

Mike Milburn
Chair
Montana

Doug Grob
Montana

Jeffery C. Allen
Idaho

Ed Schriever
Idaho



Northwest **Power** and **Conservation** Council

Thomas L (Les) Purce
Vice Chair
Washington

KC Golden
Washington

Margaret Hoffmann
Oregon

Charles F. Sams III
Oregon

March 4, 2025

MEMORANDUM

TO: Council Members

FROM: Stacy Horton, Washington Policy Analyst/Biologist
Windy Schoby, Idaho Fish and Wildlife Policy Analyst

SUBJECT: Tucannon River Spring Chinook – Risk of Extirpation and Implementation of the Safety Net Off Site (SOS) Strategy

BACKGROUND:

Presenters: Dave Johnson, Department Manager, Nez Perce Tribe (NPT) Fisheries Department
Jerimiah Bonifer, Fisheries Program Manager, Confederated Tribes of the Umatilla Indian Reservation (CTUIR)
Chris Donley, Washington Department of Fish and Wildlife (WDFW) Regional Fish Program Manager for Region 1 Spokane.

Summary: Washington Department of Fish and Wildlife (WDFW), Confederated Tribes of the Umatilla Indian Reservation (CTUIR), and the Nez Perce Tribe (NPT) will provide the Council with a status update on efforts to prevent extirpation of the Tucannon River spring Chinook population. Implementation of the Safety Net Offsite (SOS) strategy and a discussion of factors limiting the population will be presented. Presenters will also provide an update on the Quasi Extinction Threshold (QET) analysis and its proposed application to inform an expansion of the Safety Net Offsite (SOS) strategy to other Snake River spring Chinook populations. Fish populations meet the Quasi Extinction Threshold (QET) criteria when they are at or below 50 spawners for four consecutive years.

Background: The Tucannon River spring Chinook population was listed as “threatened” as part of the Snake River spring/summer Chinook Evolutionary Significant Unit (ESU) under the Endangered Species Act in 1992. Recovery efforts implemented in the Tucannon basin after listing included increased and improved hatchery smolt release strategies, a short-term captive broodstock program, habitat restoration and fishery closures. In the early 2000’s, the abundance of Tucannon spring Chinook increased and far greater numbers of adult fish compared to the 1990s were present in the basin.

Unfortunately, in the past 15 years the Tucannon spring Chinook population has faced multiple challenges including floods, fires, high pre-spawn adult mortality, high juvenile outmigration mortality, rapidly increasing piscine and avian predation in the mainstem Snake and Columbia rivers on outmigrants, and changes in marine survival because of reduced ocean productivity. These stressors in addition to the location of the Tucannon River, which empties into the mainstem Snake River in the reservoir created by Lower Monumental Dam, have combined to create a rapid downturn in the population. Spring Chinook natural spawning has not been at replacement levels since 2008.

The hatchery program is currently operating as a conservation tool to prevent extirpation and keep the population genetics extant. Since 2019, all returning hatchery and natural origin fish returning to the Tucannon have been trapped to protect them from prespawning mortality and to make sure the hatchery program is producing enough juveniles to provide a survival advantage for the population. Currently, an average of less than 200 adult fish of both hatchery and wild combined have returned to the basin annually since 2019, with an average redd count of 21 over the last six years. The Tucannon population has met the Quasi Extinction Threshold (QET) criteria of 50 or less natural origin spawner abundance for four consecutive years. Despite the best efforts of WDFW and co-managers NPT and CTUIR, Recovery Boards, and a concerned public, the current recovery efforts are not working. The presentation will detail the history and current status of spring Chinook in the Tucannon basin and how the managers are taking actions to prevent extirpation by implementing the Safety Net Offsite Strategy (SOS).

The Safety Net Offsite Strategy (SOS) uses a set of tools like captive broodstock and offsite rearing to protect and conserve the genetics of populations like the Tucannon River spring Chinook which have seen a 20% decline in population each year since 2011. The Upper Grande Ronde, Catherine Creek, and populations in the Frank Church wilderness are some additional populations in decline and under consideration for use of the SOS tools.

More info: [Officials say wild salmon runs on Tucannon River are in dire straits](#)

[Previous Presentations](#)

The Council has been presented with information on three occasions in the past four years related to the status of the Tucannon River population of spring Chinook and efforts to improve or protect the population.

April 2021-

[Nez Perce Tribe staff presentation on their analysis of the Snake River Basin Chinook and Steelhead-Quasi-Extinction Threshold and Call to Action](#)

The Nez Perce Tribe analyzed Snake River Basin spring/summer Chinook and steelhead population extinction risk and presented their results to the Fish and Wildlife Committee.

July 2022-

[Tucannon River Spring Chinook Status Update and Next Steps to Recovery](#)

WDFW detailed the history and status of spring Chinook in the Tucannon basin and what is needed for the program moving forward to find recovery success.

November 2024-

[Update on Project #2010-077-00, Tucannon River Programmatic Habitat Project](#)

The Tucannon Program Coordinator provided an update and overview of the accomplishments administered by this project that coordinates watershed restoration within the Tucannon Subbasin of Southeastern Washington. The watershed activities are focused on habitat protection, restoration and enhancement for salmon and steelhead.

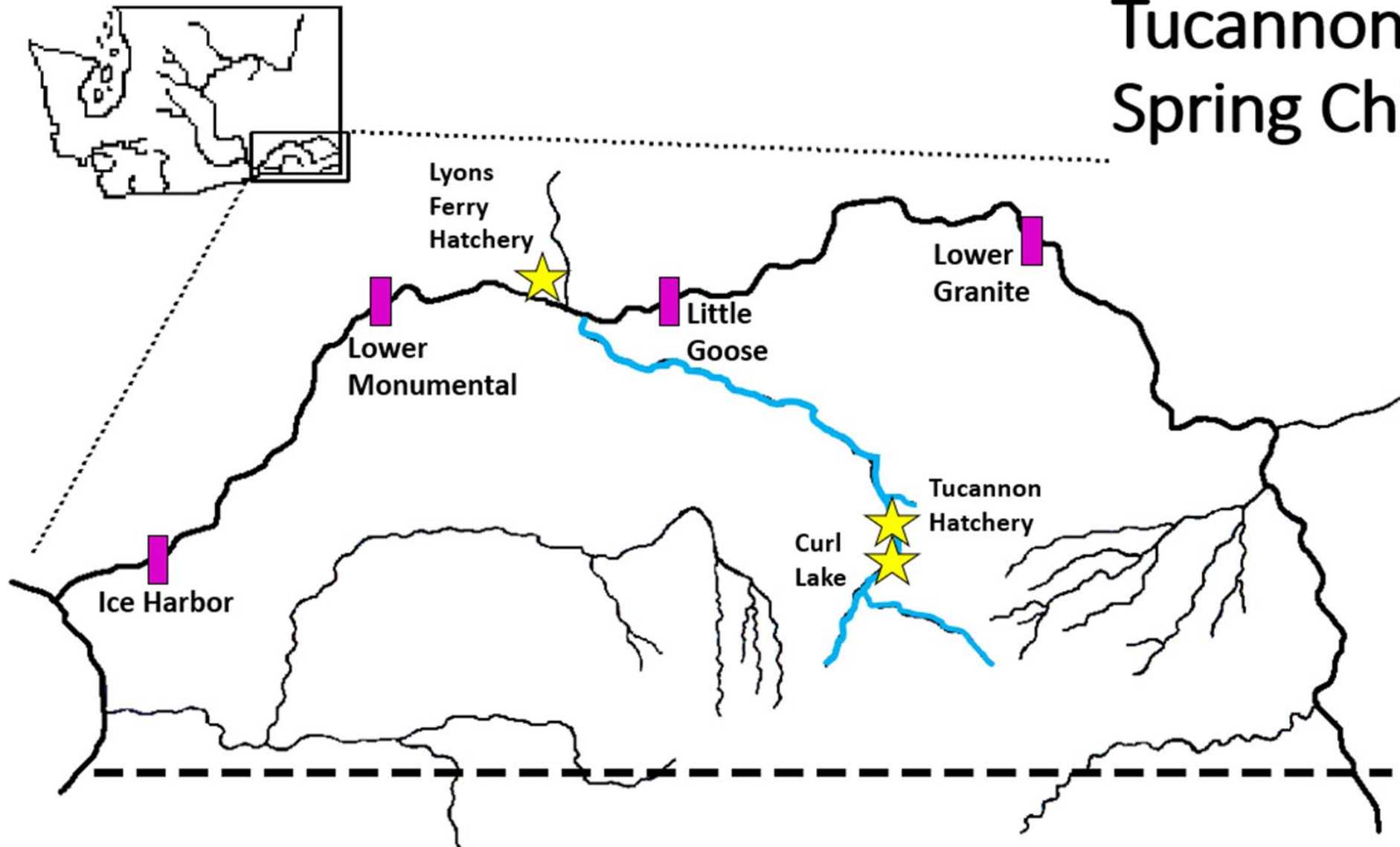


Tucannon River Spring Chinook: History, Status, and Adaptive Management

Chris Donley, WDFW



Tucannon River Spring Chinook





History:

- LSRCF Program began in 1985, NOR collected to establish broodstock.
- Program Goal = **1,152** hatchery adults (132,000 smolts released @15 fish/lb).
- 1985-1993: AVG H+W Total Return ~500
- Mid/Late 1990's – Bottom Dropped Out
 - 30 Year Floods in 1996 and 1997 (eliminated most natural production).
 - Trapped all fish returning to weir (1994, 1995, 1998, 1999).
- 1997-2002: Implemented a Captive Broodstock program (150,00 smolts)
 - Produced fish, but performed lower than expected
 - SARs were ~1/2 of the standard supplementation group program survivals
- 2006: Increased smolt production from 132,000 to 225,000
- 2008-2012: Size at Release study (9 fish/lb vs 15 fish/lb)
 - larger fish survived better, returned more adults overall
 - *Also produced more jacks/minijacks
 - 12 fish/lb is the current goal
- 2012-2016: In-River Pre-Spawn mortality increased (HOR and NOR)
 - Good Returns, lots of fish left in river for natural spawning, relatively few redds.
- 2016-2024: 100% Adult holding at Lyons Ferry Hatchery / Outplants
 - Adult outplants occurred in 2016, 2017, 2018, and 2022
 - No Outplants from 2019-2021, 2023-2024.



Past Adaptive Management:

- Poor adult returns in late 90's floods/poor survival
- Observed SARs lower than any other releases in Snake River Basin
- Low SARs for both captive and normal supplementation
- High pre-spawn mortality in adults left to spawn naturally in the river
- Captive brood program attempted from 1997-2002
- Adjusted smolt release goal to reflect realized SARs from releases
- Size at release study, changed release size to 12fpp after study
- Collected all adults at the Tucannon Fish Hatchery weir for out-planting



Other In-Basin Actions.....

PLANS: Tucannon Model Watershed (1996), Limiting Factors Analysis (2002), Tucannon Sub-Basin Plan (2004), Snake River Salmon Recovery Plan (2005, updated in 2011), Tucannon Geomorphic Assessment (2011), Tucannon Habitat Programmatic (2011), Tucannon Geomorphic Assessment – Phase 2 (2021).

FACTORS Addressed

- Reduce Fine Sediment
- Increase Riparian Corridor
- Improved Irrigation Efficiencies
- Screened Diversions
- Eliminate Fish Passage Barriers
- Increase Large Woody, Channel Complexity
- Increase Floodplain Connections, Pool and SC
- Reduce Stream Power



Extensive habitat restoration, (~\$25-30 million) over the last 20 years, with more extensive restoration still planned in future years



Tucannon Fish Hatchery



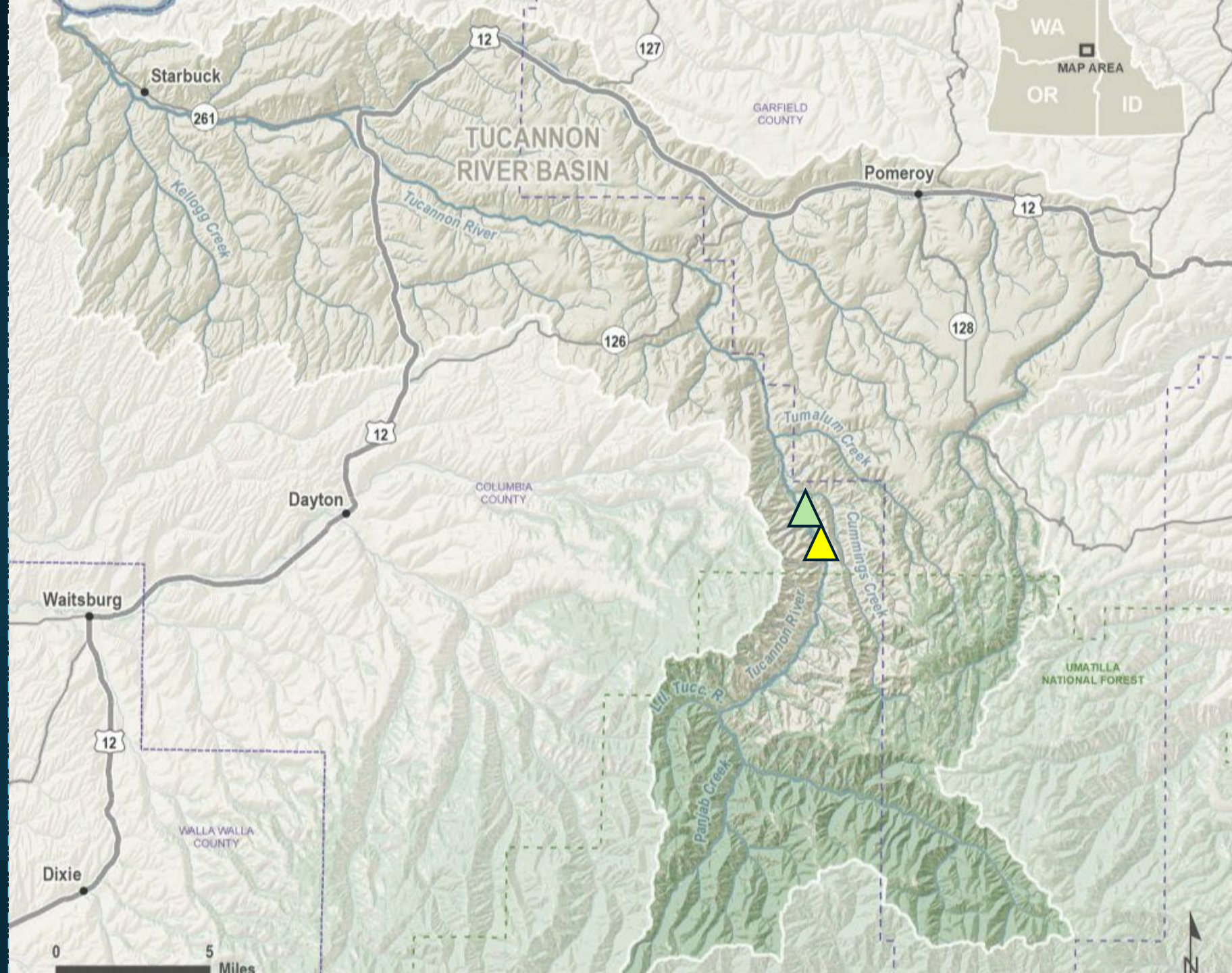
Tucannon Adult Weir

WDFW property (river corridor)

USFS property (river corridor)

SPCH spawning distribution

Proposed habitat restoration



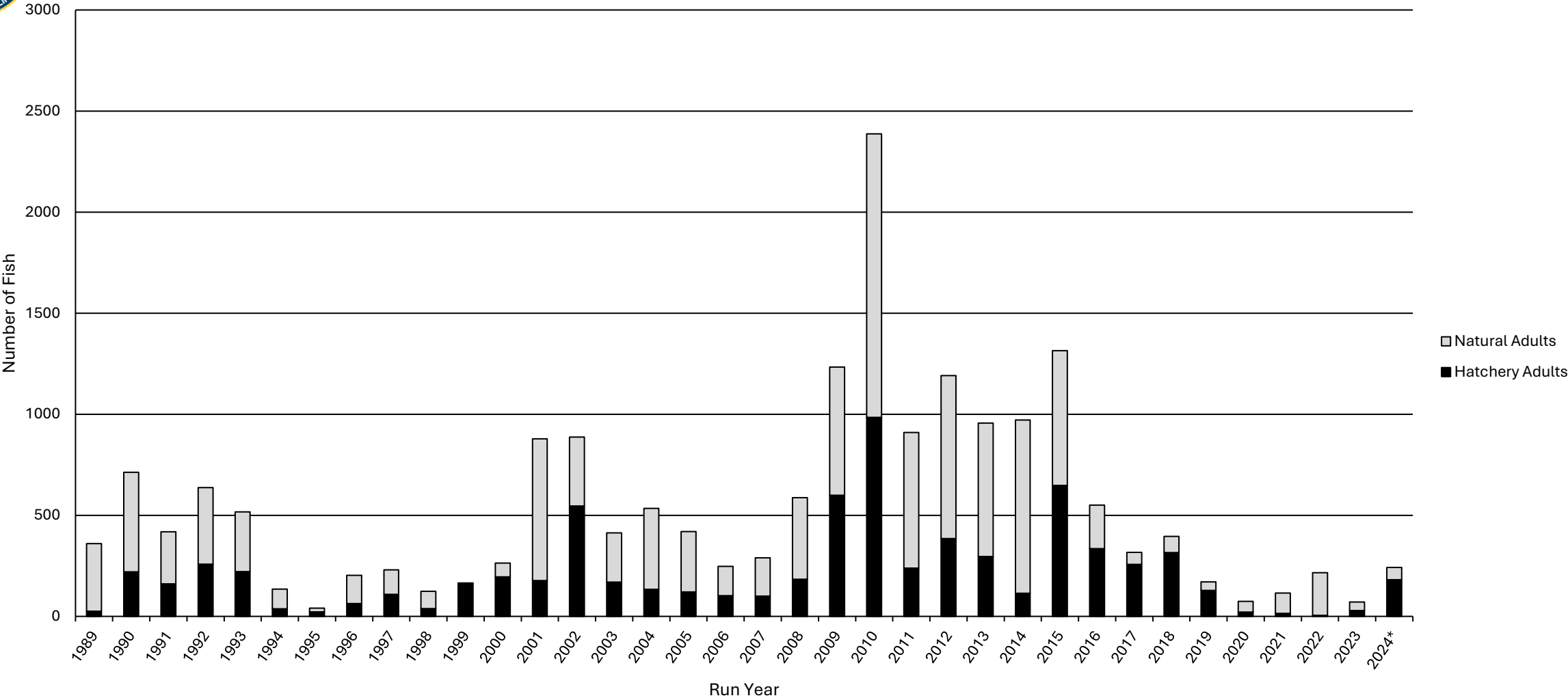


Time-series graphs





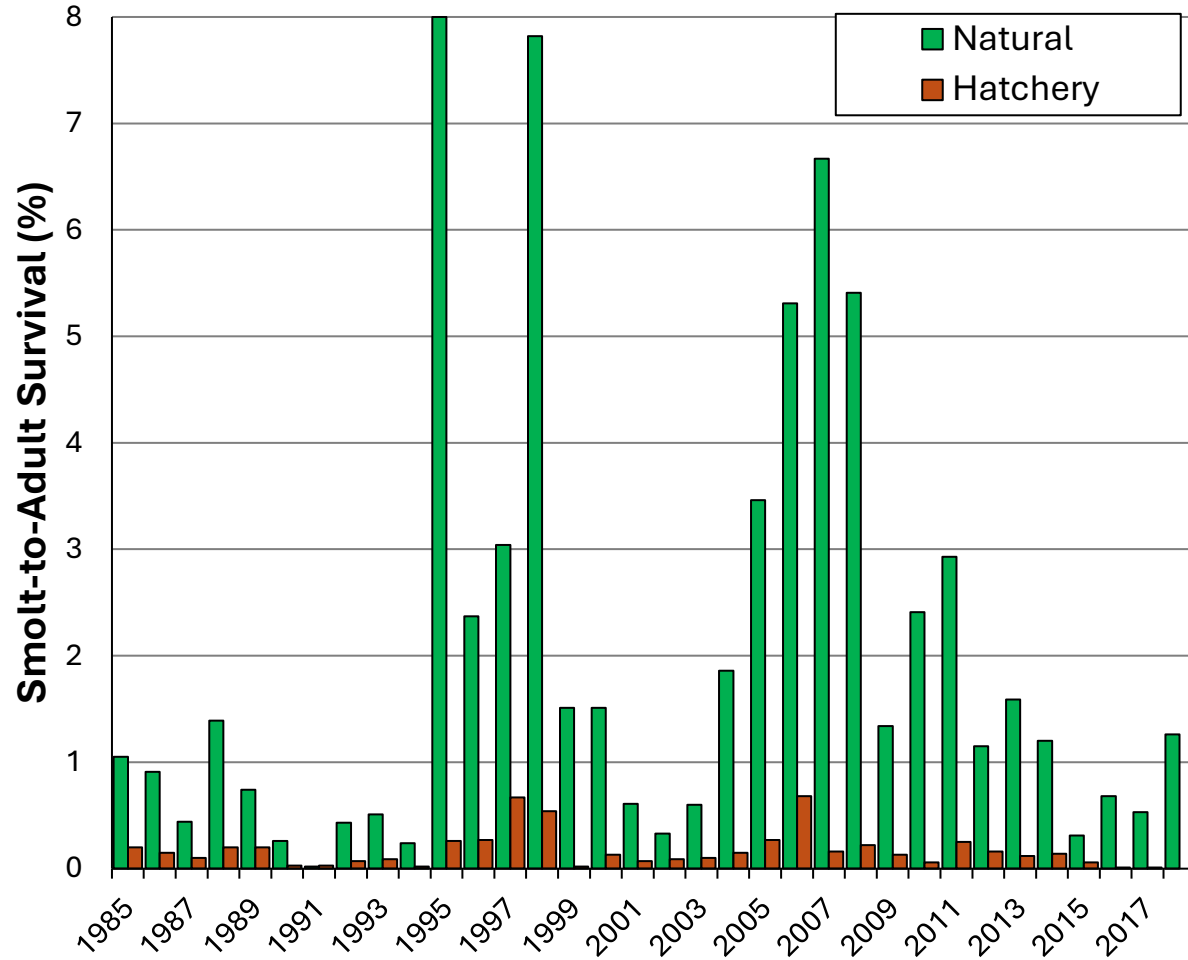
Tucannon River Spring Chinook Returns (no jack returns)



From Gallinat et al. 2024
(*preliminary escapement estimate)

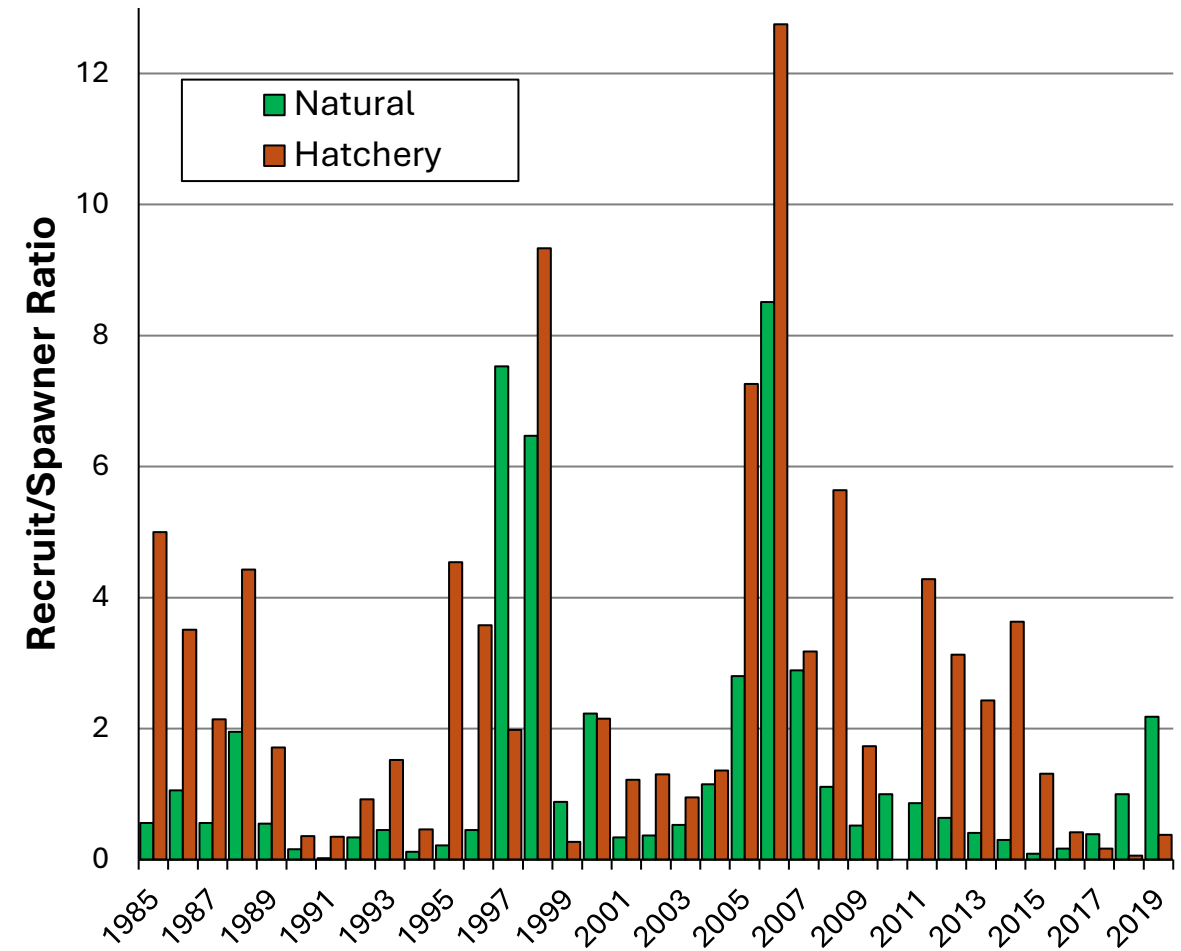


Smolt-to-Adult Returns

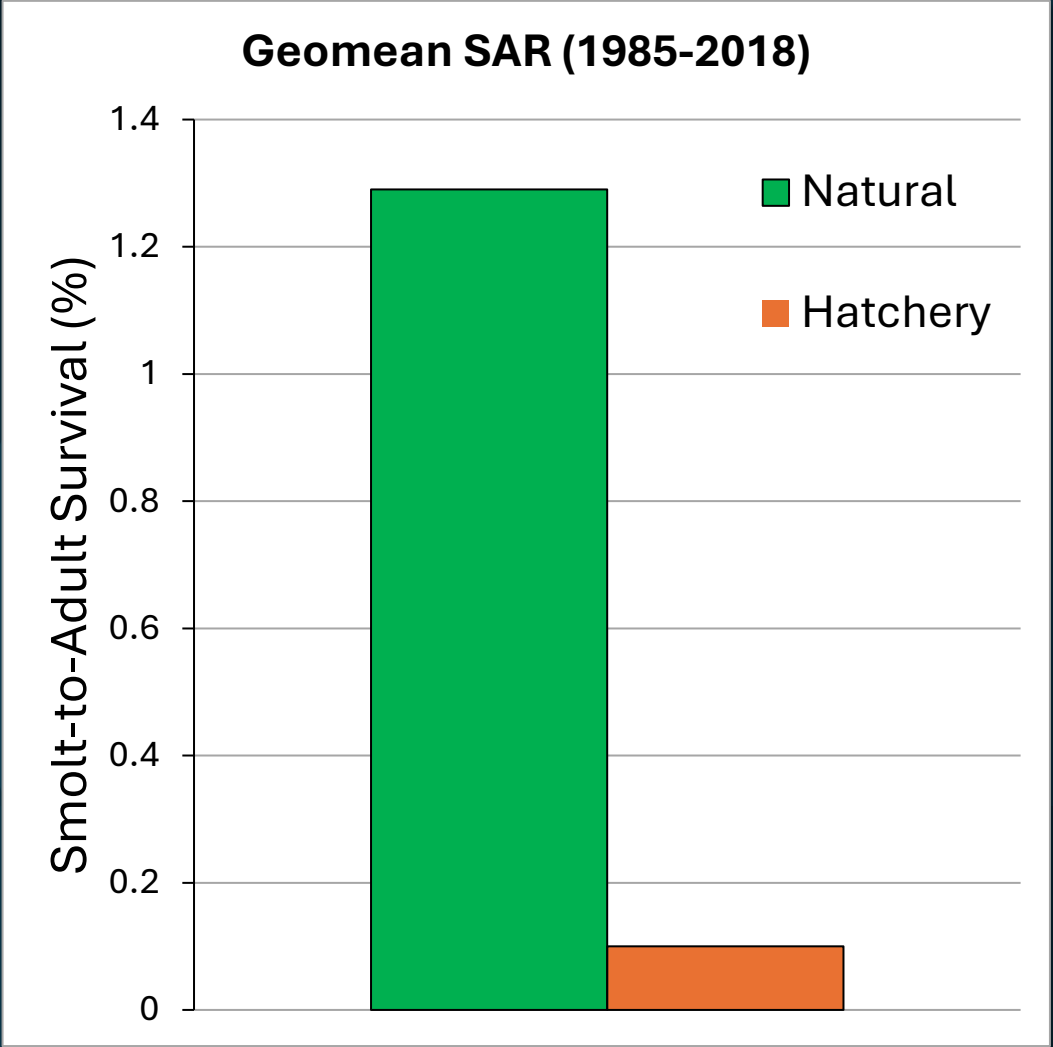


**** Average SAR of hatchery fish 1985-2018 BY = 0.17%, Lowest Spring Chinook Hatchery Program SAR in entire Snake River Basin**

Recruits/Spawner



HOR = 1.8 R/S, 10 of 35 below replacement
NOR = 0.6 R/S, 21 of 35 below replacement



From Gallinat et al. 2024

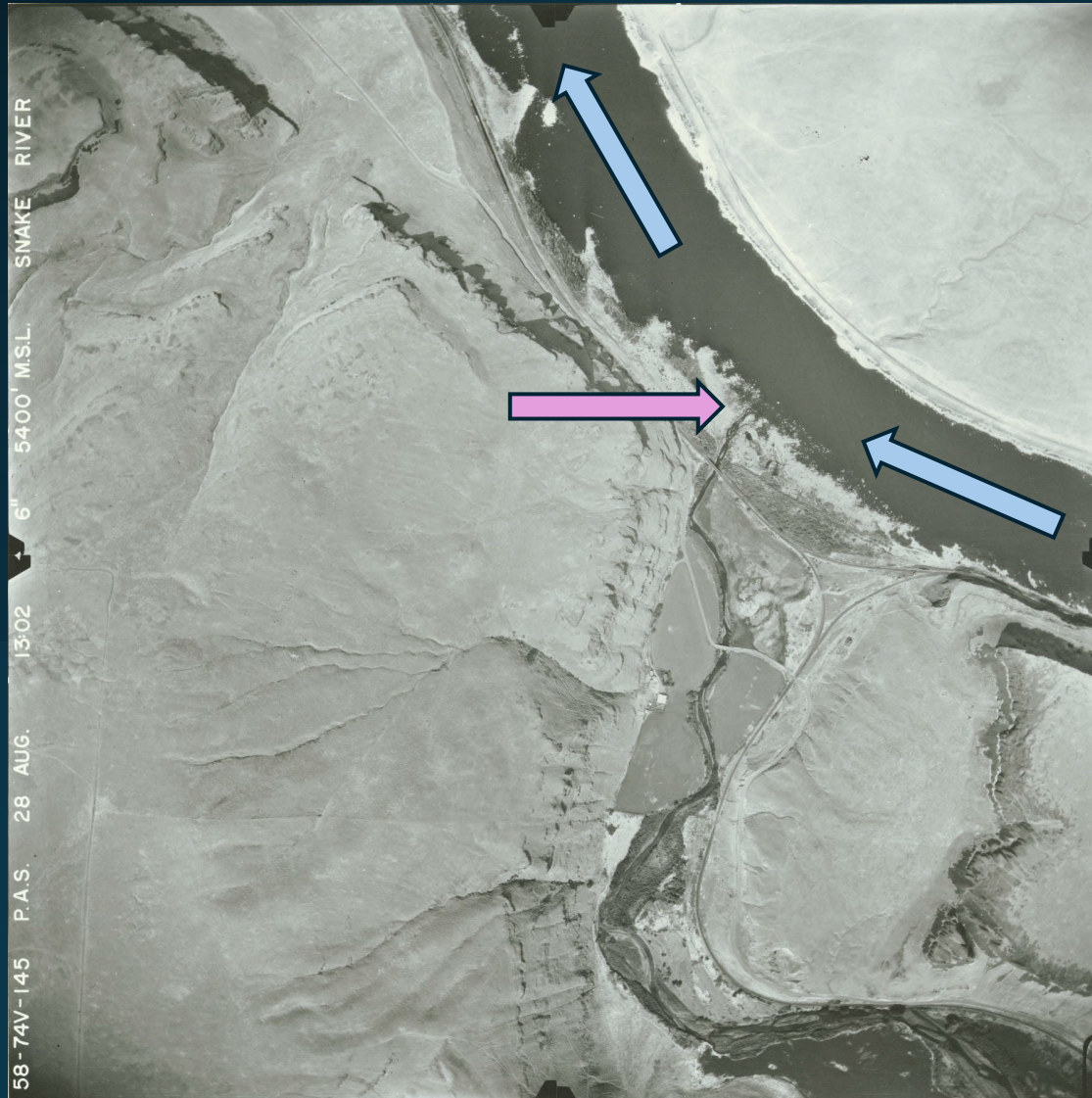
Brood Years - 2000-2013 AVG Survival		
Location	Release Site	SAS
Abv LGR	Imnaha	1.10%
Abv LGR	McCall	0.88%
Abv LGR	Grande Ronde	0.80%
Abv LGR	Dworshak	0.58%
Abv LGR	Sawtooth	0.34%
Abv LGR	Clearwater	0.33%
Blw LGR	Tucannon	0.19%

From LSRCP Annual Report 2020



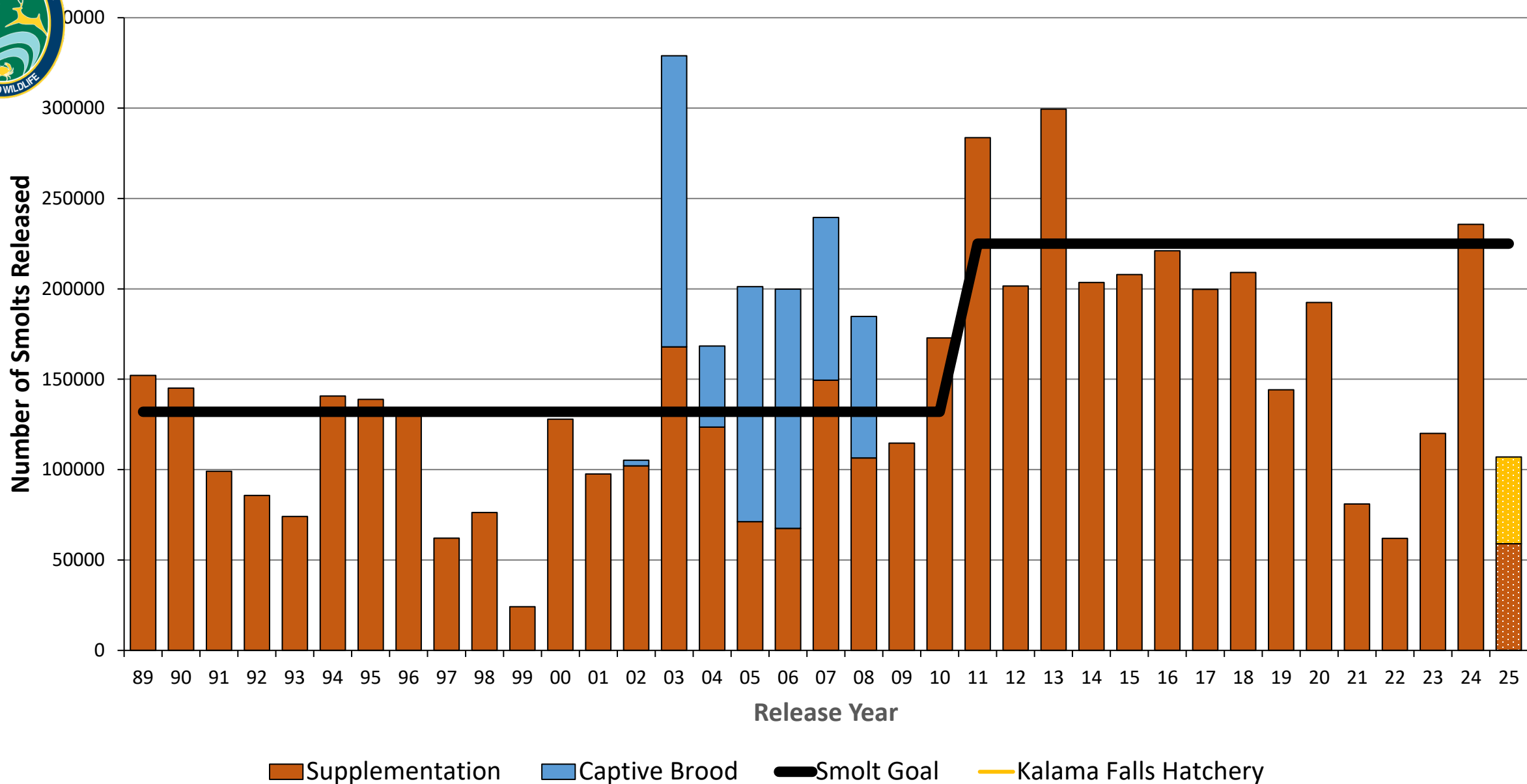
Issues facing adult returns: Overshoot

1958

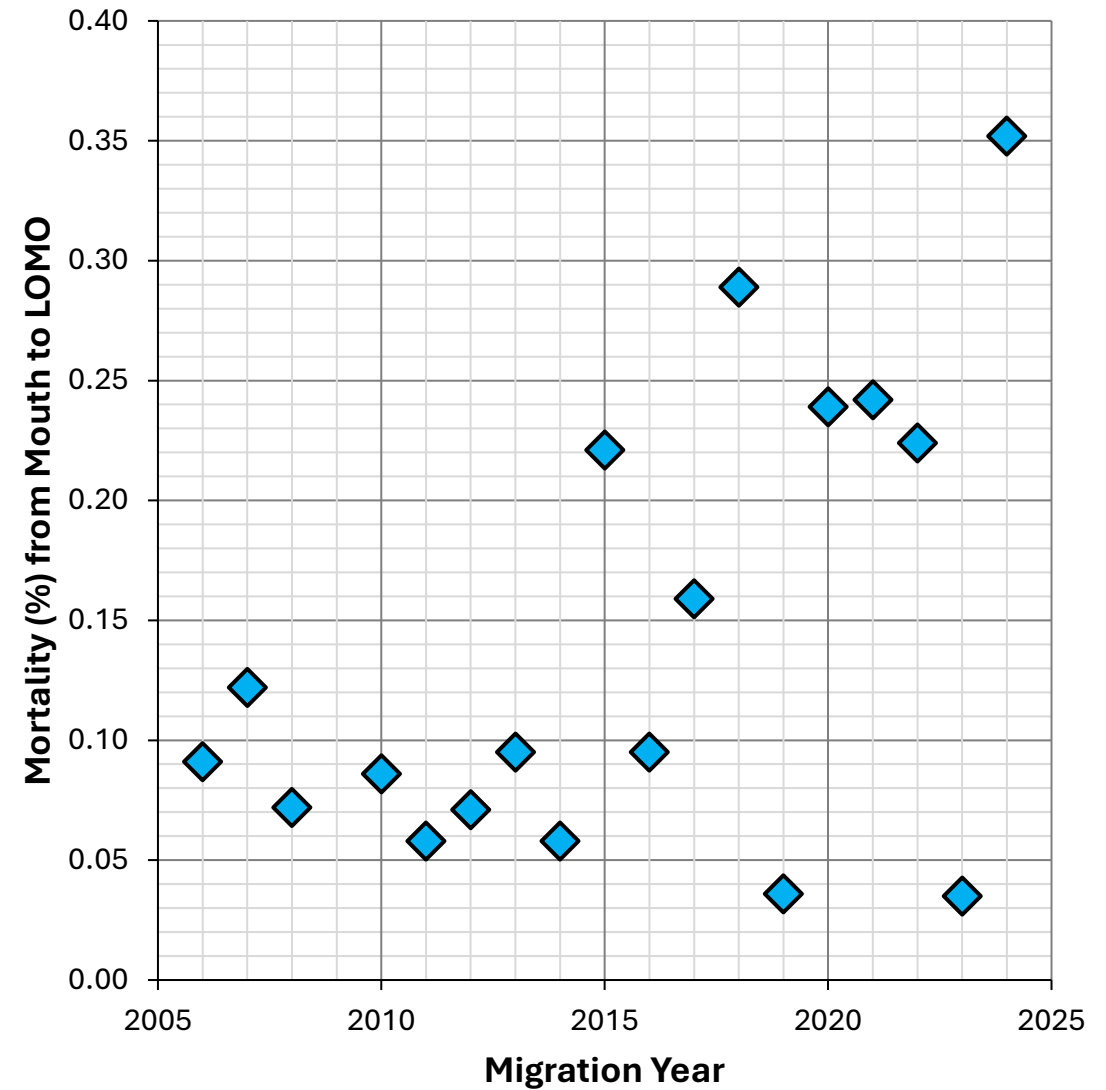
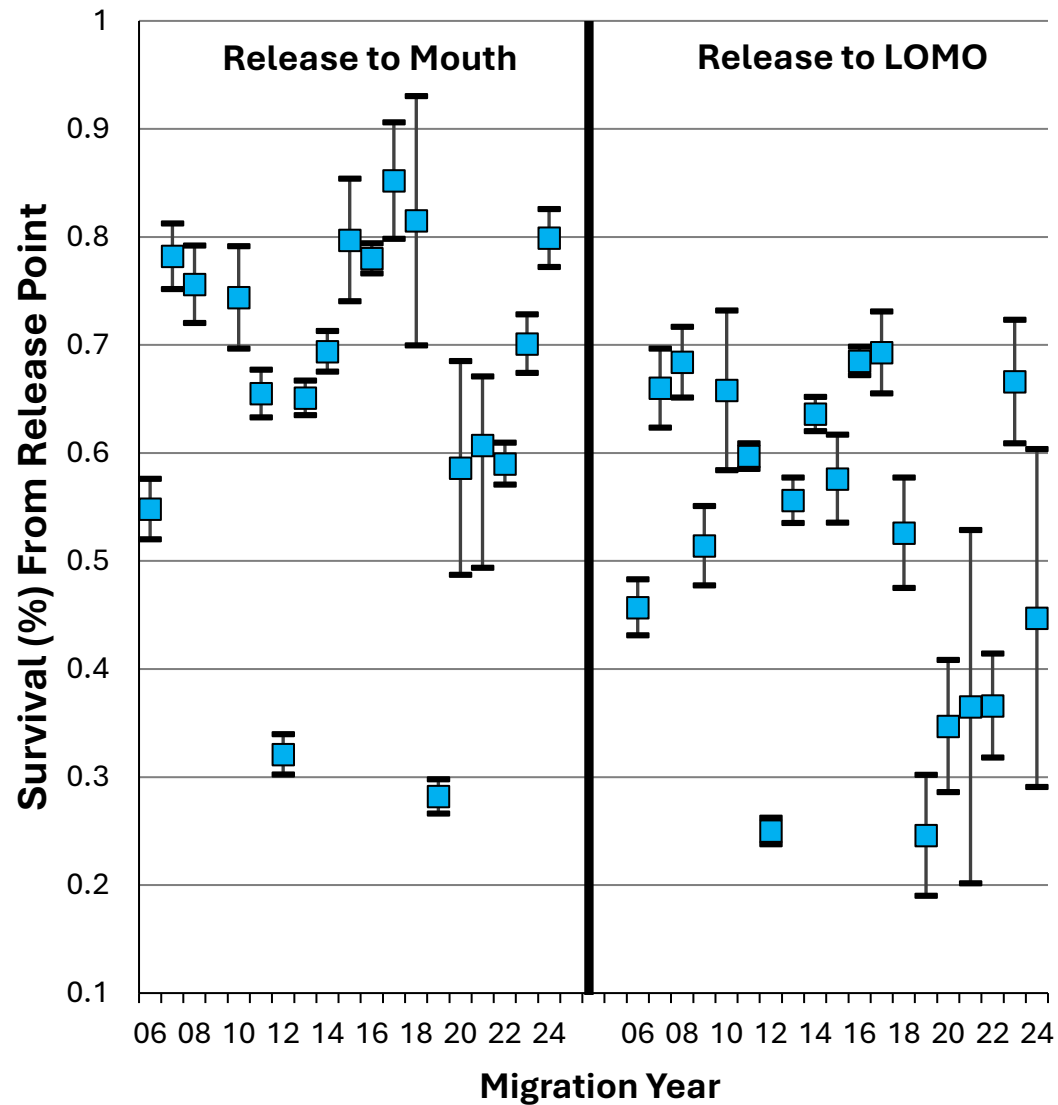


2025





From Gallinat et al. 2024



**** Lower Monumental Dam is only 62 miles away from the release point**



Issues affecting juvenile survival: predation, hydrosystem



Began capturing walleye in Tucannon smolt trap in 2022

0 captured in the previous 25 years at the same trap location (rkm 3)

2023/24
WDFW
Walleye diet
analysis study



Predation on
presumed natural
origin Tucannon
SPCH



Fork length ~110mm

Other Predators Contributing



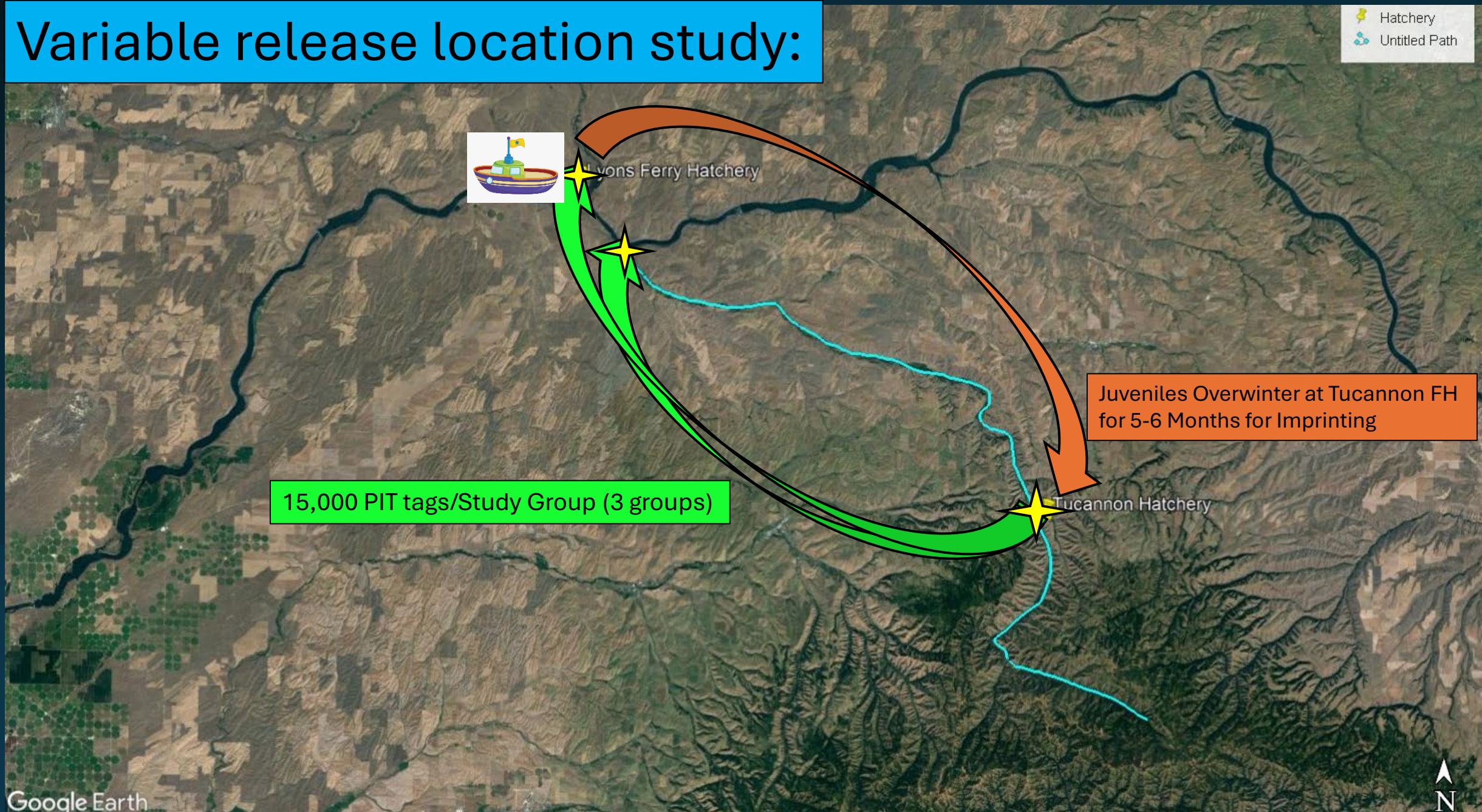


Current Adaptive Management:

- Variable release location study. Final juvenile releases in 2025, adult returns through RY 2028.
- Out of basin releases at Kalama Falls Fish Hatchery. Proposed action that begin with releases on 24 March 2025.



Variable release location study:

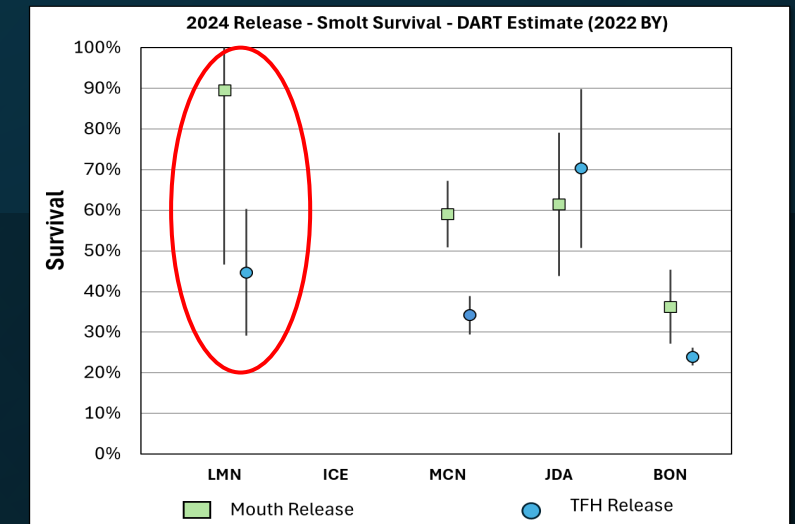
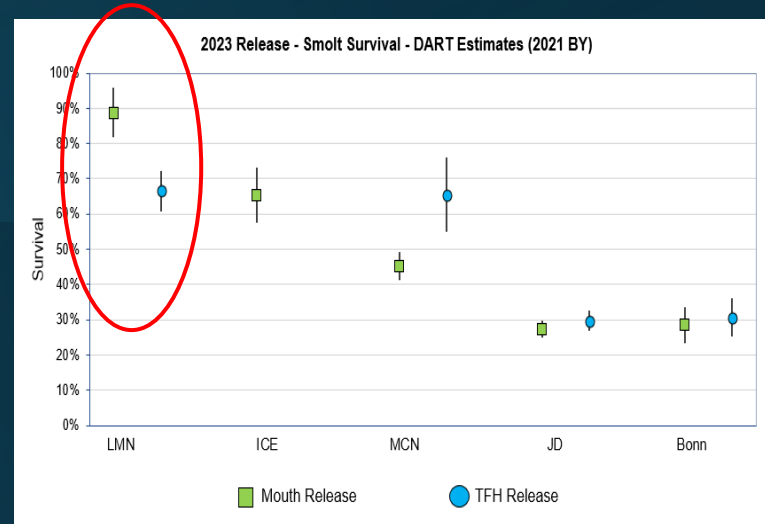
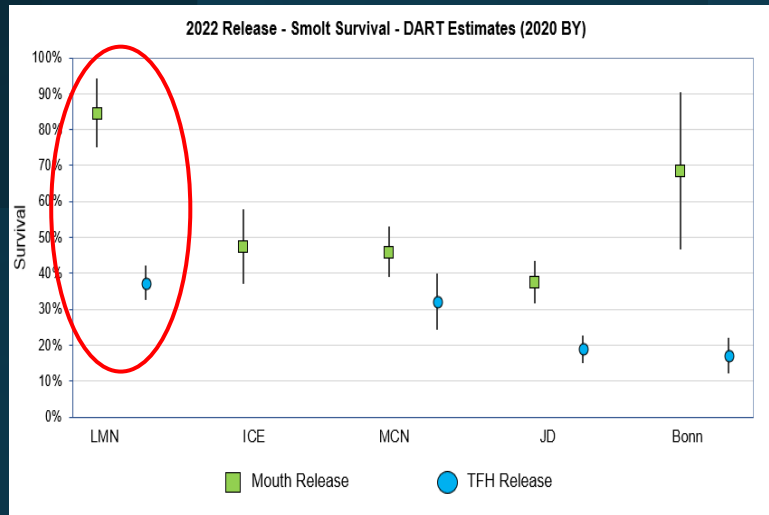




Variable release location study:

BY	RY	TFH	PITs	Mouth	PITs	Barge	PITs	Total Release
2020	2022	42,406	19,897	19,974	19,667	0	0	62,380
2021	2023	79,465	14,989	20,288	14,864	20,294	14,920	120,047
2022	2024	200,141	14,839	17,005	14,724	18,588	14,631	235,734
2023	2025	48,000*	15,000*	20,000*	15,000*	0	0	68,000*

Juvenile survival:





TFH Release (control)

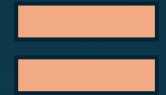
Mouth Release

Barge Release

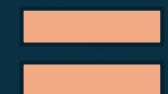
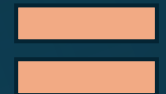
Juvenile Survival



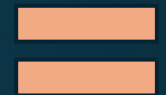
Adult Returns (SAS)



Project area (SAR)



Overshoot



Conversion to TFH



Barge
release
group
ended after
initial adult
returns

Kalama River Release

BY2023 release (~48k) on 03/24/2025

Legend
Hatchery
Untitled Path

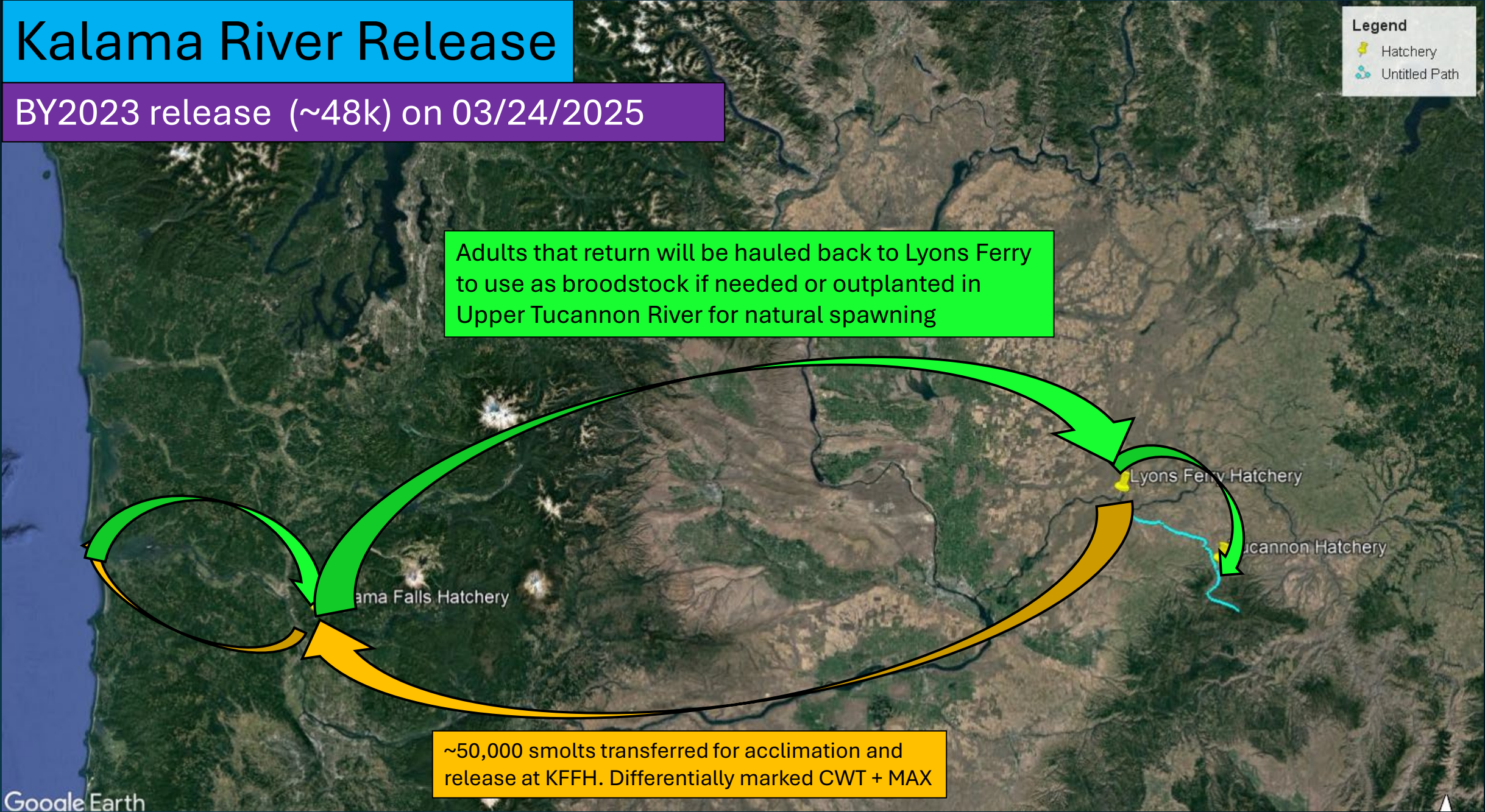
Adults that return will be hauled back to Lyons Ferry to use as broodstock if needed or outplanted in Upper Tucannon River for natural spawning

Lyons Ferry Hatchery

Tucannon Hatchery

Kalama Falls Hatchery

~50,000 smolts transferred for acclimation and release at KFFH. Differentially marked CWT + MAX





Kalama Falls Fish Hatchery Releases

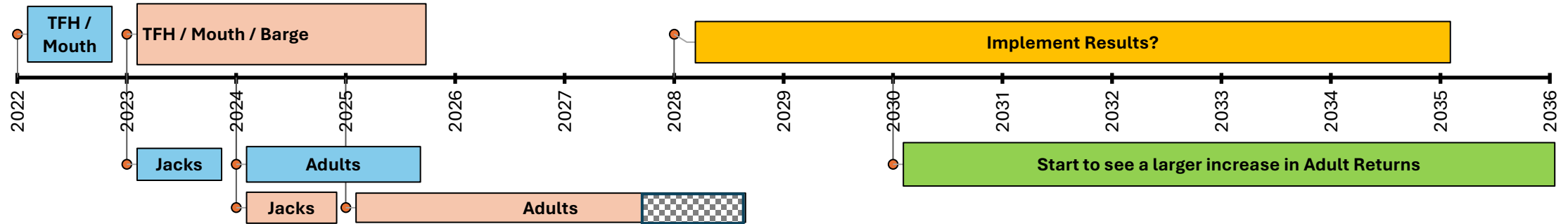
- Predicted SARs and rationale.
- ~48,000 smolts released 3/24/2025 from KFFH.
- Adult returns in 2027 will be trucked to LFH with out-plants in Tucannon River.
- BiOP completed with a Section 7 permit.

Prediction category	SAR Used	Rationale
Pessimistic (P)	0.2%	The current SAR of Tucannon spring Chinook Salmon returning to the Tucannon, and likely the worst-case scenario
Moderate (M)	0.5%	Prior modeling of CWT data from returning lower Columbia River spring Chinook Salmon showed this as moderate
Optimistic (O)	1.0%	Prior modeling of CWT data from returning lower Columbia River spring Chinook Salmon showed this is the upper bound

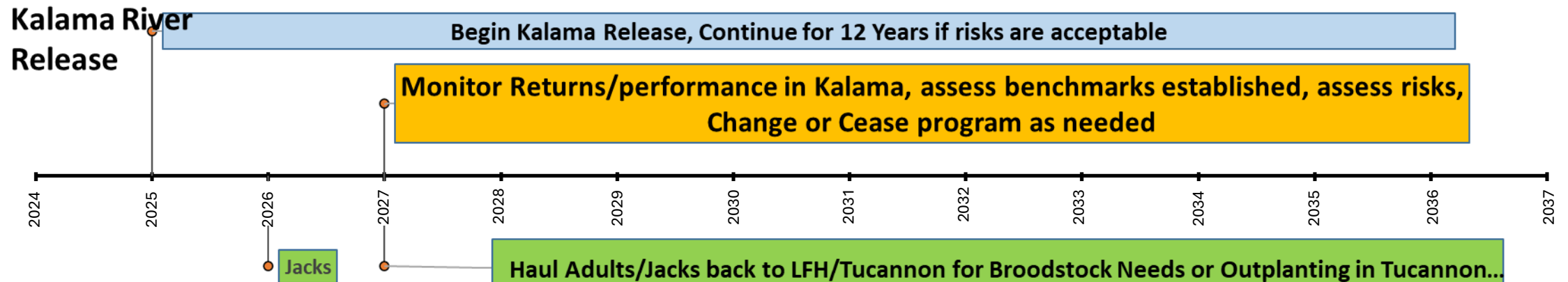
	Expected Smolt Release Number								
Number of Smolts Released	30,000			50,000			100,000		
Scenario	Pess	Mod	Opt	Pess	Mod	Opt	Pess	Mod	Opt
Assumed SAR	0.2%	0.5%	1.00%	0.2%	0.5%	1.00%	0.2%	0.5%	1.00%
Total Expected Adult Returns to Kalama	60	150	300	100	250	500	200	500	1000
Age 3	15	37	74	25	62	124	49	124	247
Age 4	42	106	212	71	177	353	141	353	706
Age 5	3	7	14	5	12	24	10	24	48
Expected Captured at Kalama Weir	48	120	240	80	200	400	160	400	800



Timeline for current management:



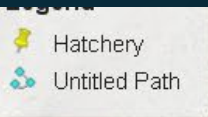
Variable release location study:



Additional management actions.....

Captive Broodstock Program

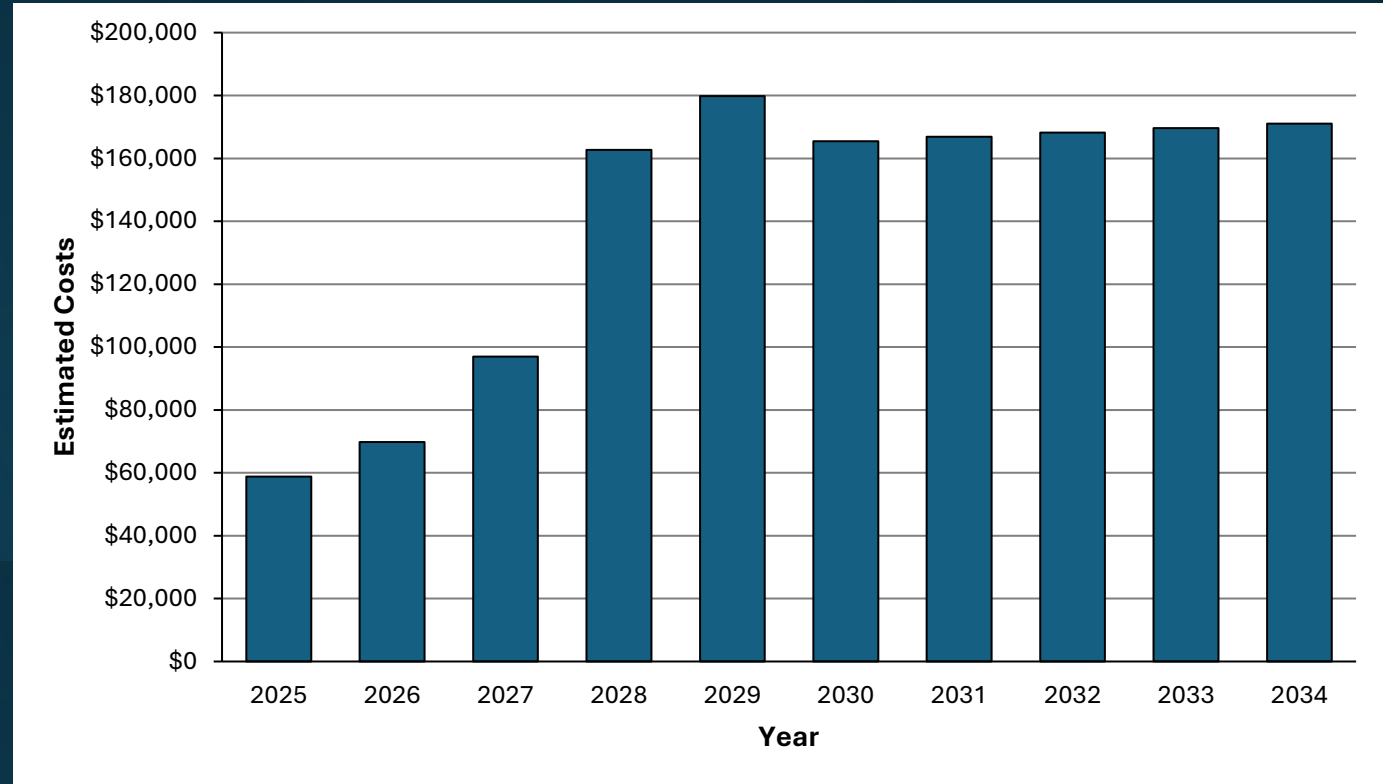
Funding Needed





Captive brood program:

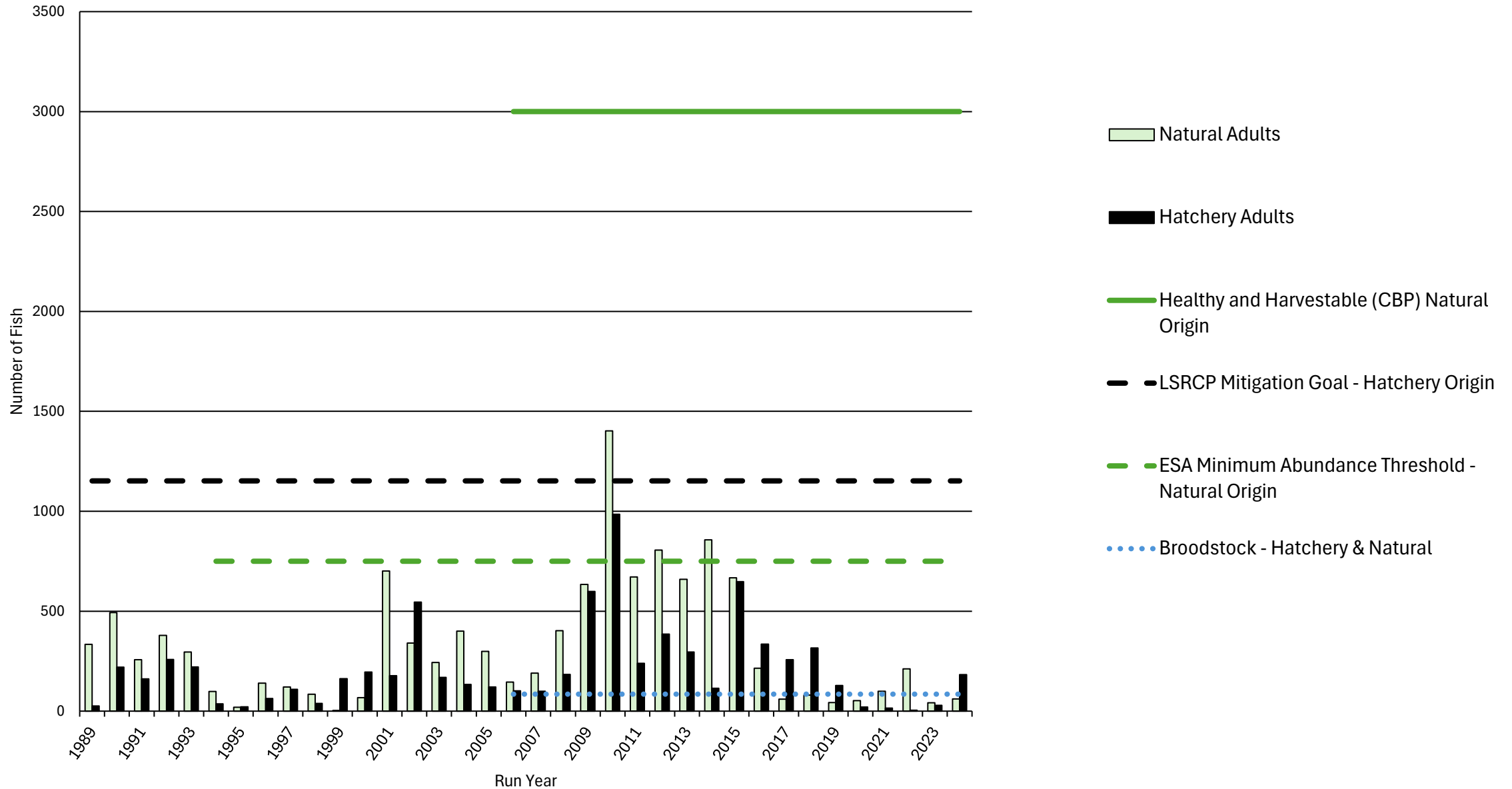
- If started with BY 2025, won't see significant adult returns for 7-8 years
- ~\$500k+ for infrastructure (concrete pad and circular tanks)
- Initial and continued funding needed to proceed.





Questions?

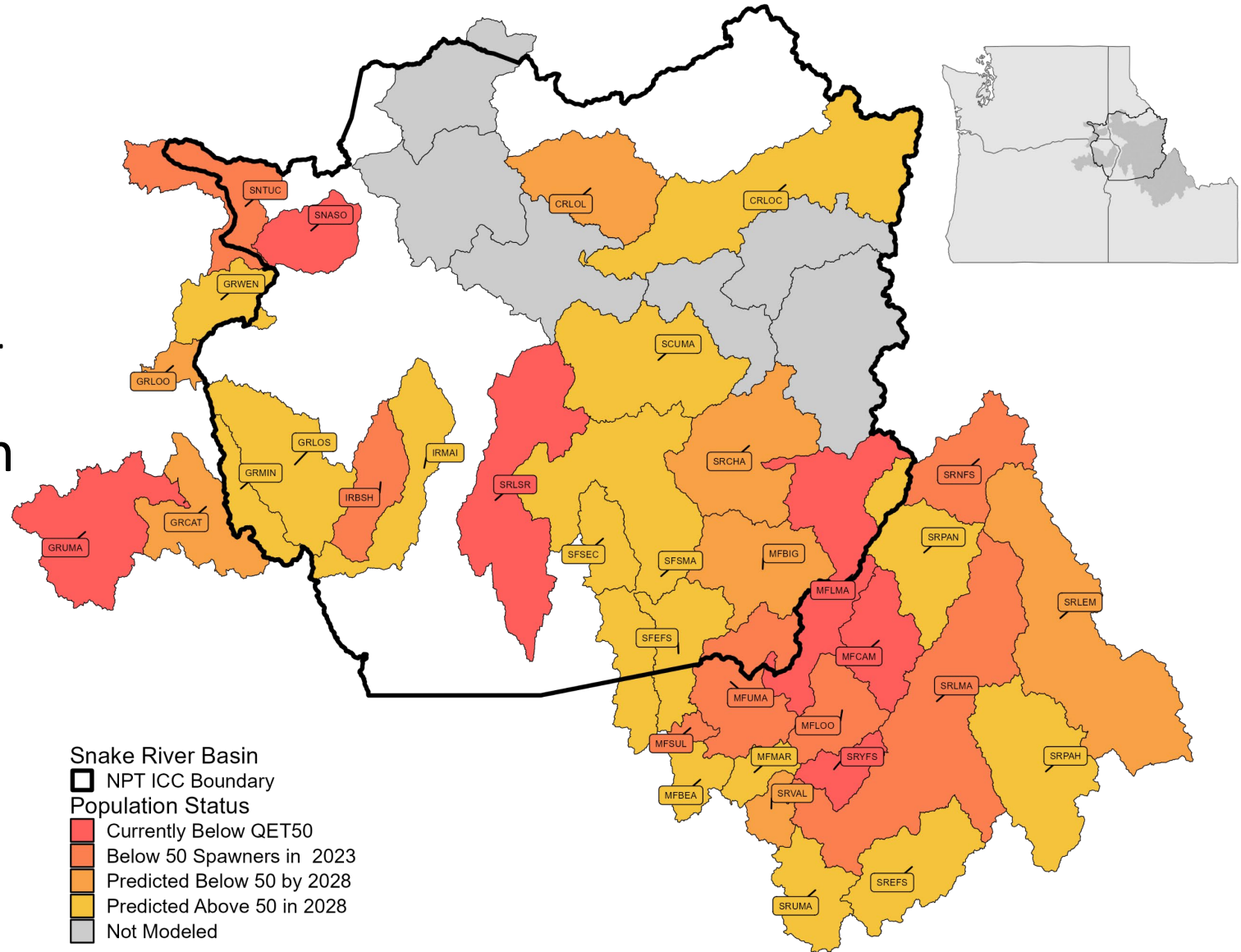
Tucannon River Spring Chinook Adult Returns



Quasi-Extinction Threshold (QET)

Spring/summer Chinook

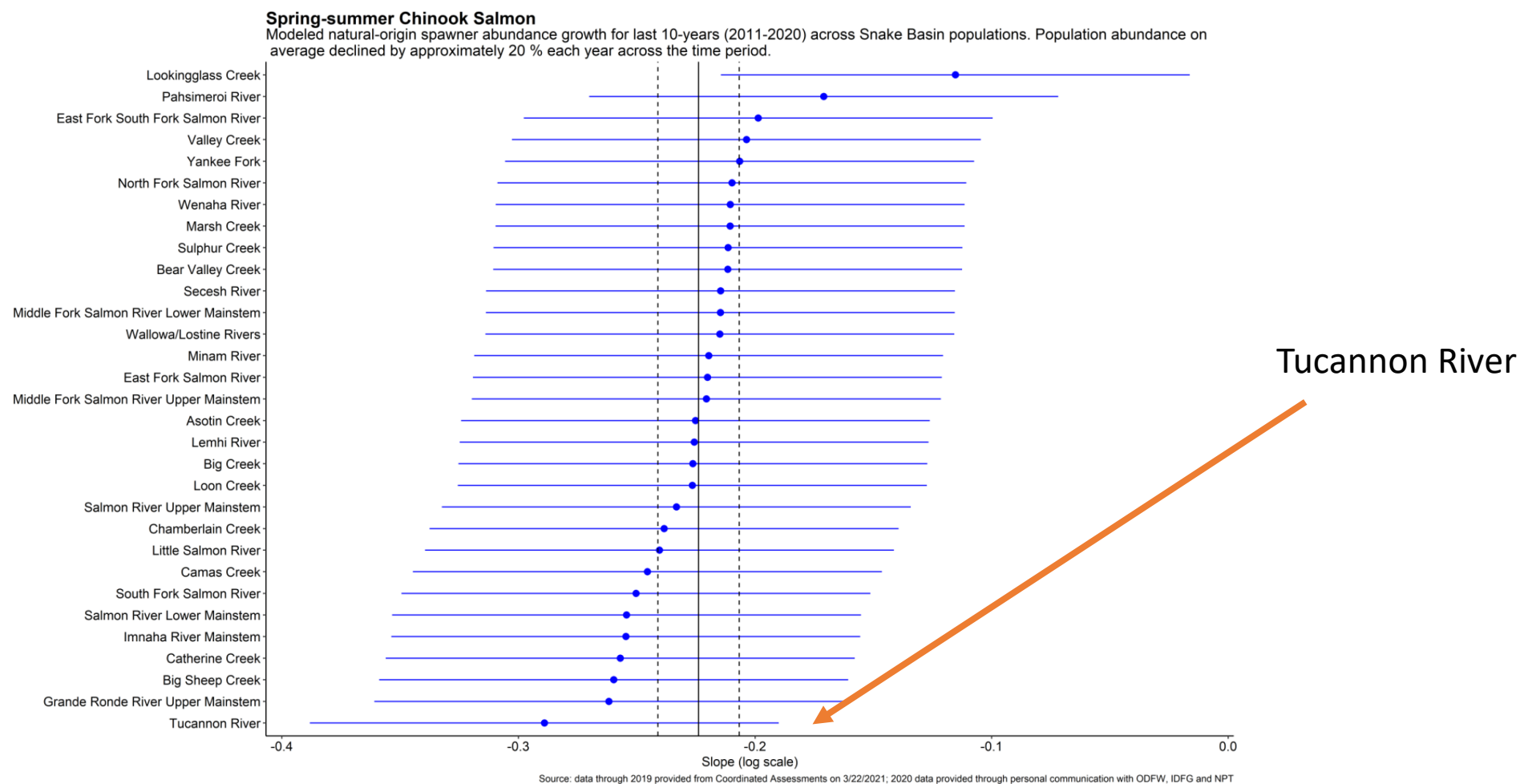
- 6 (17%) currently meeting QET
- 13 (37%) below 50 spawners in 2023
- 20 (57%) predicted to be at or below 50 before 2028



Remaining Snake River spring/summer Chinook populations

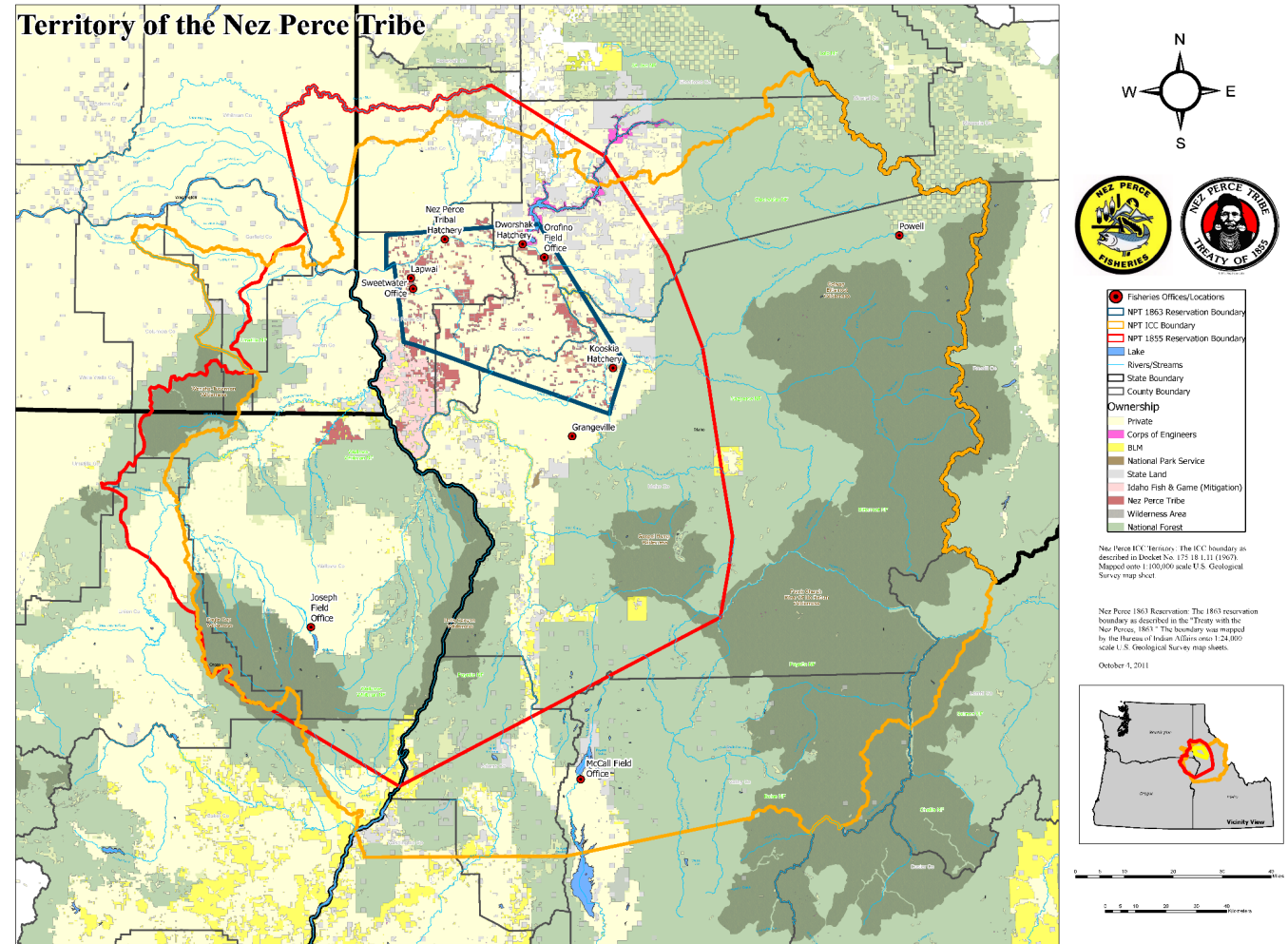
Abundance Declining 20% Each Year

Spring/summer Chinook



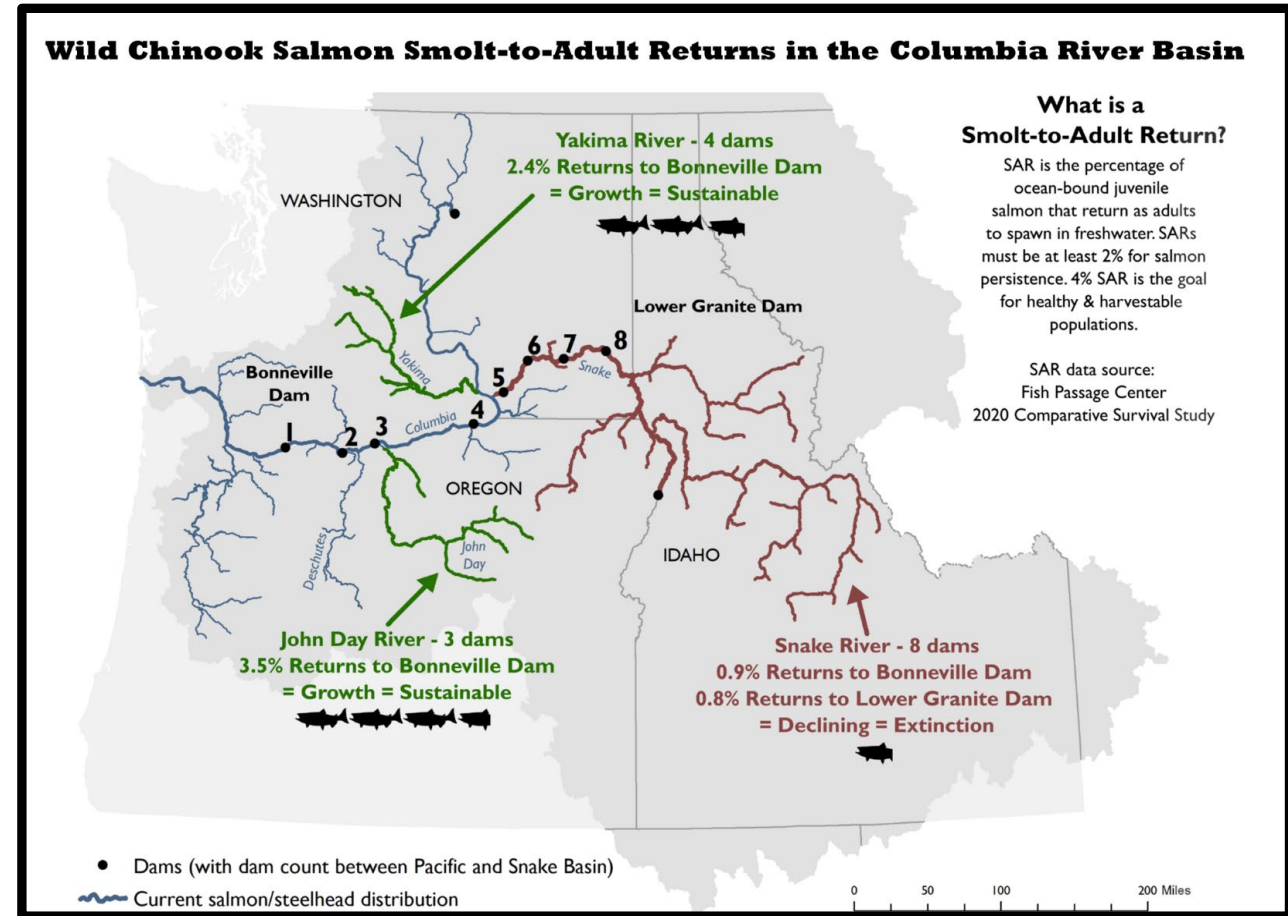
Why are Spring/Summer Chinook Important?

- @1,000,000 fish/yr; historically, the most abundant fish in the Snake River basin.
- Essential for ceremonial and subsistence purposes.
- Essential for maintaining the treaty-reserved right to fish “*in all usual and accustomed places*”.



What Is It That We Need To Do To Improve Survival?

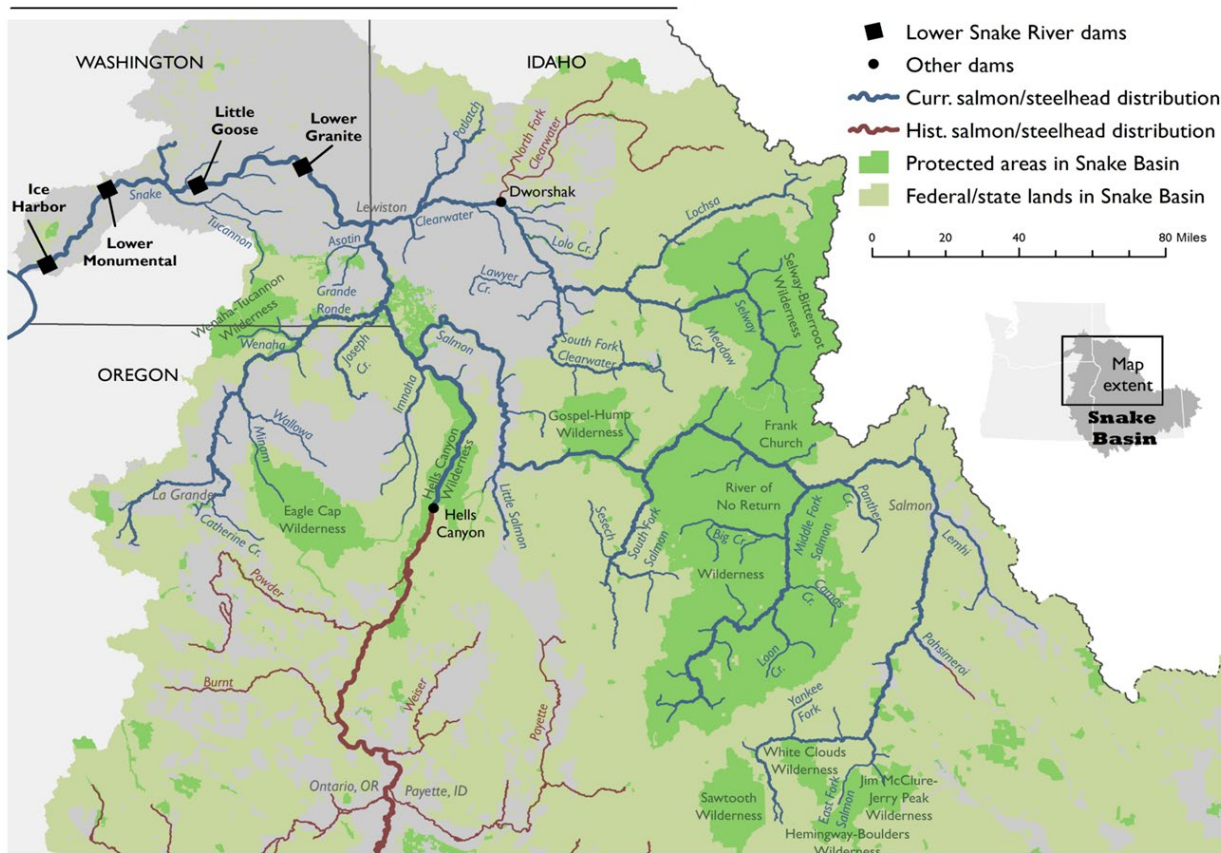
- Speed passage down to the ocean.
 - Increase water velocity.
 - Longer trips are not what the fish planned for.
- Remove injury and stress caused by physical structures.
 - Screens, turbines, bypass systems or spill.
 - Disorientation and predation.
- Alleviate artificial/exacerbated temperatures in the reservoirs.
- Reduce predation – northern pikeminnow, small mouth bass and other non-natives, birds.
 - e.g. Tucannon



WE MUST IMPROVE SMOLT-TO-ADULT SURVIVAL

Why Focus on Snake Basin Wild Returns?

Salmon and Steelhead Habitat in Snake River Basin



- Improve the wild returns, and you improve all returns.
- They have the best chance:
 - Snake basin habitat (where wild fish are) is essential for preserving the species; especially in a changing climate.
 - Snake basin habitat is vast and largely intact/wilderness.
- Wild fish (not hatchery fish) are central to ESA delisting.
- Hatcheries, because of logistics, cannot rebuild wild returns.

What the Nez Perce Are Proposing in the Interim

- Tucannon – the canary is dying
- RCBA Funding
- Predators
 - Sealions
 - Other Predators
- Hold onto genetics of the populations
 - Cryopreservation
 - Conservation Hatchery
- Increase Productivity
 - Marine Derived Nutrients
 - Shad?



