Status of ESA-listed salmon and steelhead in the Upper Columbia

Katie Barnas

Northwest Fisheries Science Center

NOAA FISHERIES

Acknowledgements

- NWFSC: Eli Holmes, Mari Williams, Damon Holzer, Mike Ford, Monica Diaz

- Data collection and compilation from multiple state, tribal and other sources including WDFW, Confederated Tribes of the Colville Reservation, Yakima Nation, Chelan and Douglas PUDs, Coordinated Assessments

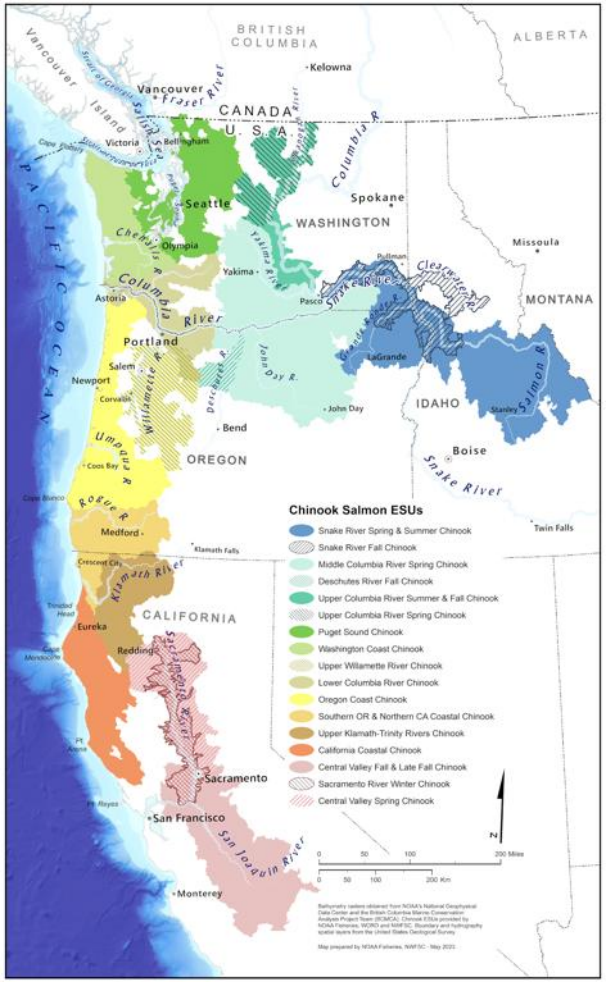
What is “status” ?

Endangered Species Act:

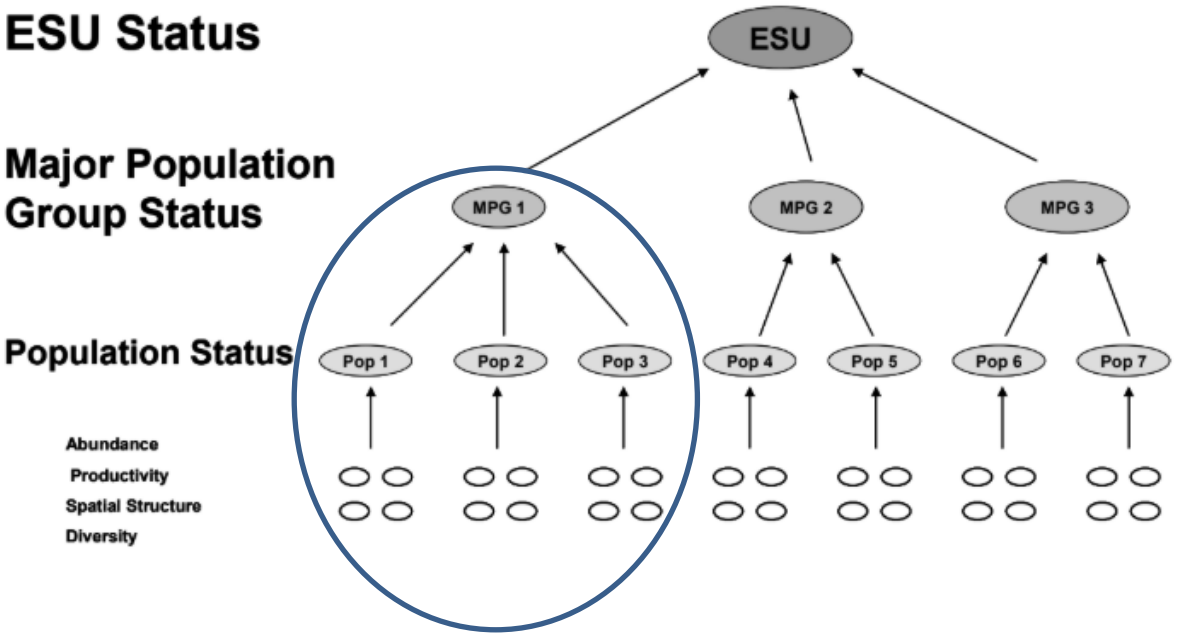
- Not Warranted= low risk of extinction
- Endangered = at risk of extinction
- Threatened = likely to be at risk of extinction in the foreseeable future

1991 NMFS ESU policy

- A Distinct Population Segment for Pacific salmon = an Evolutionarily Significant Unit (ESU)
- A population or group of population is an ESU if it is …
  - Substantially reproductively isolated from other population groups, and
    - Genetics, distance, tagging
  - An important component of the evolutionary legacy of the entire species
    - Genetics, ecology, life-history
- 2005 hatchery policy
  - Hatchery fish included in ESU if they are similar to natural fish (no more different than natural population within ESU)



Recovery/viability goals



Interior Columbia Technical Recovery Team Viability Criteria, 2007

Viability goals

Abundance (500 – 2000 natural spawners, population specific)

Productivity (compensatory recruitment at low abundance, recruits/natural spawner, population growth rate)

Spatial Structure (habitat distribution and occupancy, spawning areas)

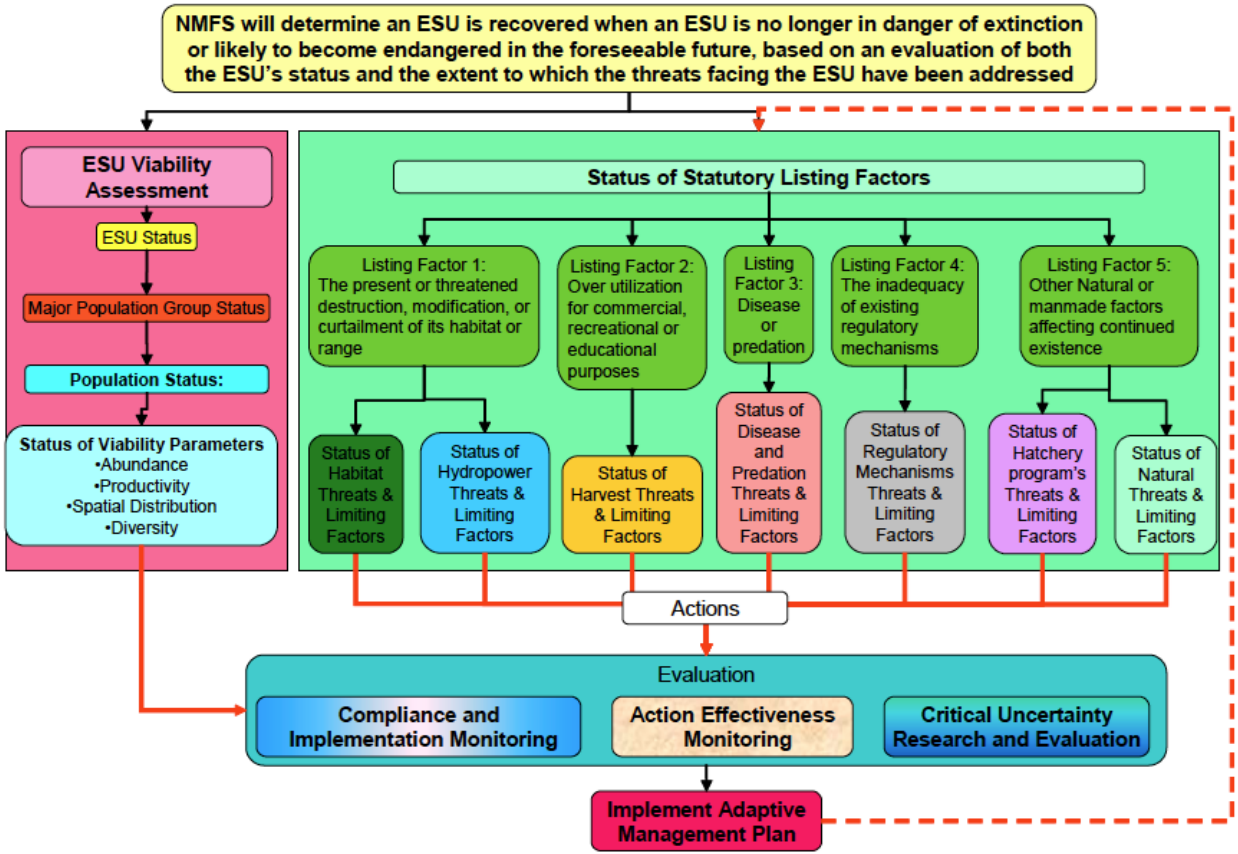
Diversity (life history, migration timing, genotype, phenotype, proportion natural fish, stray rate)

ESUs that contain only one MPG should meet the following criteria:

1. Two-thirds or more of the historical populations within the MPG should meet viability standards; AND
2. At least two populations should meet the criteria to be “Highly Viable.”

Interior Columbia Technical Recovery Team Viability Criteria, 2007

Factors related to ESA status

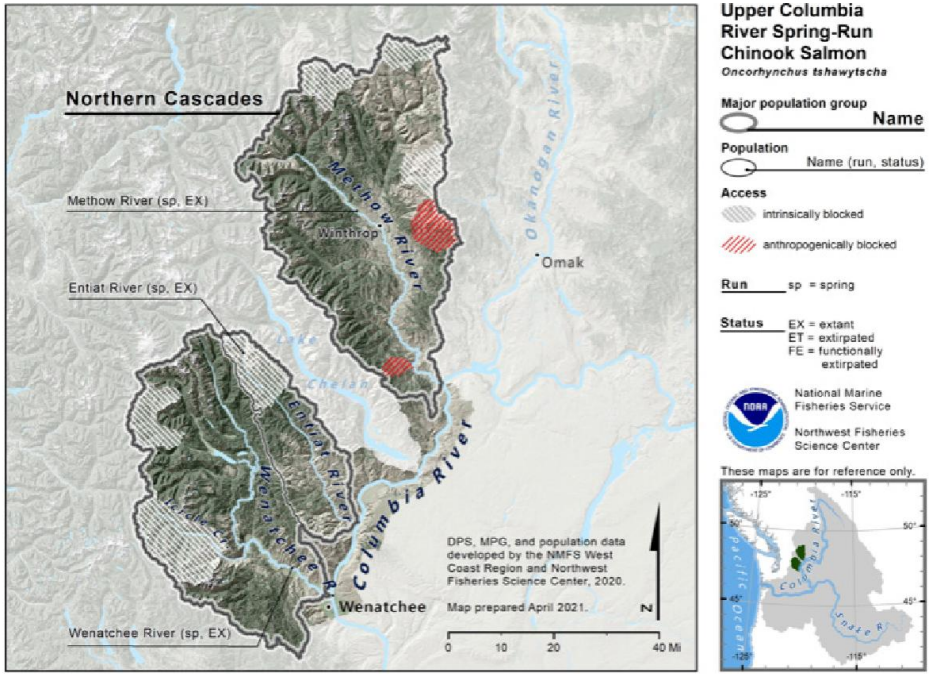


Goals for this talk

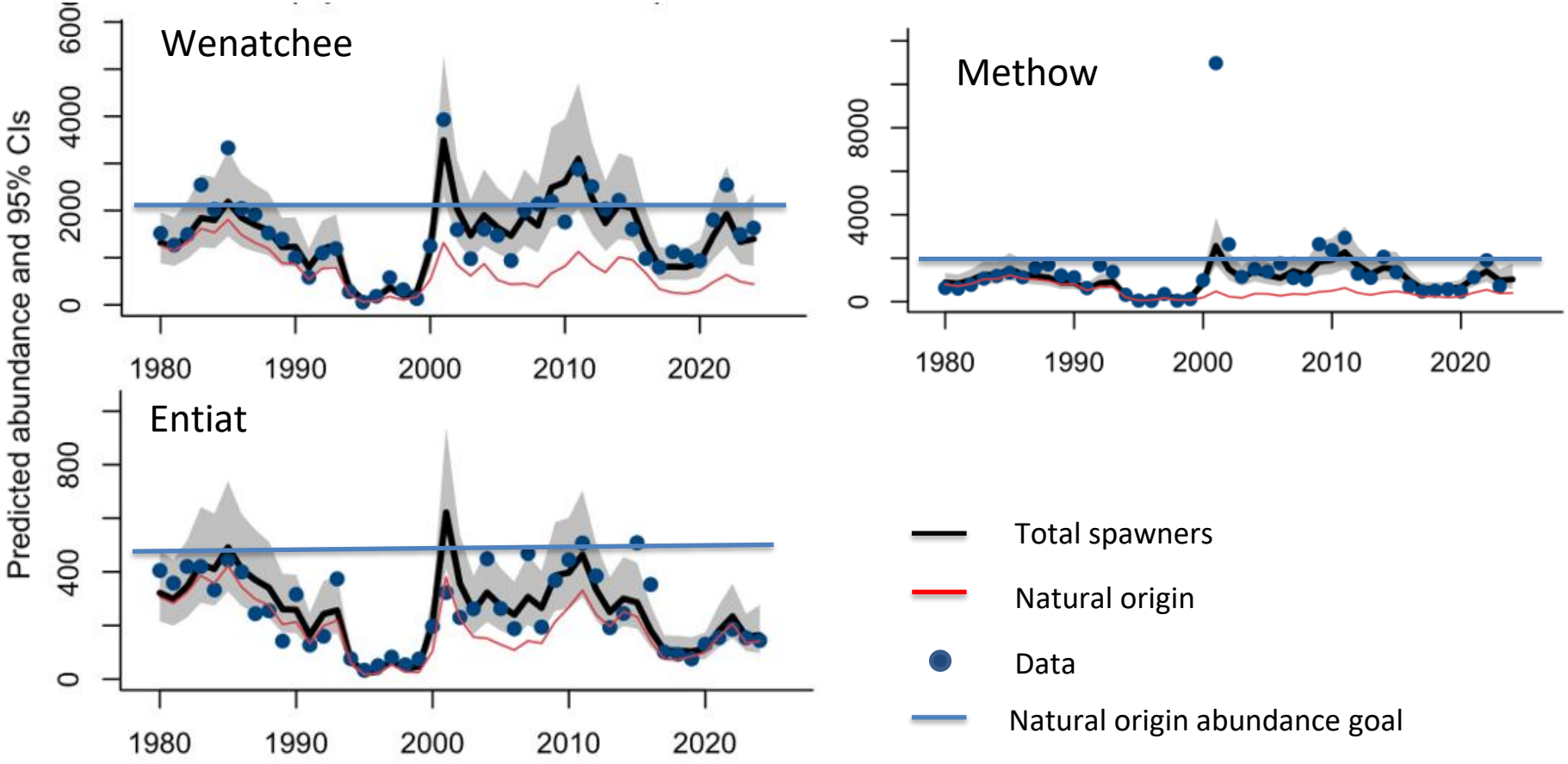
- 2-3 yrs of new data since 2022 viability report
  - Coordinated Assessments (https://cax.streamnet.org/)
  - WDFW – Salmon Population Indicators (https://data.wa.gov/Natural-Resources-Environment/WDFW-Salmonid-Population-Indicators-SPI-Escapement)
- Summarize viability report conclusions for VSP and Listing Factors
- Open Science – transparency, accessibility, reusability

Status Update: UC spring Chinook

- Upper Columbia Spring Chinook (1999, endangered)
  - 3 extant populations
    - Wenatchee
    - Entiat
    - Methow

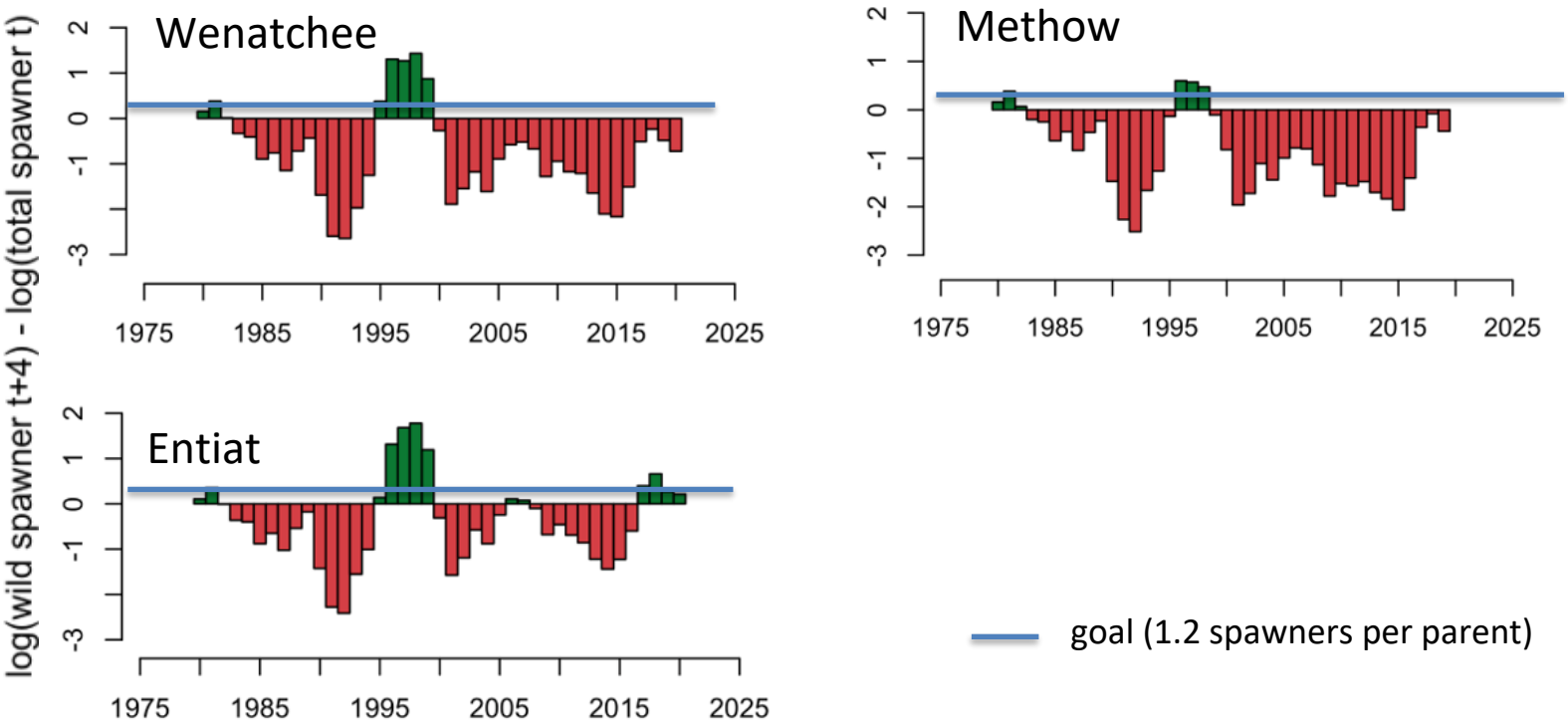


UC spring Chinook: Abundance

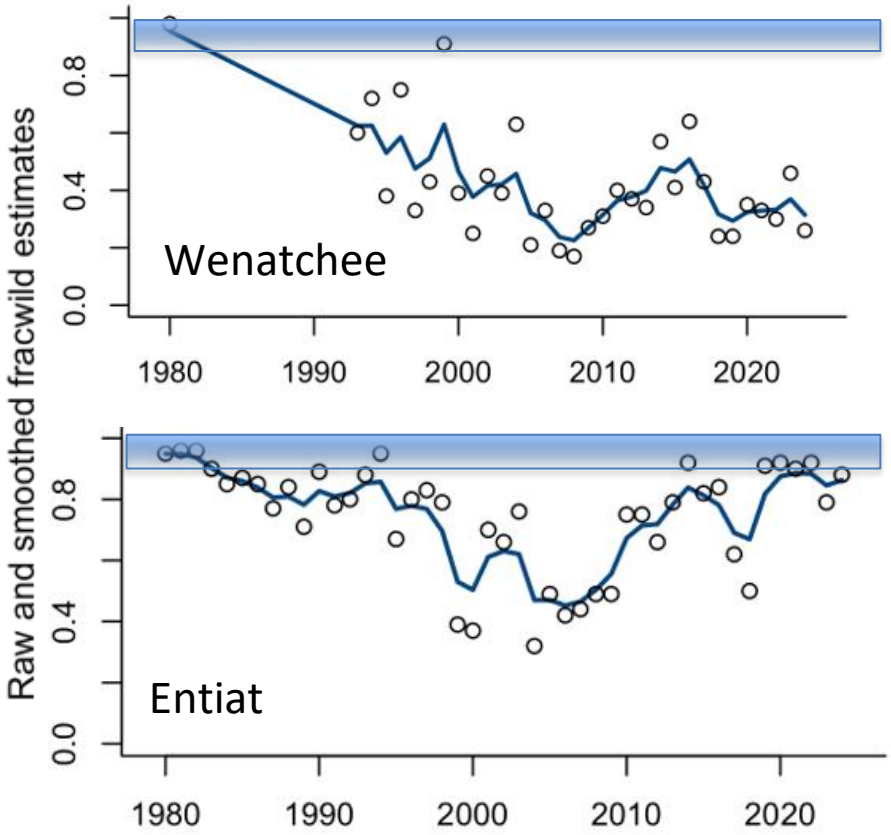


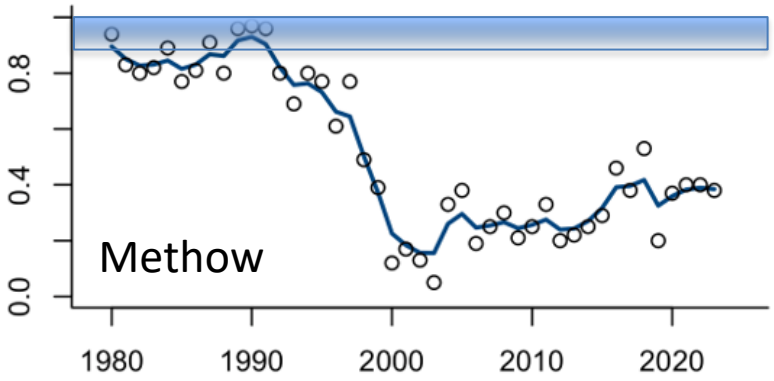
UC spring Chinook: Productivity

(log natural-origin spawner to total natural spawner ratios)



UC spring Chinook: Diversity (fraction natural origin)





Approx. goal

Population	2001-2005	2006-2010	2011-2015	2016-2020	2021-2025
Entiat R.	0.59	0.52	0.79	0.76	0.87
Methow R.	0.21	0.24	0.26	0.39	0.39
Wenatchee R.	0.39	0.25	0.42	0.38	0.34

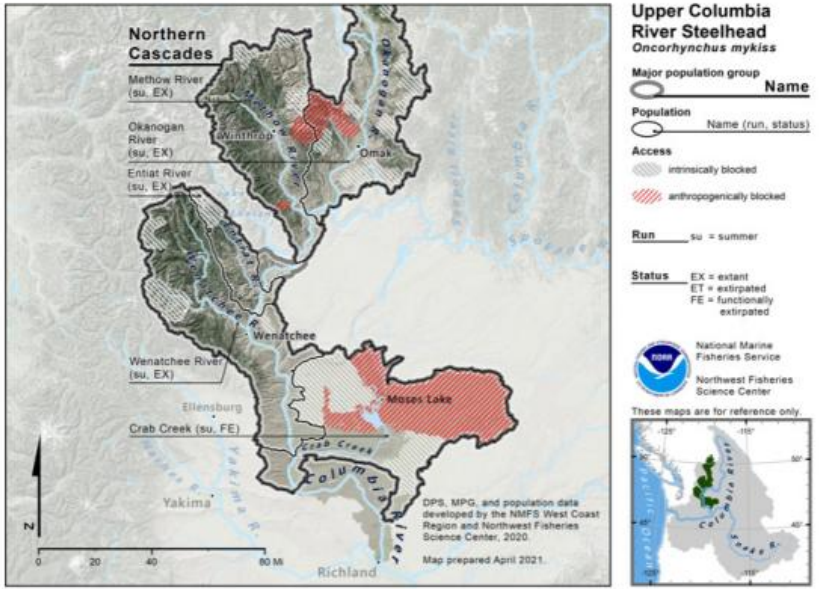
spring Chinook: 2022 viability report

	Abundance/productivity (A/P) metrics				Spatial structure/diversity (SS/D) metrics			Overall risk rating
Population	ICTRT threshold	Natural spawning	ICTRT productivity	Integrated A/P risk	Natural processes	Diversity risk	Integrated SS/D risk	
Wenatchee River SP	2,000	630 (SD 261)	0.89 (0.09, 17/20)	High	Low	High	High	High
Entiat River SP	500	193 (SD 126)	0.90 (0.14, 19/20)	High	Moderate	High	High	High
Methow River SP	2,000	323 (SD 251)	0.49 (0.33, 19/20)	High	Low	High	High	High

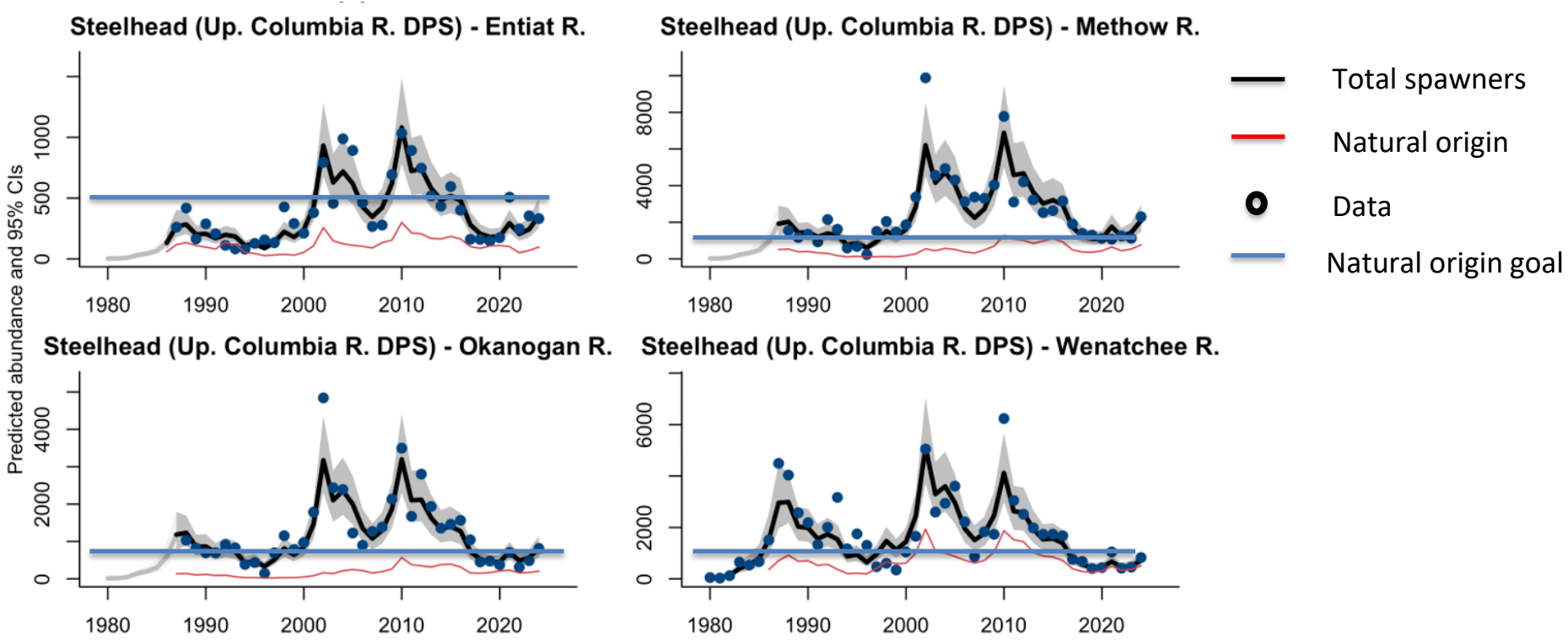
Overall risk scores unchanged since 2010 review

Status Update: UC steelhead

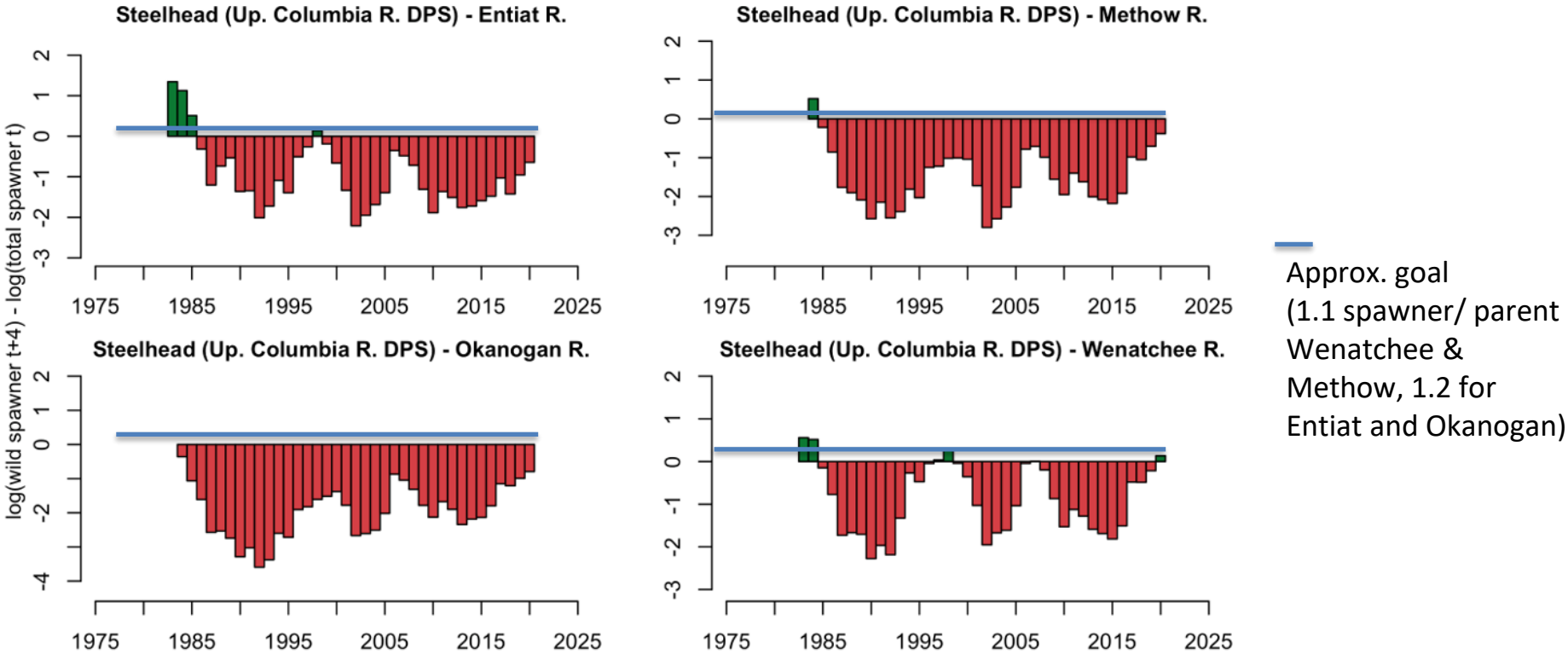
- Upper Columbia Steelhead (1997, threatened)
  - 4 extant populations
    - Wenatchee
    - Entiat
    - Methow
    - Okanogan



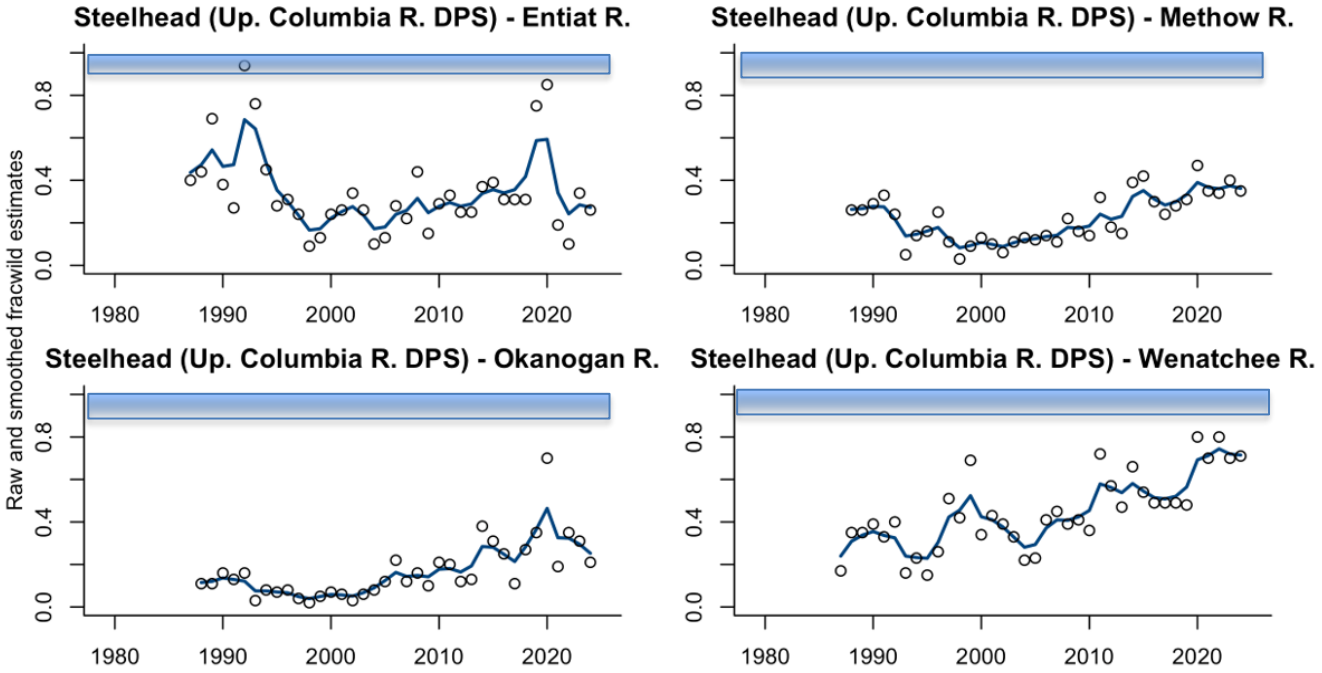
UC steelhead: Abundance



UC steelhead: Productivity



UC steelhead: Diversity (fraction natural origin)



Approx. goal

Population	2001-2005	2006-2010	2011-2015	2016-2020	2021-2025
Entiat R.	0.22	0.28	0.32	0.51	0.22
Methow R.	0.10	0.15	0.29	0.32	0.36
Okanogan R.	0.07	0.16	0.23	0.34	0.27
Wenatchee R.	0.32	0.40	0.59	0.55	0.73

UC steelhead: 2022 viability report

Population	Abundance/productivity (A/P) metrics				Spatial structure/diversity (SS/D) metrics			Overall risk rating
	ICTRT threshold	Natural spawning	ICTRT productivity	Integrated A/P risk	Natural processes	Diversity risk	Integrated SS/D risk	
Wenatchee River	1,000	931 (SD 667)	0.95 (0.06, 13/20)	Moderate	Low	High	High	High
Entiat River	500	140 (SD 89)	0.433 (0.17, 20/20)	High	Moderate	High	High	High
Methow River	1,000	703 (SD 297)	0.20 (0.22, 12/20)	High	Low	High	High	High
Okanogan River	750	297 (SD 189)	0.09 (0.25, 19/20)	High	High	High	High	High

Overall risk scores mainly unchanged since 2010 review

Listing factor conclusions from 2022 status review

Factor A: Habitat

- Much effort to improve habitat
- Opportunities exist to improve habitat: water quality and quantity, riparian condition, floodplain function

Factor B: Harvest, overutilization

- Ocean harvest negligible
- Freshwater impacts limited (~10% for spring Chinook, less for steelhead)
- Scientific take not considered to be significant factor

Listing factor conclusions from 2022 status review

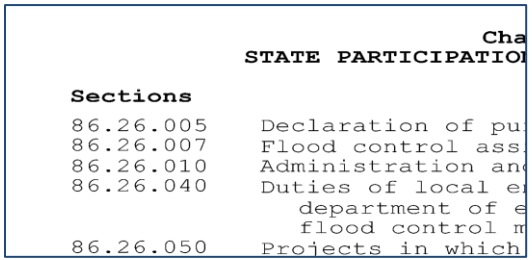
Factor C: Disease, predation

- Bird and fish predation on smolts likely similar to last review
- Pinniped predation on spring Chinook adults estimated to be quite high (20-40%)
- Recommended actions include continued efforts to monitor and mitigate predation

Seattle Times

Factor D: Regulatory mechanisms

- Little change from past reviews
- Concerns about effectiveness monitoring
- Stream temperatures, water policies
- Policies that favor infrastructure over salmon



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Sections

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86.26.040 Duties of local e
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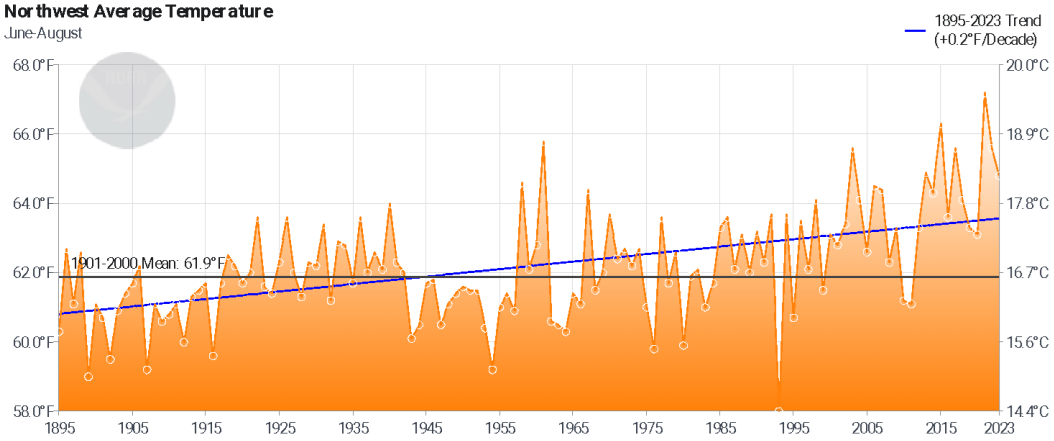
86.26.050 Projects in which

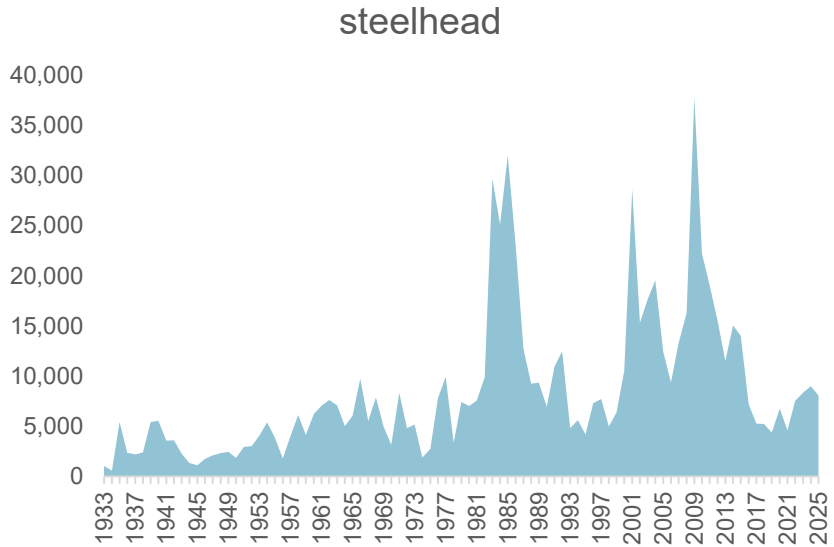
Listing factor conclusions from 2022 status review

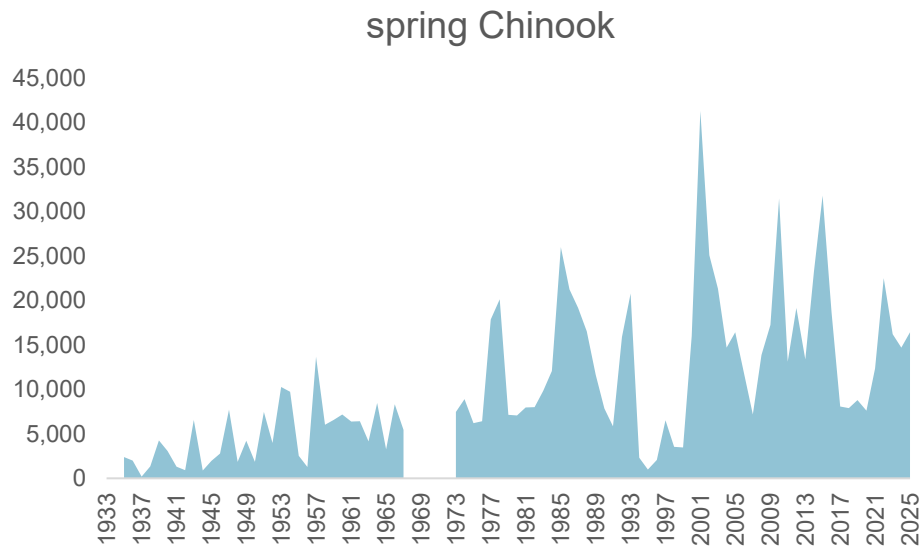
- Factor E: climate
  - Changing ocean climate
  - Warming stream temps
  - Increasing fires
  - Both species vulnerable
- Factor E: hatcheries
  - Risks assessed as improving (higher fraction wild, improved practices, reduced releases)



https://www.ncei.noaa.gov

90 year view





Rock Island Dam Counts

Data: Chelan County PUD, DART

Status Summary

Recovery is a slow process…

- For both ESUs status has improved since listing, and probably since the mid-20th Century
- New challenges - increasing threats from predation, warming stream temperatures
- All populations in both ESUs remain far from recovery goals

25 years of salmon recovery data and products

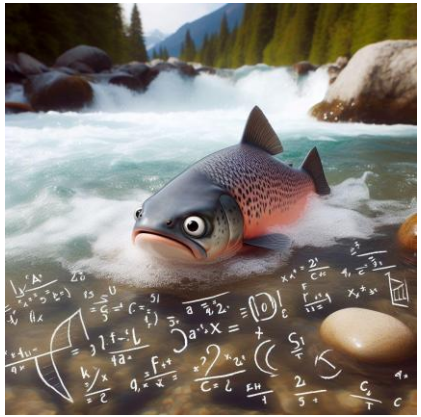
Making salmon related data more findable, accessible, and reusable

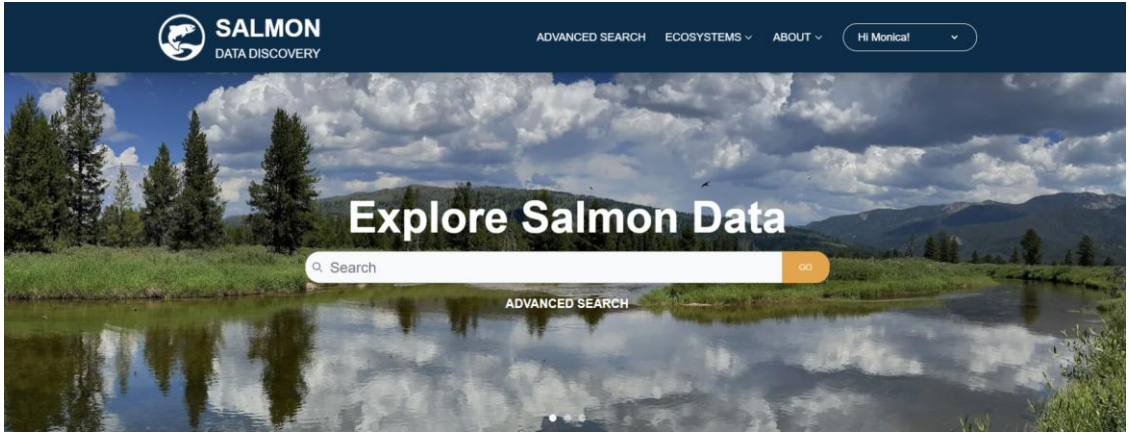
Problem:

- Where to find the data we need
- Where to house the data products we create
- Data stored separately from reports

Solution:

Develop a web-based tool where salmon datasets, derived products and documents across all ecosystems can be accessed





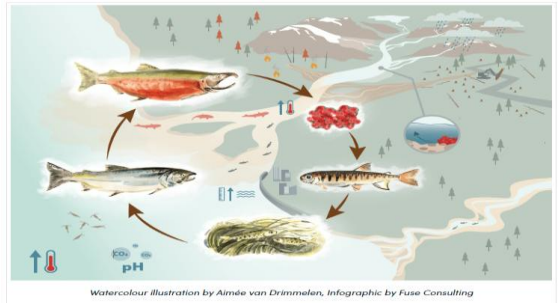
Salmon Data Discovery Tool

A Salmon Database Partnership

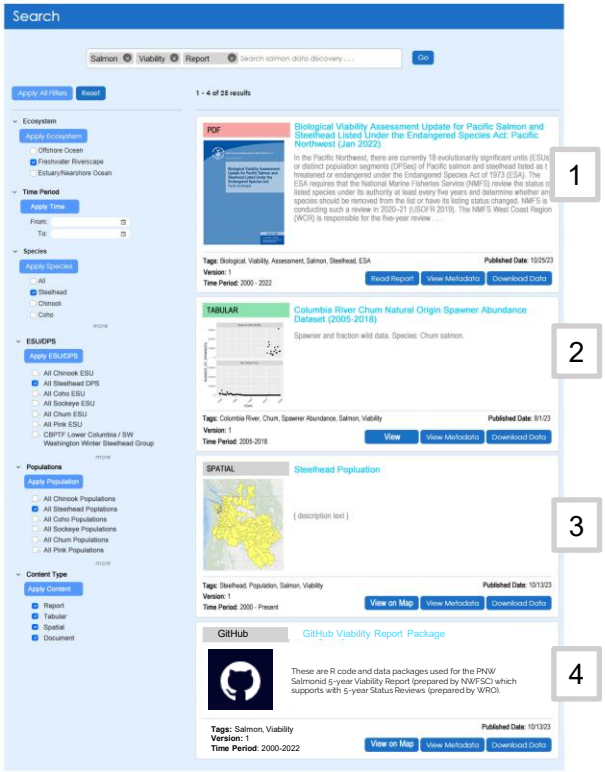
This web-based data repository fills a need to publicly house salmon relevant data and products currently held by various organizations, co-managers, and research scientists.

Scope:

- **Geographic:** West Coast of North America waters with Pacific salmon
- **Species:** prey/predator/competitor, critical ecosystem indicator
- **Contributors:** anyone!
- **Data types:** documents, data files, derived data products, spatial data, GitHub links

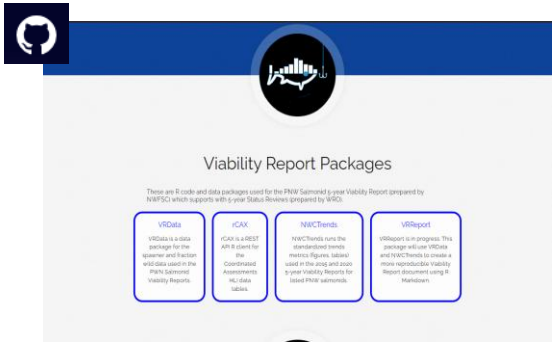


Salmon Data Discovery Tool



2022 Viability Report

1. **Report** https://library.oarcloud.noaa.gov/
2. **Data** https://www.webapps.nwfsc.noaa.gov/sps
3. **Spatial Layers**
4. **R package** https://github.com/nwfsc-math-bio/NWCTrends



SALMON
DATA DISCOVERY

ADVANCED SEARCH ECOSYSTEMS ABOUT LOGIN

Filter Options

- Freshwater Riverscape (3)
- Off-Shore Ocean (0)
- Estuary/Nearshore Ocean (0)

Species

Filter Options

- Chinook (3)
- Steelhead (3)
- Sockeye (1)
- Coho (0)
- Chum (0)

Show 2 more

ESU/DPS

Filter Options

Show 49 more

Intrinsic Potential - Interior Columbia Basin (steelhead, stream-type Chinook)

Built using 1:100k, NHD Hydrography - We developed a reach level intrinsic potential (IP) analysis for application to stream-type Chinook and steelhead spawning reaches to assess habitat quality within currently and historically occupied portions . . .

Tags: chinook, snake river, steelhead, habitat, ICTRT, Interior Columbia Basin, Intrinsic potential, spawn . . .

(82) (7) **Type:** Spatial **Version:** 3 **Published:** 2025

Required Survival Rate Changes to Meet Technical Recovery Team Abundance and Productivity Viability Criteria for Interior Columbia River Basin Salmon and Steelhead Populations

In this document we describe the “gap” in abundance and productivity between current status and Interior Columbia Technical Recovery Team (ICTRT) abundance and productivity criteria for viable populations. We briefly describe the difference between . . .

Tags: ICTRT, interior Columbia, gaps, survival

(28) (3) **Type:** Document **Version:** 1 **Published:** 2007

Viability Criteria for Application to Interior Columbia Basin Salmonid ESUs

The Interior Columbia Basin Technical Recovery Team (ICTRT) developed a set of viability criteria and guidelines specific for Interior

https://sddt.psmfc.org/

Questions?

https://sddt.psmfc.org/

June's Digger. Mari Williams, 2018