

Yakima Basin (Aquatic) Science & Management Conference 2025

Tuesday June 17, 2025 &
Wednesday June 18, 2025



photo courtesy of Zack Mays

- Information
- Communication
- Coordination

For more information visit Yakama Nation
Fisheries website (yakamafish-nsn.gov)
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Purpose: To provide a comprehensive overview and exchange of ideas about the most current biological science and resource management activities in the Yakima Basin.



photo courtesy of Scott Nicolai

Central Washington University
400 E University Way
Ellensburg, WA 98926

Discovery Hall Room 103



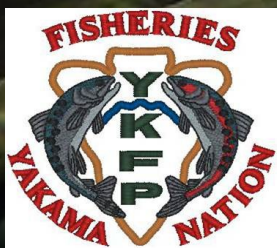
Yakima River Salmon and Steelhead: Status and Trends Update

2025 Yakima Basin Science and Management Conference

Chris Frederiksen

Photo Credit: Zack Mays
Yakima VSP Project

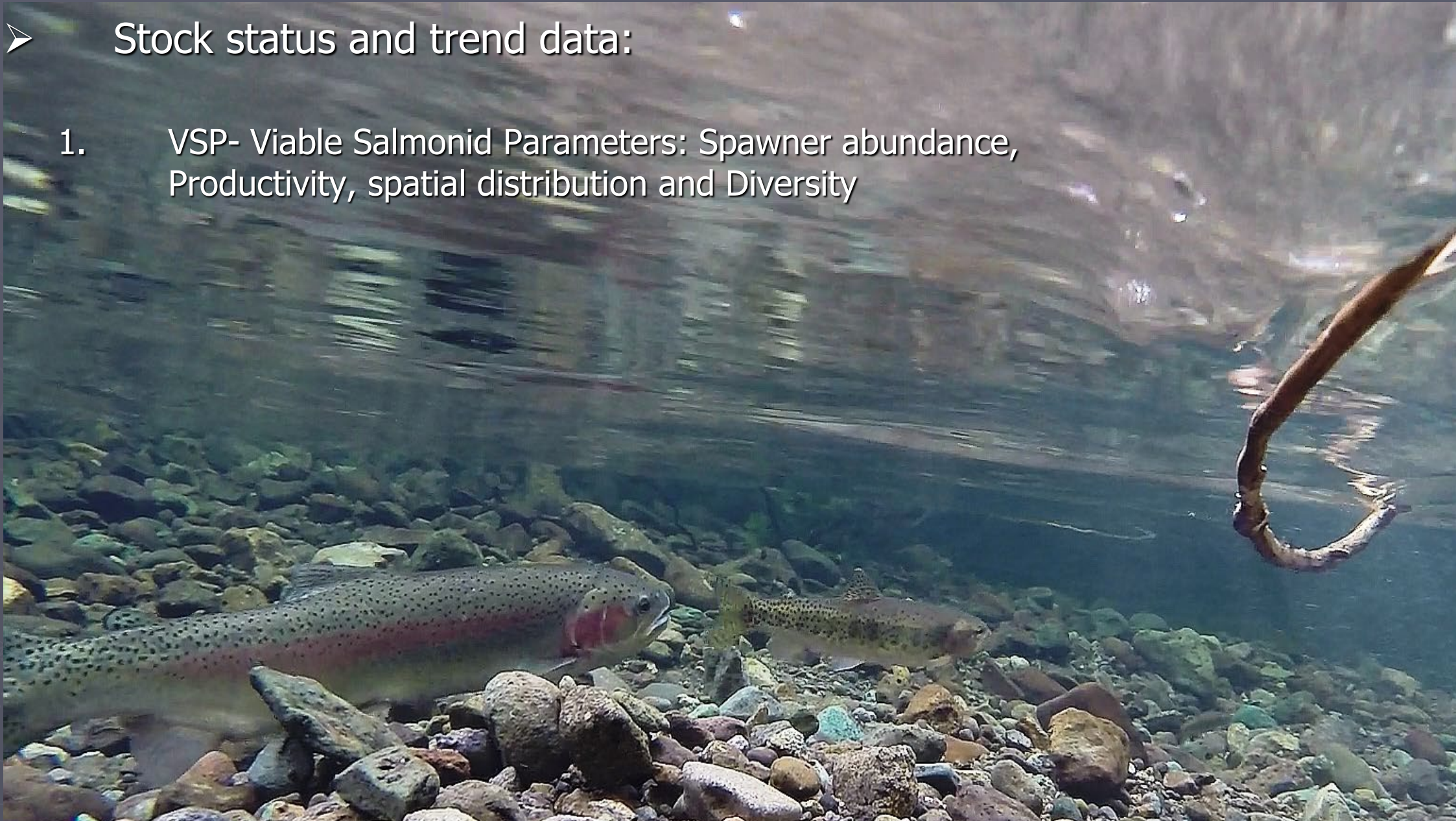
Yakama Nation Fisheries - YKFP



Yakima River Salmon & Steelhead Status and Trends Update

➤ Stock status and trend data:

1. VSP- Viable Salmonid Parameters: Spawner abundance, Productivity, spatial distribution and Diversity



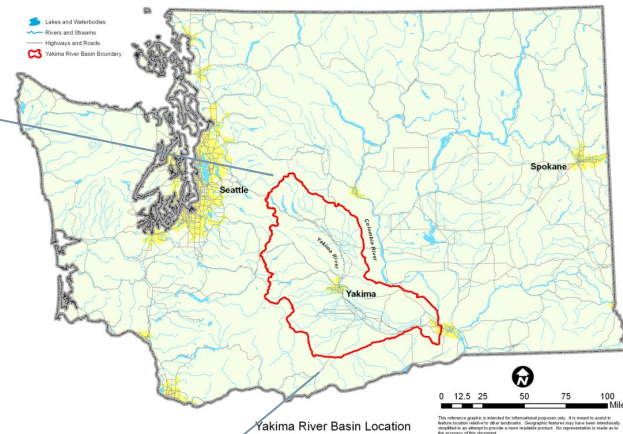
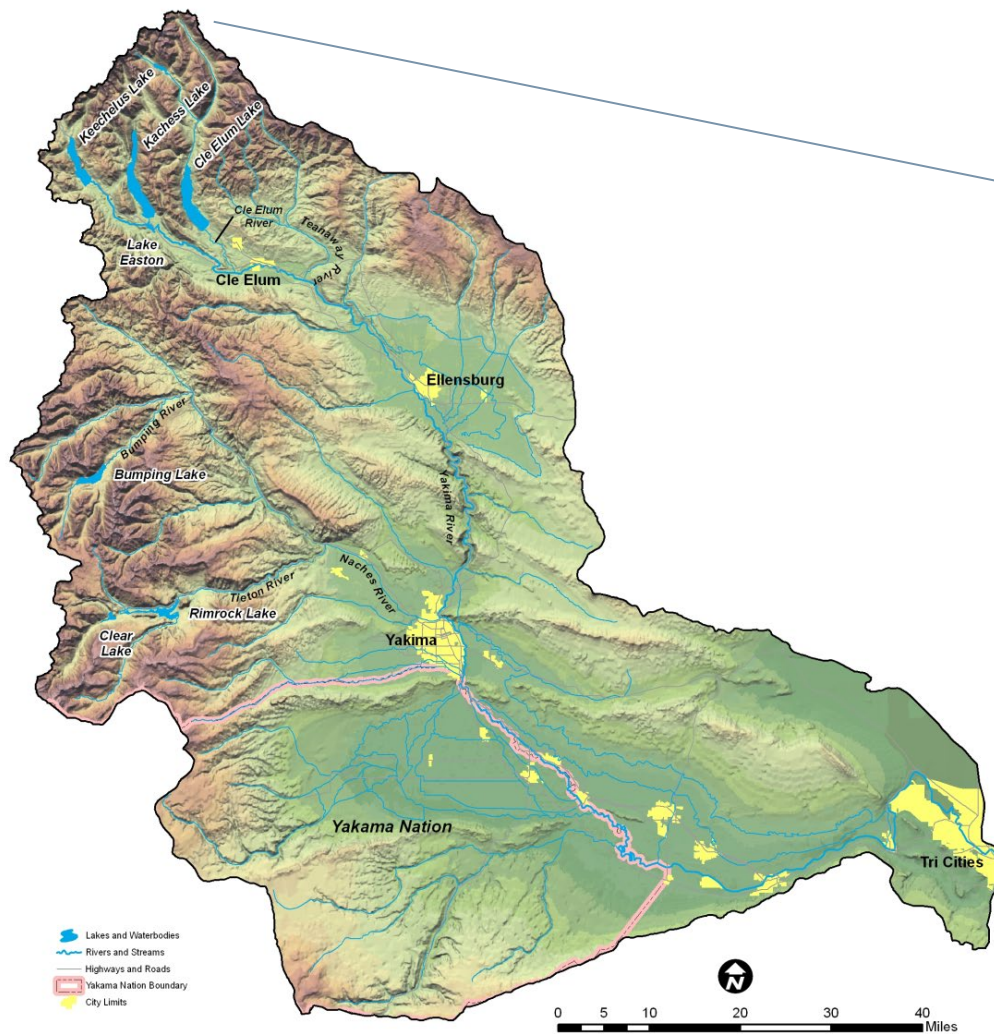
Yakima River Salmon & Steelhead Status and Trends Update

➤ Stock status and trend data:

1. VSP- Viable Salmonid Parameters: **Spawner abundance**, **Productivity**, spatial distribution and Diversity
2. Trends in adult & juvenile abundance
 - All Anadromous stocks (run at large)
 - Individual Steelhead populations
3. Productivity
 - Definition and role in Recovery
 - Trends in steelhead productivity
 - Life-Stage partitioning



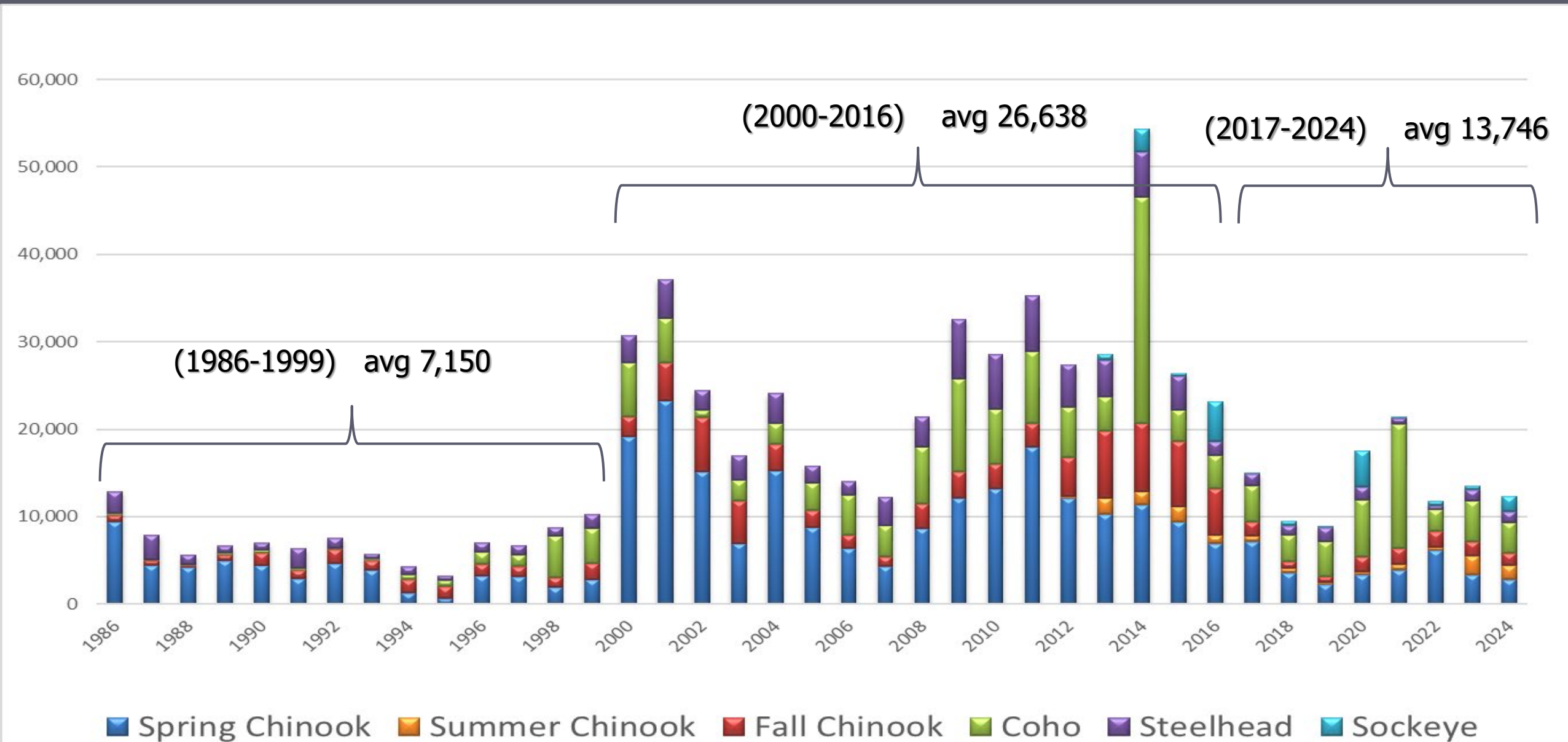
YAKIMA BASIN



- Historic Salmon/Steelhead Runs:
 - 600K-1M
- Second Only to Snake River Basin
- -Spring, Summer, Fall Chinook
- -Sockeye
- -Steelhead
- -Coho

This reference graphic is intended for informational purposes only. It is meant to assist in feature location relative to other landmarks. Geographic features may have been intentionally simplified in an attempt to provide a more readable product. No representation is made as to the accuracy of this document.

Yakima River Salmon & Steelhead Status and Trends Update



Yakima River Summer Run Steelhead

Populations

upper Yakima R.

Gmean: 51
Gmean: 181
Gmean: 86

Naches R.

Gmean: 271
Gmean: 574
Gmean: 301

Toppenish Cr.

Gmean: 117
Gmean: 182
Gmean: 99

Satus Cr.

Gmean: 300
Gmean: 426
Gmean: 201

Yakima River steelhead status

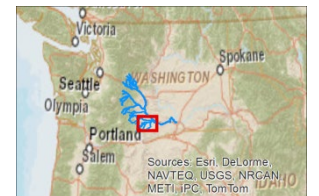
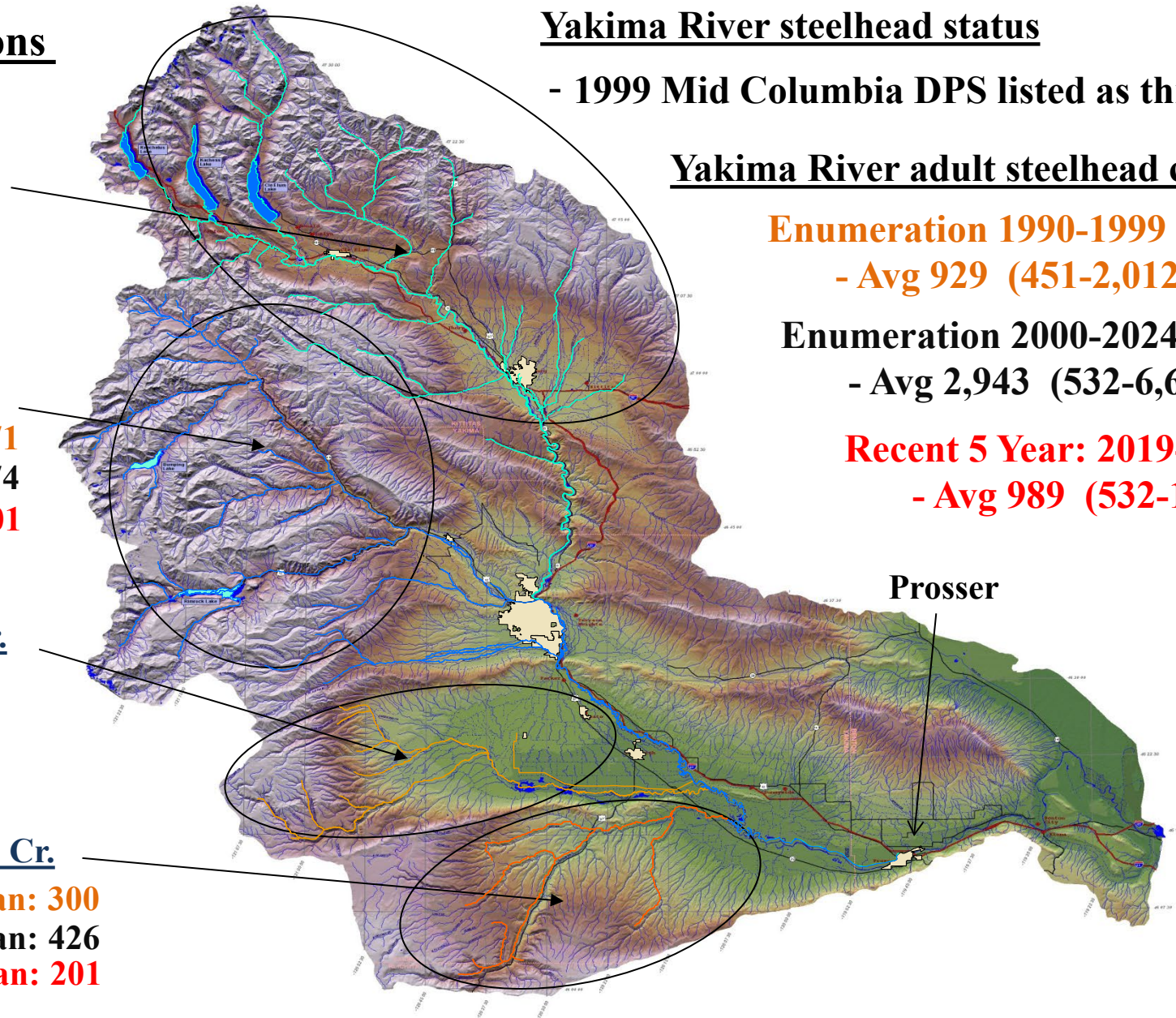
- 1999 Mid Columbia DPS listed as threatened

Yakima River adult steelhead counts

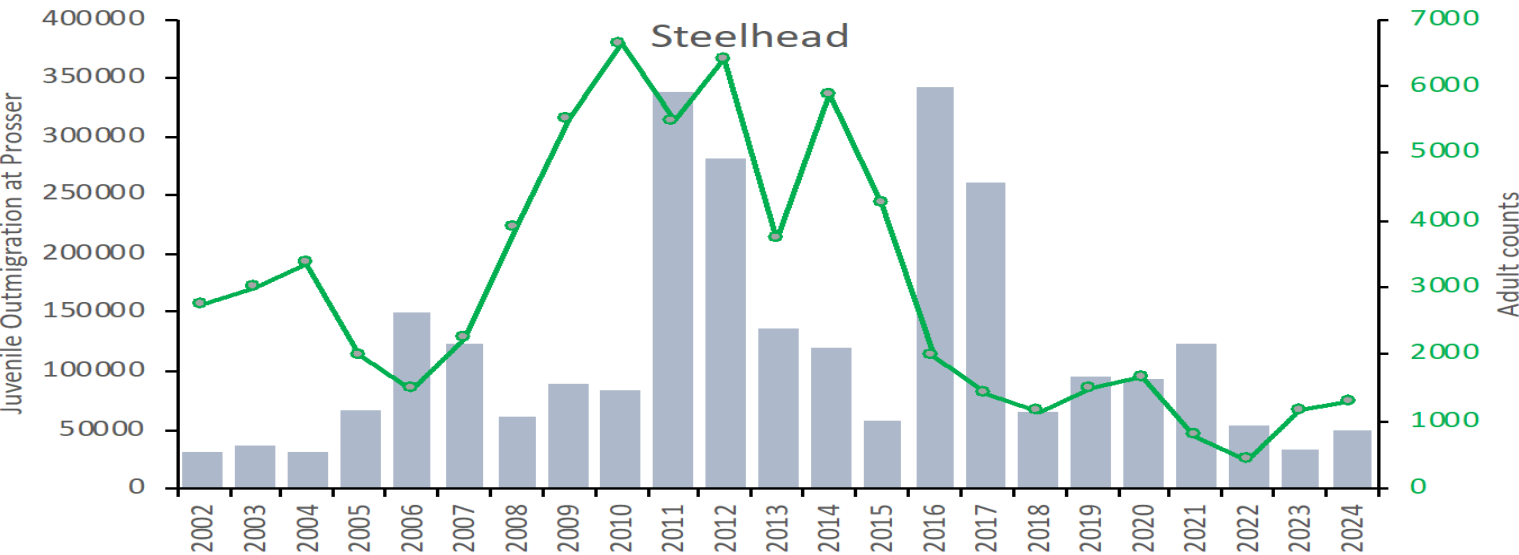
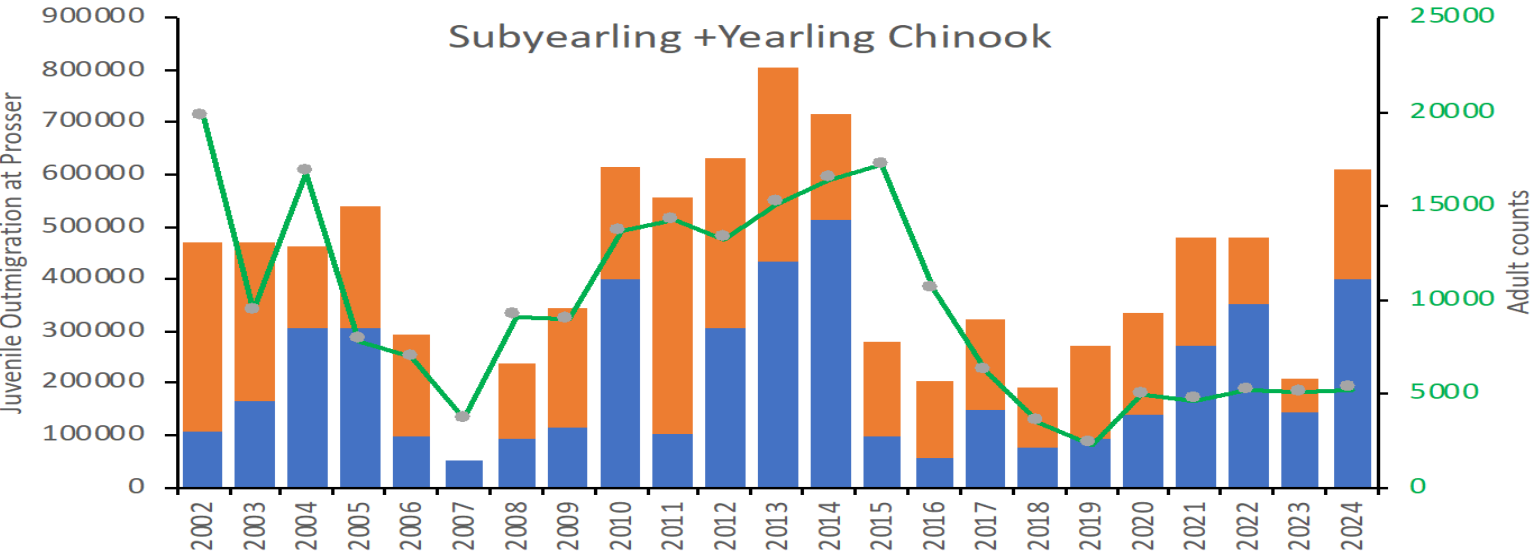
Enumeration 1990-1999
- Avg 929 (451-2,012)

Enumeration 2000-2024
- Avg 2,943 (532-6,602)

Recent 5 Year: 2019-2024
- Avg 989 (532-1,650)



Juvenile Outmigration and Adult Returns



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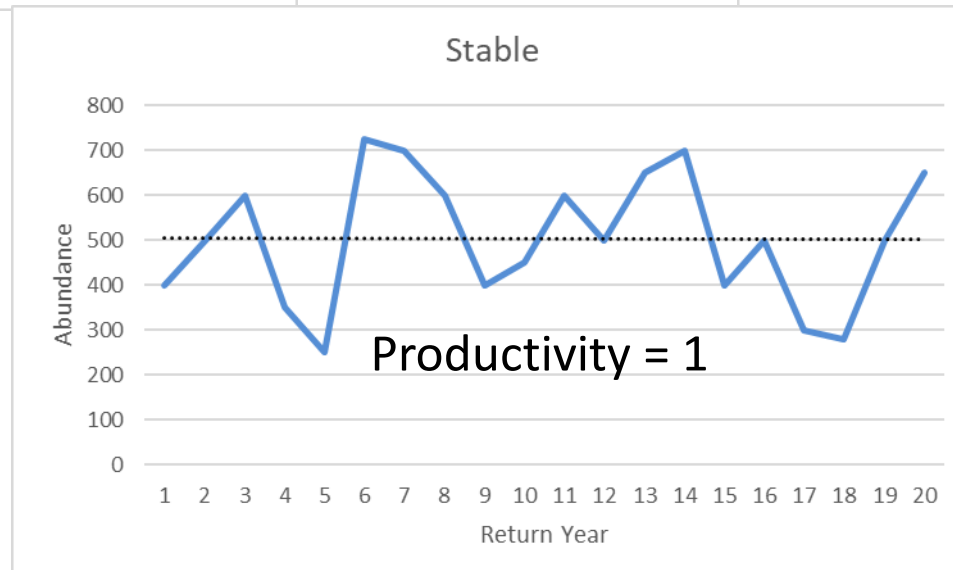
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Viability Salmonid Populations and the Recovery of Evolutionarily Significant Units: Productivity Excerpts (McElhany 2000)

- A population meeting or exceeding abundance criteria for viability should, on average, be able to replace itself (adult to adult ratio =1)
- Estimates of population growth rate (i.e., productivity over the entire life cycle) that indicate a population is consistently failing to replace itself, are an indicator of increased extinction risk, no matter what the cause.
- A viable salmonid population should exhibit sufficient productivity during freshwater life-history stages to maintain its abundance at or above viable thresholds—even during poor ocean conditions.
- Population Growth Rate is the bottom line in any population assessment

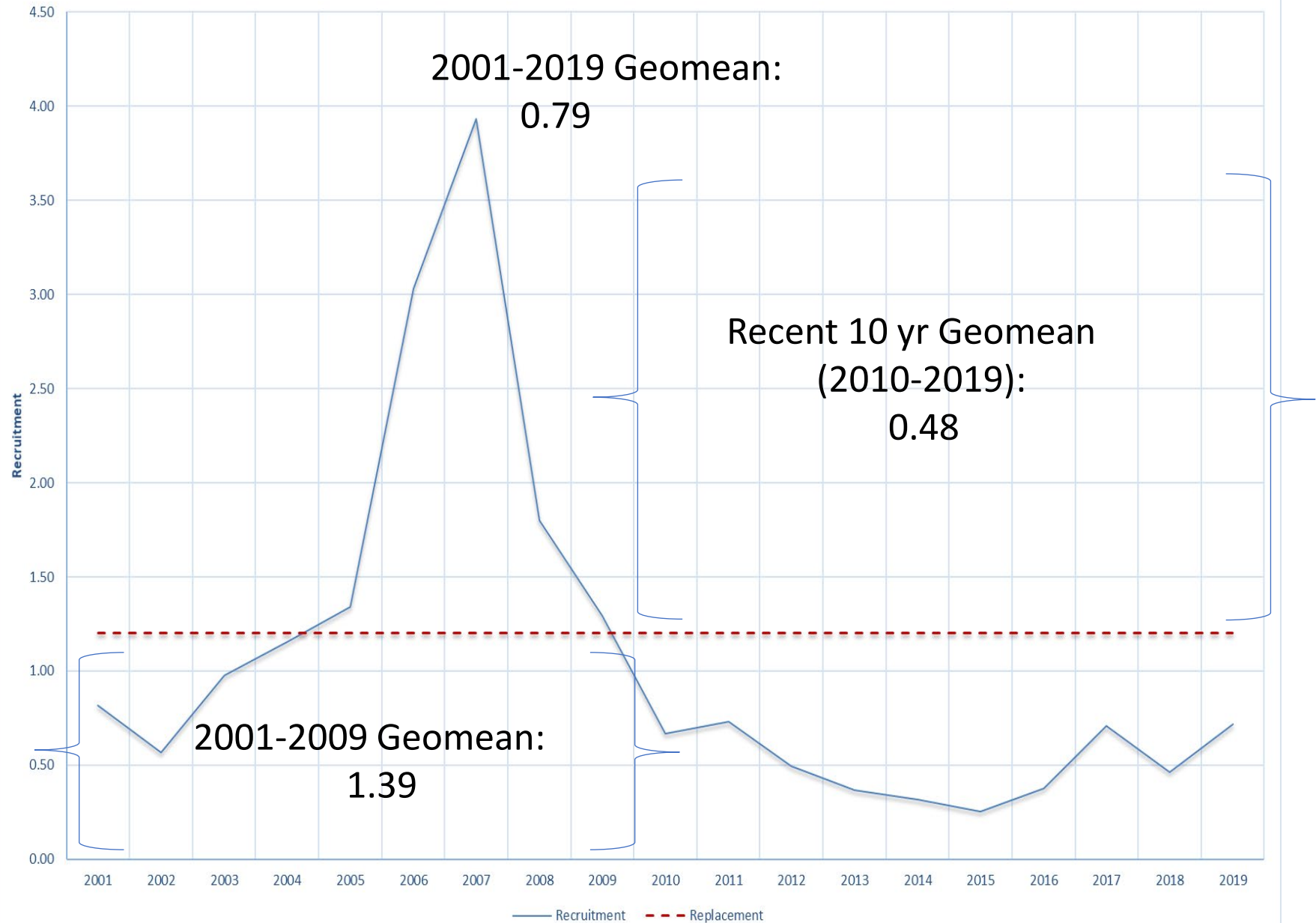
Population Abundance and Productivity Trends: Examples



*NOAA Productivity
Recovery Criteria:

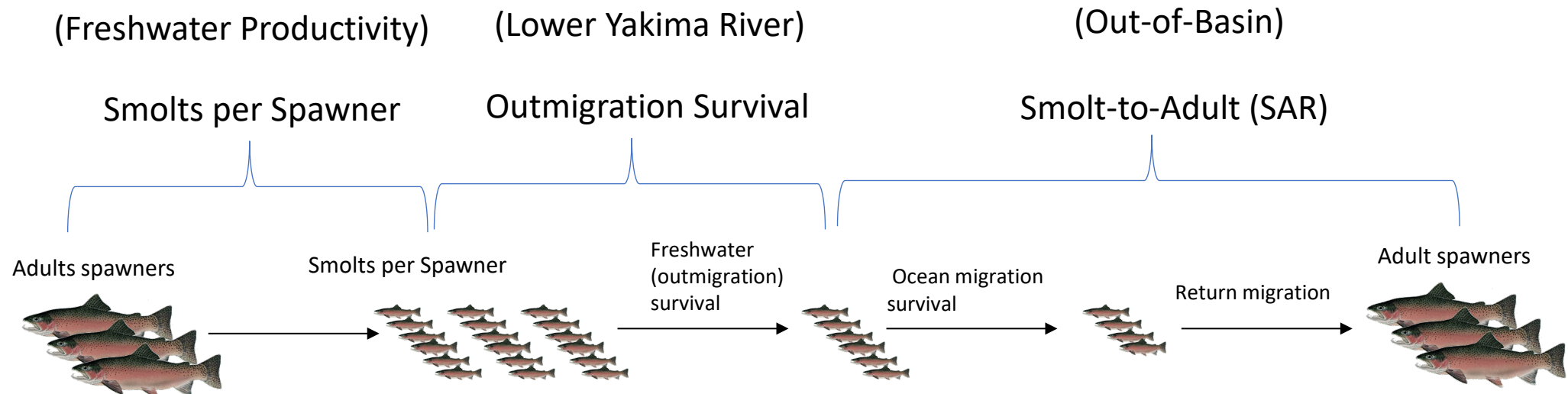
10-12 year Geomean = 1.2

**Yakima River Steelhead Adult Recruitment 2001-2019:
Spawner to Spawner Productivity**



Population Productivity Simplified:

$$\text{Smolts/Spawner} * OS * SAR = \text{Productivity}$$



Yakima River Steelhead Productivity:

Upper Yakima Smolts per Spawner

2011-2021 Smolt production estimates
(Temple 2023)

Avg = 49 Smolts per spawner

SARs

Comparative Survival Studies: 2002-2019 Outmigration years

McN JV – McN Adult

*Adjusted for Yakima Mouth JV to spawning grounds

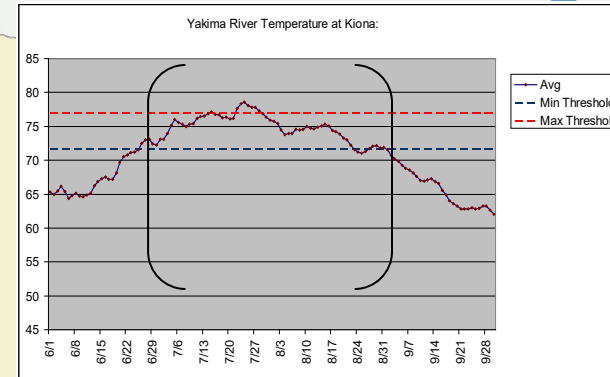
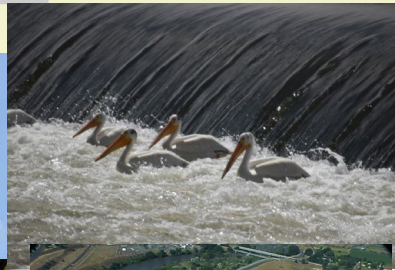
Avg = 3.09%

$OS = \text{Productivity} / (\text{Smolts/Spawner}) * SAR$

Outmigration Survival?

Productivity (1.20): $S > 78\%$

Day 2: Lower Yakima River



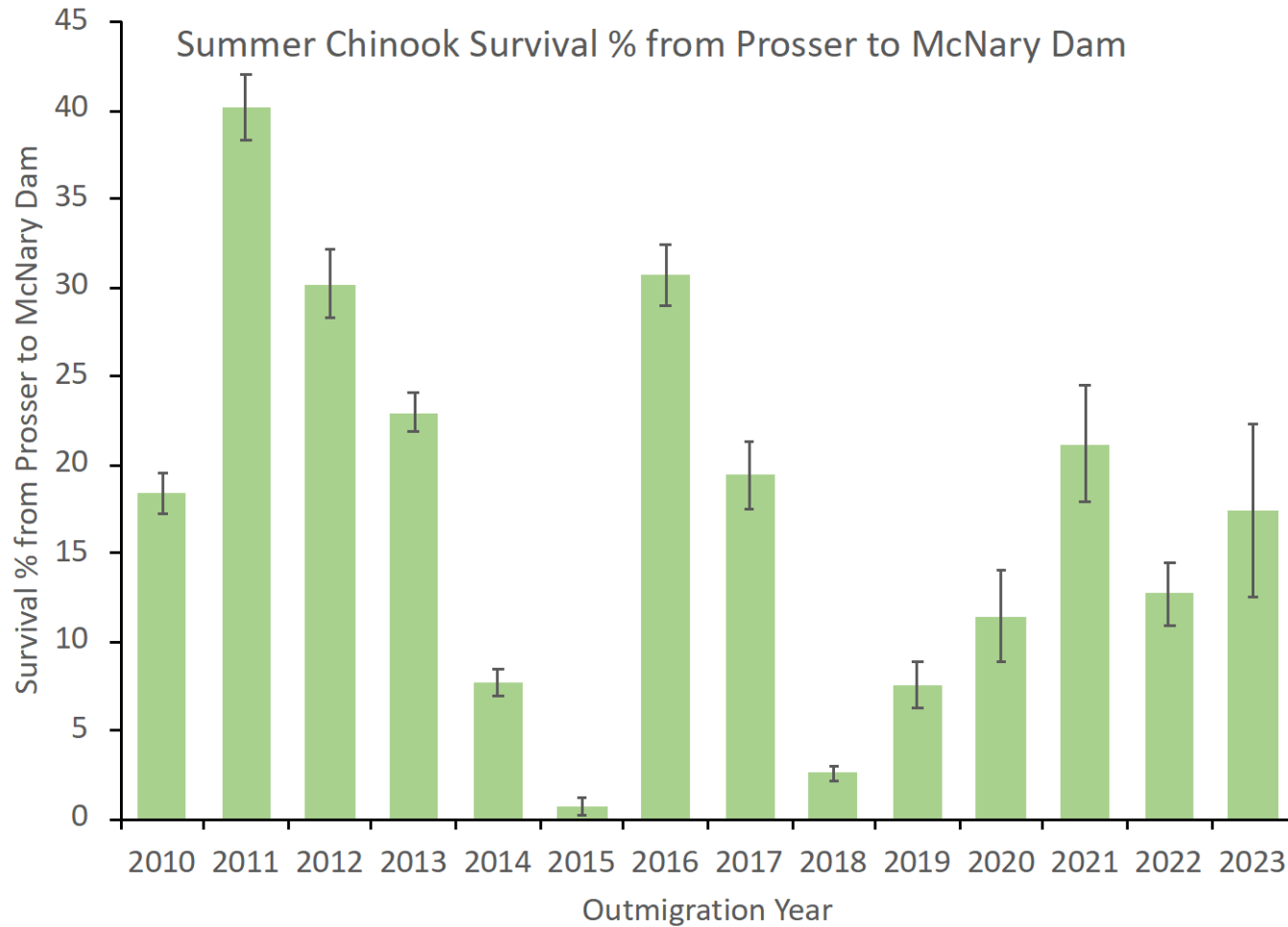
Yakima River: Anadromous Species
- Smolt Outmigration Survival

Yakima River: Lower River Thermal Barrier
-Adult Salmon & Steelhead
Upstream Migrants

Columbia River

Yakima River

Juvenile Survival (Summer Chinook)



2010-2023 Avg:
~17.39%

Yakima Basin Salmon & Steelhead Trends: The Good, the Bad, and the Ugly

- The Good: Yakima River Salmon and Steelhead have shown they can respond to favorable environmental conditions and produce significant adult returns. Habitat Restoration will continue to be critical factor for improving freshwater productivity (smolts per spawner) to buffer against drought conditions.
- The Bad: Unfavorable conditions across multiple environmental landscapes have led to severe declines in recent years that have resulted in numbers not seen since the time of ESA listing.
- The Ugly: Outmigration Survival has proven to be a major bottle neck hampering all salmonid species in the lower River. Both environmental and biological conditions will need major attention and work in order to improve conditions

