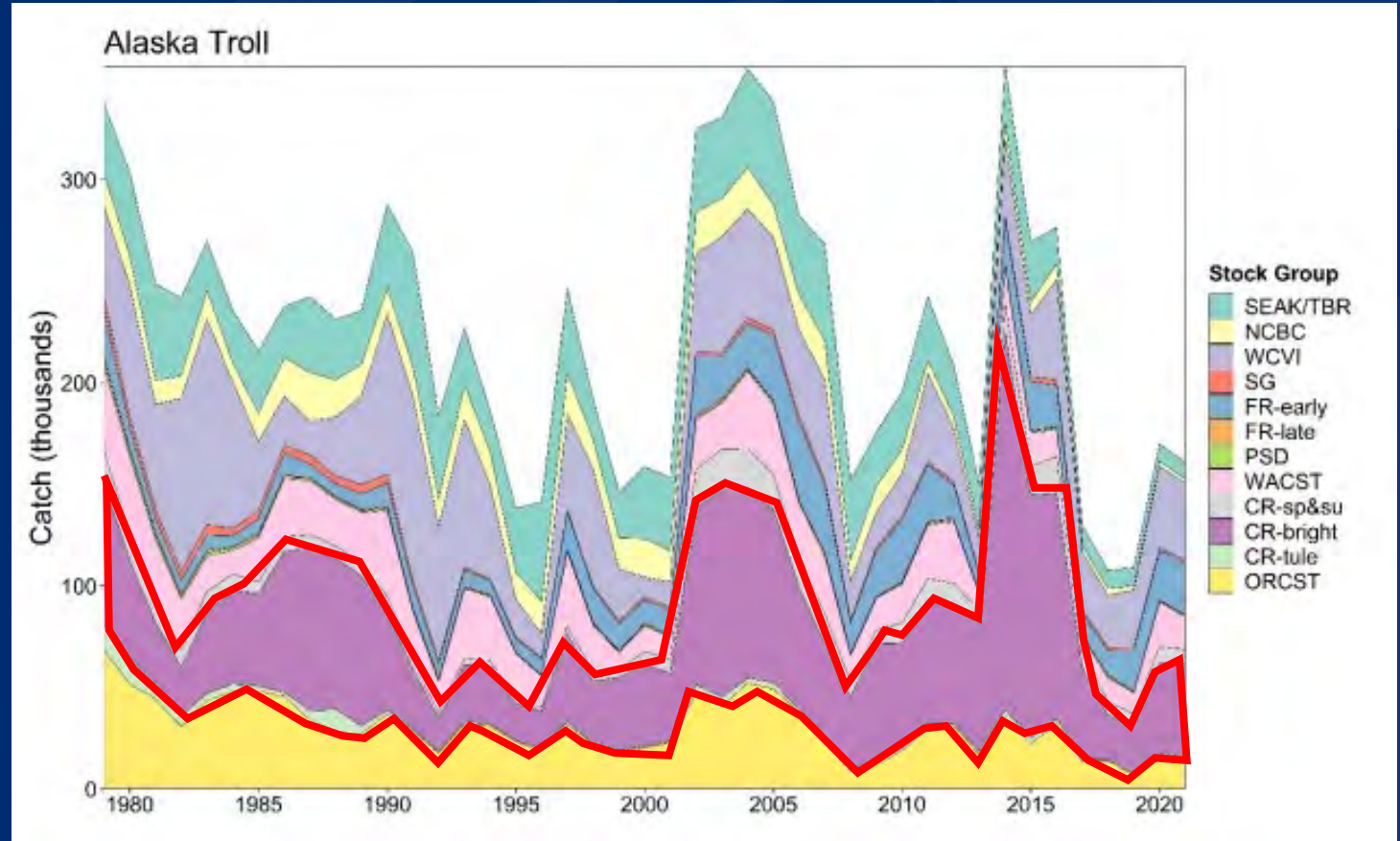
# Compliance Learning Curve



# Contributing to harvest (2022 example)

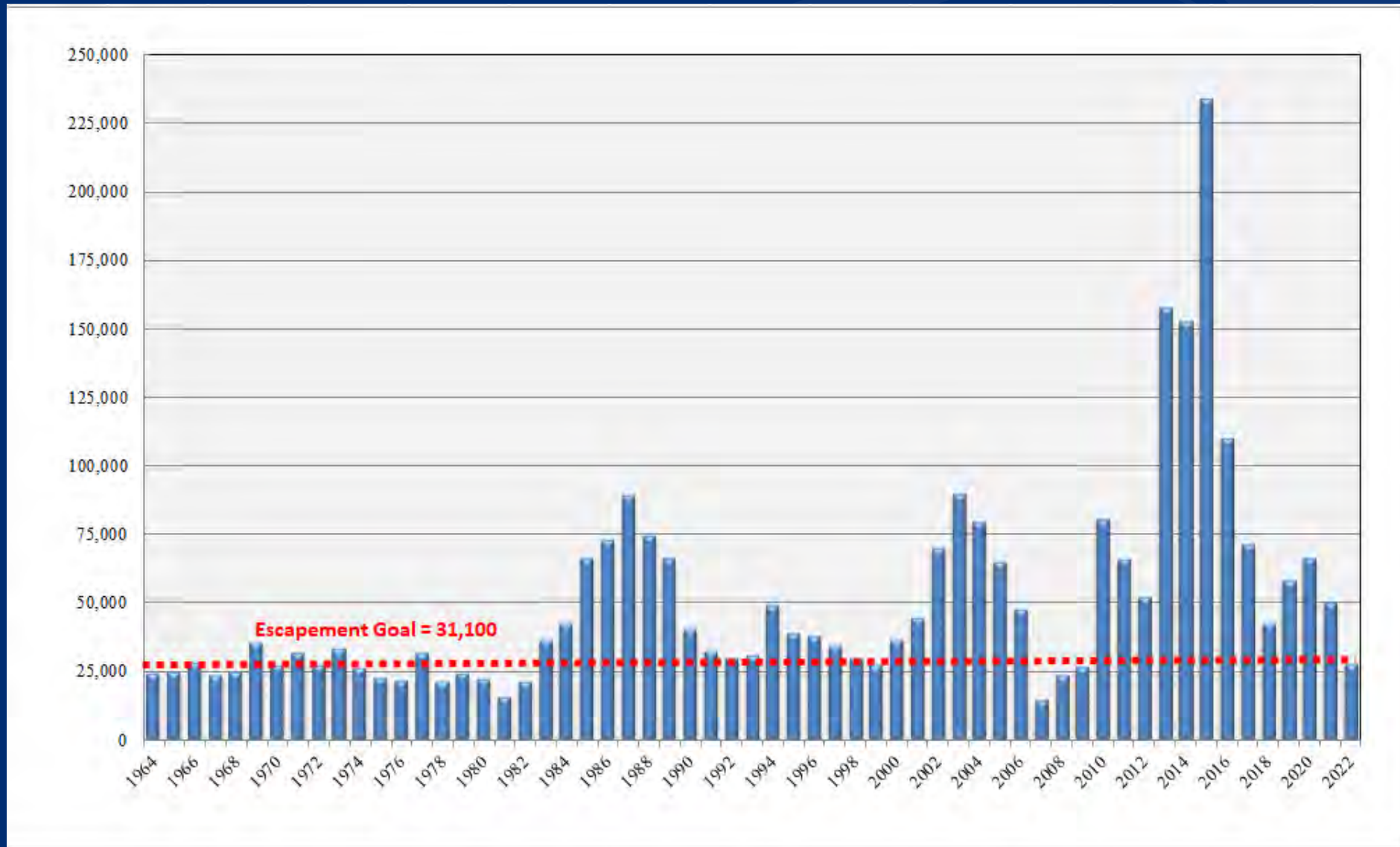
CR Upriver brights make up 20-25% of fishery catch in several areas

- Southeast AK
- North British Columbia
- West Coast Vancouver Island
- US Coastal OR and WA





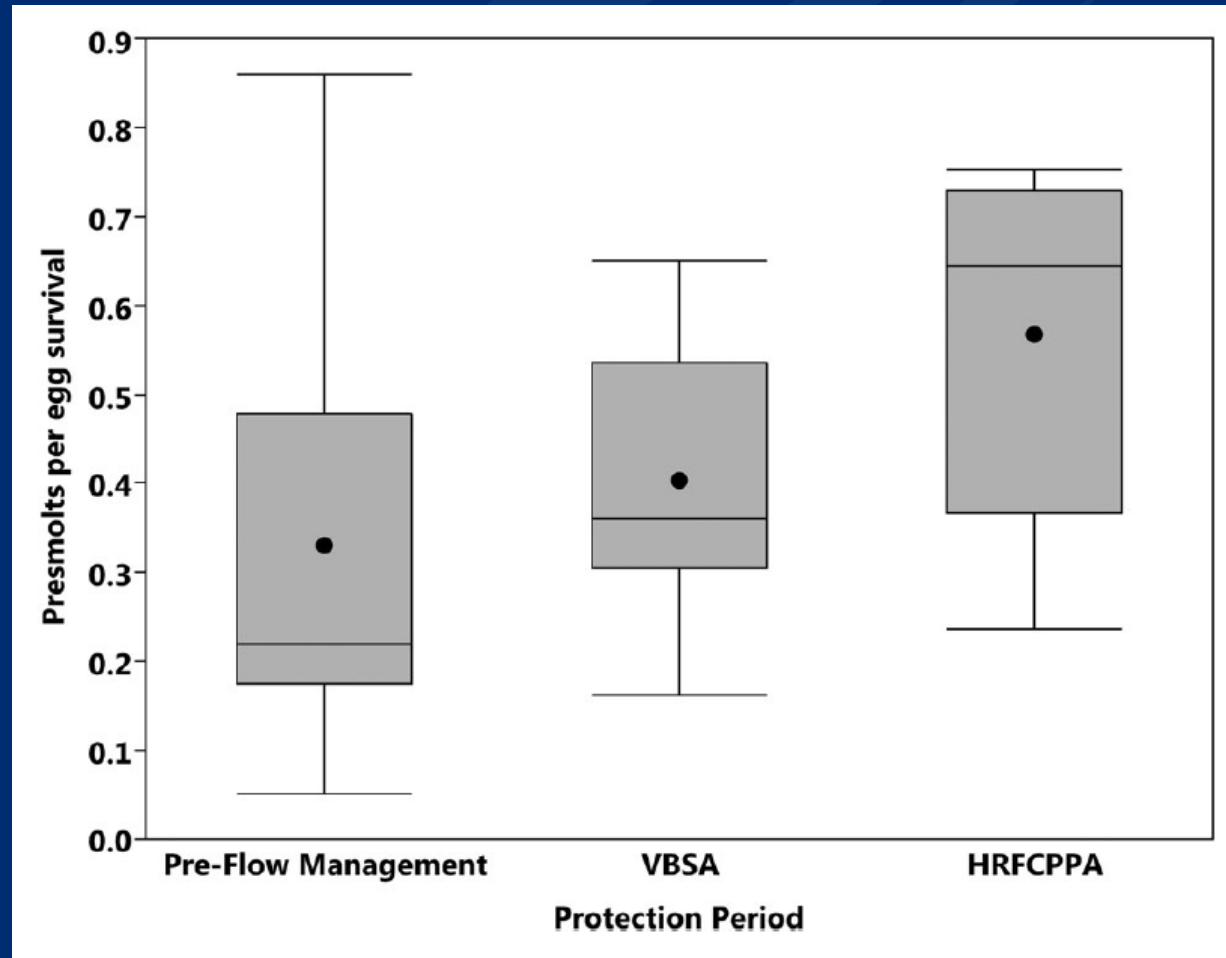
# Generally achieving escapement goal



# Published Results on HRFCPPA

“Our results indicate that altering the timing and magnitude of discharge fluctuations can minimize the adverse effects of operating hydroelectric dams on the productivity of downstream salmon populations.”

-Harnish et al. (2013)



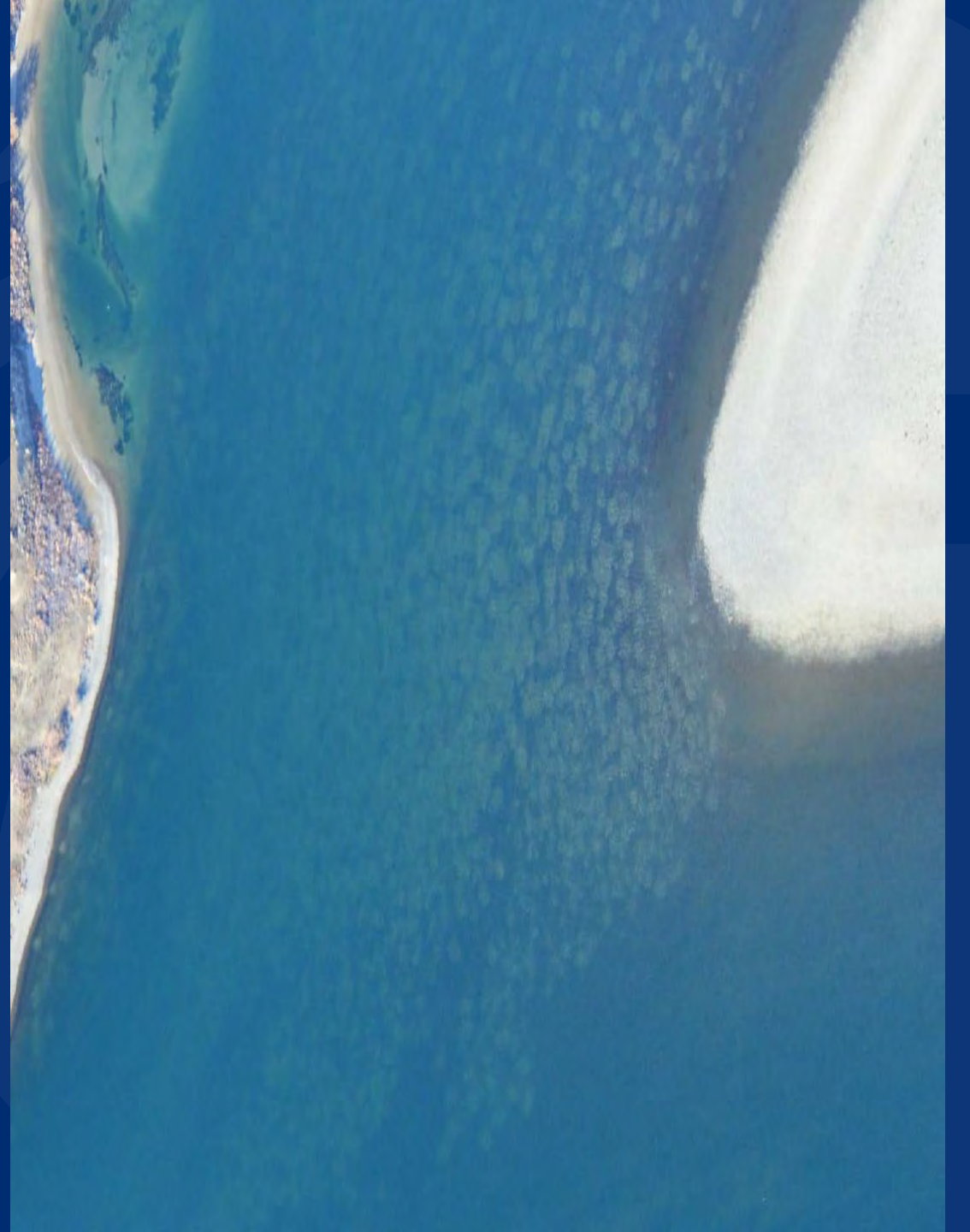
-Langshaw et al. (2018)



# Conclusions

1. Committee collaboration paved the way for success.
2. 100% compliance takes time.
3. Flow targets are being achieved.
4. Use environmental cues to design resilient flow programs.
5. Results: meeting escapement goals and contributing to harvest

Questions?











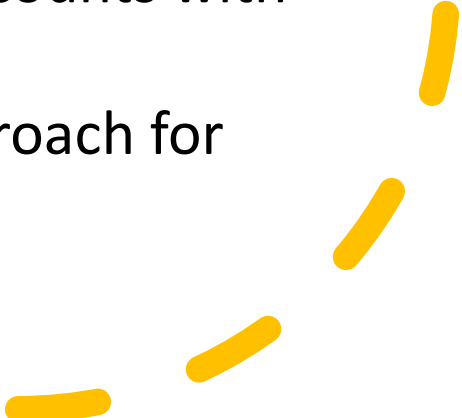
# Habitat Update-PRCC Policy Committee-July 2023

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# Purpose of PRCC Habitat

- To meet Biological Opinion(s) and Salmon & Steelhead Settlement Agreement Requirements:
    - Formed PRCC Habitat Subcommittee represented by USFWS, NOAA Fisheries, Yakama Nation, Confederated Tribes of the Colville Reservation, WDFW, Confederated Tribes of the Umatilla, GCPUD
    - Created three separate funding accounts with own respective monetary deposits
    - Operates on consensus-based approach for approving all proposals
- 



# PRCC HSC Participants & Sponsors

## **Regular Participants**

- NOAA Fisheries
- USFWS
- Colville Confederated Tribes
- Yakama Nation
- WDFW
- GCPUD

## **Sponsors with Current Projects**

- Trout Unlimited
- Real Time Research
- WDFW
- Methow Salmon Recovery Foundation
- Chelan-Douglas Land Trust
- Okanagan Nation Alliance
- Cascade Fisheries
- Colville Confederated Tribes
- Yakama Nation

# Projects Approved by the PRCC and/or HSC

---

<b>Fund/Account</b>	<b>Number of Projects</b>
NNI Fund 601	38 Projects
Habitat Supplemental Fund 602	69 Projects
Habitat Fund 603	34 Projects
Grand Total	141 Projects-December 2022



# Financial Report-2006 thru June 30, 2023

---

## For funding accounts 601, 602, & 603

Amount Deposited

\$52,366,180

Amount Spent

\$33,997,033

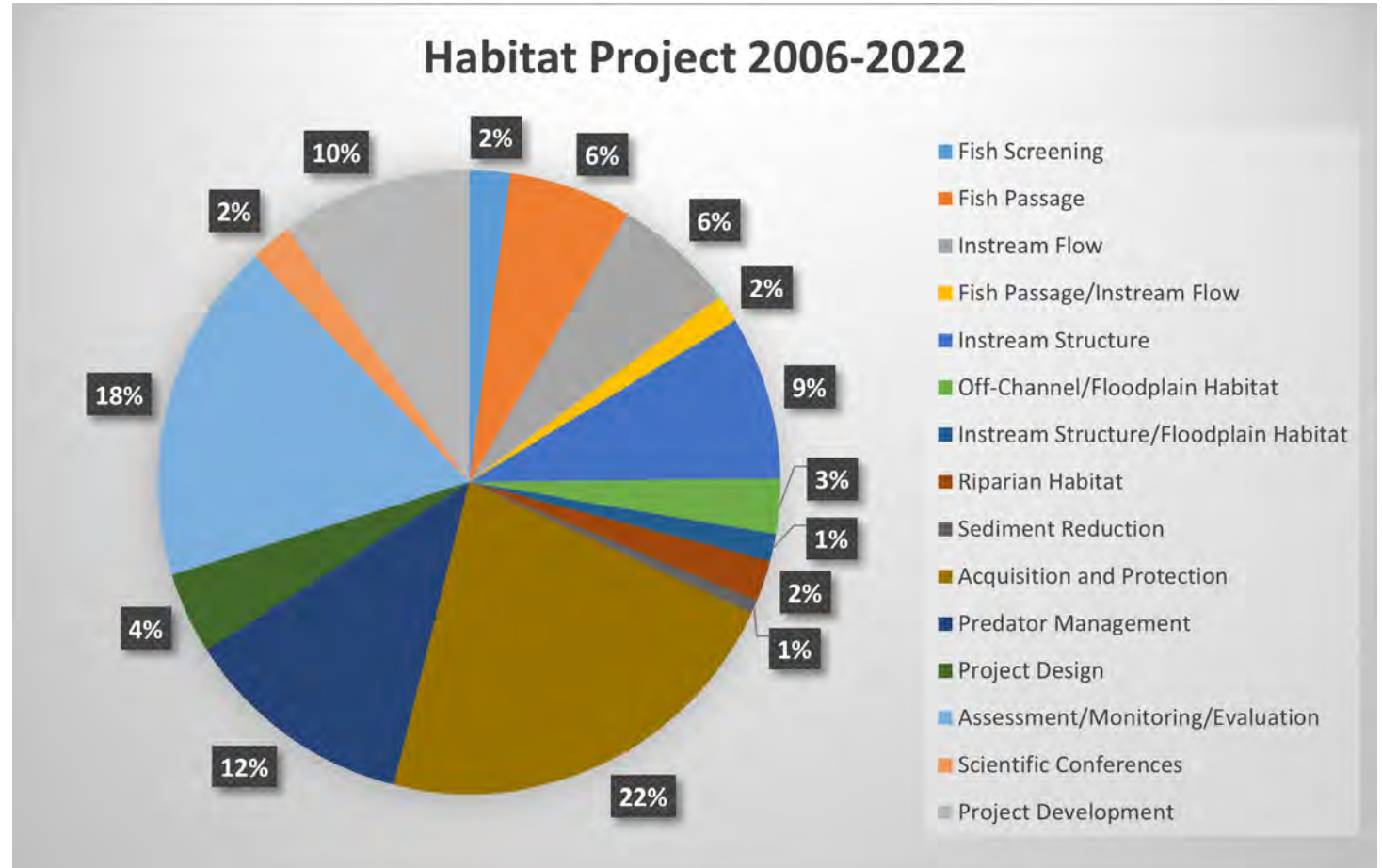
Unspent Funds

\$18,369,147

# Project Classification by Type

---

- Top Three
  - Acquisitions & Protection
  - AME Projects
  - Predator Management





# Acquisition and Land Protection-29 Total Projects

Number of Acres  
via Acquisitions-  
6705

Number of Acres  
via Conservation  
Easements-115

# Water Conservation & Fish Passage-18 Total Projects

Water Saved-  
117 cfs

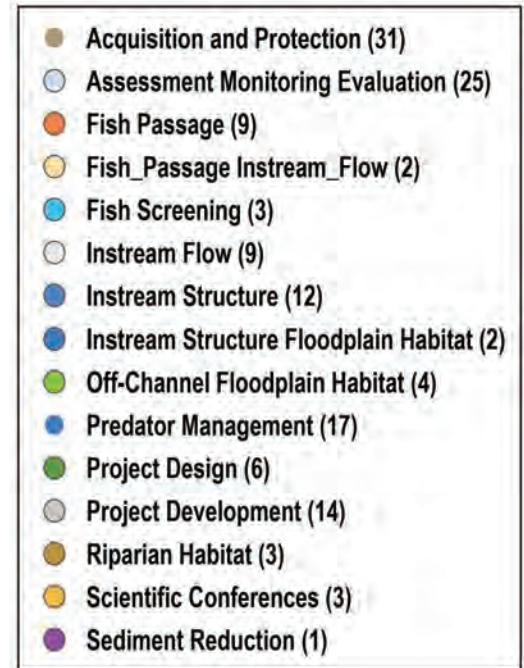
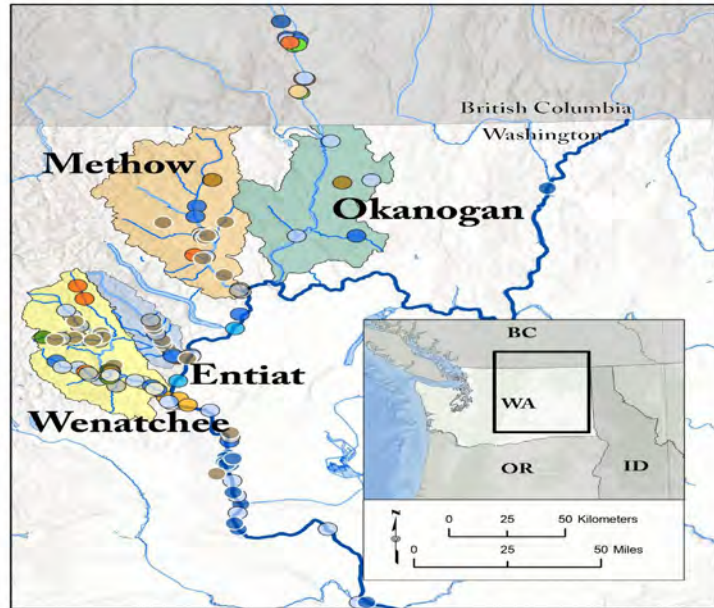
Habitat Opened-  
80 miles



# Assessment/Monitoring/Evaluation-25 Projects

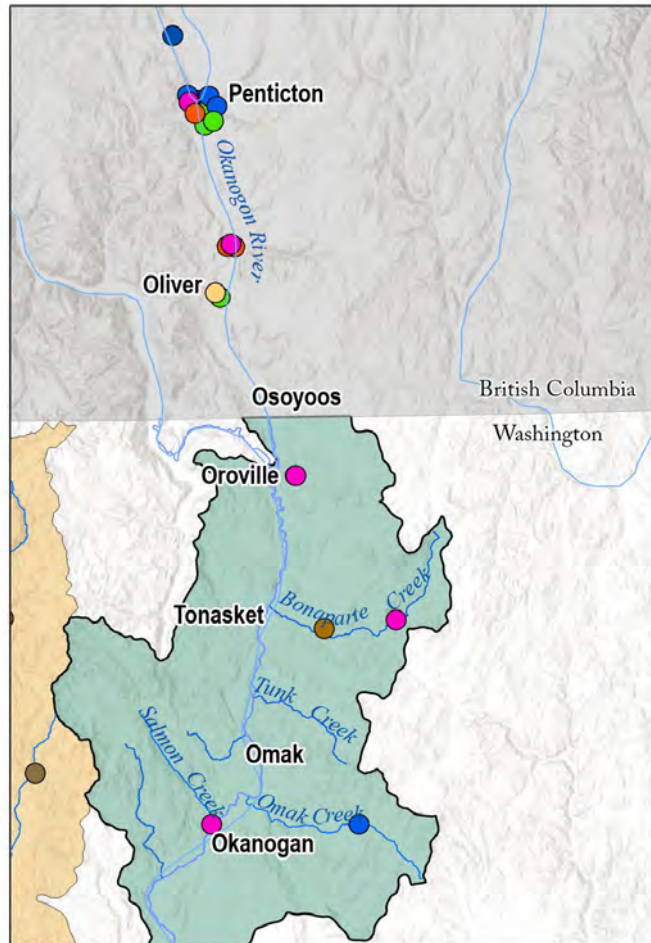
<b>AME Cap</b>	<b>\$2,500,000</b>
Spent	\$1,468,090
Unspent Project Balance	\$10,774
Remaining Cap Space	\$1,021,136

# North Central Columbia Region Map & Project Type





# Okanogan Map & Project Type



- Acquisition and Protection (1)
- Assessment Monitoring Evaluation (6)
- Fish Passage (4)
- Fish\_Passage Instream\_Flow (1)
- Instream Flow (1)
- Instream Structure (4)
- Instream Structure Floodplain Habitat (1)
- Off-Channel Floodplain Habitat (4)
- Riparian Habitat (2)
- Sediment Reduction (1)

Esri, CG

# Fish Passage to Okanagan Lake

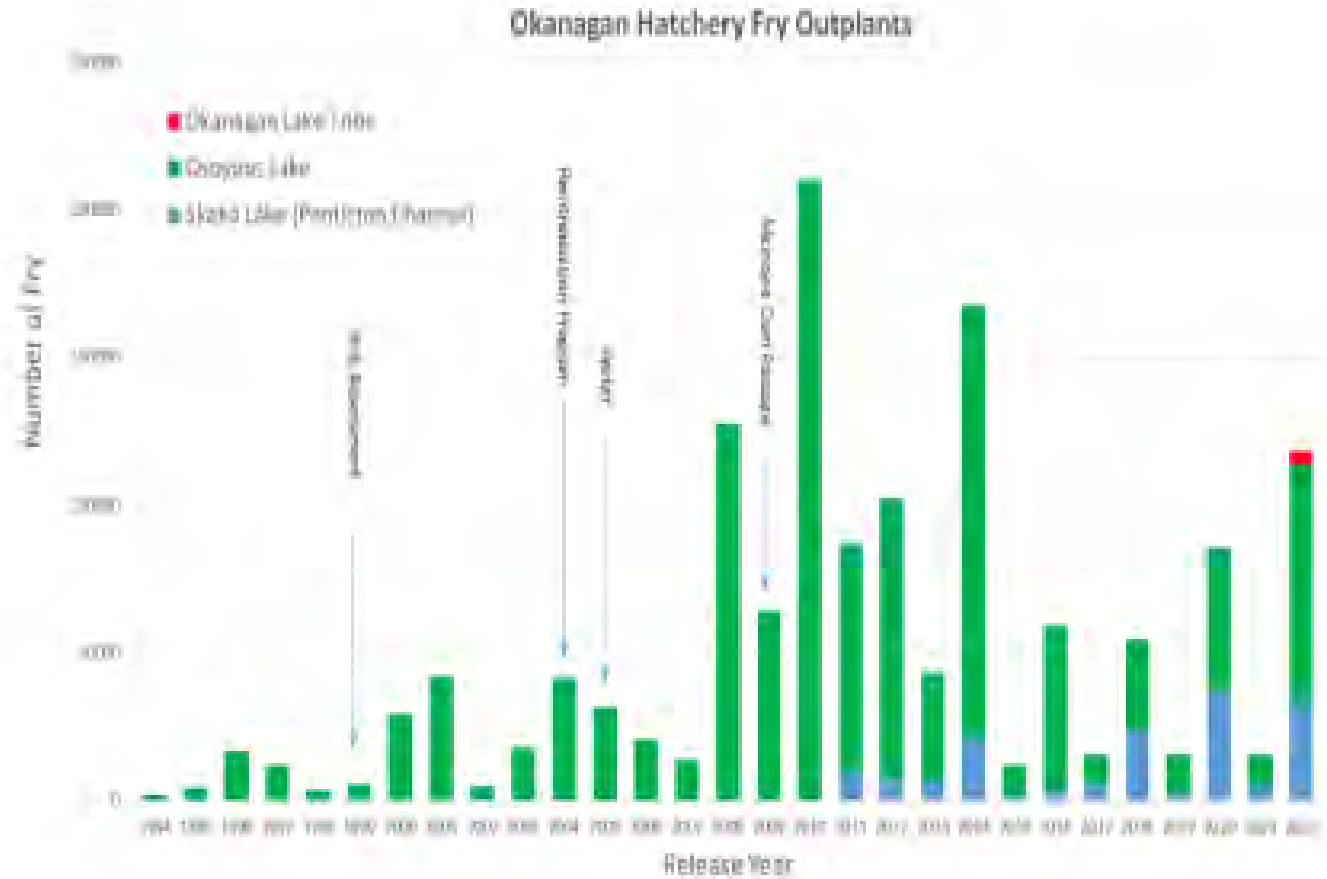
---

- 2009 Modified gates to allow passage over McIntyre Dam
- 2014 Modified gates to allow passage over Skaha Dam
- 2014 ONA released adult sockeye into OK Lake
- 2016 First Ceremonial sockeye fry releases in OK Lake by ONA
- 2018 4.2M hatchery sockeye fry released into OK Lake
- Sept 2022-ONA received approval for unimpeded volitional passage into OK Lake

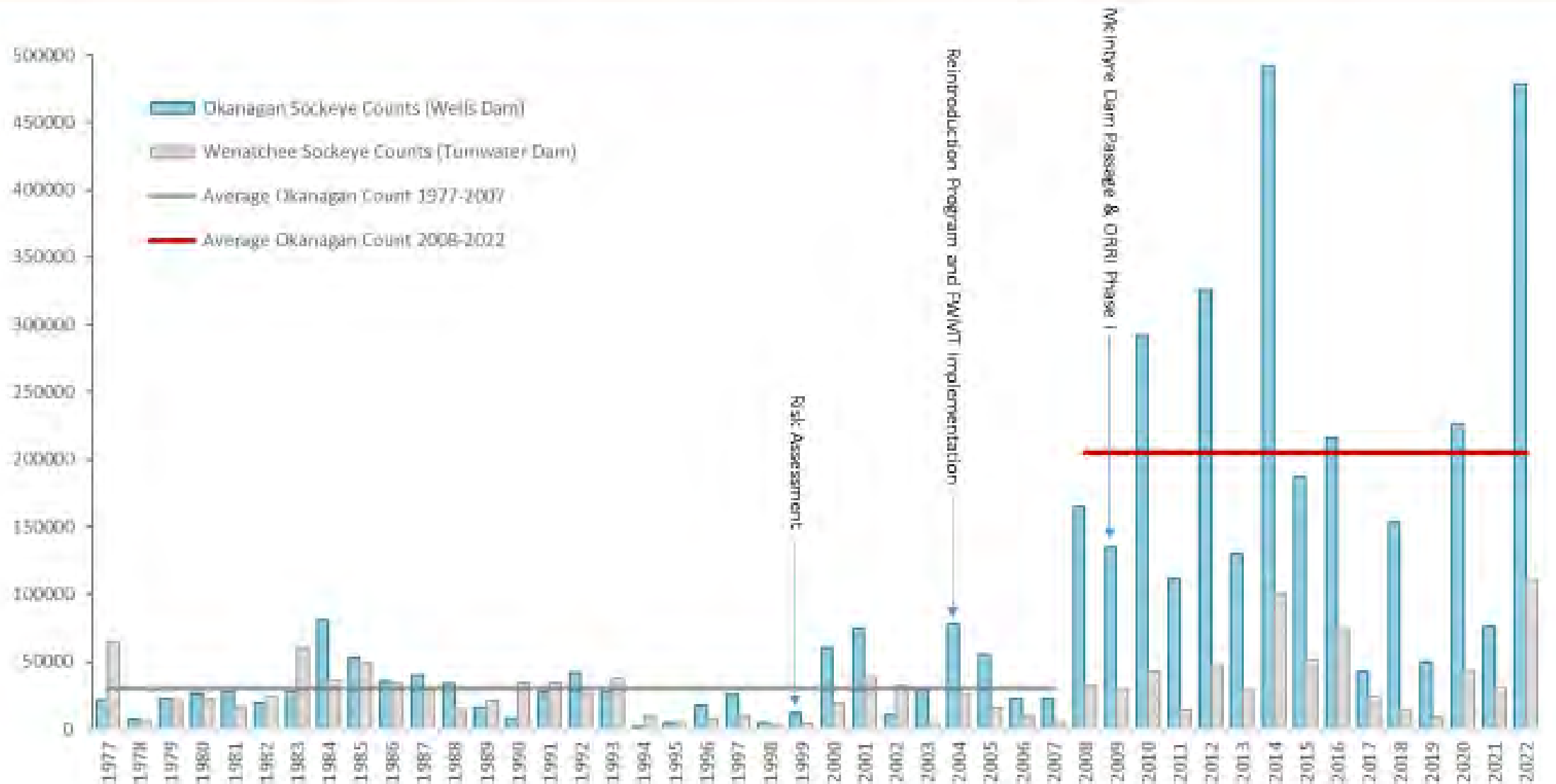




# Sockeye Fry Release Locations



# Sockeye Returns Before and After Okanagan Restoration and Reintroduction Initiatives



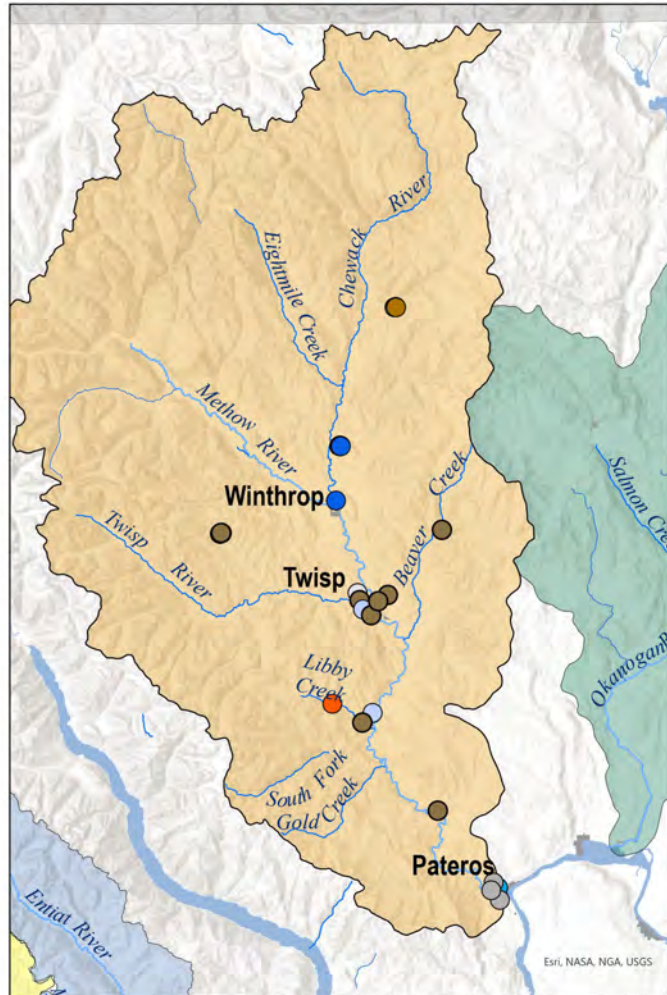


Sockeye  
Passage at  
McIntyre Dam  
with New  
Gates

---

**NEW OVERSHOT GATES**

# Methow Map & Project Type



- Acquisition and Protection (13)
- Assessment Monitoring Evaluation (2)
- Fish Passage (2)
- Fish Screening (1)
- Instream Flow (4)
- Instream Structure (2)
- Project Design (1)
- Project Development (3)
- Riparian Habitat (1)



# Buckley Acquisitions- MVID & Twisp River

---

- Remove the MVID screen, intake headgates, fish return
- Remove segments of the protective levee
- Repurpose the MVID intake and fish return as a natural unconstrained side-channel



# Entiat & Wenatchee Map & Project Type



- Acquisition and Protection (16)
- Assessment Monitoring Evaluation (11)
- Fish Passage (4)
- Fish\_Passage Instream\_Flow (1)
- Fish Screening (1)
- Instream Flow (5)
- Instream Structure (4)
- Instream Structure Floodplain Habitat (1)
- Project Design (5)
- Project Development (10)
- Riparian Habitat (1)
- Scientific Conferences (3)

Ent, NACA, WCA, WSS, W  
DL, Ent, HRE, Gamin, S  
MTY, NAA, MGS, Bureau  
Management, EPA, DFO



# Entiat-Enlow Acquisition & Restoration

- House removal in floodplain
- Side channel re-connectivity
- 48 log jams
- Restore wetland and vegetation community





# Icicle Creek Boulder Field

---

- Assessment
- Design
- Multi-phased approach
- Multiple funders
- ICBF Steering Committee
- Community Effort
- Restored fish passage past barrier





# Boulder Field Fish Passage

---





# PRCC Habitat Subcommittee Achievements

- 141 approved projects (including NNI)
- Acquisition-6705 acres
- Conservation Easements-115
- Water Conservation-117 CFS
- Blocked Habitat Opened-80 miles





# Outlook

---

Will habitat restoration projects keep up with habitat degradation to the point of increasing fish populations?

---

Impact of climate change?

---

Will more monitoring be needed to evaluate successful/unsuccessful projects?

---



# Questions, Comments, Discussion

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- Committee approved design for fish passage on east bank of Penticton Dam.
- Third dam made passable for anadromous fish
- Opens 84 miles of rearing habitat, access to over a dozen spawning streams, and potential shore spawning for sockeye







# Grant PUD Hatchery Mitigation Programs

*Presentation to Policy Group, July 20, 2023*

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*Our commitment to generating low-cost, reliable energy while caring for the environment*



**Powering our way of life.**

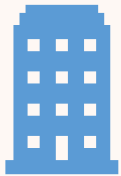


# Background

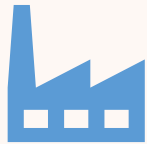
- Previous license only required hatchery inundation mitigation for fall Chinook and HSC did not exist
- SSSA (2006) and new license (2008) requires NNI of plan species
- PRCC HSC meets monthly and oversees implementation of hatchery programs
- Decisions made by consensus
- Partnerships to fulfill requirements (HSC, PUDs, BPA, contractors – WDFW, YN, CTCR)



# PRCC HSC Accomplishments (2008-2023)



Facilities



Production



Monitoring and  
evaluation



Challenges and  
successes

# 1. Facilities

---

- **Facilities are in place to produce all of the GPUD hatchery mitigation requirements**
- Much work was required to maximize efficient use of existing facilities as well as construction of new facilities





# 1. Facilities

- Constructed facilities (first fish release)
  - Priest Rapids Hatchery (2013)



- Nason Acclimation Facility (2015)
  - **circular tanks**



- Carlton Acclimation Facility (2014)
  - **circular tanks**





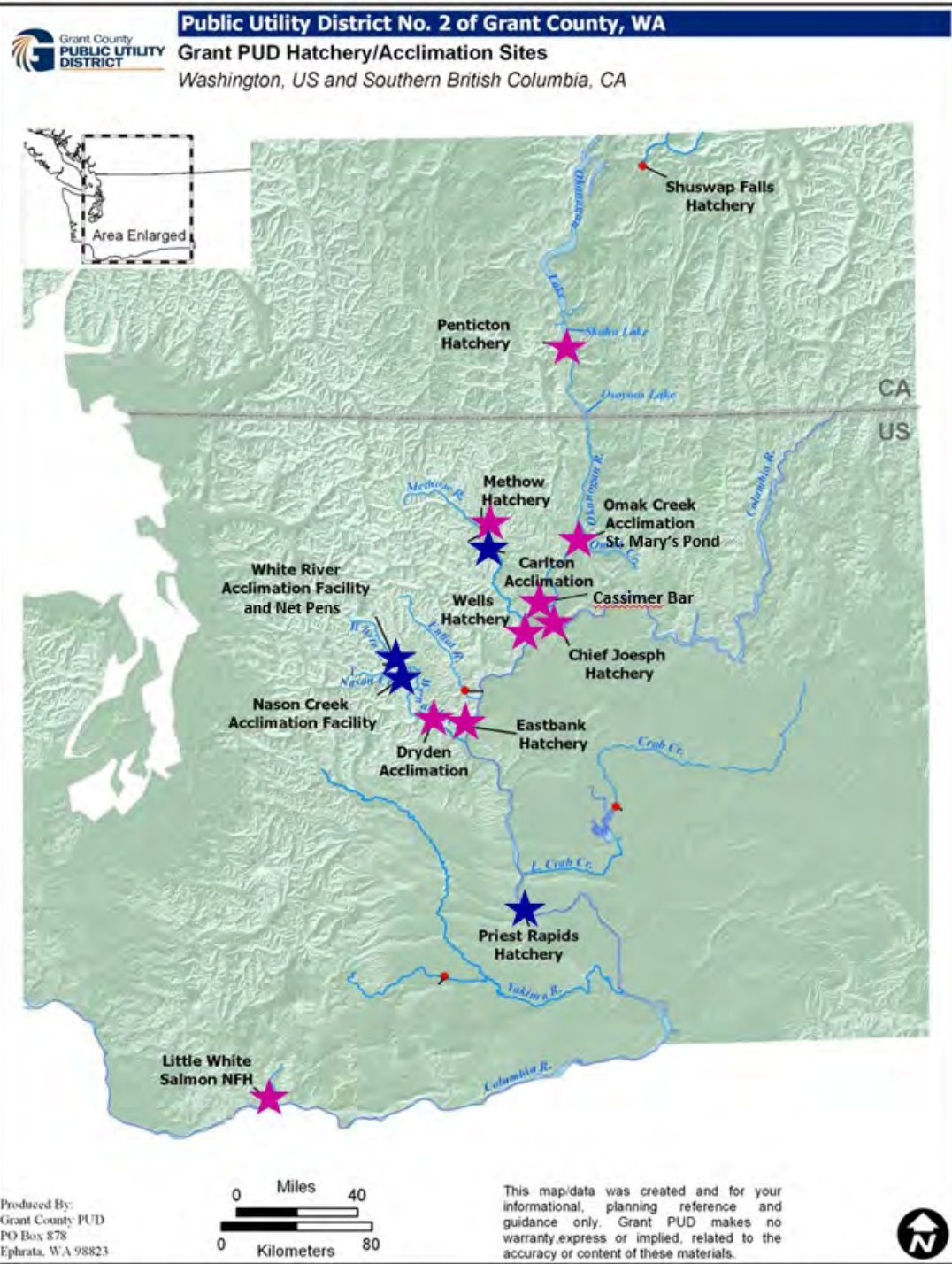
# 1. Facilities

- **Shared** facilities and construction
  - Eastbank Hatchery complex
  - Wells Hatchery
  - Methow Hatchery complex
  - Chief Joseph Hatchery complex
  - St. Mary's Acclimation
  - *Cassimer Bar Hatchery*
  - Penticton Hatchery
  - *Little White Salmon NFH, Aquaseed*





# 1. Facilities



## 2. Production

- **Production requirements are being met**
- Consistent with hatchery reform principles
- All programs covered by environmental permits (e.g., section 10)
- Broodstock Collection Protocols approved annually
- 2 hatchery recalculations (2013, 2023)

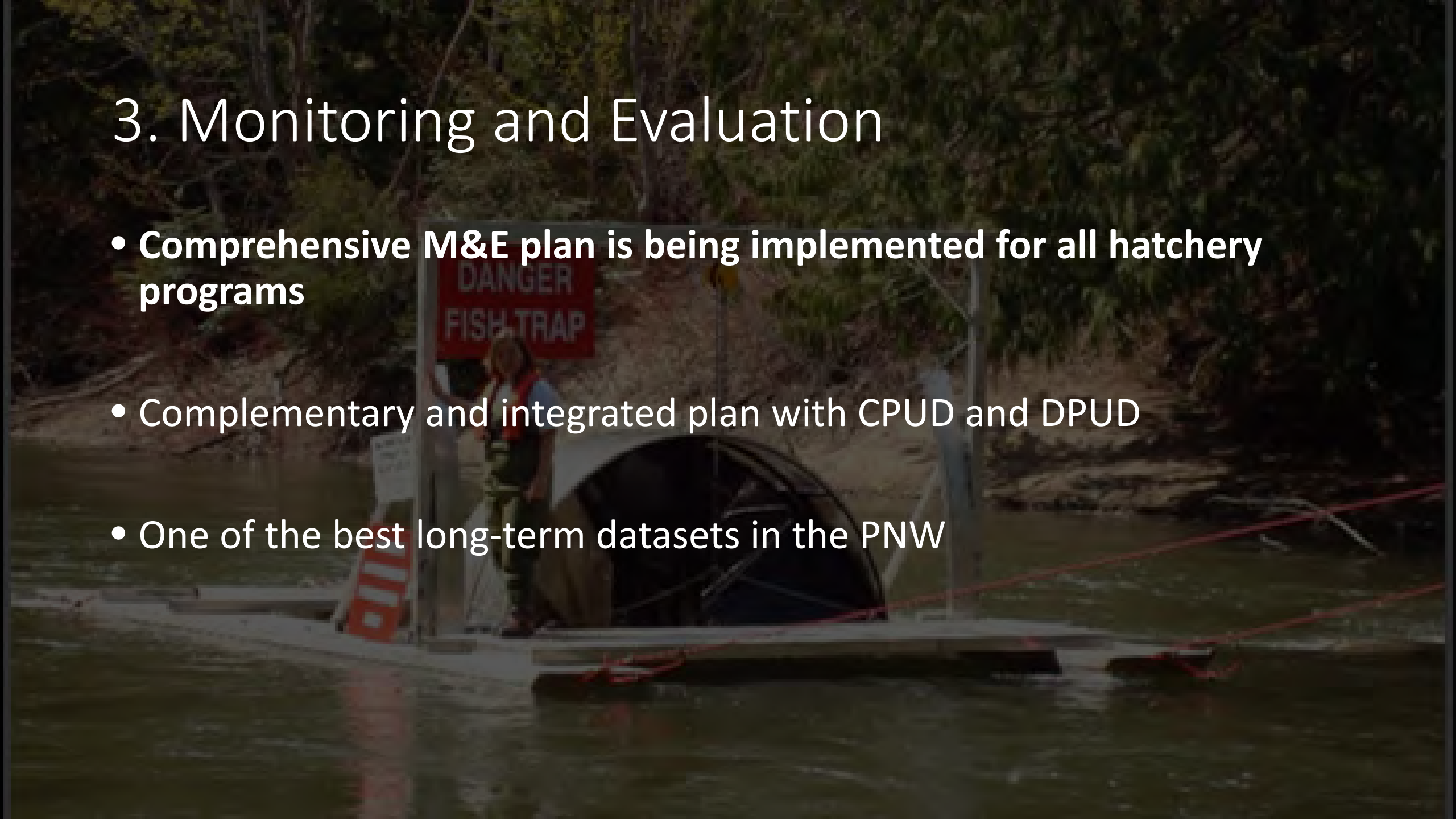


## 2. Production

Species	Facility	2013	2023	Purpose
Spring Chinook	Chief Joseph	110,000	110,000	NNI
	Methow	134,126	134,000	NNI
	Nason	223,670	203,650	NNI
Summer Chinook	Chief Joseph	278,000	305,000	NNI
	Carlton	200,000	164,533	NNI
	Dryden	181,816	206,224	NNI
Fall Chinook	Priest Rapids	5,000,000	5,000,000	Inundation
		325,543	127,306	NNI
		273,961	273,961	Flow Mit.
Steelhead	Wells/Okanogan	100,000	100,000	NNI
Sockeye	Pentiction	Fund	Fund	NNI
Coho	Multiple	Fund	Fund	NNI
<b>Total</b>		<b>6,827,116</b>	<b>6,624,674</b>	

### 3. Monitoring and Evaluation

- **Comprehensive M&E plan is being implemented for all hatchery programs**
- Complementary and integrated plan with CPUD and DPUD
- One of the best long-term datasets in the PNW





# 3. Monitoring and Evaluation

- Reporting
  - Monthly
  - Annual
  - Statistical (5 years)
  - Comprehensive (10 years)
  - Annual Project and Implementation Report to FERC

# 3. Monitoring and Evaluation

- Adaptive management
  - M&E plans and updates (2009, 2013, 2017, 2019, 2023)
  - Reviewed by ISAB and panel of genetics experts
  - Program adaptation step (2023)
- Annual approval of M&E implementation plan



# 3. Monitoring and Evaluation (Science)

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- Reproductive success (Williamson et al. 2010; Ford et al. 2016)
- Hatchery reform (Pearsons et al. 2013; Pearsons et al. 2020)
- Embryonic imprinting (Dittman et al. 2015)
- Straying (Pearsons and O'Connor 2020; Pearsons and Miller in review)
- Precocious maturation (Ford et al. 2015; Pearsons et al. 2023)
- Ecological interactions (Pearsons et al. 2012; Hyatt et al. 2021)
- Life-history/Survival (Murauskas et al. 2021; Sorel et al. 2023 a,b)
- Emergency fish passage (Pearsons et al. 2016)
- Monitoring methods (Murdoch et al. 2019; Auerbach and Fremier 2022)
- Other publications in the works and in other disciplines (e.g., avian predation)
- Professional science meetings (presentations, symposia, and support; WFC 2024)



## 4. Challenges and Successes



Listed  
species



Unlisted  
Species

---



## 4. Challenges – Listed species

- Listed species are still listed (spring Chinook, steelhead)
- ESA situation is not unique (delistings in UC are not occurring)
- Spring Chinook has received much attention (HSRG and ISAB reviewed UC spring Chinook)
- Local and regional challenges (e.g., all H's, Atlas et al. 2023)

# Future Challenges

- Adapting/Updating production and M&E plan responsibilities (2023)
- Restarting a White River hatchery program (2025/6)
- Recalculation (GPUDs responsibilities, reintroduction, Orca)(2033)
- Sockeye mitigation and natural production (2041)
- Climate change and GPUDs responsibilities (water availability, stressors to populations)



## 4. Successes – Listed and unlisted

- Largest fall Chinook and sockeye populations in the Columbia
- Support reintroduction and production efforts below Chief Joseph Dam and in the UC (sockeye, coho, Okanogan spring Chinook) and outside the UC (e.g., sockeye, fall Chinook)
- All programs contributing to harvest
- Summer and fall Chinook support some of the highest harvest rates
- Most reintroduced species are transitioning to natural production

# Summary

- **The PRCC HSC has made tremendous progress (2008-2023)**
- **Hatchery mitigation requirements are being met**
  - Facilities
  - Production
  - M&E
- **Additional benefits are being provided**
  - Exported science
  - Exported fish
  - Exported facility designs



The background image shows a dark, industrial interior, possibly a factory or a large warehouse. The ceiling is high and features a complex network of metal beams and pipes. In the foreground, there are green safety barriers or railings that curve around a central area. The overall lighting is dim, creating a moody and industrial atmosphere.

# Questions and Discussion

# Priest Rapids Fish Forum

Policy Group Meeting  
July 20, 2023

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Operate Responsibly by Attaining Environmental, Cultural  
Resource and Regulatory Compliance



Powering our way of life.



# Priest Rapids Fish Forum (PRFF)

- **Members include biologists from Grant PUD, Tribes, and federal and state regulators**
- **Monthly coordination meetings**
- **The PRFF reviews the WSMP annual study plans, annual reports, and provides guidance on study design**
- **Provides guidance for policy documents**
  - **Statement of Agreement 2016 for annual hatchery White Sturgeon release numbers**

# Grant PUD White Sturgeon Management Plan (WSMP)

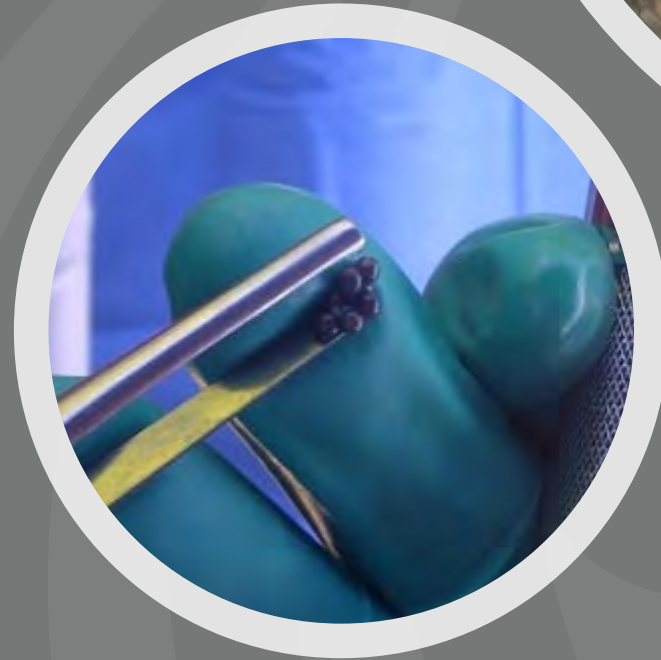
## WSMP Key Accomplishments 2010 to 2023

- **White Sturgeon Broodstock Capture**
- **Annual Hatchery White Sturgeon Tagging and Release**
- **Telemetry Movement Monitoring**
- **Adult White Sturgeon Population Assessment**
- **Juvenile White Sturgeon Population Assessment**



# White Sturgeon Broodstock Capture

- Program genetic diversity objectives: 36 families from a 6M x 6F cross
- Broodstock captured below McNary Dam using guided angling
- Adults are surgically inspected to determine sex and maturity
- Viable adults are transported to Yakama Nation Sturgeon Hatchery (YNSH)
- Spawn occurs in June; fish are returned to location of capture



# Hatchery White Sturgeon Tagging and Release

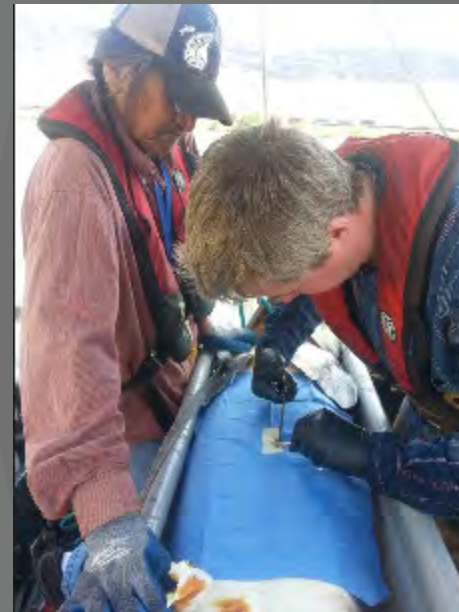
- Juvenile sturgeon raised at YNSH from June to April
- Collaborative tagging effort by Grant, YNSH, and subconsultants
  - Coulter counter to test for autopolyploidy
  - Tagged, marked, and measured
- Release target: 3,250 fish in April (SOA 2016)
- **47,256 fish released as of 2023**





# Telemetry Movement Monitoring

- Monitor entrainment, seasonal migration, and habitat use by adult and juvenile White Sturgeon
- Acoustic tags surgically implanted in 346 juveniles and 97 adults
- Up to 29 stationary acoustic receiver stations installed and maintained from 2010 to 2019
  - Supported by boat-based telemetry tracking



# Juvenile White Sturgeon Population Assessment

- Assess the survival and growth of juvenile White Sturgeon
- Population estimate via mark recapture model estimates; Rmark
- Conducted in 2014, and annually from 2016 to present
- **5,214 fish captured as of 2022**





# Adult White Sturgeon Population Assessment

- Assess the survival and growth of adult White Sturgeon and older hatchery fish
- Population estimate via mark recapture model estimates; POPAN
- Conducted in 2010, 2012, 2015, 2018, and 2021 (every 3 years)
- **2,126 fish captured as of 2021**



# PLMP Key Accomplishments

- **Fishway Improvements**
- **Monitoring and Evaluation Program**
- **2014 Wanapum Fracture Response**
- **Adult Pacific Lamprey No-Net-Impact Statement of Agreement**



# Fishway Improvements for Adult Lamprey Passage

- Installation during 2009-2010 winter ladder maintenance outage
- Modifications included:
  - Plating at diffusion grating edges and through orifices
  - Ramps at perched orifices
  - Fish count station crowders



# 2010 Evaluation of Fishway Modifications

- Underwater video to evaluate behavior, use, and performance at modifications
- Conclusions:
  - Weir orifice plating facilitates adult lamprey passage
  - Fish crowder design effectively guides lamprey through count station





# Long-term HDX-PIT Monitoring

- Installed in 2010 to monitor fishway modifications, fishway passage times, and overall Project passage efficiency
- 2010-2019 dataset from coordinated tagging at Bonneville with University of ID and Confederated Tribes of Warm Springs
- To date, over 600 HDX-PIT tags monitored at each dam
- Long-term (2010-2019) average fishway passage efficiency for period is 86.6% and 89.4% at PR and Wanapum, respectively



# 2014 Wanapum Fracture Response

- Discovered on spillway monolith #4 on February 24, 2014
- Rapid response coordinated amongst partners at the PRFF and PRCC
- Approach:
  - Volitional Passage
  - Trap and Transport
  - Monitoring and Evaluation



## High and Dry

Wanapum Dam left bank fish ladder exit following reservoir emergency drawdown.



# 2014 Wanapum Fracture Response

## Results:

- Volitional design was effective
- Trap and transport mitigated delays
- Maintained excellent overall passage
  - 93% of tagged fish detected at final weir
  - 1,787 (PR) and 676 (WAN) lamprey trapped and transported



False weir



Spiral Flume



Mechanical Traps



Tube Traps

# Adult Pacific Lamprey Statement of Agreement

- 2018 consensus 10-year agreement beginning that addresses adult No-Net-Impact and focuses on trap and transport
- Lamprey trapped at Priest Rapids Dam and released at Kirby Billingsley Hydropark, or upstream of Wells Dam (to support Douglas PUD's agreement), or provided to Colville Confederated Tribes for translocation in Okanogan Basin
- Since 2018, total numbers of fish trapped and transported on behalf of both agreements range from 263 to 2,300 fish annually (Avg. 846/yr)



# Native Resident Fish Management Plan

- Provides funding for Columbia Basin Hatchery (WDFW)
- Evaluation of resident native fish (and non-native) within the PRPA every 5 years to monitor species abundance over time and identify potential changes
- Results show no noticeable changes to species abundance and composition



# Priest Rapids Fish Forum

## Questions?

**Policy Group Meeting  
July 20, 2023**

Operate Responsibly by Attaining Environmental, Cultural  
Resource and Regulatory Compliance



Powering our way of life.