Statewide Salmon Forecast Meeting

WDFW Fish Program staff

February 28, 2025

Washington Department of FISH & WILDLIFE

Public Meeting Guidelines and Etiquette

Public meeting guidelines and etiquette

- Upon joining the virtual meeting, your microphone will be muted automatically.
- In case of any technical issues during the meeting, notify us in the chat, and we will help you. The chat will only be monitored for technical assistance.
- Public comments are welcome and will be rotated between in-person and virtual attendees.
- To ask a question or make a comment, please use your device's "raise hand" feature. If on the phone, dial *9 on Zoom , if using a computer, click the hand/reactions icon at the bottom of your screen, and if in-person, please raise your hand.
- During the comment period, the host will enable you to unmute yourself. You can then unmute yourself by pressing the mute button on your device or dialing *6 on your phone.
- Keep discussions focused on the agenda items and questions at hand.

Public meeting guidelines and etiquette

- Offensive, disrespectful, or derogatory language, including profanity, personal attacks, threats, or insults towards individuals, governments, or organizations, is strictly prohibited.
- Assume positive intentions from those speaking and listen respectfully.
- To ensure a balanced discussion, limit your comments to two minutes with one clarifying follow-up question.
- Provide constructive feedback regarding the fisheries in which you participate. Remember that the most compelling comments are those that pertain to the topics under discussion.
- WDFW staff may close public comment to stay on schedule with the agenda or to provide others who still need to comment with an opportunity to speak.
- Hybrid meetings will be recorded and posted online.
- If you have further questions or comments, please submit them in written format on our public comment webpage.

Meeting Agenda

9:00 – 9:30	**Introduction** • Welcome and Opening Remarks • North of Falcon – Setting Salmon Fisheries in 2025	 Kelly Cunningham Kyle Adicks
9:30 – 11:00	**Salmon Forecasts 2025** • 2024/25 Environmental Outlook • Puget Sound and Coastal Chinook and Coho • Puget Sound and Coastal Chum, Pink, and Sockeye • Columbia River Salmon and Steelhead Stocks • PFMC Salmon Technical Team Review	 Mickey Agha Jake Rice and Christina Iverson Matthew Bogaard Shannon Conley Alex Safiq
11:30 – 2:00	**Regional Discussion Sessions** • Puget Sound Recreational OB2 - Auditorium • Ocean & Columbia River NRB – Rm 172 • Puget Sound Commercial NRB – Rm 175 • Coastal and Straits NRB – Rm 682	 Jake, Christina, Lyle, Hailey, and Reg. 6 & 4 staff Kyle, Kyle, Alex, and Columbia River staff Mickey, Sam, Edward, and Kwasi Chad, Marlene, and Region 6 staff

WDFW staff will take questions and comments following each presentation.
Regional discussion sessions will offer opportunities to ask questions and provide comments as well.

North of Falcon – Setting Salmon Fisheries in 2025

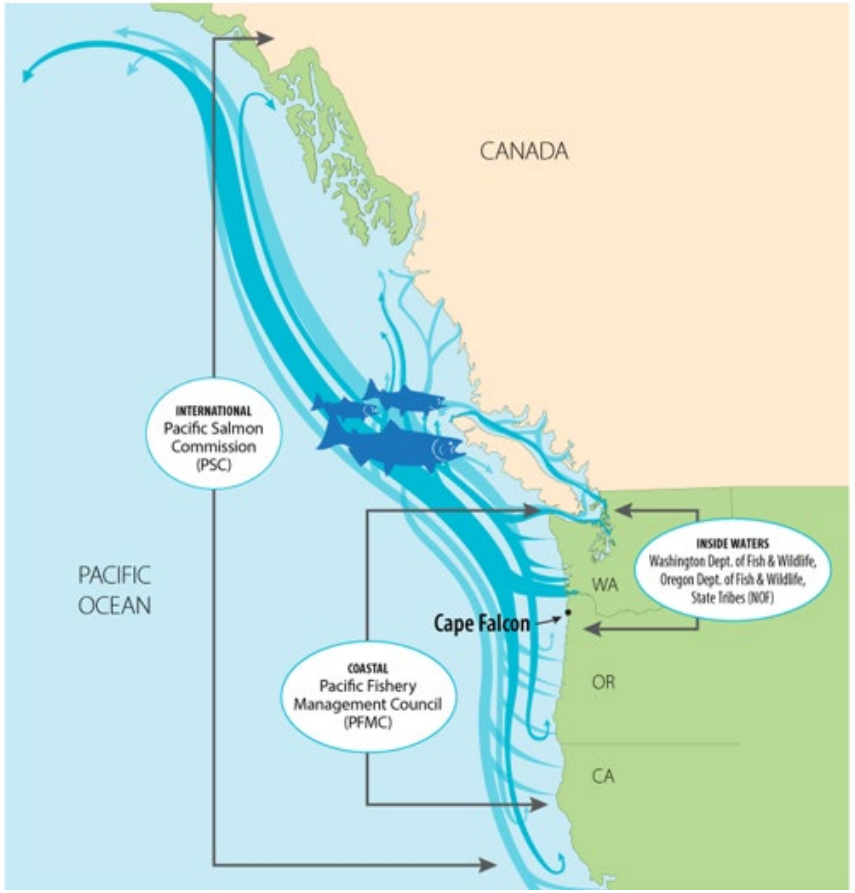
What is North of Falcon?

- North of Falcon is the annual, cooperative process to plan salmon seasons for Washington waters.
- The name refers to waters north of Oregon's Cape Falcon, which marks the southern border of Washington's management of salmon stocks.
- One component of a larger salmon season-setting process that also involves the state, tribal governments, federal regulators, other U.S. states, and Canada.

What guides North of Falcon?

Fishery managers must weigh many factors when developing salmon seasons, including:

- Endangered Species Act (ESA) constraints.
- Commission policy.
- Pacific Salmon Treaty obligations.
- Tribal co-management: Washington's treaty tribes manage their own fisheries, sharing data and splitting harvest with the state.
- Extensive monitoring and evaluation of fisheries statewide.



Inside, coastal, and international waters management

North of Falcon timeline (Jan-April)

JANUARY - FEBRUARY

WDFW

Develop salmon run forecasts.

FEBRUARY

WDFW & Tribal Governments

Release initial forecasts for Columbia River, Puget Sound, and Washington Coast.

MARCH

Pacific Fishery Management Council

WDFW works with state, tribal and federal fisheries managers and other representatives to develop preliminary options for ocean fisheries based on annual abundance forecasts.

MARCH

WDFW

Receive comments and feedback from public on potential fishing seasons based on pre-season forecasts.

Public meetings

- Coast Proposals
- Columbia River Proposals
- Puget Sound Proposals

MARCH - APRIL

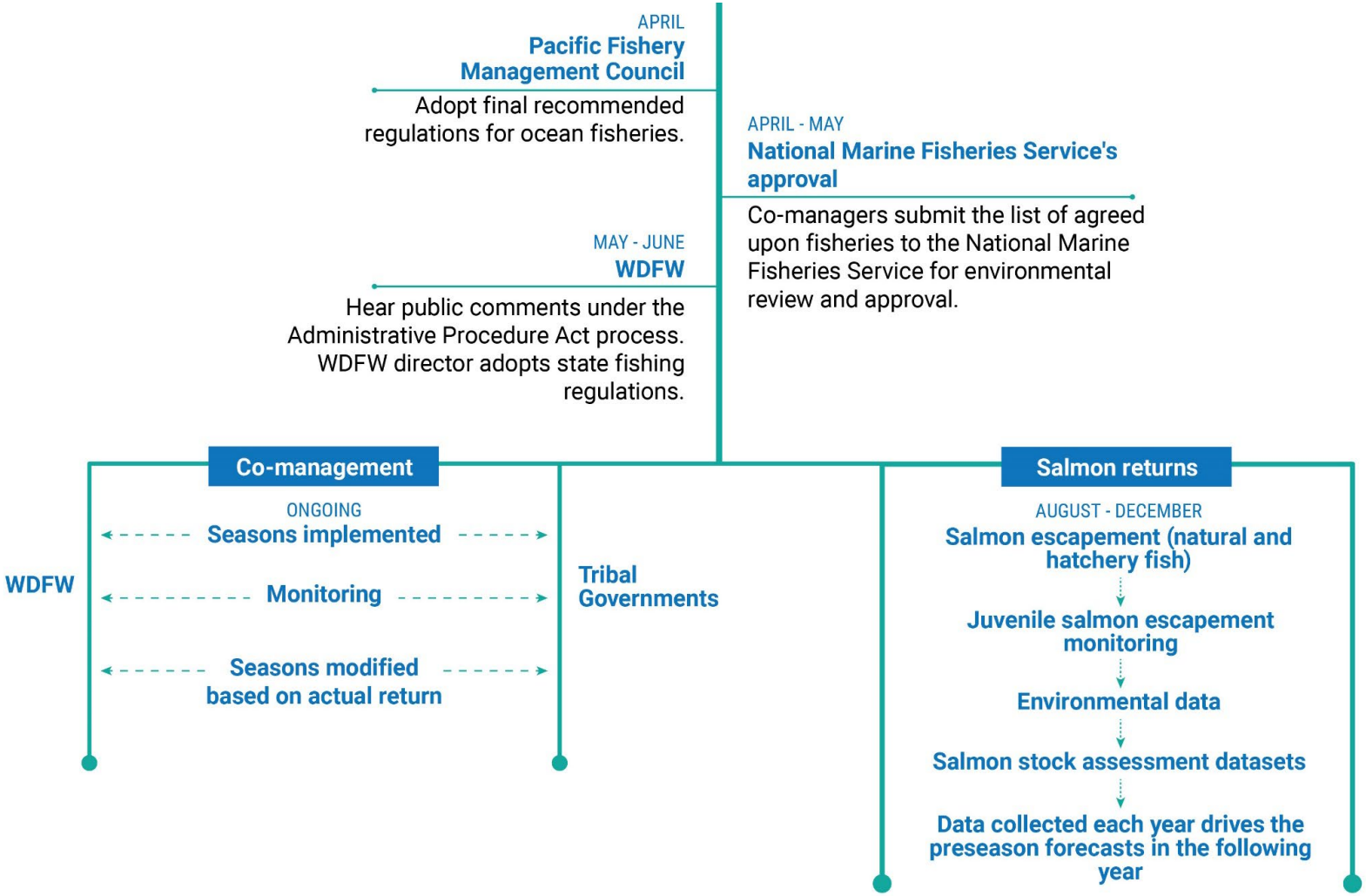
Draft regulations developed

Draft regulations for state fisheries developed based on public input, co-manager negotiations, and PFMC final regulations.

Conservation Objectives and Legal Framework

US v WA, *US v Oregon*, Magnuson-Stevens Act, Endangered Species Act, State Law and Pacific Salmon Treaty.

North of Falcon timeline (April – ongoing)



2025 NOF Meeting Schedule

Date	Meeting
Feb. 28	Statewide forecast meeting
March 5-11	Pacific Fishery Management Council meeting – Vancouver, WA
March 12	Willapa Bay and Grays Harbor fisheries
March 18	Columbia River Fisheries – upper Columbia River (including Hanford) and Snake River
March 19	North of Falcon #1 – Statewide proposals
March 24	PFMC public hearing – Westport, WA

2025 NOF Meeting Schedule (cont.)

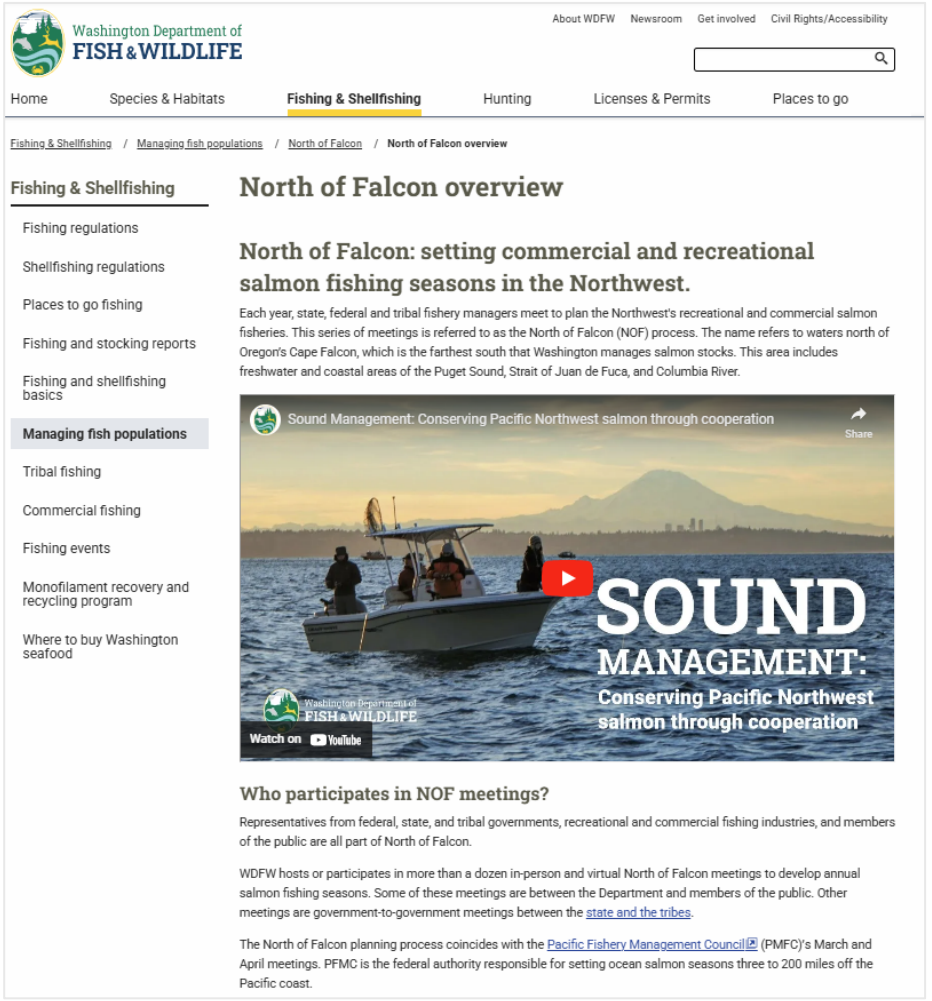
Date	Meeting
March 25	North of Falcon #2 – statewide proposals
April 1	Coastal freshwater and Puget Sound recreational fisheries
April 2	Willapa Bay and Grays Harbor fisheries
April 3	Columbia River Fisheries – Buoy 10 to Highway 395 Bridge at Pasco, WA
April 3	Puget Sound freshwater and Puget Sound recreational fisheries
April 9-15	Pacific Fishery Management Council meeting – San Jose, CA

Registrations links and meeting materials are available on the WDFW website.

Learn more at WDFW.wa.gov/NOF

Find up-to-date information about:

- Upcoming meetings
- Proposed seasons
- Updated forecasts
- Public input opportunities



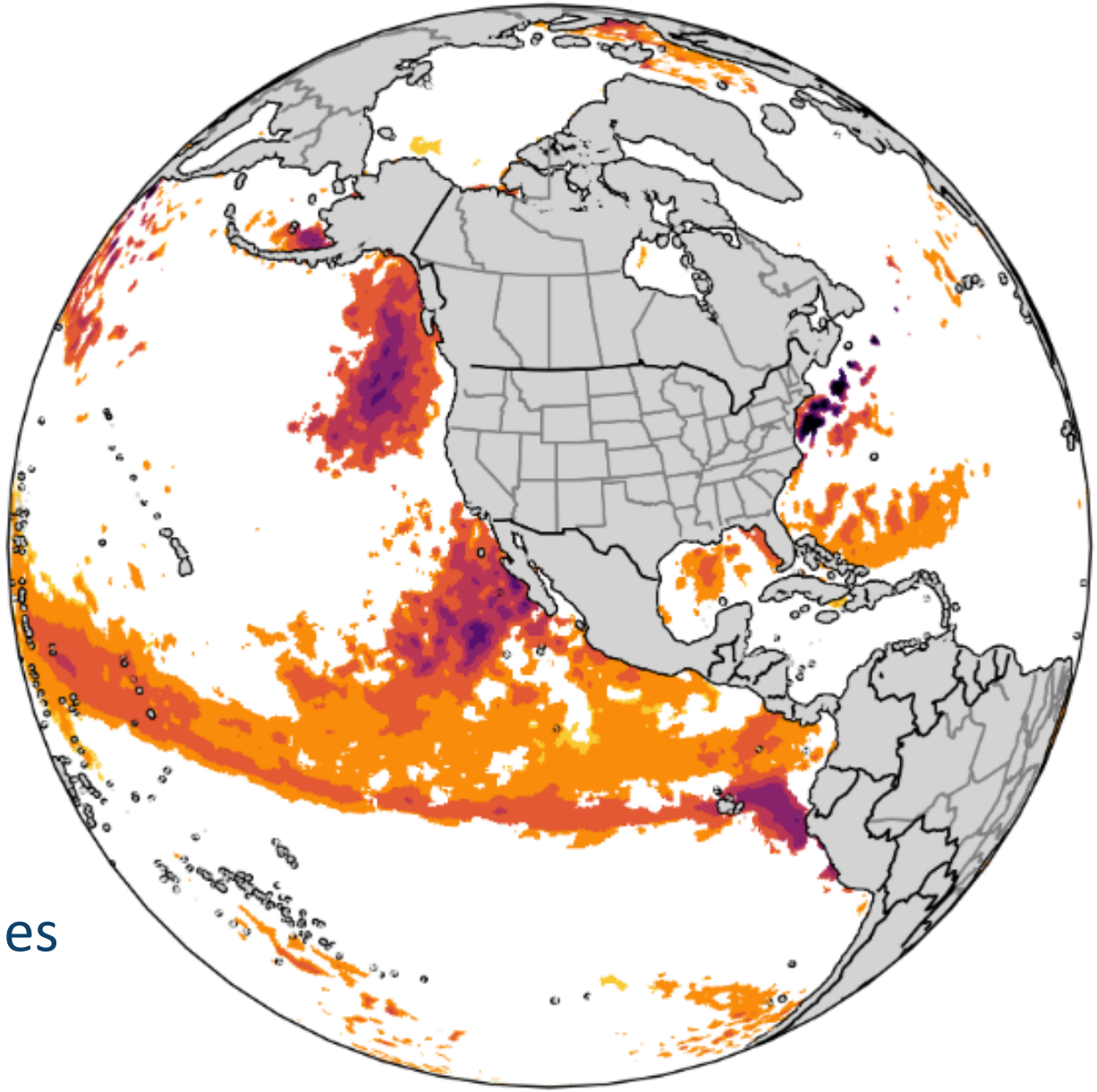
2024-25 Environmental Outlook

Dr. Mickey Agha

Washington
Department of
FISH &
WILDLIFE

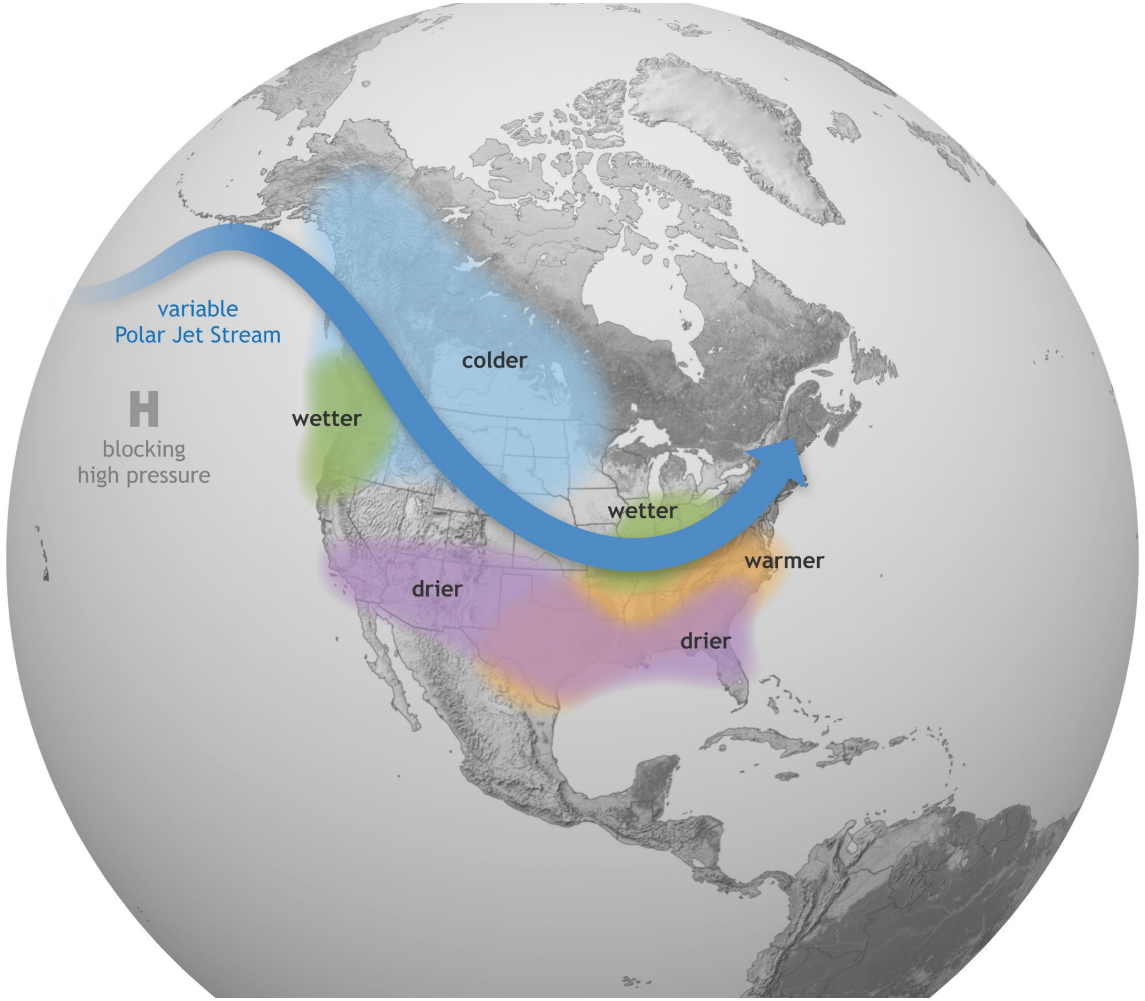
Outline

1. Physical Environmental Drivers
   - Global temperatures
   - Heat Waves
   - El Niño/La Niña
2. Biological Response
   - NWFSC Stoplight Chart
   - Marine Species Observations
   - Salmon Response
3. Environmental Forecasts
   - El Niño/La Niña
   - Sea Surface Temperature anomalies
   - Take-Home Messages



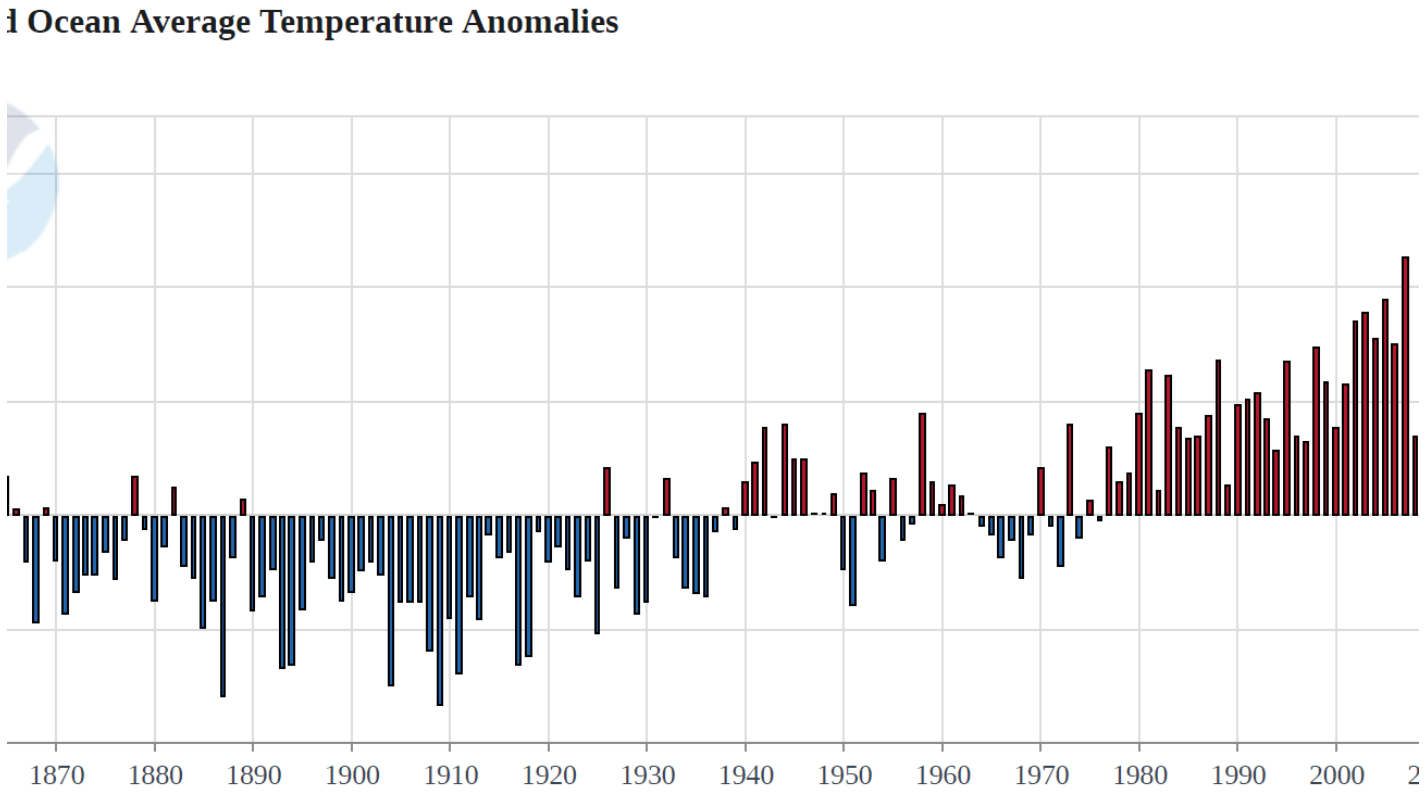
1. Physical environmental conditions past and present

- Global Temperatures
- Recent marine heat waves
- El Niños and La Niñas



Global land and ocean temperature anomalies

January 2025 global sea surface temperatures were above 20th century average and warmest January on record



2024 was the warmest year on record

Record High Temperatures in the Ocean in 2024

Original Paper | Open access | Published: 10 January 2025
(2025) Cite this article

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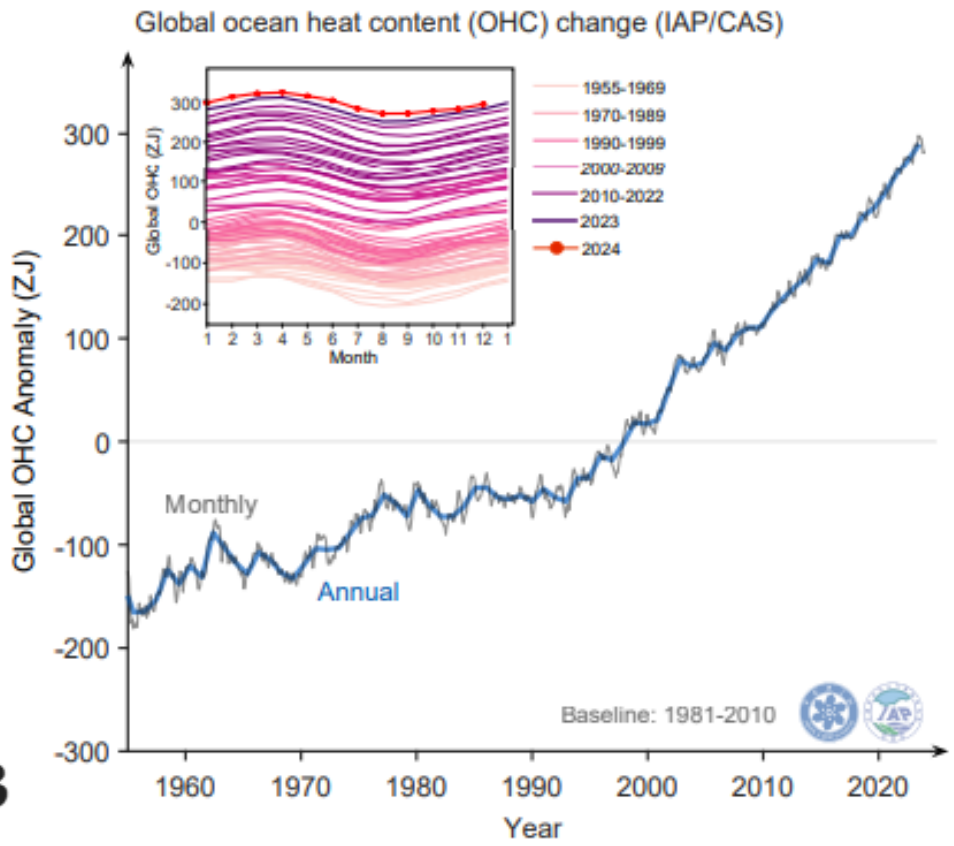
Lijing Cheng, John Abraham, Kevin E. Trenberth, James Reagan, Huai-Min Zhang, Andrea Storto, Karina Von Schuckmann, Yuying Pan, Yujing Zhu, Michael E. Mann, Jiang Zhu, Fan Wang, Fujiang Yu, Ricardo Locarnini, John Fasullo, Boyin Huang, Garrett Graham, Xungang Yin, Viktor Gouretski, Fei Zheng, Yuanlong Li, Bin Zhang, Liying Wan, Xingrong Chen, ... Flora Gues Show authors

Brief Communication | Published: 23 July 2024

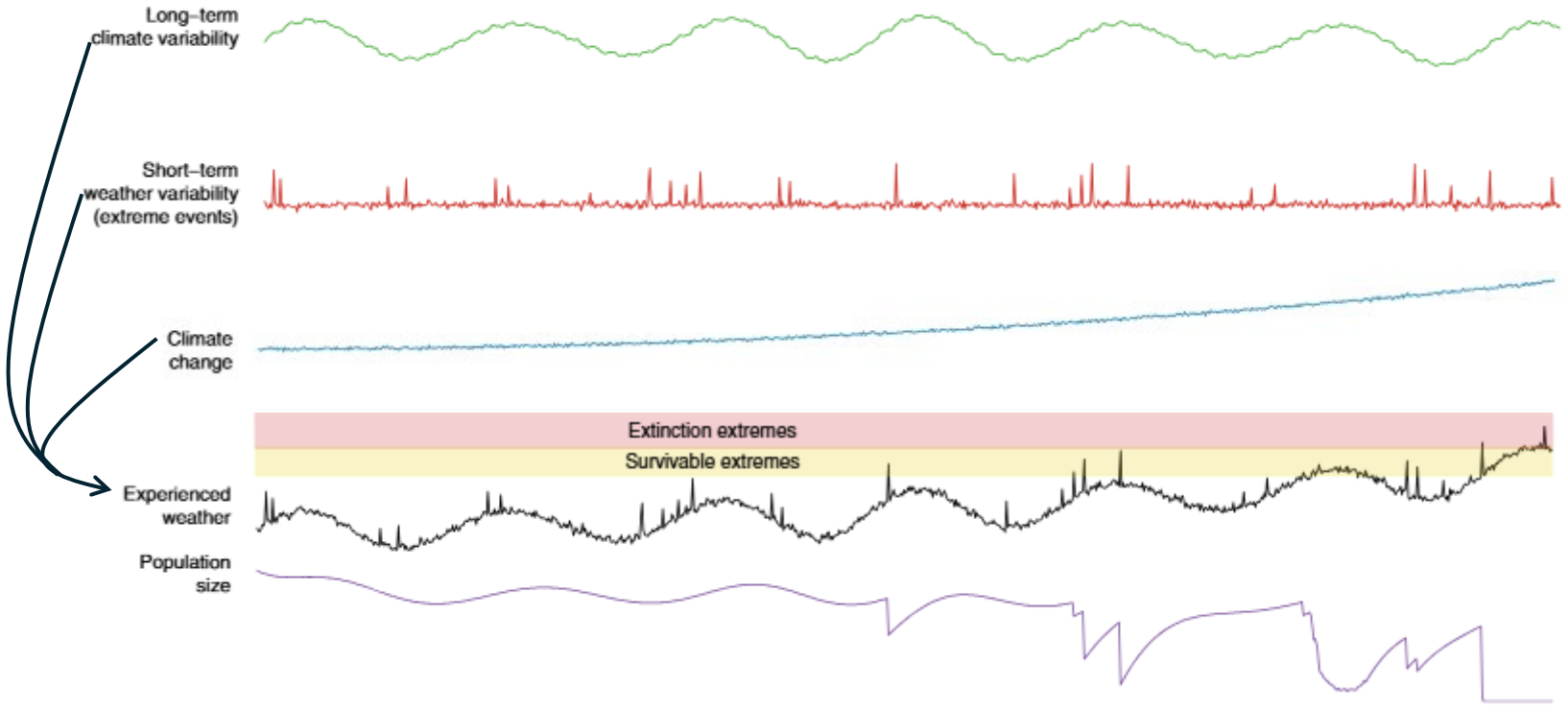
Accelerated warming in the North Pacific since 2013

Zeng-Zhen Hu, Michael J. McPhaden, Boyin Huang, Jieshun Zhu & Yunyun Liu

Nature Climate Change **14**, 929–931 (2024) | Cite this article



Biological responses to the press and pulse of climate trends and extreme events



"Press and pulse" of climate change

Press = gradual changes

Pulse = short term (extreme events)

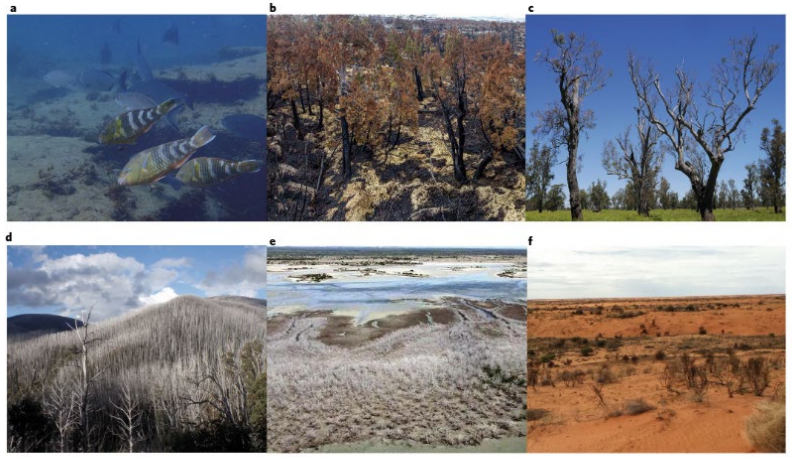


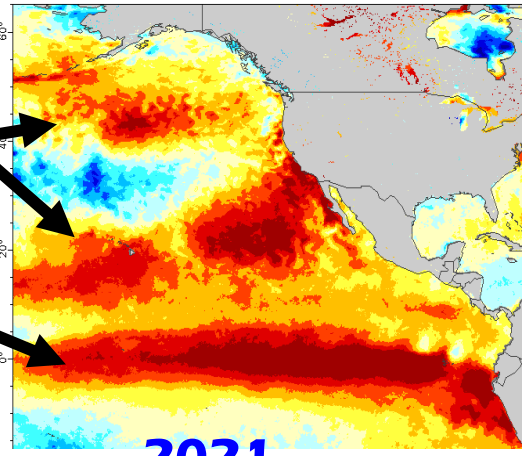
Fig. 3 | Extreme biological responses to extreme weather events. a, Kelp forests after the 2011 marine heatwave. **b**, The largest remaining palaeo-endemic pencil pine forest growing in sphagnum, killed by lightning-ignited fires in 2016. **c**, Dieback of floodplain forests during unprecedented drought from 2003–2009. **d**, Obligate seeder forest burnt three times resulting in the local extinction of *E. delegatensis* (taken in 2014). **e**, Mangrove dieback (taken in 2015). **f**, Aftermath of large-scale wildfires in the Strzelecki Desert in 2013 due to fuel accumulation following extreme rainfall events that were linked to the La Niña Phase of ENSO in 2010/2011. Credits: **a**, J. Costa and S. Bennett; **b**, R. Blakers; **f**, M. Letnic.

Harris et al. 2018. Biological responses to the press and pulse of climate trends and extreme events. Nature Climate Change 8:579–587. https://doi.org/10.1038/s41558-018-0187-9

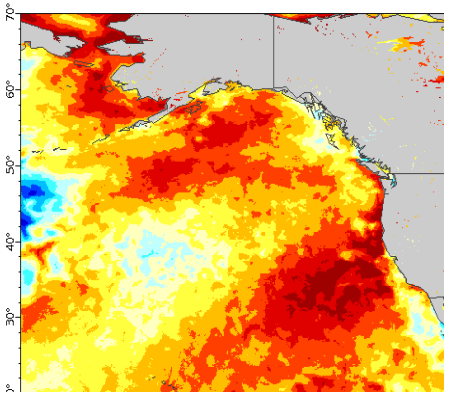
Recent NE Pacific Marine Heat Waves

Sea Surface Temperature Anomalies in September

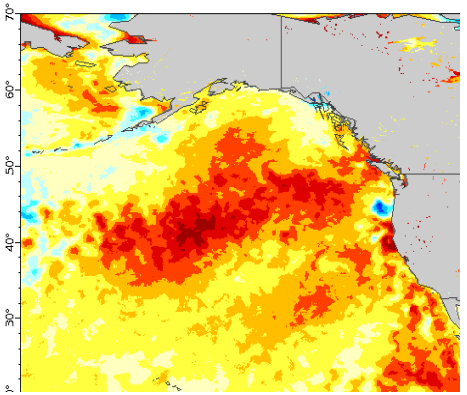
2014-16 "The blob"



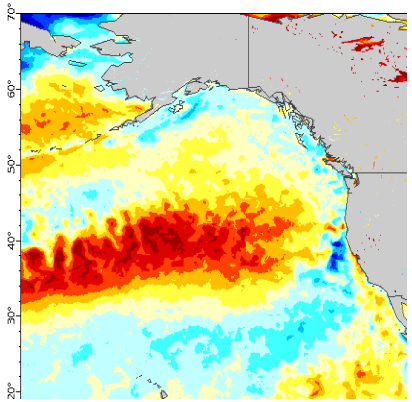
2019



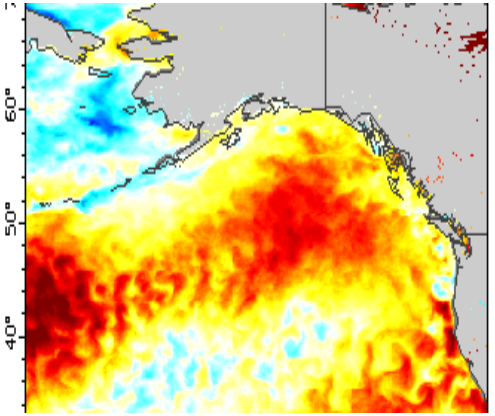
2020



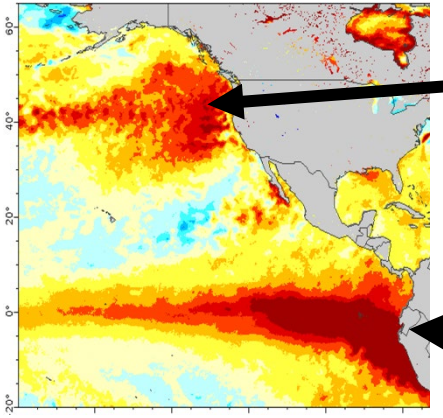
2021

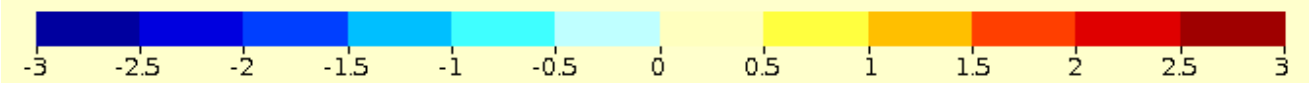


2022



2023

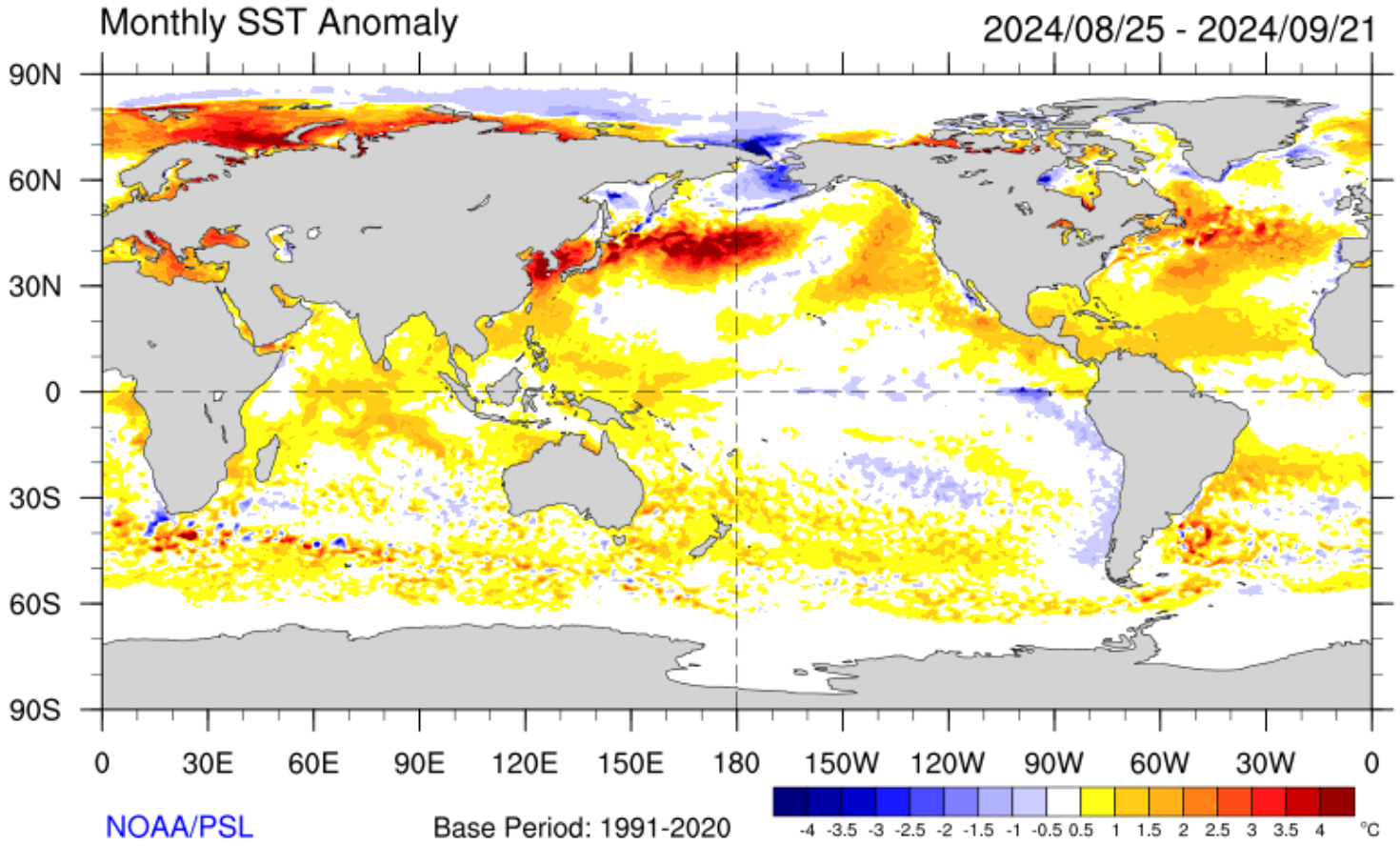




https://www.integratedecosystemassessment.noaa.gov/regions/california-current/cc-projects-blobtracker

Recent NE Pacific Marine Heat Waves

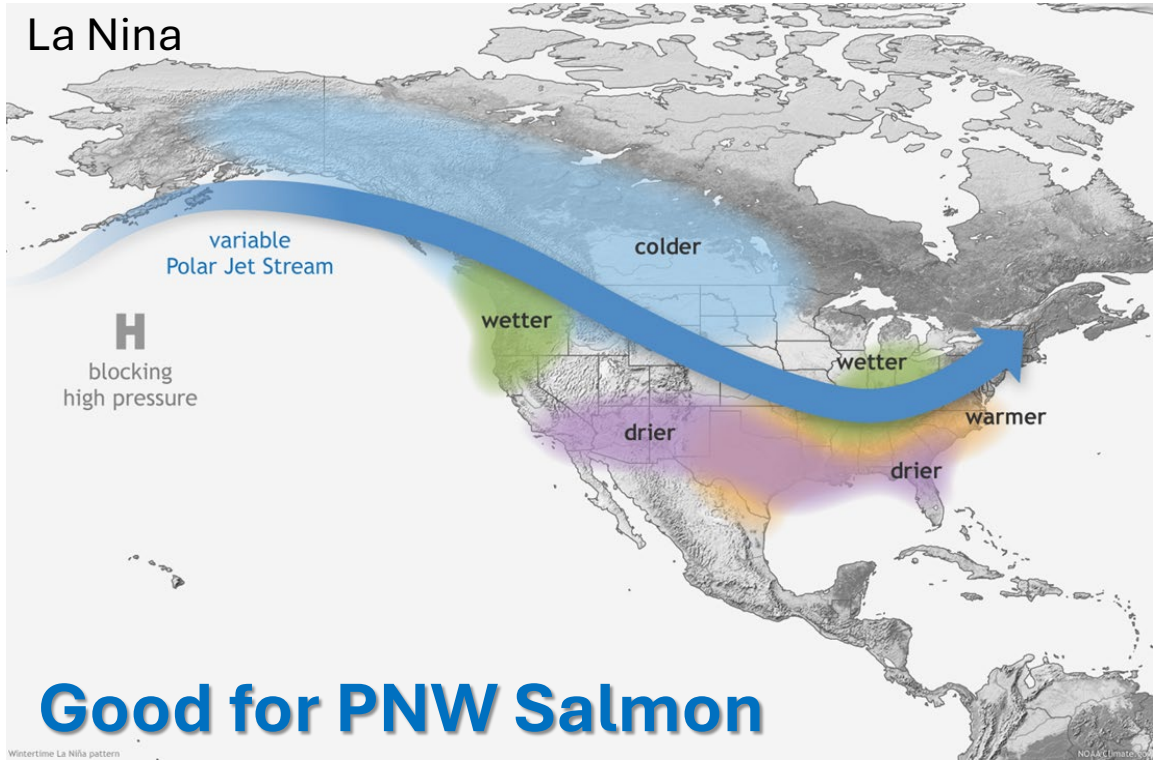
September 2024



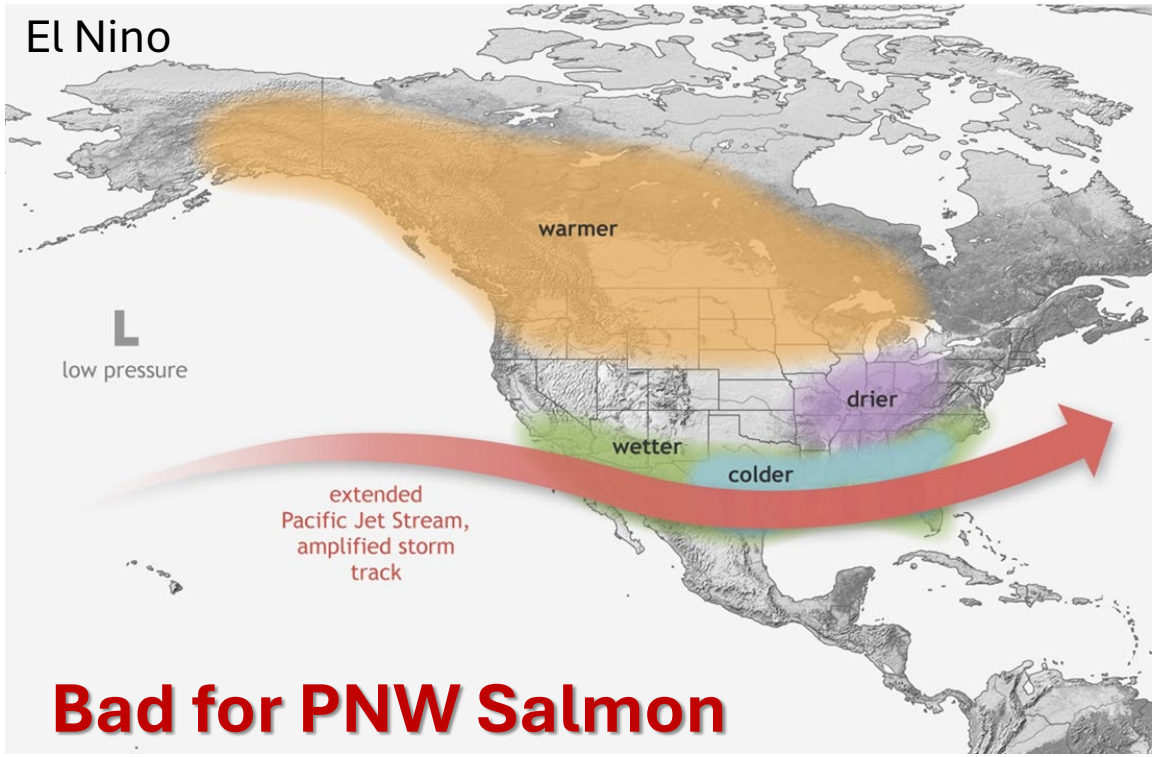
- Mass of hot water in western pacific and some smaller more dispersed in eastern pacific

El Niños / La Niñas

- El Niños and La Niñas are warm and cool tropical phenomena that impact global weather
- A primary predictor of global climate disruptions



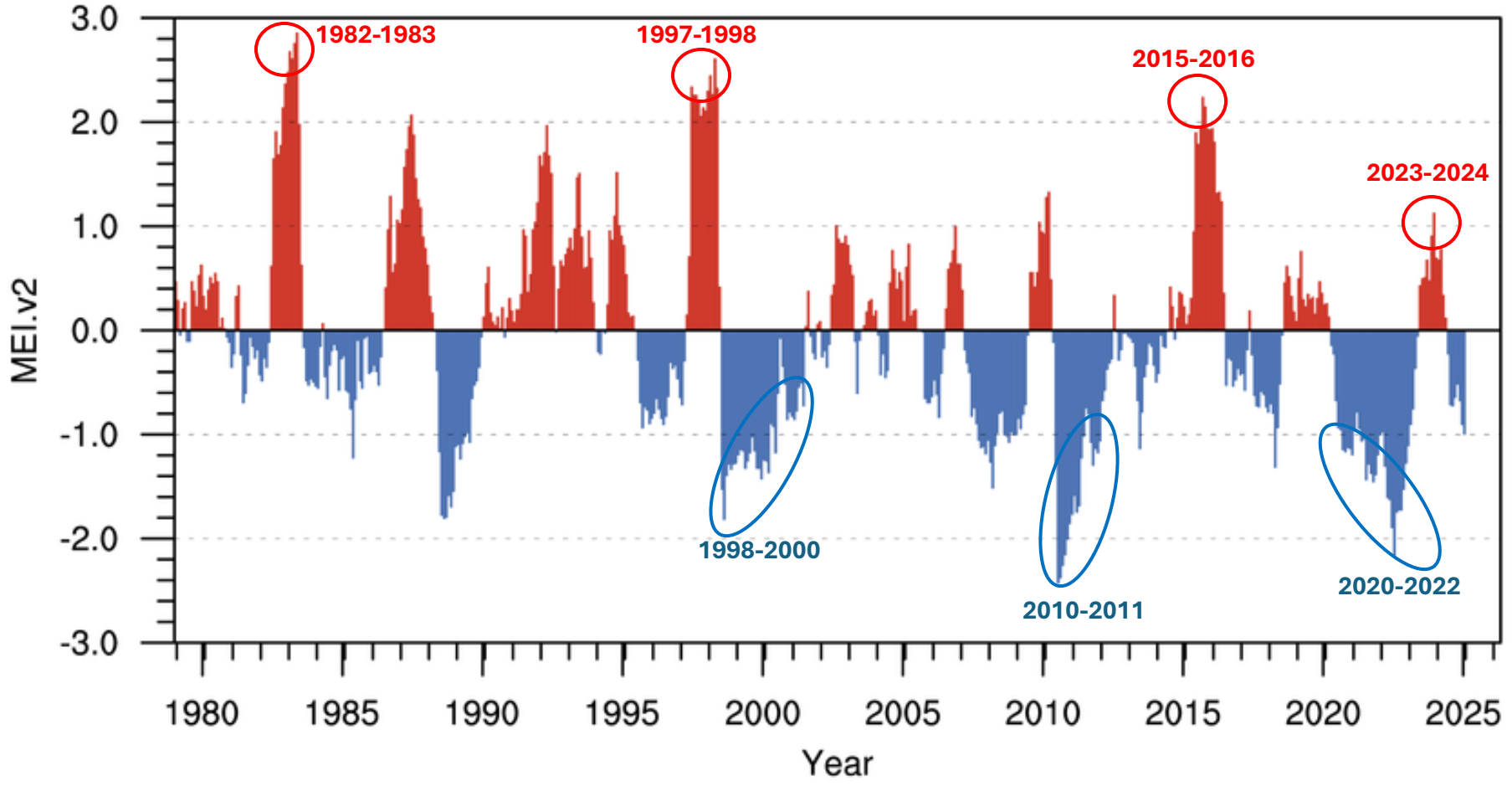
Cool coastal ocean, deep snowpack



Warm coastal ocean, low snowpack

www.climate.gov

Recent El Niño / La Niña Events



El Niños

La Niñas

https://www.psl.noaa.gov/enso/mei/

www.nws.noaa.gov

National Weather Service

Climate Prediction Center

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ENSO Diagnostic Discussion

EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

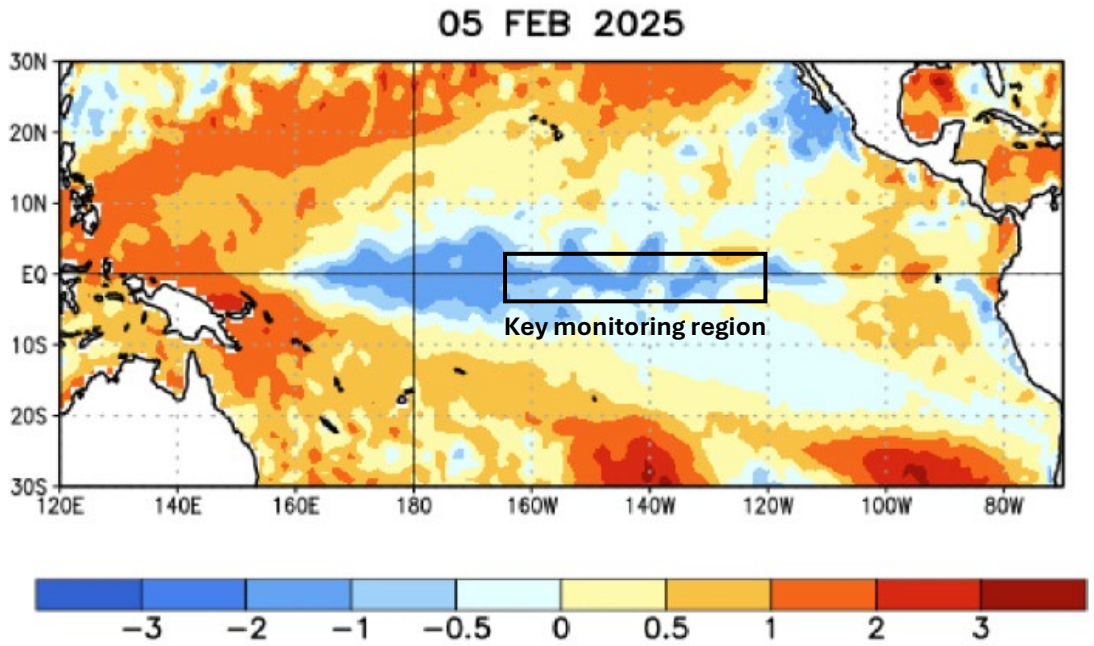
issued by
CLIMATE PREDICTION CENTER/NCEP/NWS

13 February 2025

ENSO Alert System Status: La Niña Advisory

Synopsis: **La Niña conditions are expected to persist in the near-term, with a transition to ENSO-neutral likely during March-May 2025 (66% chance).**

Sea Surface Temperature (SST) Anomalies

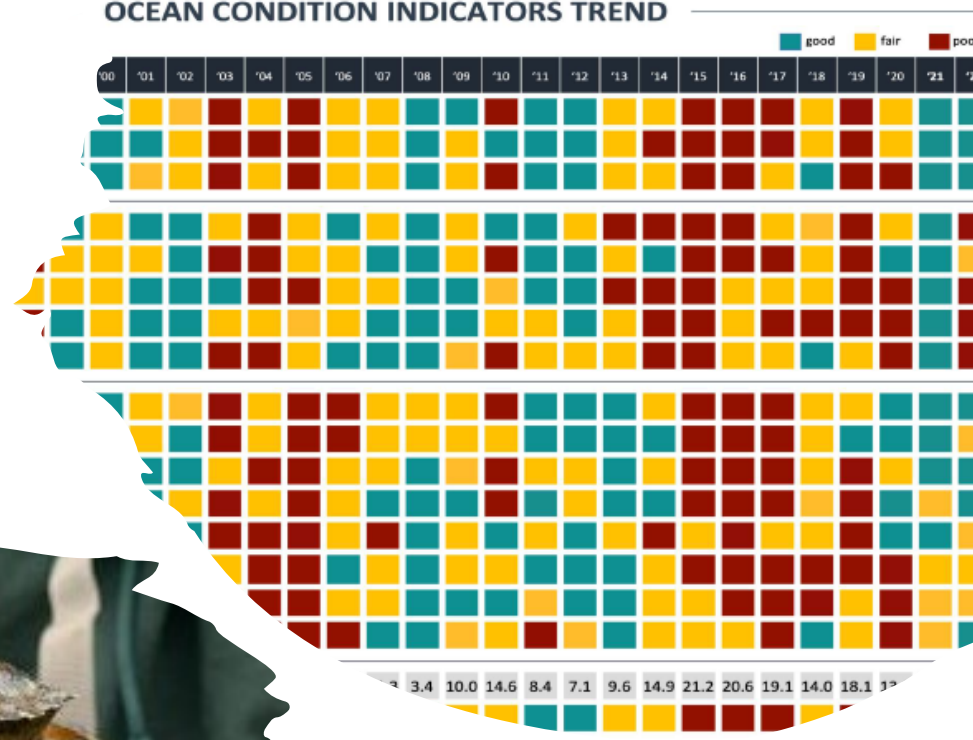


- Equatorial sea surface temperatures are below average suggesting La Niña formation
- Expect continued low elevation precipitation, windstorms, and high elevation snow in the Pacific Northwest over next several weeks, followed by dissipation of La Niña conditions into Spring

https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.shtml

2. Biological Response

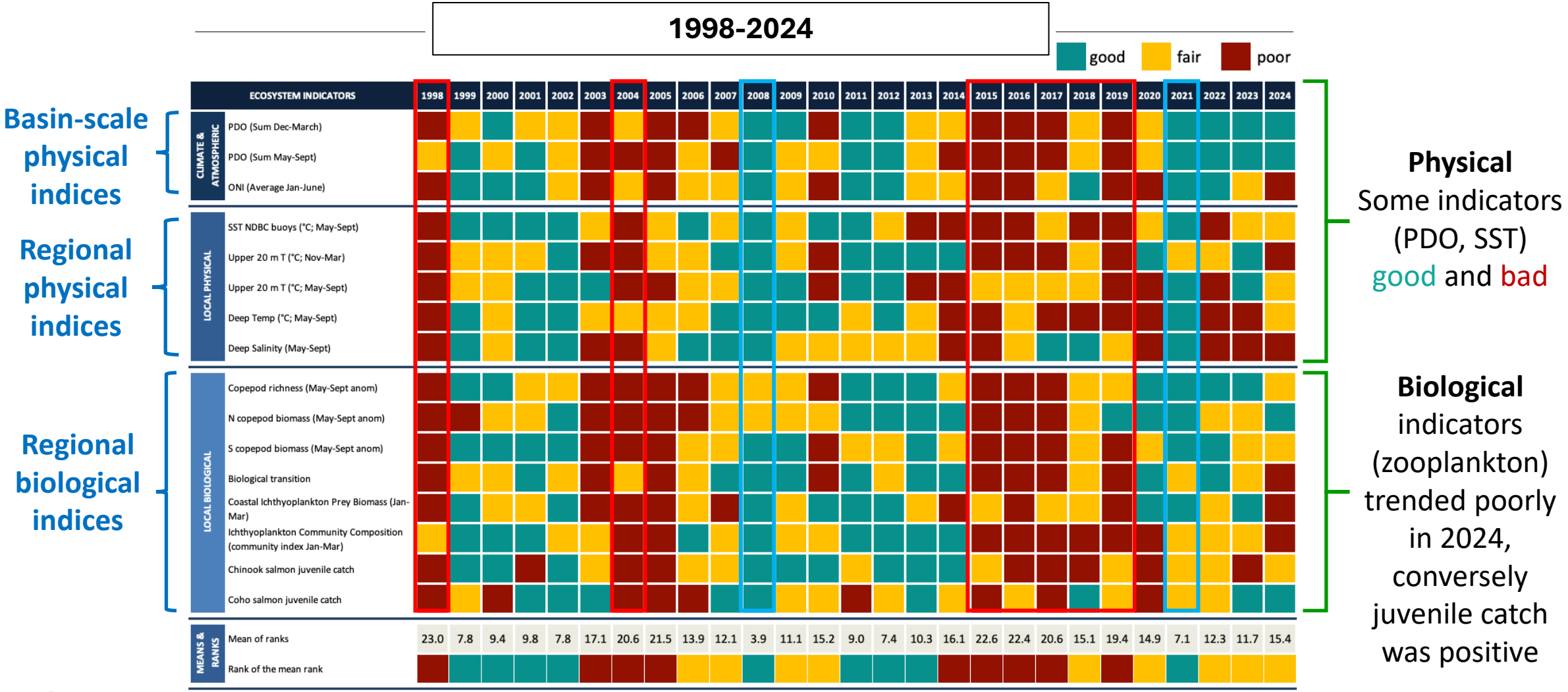
- Northwest Fisheries Science Center Stoplight Chart
- Juvenile Salmon Catch
- Marine Species Observations
- Adult Salmon Response



Photograph: WDFW

Photograph: Andrew Hendry

Salmon Indicators: Bad -> Fair -> Good



Basin-scale physical indices

Regional physical indices

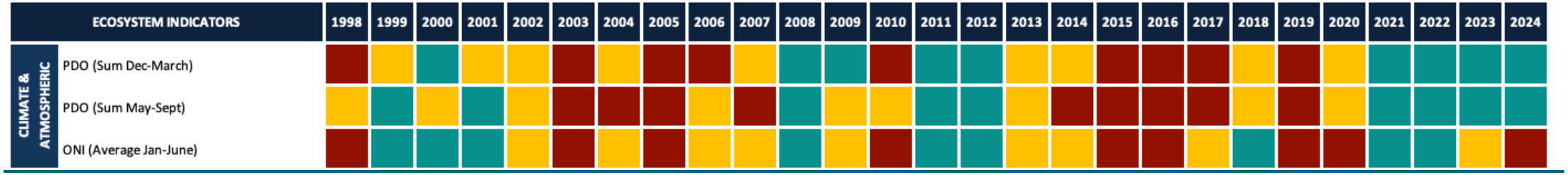
Regional biological indices

Physical
Some indicators (PDO, SST) good and bad

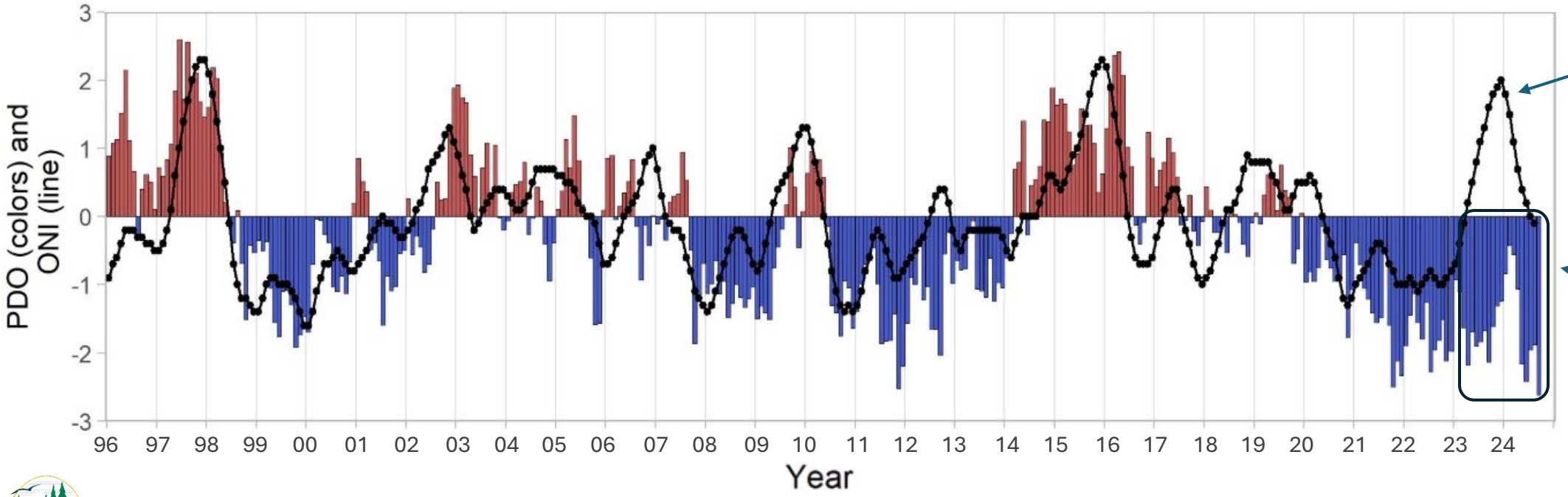
Biological
indicators (zooplankton) trended poorly in 2024, conversely juvenile catch was positive

https://www.fisheries.noaa.gov/west-coast/science-data/ocean-conditions-indicators-trends

Basin Scale Indicators



- Basin-scale PDO potentially diverging from local coastal sea surface temperatures (SST)



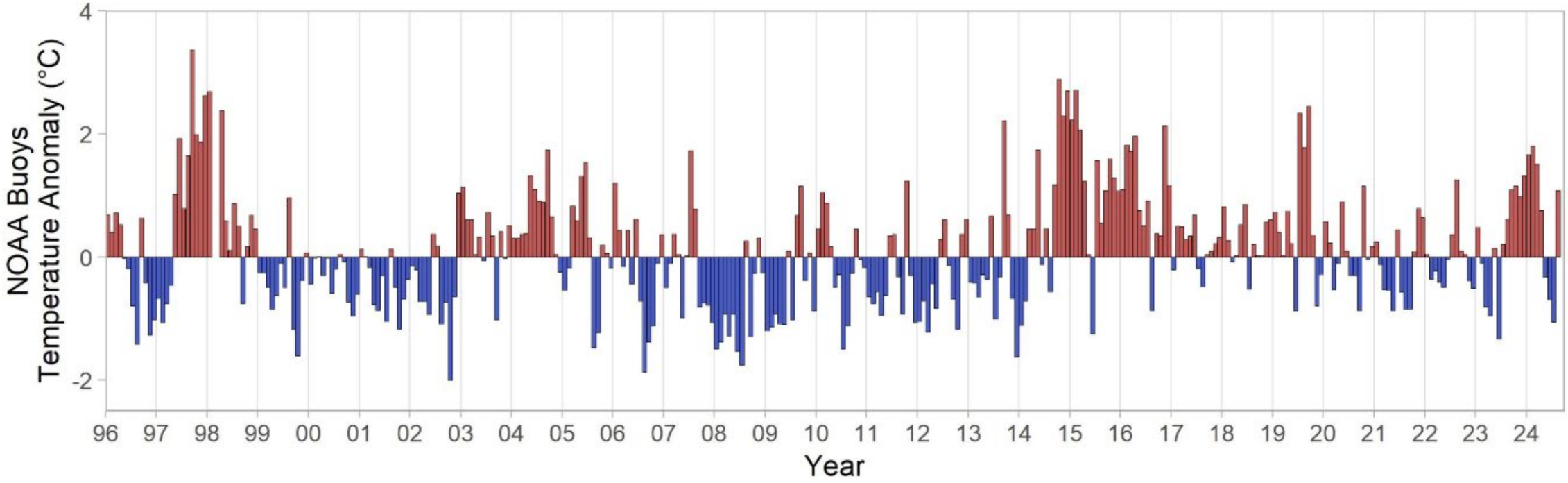
ONI from tail end of strong 2023/24 El Niño

PDO still strongly negative, however, not reflecting local SSTs like it used to historically

https://www.fisheries.noaa.gov/west-coast/science-data/ocean-conditions-indicators-trends

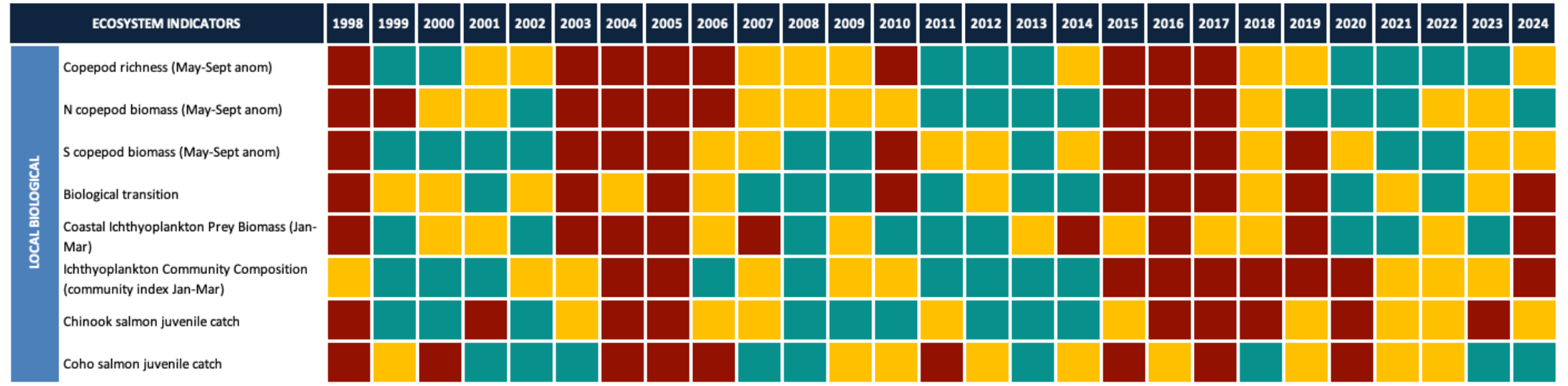
Regional Physical Indices

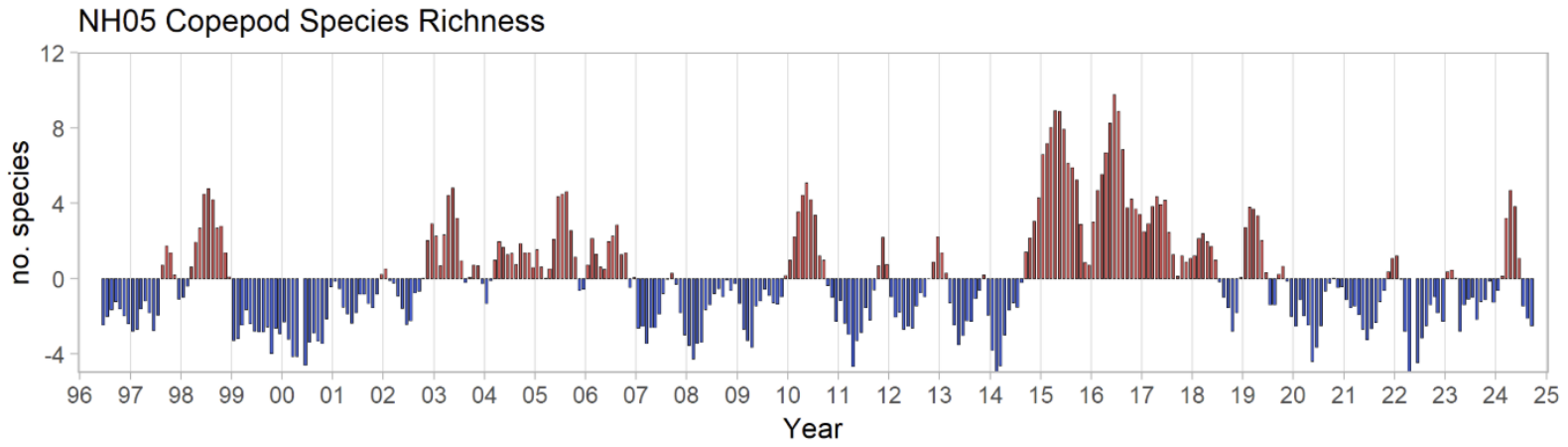
ECOSYSTEM INDICATORS		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
LOCAL PHYSICAL	Upper 20 m T (°C; Nov-Mar)																											
	Upper 20 m T (°C; May-Sept)																											
	Deep Temp (°C; May-Sept)																											
	Deep Salinity (May-Sept)																											



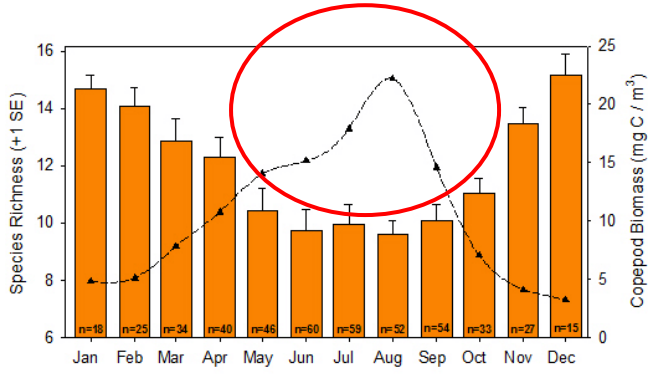
https://www.fisheries.noaa.gov/west-coast/science-data/ocean-conditions-indicators-trends

Regional Biological Indices





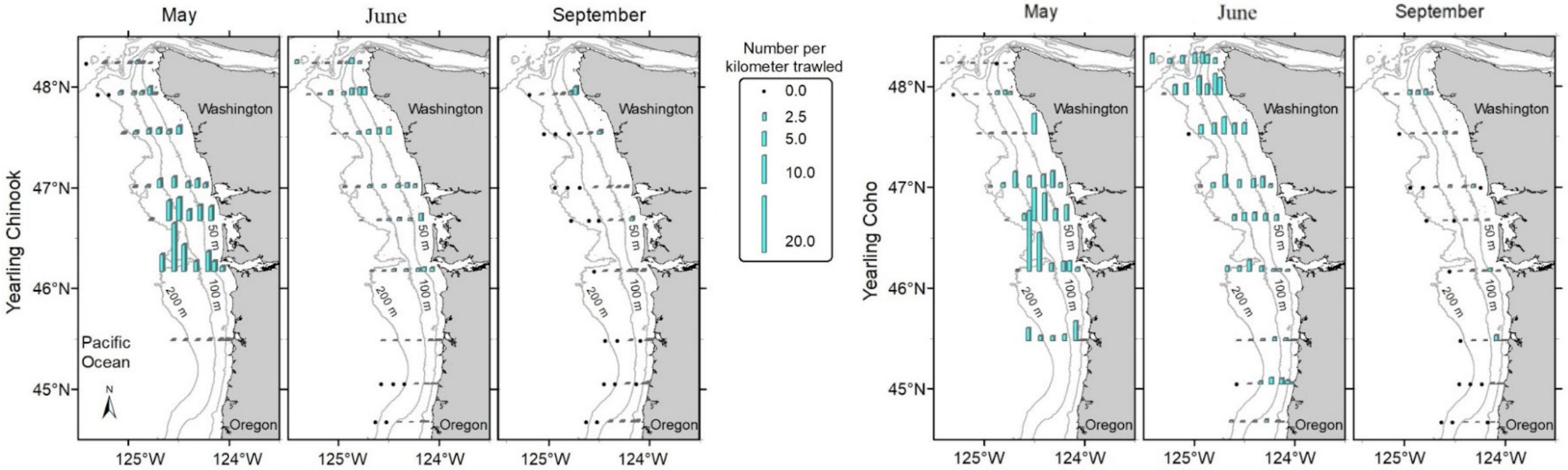
Low during critical period



https://www.fisheries.noaa.gov/west-coast/science-data/ocean-conditions-indicators-trends

Juvenile Salmon Catch

- The number of juvenile salmon caught during coastal NOAA surveys can serve as an index of ocean survival for yearling Chinook and coho salmon.
- NOAA observed the highest average juvenile Chinook and coho salmon abundance during May 2024 cruises in the Columbia River vicinity.



Coho salmon distribution was more widespread, whereas yearling Chinook salmon were far less common off Oregon than Washington.

https://www.fisheries.noaa.gov/west-coast/science-data/ocean-conditions-indicators-trends

Marine Species Observations

WDFW

WDFW

In Hot Water: How Marine Heatwaves are Transforming the Recreational Albacore Fishery in the Eastern North Pacific

29 Pages • Posted: 8 Jan 2025

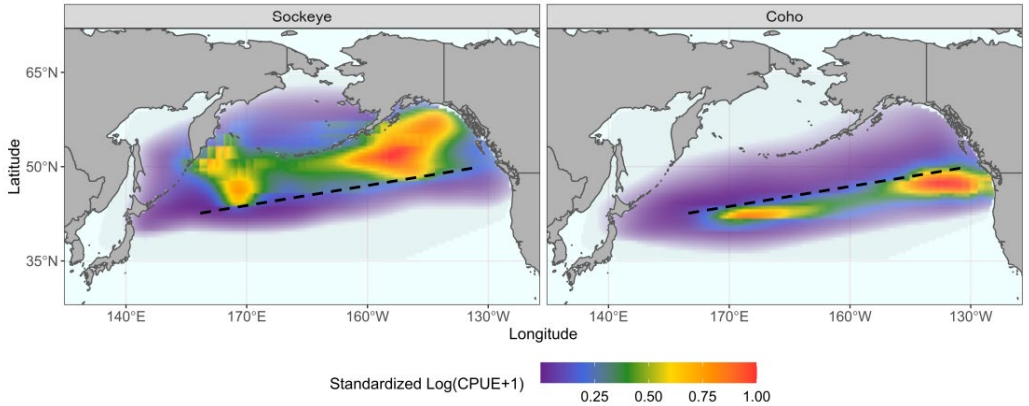
Ian Blixt
Victoria University of Wellington

Article | Open access | Published: 27 June 2024

Marine heatwaves alter the nursery function of coastal habitats for juvenile Gulf of Alaska Pacific cod

Hillary L. Thalmann, Benjamin J. Laurel, L. Zoe Almeida, Kaitlyn E. Osborne, Kaylee Marshall & Jessica A. Miller

Scientific Reports **14**, Article number: 14018 (2024) | Cite this article



FISH and FISHERIES

ORIGINAL ARTICLE

Opening the black box: New insights into the role of temperature in the marine distributions of Pacific salmon

Joseph A. Langan, Curry J. Cunningham, Jordan T. Watson, Skip McKinnell

First published: 26 March 2024 | https://doi.org/10.1111/faf.12825 | Citations: 1

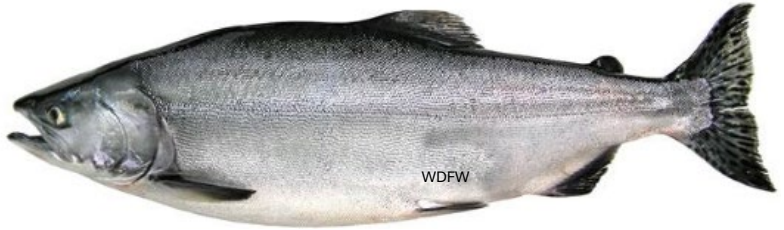
Adult Salmon Response

2024

- Columbia River Sockeye 762K (Record-breaking Year)
- Puget Sound Chum (Strongest returns over recent 40 years)

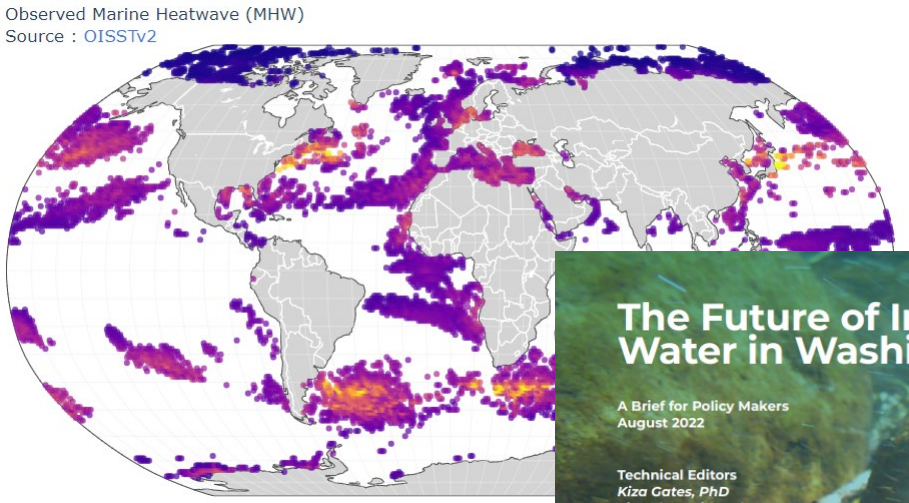
2025

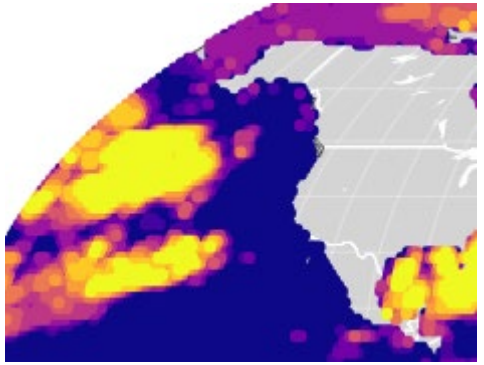
- Record Pink forecasts ahead

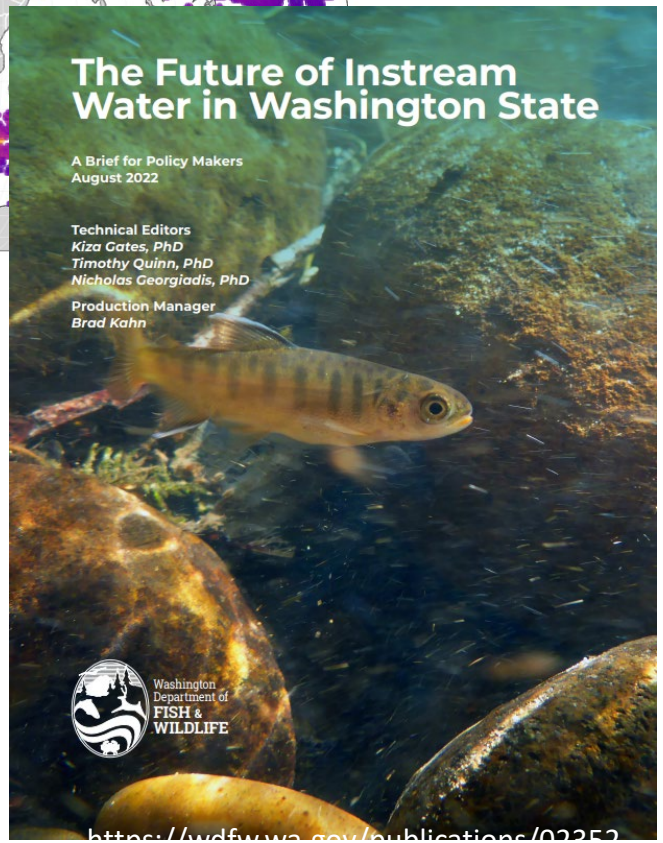


3. 2025 Marine Climate Forecasts and Conclusions

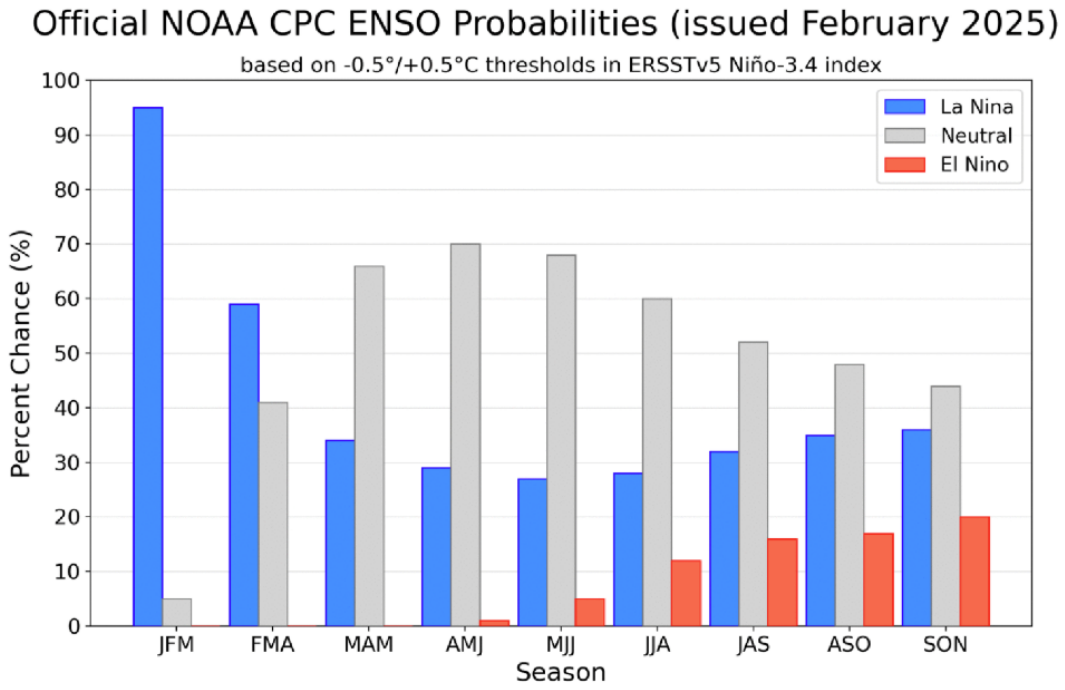
- Probabilistic EL Nino-Southern Oscillation Outlook
- Sea Surface Temperature Anomaly Outlook
- Take-Home Messages

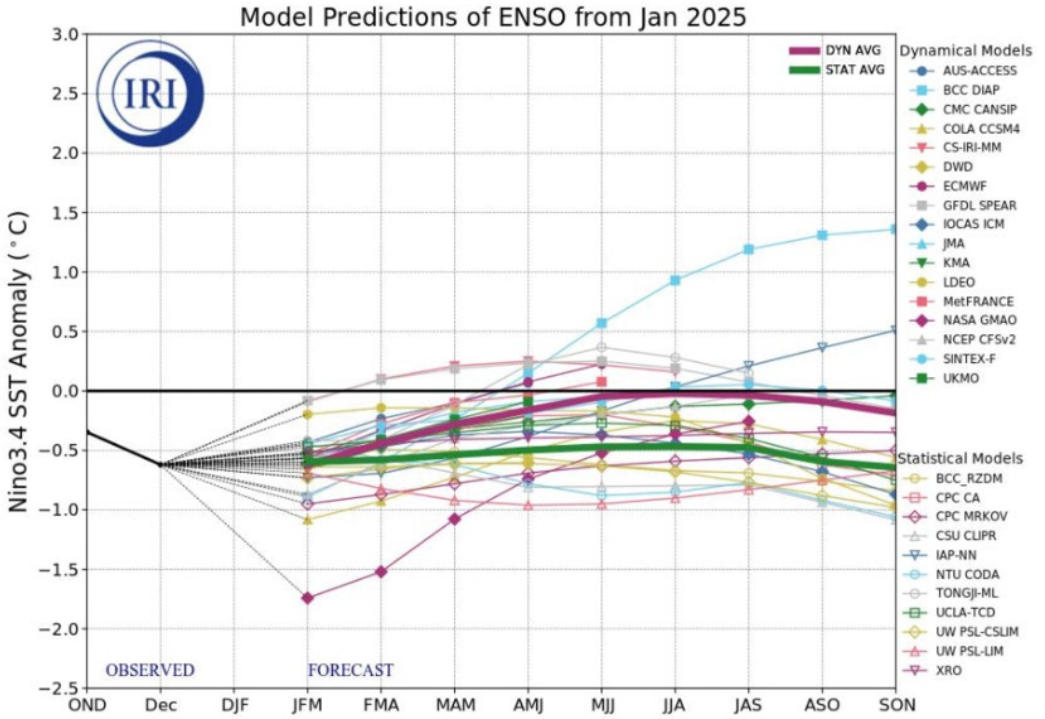






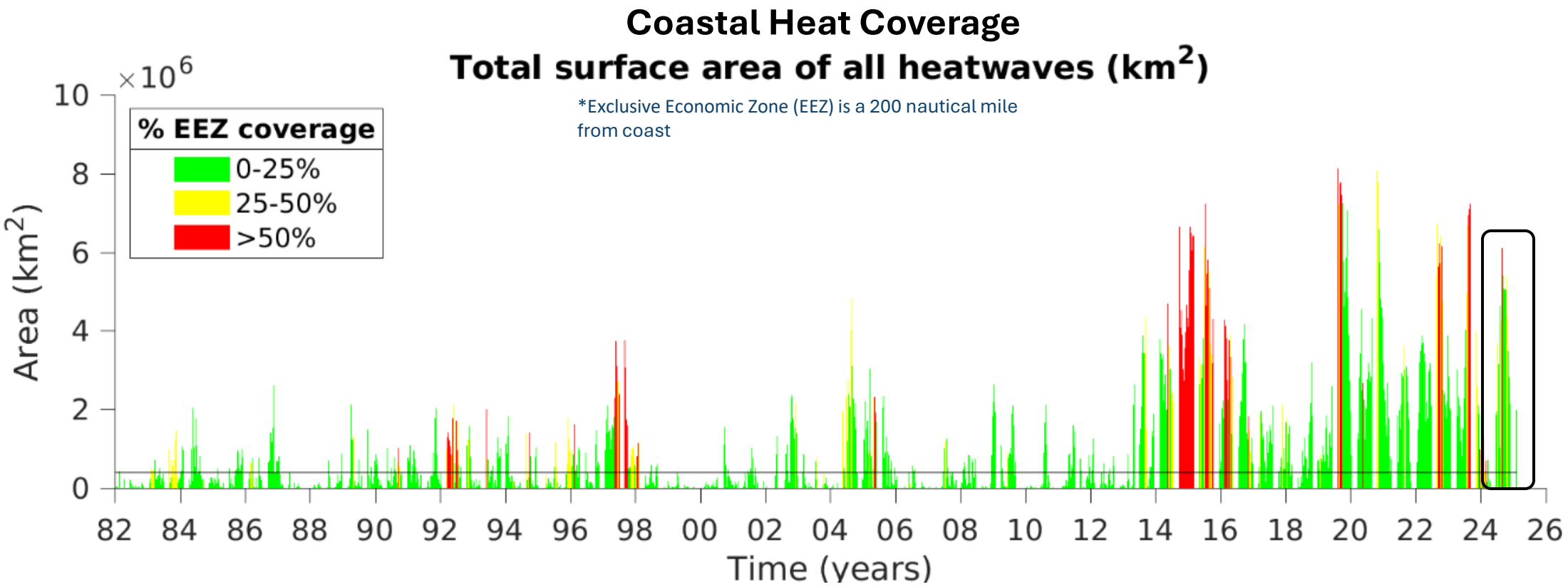
El Niño/La Niña Forecasts





https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.s
html

Sea Surface Temperature Projections

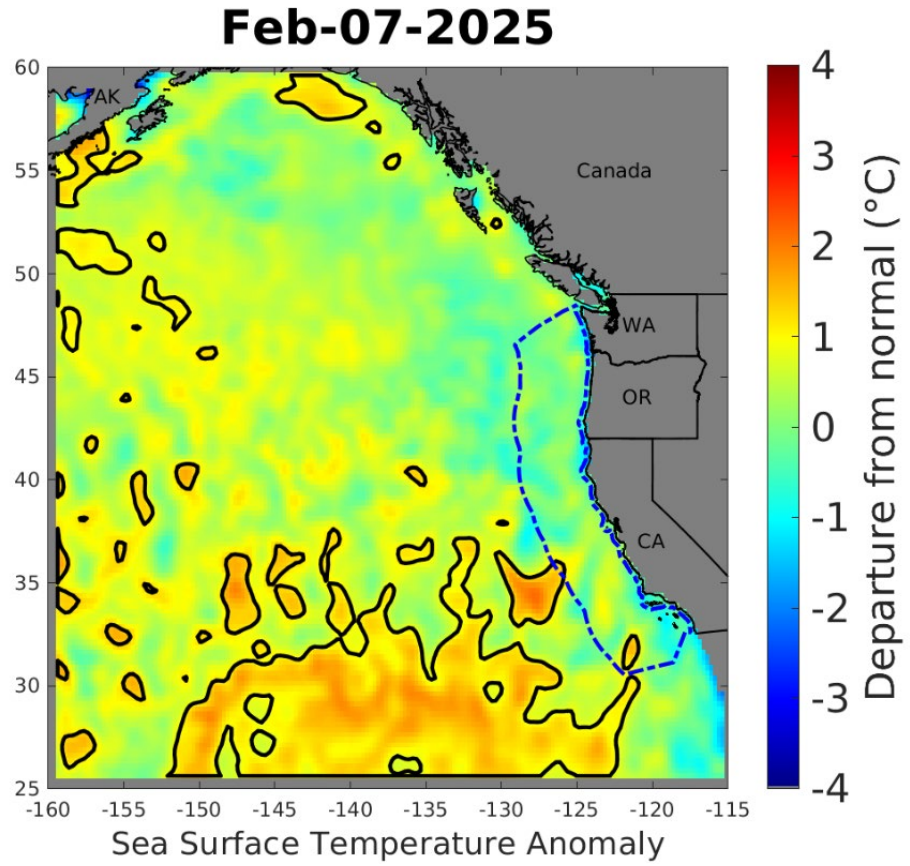


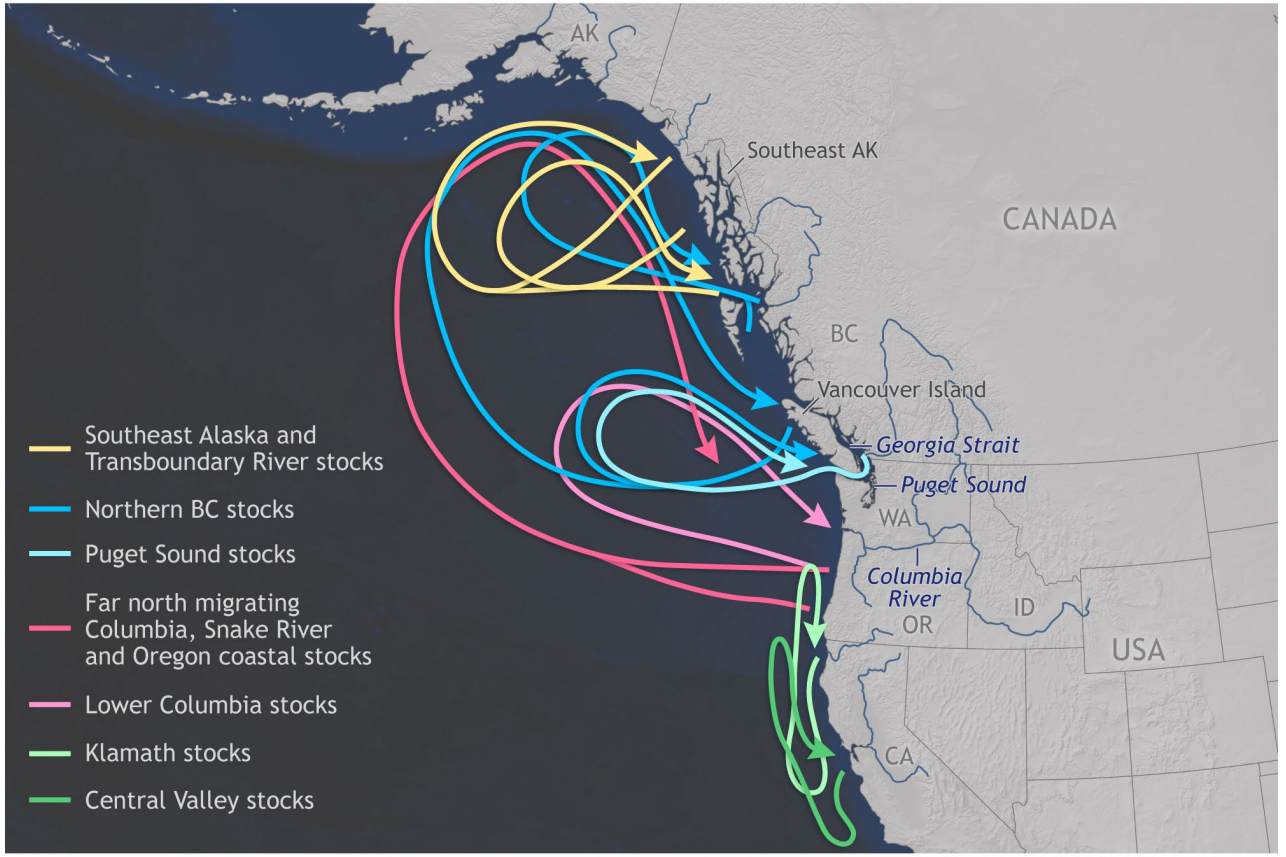
- North Pacific and Gulf of Alaska projected to see heat waves extend into May 2025
- Pacific Northwest projected to see marine heat waves weaken and cooler sea surface temperatures persist in proximity to coast (EEZ) until ENSO neutral

https://psl.noaa.gov/marine-heatwaves/

https://www.integratedecosystemassessment.noaa.gov/regions/california-current/california-current-marine-heatwave-tracker-blobtracker

Sea Surface Temperatures and Migration Pathways





https://psl.noaa.gov/marine-heatwaves/

Take-Home Messages

- Smolts entering the ocean experienced moderate to good ocean conditions over last four years
- La Niña is projected to weaken in early Spring, so keep an eye on:
  - NE Pacific sea surface temperatures increasing and salmon returning into hot water
  - Low Snowpack (low flow, warm summer stream temperatures)
- Marine heat waves shifting from coastal environments into deep sea NE Pacific driving higher uncertainty in some salmon forecasts (i.e., some species taking advantage, adapting, changing migratory behavior, while others mismatched with optimal conditions)
- **In conclusion, consistent trends in ocean climate over recent years suggest 2025 Washington State salmon survival and returns have the potential to mirror 2024**

Acknowledgements

- Dr. Marisa Litz, Science Division, WDFW
- Dr. Laurie Weitkamp, NOAA Fisheries, NWFSC
- Pacific Salmon Commission
- NOAA Climate Prediction Center

Questions?

WA Coast and Puget Sound 2024 Returns and 2025 Forecasts

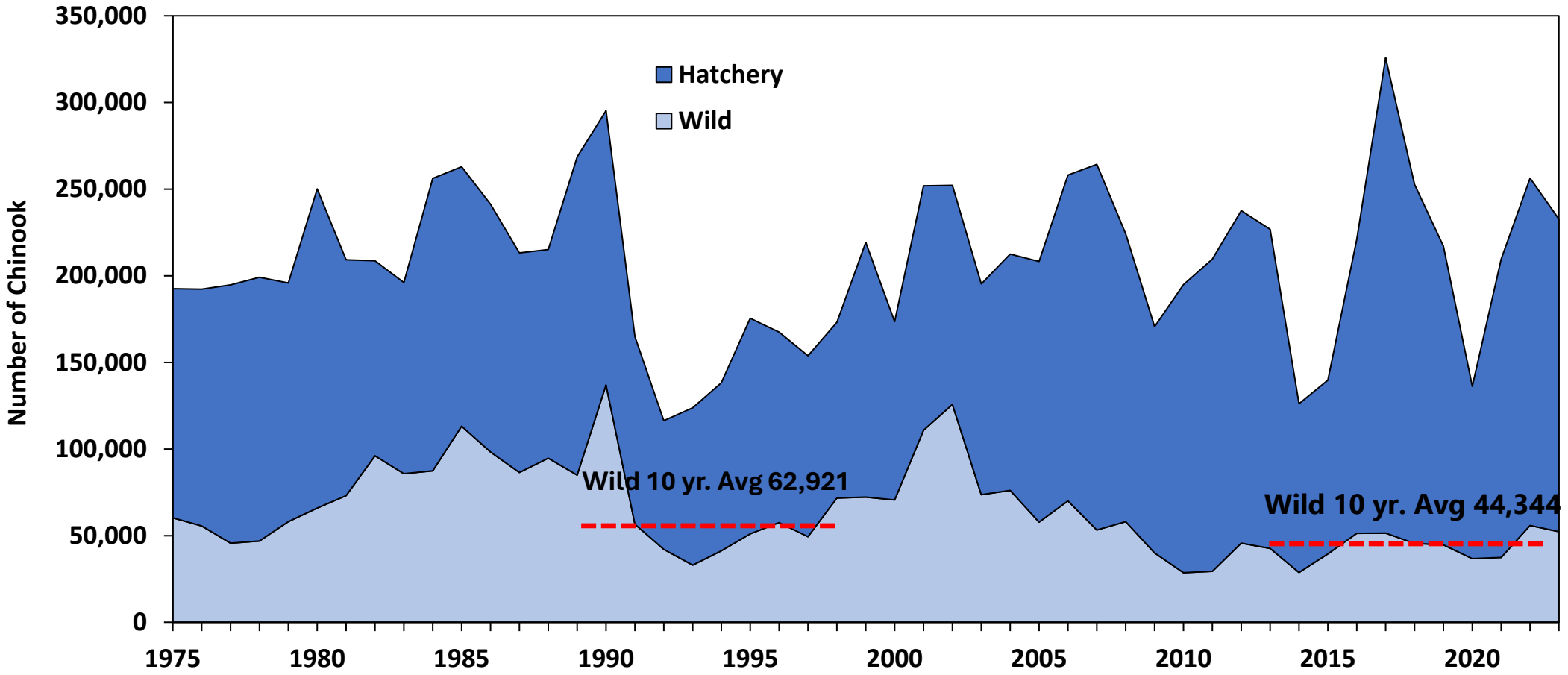
Jake Rice, Christina Iverson, and Matthew Bogaard

Washington Department of FISH & WILDLIFE

Chinook forecast

Photo credit: Ty Garber

Chinook historical run size – Puget Sound



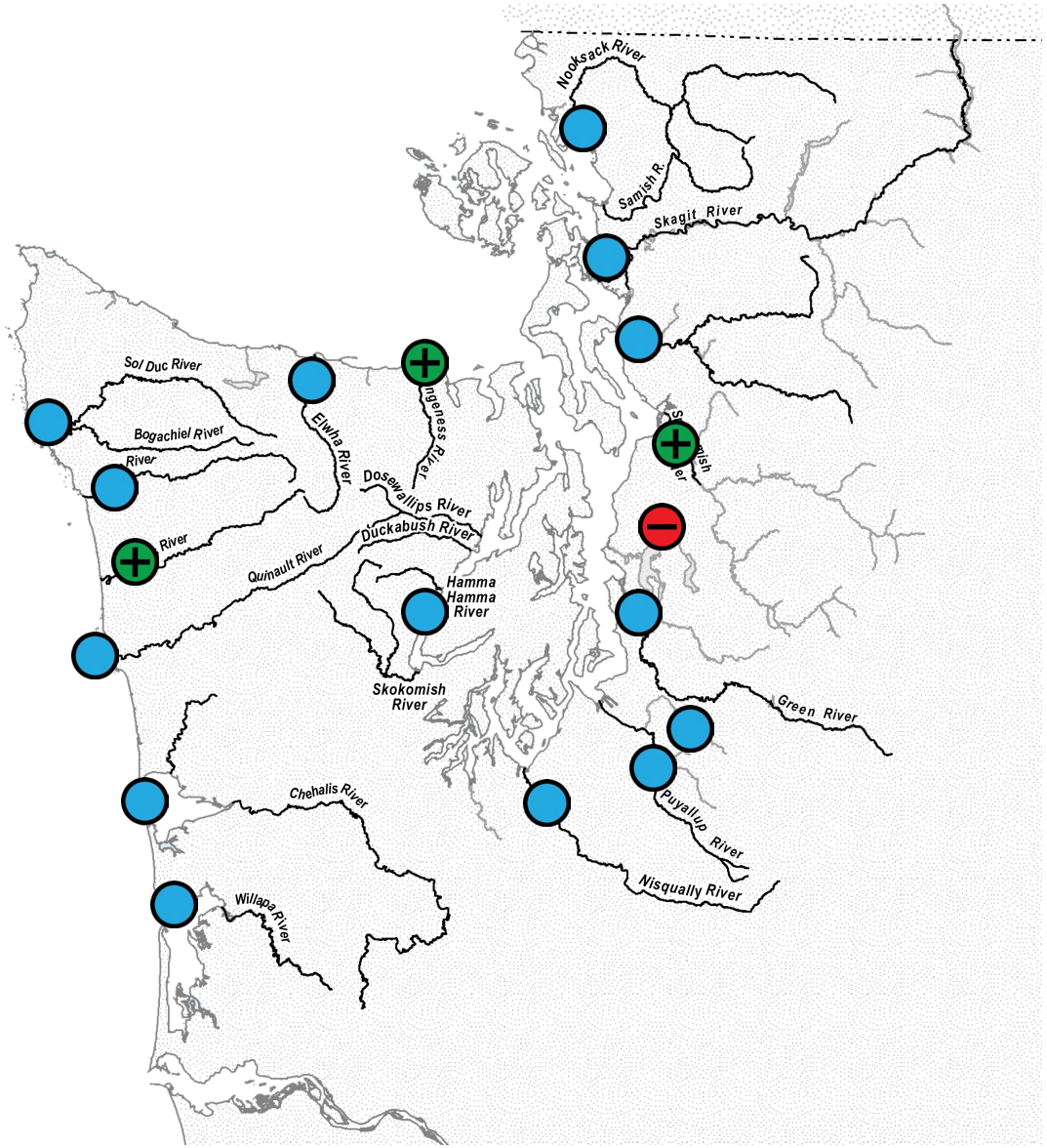
Wild Chinook ⬇~28% since 10yr avg. prior to listing under ESA in 1999

2024 Chinook returns

- All returns are preliminary
- Returns range from **Poor** to **Good** in Puget Sound
- Returns were mostly **Neutral** on the Coast with one **Good**

Relative to recent 10-year average run size:

- ⊕ Good > 125%
- Neutral 75-125%
- ⊖ Poor < 75%

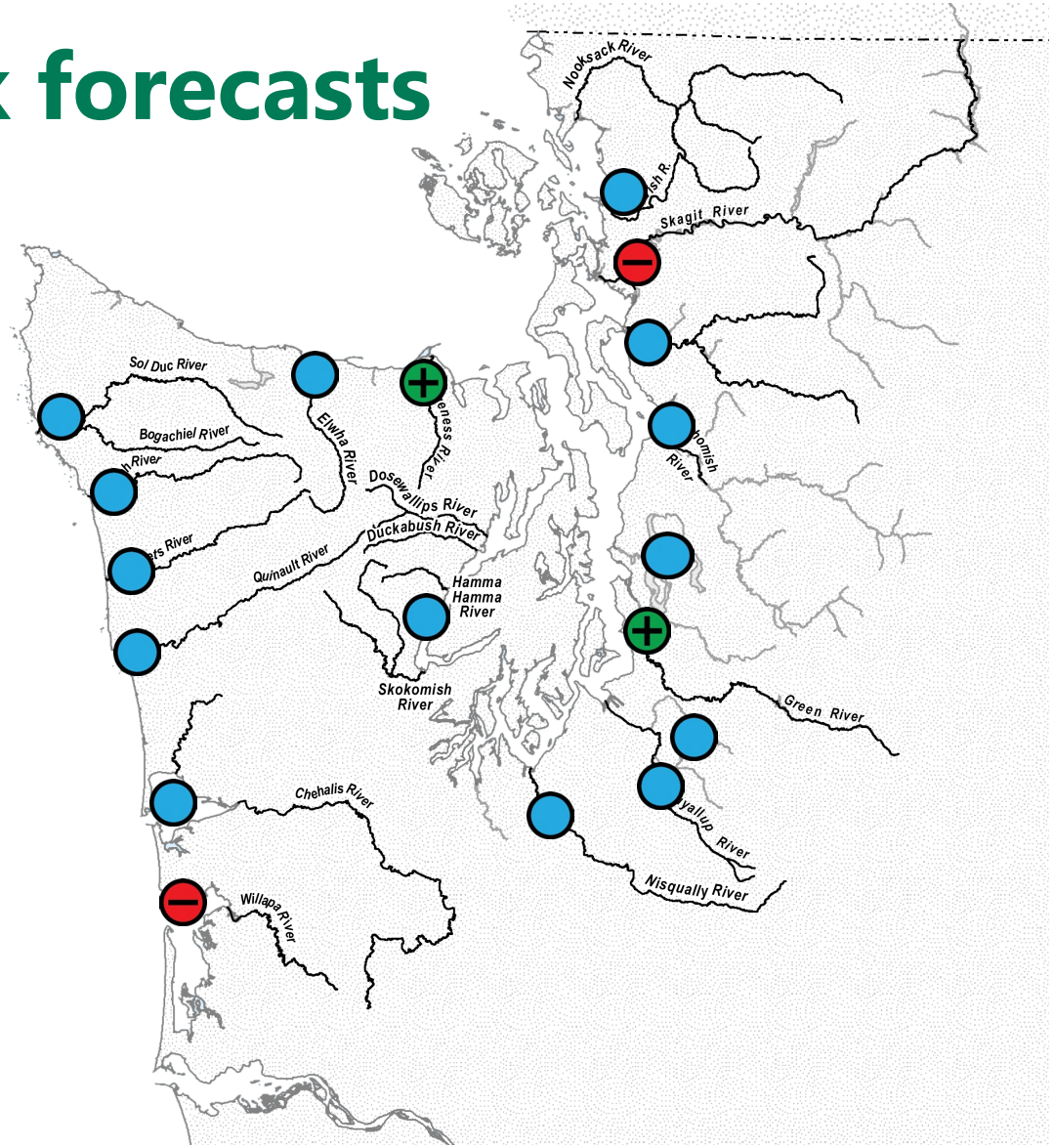


2025 summer/fall Chinook forecasts

- Forecasts mostly range from **Neutral** with one **Poor** and two **Good** for Puget Sound and **Neutral** to **Poor** for the Coast
- Puget Sound – 271,377 Total
  - 246,524 H / 24,853 W
- Coast – 75,263 Total
  - 42,440 H / 32,823 W

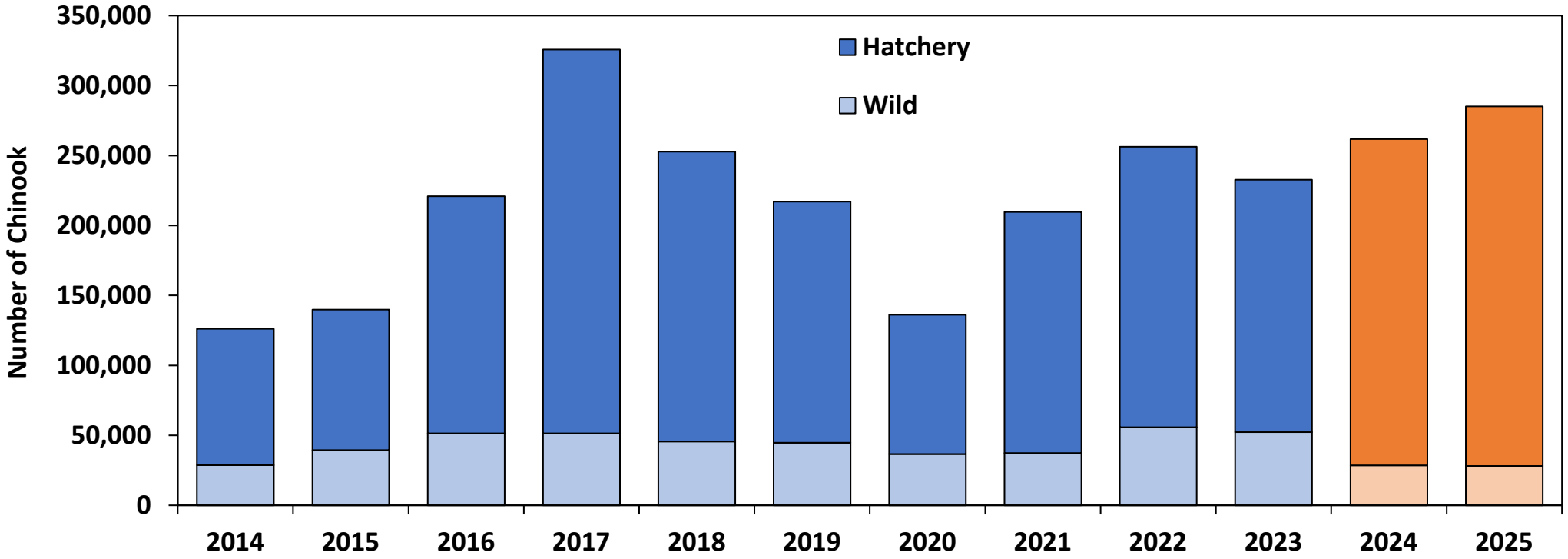
Relative to recent 10-year average run size:

- Good > 125%
- Neutral 75-125%
- Poor < 75%



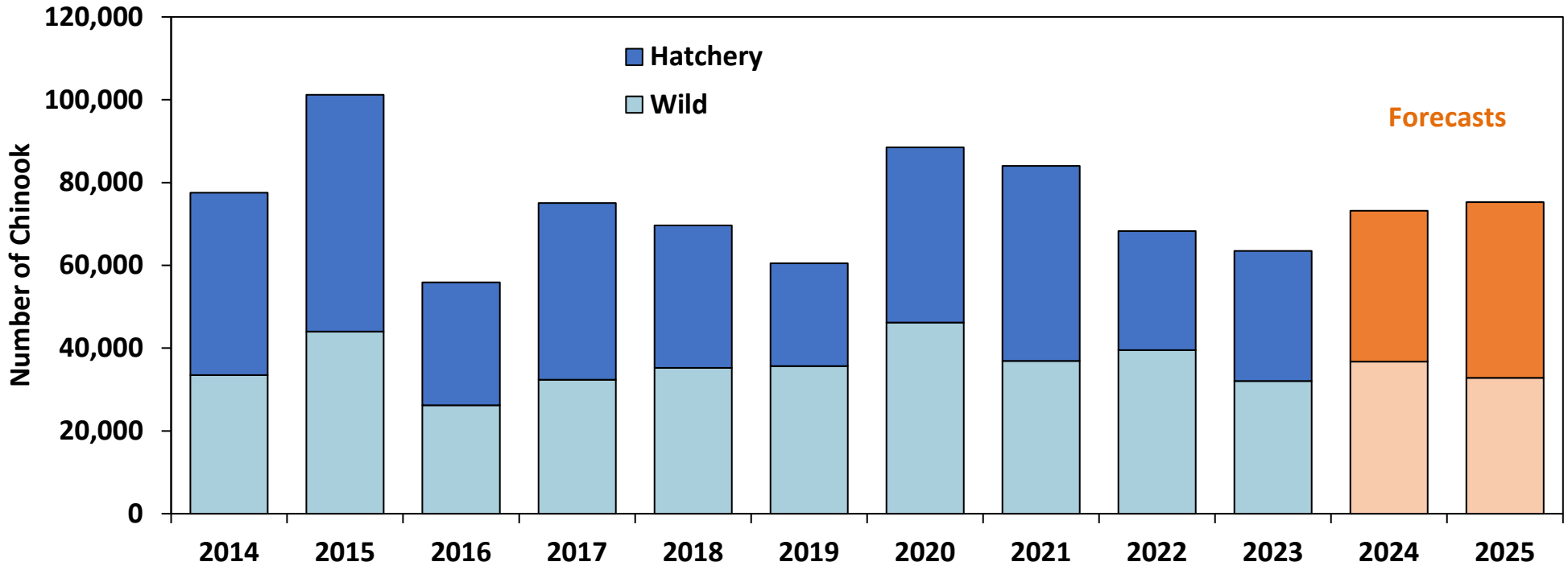
Puget Sound Chinook forecasts and abundance trends

- 2025 forecast comparisons:
  - Hatchery ⬆ **53%** and Wild ⬇ **37%** compared to recent 10-year average adult return
  - Hatchery ⬆ **10%** and Wild ⬇ **2%** compared to 2024 forecast
  - Total PS Chinook ⬆ **32%** from the 10 yr. avg run size and ⬆ **9%** from last year's forecast



Coastal Chinook forecasts and abundance trends

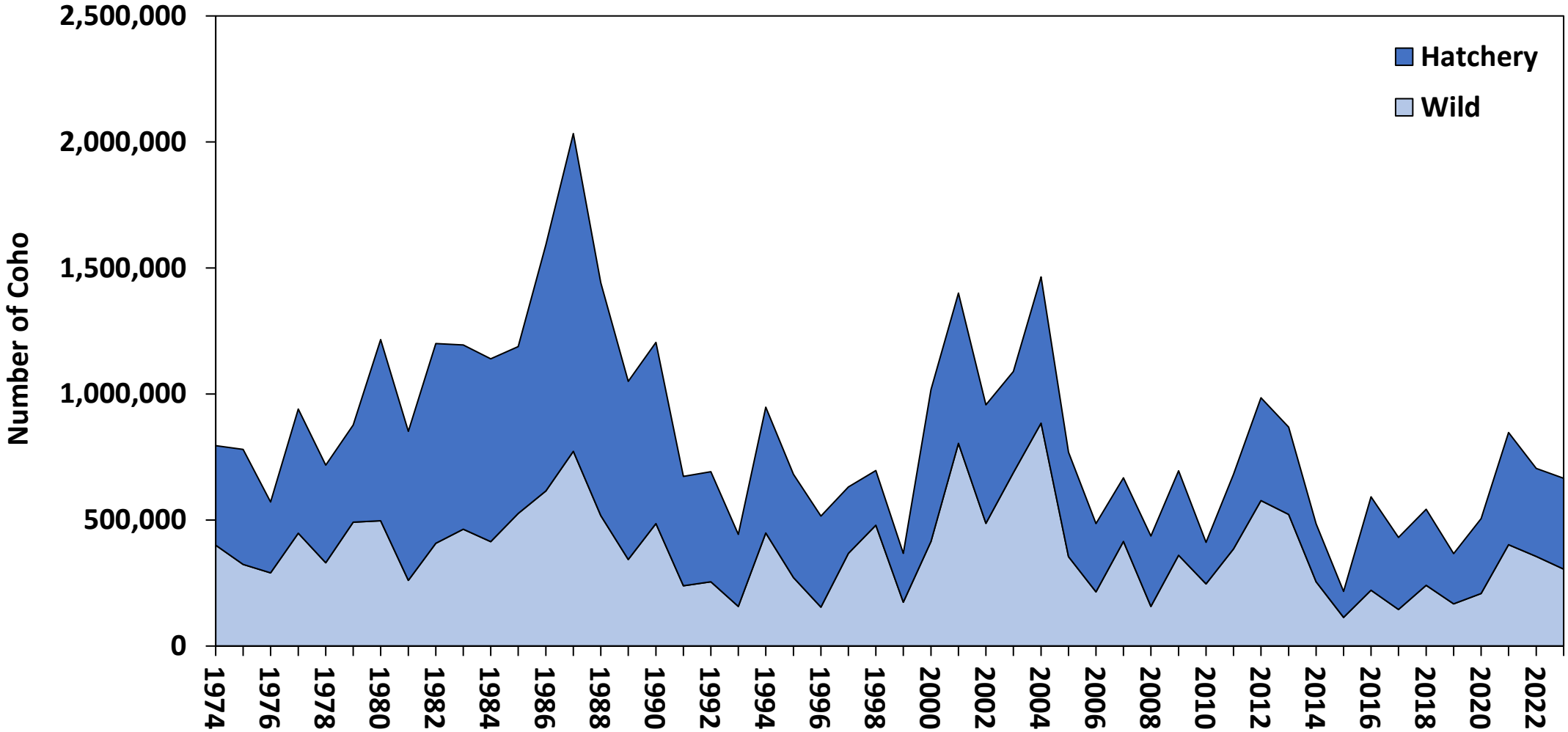
- 2025 Forecast comparisons:
  - Hatchery ⬆ **11%** and Wild ⬇ **9%** compared to recent 10-year average adult return
  - Hatchery ⬆ **16%** and Wild ⬇ **11%** compared to 2024 forecast
  - Total Chinook ⬆ **1%** above the 10 yr. avg run size and ⬆ **3%** above last year's forecast



Coho forecast

Photo credit: Brice Crayne

Coho historical run size – Puget Sound

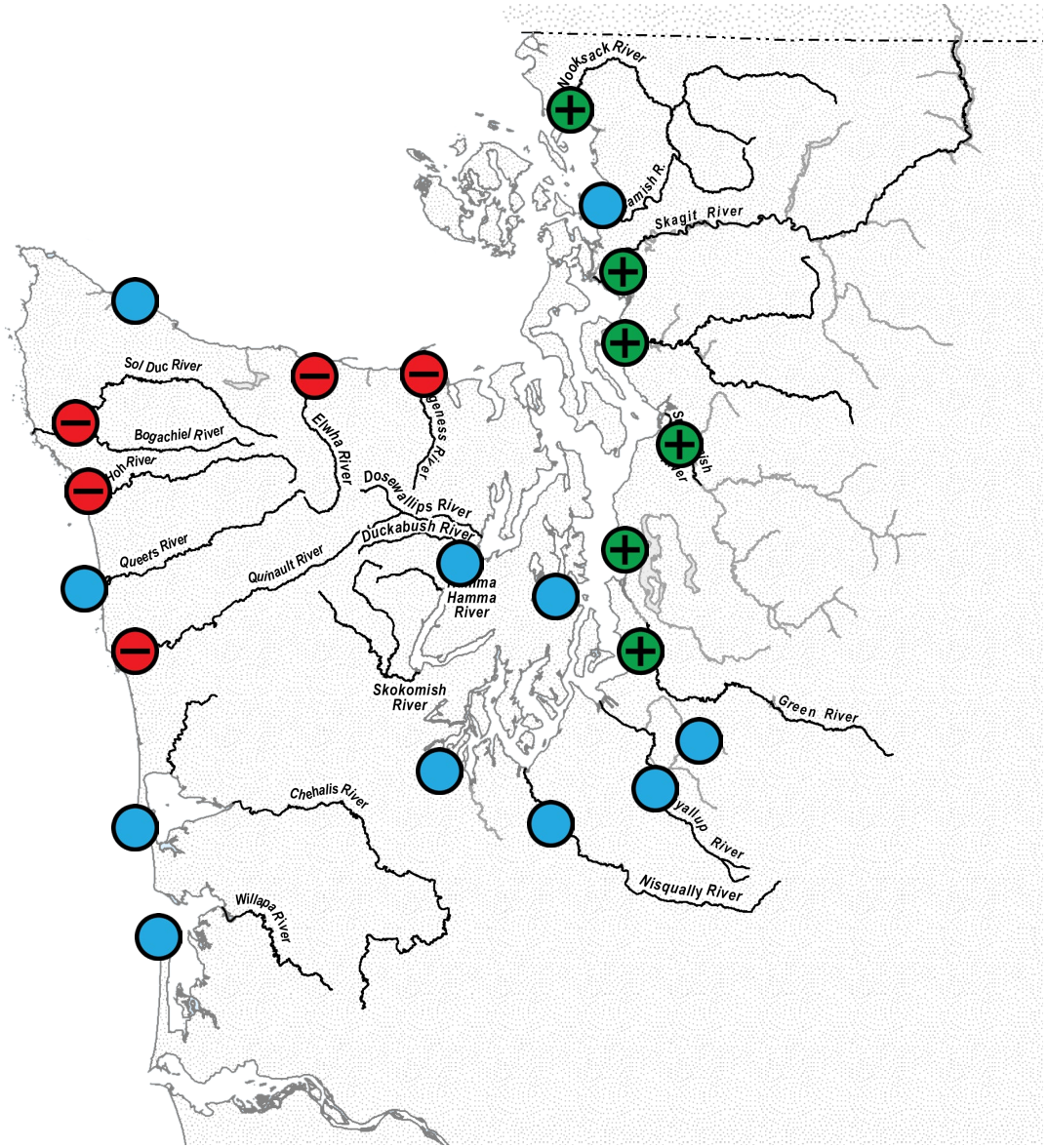


2024 Coho returns

- All returns are preliminary
- Returns ranged from **Good** to **Poor** for Puget Sound
- Returns for the coast were **Neutral** to **Poor**

Relative to recent 10-year average run size:

- Good > 125%
- Neutral 75-125%
- Poor < 75%

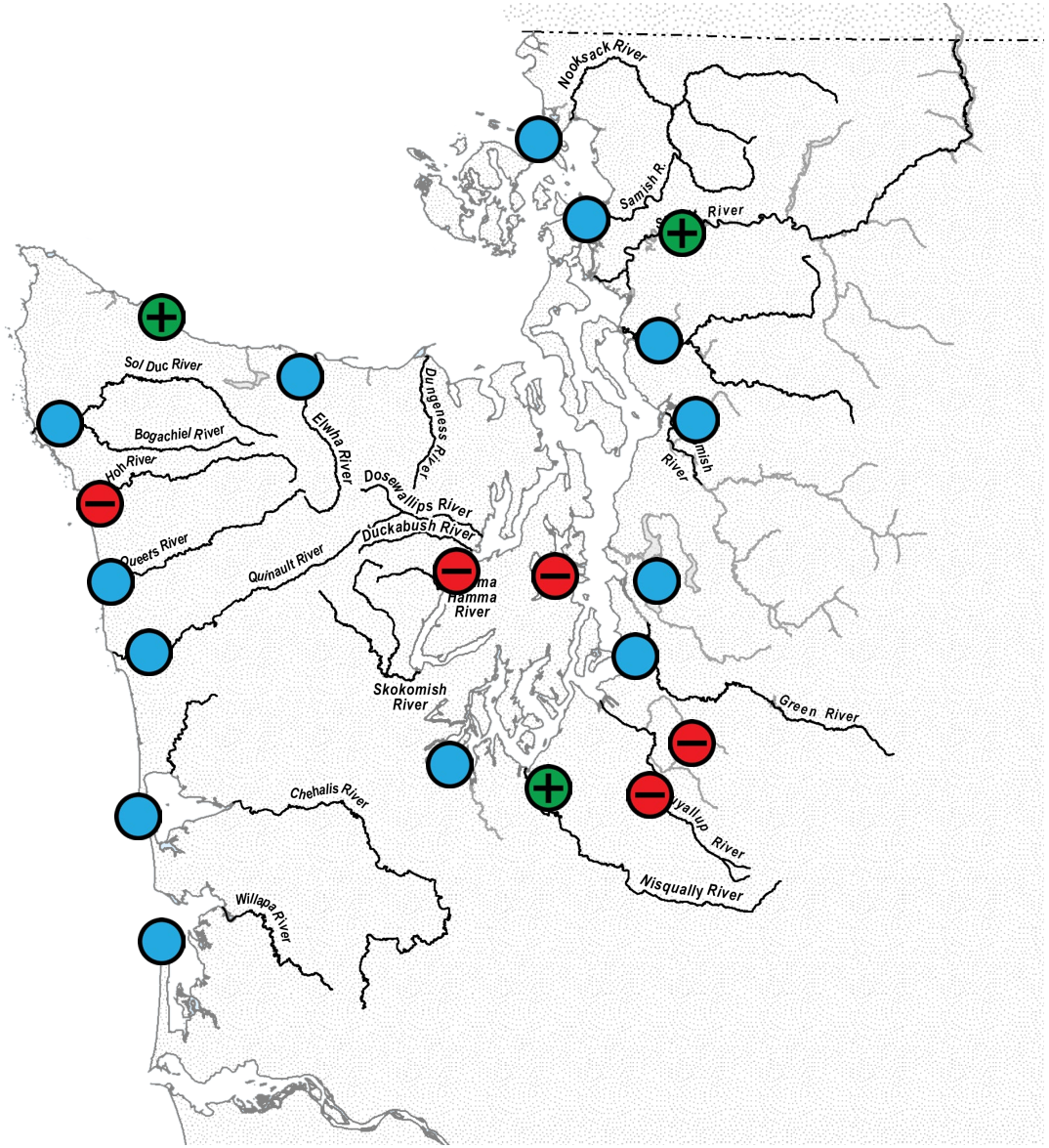


2025 Coho forecasts

- Forecasts range mostly from **Neutral** across Puget Sound with a couple **Poor** and a couple **Good** forecasts.
  - 727,058 Total
    - 462,180 H / 264,878 W
- Forecasts are **Neutral** to **Poor** across the Coast
  - 381,900 Total
    - 244,939 H / 136,961 W

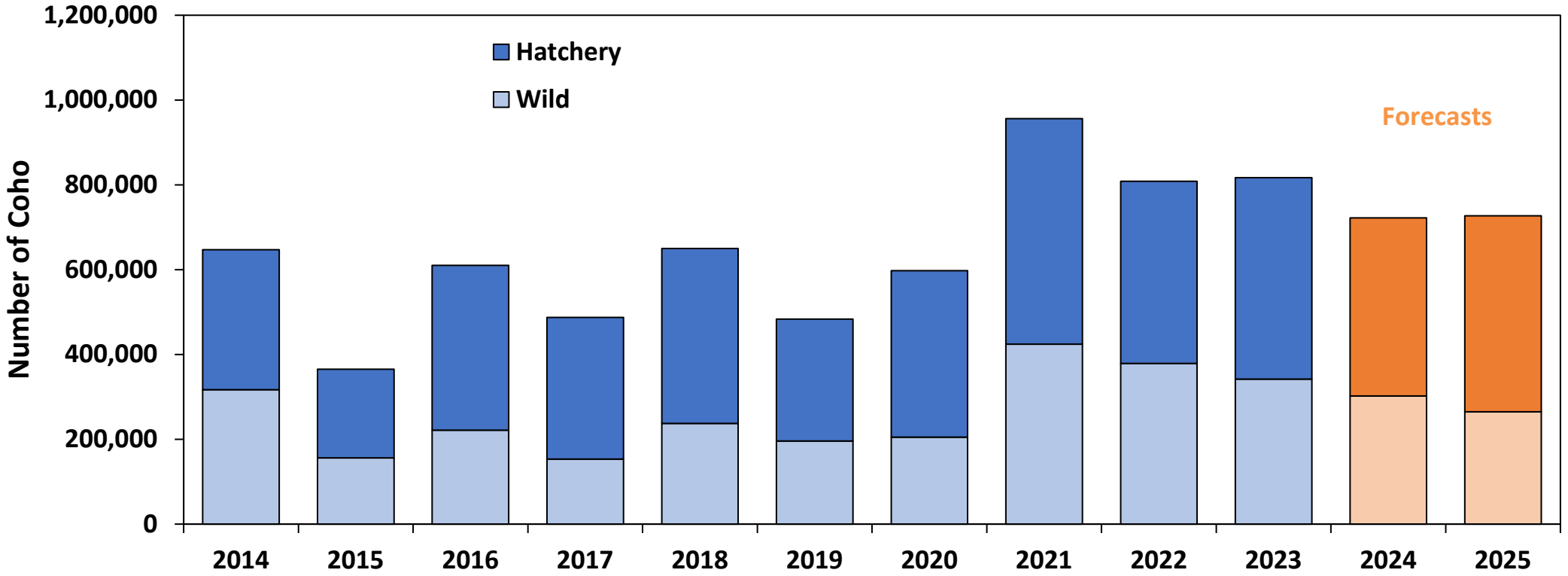
Relative to recent 10-year average run size:

- Good > 125%
- Neutral 75-125%
- Poor < 75%



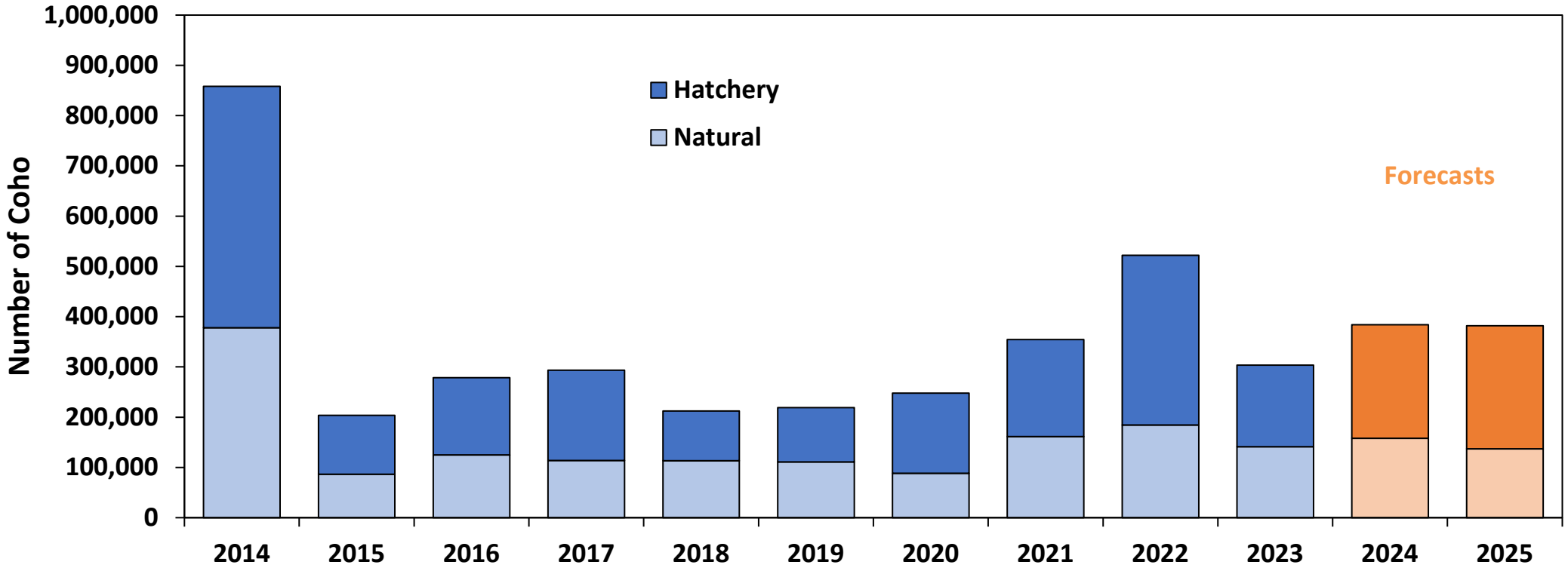
Puget Sound coho forecasts and abundance trends

- 2025 forecast comparisons:
  - Hatchery ⬆ **22%** and Wild ⬆ **1%** over recent 10-year average
  - Hatchery ⬆ **10%** and Wild ⬇ **12%** compared to 2024 forecast
  - Total PS Coho ⬆ **13%** from the 10 yr. avg run size and ⬆ **1%** from last year's forecast



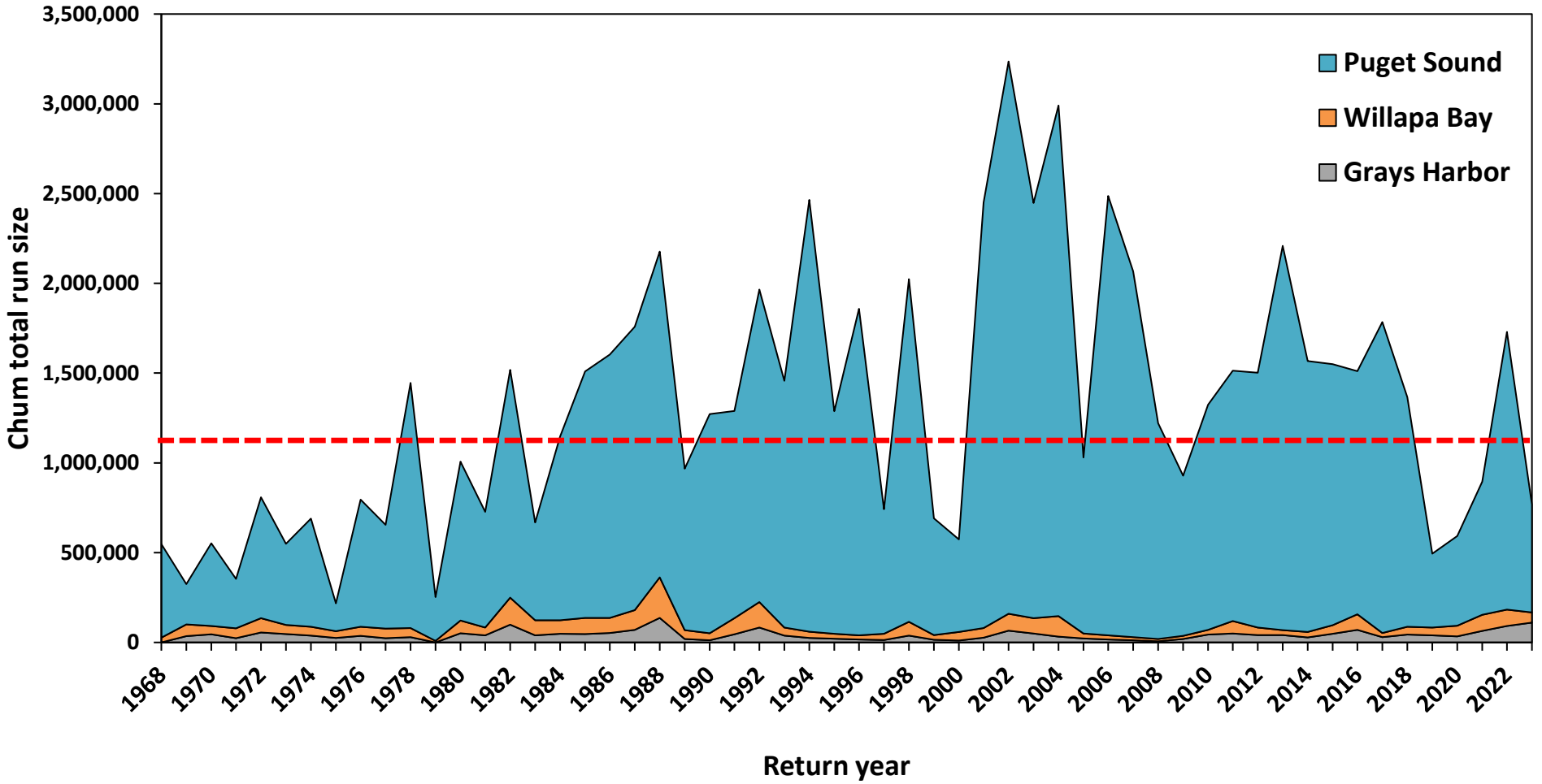
Coastal coho forecasts and abundance trends

- 2025 forecast comparisons:
  - Hatchery ⬆**23%** and Wild ⬇**9%** compared to recent 10-year average adult return
  - Hatchery ⬆**8%** and Wild ⬇**13%** compared to 2024 forecast
  - Total Coho ⬆**9%** from the 10 yr. avg run size and ⬇**0.5%** from last year's forecast



Chum Salmon

Historical Chum run sizes



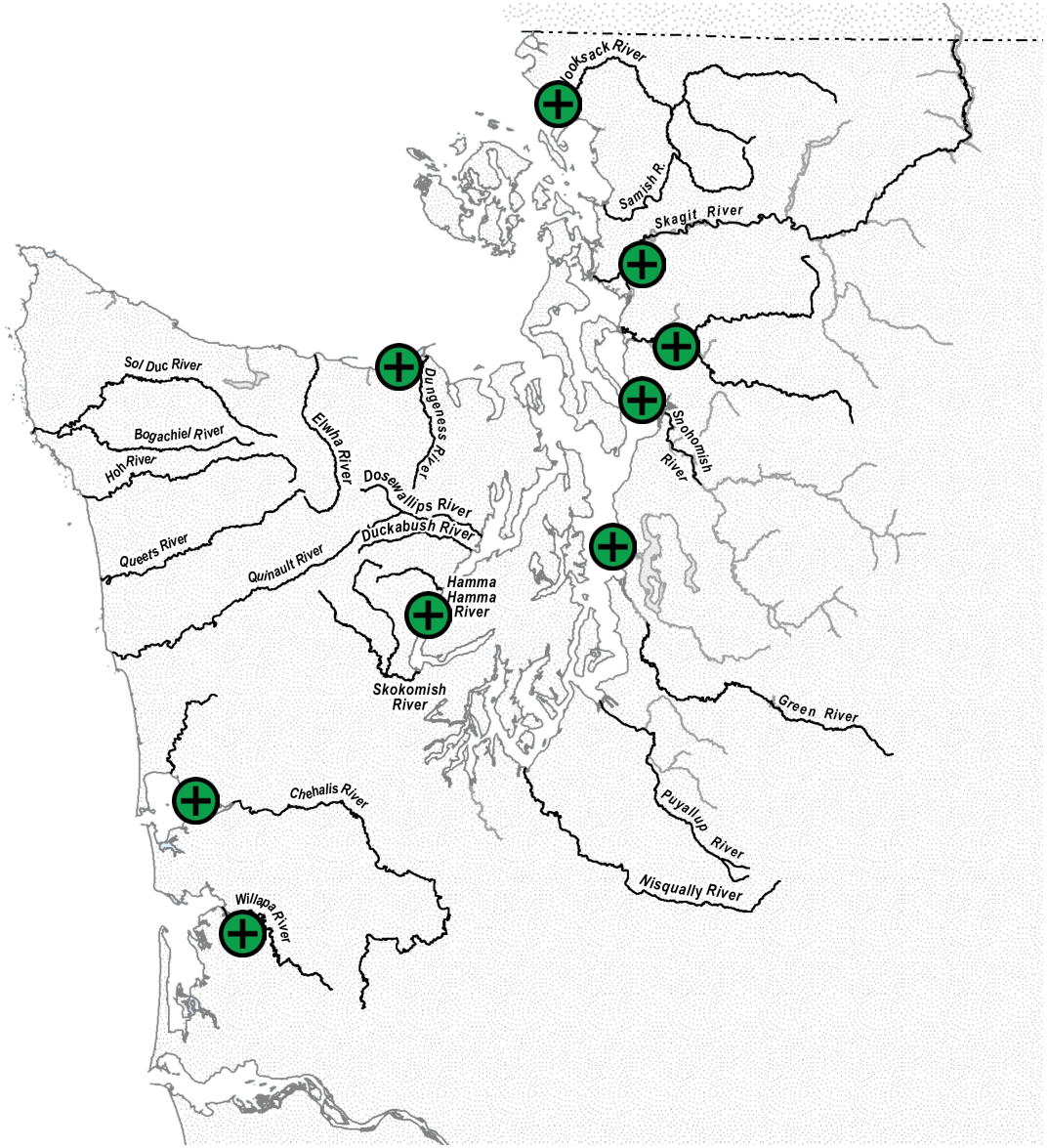
Puget Sound recent 10-year average 1.11 million

2024 fall Chum returns

- Returns were **Good** throughout Puget Sound
- Returns were **Good** along the coast
- HC and South Sound are relative to in-season updated run sizes, not escapement

Relative to recent 10-year average escapement:

- Good > 125%
- Neutral 75-125%
- Poor < 75%

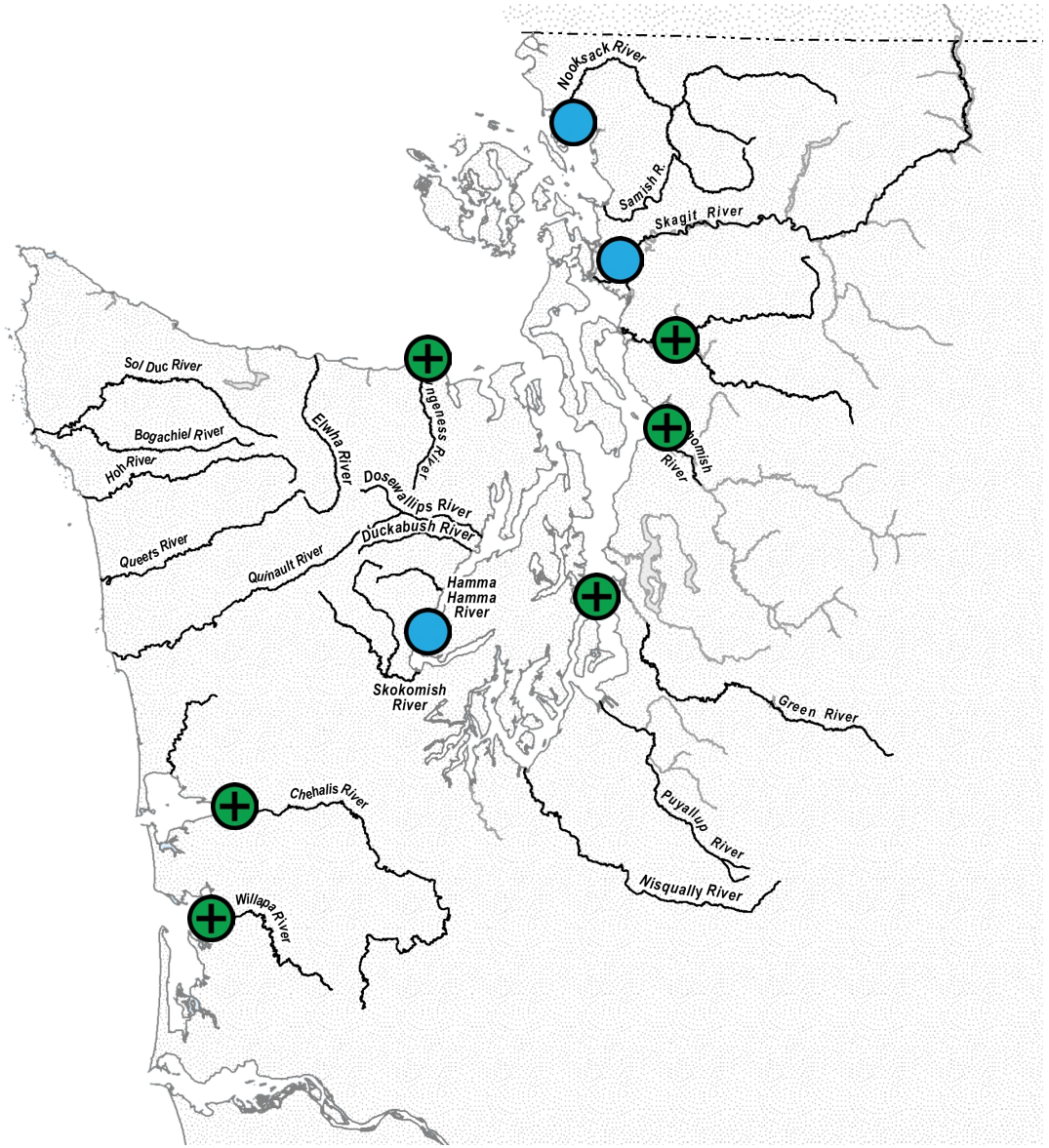


2025 fall Chum forecast

- Forecasts range from **Neutral** to **Good** in Puget Sound
- North Sound – 112,006
- Central/S. Sound – 730,267
- Hood Canal – 454,881
- Willapa – 94,464
- Grays H – 151,913

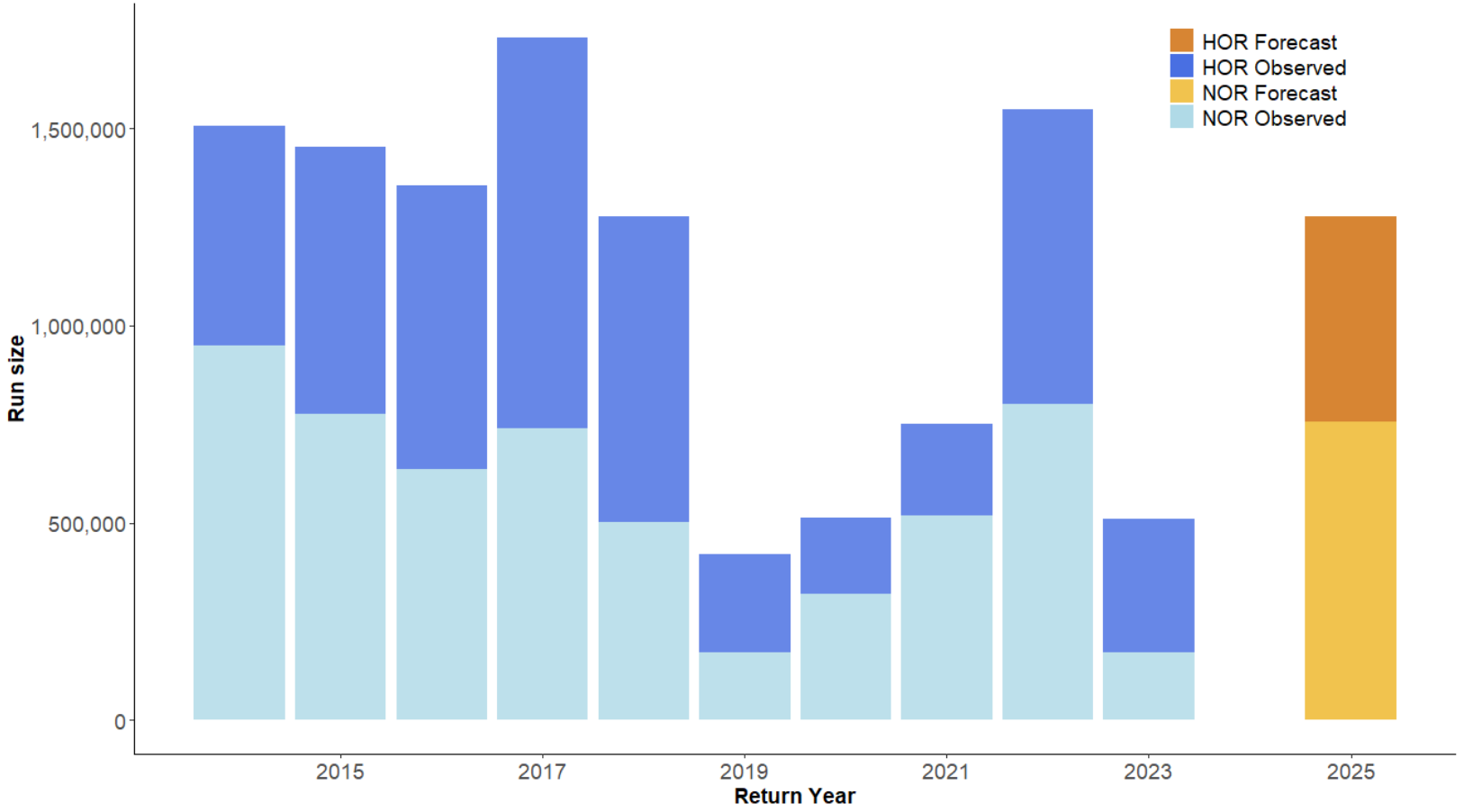
Relative to recent 10-year average escapement:

- Good > 125%
- Neutral 75-125%
- Poor < 75%



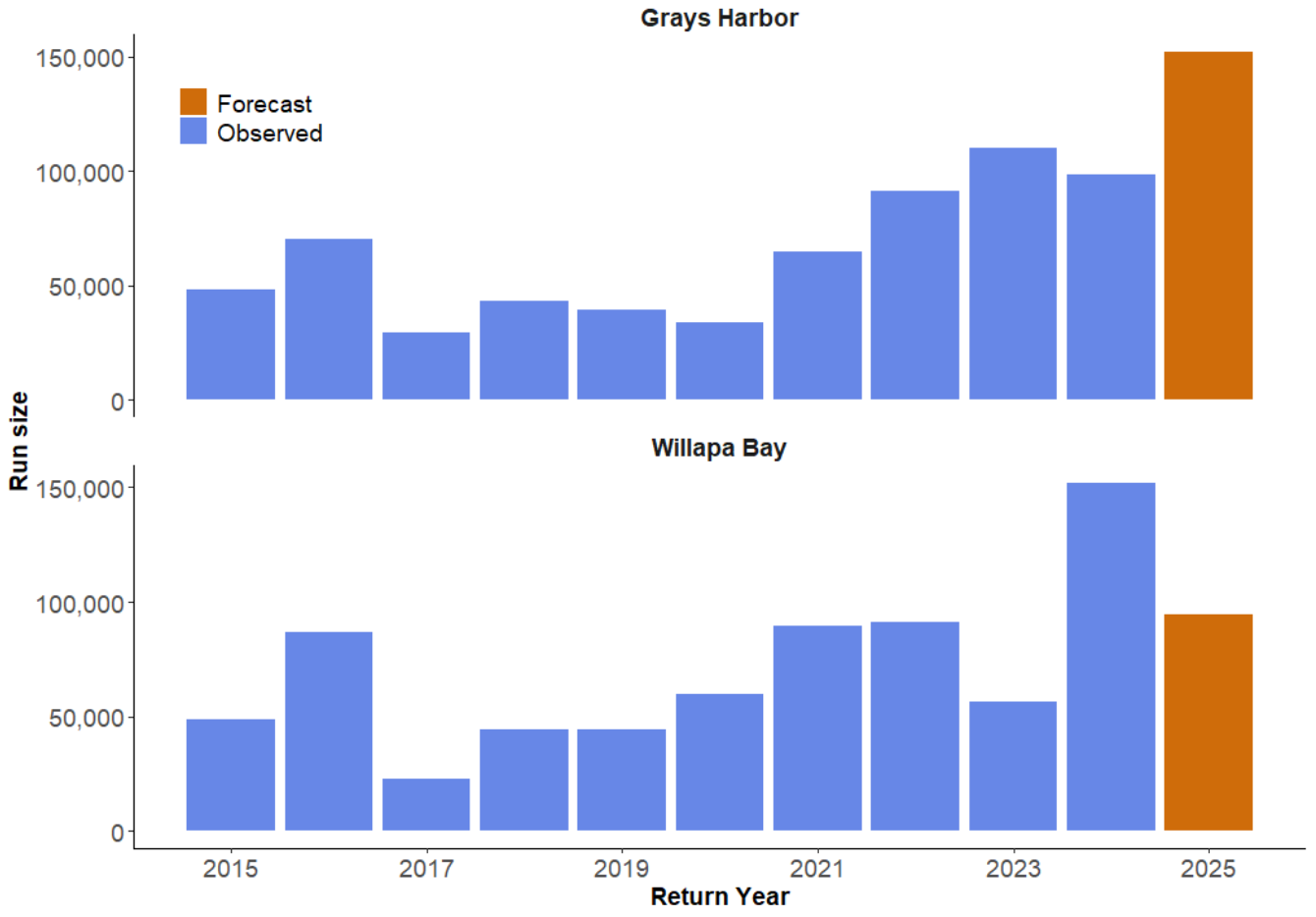
Puget Sound fall Chum forecasts

Hatchery origin (HOR) ⬇ **5%** and Natural origin (NOR) ⬆ **35%** over recent 10-year average



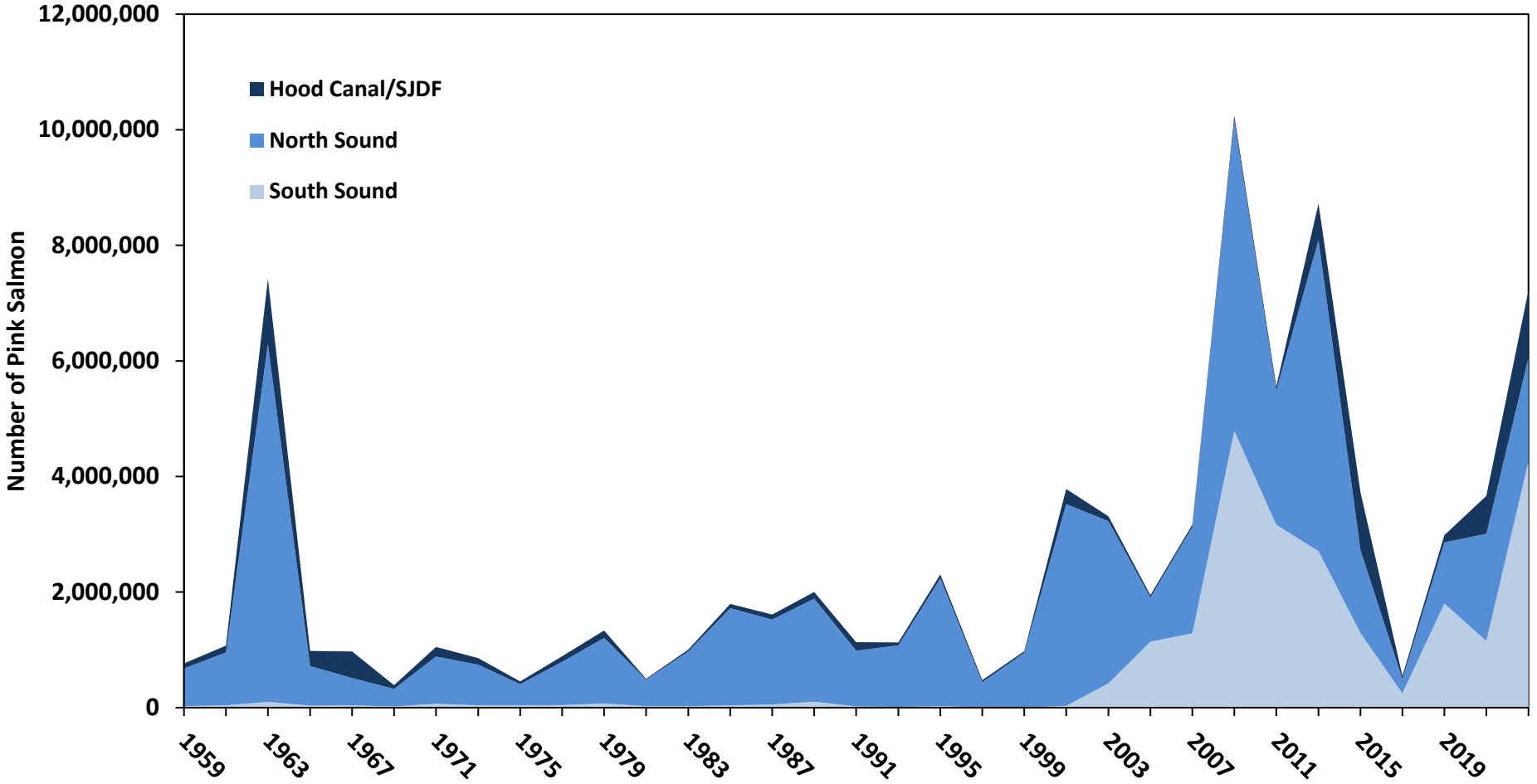
Coastal Chum forecasts

Grays Harbor ⬆ **141%** and Willapa Bay ⬆ **36%** over recent 10-year average



Pink Salmon

Puget Sound Pink Salmon run size

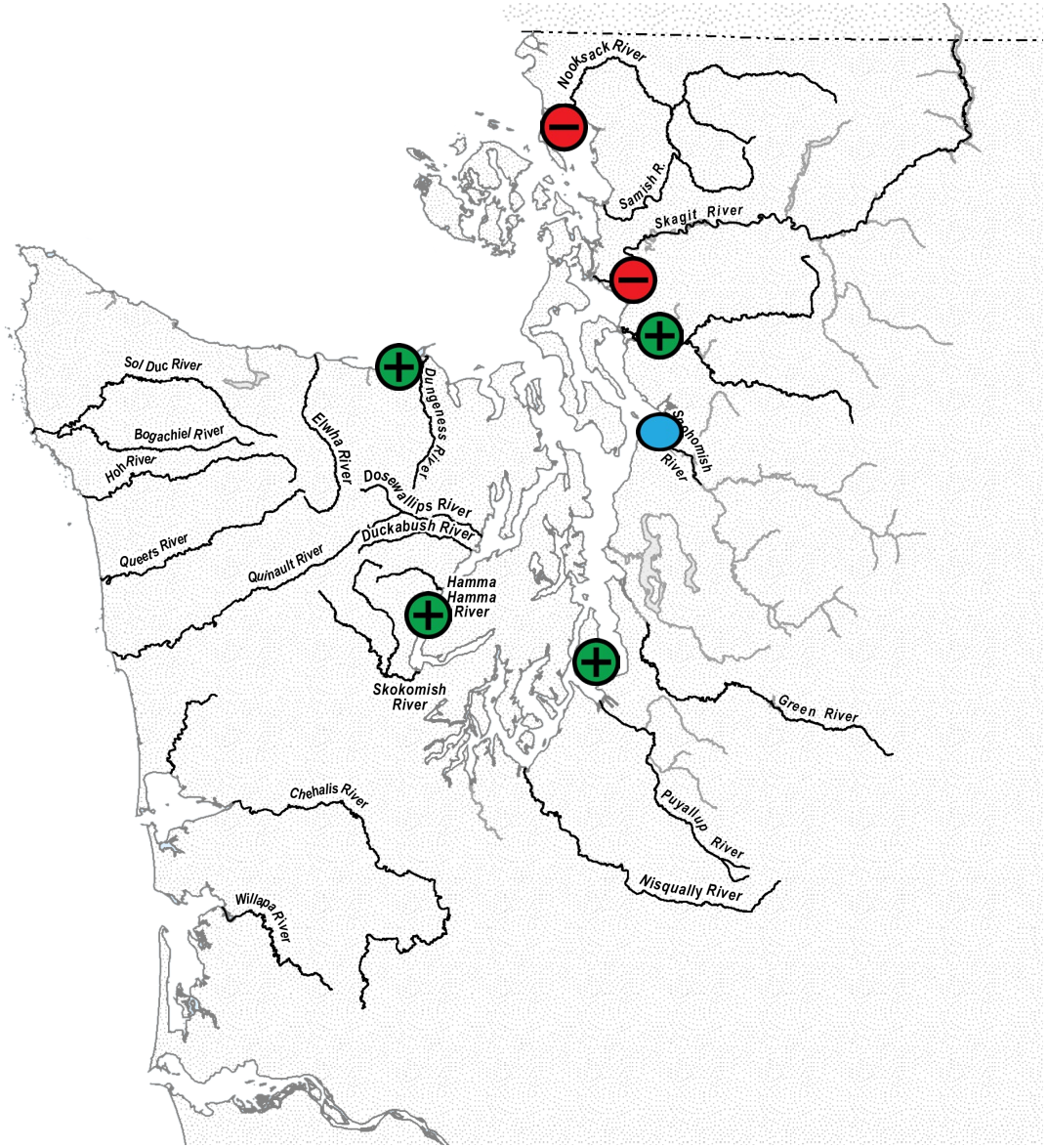


2023 Pink returns

- Returns ranged from **Poor** to **Good** throughout Puget Sound
- Some watersheds reaching record high escapement

Relative to recent 10-cycle average run size:

- Good > 125%
- Neutral 75-125%
- Poor < 75%



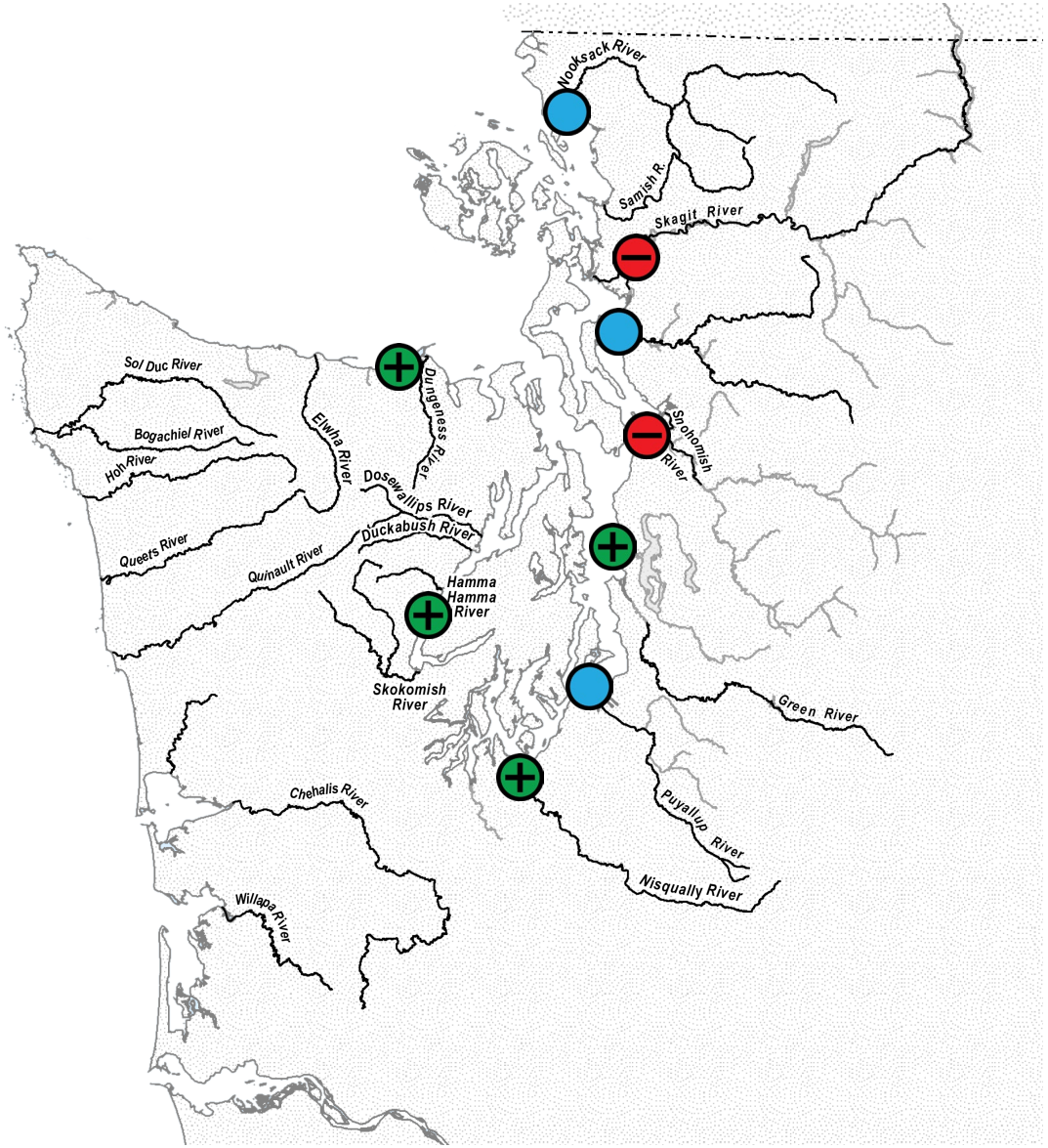
2025 Pink forecast

Forecasts range from **Poor** to **Good** throughout Puget Sound

- North Sound – 999k
- Central/S. Sound – 4.05M
- Hood Canal/SJDF – 2.7M

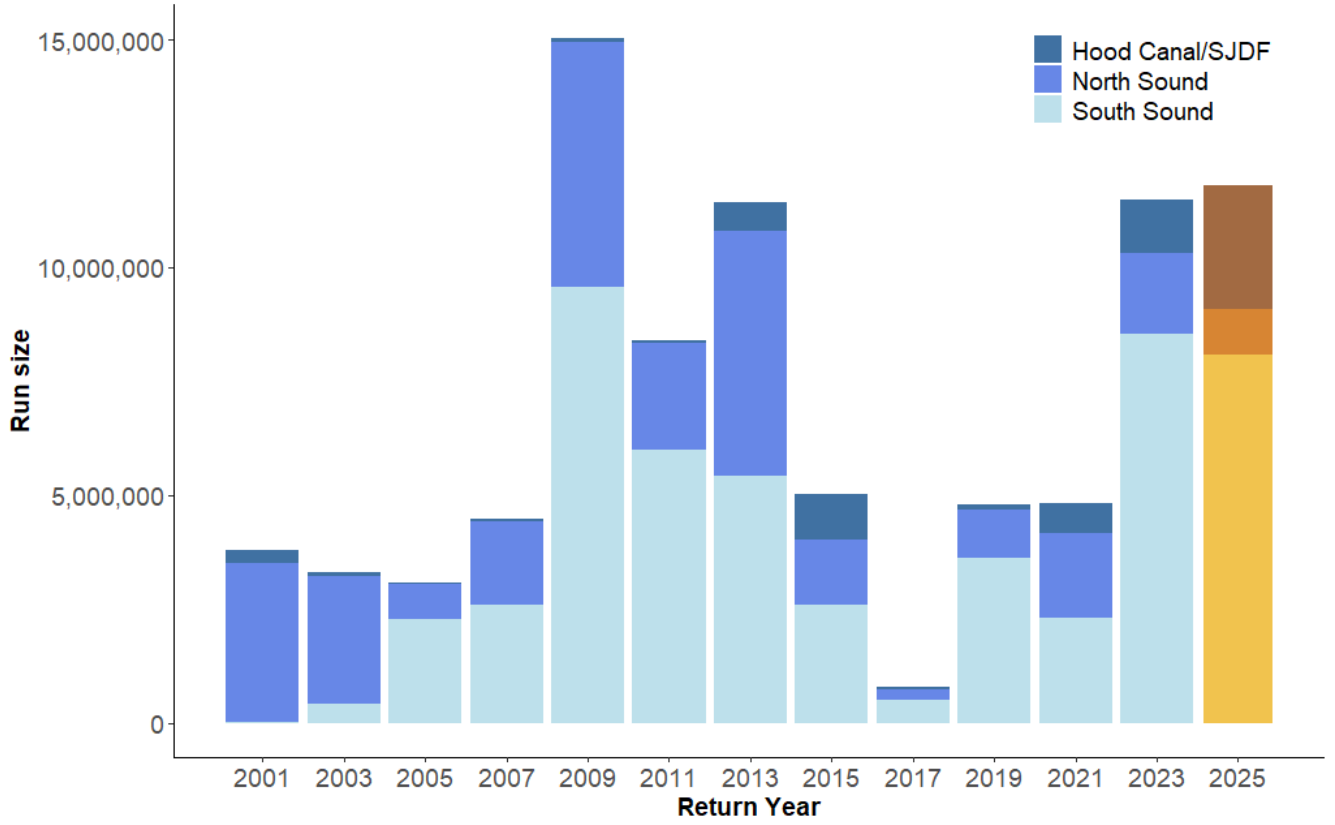
Relative to recent 10-year average escapement:

- Good > 125%
- Neutral 75-125%
- Poor < 75%



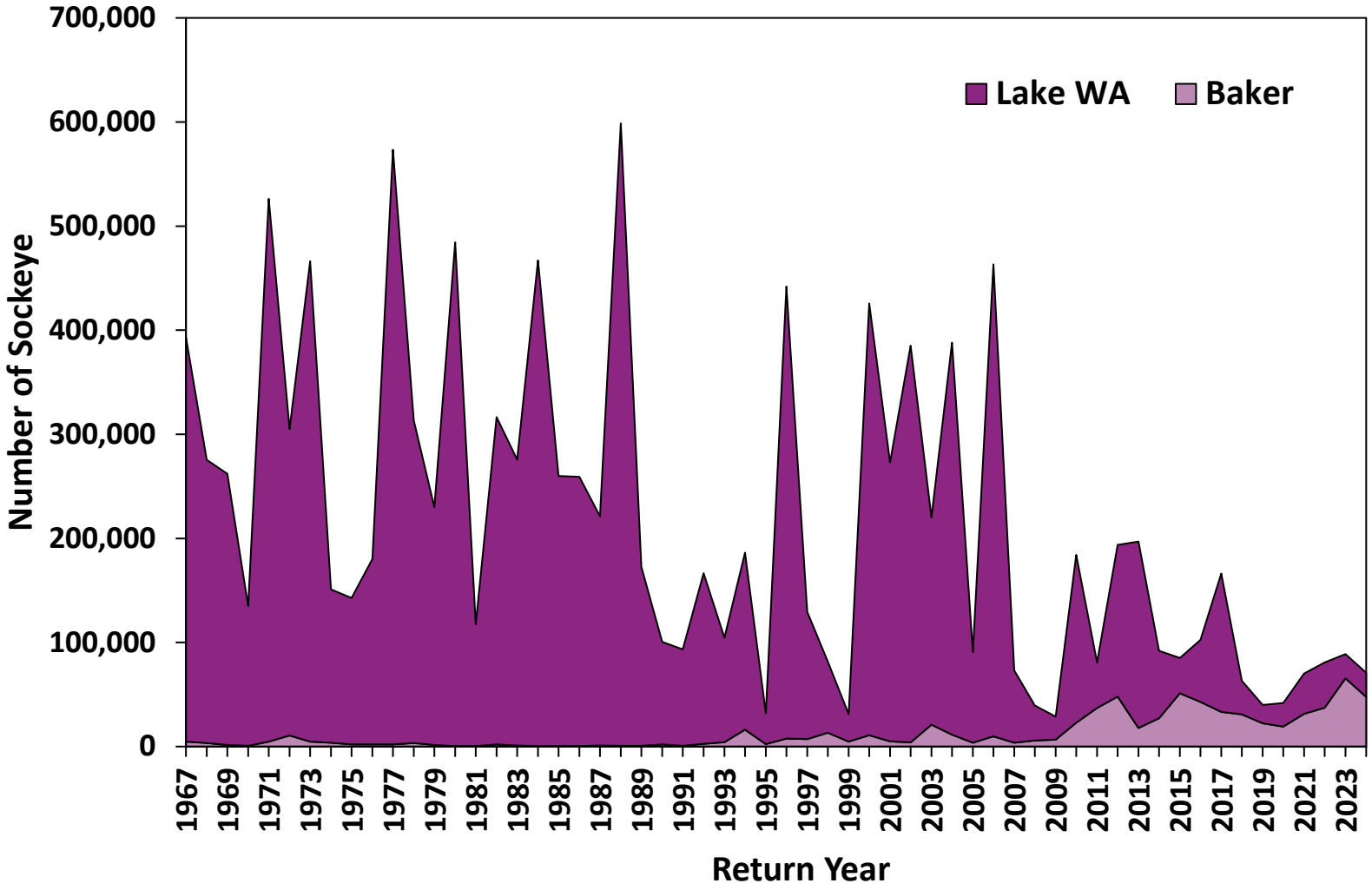
2025 Pink forecast

Total Puget Sound Pink forecast ⬆ **70%** over recent 10-year cycle average



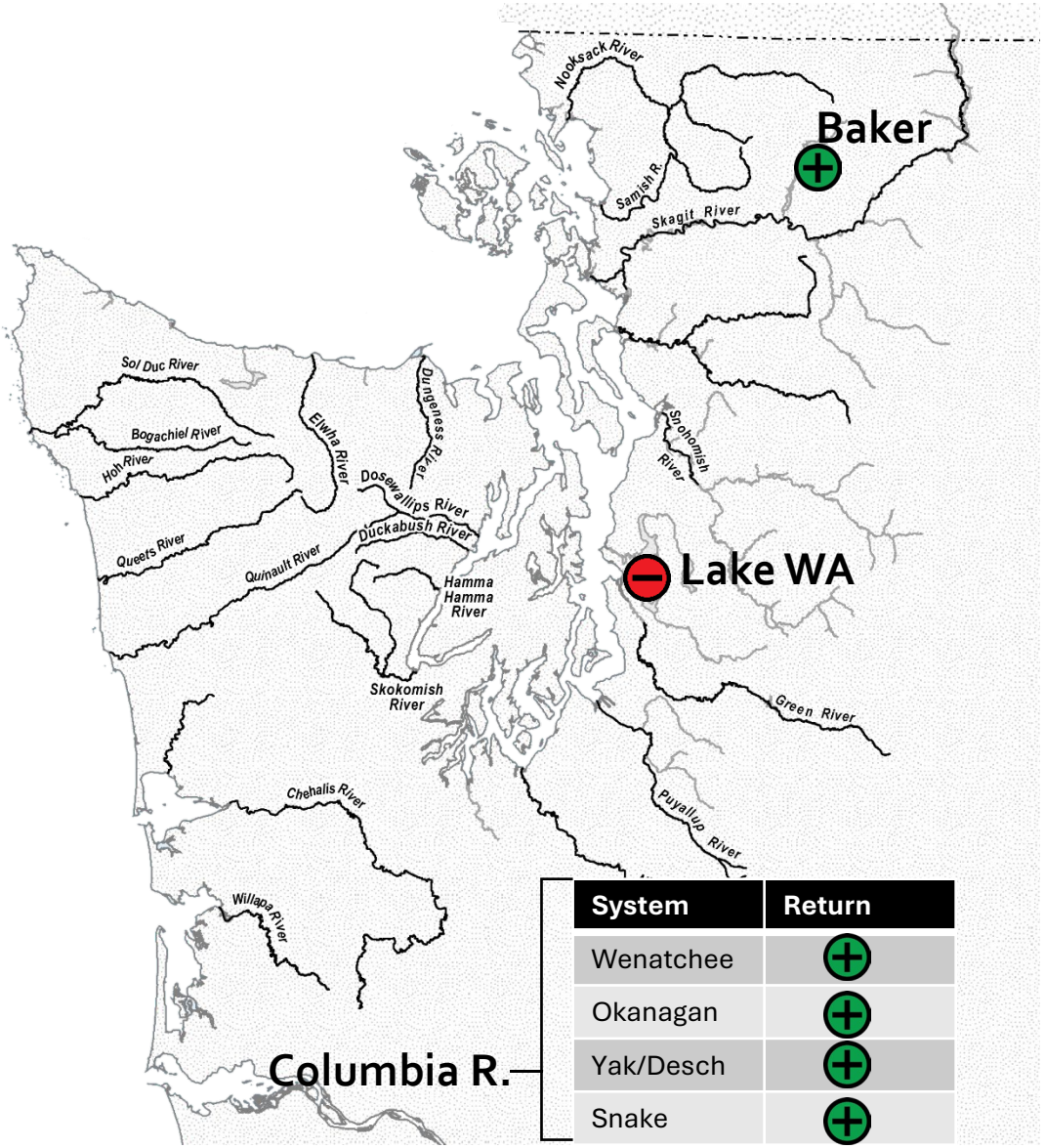
Sockeye Salmon

Puget Sound Sockeye run size



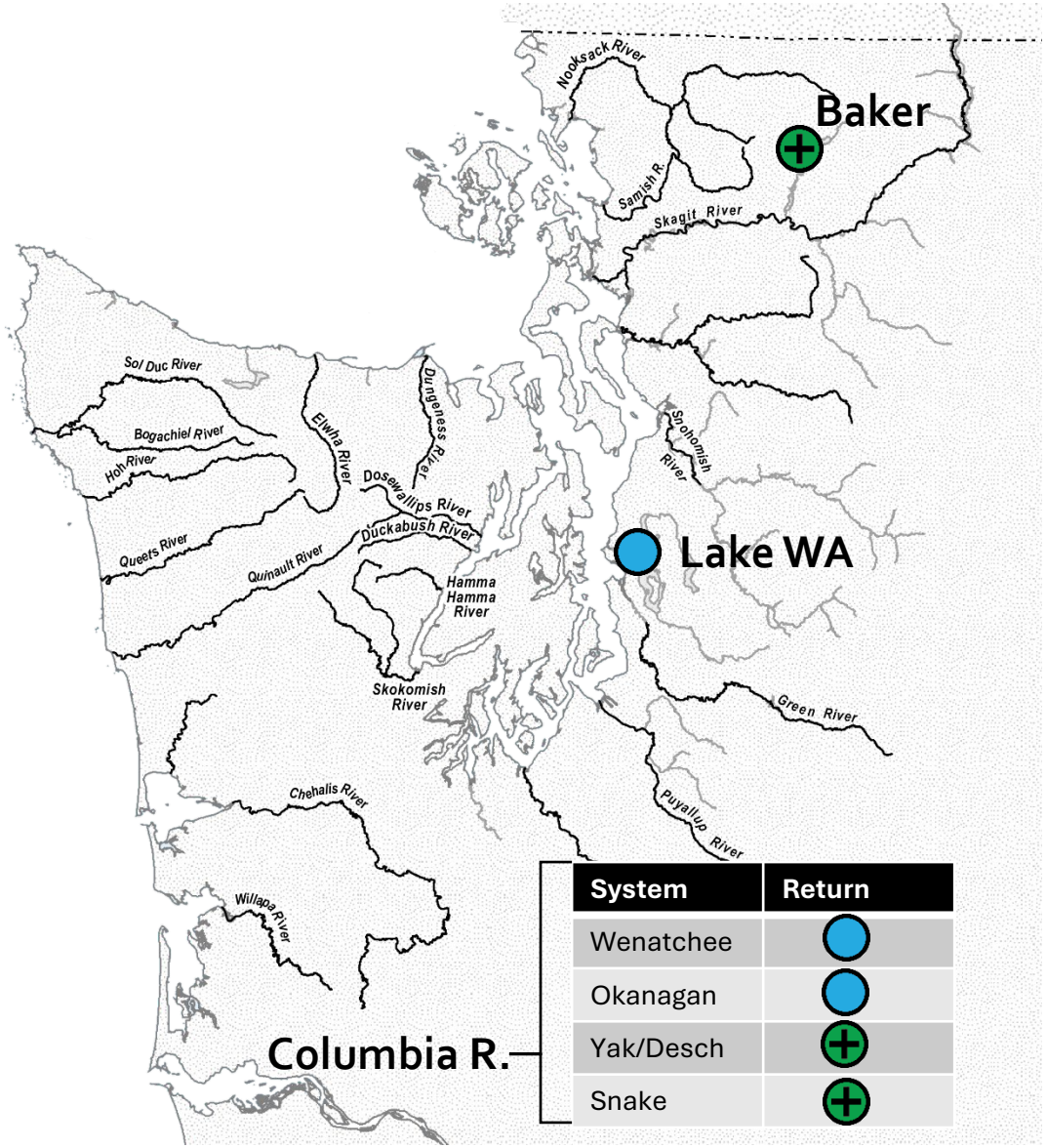
2024 Sockeye returns

- Returns were **Good** at Baker Lake
- Lake Washington returns were **Poor**
- Total Columbia River and stock specific returns were **Good**



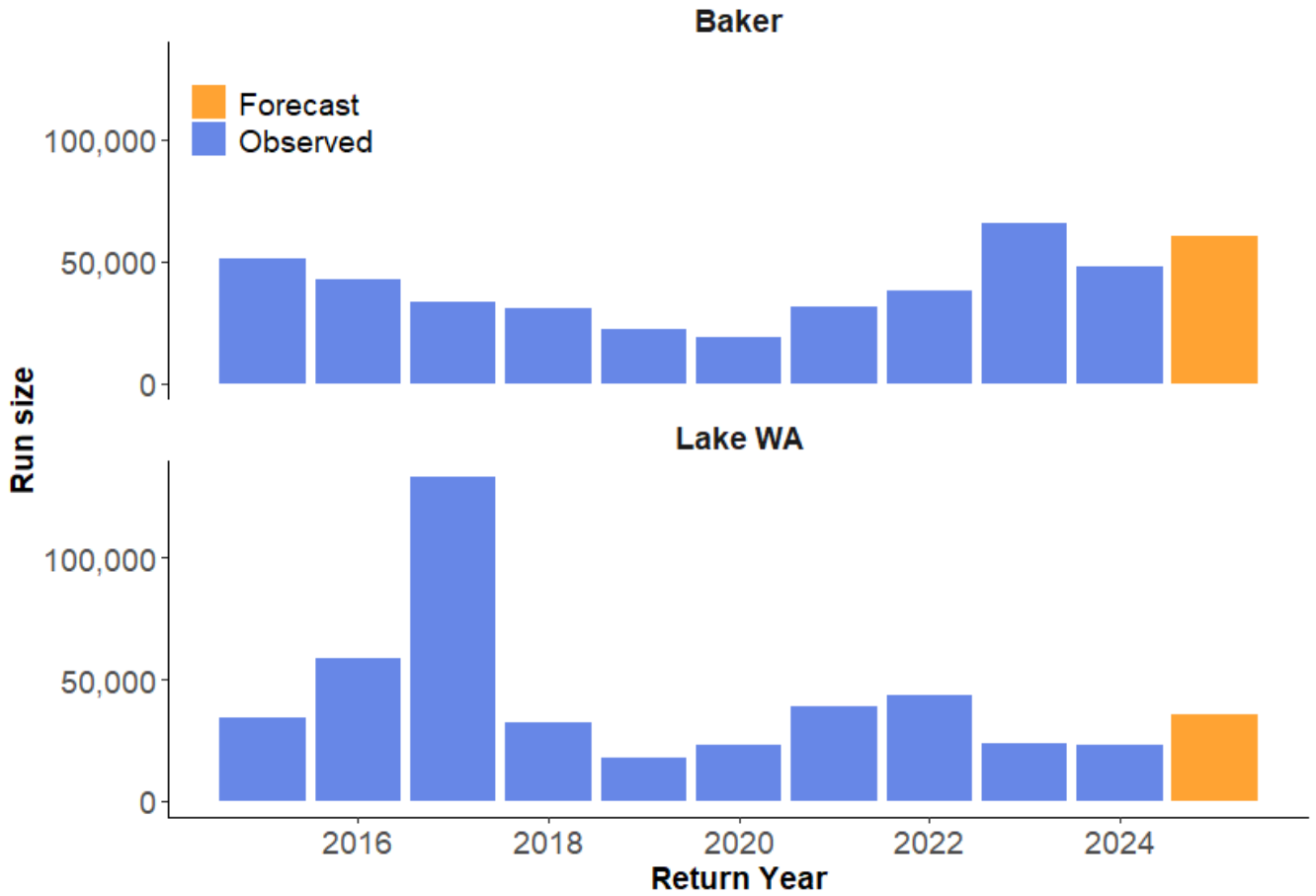
2025 Sockeye forecast

- Baker Lake – 60,214
- Lake WA – 35,356
- Columbia River – 350,200
  - Wenatchee – 94,000
  - Okanagan – 248,000
  - Yakima/Deschutes – 5,100
  - Snake River – 3,100



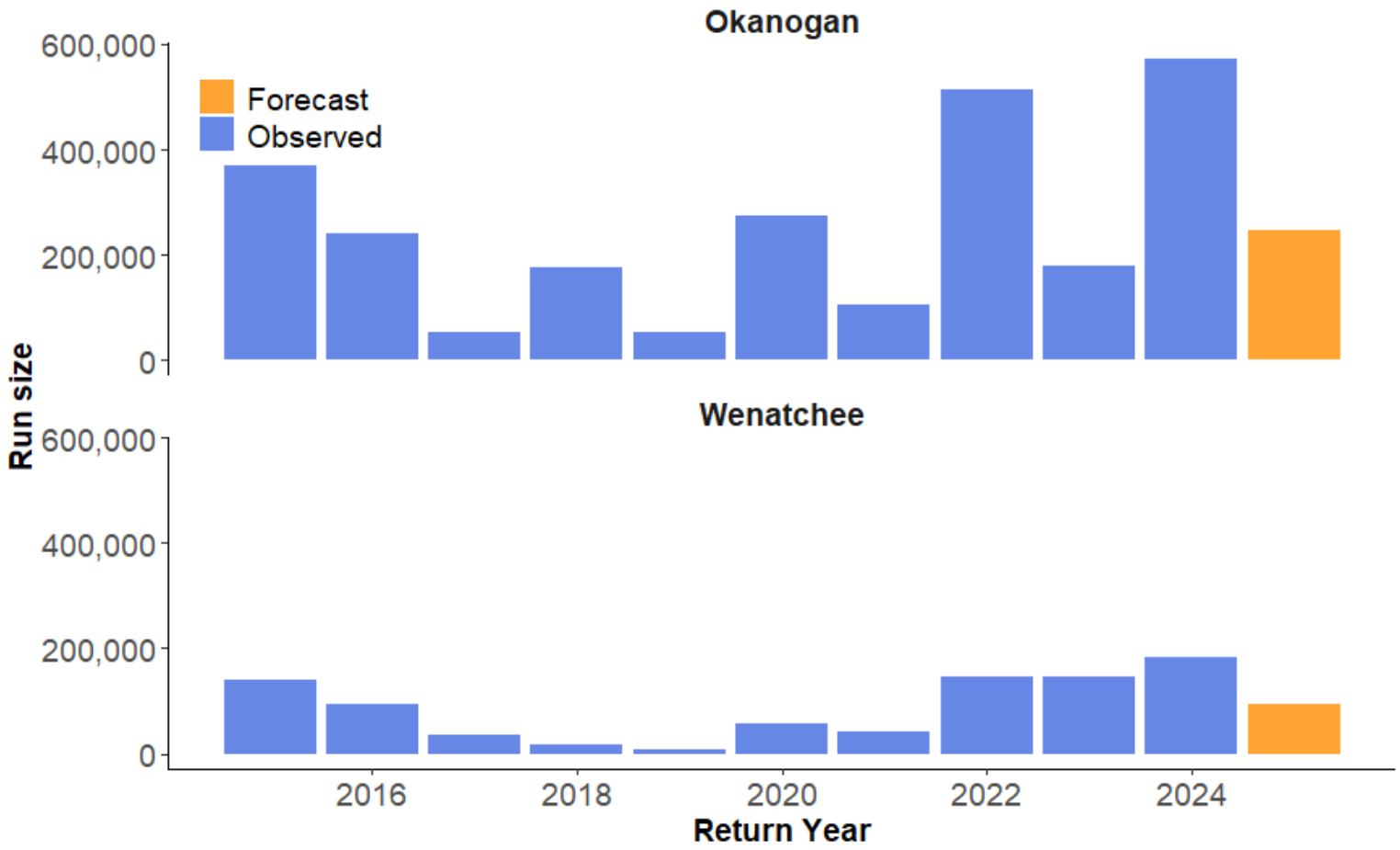
Puget Sound Sockeye forecasts

Lake WA ⬇ **17%** and Baker ⬆ **57%** over recent 10-year average



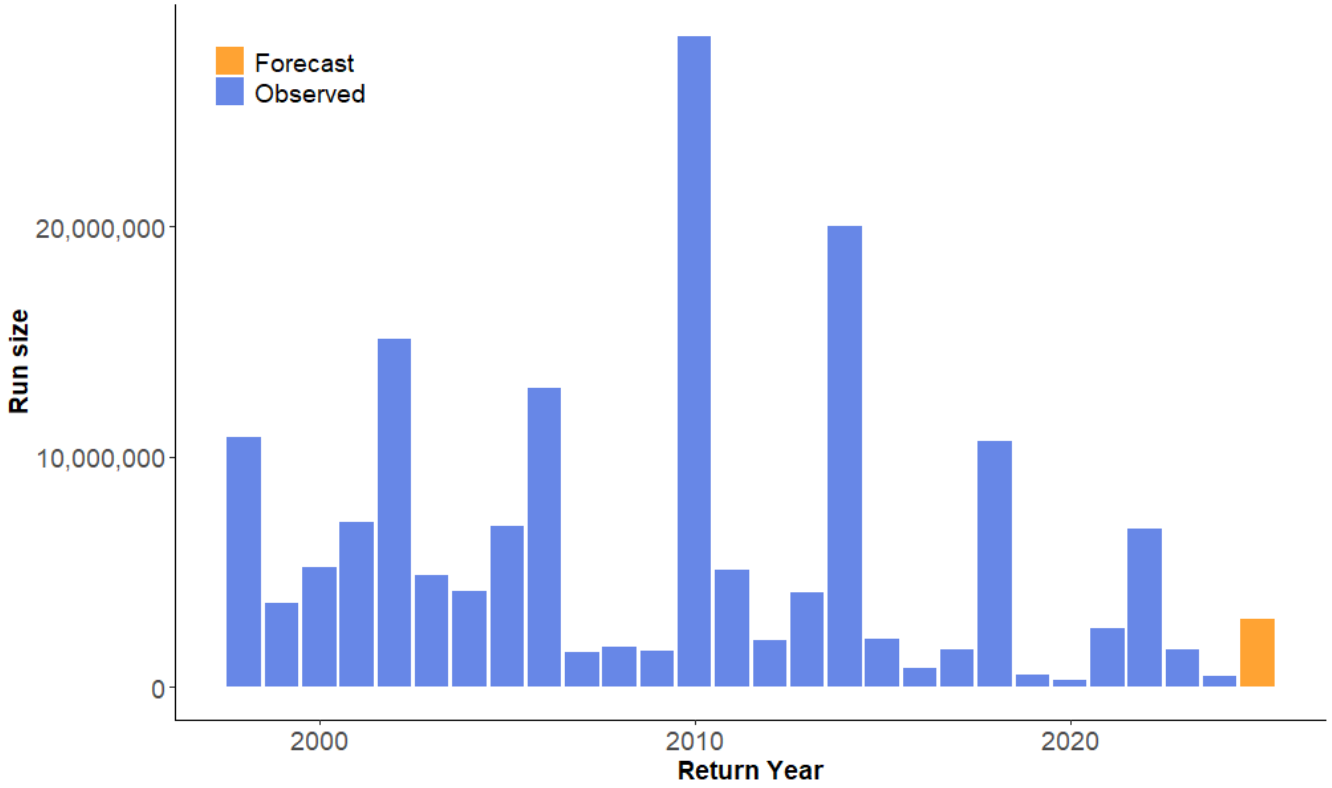
Columbia River Sockeye forecasts

- Lake Wenatchee ⬆ **1%** and Okanogan ⬇ **2%** over recent 10-year average



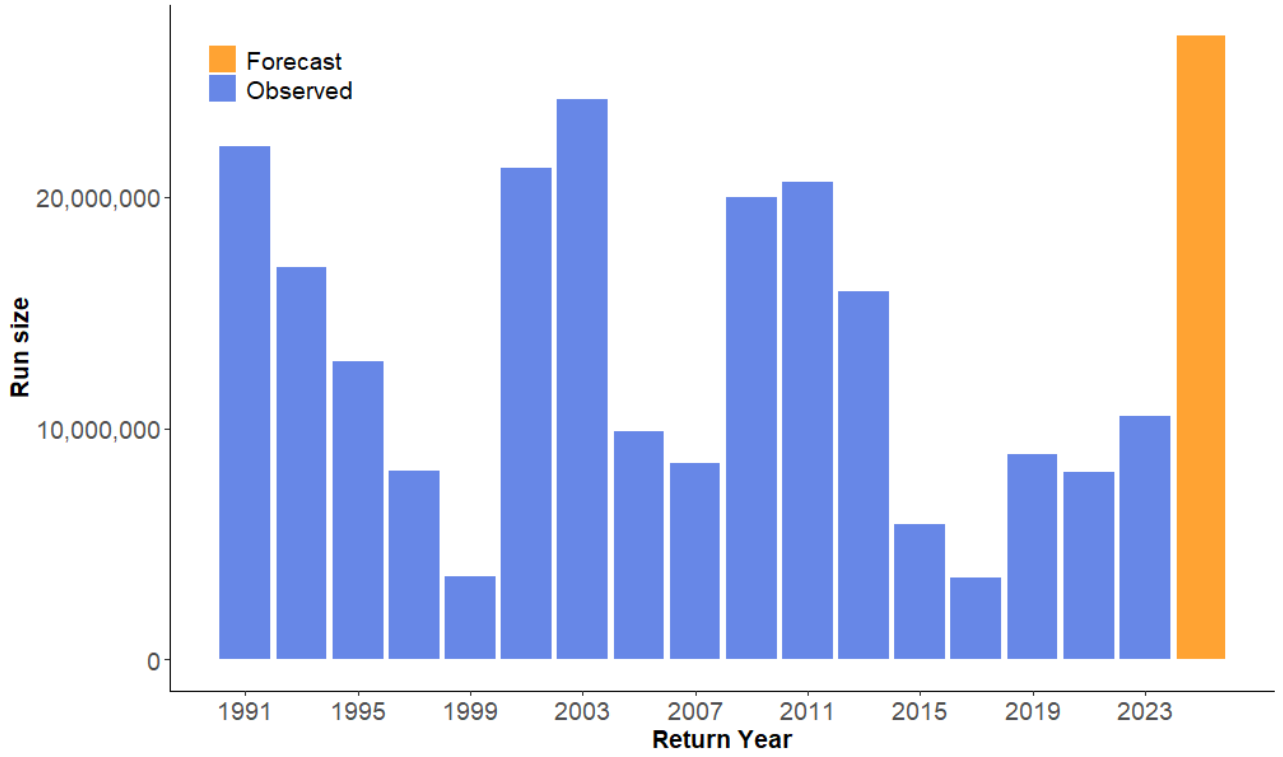
2025 Fraser River Sockeye forecast

- Higher than expected return from 2021 parent brood
- Average productivity
- Total Fraser Sockeye – **2,947,000**
  - Early Stuart – 116k
  - Early Summer – 220k
  - Summer – 2.14M
  - Late – 474k
- Below historical cycle-line median (7.98 M)



2025 Fraser River Pink forecast

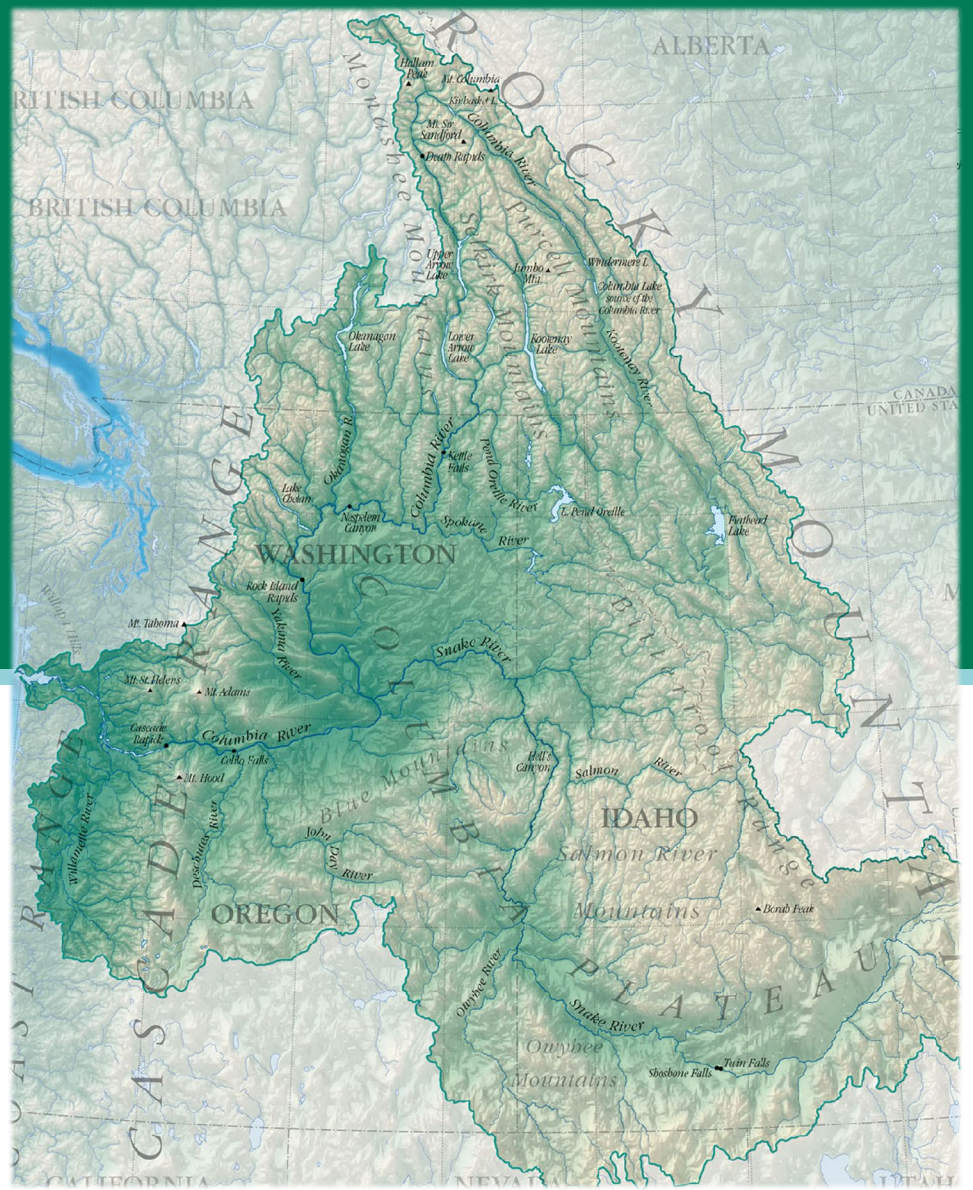
- Record high forecast
- Strong returns in 2023 with record high outmigrant estimates in 2024



Questions?

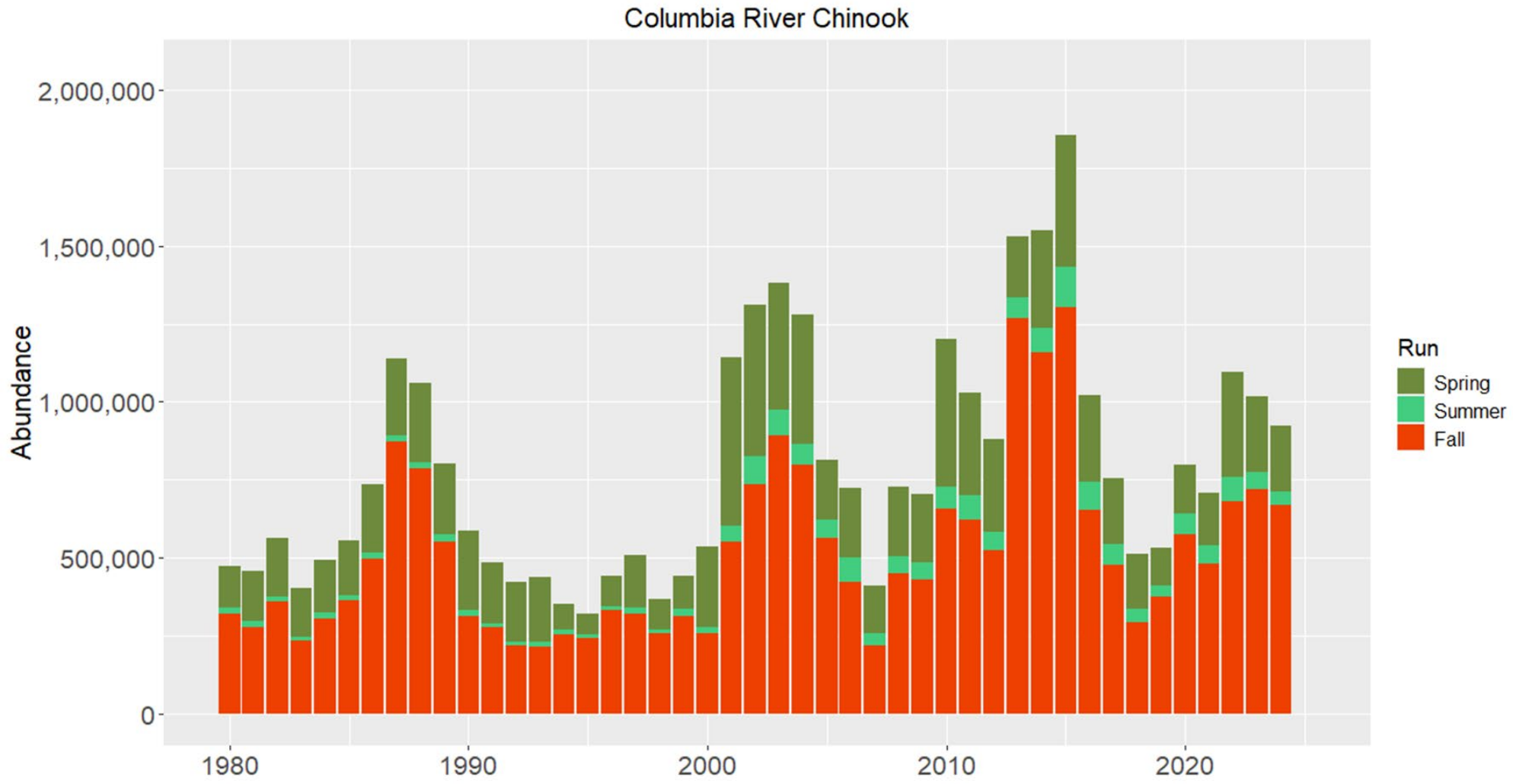
Columbia River 2024 returns and 2025 forecasts

Shannon Conley



Washington Department of FISH & WILDLIFE

Chinook



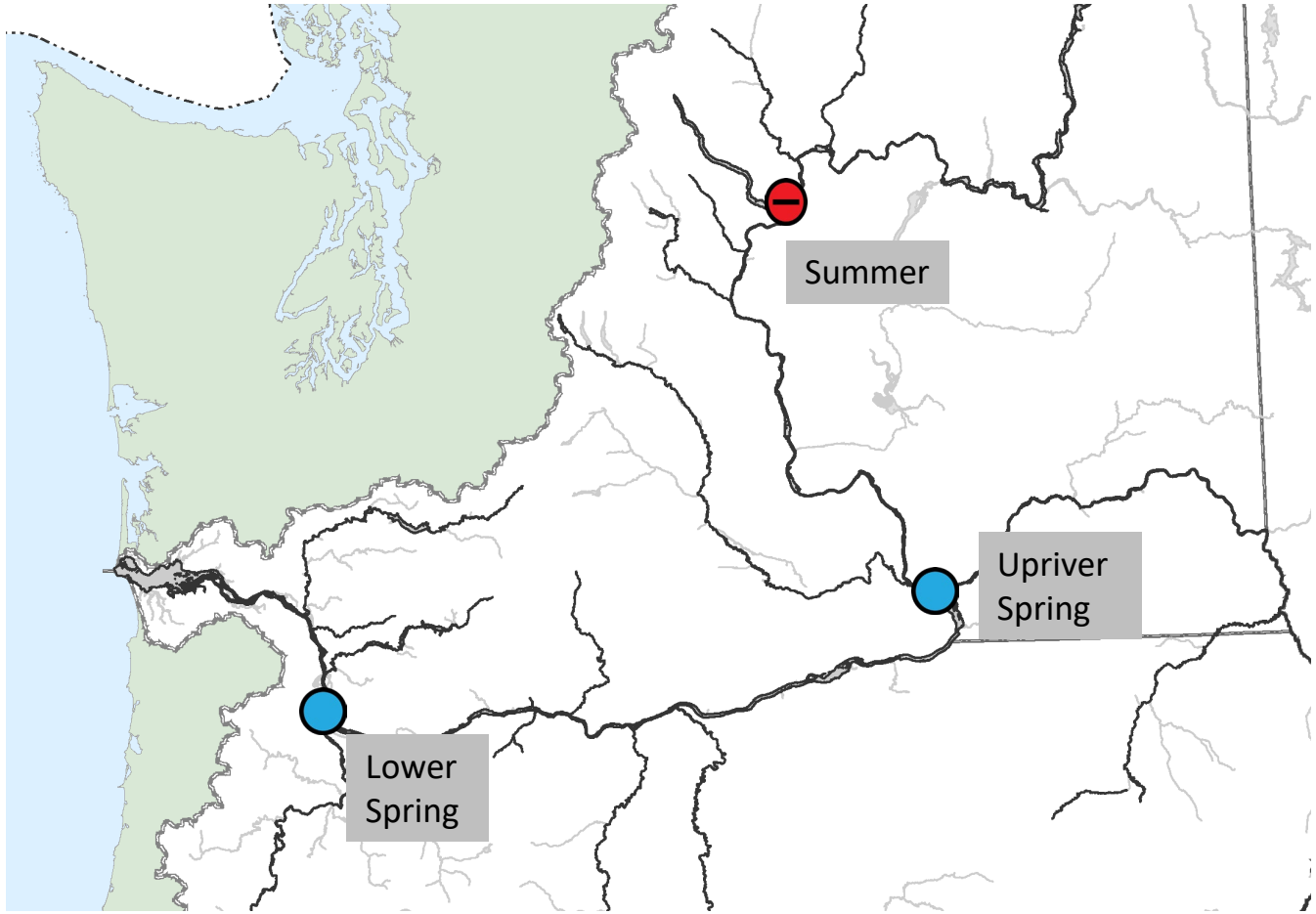
**Run sizes to river mouth*

2024 spring and summer Chinook returns

- Lower Spring – 73,227 (93%)
  - Cowlitz, Kalama, Lewis, Sandy, Willamette, and Select Areas
- Upriver Spring – 116,332 (76%)
  - Upstream of Bonneville Dam
- Summer – 42,511 (61%)
  - Upper Columbia

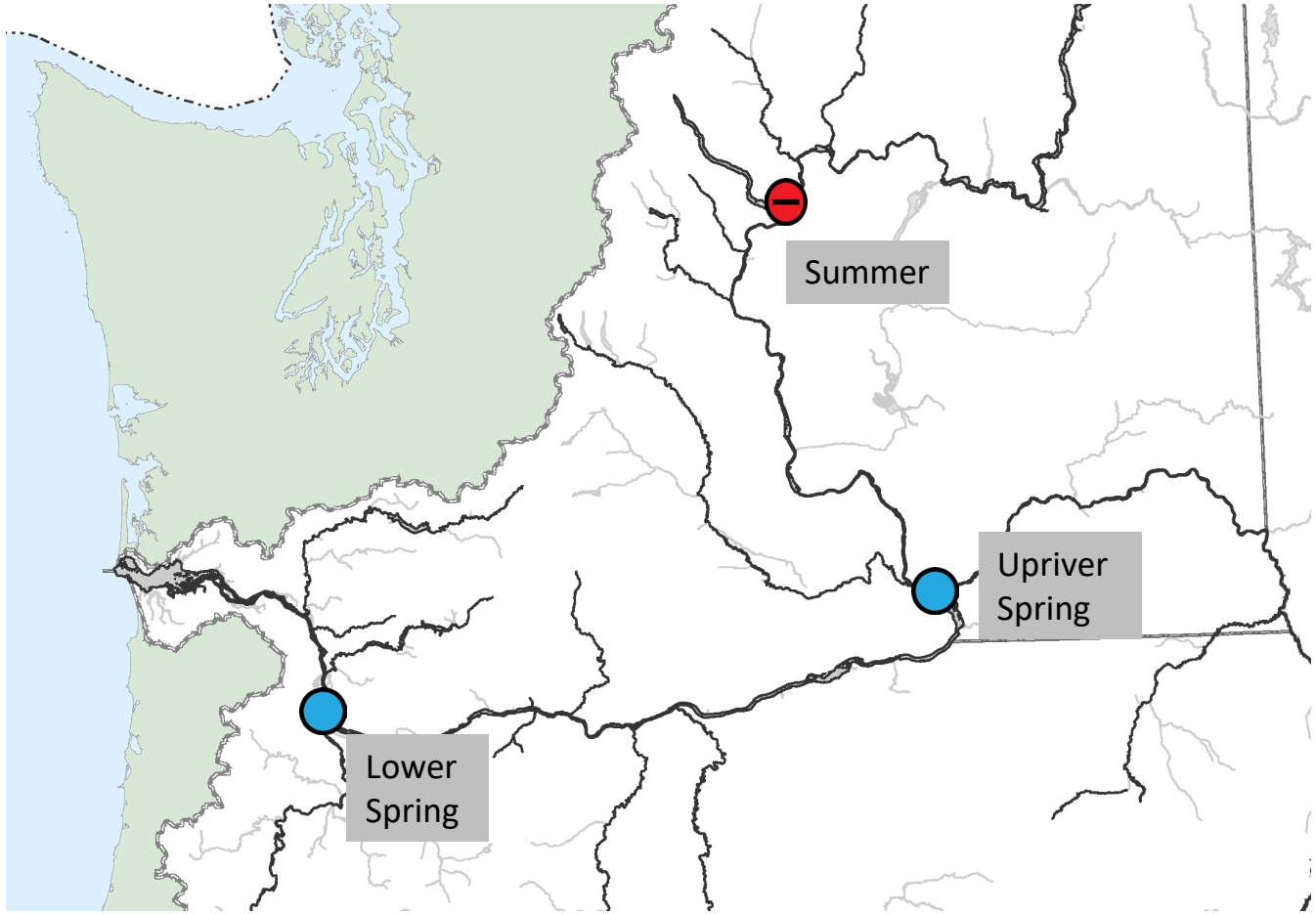
Relative to recent 10-year average run size:

- Good > 125%
- Neutral 75-125%
- Poor < 75%



2025 spring and summer Chinook forecasts

- Lower Spring – 95,000 (119%)
- Upriver Spring – 122,500 (88%)
  - Snake River wild forecast is 8% of the total upriver run
- Summer – 38,000 (58%)



Relative to recent 10-year average run size:

- Good > 125%
- Neutral 75-125%
- Poor < 75%

2024 fall Chinook returns

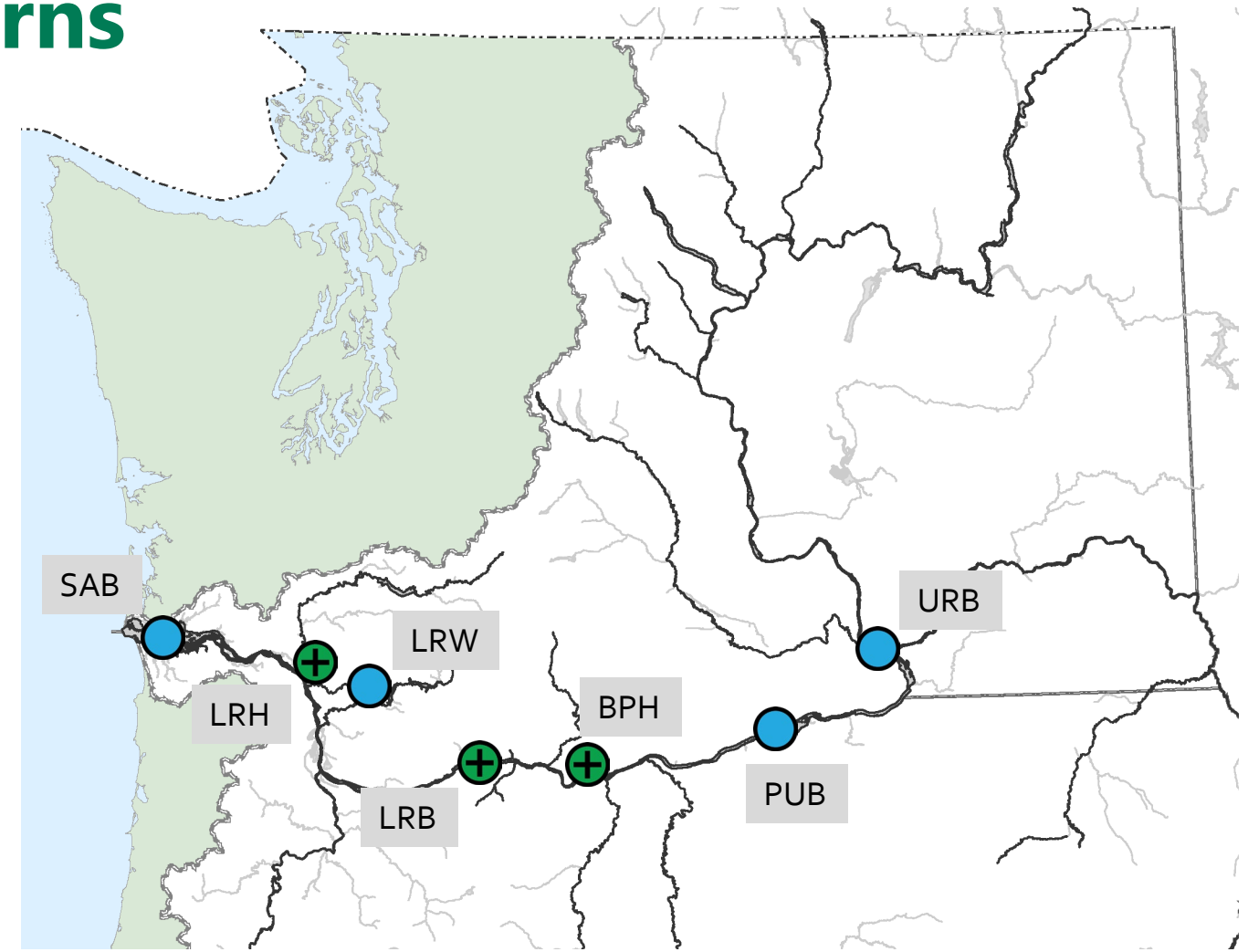
Tule stock

- LRH (Lower River Hatchery) – 114,431 (142%)
- BPH (Bonneville Pool Hatchery) – 129,006 (126%)

Bright stock

- SAB (Select Area Bright) – 5,298 (102%)
- LRW (Lower River Wild) – 15,105 (86%)
- LRB (Lower River Bright) – 8,708 (139%)
- PUB (Pool Upriver Bright) – 78,868 (96%)
- URB (Upriver Bright) – 318,089 (86%)

Total Fall – 669,505 (100%)



2025 fall Chinook forecasts

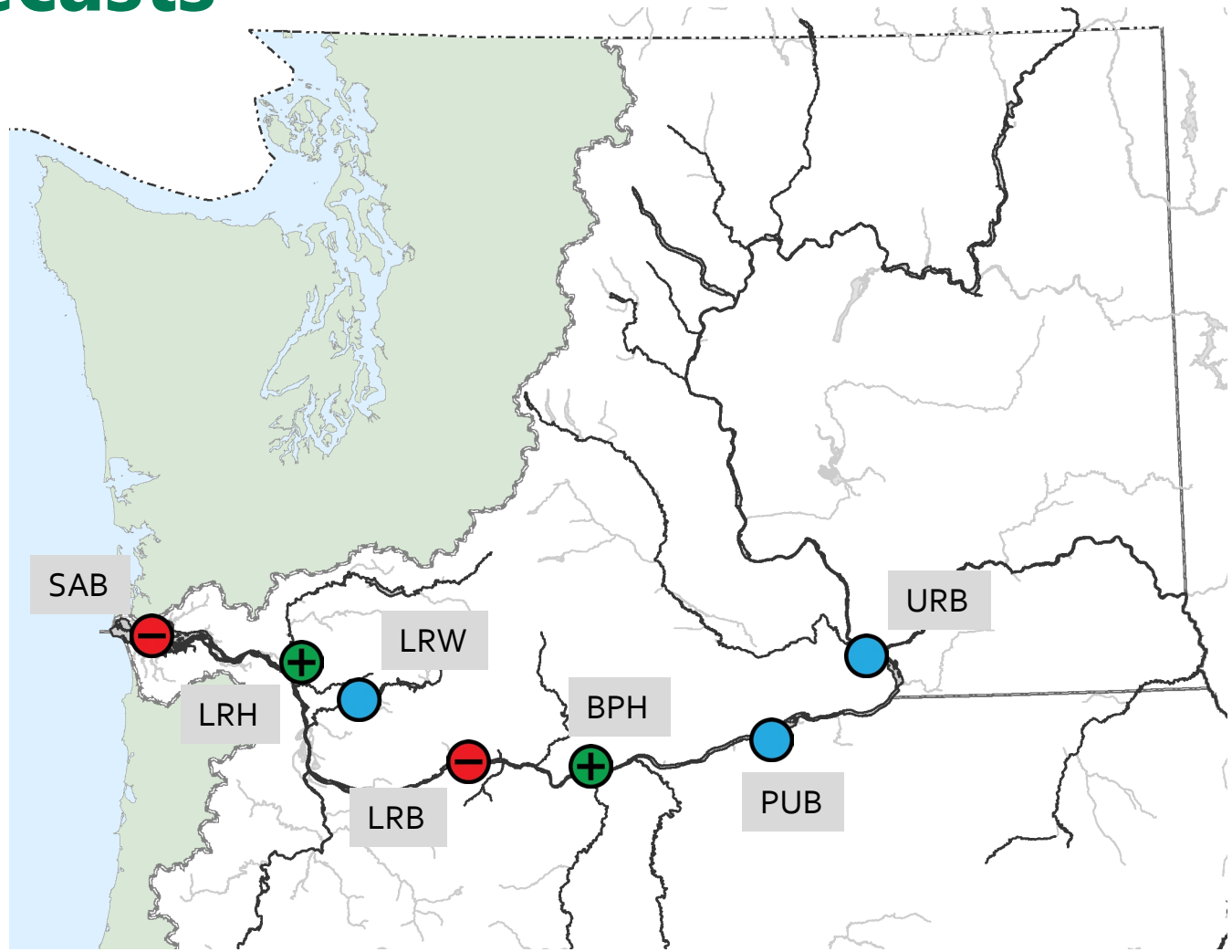
Tule stock

- LRH (Lower River Hatchery) – 121,500 (148%)
- BPH (Bonneville Pool Hatchery) – 184,700 (180%)

Bright Stock

- SAB (Select Area Bright) – 900 (22%)
- LRW (Lower River Wild) – 14,200 (86%)
- LRB (Lower River Bright) – 4,300 (62%)
- PUB (Pool Upriver Bright) – 79,000 (108%)
- URB (Upriver Bright) – 313,400 (94%)

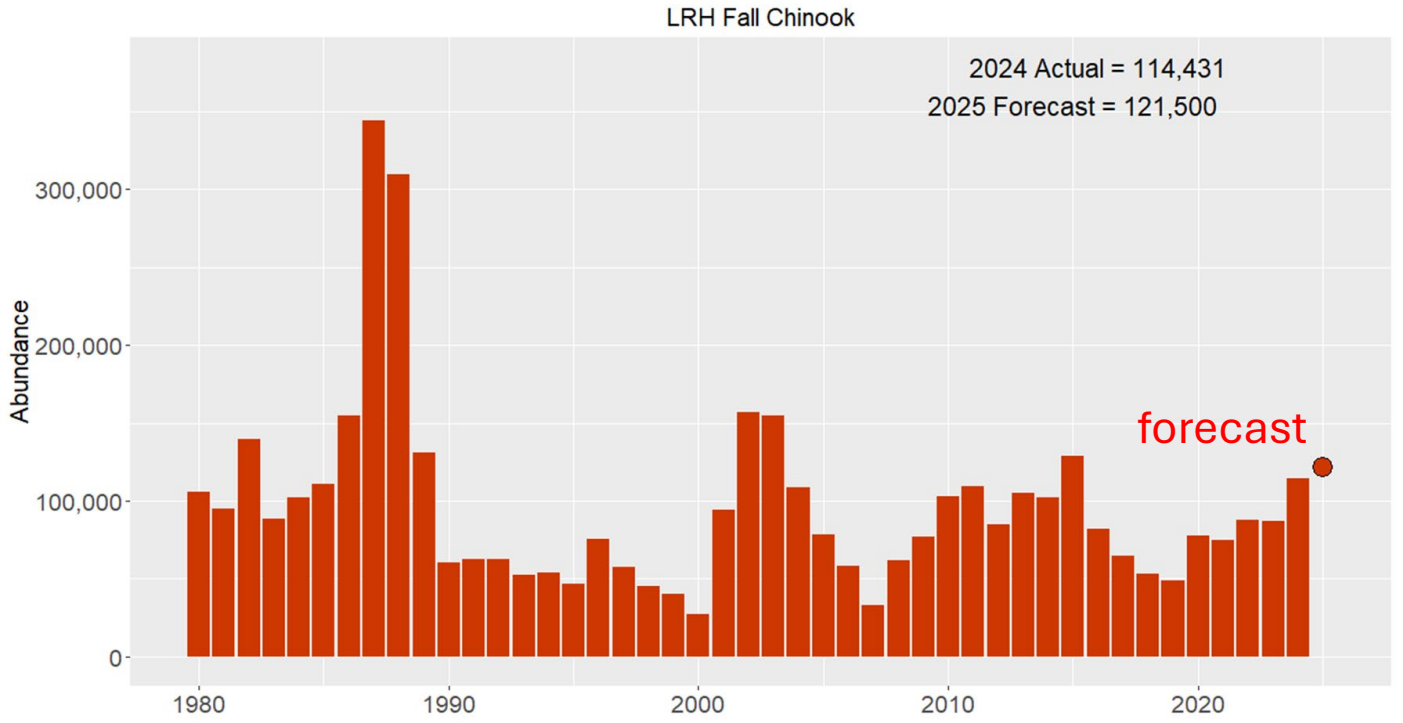
Total Fall – 718,000 (115%)



Lower Columbia River Tule Exploitation Rate (ER) Matrix

- Expected to be managed to a limit of 41% ER for ocean and in-river fisheries combined.

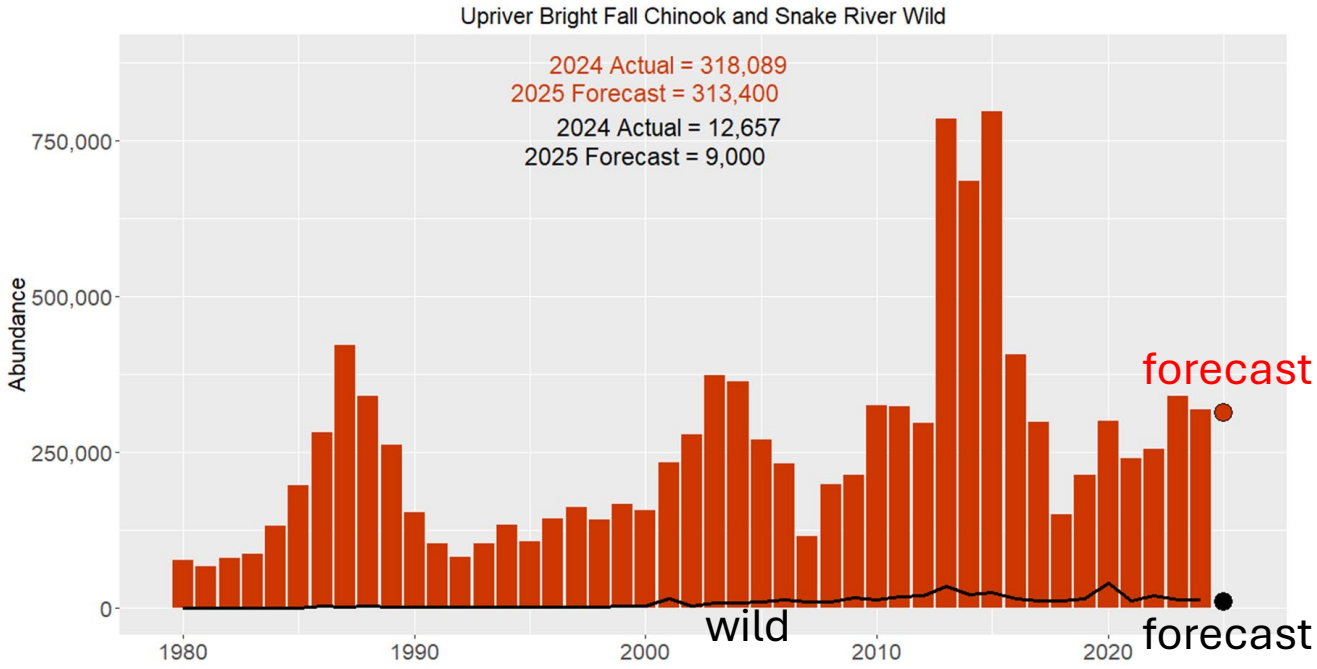
LRH Run Size	LCR Tule ER
<24,000	30%
24,000 – 31,000	35%
31,000 – 67,000	38%
>67,000	**41%**



URB Harvest Rate Schedule

URB Run Size	NT Harvest Rate
<60,000	1.5%
60,000-119,999	4%
120,000-200,000	8.25%
>200,000	**15%**

Snake River Wild (SRW) Run Size	NT Harvest Rate
<1,000	1.5%
1,000-1,999	4%
2,000-4,999	8.25%
5,000-5,999	8.25%
6,000-7,999	11%
8,000+	**15%**

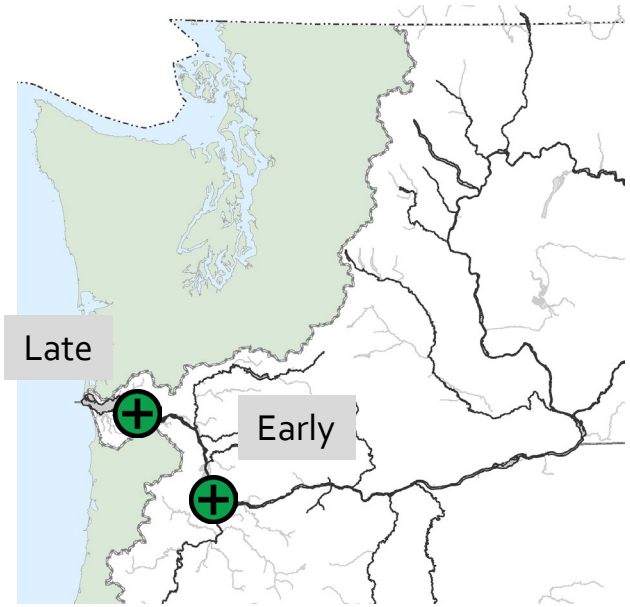


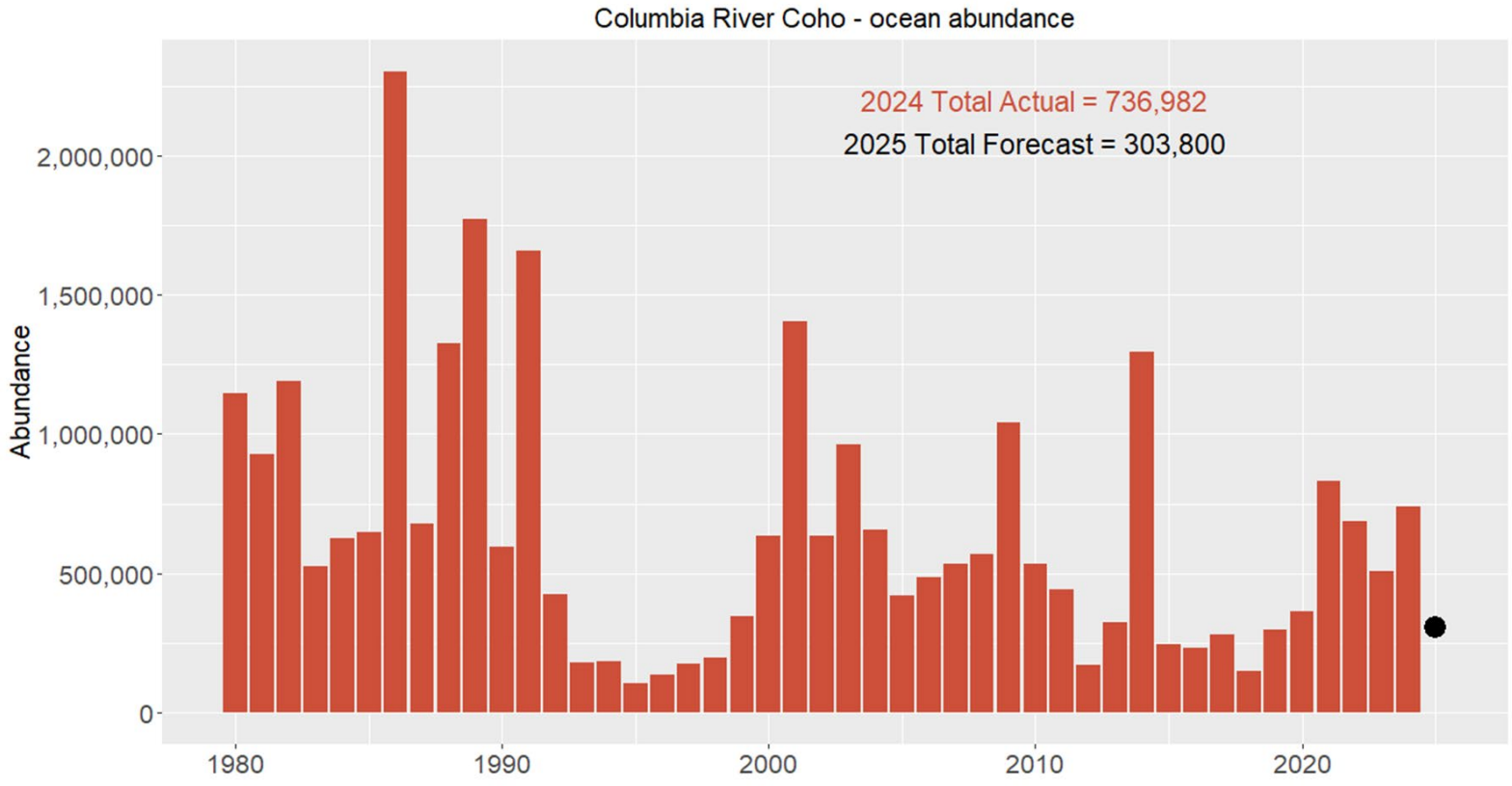
- The most constraining of the URB and Snake River Wild run sizes determine the in-river non-treaty harvest rate.
- URB/SRW expected to be managed to a limit of 15% harvest rate for in-river fisheries.

Coho

Photo credit: Thomas Kline

2024 coho returns - ocean abundance





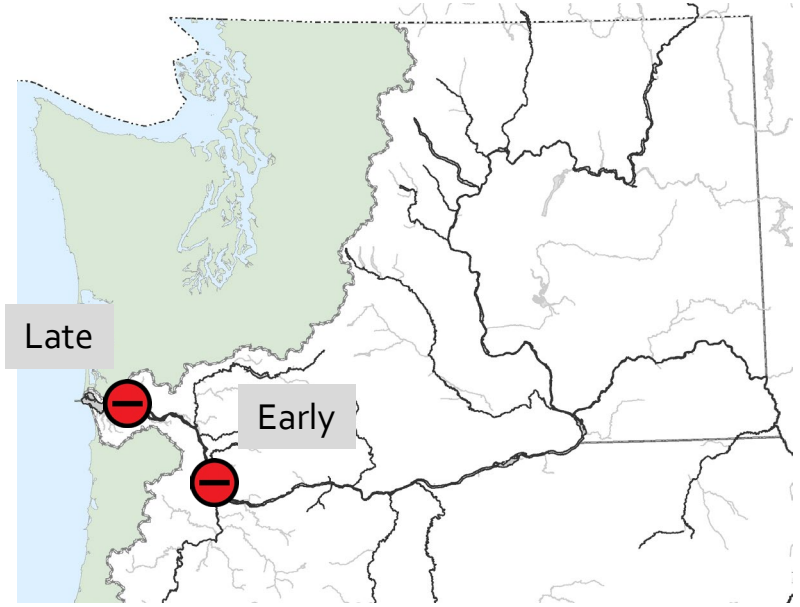
Early – 496,783 (156%)

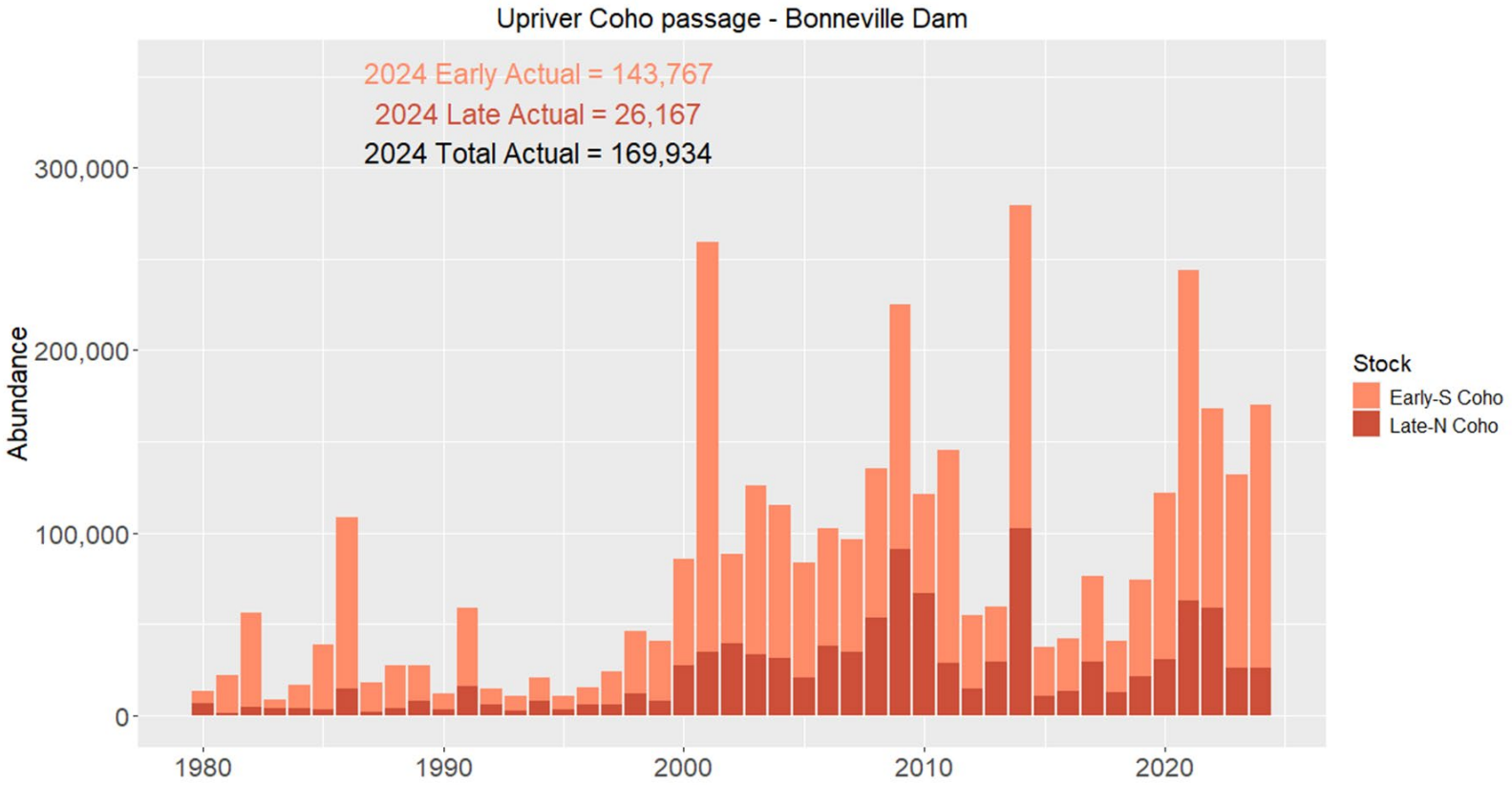
Late – 240,199 (134%)

Total – 736,982 (148%)

Pre-ocean and in-river fisheries estimate

2025 coho (preliminary) forecasts - ocean abundance





Early – 214,100 (74%)

Late – 89,700 (59%)

Total – 303,800 (69%)

Forecasts are subject to change. Finalized forecasts used in pre-season planning are approved by the Pacific Fishery Management Council.

Lower Columbia natural coho exploitation rate (ER) matrix

Marine survival index is **high** (0.25%).

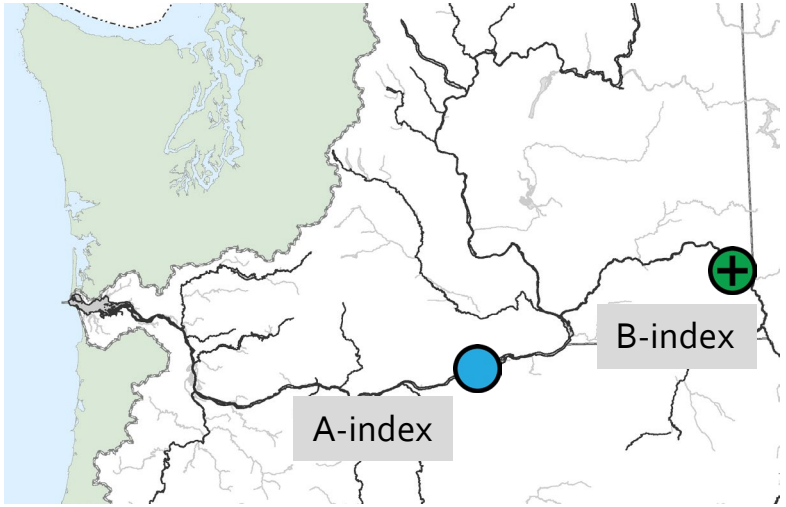
LCN coho expected to be managed to a limit of **23% ER** for ocean and in-river fisheries combined.

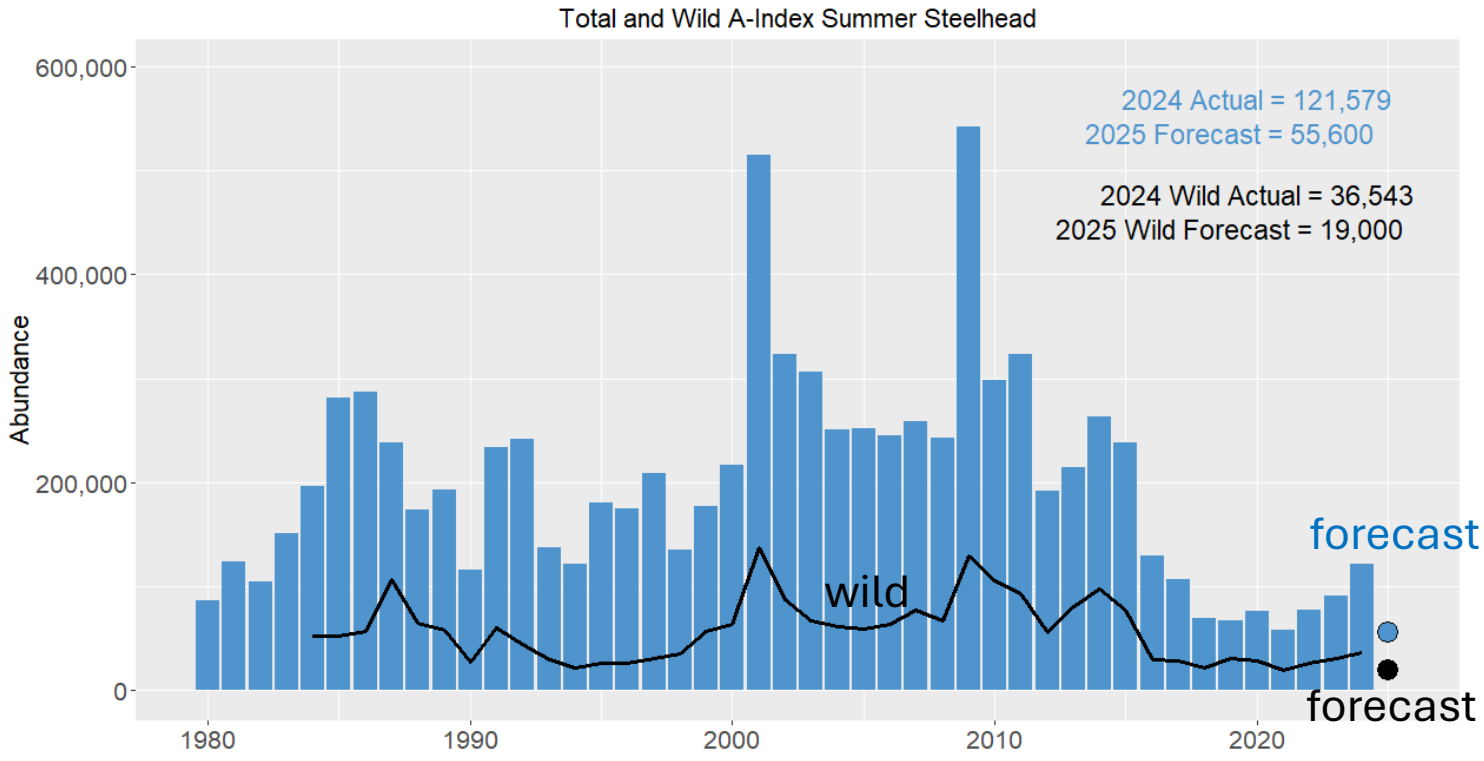
Marine Survival Index		ER
Very Low	≤ 0.06%	10%
Low	≤ 0.08%	15%
Medium	≤ 0.17%	18%
High	**≤ 0.40%**	**23%**
Very High	> 0.40%	30%

Upriver Summer Steelhead

Photo credit: Chase Gunnell

2024 upriver summer steelhead returns

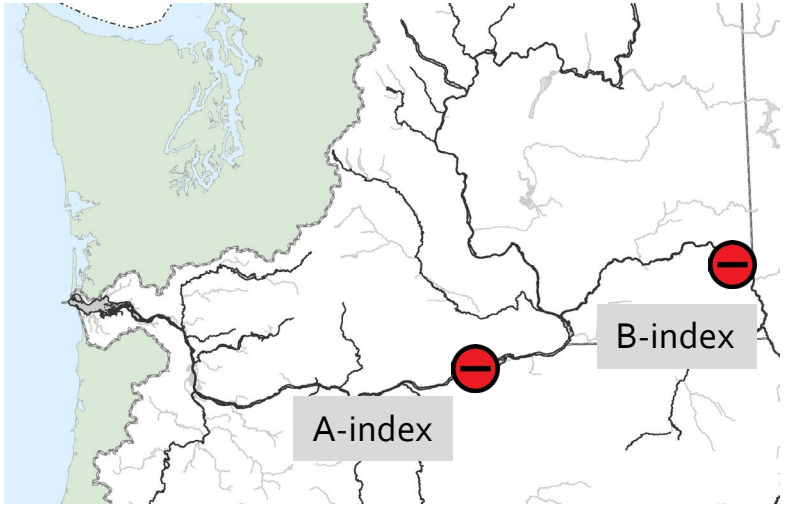


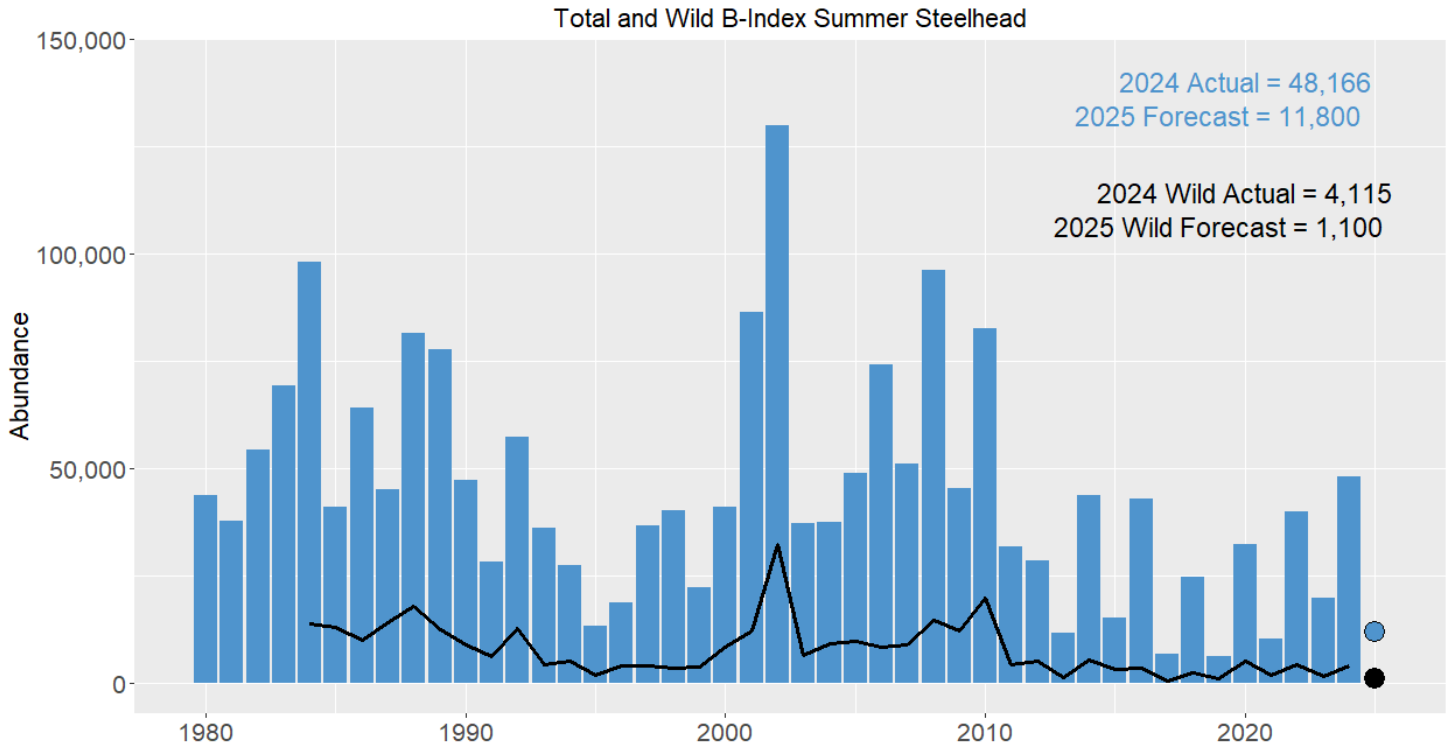


- A-index* – 121,579 (104%)
  - Wild – 36,543 (90%)
- B-index* – 48,166 (193%)
  - Wild – 4,115 (98%)

**Includes hatchery and wild combined*

2025 upriver summer steelhead forecast





- A-index* – 55,600 (54%)
  - Wild – 19,000 (57%)
- B-index* – 11,800 (47%)
  - Wild – 1,100 (34%)

**Includes hatchery and wild combined*

Questions?

Pacific Fishery Management Council Salmon Technical Team review

Alex Safiq, PhD

Washington Department of FISH & WILDLIFE

PFMC Pre-I Table I-1

TABLE I-1. Preseason adult Chinook salmon stock forecasts in thousands of fish. (Page 1 of 3)

Production Source and Stock or Stock Group	2020	2021	2022	2023	2024	2025	Methodology for 2025 Prediction and Source
Sacramento River							
Fall (Sacramento Index)	473.2	271.0	396.5	169.8	213.6	165.7	Log-log regression of the Sacramento Index on jack escapement from the previous year, accounting for lag-1 autocorrelated errors. STT.
Winter (age-3 absent fishing)	3.1	9.1	6.0	4.5	1.1	4.5	Gaussian process model applied to a time series of the SRWC age-3 escapement absent fishing. NMFS.
Klamath River (Ocean Abundance)							
Fall	186.6	181.5	200.1	103.8	180.7	82.7	Linear regression analysis of age-specific ocean abundance estimates on river runs of same cohort. STT.
Oregon Coast							
North and South/Local Migrating	--	--	--	--	--	--	None.
Columbia River (Ocean Escapement)							
Cowlitz Spring	1.4	1.8	4.1	9.0	4.7	13.7	Cowlitz, Kalama, and Lewis: Age-specific linear regressions of cohort returns in previous run years. WDFW.
Kalama Spring	1.0	2.2	2.0	2.4	1.9	3.0	
Lewis Spring	1.4	2.4	2.4	4.7	3.4	3.2	
Sandy Spring	5.2	5.3	5.6	7.8	7.7	7.3	Recent 3-year average. ODFW.
Willamette Spring	40.8	50.1	51.2	71.0	48.7	51.2	Age-specific linear regressions of cohort returns in previous run years. Forecast includes adult fish only. ODFW.
Upriver Spring [a/]	81.7	75.2	122.9	198.6	121.0	122.5	Columbia River Upriver Spring and Summer Chinook: Mean Absolute Percent Error (MAPE)-weighted average of age-specific cohort ratios and sibling regression models. Columbia River TAC subgroup and WDFW.
Upriver Summer [b/]	38.3	77.6	57.5	84.8	53.0	38.0	
LRW Fall	19.7	20.0	10.8	8.6	10.5	14.2	Columbia River Fall Chinook: Mean Absolute Percent Error (MAPE)-weighted average of age-specific cohort ratios and sibling regression models. Columbia River TAC subgroup and WDFW.
LRH Fall	51.0	73.1	73.0	77.1	85.5	121.5	
SCH Fall	46.2	46.8	91.2	136.1	129.8	184.7	
MCB Fall	79.7	86.2	78.9	52.6	63.4	83.3	
URB Fall	233.4	354.2	230.4	272.4	258.3	313.4	

PFMC Pre-I Table I-1 (cont.)

TABLE I-1. Preseason adult Chinook salmon stock forecasts in thousands of fish. (Page 2 of 3)

Production Source and Stock or Stock Group		2020	2021	2022	2023	2024	2025	Methodology for 2025 Prediction and Source
Washington Coast								
Willapa Bay Fall	Natural	2.9	3.9	3.1	2.8	3.5	2.3	Return/spawner adjusted for recent model performance.
	Hatchery	28.3	30.5	30.1	27.5	27.3	33.4	Return/spawner adjusted for recent model performance.
Grays Harbor Fall	Natural	15.0	15.5	17.9	15.0	14.3	14.2	Combination of geometric mean of recent year returns and linear relationships of sibling recruits per spawner.
	Hatchery	6.9	7.6	8.6	5.9	5.3	3.9	Recent 5-year geometric mean of returns per release.
Quinault Spring/Summer	Natural	NA	NA	NA	NA	NA	NA	
	Hatchery	NA	NA	NA	NA	NA	NA	
Quinault Fall	Natural	4.2	6.0	3.2	4.0	4.3	4.1	Recent 10-year geometric mean for age 3-5 returns and recent 10-year average return for age 6.
	Hatchery	4.5	4.9	5.6	7.6	3.4	4.6	Recent 5-year mean terminal return rates (return/smolt release) for age 3-6 adult returns, adjusted by brood performance.
Queets Spring/Sum	Natural	0.6	0.6	0.6	0.4	0.4	0.6	Recent 3-year (2022-2024) geometric mean terminal run size.
Queets Fall	Natural	4.1	4.3	5.3	4.3	2.6	3.3	Recent year mean return/spawner rates.
	Hatchery	0.7	0.6	0.5	0.8	0.4	0.6	Recent year return/smolt release adjusted by brood performance.
Hoh Spring/Summer	Natural	0.8	1.0	0.7	1.0	1.1	1.2	5-year mean recruit/spawner adjusted by previous performance.
Hoh Fall	Natural	2.6	2.6	3.4	2.6	3.5	2.5	5-year mean recruit/spawner adjusted by previous performance.
Quillayute Spring/Summer	Hatchery	2.4	2.6	3.0	2.8	2.5	2.4	Recent 5-year mean return/spawner, adjusted by previous year brood performance.
Quillayute Sum/Fall	Natural	9.8	9.6	8.8	11.3	10.1	8.1	Recent 5-year mean return/spawner, adjusted by previous year brood performance.
Hoko[c/]	Natural	2.6	1.3	0.9	2.8	3.9	1.9	Escapement without fishing, includes supplemental. Sibling regressions using data from return years 1988-2023.
North Coast Totals								
Spring/Summer	*Natural*	*1.4*	*1.5*	*1.3*	*1.4*	*1.5*	*1.8*	
Fall	*Natural*	*20.6*	*22.5*	*20.7*	*22.1*	*20.5*	*18.0*	
Spring/Summer	*Hatchery*	*2.4*	*2.6*	*3.0*	*2.8*	*2.5*	*2.4*	
Fall	*Hatchery*	*5.2*	*5.5*	*6.1*	*8.4*	*3.8*	*5.1*	

PFMC Pre-I Table I-1 (cont.)

TABLE I-1. Preseason adult Chinook salmon stock forecasts in thousands of fish. (Page 3 of 3)

Production Source and Stock or Stock Group		2020	2021	2022	2023	2024	2025	Methodology for 2025 Prediction and Source
Puget Sound summer/fall[d/]								
Nooksack/Samish	Hatchery	18.2	18.9	28.1	41.2	40.9	53.7	Three year average return rate
East Sound Bay	Hatchery	0.3	0.6	0.4	0.2	0.2	1.0	Three year average return rate
Skagit	Natural	12.9	10.5	12.5	12.2	10.4	9.7	Natural: Hierarchical Bayesian model to estimate the spawner-recruit dynamics. Hatchery: One year ahead forecasts generated using Chinook run sizes and GAM and ARIMA models.
	Hatchery	0.5	0.5	0.5	0.5	0.6	0.5	
Stillaguamish	Natural	0.9	0.9	0.9	1.2	0.9	1.1	Age-specific return rates predicted by linear regressions and generalized linear models that incorporate environmental variables (SCODEN model).
Snohomish	Natural	3.0	2.9	2.4	3.4	2.7	2.9	Age specific ForecastR models.
	Hatchery	6.8	6.1	6.0	7.5	8.4	11.4	Average return at age by lifestage.
Tulalip	Hatchery	6.0	5.8	7.7	5.5	5.9	4.9	Suite of naïve and sibling regression models for individual age components.
South Puget Sound	Natural	5.8	7.0	6.9	7.0	7.3	8.5	Natural: Lake Washington; 2-yr avg recruit per spawner for age 3, 3-yr avg sibling ratios for ages 4 & 5. Green; 5-yr average return rate for age 3 and 3-yr average return rates for ages 4 and 5. Puyallup; NPGO climate prediction for age 3 RPS, SAR sibling relationship for age 4, and 5 year average for age 5. Nisqually; 5-yr average recruit per spawner for ages 3 and 5, sibling relationships for age 4. Hatchery: Variety of recent year average return rates or sibling relationships.
	Hatchery	100.7	78.8	90.3	90.4	90.5	94.4	
Hood Canal	Natural	4.6	5.7	5.4	3.2	4.3	5.2	Includes hatchery strays to spawning grounds in Skokomish River. Proportioned using Hood Canal terminal run reconstruction-based relative contribution of the individual management units for 2019-2023 return years. Area 12B derived by 5-year average return (2020-2024).
	Hatchery	67.6	64.1	51.9	53.6	56.3	54.5	Brood 2020 fingerling lbs released from WDFW facilities in 2021, multiplied by the average of post-season estimated terminal area return rates for the last 5 years (2020-2024).
Strait of Juan de Fuca Including Dungeness spring run	Natural	5.0	5.5	5.0	3.7	4.3	5.2	Natural and hatchery. Elwha: recent 5-yr mean return rates adjusted by previous brood perfomance for hatchery, 13-yr average hatchery/wild proportion for wild. Dungeness: recent 5-yr mean return rates adjusted by previous brood perfomance .

a/ Since 2005, the upriver spring Chinook run includes Snake River summer Chinook.
b/ Since 2005, the upriver summer Chinook run includes only upper Columbia summer Chinook, and not Snake River summer Chinook.
c/ Expected spawning escapement without fishing.
d/ Unless otherwise noted, Puget Sounds forecasts are in units of terminal run size.

PFMC Pre-I Table I-2

TABLE I-2. Preseason ocean abundance adult coho salmon stock forecasts in thousands of fish. (Page 1 of 2)

Production Source and Stock or Stock Group		2020	2021	2022	2023	2024	2025	Methodology for 2025 Prediction and Source
OPI Area Total Abundance (California, Oregon Coasts, and Columbia River)		268.7	1,732.9	1,225.9	1,135.7	636.3	601.6	Abundance of all OPI components based on post-season coho FRAM runs; prior to 2008 only fishery impacts south of Leadbetter Point were used (traditional OPI accounting). OPITT, see Chapter III for details.
OPI Public	Hatchery	185.7	1607.9	1003.5	896.9	403.1	312.6	OPIH: ARIMA-based MAPE weighted ensemble forecast. Columbia early/late and Coastal proportions based on jacks; Coastal N/S proportions based on smolts.
Columbia River Early		130.7	1014.0	592.5	481.8	227.5	214.1	
Columbia River Late		50.3	576.0	404.7	404.3	173.6	89.7	
Coastal N. of Cape Blanco		2.4	6.4	1.9	3.0	0.6	3.3	
Coastal S. of Cape Blanco		2.3	11.5	4.4	7.8	1.4	5.5	
Lower Columbia River (LCN)	Natural	24.8	39.2	65.7	45.5	87.8	72.0	Oregon: recent three year average return; Washington: natural smolt production multiplied by 2022 brood marine survival rate. Abundance is subset of early/late hatchery abundance above.
Oregon Coast (OCN)	Natural	83.0	125.0	222.4	238.8	233.2	289.0	Rivers: Generalized additive model (GAM) relating ocean recruits to parental spawners and marine environmental variables. See text in Chapter III for details. Lakes: recent three year average abundance.
Washington Coast								
Willapa	Natural	17.9	19.0	35.8	42.7	29.5	28.0	Washington Coast stocks: A variety of methods were used, primarily based on smolt production and survival. See text in Chapter III for details.
	Hatchery	51.8	61.6	74.7	111.0	91.5	93.7	
Grays Harbor	Natural	50.0	44.8	120.8	103.2	74.9	62.2	
	Hatchery	42.3	31.7	78.3	111.4	68.2	87.8	
Quinault	Natural	17.5	15.0	19.4	23.6	25.3	21.1	
	Hatchery	27.0	24.6	42.7	30.6	34.7	37.3	
Queets	Natural	7.8	3.9	18.3	12.5	12.8	9.0	
	Hatchery	10.9	11.8	22.2	14.9	18.9	9.7	
Hoh	Natural	4.2	3.0	4.7	6.6	4.9	5.4	

PFMC Pre-I Table I-2 (cont.)

TABLE I-2. Preseason adult coho salmon stock forecasts in thousands of fish. (Page 2 of 2)

Production Source and Stock or Stock Group		2020	2021	2022	2023	2024	2025	Methodology for 2025 Prediction and Source
Quillayute Fall	Natural	9.2	7.5	12.5	13.5	10.2	10.9	For all Washington Coast stocks: A variety of methods were used, primarily based on smolt production and survival. See text in Chapter III for details.
	Hatchery	13.0	15.1	20.3	19.1	10.3	13.4	
Quillayute Summer	Natural	0.8	0.3	0.9	1.6	0.4	0.3	
	Hatchery	3.4	3.4	4.6	3.9	2.3	2.9	
North Coast Independent Tributaries	Natural	5.1	4.7	18.0	13.5	4.9	9.4	
	Hatchery	1.3	0.1	0.1	11.8	9.0	3.3	
WA Coast Total	*Natural*	*112.4*	*98.4*	*230.5*	*217.2*	*162.8*	*146.4*	
	Hatchery	*149.6*	*148.2*	*243.0*	*302.7*	*234.9*	*248.1*	
Puget Sound								
Strait of Juan de Fuca	Natural	7.5	6.7	7.3	15.6	19.7	14.0	For all Puget Sound stocks: A variety of methods were used, primarily based on smolt production and survival. See text in Chapter III and Joint WDFW and tribal annual reports on Puget Sound Coho Salmon Forecast Methodology for details.
	Hatchery	20.6	12.5	12.7	21.8	22.6	18.3	
Nooksack-Samish	Natural	15.4	35.3	36.0	29.5	35.1	29.5	
	Hatchery	42.5	54.6	73.8	66.6	72.3	58.9	
Skagit	Natural	31.0	58.4	80.4	43.1	63.4	66.3	
	Hatchery	18.2	22.0	21.3	21.1	27.3	37.2	
Stillaguamish	Natural	19.5	26.8	24.9	30.2	30.8	27.5	
	Hatchery	2.3	4.0	1.9	1.7	0.9	1.2	
Snohomish	Natural	39.0	60.0	64.2	76.5	71.6	59.0	
	Hatchery	26.6	29.9	22.6	64.0	34.7	76.2	
South Sound	Natural	7.3	27.5	31.0	58.3	38.1	41.6	
	Hatchery	164.0	192.7	208.5	218.8	201.9	213.8	
Hood Canal	Natural	35.0	28.8	20.2	37.9	36.5	19.0	
	Hatchery	72.2	55.7	61.4	74.8	67.2	63.8	
Puget Sound Total	*Natural*	*154.6*	*243.5*	*264.0*	*291.2*	*295.3*	*256.9*	
	Hatchery	*346.3*	*371.4*	*402.3*	*468.8*	*426.9*	*469.5*	

Breakout room list

Questions?

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