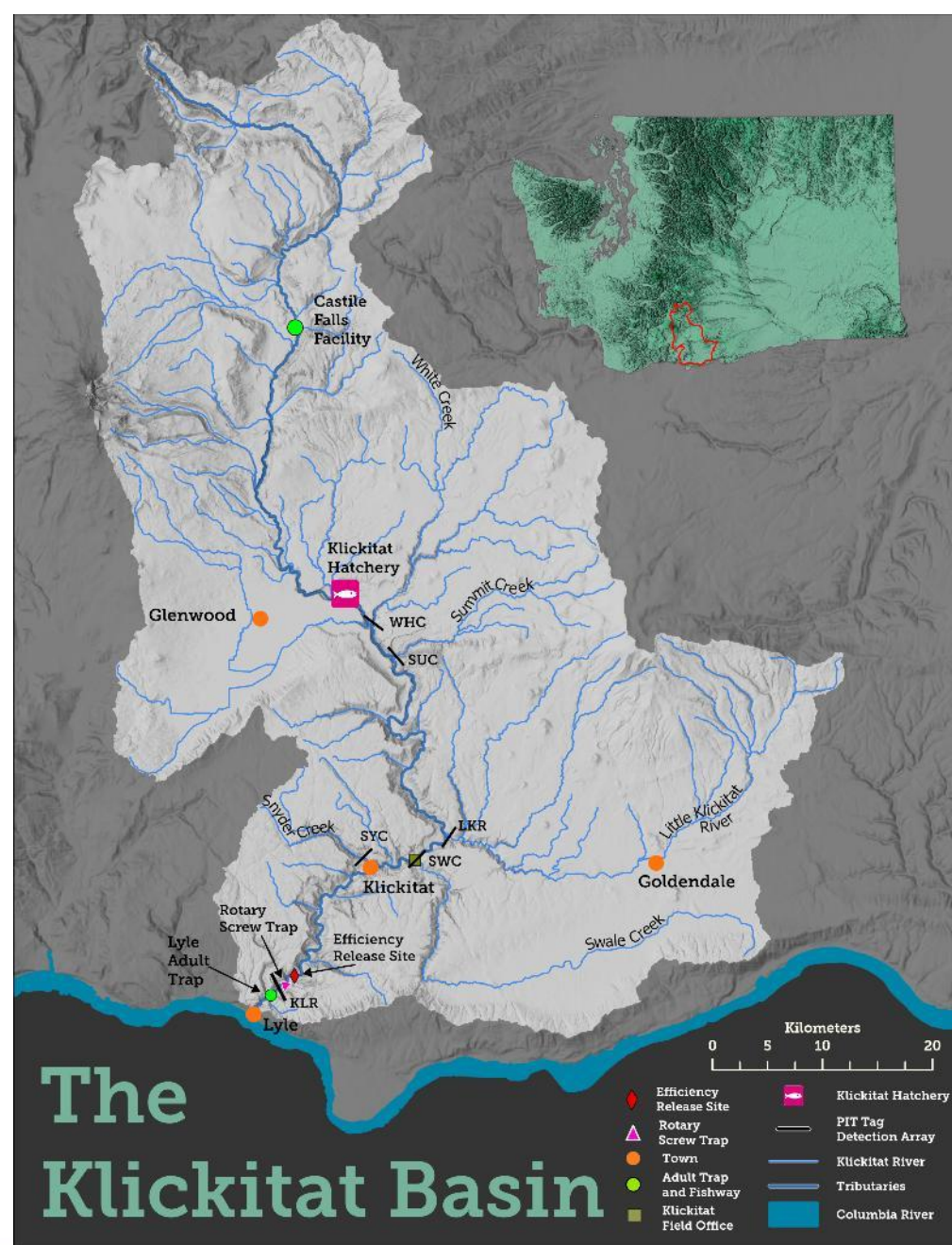


Klickitat River Juvenile Salmonid Outmigration Monitoring 2017-2025



**Kory Kuhn
&
Nicolas Romero**

- Second longest free flowing river in Washington.
- Majority of the upper basin on closed area of the Yakama Nation Reservation.
- Only trap on the Klickitat (RKM 4.5) and below all steelhead spawning tributaries.
- Efficiency release site at RKM 6.
- Floating PIT tag array 100 meters downstream of trap.



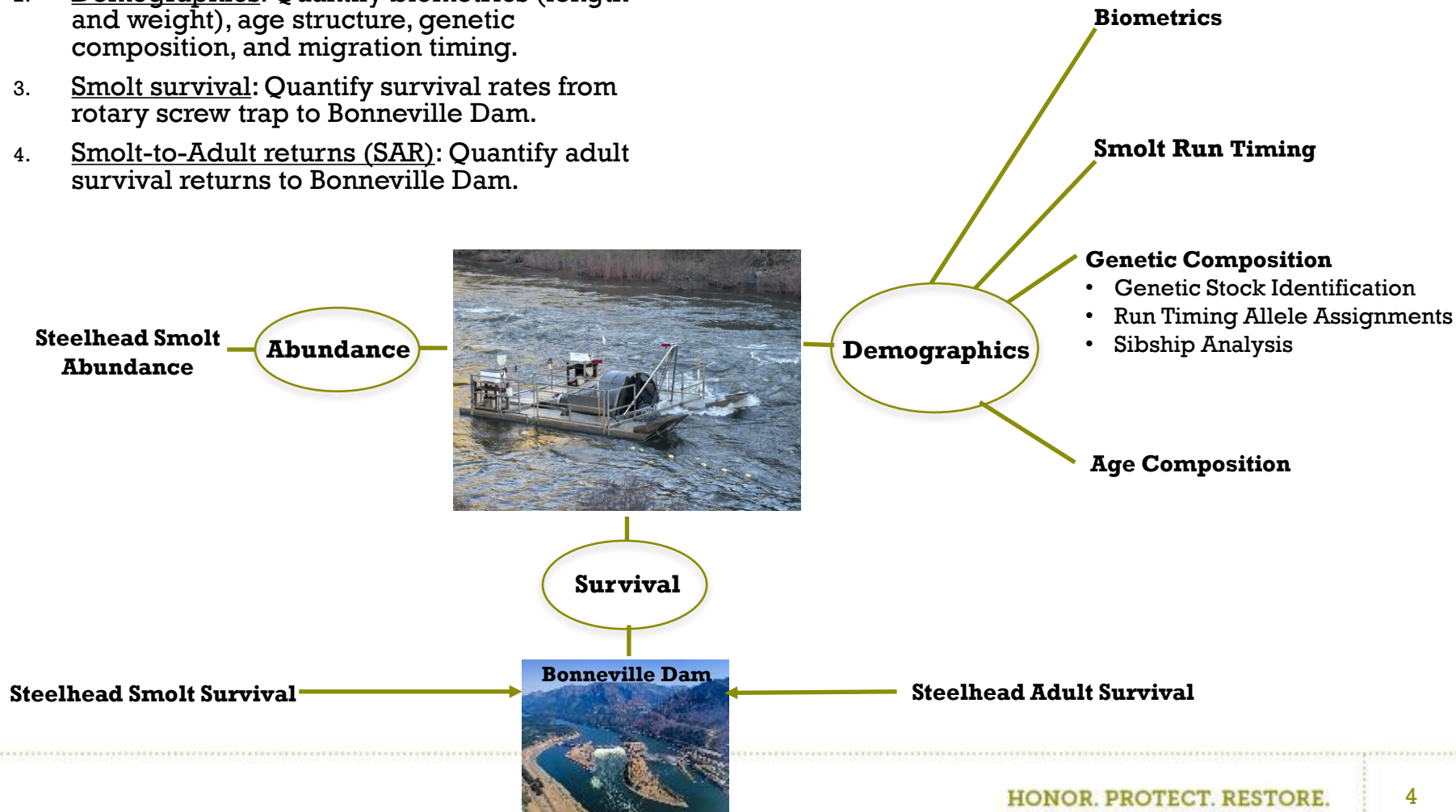


Why Use a Rotary Screw Trap?



■ Study Objectives:

1. Smolt abundance: Generate annual smolt abundance estimates.
2. Demographics: Quantify biometrics (length and weight), age structure, genetic composition, and migration timing.
3. Smolt survival: Quantify survival rates from rotary screw trap to Bonneville Dam.
4. Smolt-to-Adult returns (SAR): Quantify adult survival returns to Bonneville Dam.



Trap Staff Clearing the Live-Box



Klickitat Screw Trap Target Species



Natural origin steelhead (*Oncorhynchus mykiss*):

- Middle Columbia River DPS
- Listed as threatened by the endangered species act and the primary target species.



Natural origin Spring Chinook (*Oncorhynchus tshawytscha*):

- Depressed stock in the Klickitat. Important to the Yakama Nation (ceremonial and subsistence).
- Too few captured to estimate smolt abundance at the screw trap.



Trap Deployment by Crane



Operational Challenge: Debris



Operational Challenge: Hatchery Fish



Non-Native Fish Species



Brown bullhead catfish



Pumpkinseed (inaturalist.org)



Brook trout (inaturalist.org)



Bluegill (inaturalist.org)

The Lyle Falls Theory



Photo Credit: David Lindley

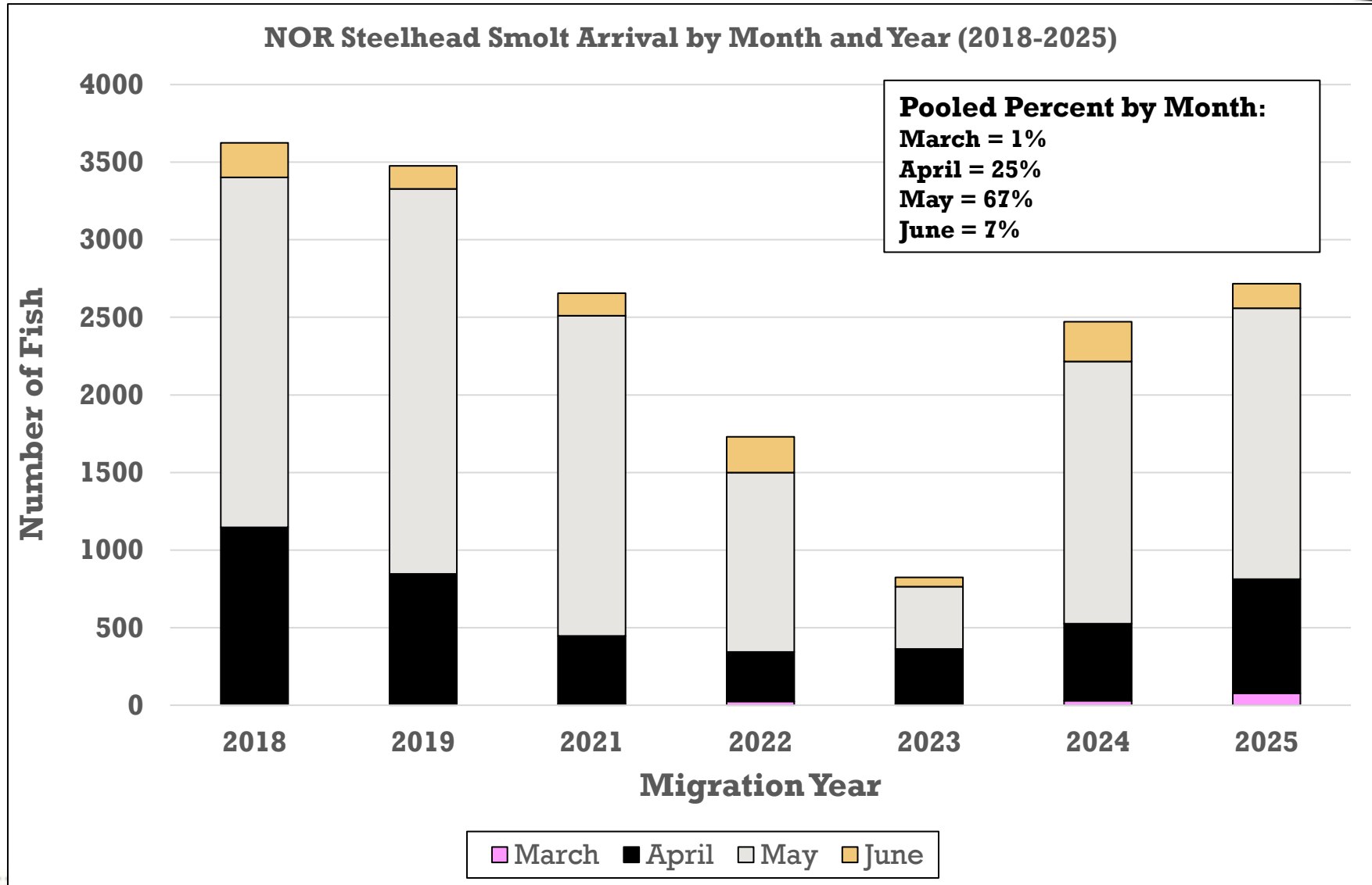
What Probing Do Captured NOR Steelhead Endure?



- **Scanned for a PIT tag.**
- **PIT tagged if no tag present.**
- **Measured for fork length.**
- **Weighed.**
- **Subsampled for scales.**
- **DNA tissue sample collected from upper caudal lobe.**

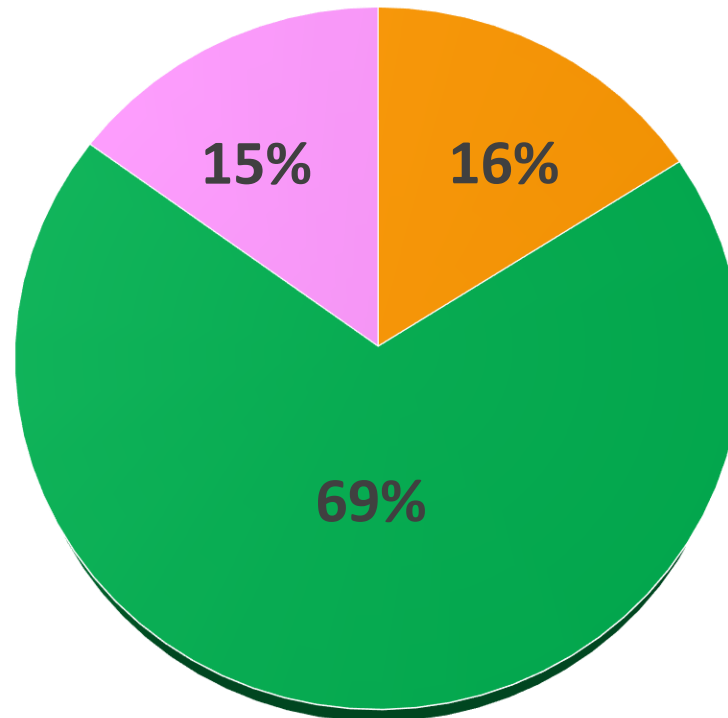


Smolt Arrival to The Screw Trap



Smolt Age Composition

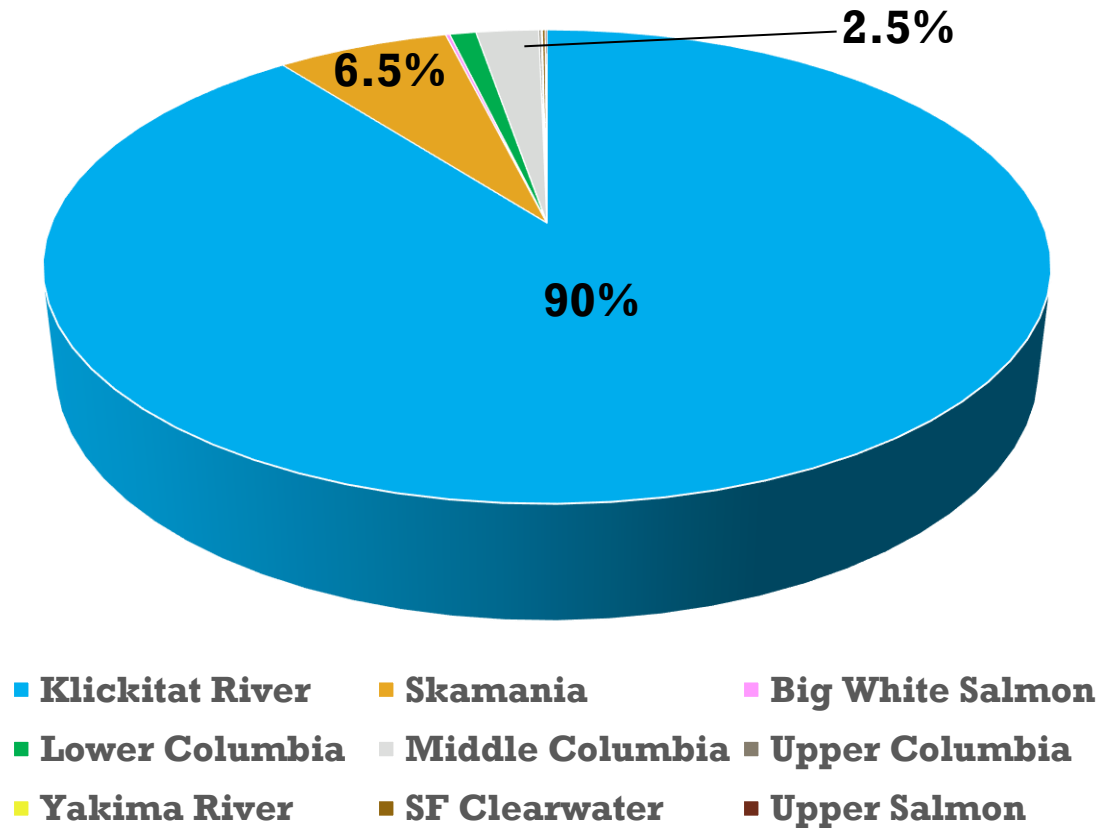
Pooled NOR Steelhead Smolt Age Classes 2018-2025 (n=4,458)



■ Age 0 ■ Age 1 ■ Age 2 ■ Age 3 ■ Age >4

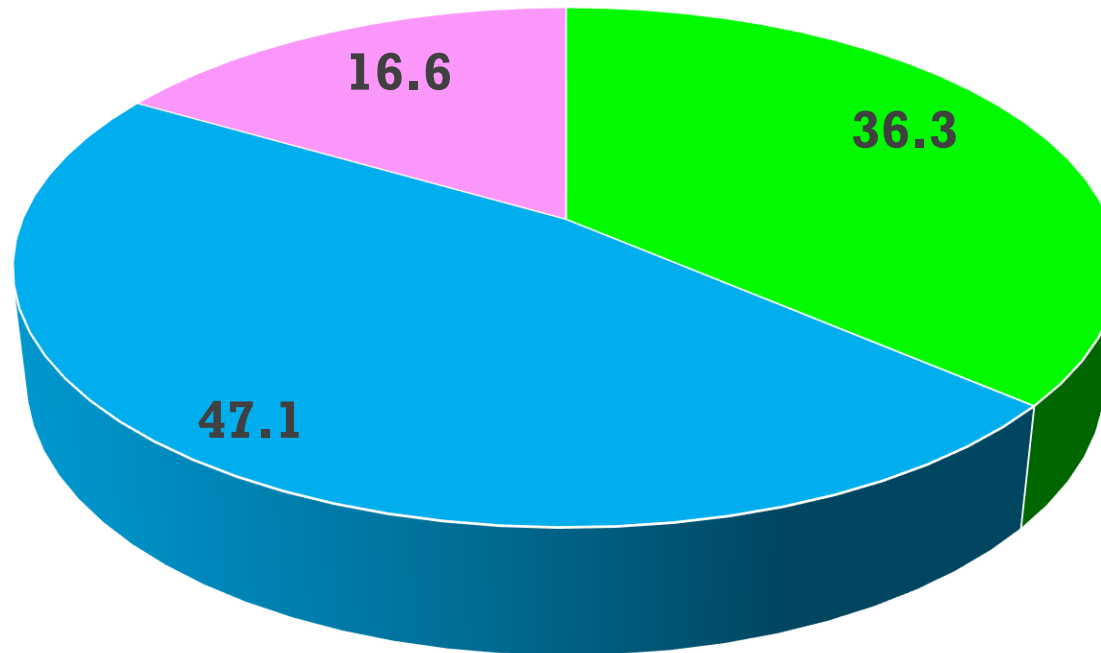
Smolt Genetic Composition

Pooled NOR Steelhead Smolt Genetic Stock Identification
Assignments 2021-2024



Smolt Run Timing Genotypes

Pooled NOR steelhead Smolt Genetic Run Timing
2021-2024



■ Early (Summer) ■ Heterozygous (Transitional) ■ Late (Winter)

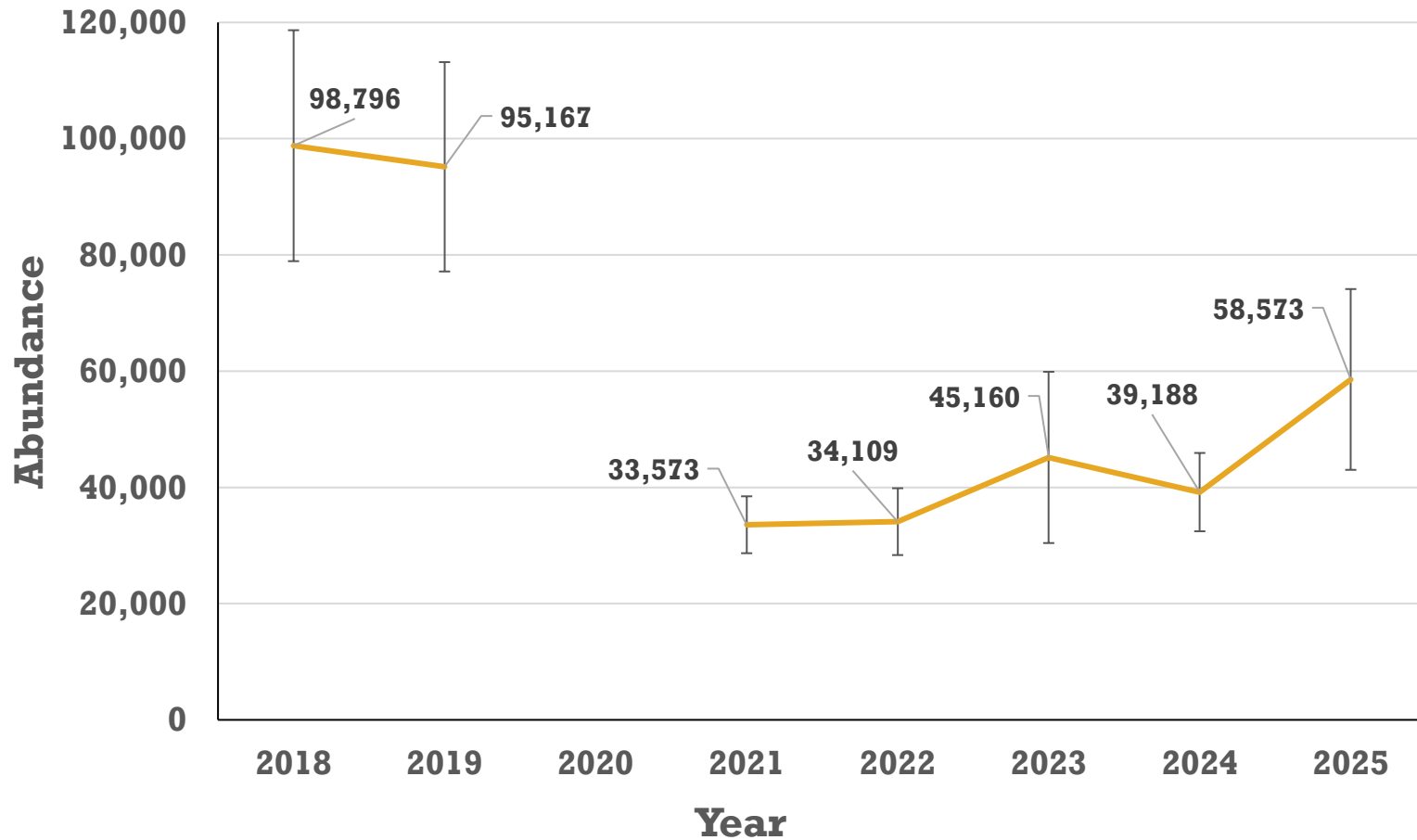


Screw Trap Capture Efficiency

Release Year	# Eff. Release Groups	# Fish Captured	# Eff. Released Fish	# Eff. Released Captures	Trap Capture Efficiency
2025	147	2,717	2,601	156	6.0
2024	140	2,472	2,346	157	6.7
2023	58	828	690	24	3.5
2022	115	1,722	1,561	93	6.0
2021	114	2,640	2,342	220	9.4
2020 ¹	-	-	-	-	-
2019	156	3,475	3,384	157	4.6
2018	137	3,616	3,186	159	5.0
2017	126	231	210	3	1.4
Total	746	14,984	13,719	813	5.9

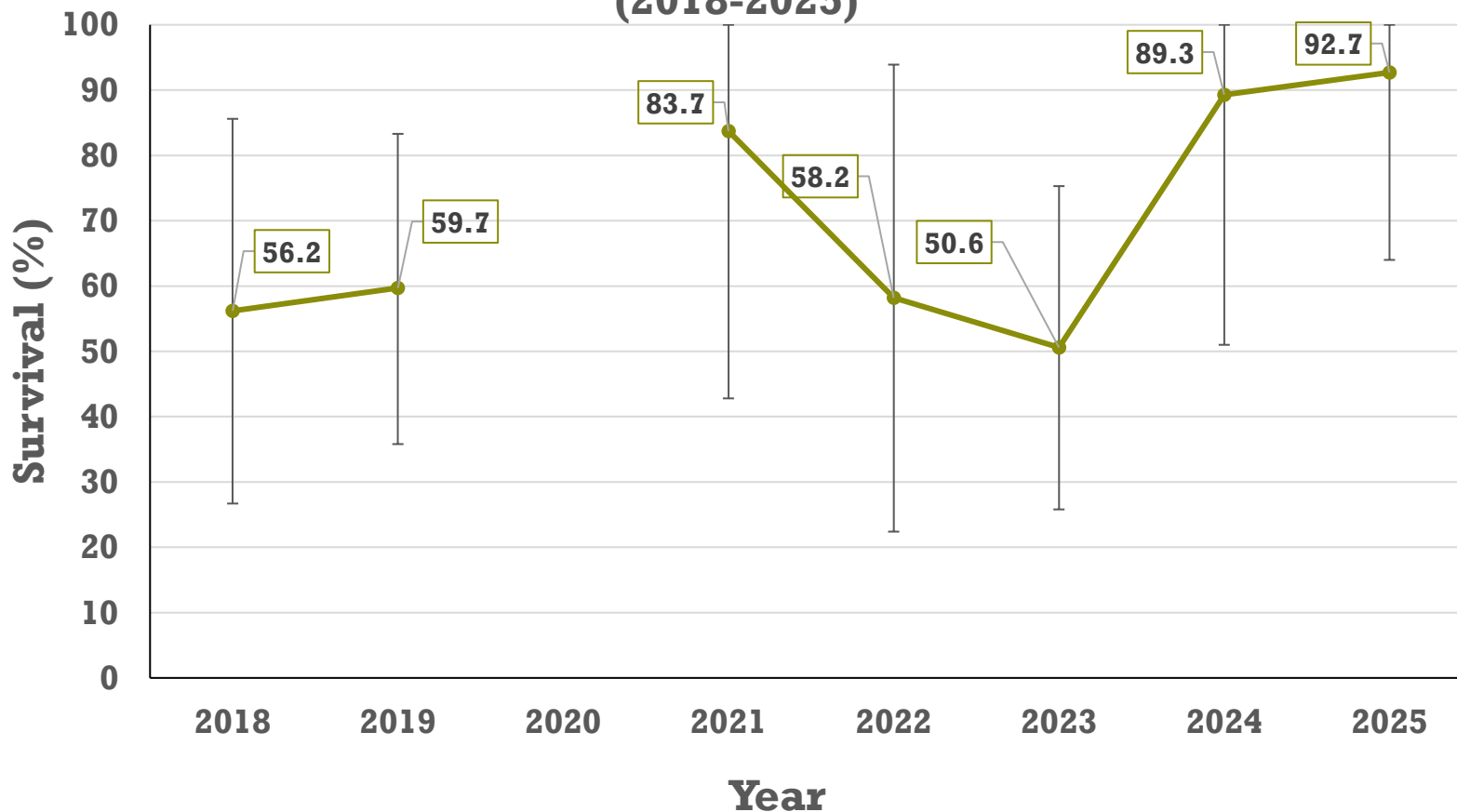
Smolt Abundance

NOR Steelhead Smolt Abundance Estimates (2018-2025)



Smolt Survival

NOR Steelhead Smolt Survival to Bonneville Dam (2018-2025)



NOR Steelhead Smolt to Adult Return



Release Year	Tagged Fish Released	Number of Adult Returns	1 Year Ocean	2 Year Ocean	3 Year Ocean	Smolt-to-Adult Return
2017	221	2	2	0	0	0.90%
2018	3,210	45	7	35	3	1.40%
2019	3,397	10	3	6	1	0.29%
2020	-	-	-	-	-	-
2021	2,358	19	2	17	0	0.81%
2022	1,628	51	6	43	2	3.13%
2023	787	15	0	15	-	1.91%
2024	2,472	12	12	-	-	0.49%
2025	2,717	-	-	-	-	-
					Average	1.31%

To Summarize:



- Hatchery releases and an unregulated river create severe operational challenges.
- Non-native fish species are very rare in the Klickitat river above Lyle Falls.
- The majority of steelhead smolts over all years arrive to the trap in May.
- Age two steelhead smolts are the dominant age class over all years.
- Klickitat steelhead smolts assigned 90% to the Klickitat genetic stock.
- Minimal but measureable interaction with Skamania hatchery stock steelhead.
- Smolt abundance and survival is variable by year and both appear trending upward.
- Smolt to adult returns are variable and on average are 1.3%.

Future Work:

- ❖ Continued operation of the rotary screw trap to build and maintain a robust long-term dataset to monitor status and trends in juvenile *O. mykiss* abundance in the Klickitat subbasin.

- ❖ Operation of a rotary screw trap on the lower White Salmon River beginning spring 2027 through the 2029 trapping season. NOAA Pacific Coastal Salmon Recovery Fund (PCSRF) grant.

Acknowledgments:



- ❖ **BPA- Funding Agency.**
- ❖ **YKFP M&E Trap Staff- Lance Downing, Ryan Gerstenberger, Joe Zendt, Dean Antone, Vaughan Gilmore, Richard Littlewolf, Shawn Bechtol, and Jeremy Takala.**
- ❖ **Screw Trap Database Creator and Manager- Mike Babcock.**
- ❖ **YKFP O&M staff- Jerrod Bartholomew, Greg Knott, Duane Spino.**
- ❖ **WDFW Scale Ageing Laboratory- Scale ageing.**
- ❖ **CRITFC Hagerman Genetics Lab- Genetic analysis.**



Questions?

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