Washington Department of Fish and Wildlife *draft 2/27/19*

North of Falcon Background Information

What is North of Falcon?

- Each year (February-April) state, federal, and tribal fishery managers plan recreational and commercial salmon fisheries for the state and tribes
- Pacific Fishery Management Council (PFMC) establishes ocean salmon seasons from three to 200 miles off the Pacific Coast
- "North of Falcon" (NOF) process involves a series of public and state/tribal meetings to come to an agreement for the upcoming year's salmon fisheries
- NOF is north of Cape Falcon in northern Oregon and encompasses Oregon and Washington (Columbia River, Coast, and Puget Sound)

What Governmental Policies affect the NOF process?

- The Boldt Decision (1974): upheld by the Supreme Court and based upon treaties with the Puget Sound Treaty tribes to allow the state and tribes to manage their own fisheries (co-managers) and share half of the harvestable salmon
- Endangered Species Act (ESA): fisheries must not pose jeopardy ESA-listed fish such as Puget Sound Chinook (1999)
- Pacific Salmon Treaty (U.S./Canada): helps ensure enough fish destined for the southern U.S. are allowed to pass through Canadian waters to allow fishing opportunity and enough fish to reach the spawning grounds (and vice versa for fish returning to Canada)
- Conservation objectives are agreed to by the co-managers to ensure enough fish get past fisheries and reach rivers to spawn and recover the population

What are the steps?

- Estimate the forecasted returns of individual hatchery and wild stocks of salmon
    - Determine if enough fish are returning to allow for harvest
- Predict harvest for tribal and state recreational and commercial fisheries for Oregon and Washington; include the northern fisheries (Alaska and Canada) too
- Analyze forecast and harvest scenarios using the Fisheries Regulations Assessment Model (FRAM) to determine whether proposed fishing plans meet management objectives (e.g., ESA impact limits)
- Negotiate with the recreational anglers, commercial fishers, and tribes to allow a fair sharing of catch and ensure conservation objectives are met
- Combine all Puget Sound and ocean fisheries into the "Agreed-to Fisheries Document" that the recreational (sport) fishing rules pamphlet is based upon

Glossary

AEQ: Adult equivalents (number of wild salmon that would have returned to the river if not killed in fisheries)

CERC: Critical exploitation rate ceiling (maximum fishery impacts allowed when a stock is in critically low abundance, see Escapement LAT)

Constraining stock: Wild fish for a particular river that is estimated to be the most over-impacted that will limit (or reduce) fishing opportunities

CWT: Coded-wire tag (placed in nose of juvenile salmon and recovered from adults that return to estimate where the fish is from)

Encounters: Number of fish harvested plus released fish

ESA: Endangered Species Act

ERC: Exploitation rate ceiling (maximum allowable rate of returning wild salmon that can be killed in fisheries without compromising stock recovery)

Escapement LAT: Escapement Low Abundance Threshold (minimum number of naturally spawning salmon needed to recover that stock; if below then stock is in critical status)

Exploitation Rate (ER): Percent of total mortality (i.e., in fisheries and on spawning grounds) that occurs in fisheries, including landed and non-landed fishery mortality components

Forecast: Estimated number of adult salmon that will return

FRAM: Fisheries Regulation Assessment Model (used to combine forecasts and harvest of fisheries to estimate number of wild fish that will return to the rivers to spawn)

LCN: Lower Columbia Natural Tule Chinook (sometimes called LCR, Lower Columbia River, tule)

Release Mortality Rate: Percent of fish released that die due to the encounter with handling

MSF: Mark-selective fisheries (hatchery targeted fishery where wild fish are released)

Escapement: Number of wild salmon returning to the spawning grounds for a particular stock

NOF: North of Falcon (process to establish salmon seasons for state and tribal fisheries)

NT: Non-treaty fisheries (sport and commercial including net and troll)

SUS: Southern United States (WA, OR, CA)

SUS PT ER: Southern U.S. (WA, OR, CA) pre-terminal exploitation rate (caught in marine waters within the southern U.S.)

T: Treaty fisheries (tribal ceremonial/subsistence and commercial: net, freshwater net, troll (tr))

Total ER: Total exploitation rate for Alaska, Canada, and southern U.S.

FISH AND WILDLIFE COMMISSION
POLICY DECISION

POLICY TITLE: 2019-2023 North of Falcon **POLICY NUMBER: C-3608**

Supersedes: C-3608, 2017-2018

Effective Date: January 11, 2019
Termination Date: December 31, 2023

See Also: C-3001 C-3622 C-3620 C-3621

Approved by: _____ Chair
Washington Fish and Wildlife Commission, January 11, 2019

North of Falcon Policy

This Policy will guide Department staff in considering conservation, allocation, in-season management, and monitoring issues associated with the annual salmon fishery planning process known as "North of Falcon." When considering management issues, Department staff will ensure that decisions are made consistent with: the Department's statutory authority; *U.S. v. Washington; U.S. v. Oregon;* the Endangered Species Act; the Puget Sound Chinook Harvest Management Plan; the Pacific Salmon Treaty; the Pacific Fishery Management Council's Framework Salmon Management Plan; pertinent state/tribal agreements; and the applicable Fish and Wildlife Commission policies.

The Department will implement this Policy consistent with the purposes and intended outcomes described in the 21st Century Salmon and Steelhead Planning Project including:

- Salmon and steelhead will be managed to recovery and to assure sustainability in a way that is science-based, well-documented, transparent, well-communicated, and accountable.

- Fisheries will be managed to meet or exceed ESA, recovery, and conservation goals; and harvest management measures will protect and promote the long-term well-being of the commercial and recreational fisheries.

Fishery Management

General

- On a statewide basis, fishing opportunities will be provided when they can be directed at healthy wild and hatchery stocks.
- Selective fishing methods and gears that maximize fishing opportunity and minimize impacts on depressed stocks will be utilized to the fullest extent possible taking into consideration legal constraints on implementation and budgetary limits associated with required sampling, monitoring and enforcement programs.
- When assessed from a statewide perspective, fishing directed at chinook, coho, pink, sockeye, or chum salmon will not be exclusively reserved for either sport or commercial users.
- When managing sport fisheries, meaningful recreational fishing opportunities will be distributed equitably across fishing areas and reflect the diverse interests of fishers, including retention and catch and release fisheries.
- The Department will seek non-treaty fishing access to unutilized portions of treaty harvest allocations through the implementation of pre-season agreements, taking into consideration changes in abundance, fishery conflicts, and factors that may influence attainment of spawning escapement objectives.

Puget Sound

- The Puget Sound harvest management objectives for chinook and coho stocks, in priority order, are to: (1) provide meaningful recreational fishing opportunities; and (2) identify and provide opportunities for commercial harvest. When managing sport fisheries in this region, recreational opportunities will be distributed equitably across fishing areas, considering factors such as: the uniqueness of each area; the availability of opportunities for various species in each area throughout the season; the desire to provide high levels of total recreational opportunity; and the biological impacts.
- Puget Sound-origin sockeye will be prioritized for recreational fishing opportunity
- For fisheries directed at Fraser River-origin chum, pink, and sockeye stocks, the majority of harvest will be provided to the commercial fisheries.
- For fisheries directed at harvestable Puget Sound-origin chum stocks, the majority of harvest will be provided to the commercial fisheries.
- For fisheries directed at harvestable Puget Sound-origin pink salmon, seasons will be established that provide meaningful opportunities for both recreational and commercial fisheries while minimizing gear and other fishery conflicts.

Grays Harbor

- Grays Harbor will be managed consistent with the Commission's Grays Harbor Policy (POL C-3621), including any modifications made to the policy, and any guidance or clarifications adopted by the Commission following notice and opportunity for review and comment.

Willapa Bay

- Willapa Bay will be managed consistent with the Commission's Willapa Bay Salmon Management Policy (POL C-3622), including any modifications made to the policy, and any guidance or clarifications adopted by the Commission following notice and opportunity for review and comment.

Columbia River

- The Fish and Wildlife Commission's policy on Columbia River Salmon Management (POL C-3620), including any modifications made to the policy, and any guidance or clarifications adopted by the Commission following notice and opportunity for review and comment, shall guide pre-season and in-season planning of Columbia River salmon fisheries. Columbia River harvest management regimes shall be developed in cooperation with Oregon Department of Fish and Wildlife representatives.

Pacific Ocean

- Pacific Ocean harvest shall be managed consistent with the Pacific Fishery Management Council's Framework Salmon Management Plan and the National Standards that provide for fair and equitable allocation of fishing privileges among various fishers.

In-Season Management

- When in-season management actions are taken, they will be implemented in a manner that is consistent with pre-season conservation and harvest management objectives, and the fishery intent developed through the North of Falcon process.
- Prior to use, in-season updates of stock abundance affecting Puget Sound fisheries will be evaluated for technical merit and potential to improve achievement of conservation and allocation objectives.
    - When possible, in-season updates should be documented within the co-manager's annual List of Agreed Fisheries or as part of regional comanager memoranda of understanding.
    - Descriptions of potential modifications to fisheries that are contingent on in-season updates should be included in the List of Agreed Fisheries.

Monitoring and Sampling

- Monitoring, sampling and enforcement programs will be provided to account for species and population impacts of all fisheries.
- Fishery participants will be required to comply with fishery monitoring and evaluation programs designed to account for species and population impacts.

Enforcement and Compliance

- Enforcement strategies will be developed and staffing will be provided to promote compliance with state regulations.
- WDFW Enforcement will seek to establish and maintain effective coordination with Tribal enforcement to enhance the sharing of information.

Gear and Fishery Conflicts

- Recreational and commercial fisheries shall be structured to minimize gear and other fishery conflicts. Unanticipated fishery interaction issues identified in-season, including conflicts with fisheries directed at other species, shall be resolved by involving the appropriate sport and commercial representatives in a dispute resolution process managed by Department staff.

Incidental Mortalities

- The Department will manage fisheries to minimize mortalities on non-target species (e.g. rockfish, sea birds, etc.). Management regimes will include strategies to limit seabird mortalities consistent with the federal Migratory Bird Treaty Act.

Communications

- The Department shall strive to make ongoing improvements for effective public involvement during the North of Falcon planning process and annual salmon fishery implementation, incorporating the following intents:
    - North of Falcon participants will be included as observers during appropriate state/tribal discussions of fishery issues.
    - All decisions made during the North of Falcon process will be recorded in writing.
    - A variety of tools will be used to effectively communicate with the public, to receive input on pre-season planning or in-season fishery issues, and to make available the record of decisions. Such tools will include: recreational and commercial advisory groups; public workshops to address key issues; the WDFW North of Falcon Web site; and in-season tele-conferences.
    - The Department will increase transparency by consulting with stakeholders throughout the pre-season planning process and prior to making major decisions with the co-managers.

Other Species

- The Department will continue to consider effects of salmon fisheries on Southern Resident Killer Whales (SRKW) when setting fishing seasons. The Department will work with the National Marine Fisheries Service to refine tools to assess the effects of fisheries on available prey for SRKW, and will plan fisheries to ensure that they provide proper protection to SRKW from reduction to prey availability or from fishery vessel traffic, consistent with the Endangered Species Act.
- The Fish and Wildlife Commission's policy on Lower Columbia Sturgeon Management (POL-C3001) shall guide pre-season and in-season planning of Columbia River and coastal sturgeon fisheries and related incidental impacts.

Delegation of Authority

The Fish and Wildlife Commission delegates the authority to the Director to make harvest agreements with Northwest treaty tribes and other governmental agencies, and adopt permanent and emergency regulations resulting from the agreements made during the annual North of Falcon process. Further, the Department has the authority to adopt regulations for the protection, preservation and management of species other than salmon that are promulgated through the North of Falcon process, to the extent that such regulations are necessary to implement court orders, comanager agreements or Columbia River Compact agreements, to achieve Washington management objectives, or to comply with Endangered Species Act requirements.

2019 North of Falcon

Salmon Forecasts

2019 Forecast Meeting Schedule

9:00 – 9:30	Introduction		
	• Welcome and Introduction		Ron Warren
	• North of Falcon – Setting Salmon Fisheries in 2019		Kyle Adicks
9:30 – 10:00	Southern Resident Killer Whales		Kirt Hughes
10:00 – 11:00	Salmon Forecasts 2019		
	• 2018/19 Environmental Outlook		Marisa Litz
	• Puget Sound and Coast Chinook, Coho, Pink, Chum, Sockeye Stocks		Aaron Dufault
	• Columbia River Salmon Stocks		Ryan Lothrop Cindy LeFleur
	• PFMC Salmon Technical Team Review		Wendy Beeghley
11:00 - Noon	Regional Discussion Sessions		
	• Puget Sound Recreational	Big Room	Mark, Aaron, Derek
	• Columbia River & Ocean	Small Room 1	Ryan, Kyle(s),Wendy
	• Coastal		Annette
	• Puget Sound Commercial	Small Room 2	Kirt, Kwasi, Marisa
Noon – 1:00 pm	Lunch Break		
1:00 – 3:00	Regional Discussion Sessions Continued		

Slides Available Online: http://wdfw.wa.gov/fishing/northfalcon/

2019 NOF Meeting Schedule

Date	Purpose	Location
Feb. 26	Willapa Bay – Grays Harbor Forecast meeting	Montesano City Hall
Feb. 27	Statewide Forecast Meeting	Lacey Community Center
Mar. 7-12	Pacific Fishery Management Council meeting	Vancouver, WA Hilton
Mar. 18	Columbia River Fisheries Meeting	WDFW Region 5 Headquarters, Ridgefield
Mar. 19	North of Falcon 1	DSHS Office Building 2 Auditorium, Olympia
Mar. 21	Puget Sound Recreational Fisheries Discussion	Trinity Methodist Church, Sequim
Mar. 25	Ocean Management Option Public Hearing	Chateau Westport
Mar. 26	Grays Harbor Fisheries Discussion	Montesano City Hall
Mar. 26	Upper Columbia River Fisheries Discussion	Douglas County PUD, Wenatchee
Mar. 27	Puget Sound Recreational Fisheries Discussion	WDFW Mill Creek Office
Mar. 27	Willapa Bay Fisheries Discussion	Raymond Elks Club
Mar. 27	Mid-Columbia River Public Meeting	Kennewick Irrigation District Board Auditorium
Mar. 28	Snake River Fisheries Discussion	Walla Walla Comm. College, Clarkston
Apr. 2	Columbia River and Ocean Fisheries Discussion	WDFW Region 5 Headquarters, Ridgefield
Apr. 3	North of Falcon 2	Lynnwood Embassy Suites
Apr. 11-15	Pacific Fishery Management Council	Double Tree Hilton Sonoma, Rohnert Park, CA

Available Online: http://wdfw.wa.gov/fishing/northfalcon/

Handouts

- Agenda/Schedule
- FWC Policies (NOF Policy)
- PFMC Tables
- Regional Forecast Details:
  - Puget Sound and Columbia Chinook
  - Puget Sound Coho
  - Puget Sound Chum & Sockeye
- Presentation slides (http://wdfw.wa.gov/fishing/northfalcon/)

Update on Southern Resident Orca Recovery Efforts

Dave Ellifrit, Center for Whale Research

WHAT IS WASHINGTON DOING TO HELP ORCAS?

Over the past several years, Washington state has been working to protect the ecosystem that supports orcas. Saving our southern resident killer whales requires us to tackle many challenges, both in the short-term and over the coming decades.

Governor Inslee takes action

Governor's Executive Order

March 2018

- Supplemental Funding
- Immediate actions for state agencies
- Established Task Force

Task Force and Working Groups

- Stephanie Solien & Les Purce, co-chairs
- Diverse membership
- Three Working Groups
  - ✓Vessels (Todd Hass, Puget Sound Partnership)
  - ✓Contaminants (Derek Day, Ecology)
  - ✓Prey [Penny Becker (WA Dept. Fish & Wildlife) & Steve Martin (Gov. Salmon Recovery Office)]

Reports

2018

Draft due Oct. 1, 2018 | Final due Nov. 15, 2018

Content included:

- Task Force recommendations for addressing all major threats and recovering Southern Residents (policies, programs, priority actions, legislation, budget needs)
- Summary of minority views and actions considered but not ultimately recommended

2019

Due Oct. 1, 2019

Content will include:

- Progress made
- Lessons learned
- Outstanding needs and additional recommendations

Task Force Recommendations

36 recommendations

- **Prey - 16 recommendations**
- Vessels - 10 recommendations
- Contaminants - 10 recommendations
  - 10 recommendations require or likely require legislative changes

Prey Recommendations

RESTORE & ACQUIRE HABITAT

Recommendations 1 and 2

- Significantly increase investment in restoration and acquisition of habitat for Chinook and forage fish

BETTER IMPLEMENT & ENFORCE HABITAT PROTECTION LAWS

Recommendation 3

- Increase Enforcement and Technical Assistance for Hydraulic Permitting, Shoreline, Water Quality and Water Quantity Laws

AMEND LAWS TO STRENGTHEN HABITAT PROTECTION

Recommendation 4

- Through legislation, amend existing State authorities to better align with local Shoreline Management laws
- Give state agencies the authority to deny, amend unnecessary bulkhead requests to protect habitat

INCENTIVIZE HABITAT PROTECTION & ENHANCEMENT

Recommendation 5

- Develop incentives to encourage voluntary actions to protect habitat

INCREASE HATCHERY PRODUCTION

Recommendation 6

- Increase Hatchery Production of Salmon in Concert with increased Habitat protection and restoration

INCREASE ABUNDANCE AND IMPROVE SURVIVAL OF CHINOOK AROUND HYDRO DAMS

Recommendation 7

- Prepare an implementation strategy to reestablish salmon runs above existing dams

Recommendation 8

- Modify State Water Quality Standards for Greater Spill over Columbia River and Snake River Dams

Recommendation 9

- Facilitate a Stakeholder process around potential Lower Snake River Dam Removal

INCREASE CHINOOK ABUNDANCE THROUGH REDUCED CATCH AND BYCATCH

Recommendation 10

- Support full implementation and funding of the 2019-28 Pacific Salmon Treaty – Federal Request

Recommendation 11

- Reduce Chinook bycatch in West Coast Commercial Fisheries

DECREASE THE NUMBER OF CHINOOK LOST TO PREDATION BY SPECIES OTHER THAN ORCAS

Recommendation 12

- Develop Science and Options for Pinniped Management in Puget Sound

Recommendation 13

- Increase Management of Pinnipeds on the Columbia River

Recommendation 14

- Reduce populations of nonnative predatory fish that prey upon or compete with Chinook

SUPPORT A HEALTHY MARINE FOOD WEB AND FORAGE FISH POPULATIONS

Recommendation 15

- Monitor and manage forage fish populations to support Chinook

Recommendation 16

- Support the Puget Sound zooplankton sampling program for management of Chinook and forage fish

What’s Going On Now, What’s Next

Budget	Recommendation
Operating	$66.3 M
Capital	$594.8 M
Transportation	$408.7 M
Total	**$1.07 B**

- 3 Governor request plus multiple other state legislative bills (vessels, oil traffic, habitat)
- State agencies implement recommendations as possible with funds now and when new funds hopefully become available in July 2019
- Year 2 work of the Task Force

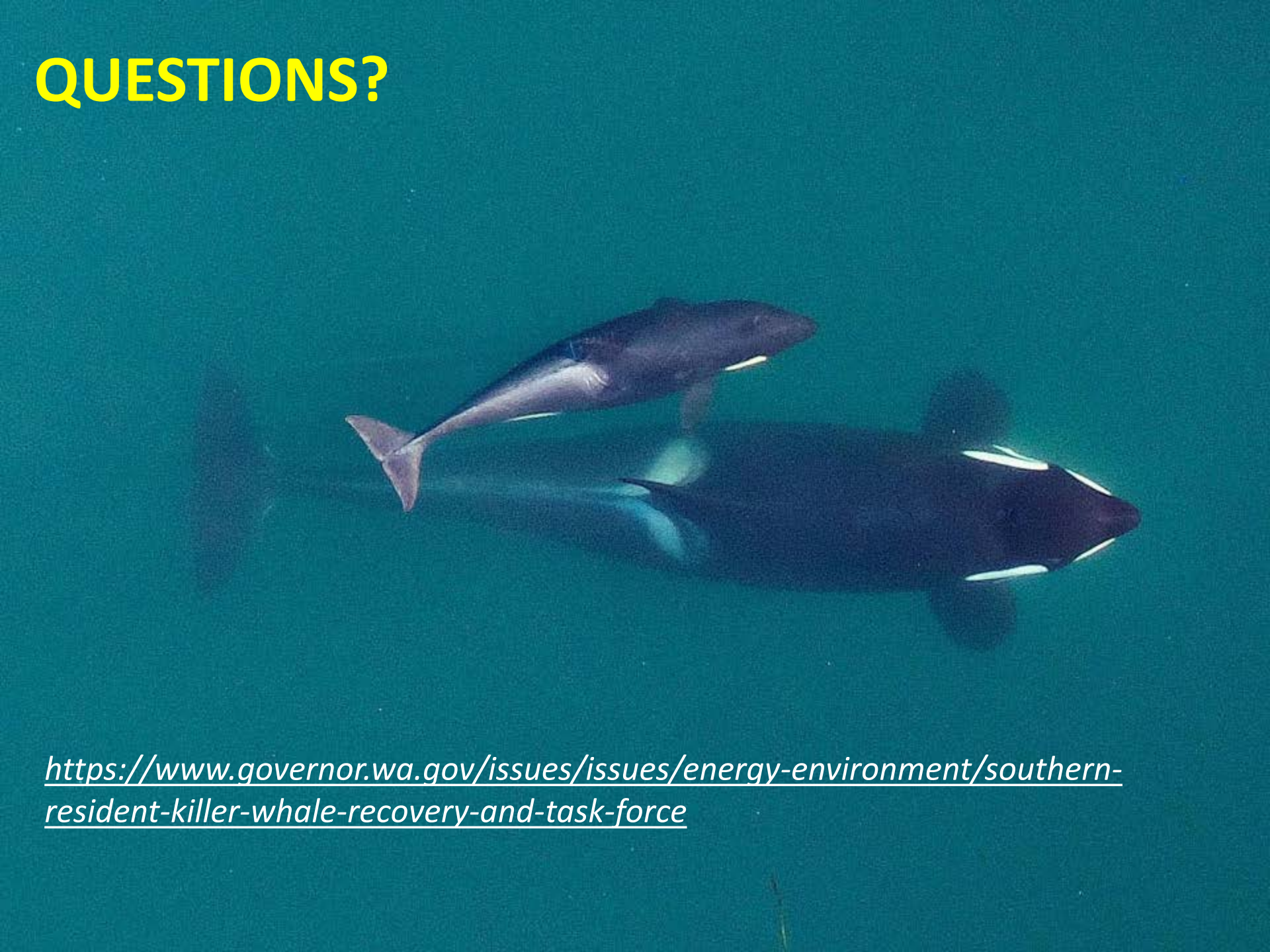
Fish & Wildlife Commission North of Falcon Policy Direction

The Department will continue to consider effects of salmon fisheries on Southern Resident Killer Whales (SRKW) when setting fishing seasons. **The Department will work with the National Marine Fisheries Service to refine tools to assess the effects of fisheries on available prey for SRKW, and will plan fisheries to ensure that they provide proper protection to SRKW from reduction to prey availability or from fishery vessel traffic**, consistent with the Endangered Species Act.

Orca Risk Assessment and Adaptive Management Framework

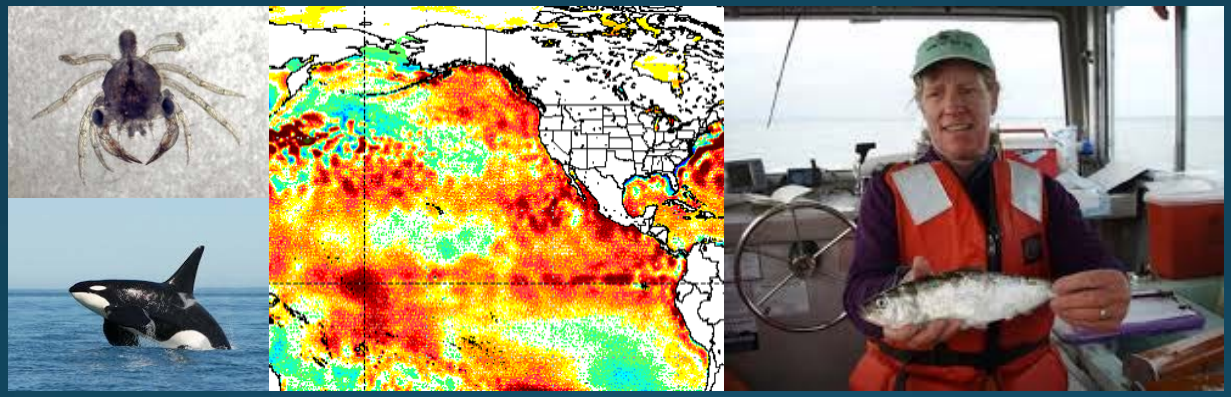
- Identifies conditions when increased prey is essential for orcas
- Categorizes orca status and expected Chinook abundance for a given year, weights fisheries based on their spatial overlap with orcas during key foraging times, and establishes threshold proportions for maximum allowable reduction of Chinook by fisheries for a given time and area
- If planned fisheries are projected to exceed the allowable prey reduction threshold, then adjustments made until the threshold is met

QUESTIONS?



https://www.governor.wa.gov/issues/issues/energy-environment/southern-resident-killer-whale-recovery-and-task-force

Update on Ocean Conditions



Marisa Litz

Marisa.litz@dfw.wa.gov

Washington Department of FISH and WILDLIFE

Acknowledgements:
Laurie Weitkamp, NOAA Fisheries

Outline

- Update on the "Warm Blobs", El Niños, and La Niñas
- Physical and biological observations
- NWFSC environmental indicators (stoplight chart)

Take-Home Messages:

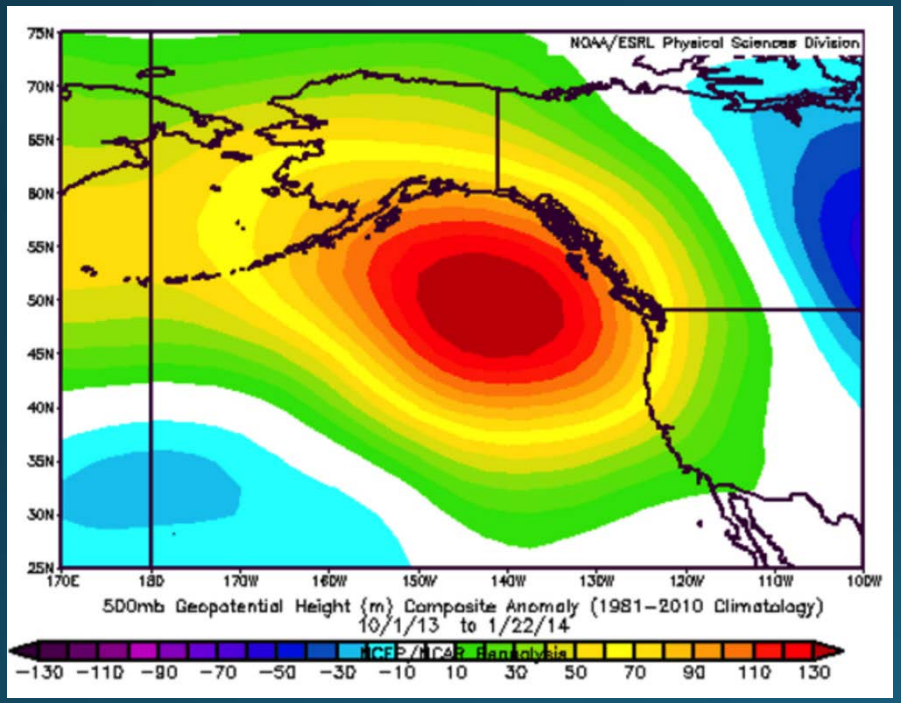
- Sea surface temperatures (SSTs) cooled following "The Blob", ushering in weak La Niñas
- Return of warm SST anomalies to the North and South in Fall 2018
- Projections are for a weak El Niño through spring 2019
- Cooling in 2018 and return to "normal"ish conditions (upwelling/copepods) may lead to better survival

The ecosystem is connected

www.ecosystems.noaa.gov

What is the "Warm Blob"?

Ridiculously Resilient Ridge

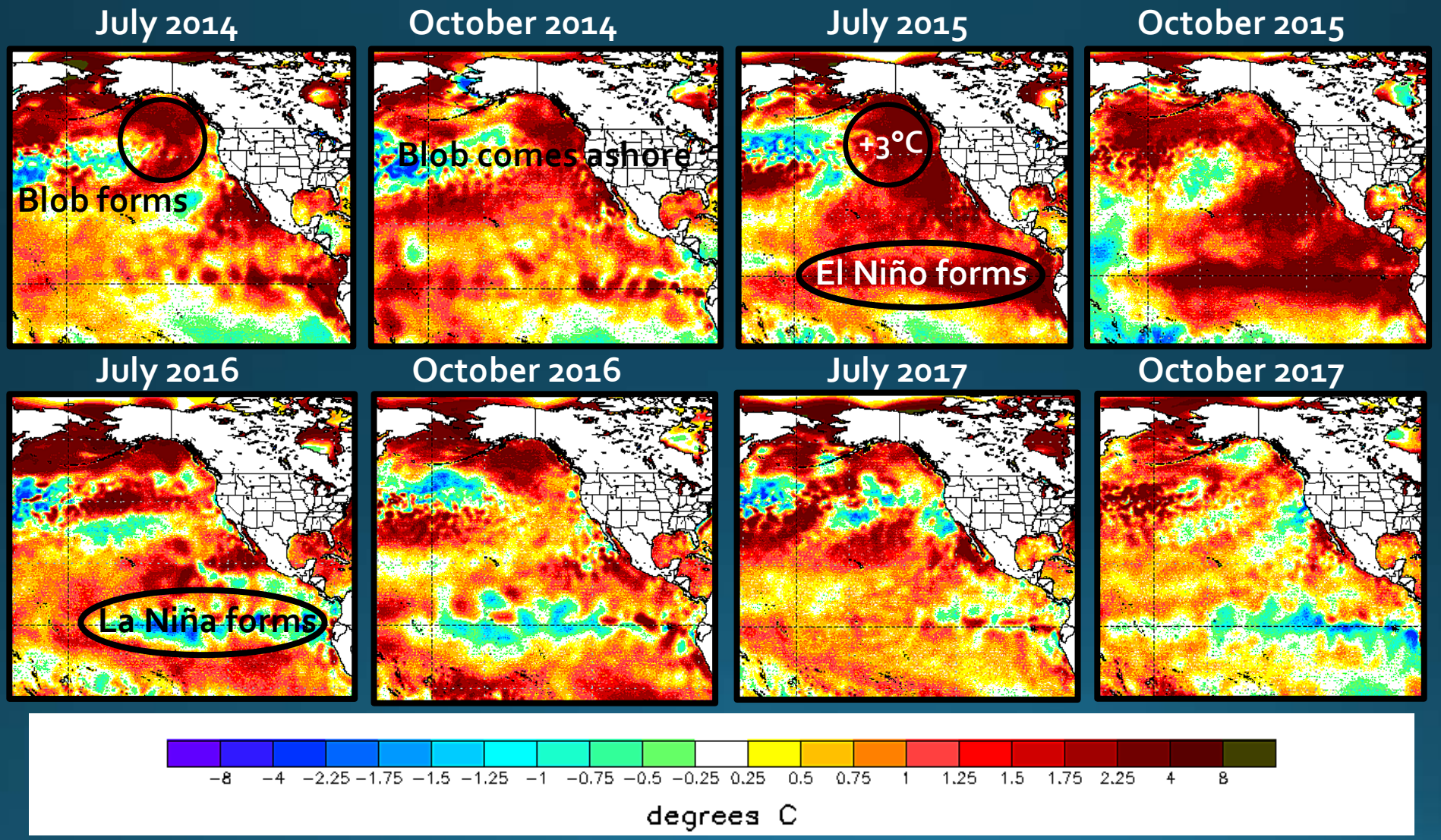


Atmospheric Pressure Anomalies

Oct 1, 2013 – Jan 22, 2014

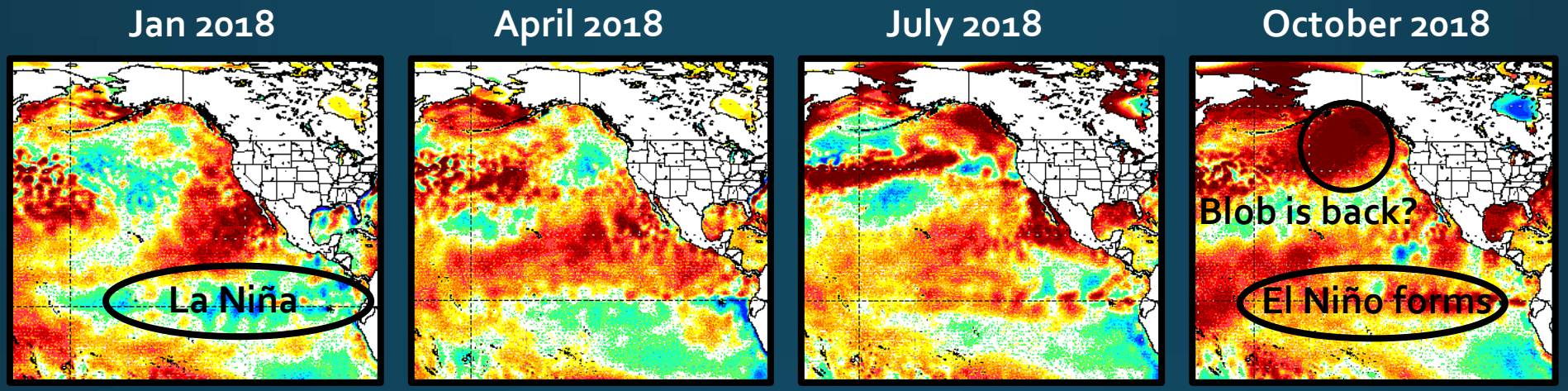
Michael Jacox, Bond et al. 2015

Sea Surface Temperature Anomalies



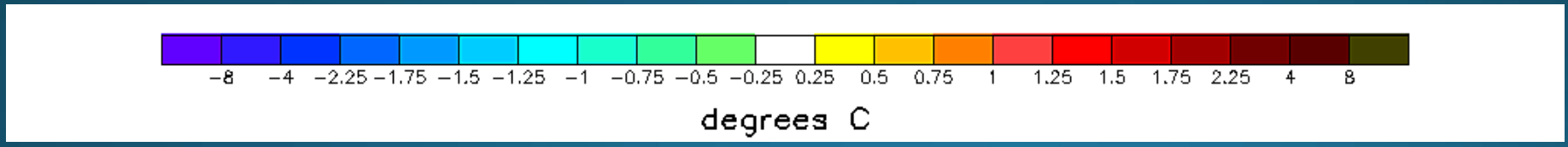
polar.ncep.noaa.gov/sst/ophi/

Sea Surface Temperature Anomalies



Weak La Niña dissipated in Spring 2018 and summer/fall were ENSO neutral

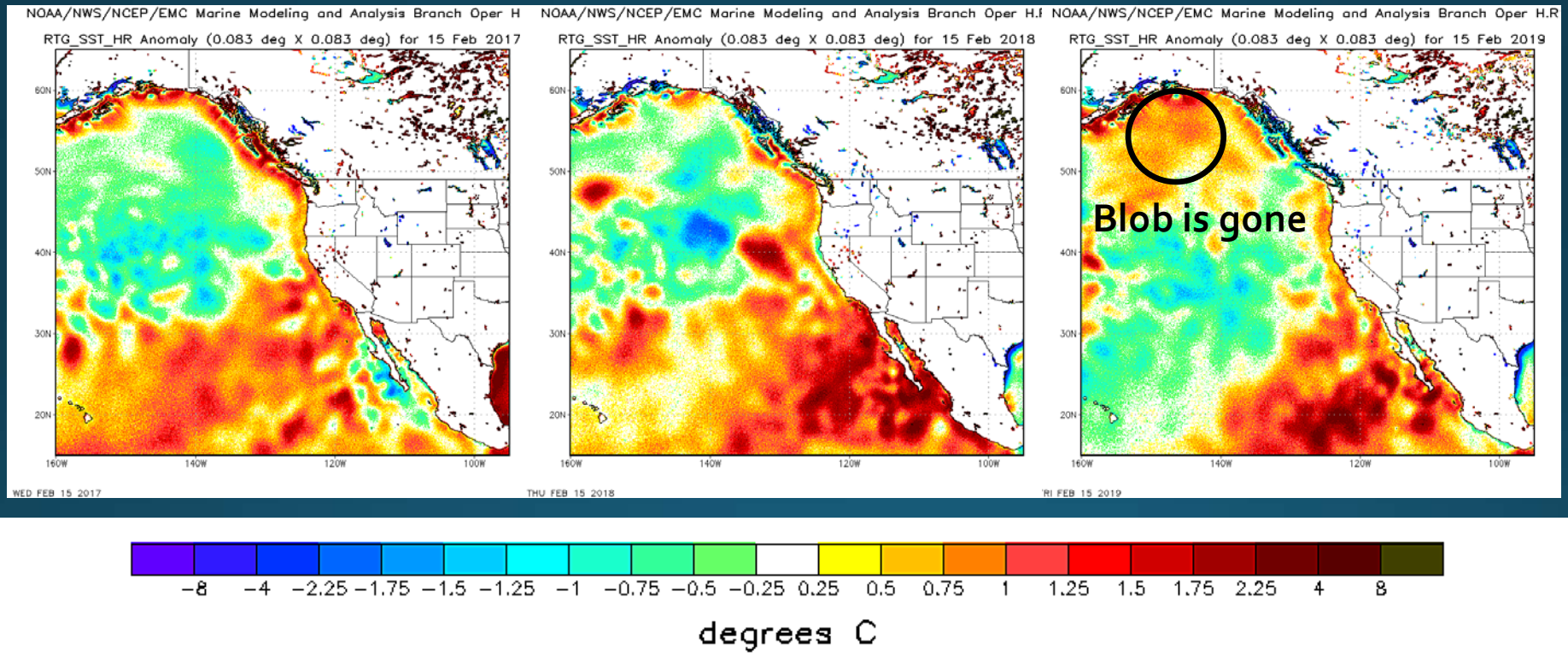
Mild September and October led to concerns of a return of "The Blob"



polar.ncep.noaa.gov/sst/ophi/

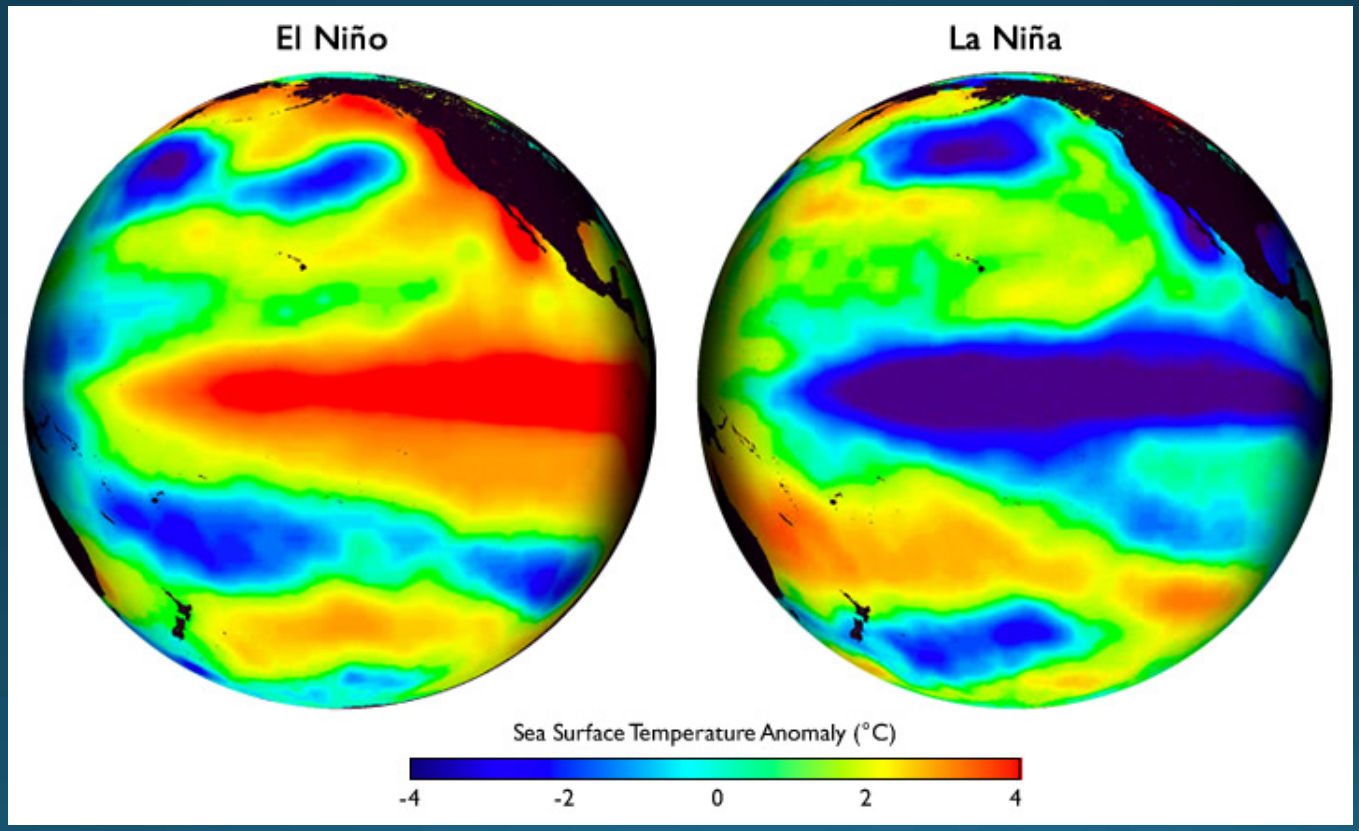
North Pacific cools through 2017-2018

Feb 15, 2017 Feb 15, 2018 Feb 15, 2019



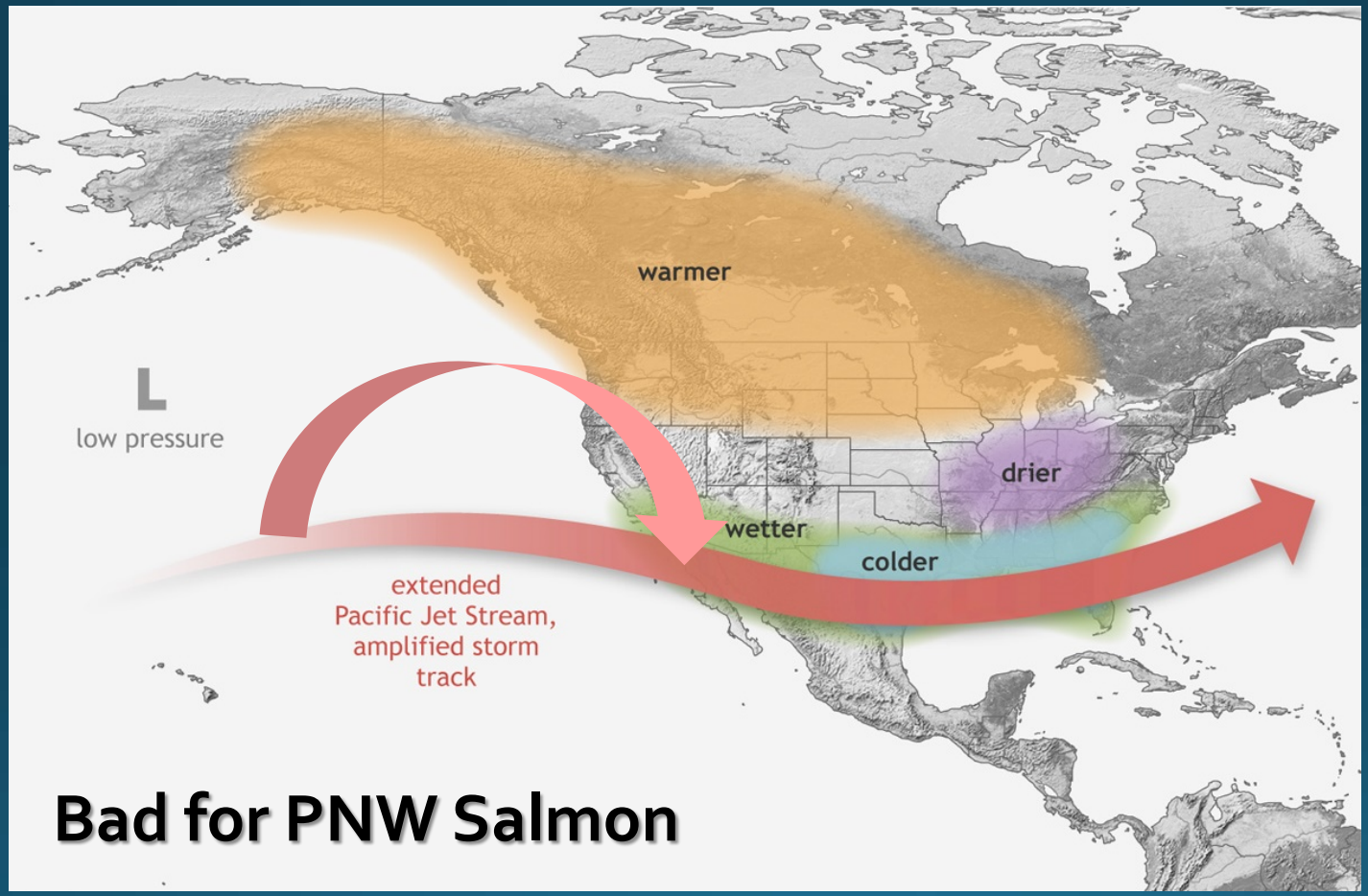
polar.ncep.noaa.gov/sst/ophi/

2014-16 **Strong** and 2019 *weak* **El Niños** and 2016 + 2017/2018 *weak* **La Niñas**

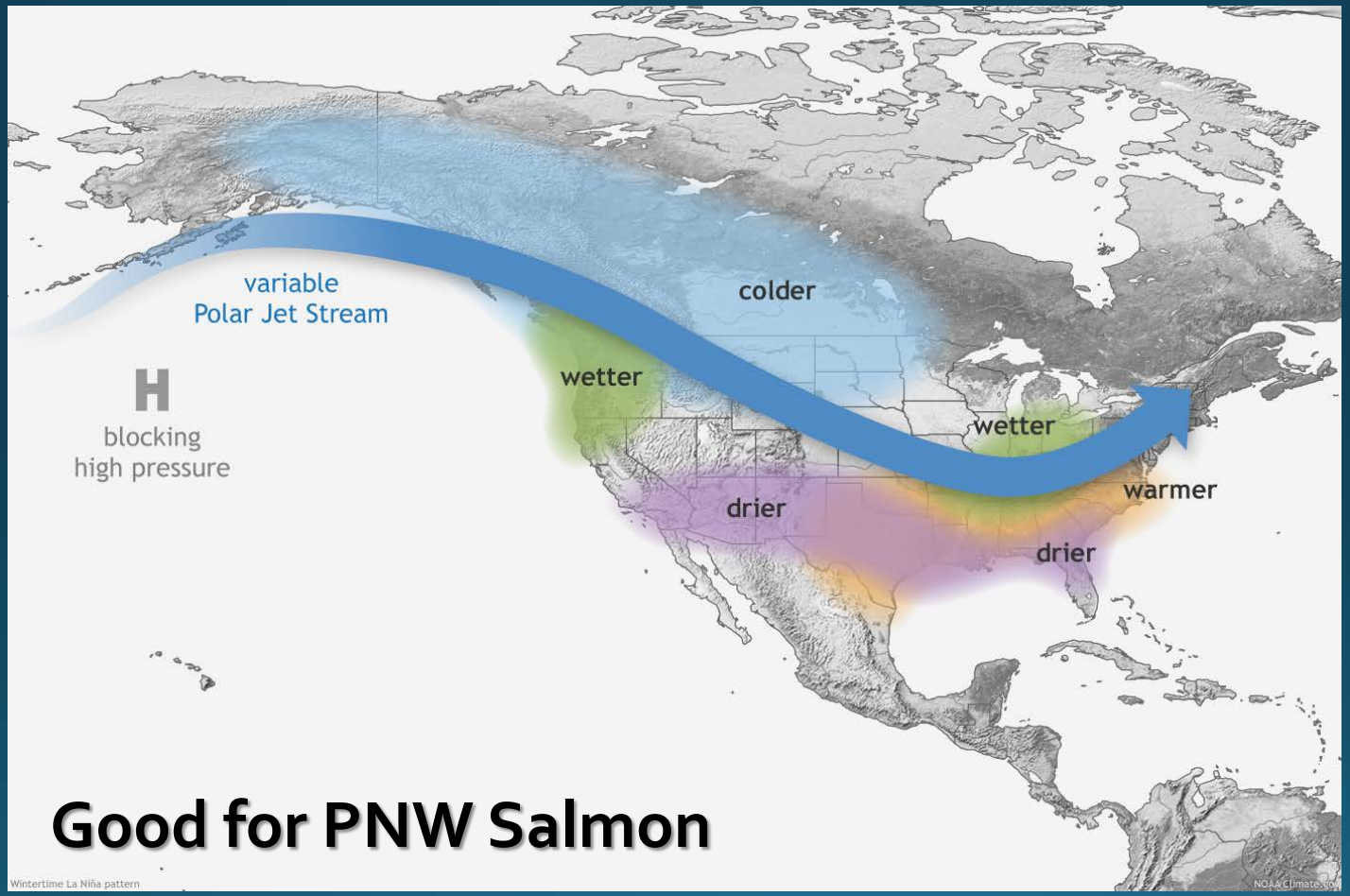


www.climate.gov/enso

Typical El Niño Pattern



Typical La Niña Pattern



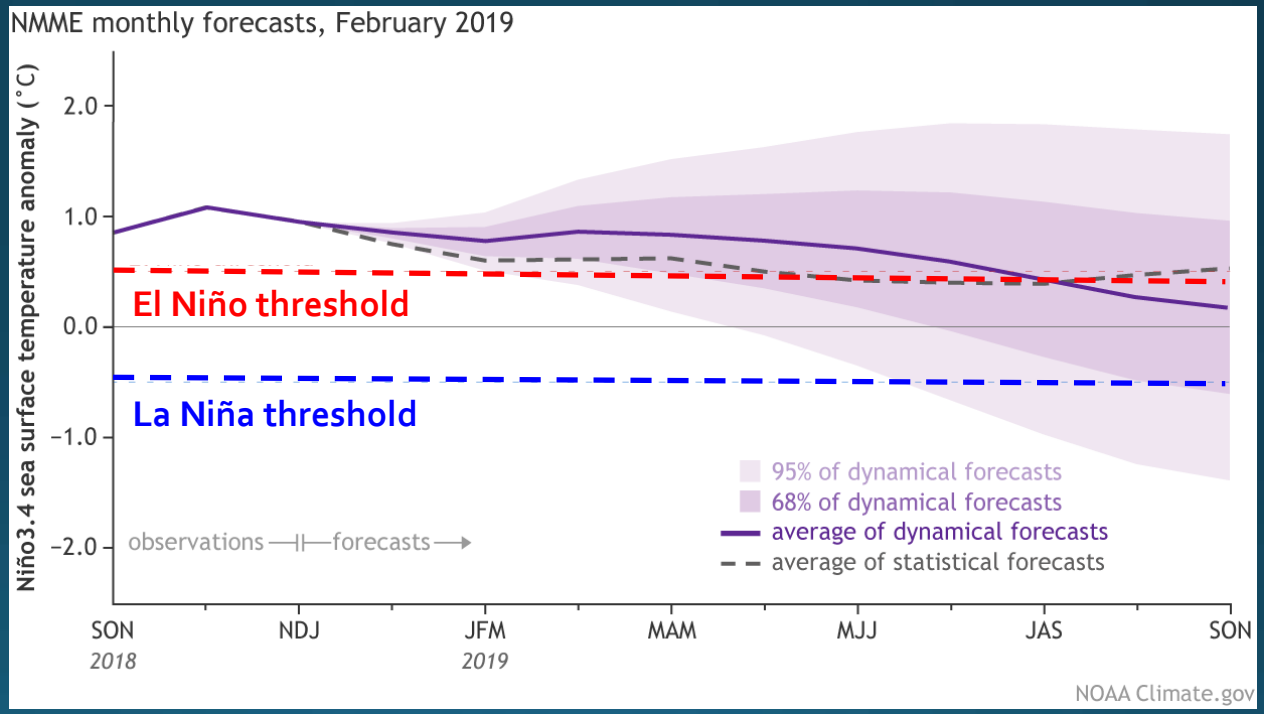
ENSO Outlook

El Niño Advisory

Equatorial sea surface temperatures (SSTs) are above average across most of the Pacific Ocean.

Weak El Niño conditions are present and are expected to continue through the Northern Hemisphere spring 2019 (~55% chance).

Widespread or significant global impacts are not anticipated.

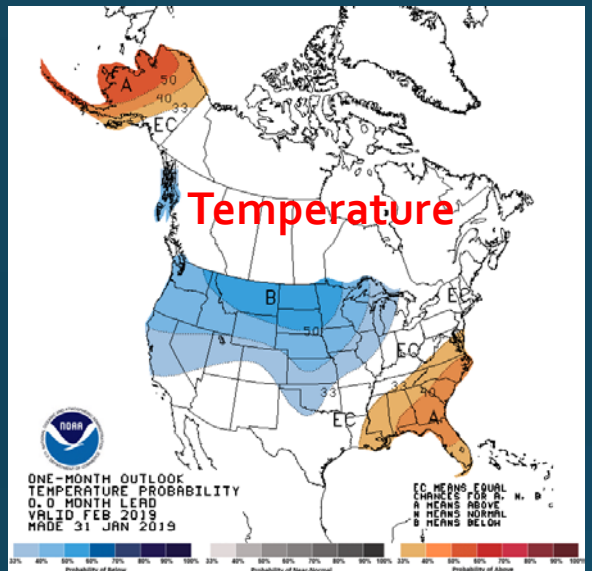


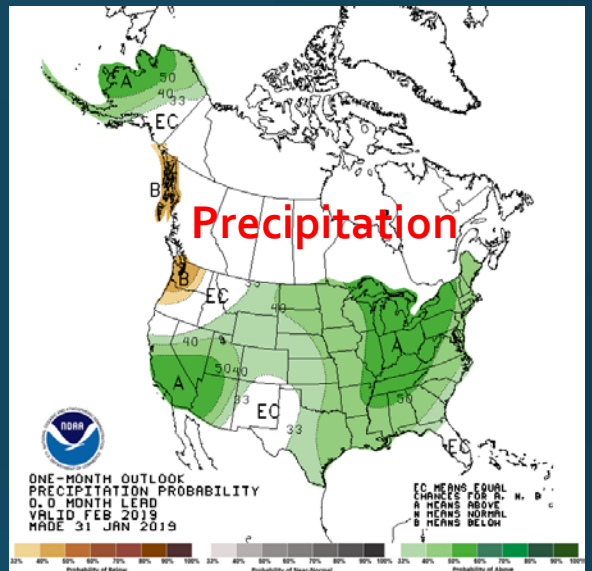
https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.html

Terrestrial impacts on salmon production

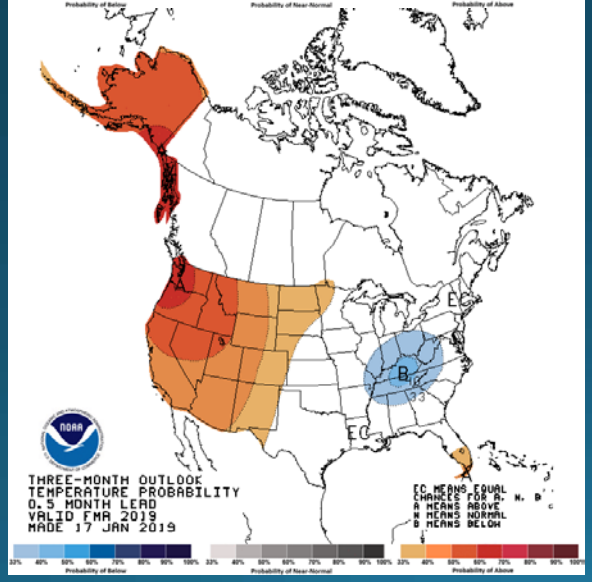
Terrestrial Climate Outlook

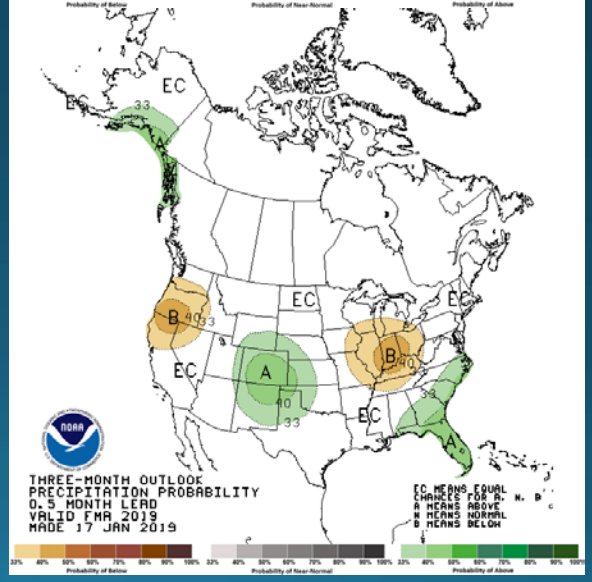
1 Month
Feb 2019





3 months:
Feb – Apr 2019

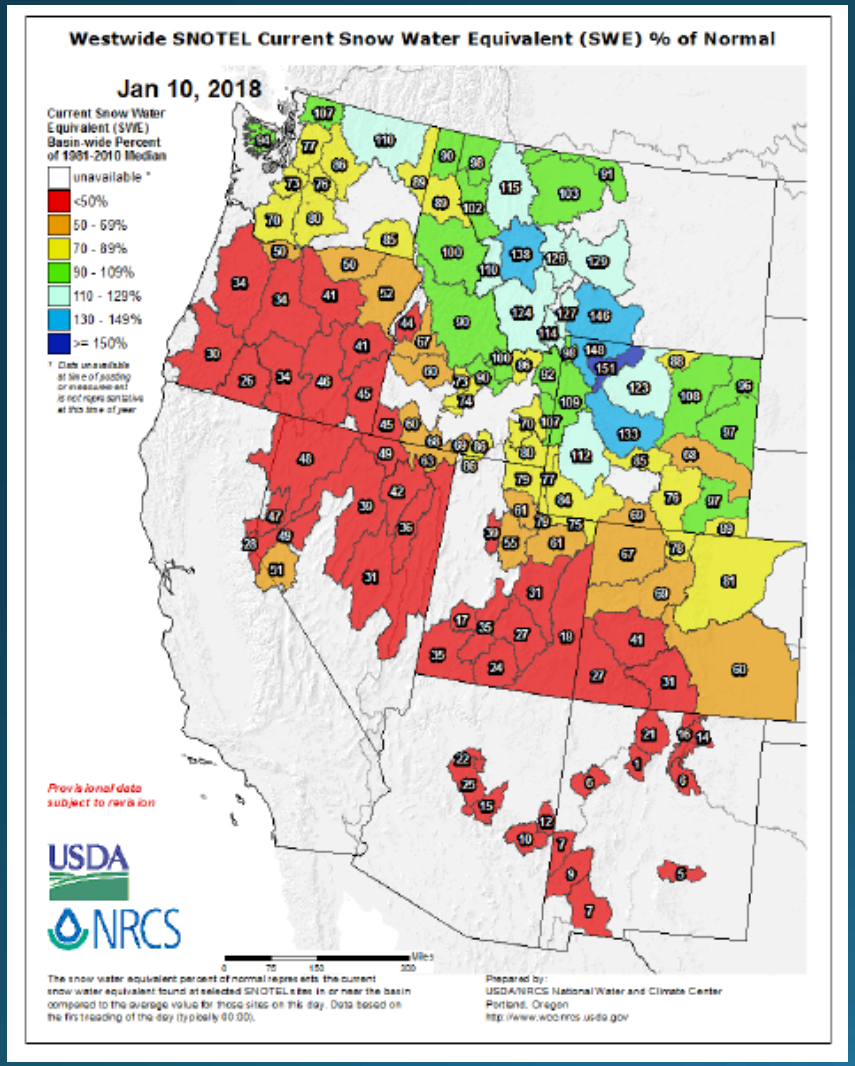




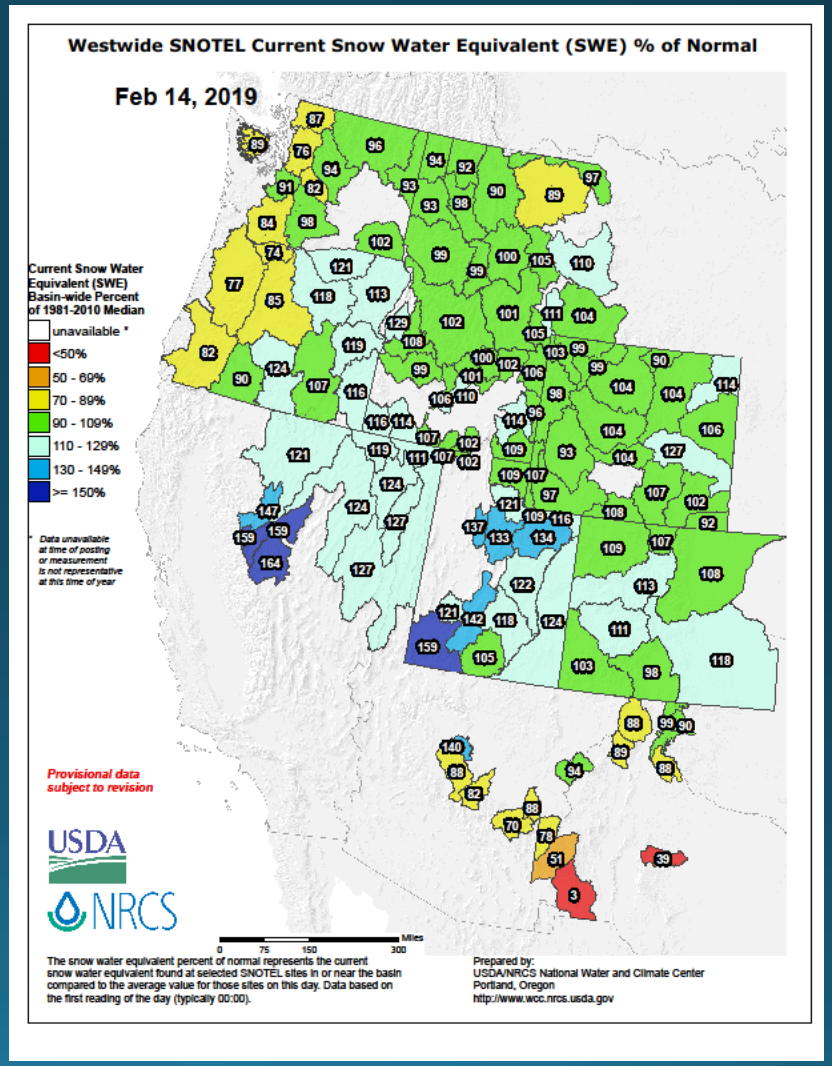
www.cpc.ncep.noaa.gov/products/forecasts

Current Snow Pack

Jan 2018



Feb 2019



www.wcc.nrcs.usda.gov/gis/snow.html

Biological Responses to the Warm Ocean

2015

Harmful algal blooms shut down crab and clam fisheries CA – AK

Reductions in zooplankton and changes to jellyfish community

Tropical fish caught in the PNW

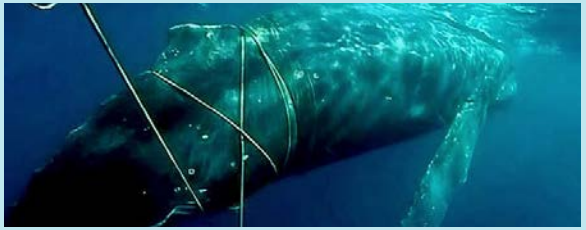
Whales feeding in estuaries

2016

Pelagic red crabs wash ashore

Food web changes continue

Anchovy increase in Salish Sea



Whales nearshore; entangled in fishing lines

2017

Pyrosomes explode in N Pacific

Sea bird die offs in Bering Sea

Pacific cod collapse in Gulf of AK

Sea lion abundance increasing in PNW

Huge Responses at all Trophic Levels

2018

More whale entanglements in estuaries and near shore

Hypoxic conditions on shelf and estuary from Jun-Sep

Better than expected Chinook returns to South Puget Sound

Northern, lipid-rich copepods and high abundances of crab megalopae in coastal waters

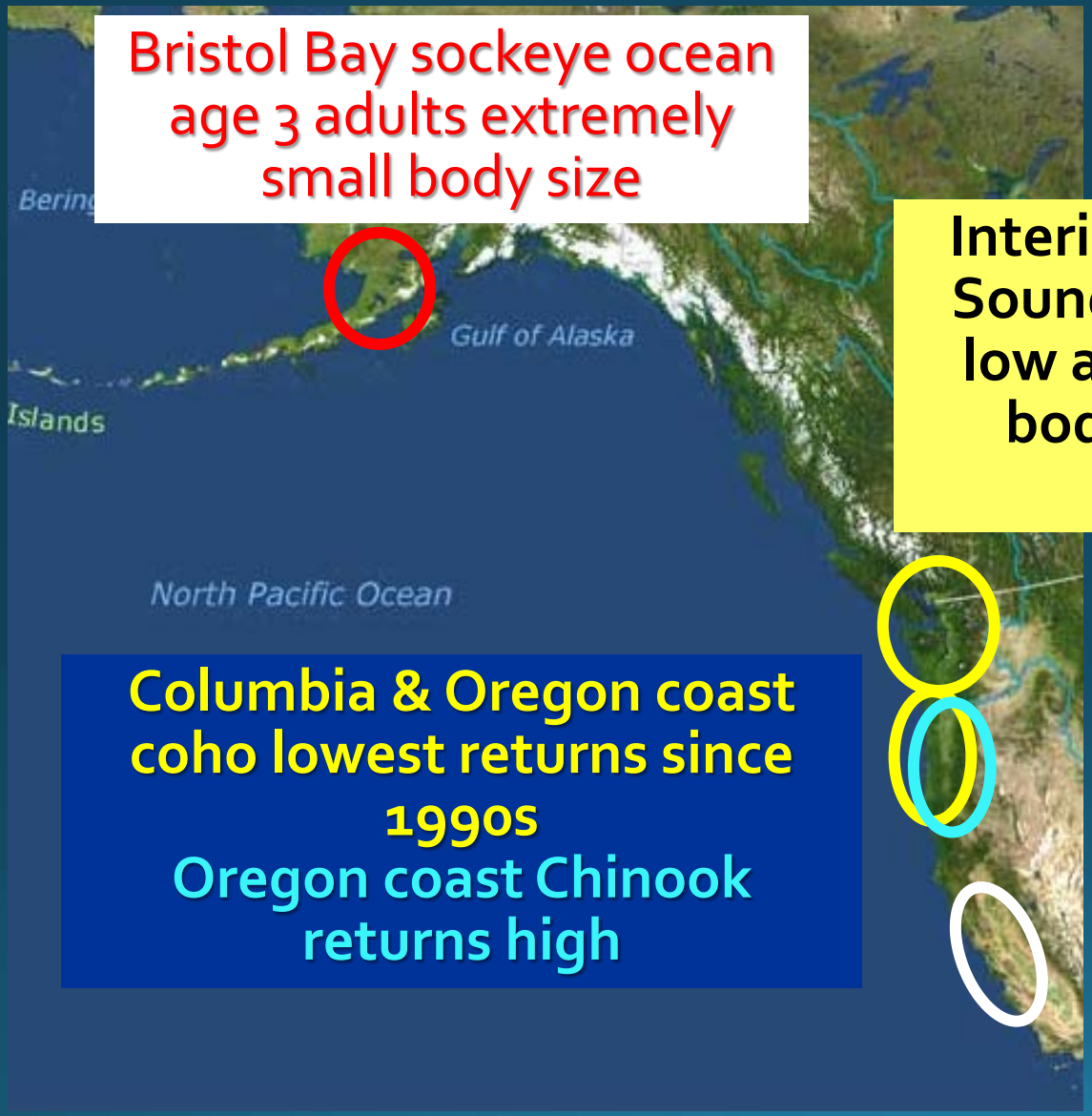
Pyrosomes dissipated off OR/WA for first time since 2017

Record breaking opah caught off WA

Culling of up to 93 sea lions approved by federal government below Willamette Falls to protect winter run of steelhead

Mourning Orca mother carries dead calf for a record 17 days

Unusual salmon observations in **2015**

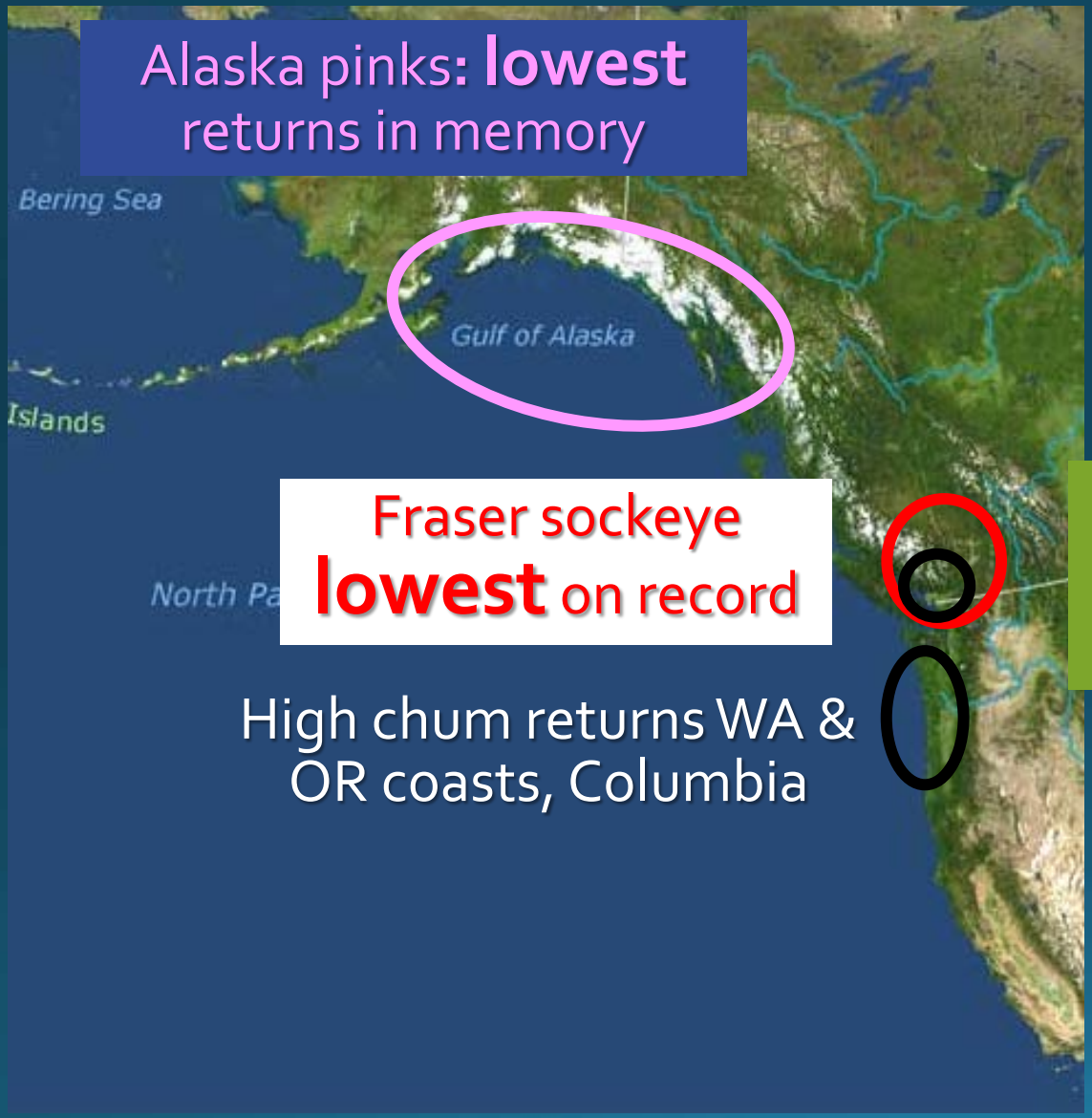


Interior Fraser & Puget Sound coho extremely low abundance, small body size, and low fecundity

Extremely low downstream survival Central Valley Chinook & steelhead (drought)

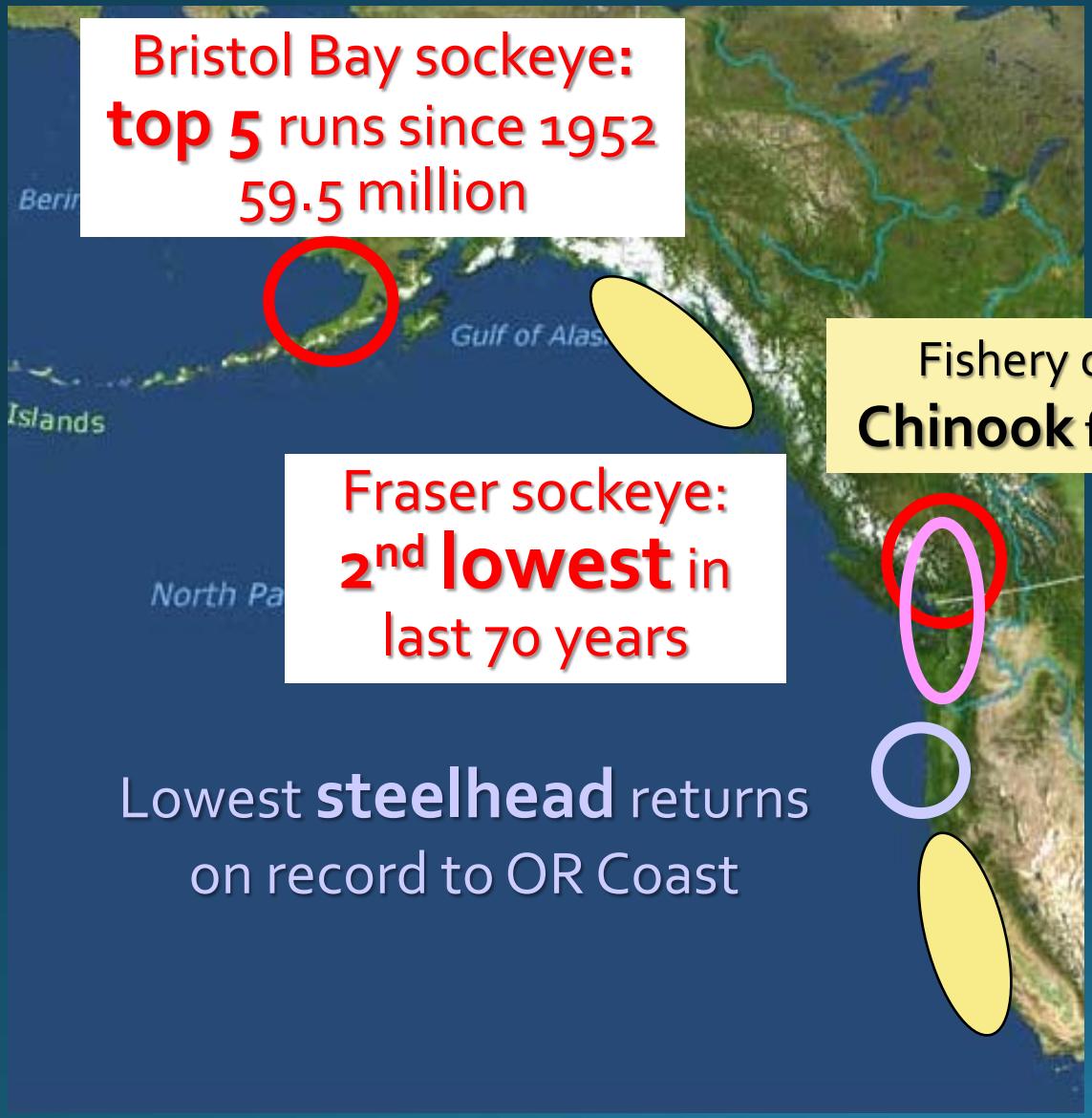
Modified from L. Weitkamp

Unusual salmon observations in **2016**



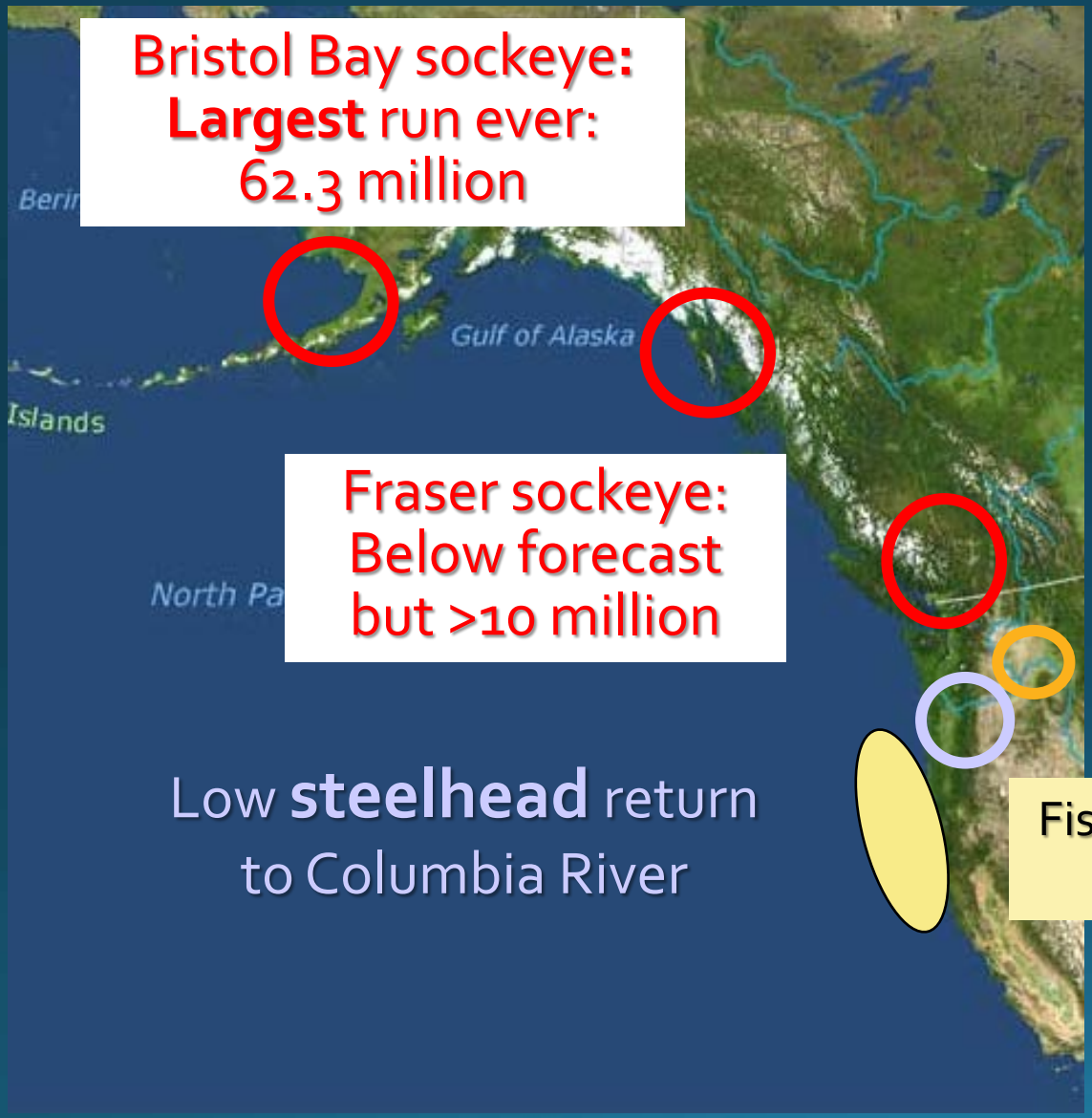
Modified from L. Weitkamp

Unusual salmon observations in **2017**



Modified from L. Weitkamp

Unusual salmon observations in **2018**



Bristol Bay sockeye:
Largest run ever:
62.3 million

Poor sockeye, pink, and Coho run in SE Alaska

Fraser sockeye:
Below forecast
but >10 million

High **shad** returns on Columbia River

Low **steelhead** return to Columbia River

Fishery closures for **Coho** in OR and CA

Salmon Indicators: Bad -> Fair -> Good

	Ecosystem Indicators	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
		Year																				
Basin-scale physical indices	PDO (Sum Dec-March)	18	6	3	13	7	20	12	16	14	9	5	1	15	4	2	8	10	21	19	17	11
	PDO (Sum May-Sept)	10	4	6	5	11	17	16	18	12	14	2	9	7	3	1	8	19	21	20	15	13
	ONI (Average Jan-June)	20	1	1	7	14	16	15	17	9	12	3	11	18	4	6	8	10	19	21	13	5
Regional physical indices	46050 SST (°C; May-Sept)	16	9	3	4	1	8	21	15	5	17	2	10	7	11	12	13	14	20	18	6	19
	Upper 20 m T (°C; Nov-Mar)	20	11	8	10	6	15	16	12	13	5	1	9	17	4	3	7	2	21	19	18	14
	Upper 20 m T (°C; May-Sept)	17	12	14	4	1	3	21	19	7	8	2	5	13	10	6	18	20	9	15	11	16
	Deep temperature (°C; May-Sept)	21	6	8	4	1	10	12	16	11	5	2	7	14	9	3	15	20	18	13	17	19
	Deep salinity (May-Sept)	19	3	9	4	5	16	17	10	7	1	2	14	18	13	12	11	20	15	8	6	6
Regional biological indices	Copepod richness anom. (no. species; May-Sept)	19	2	1	7	6	14	13	18	15	10	8	9	17	4	5	3	11	20	21	16	12
	N. copepod biomass anom. (mg C m^{-3}; May-Sept)	19	14	10	11	3	16	13	20	15	12	6	9	8	1	2	4	5	17	21	18	7
	S. copepod biomass anom. (mg C m^{-3}; May-Sept)	21	2	5	4	3	14	15	20	13	10	1	7	16	9	8	6	11	18	19	17	12
	Biological transition (day of year)	18	8	5	7	9	14	13	19	12	2	1	3	16	6	10	4	11	21	21	17	15
	Ichthyoplankton biomass (mg C 1,000 m^{-3}; Jan-Mar)	21	12	3	8	10	19	18	15	17	16	2	13	5	14	11	9	20	6	7	1	4
	chthyoplankton community index (PCO axis 1 scores; Jan-Mar)	10	13	2	7	5	11	20	18	3	12	1	14	15	8	4	6	9	19	21	17	16
	Chinook salmon juvenile catches (no. km^{-1}; June)	19	4	5	16	8	12	17	20	11	9	1	6	7	15	3	2	10	13	18	21	14
	Coho salmon juvenile catches (no. km^{-1}; June)	19	8	13	6	7	3	16	20	17	5	4	10	11	15	18	1	12	9	14	21	2
	Mean of ranks	17.9	7.2	6.0	7.3	6.1	13.0	15.9	17.1	11.3	9.2	2.7	8.6	12.8	8.1	6.6	7.7	12.8	16.7	17.2	14.4	11.6
	Rank of the mean rank	21	5	2	6	3	15	17	19	11	10	1	9	13	8	4	7	13	18	20	16	12

2018 = Ranked 12th

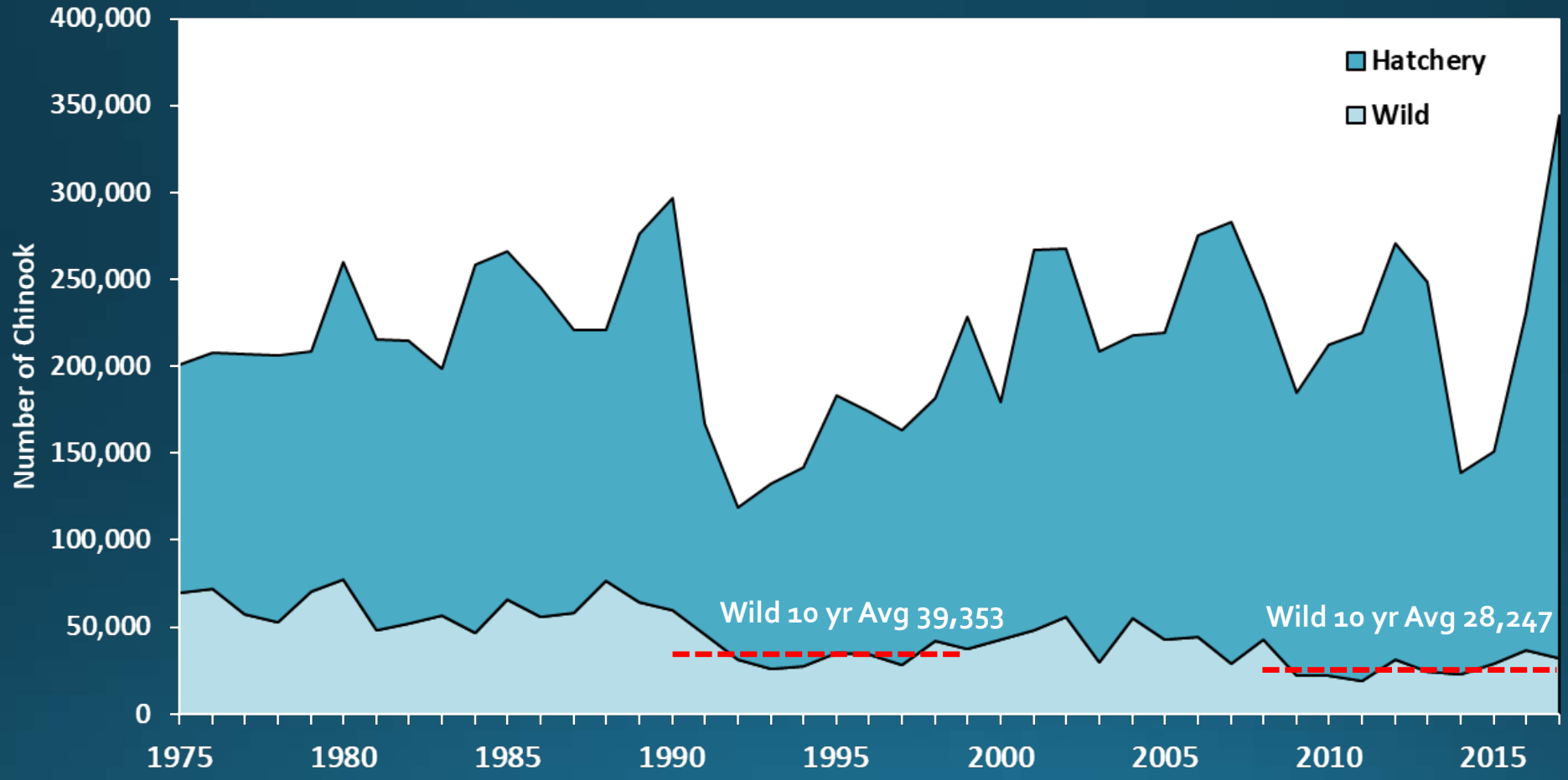
www.nwfsc.noaa.gov

Questions?

WA Coast and Puget Sound 2018 Returns and 2019 Forecasts

Chinook Salmon

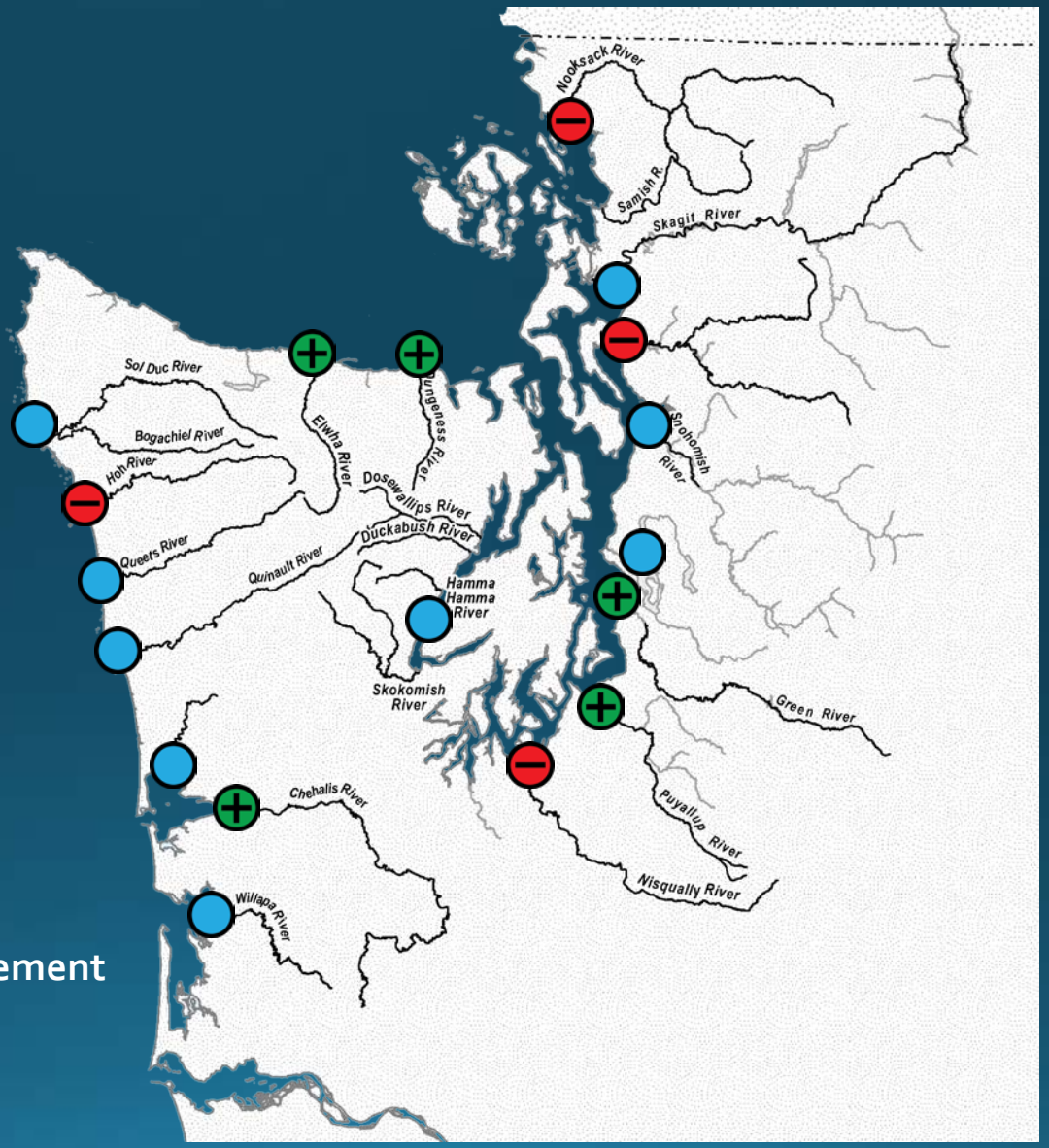
Chinook Historical Runsize – Puget Sound



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

2018 Wild Fall Chinook Returns

- All returns are preliminary
- Returns range from Poor to Good in Puget Sound and on the Coast

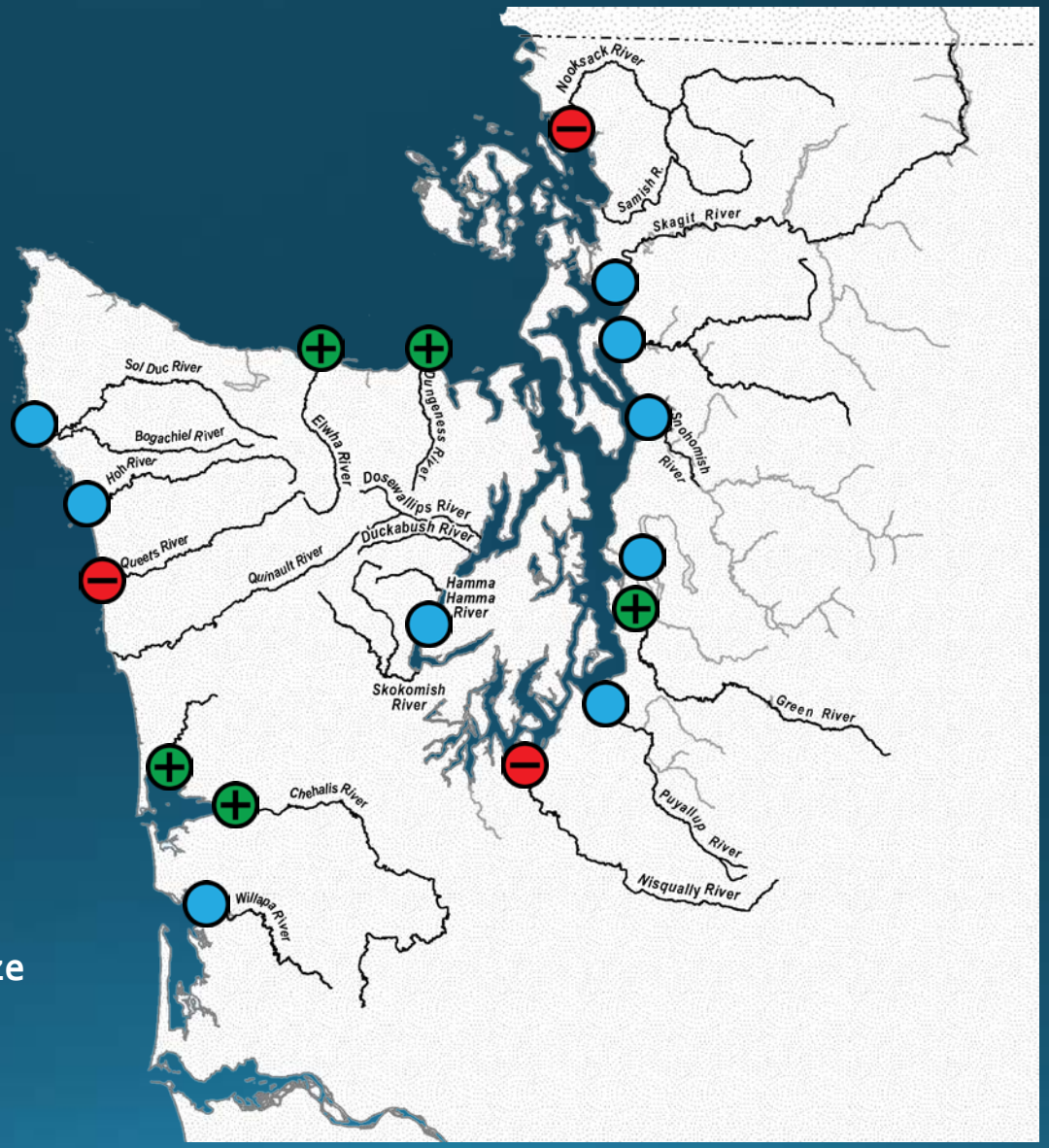


Relative to Recent 10yr Avg. Escapement

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

2019 Wild Fall Chinook Forecasts

- Forecasts range from Poor to Good for both Puget Sound and Coast
- Both Puget Sound and Coast wild forecasts ⬆ 6%

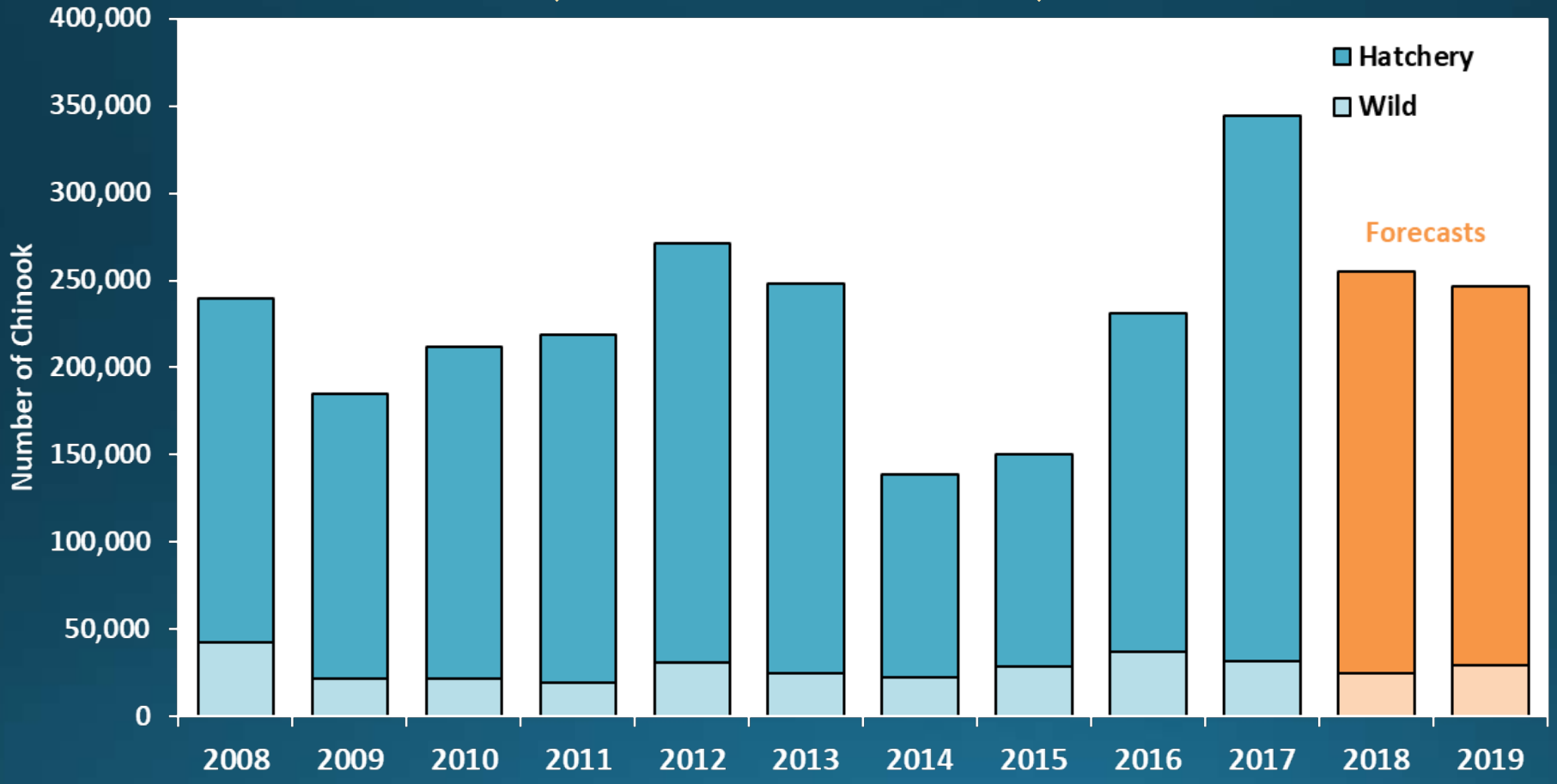


Relative to Recent 10yr Avg. Runsize

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

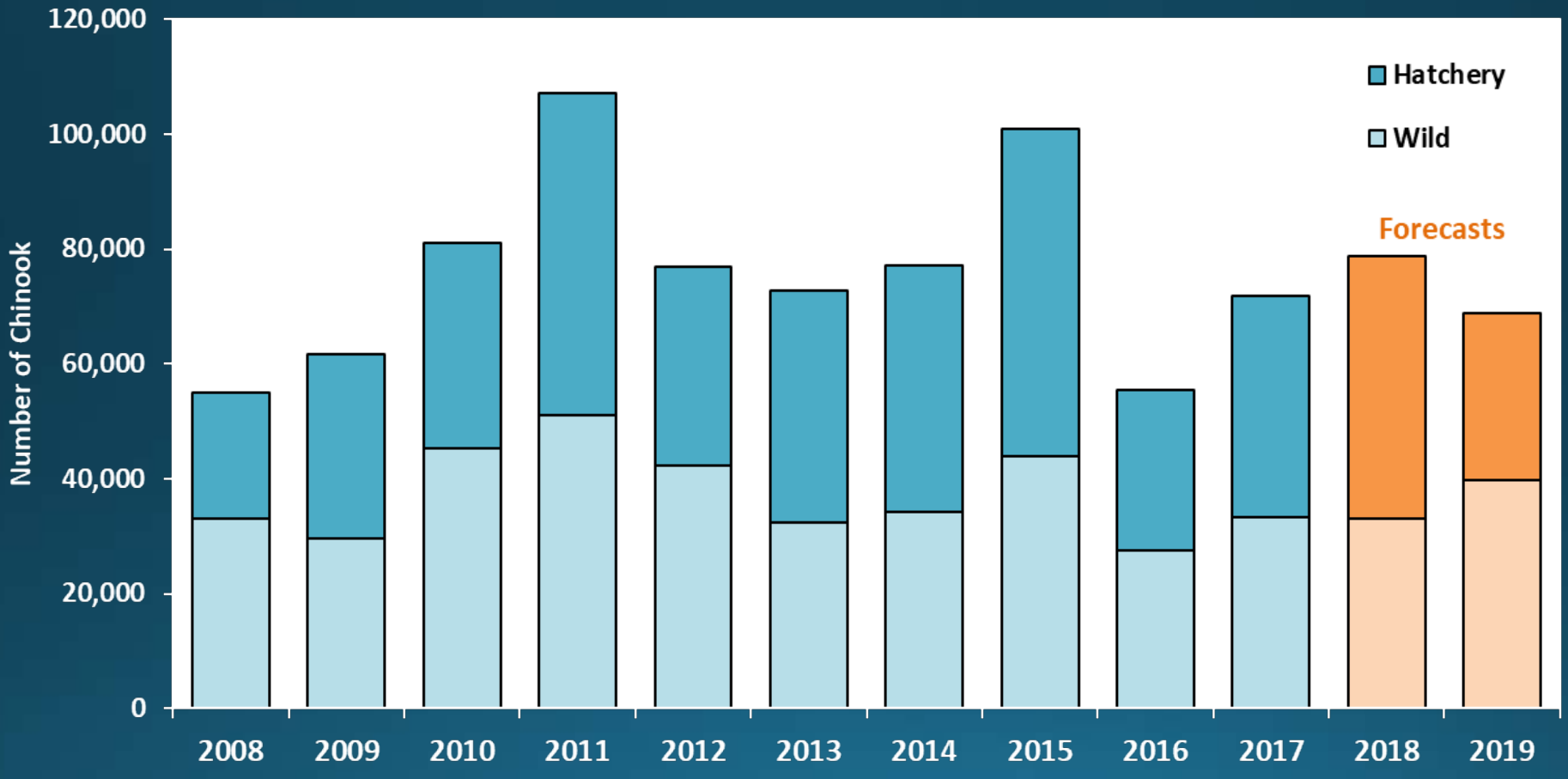
P. Sound Hatchery Chinook Forecasts

Puget Sound hatchery Chinook forecast ⬆ 11% from recent 10 year avg
(⬇ 6% from 2018 forecast)



Coastal Hatchery Chinook Forecasts

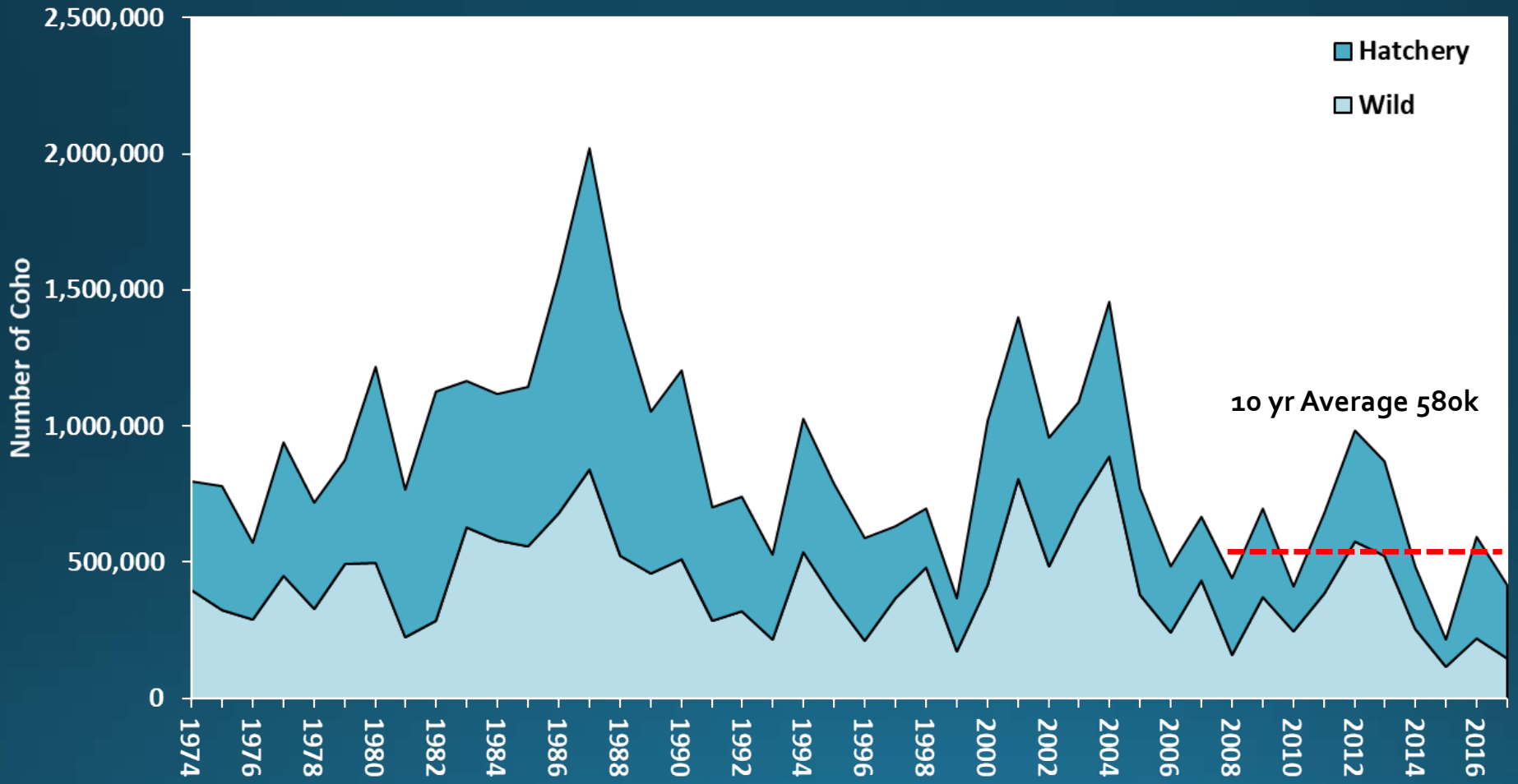
Coastal Hatchery Chinook forecast ⬇25% from recent 10 yr avg.
(⬇36% from 2018 Forecast)



*Excludes Quinault R.
Several Coastal forecasts are preliminary and subject to change

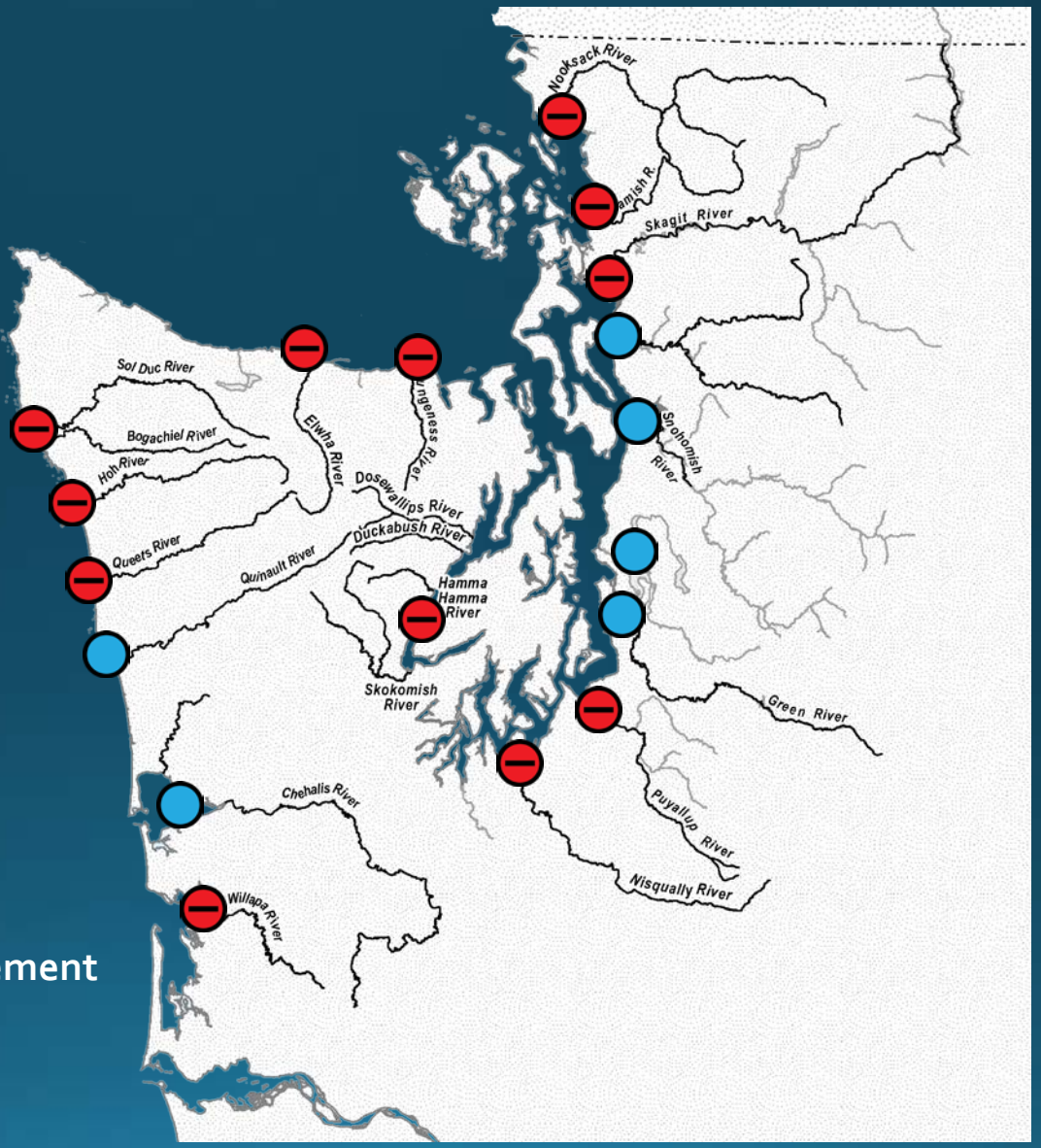
Coho

Coho Historical Runsize – Puget Sound



2018 Wild Coho Returns

- All returns are preliminary
- Returns ranged from Poor to Neutral for Puget Sound and Coast

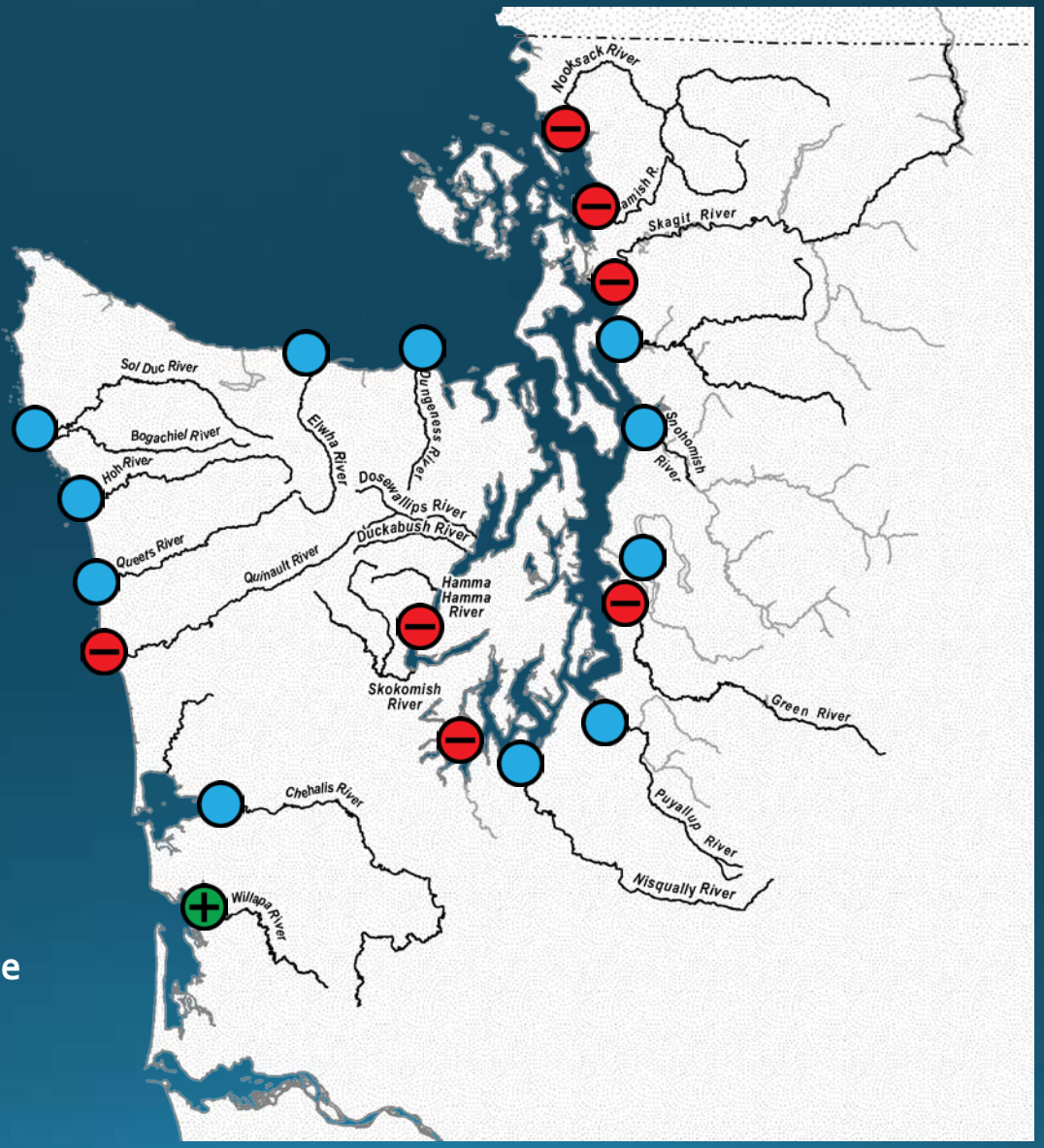


Relative to Recent 10yr Avg. Escapement

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

2019 Wild Coho Forecasts

- Forecasts range from Poor to Neutral across Puget Sound; ⬇ 15%
- Poor to Good on coast; ⬇ 11%

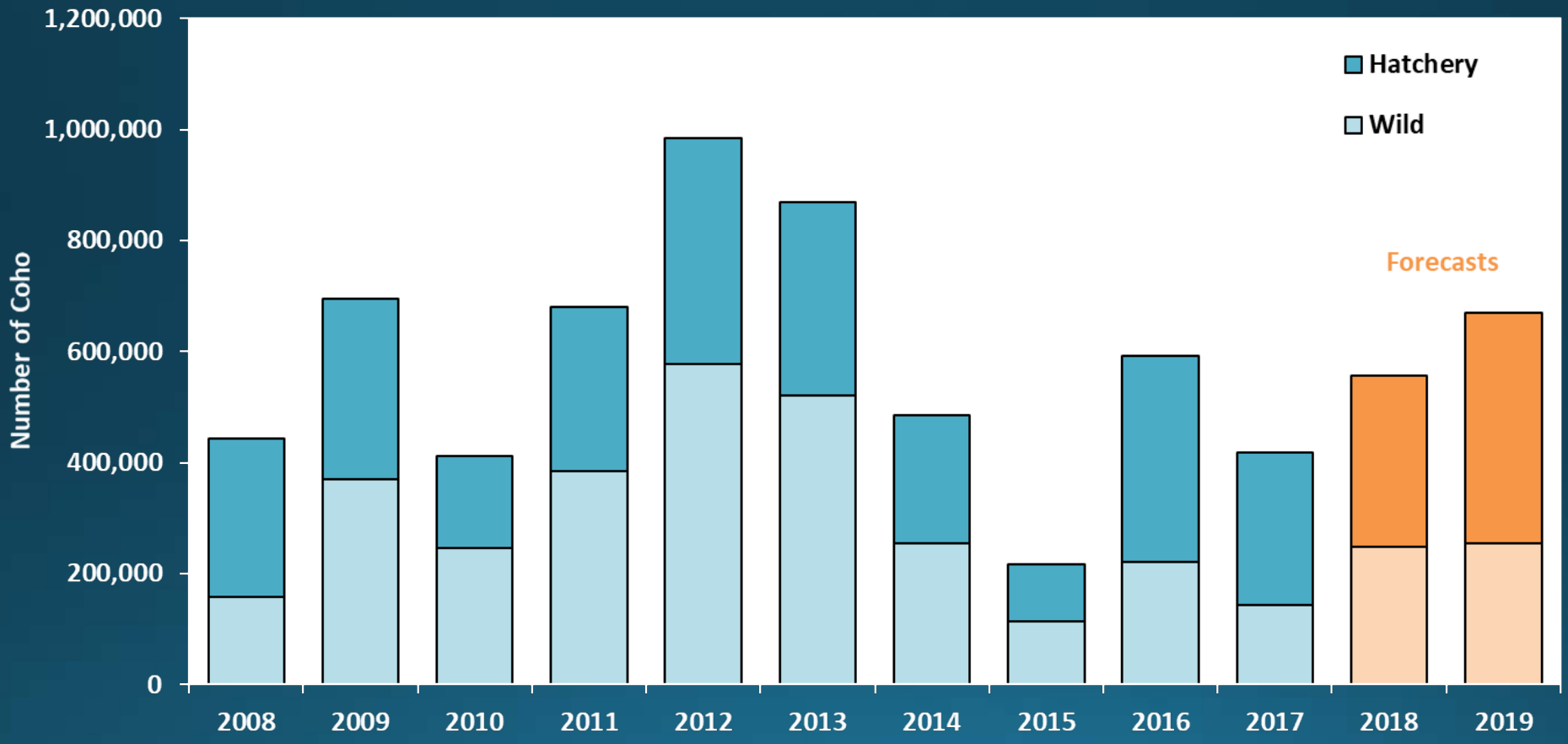


Relative to Recent 10yr Avg. Runsize

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

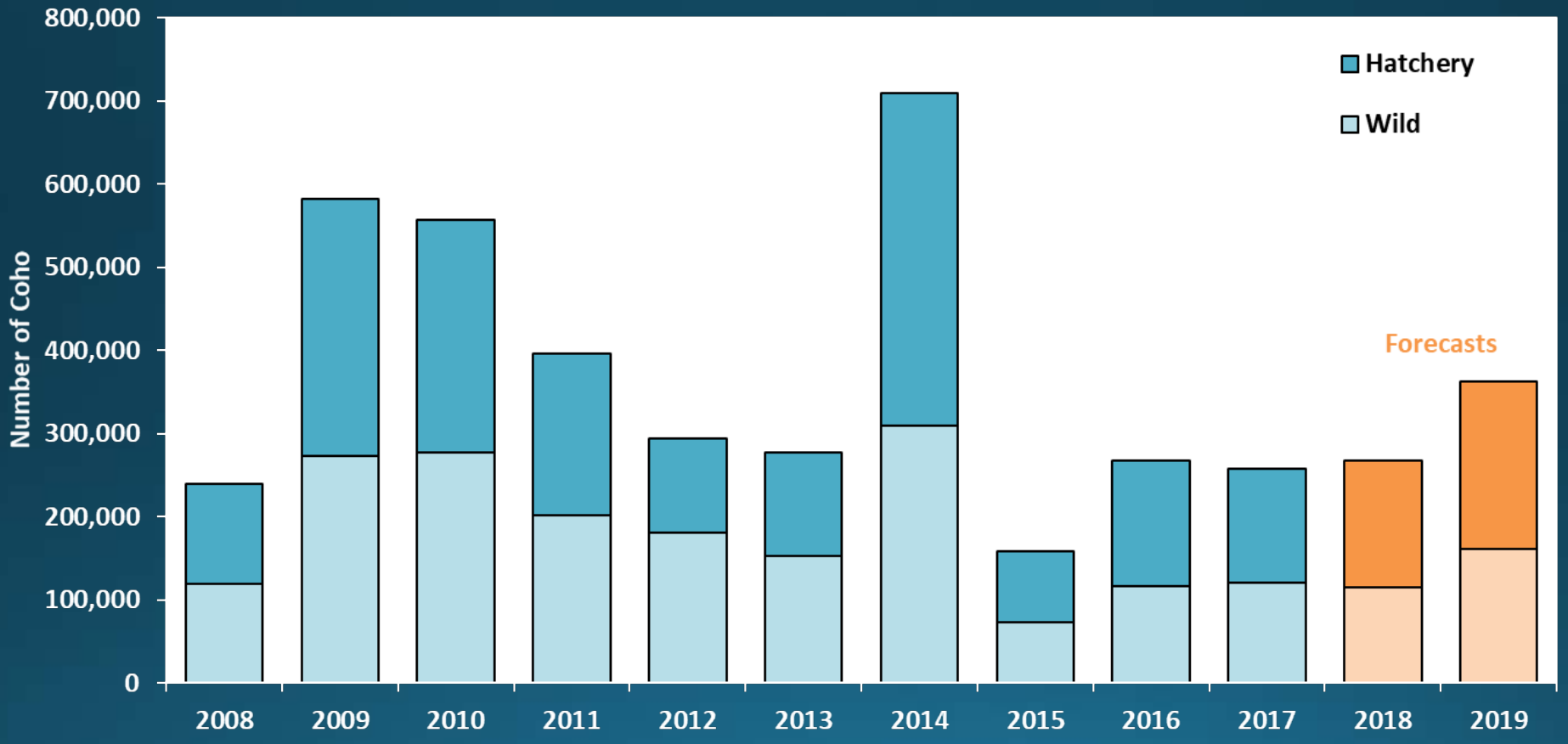
P. Sound Hatchery Coho Forecasts

Puget Sound Hatchery Coho forecast ⬆ 49% from recent 10 year avg.
(⬆ 35% from 2018 forecast)



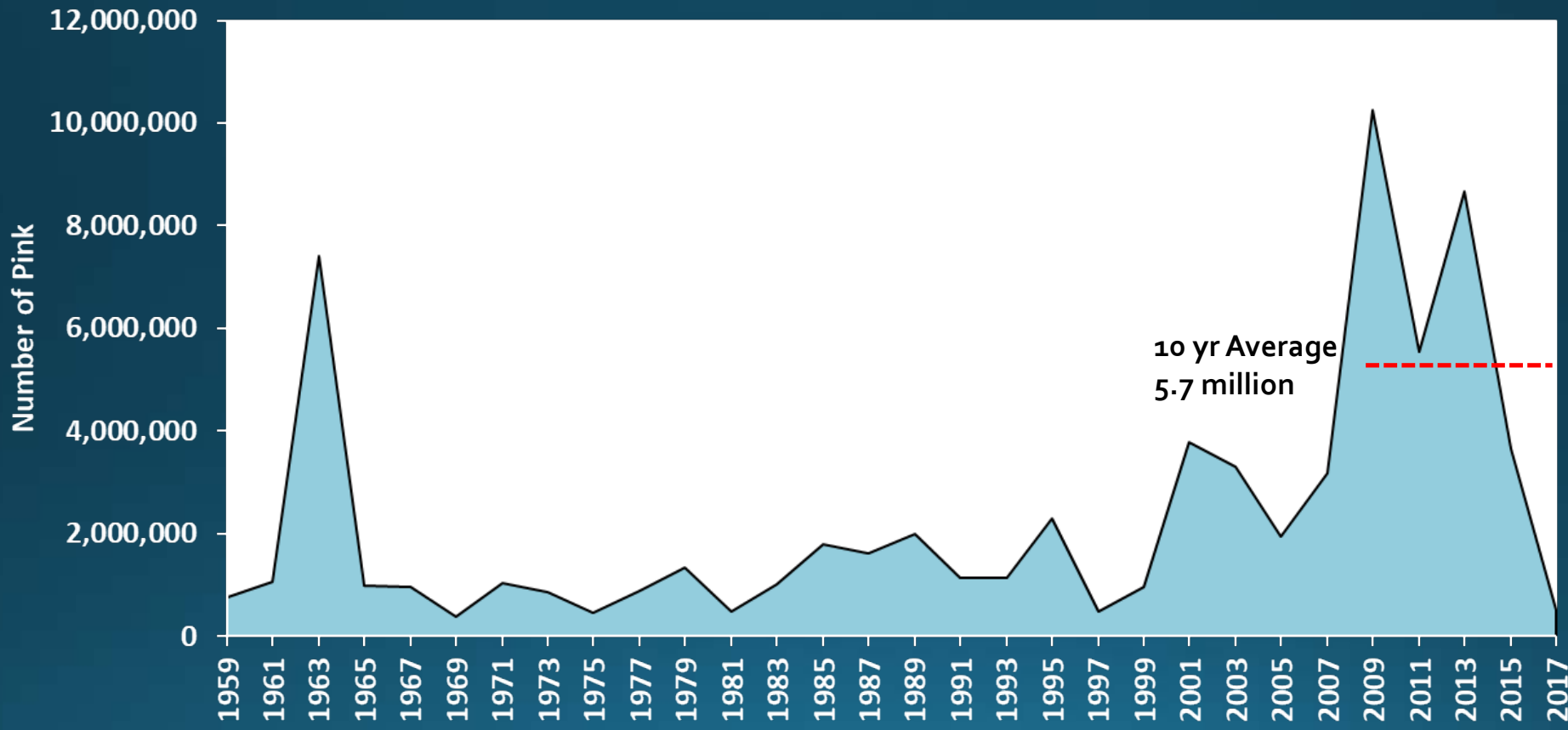
Coastal Hatchery Coho Forecasts

Coastal Hatchery Coho forecast ⬆ 5% from recent 10 year avg.
(⬆ 20% from 2018 forecast)



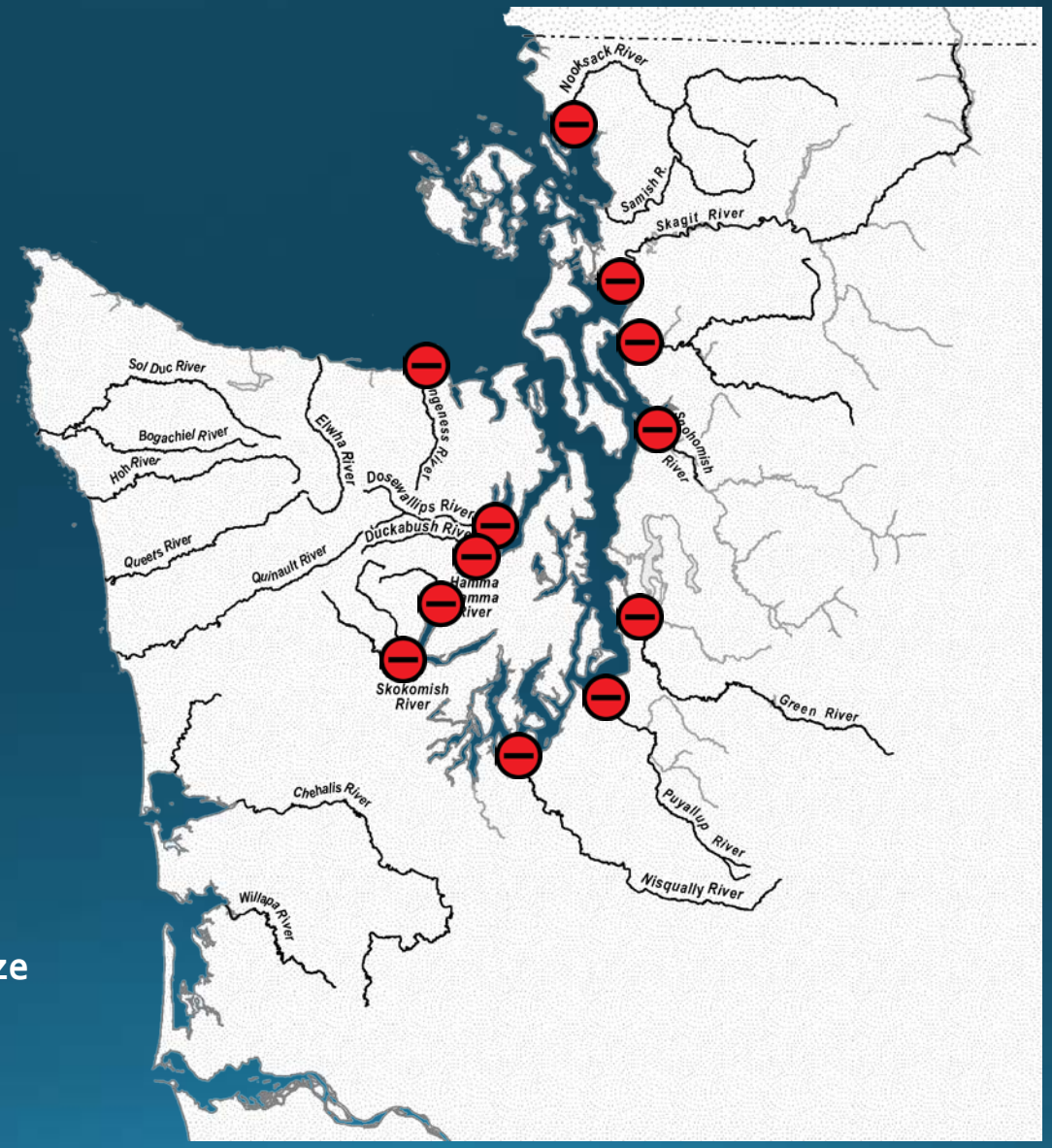
Pink

Pink Historical Runsize



2017 Pink Returns

- Returns were poor everywhere
- Large body size common
- Poor freshwater production as fry

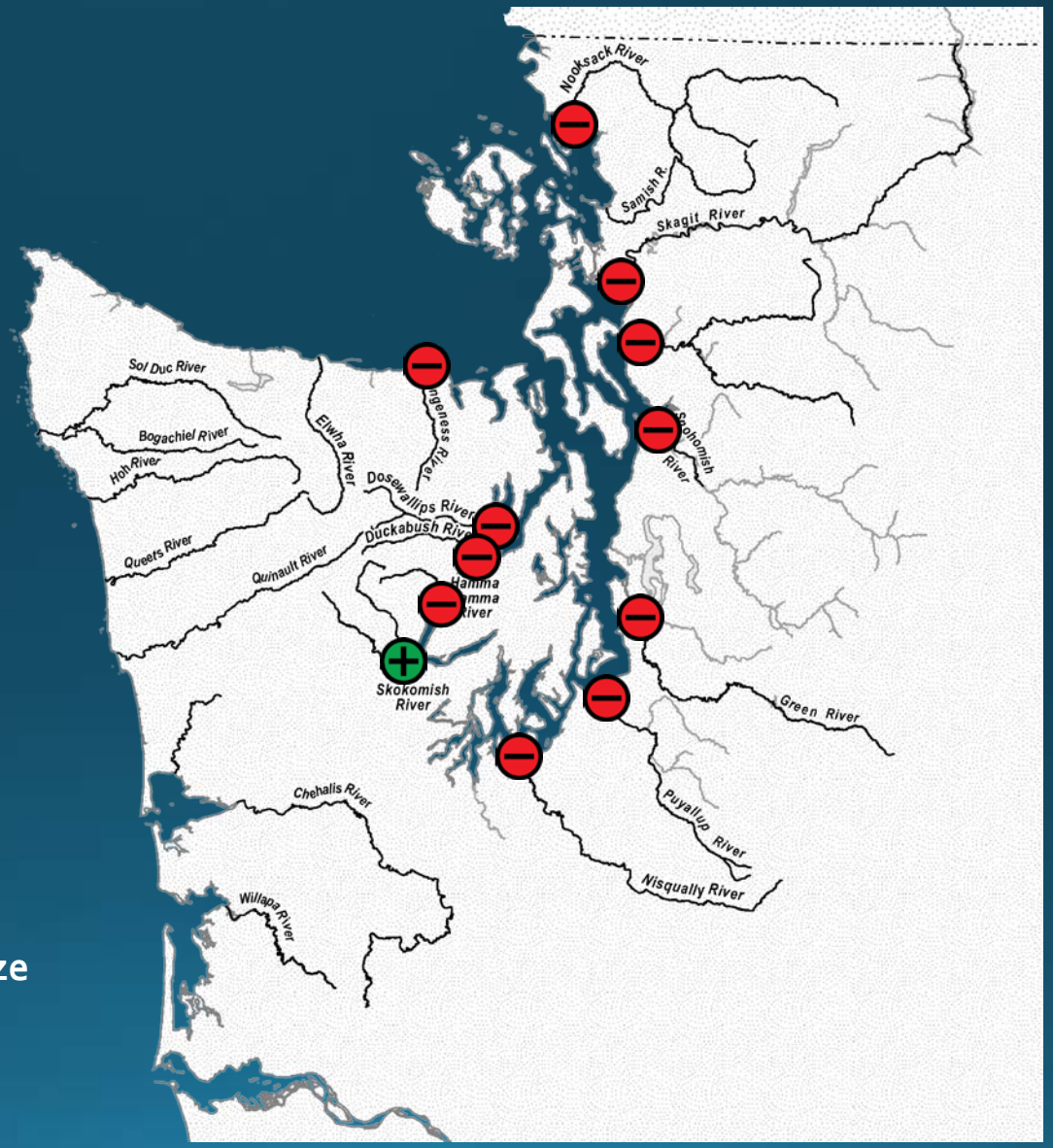


Relative to Recent 10yr Avg. Runsize

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

2019 Pink Forecasts

- Forecasts are mostly poor
- Very poor outmigrating fry numbers from most systems

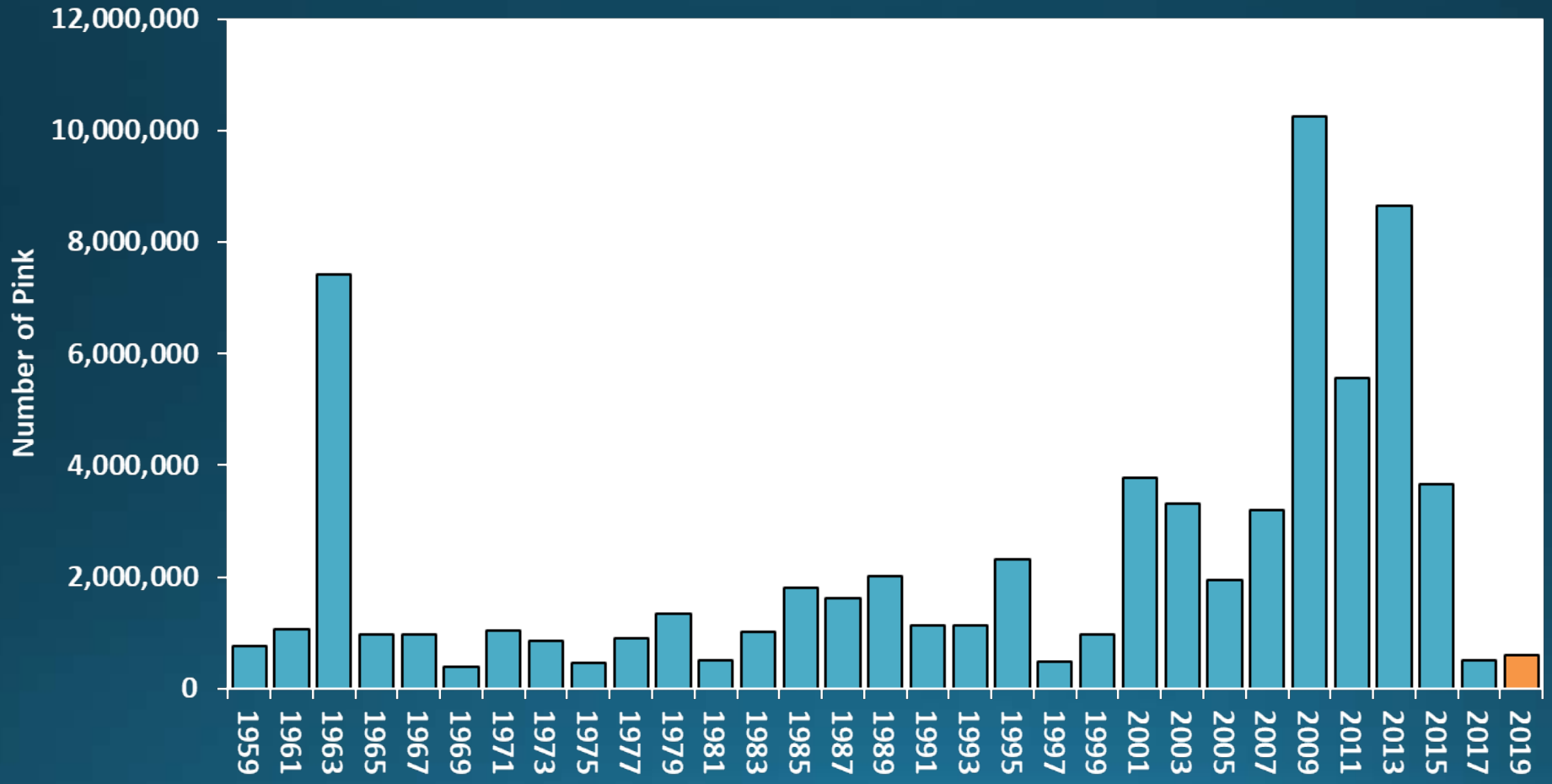


Relative to Recent 10yr Avg. Runsize

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

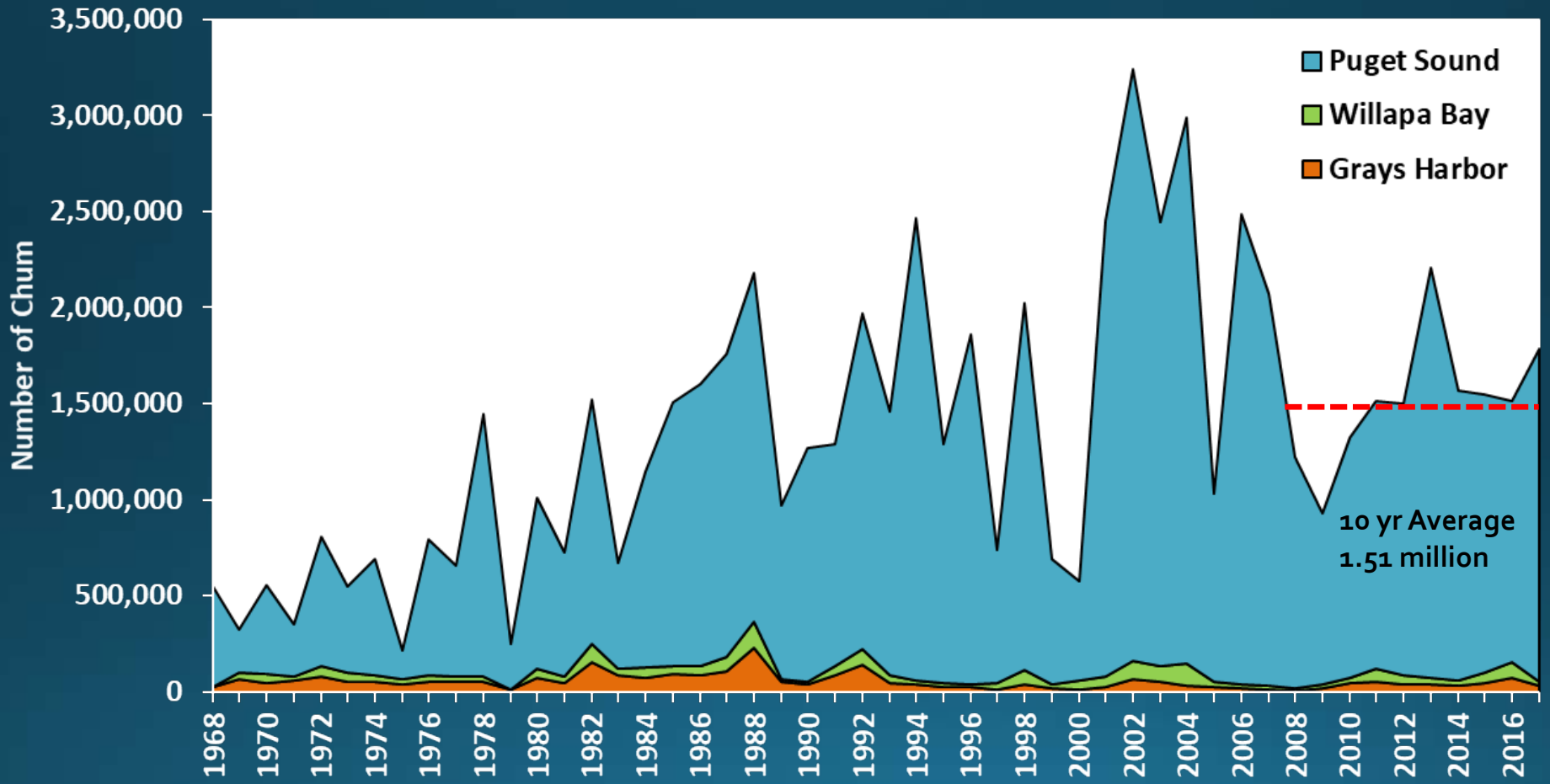
2017 Pink Forecasts

Puget Sound Pink forecast ⬇ 89% from recent 10 year avg.



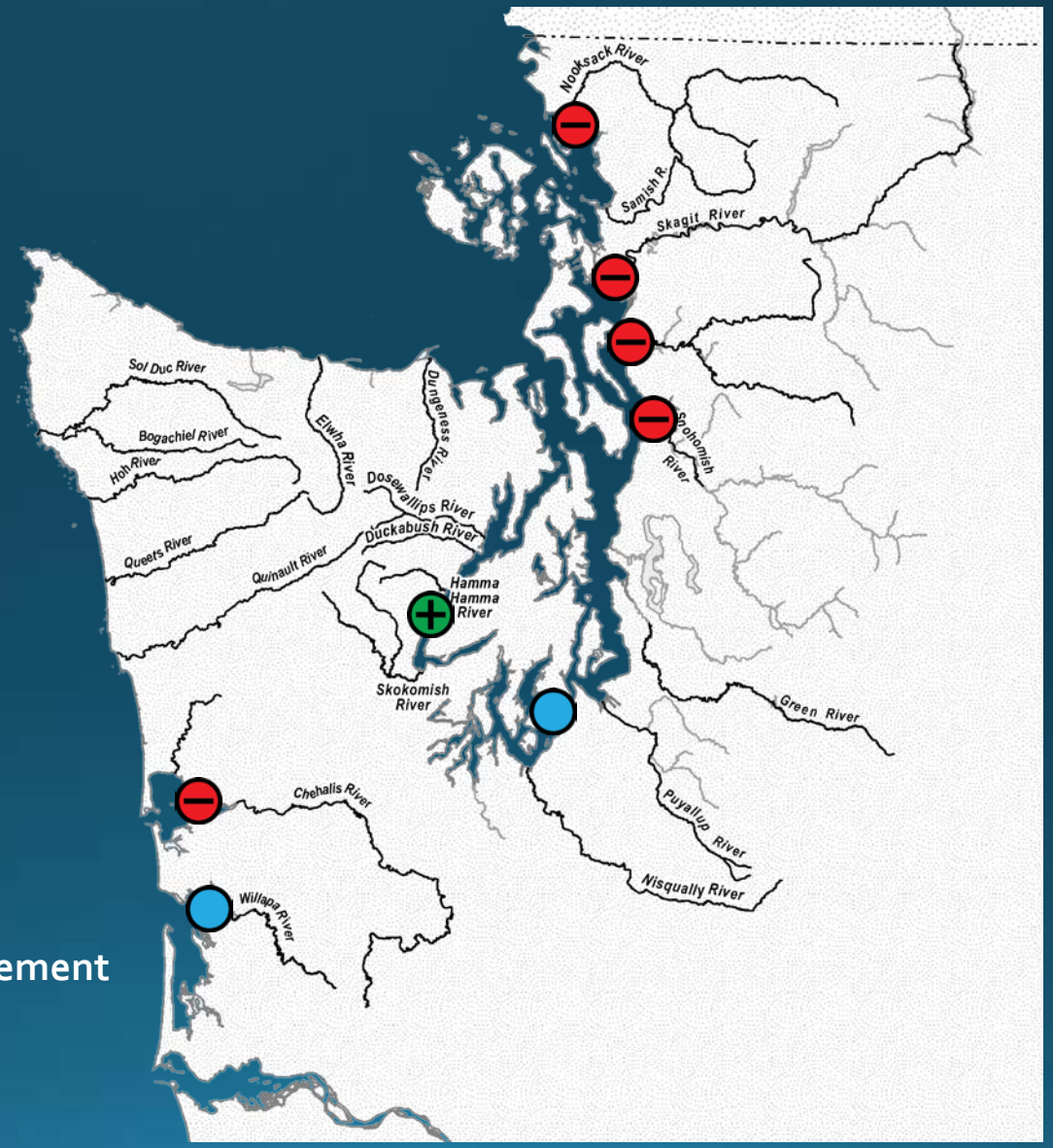
Chum

Chum Historical Runsize



2018 Fall Chum HOR/NOR Returns

- Returns were Poor for N. Sound Rivers
- Neutral to Good in SS and HC
- HC and SS are relative to in-season updated runsizes, not escapement

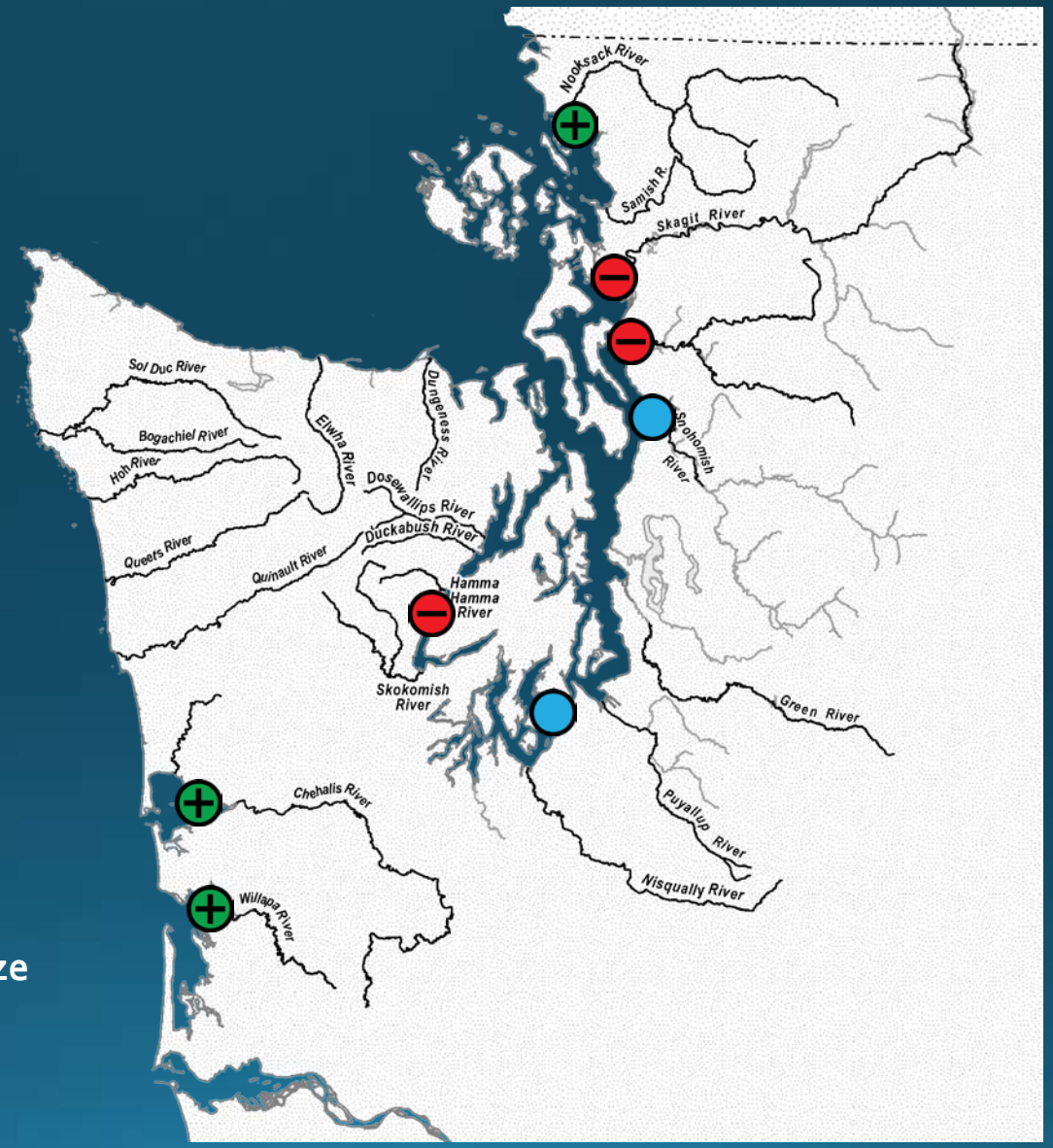


Relative to Recent 10yr Avg. Escapement

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

2019 Fall Chum HOR/NOR Forecast

- Forecasts range from Good to Poor
- Hood Canal - 519k*
- Central/S. Sound – 391k*
- Coast – Willapa – 52k
  Grays H – 72k



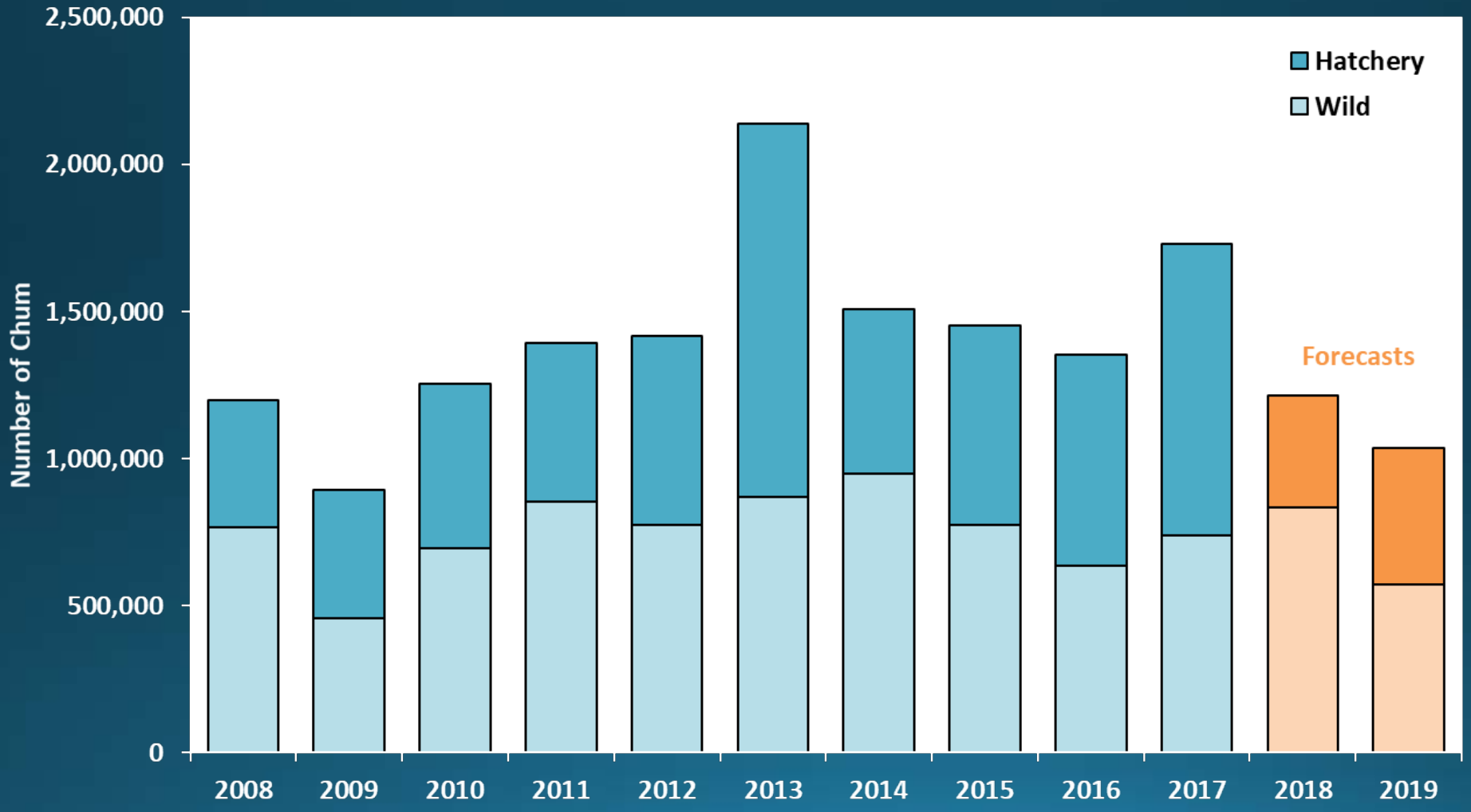
Relative to Recent 10yr Avg. Runsize

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

* Forecasts not "agreed-to" with comanagers

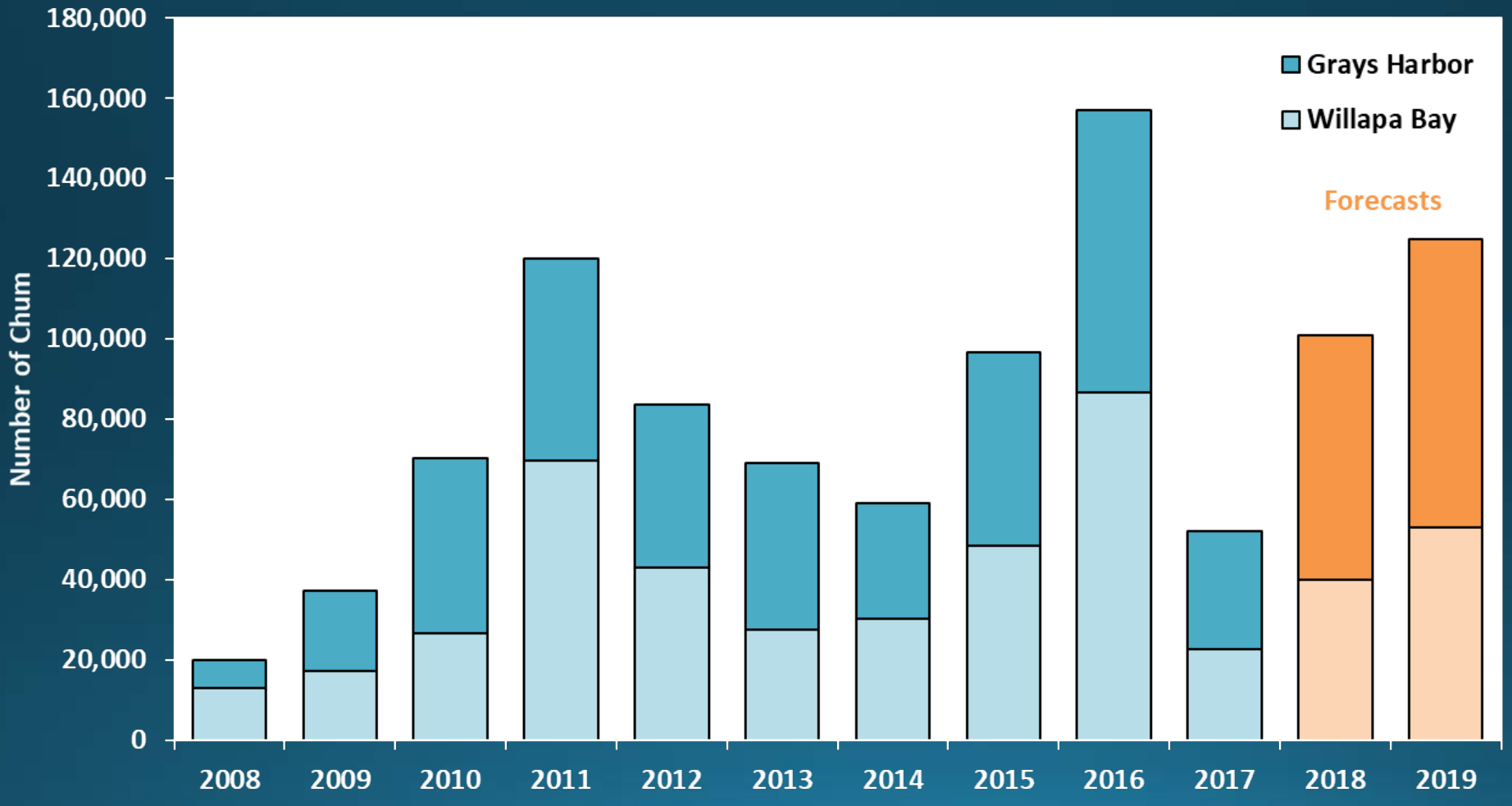
Puget Sound Chum Forecasts

Hatchery ⬇ 32% and Wild ⬇ 23% over recent 10 year avg.



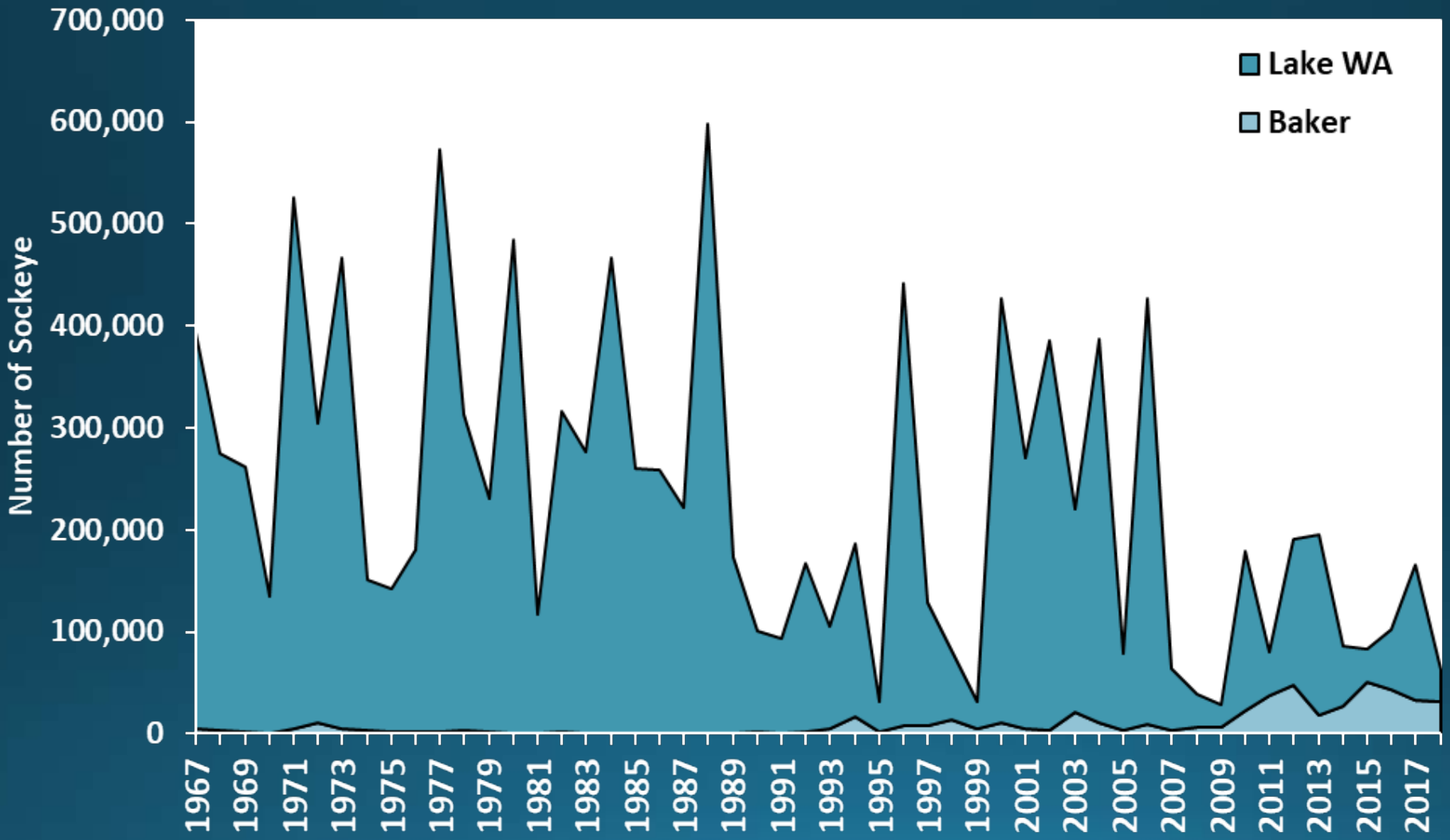
Coastal Chum Forecasts

Willapa Bay ⬆ 37% and Grays Harbor ⬆ 89% over recent 10 year avg.



Sockeye

Puget Sound Sockeye Runsize



2018 Sockeye HOR/NOR Returns

- Returns ranged from Poor to Good in Puget Sound
- Columbia Return was Poor
- Baker and Lake Wa relative to total runsize

Relative to Recent 10yr Avg. Escapement

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

2019 Sockeye HOR/NOR Forecast

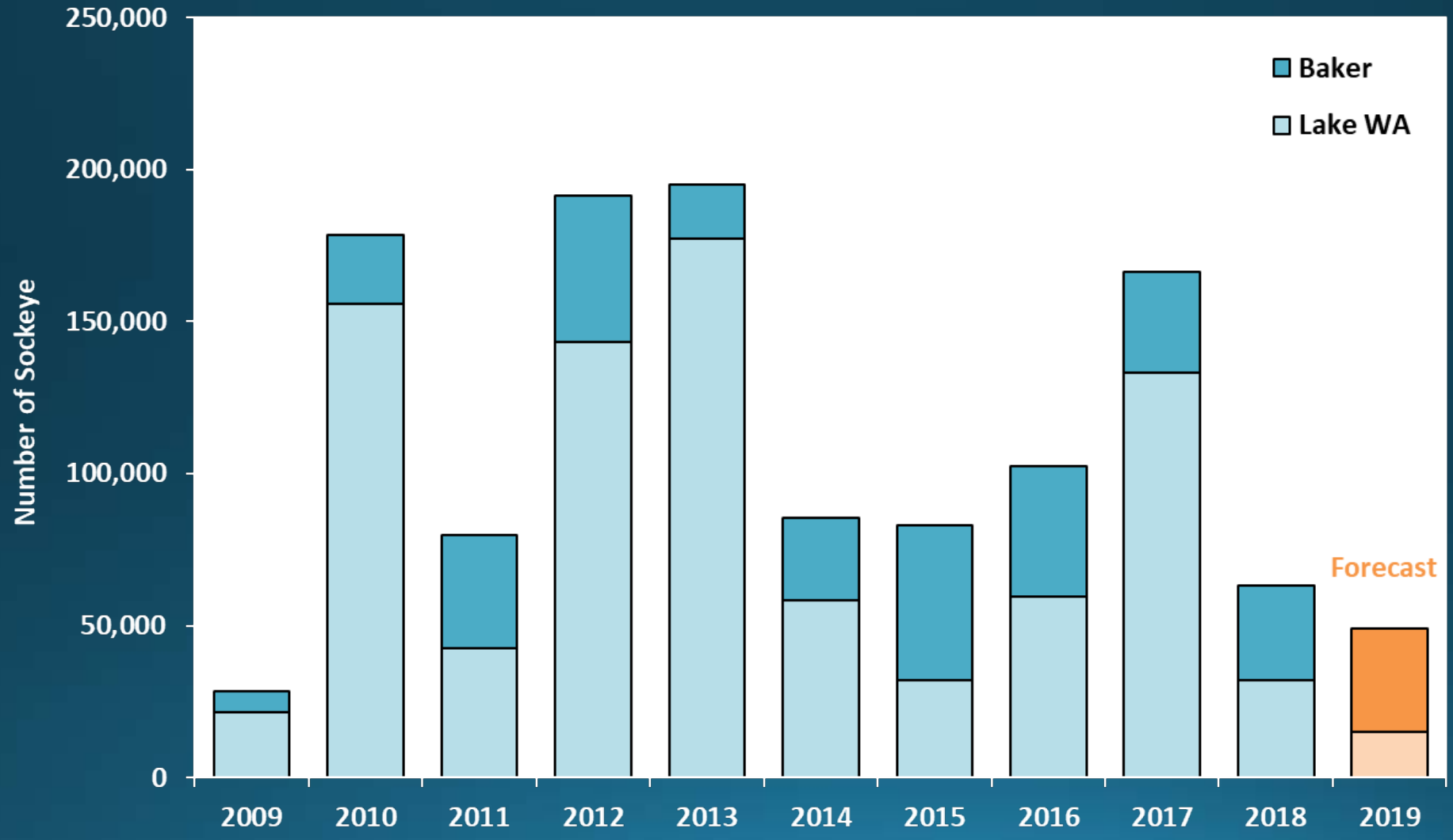
- Baker Lake – 34k
- Lake WA – 15k
- Columbia river - 93k

Relative to Recent 10yr Avg. Runsize

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

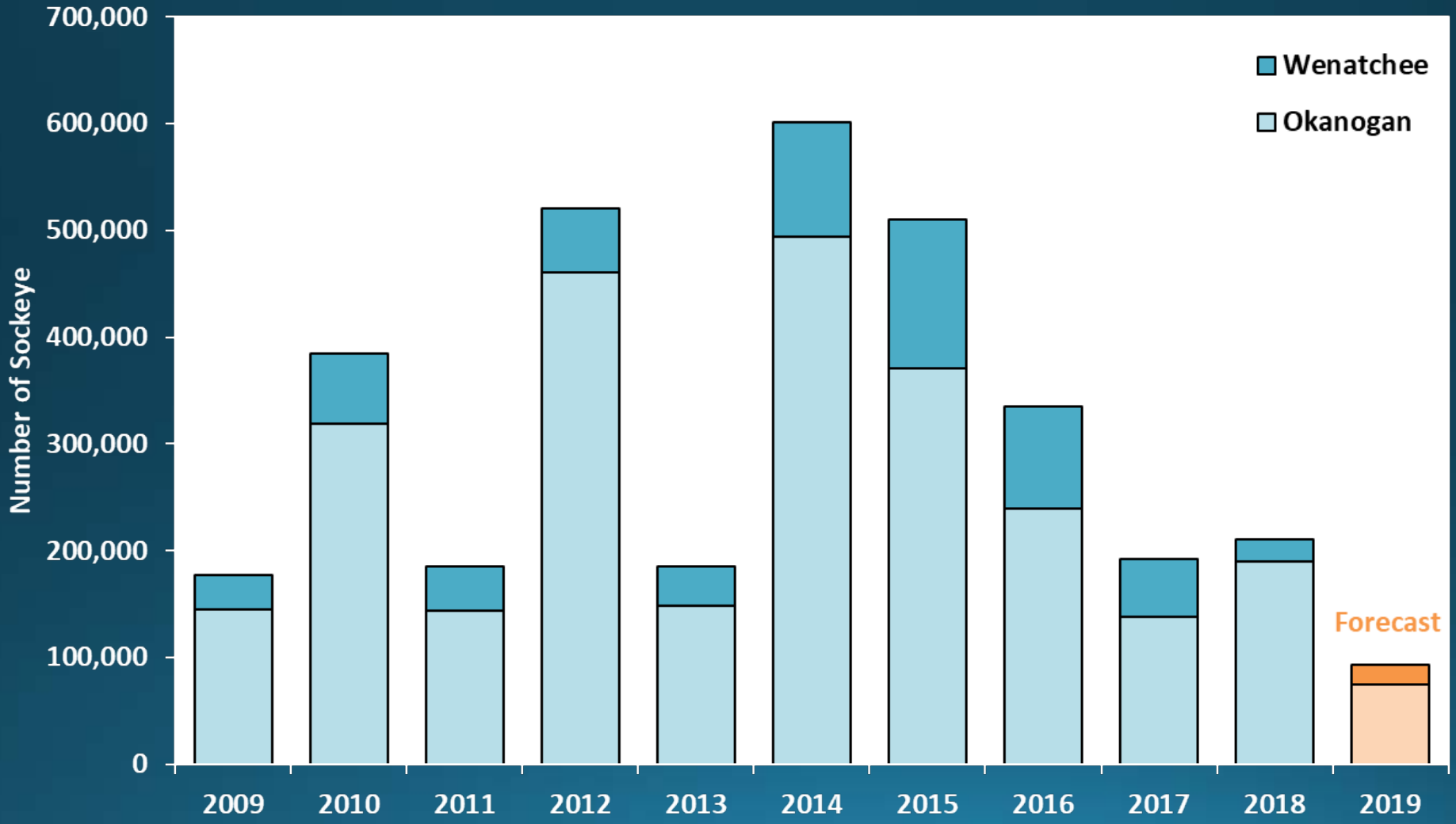
Puget Sound Sockeye Forecasts

Lake WA ⬇ 82% and Baker ⬆ 6% over recent 10 year avg.



Columbia Sockeye Forecasts

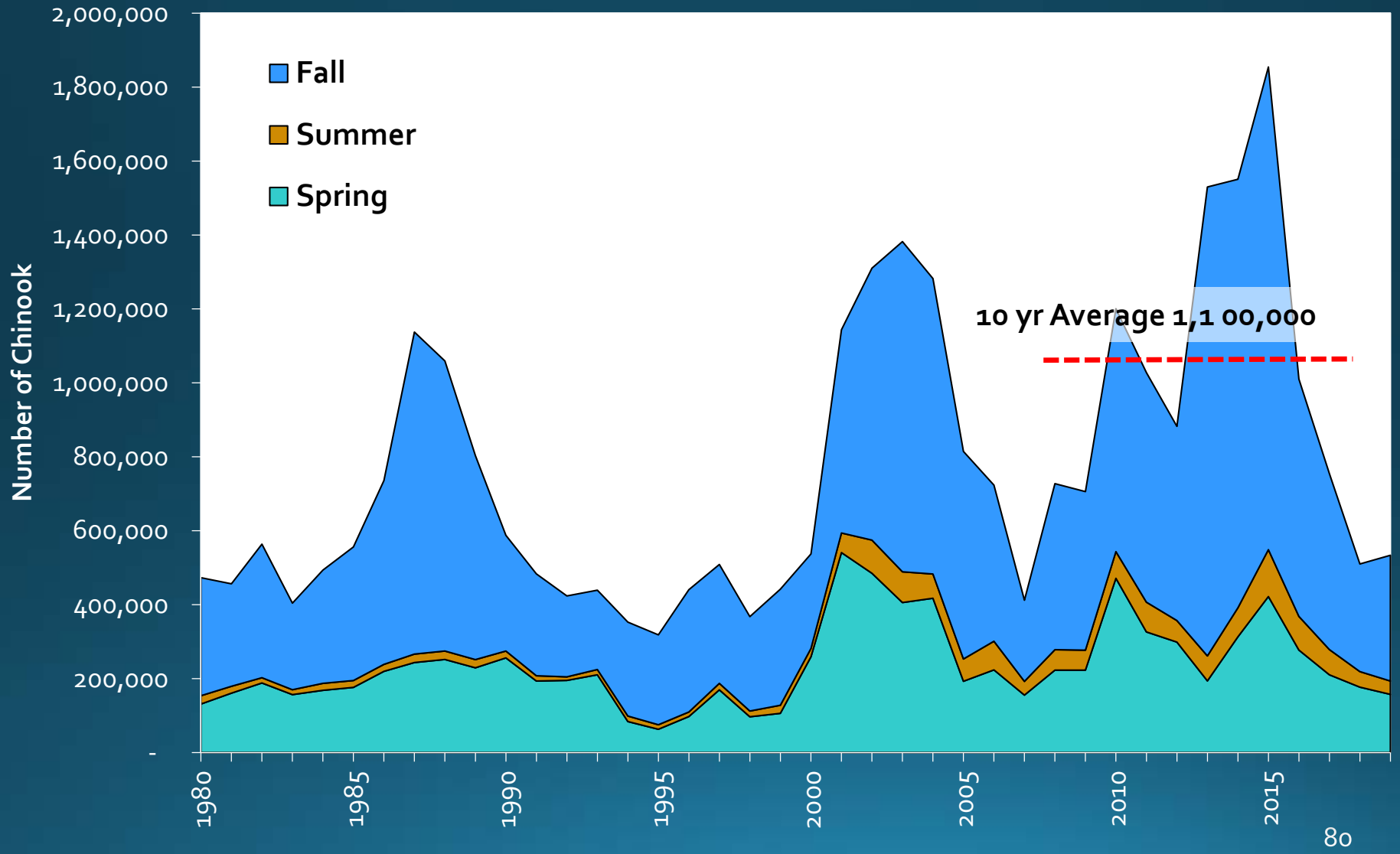
Lake Wenatchee ⬇ 72% and Okanogan ⬇ 72% over recent 10 year avg.



WA Columbia River Chinook and Coho 2018 Returns and 2019 Forecasts

Chinook Salmon

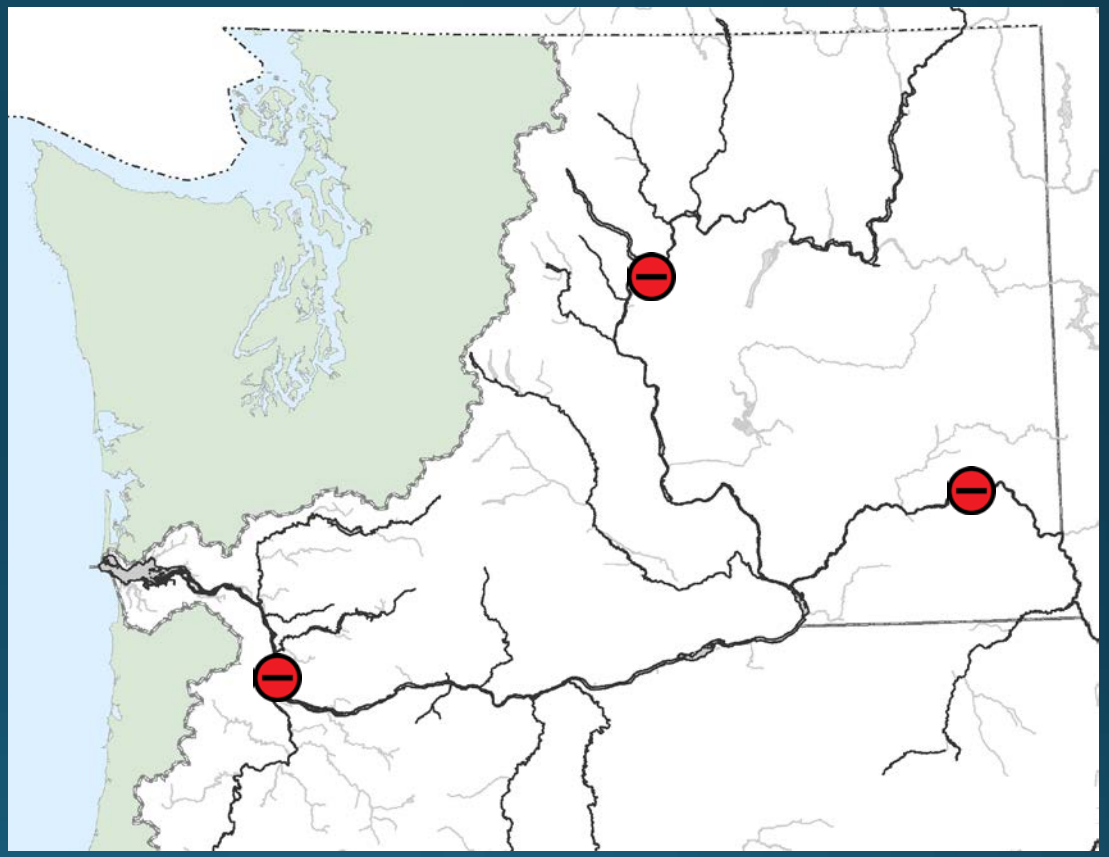
Chinook Historical Runsize – Columbia River



2018 Spring/Summer Chinook Returns

All returns are preliminary and returns range from

- Lower Spring – 62k (71%)
- Upriver Spring – 115k (56%)
- Summer – 42k (56%)



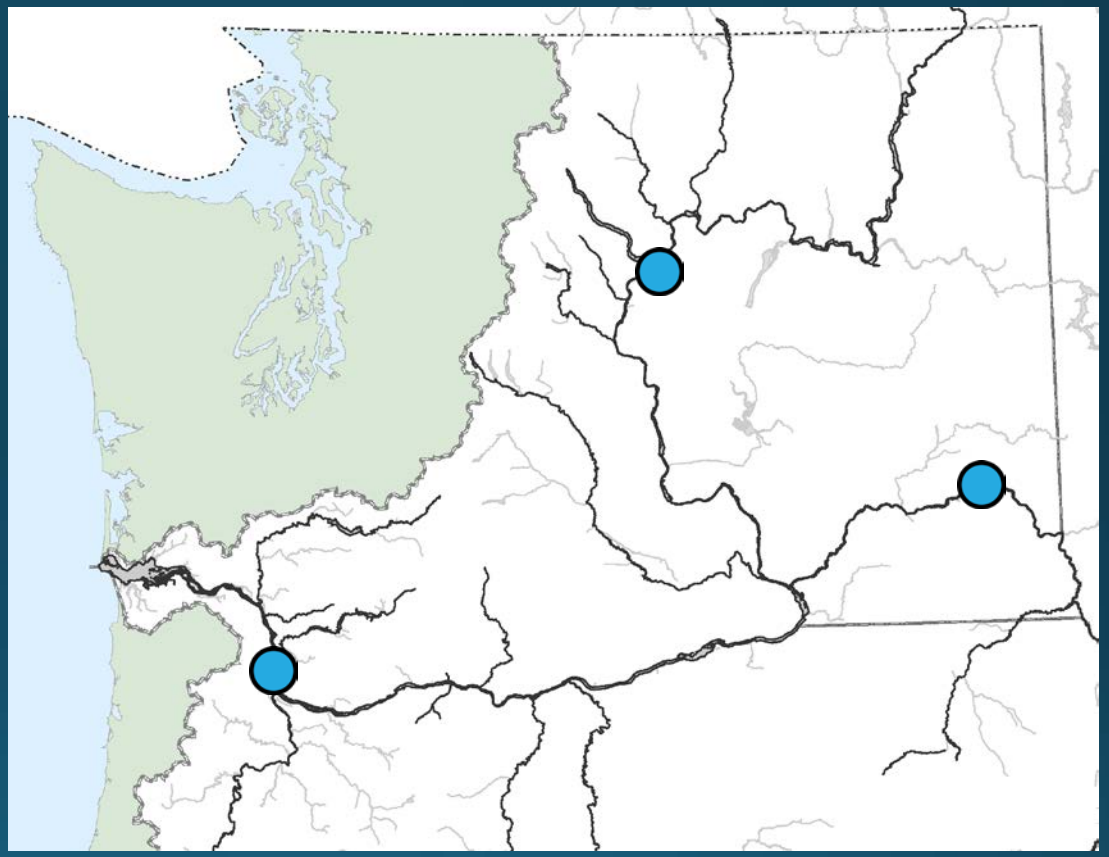
Relative to Recent 10yr Avg. Escapement

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

2019 Spring/Summer Chinook Forecasts

Forecasts in Columbia River range from

- Lower Spring – 58k (94%)
- Upriver Spring – 99k (86%)
- Summer – 36k (85%)



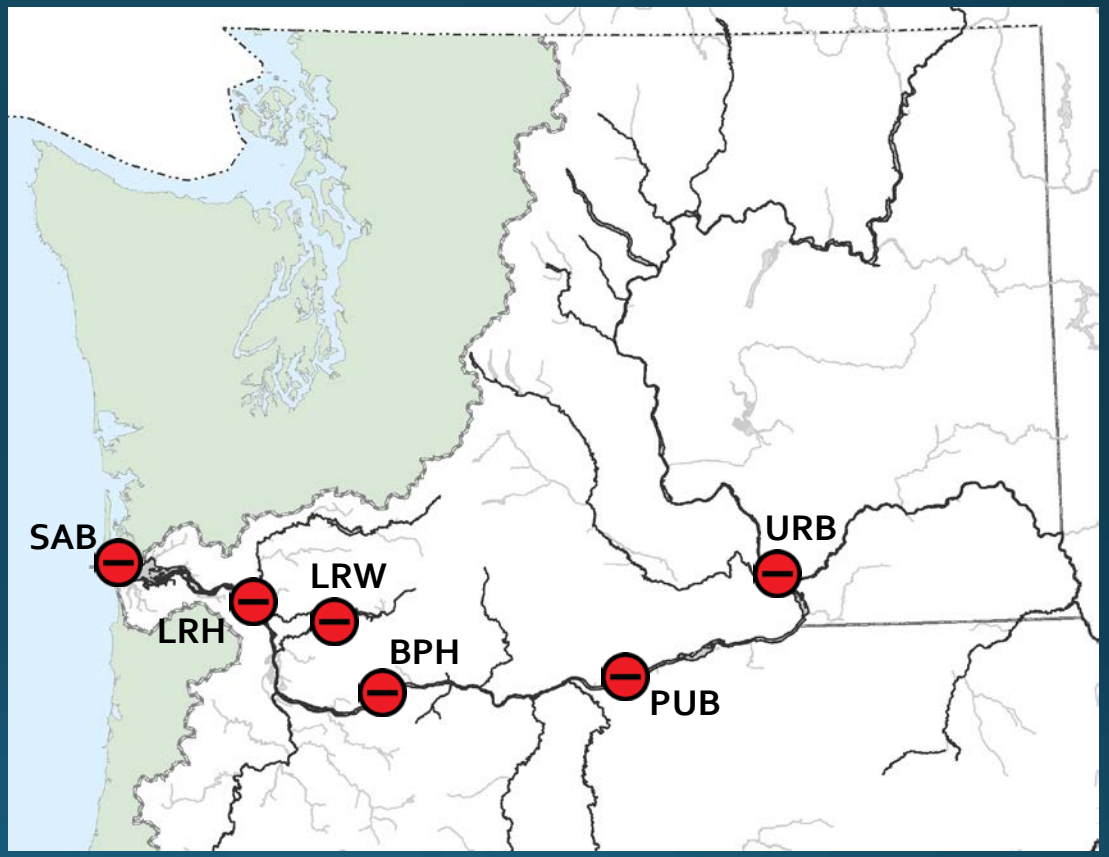
Relative to 2018 Runsize

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

2018 Fall Chinook Returns

All returns are preliminary and range from

- SAB (Select Area Bright) – 4.1k (33%)
- LRH (Lower River Hatchery) – 50k (55%)
- LRW (Lower River Wild) – 8.3k (53%)
- BPH (Bonneville Pool Hatchery) – 29k (33%)
- PUB (Pool Upriver Bright) – 36k (42%)
- URB (Upriver Bright) – 149k (34%)



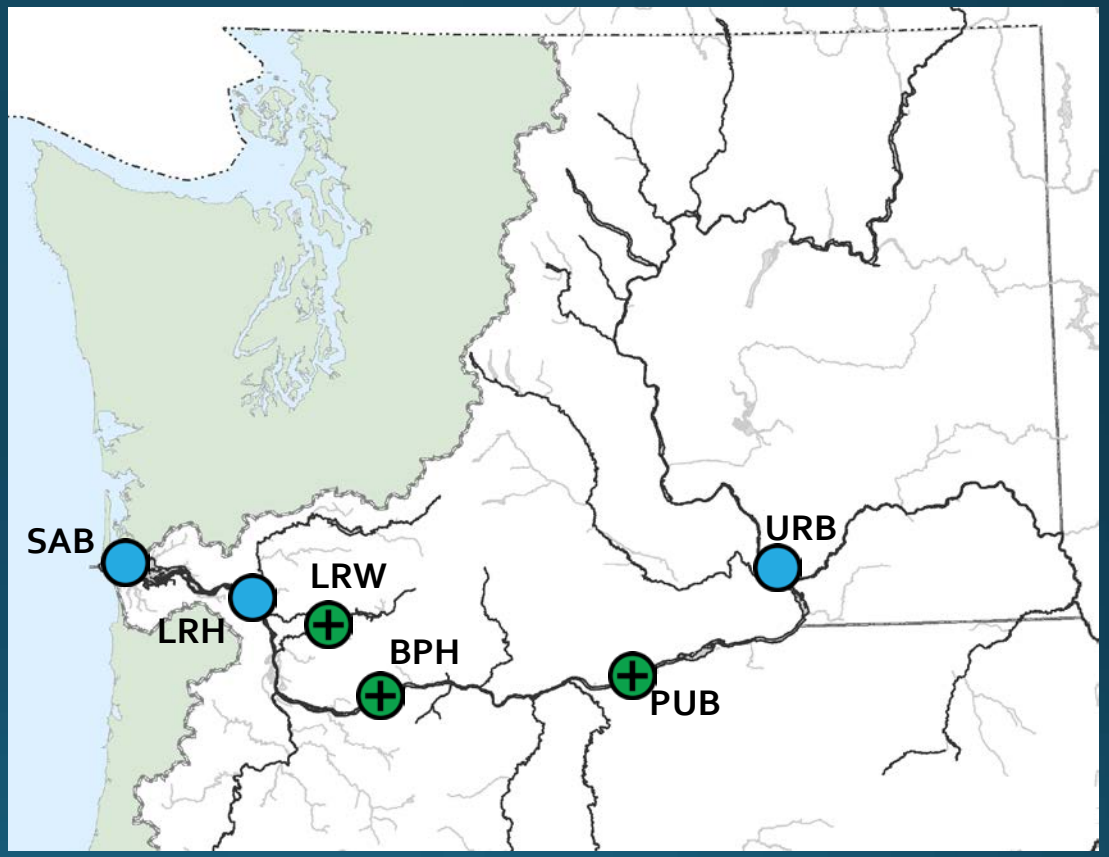
Relative to Recent 10yr Avg. Escapement

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

2019 Fall Chinook Forecasts

Forecasts in Columbia River range from

- SAB (Select Area Bright) – 3.1k (76%)
- LRH (Lower River Hatchery) – 54.5k (108%)
- LRW (Lower River Wild) – 13.7k (165%)
- BPH (Bonneville Pool Hatchery) – 46k (159%)
- PUB (Pool Upriver Bright) – 57k (158%)
- URB (Upriver Bright) – 158k (106%)

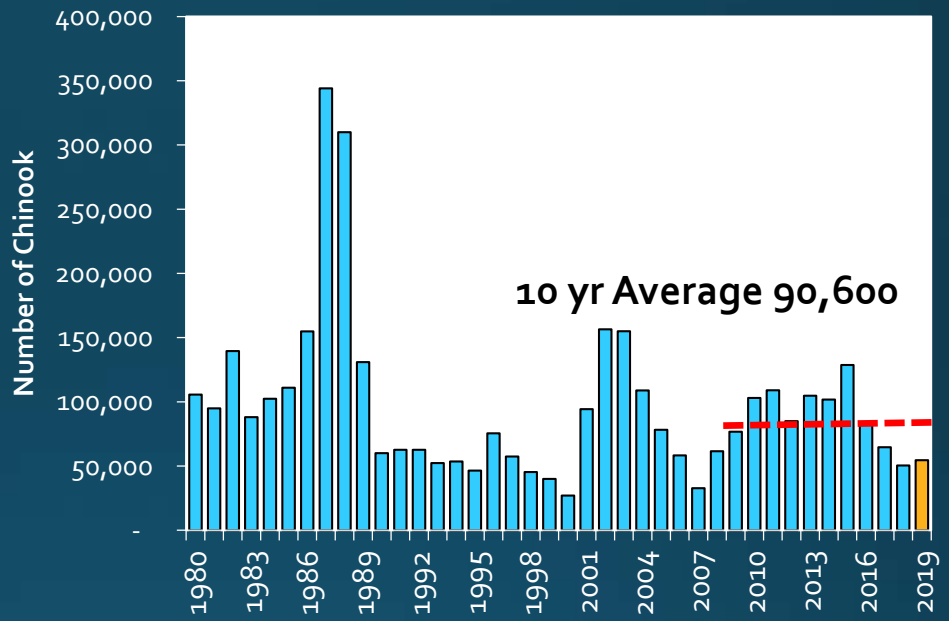


Relative to 2018 Runsize

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

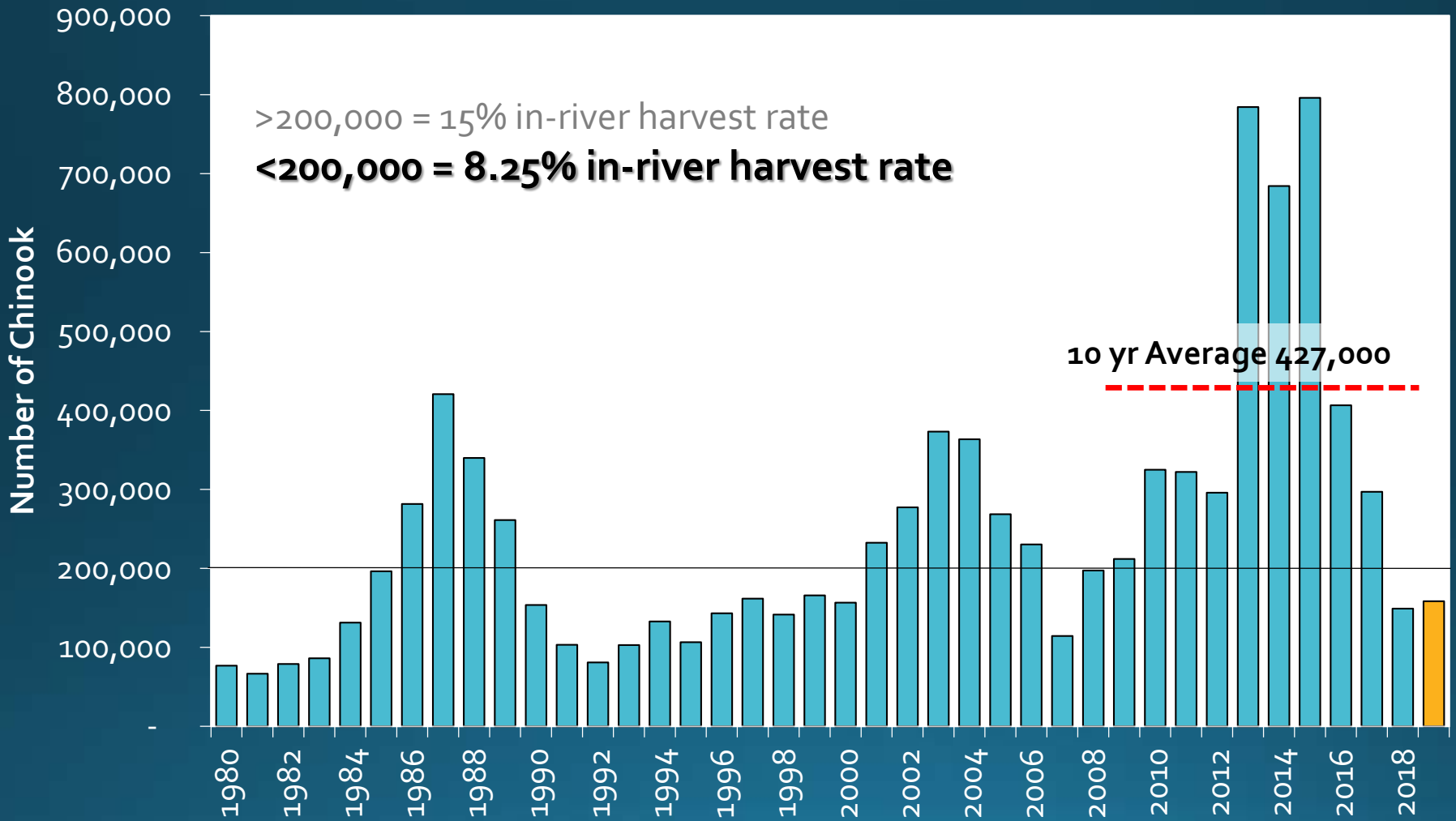
Lower Columbia River Tule Exploitation Rate (ER) Matrix

LRH Run Size	LCR Tule ER
<30,000	30%
30,000 – 40,000	35%
40,000 – 85,000	**38%**
>85,000	41%

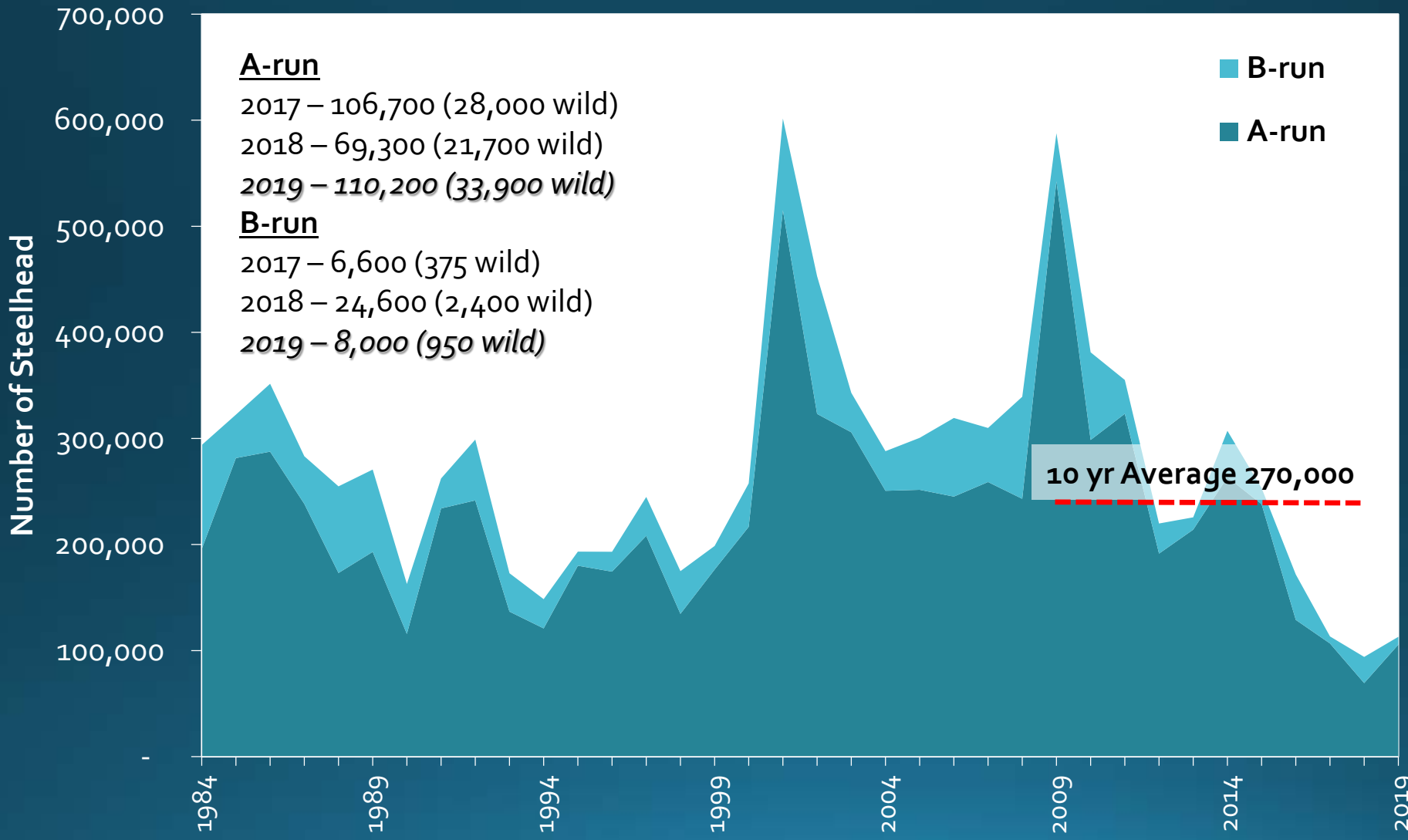


- LRH is down 40% compared to the previous 10 year return.
- 2018 LRH forecast of 54,500 will manage in ocean and in-river fisheries to not to exceed a 38% ER.

Chinook Historical Runsize – URB

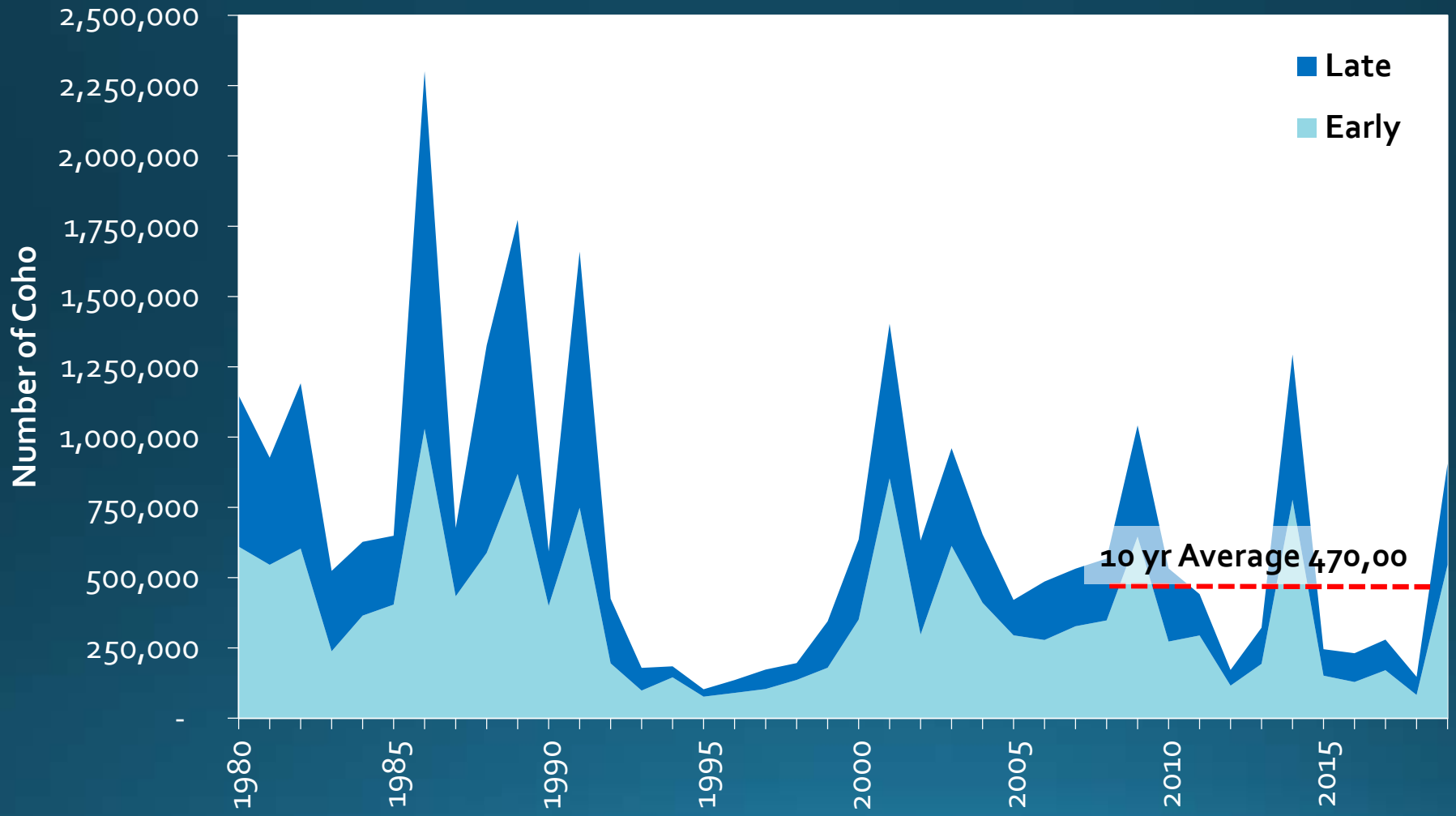


Upper Summer Steelhead



Coho

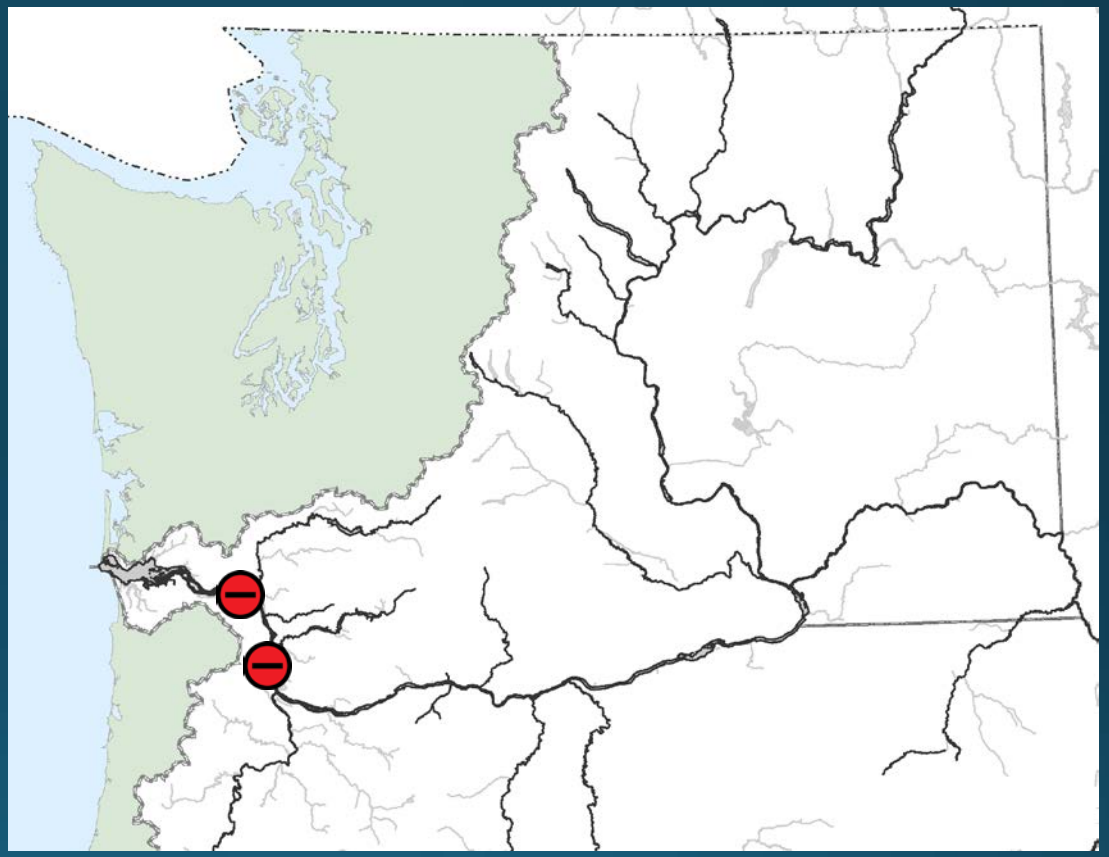
Coho Ocean Abundance – Columbia River



2018 Coho Returns

All returns are preliminary and returns range from

- Early – 83k (27%)
- Late –165k (32%)



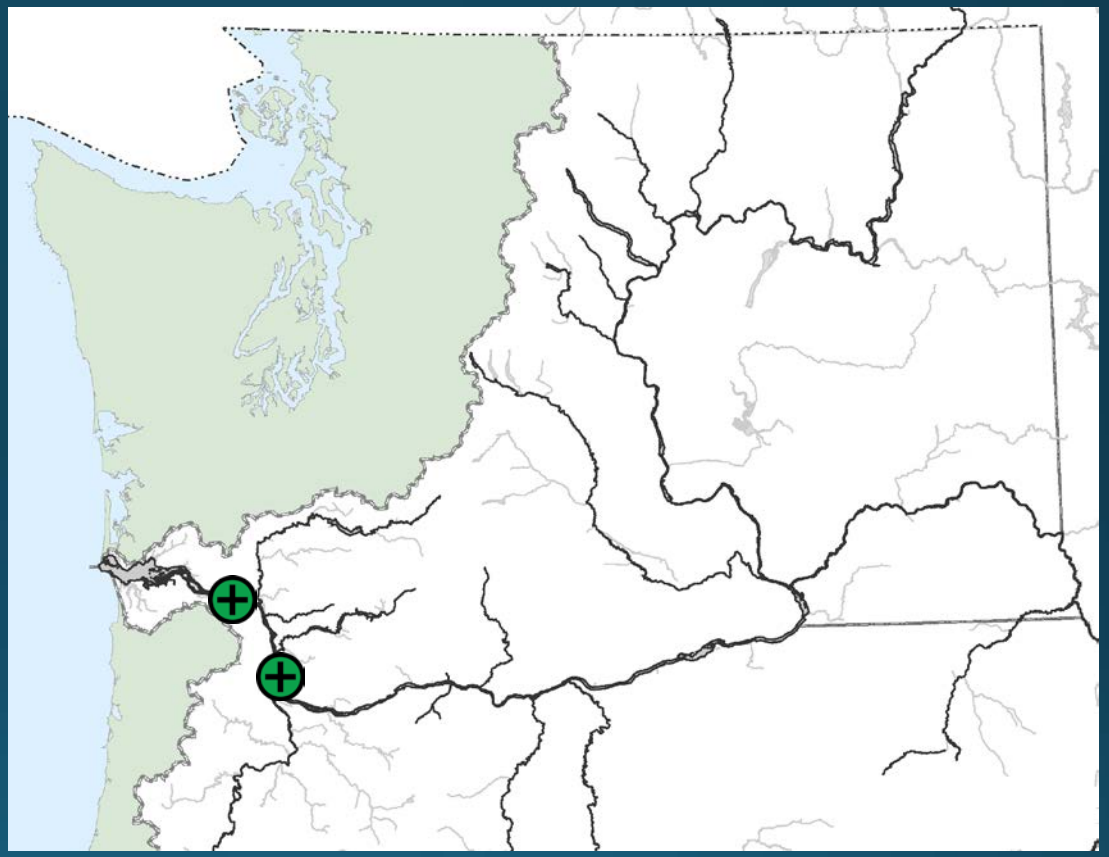
Relative to Recent 10yr Avg. Escapement

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

2019 Coho Forecasts

Forecasts in Columbia River range from

- Early – 545k (660%)
- Late – 360k (560%)



Relative to Recent 2018 Runsize

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

Lower Columbia Natural Coho Exploitation Rate (ER) Matrix

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%

- Marine survival index is 0.27% (high).
- Normal seeding, exceeds 30% on index sites.
- Exploitation rate for 2019 is 23%.

Questions?

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	Preseason Abundance Forecasts					
	2014	2015	2016	2017	2018	2019
Sacramento River						
Fall (Sacramento Index)	634.7	652.0	299.6	230.7	229.4	379.6
Winter (age-3 absent fishing)	--	--	--	--	1.6	1.9
Klamath River (Ocean Abundance)						
Fall	299.3	423.8	142.2	54.2	359.2	274.2
Oregon Coast						
North and South/Local Migrating	--	--	--	--	--	--
Columbia River (Ocean Escapement)						
Upriver Spring [a/]	227.0	232.5	188.8	160.4	166.7	99.3
Willamette Spring	58.7	55.4	68.7	38.1	53.8	40.2
Sandy Spring	5.5	5.5	NA	3.6	5.3	5.5
Cowlitz Spring	7.8	11.2	25.1	17.1	5.2	1.3
Kalama Spring	0.5	1.9	4.9	3.1	1.5	1.4
Lewis Spring	1.1	1.1	1.0	0.7	3.7	1.5
Upriver Summer [b/]	67.5	73.0	93.3	63.1	67.3	35.9
URB Fall	973.3	500.3	589.0	260.0	200.1	158.4
SCH Fall	115.1	160.5	89.6	158.4	50.1	46.0
LRW Fall	34.2	18.9	22.2	12.5	7.6	13.7
LRH Fall	110.0	94.9	133.7	92.4	62.4	54.5
MCB Fall	360.1	113.3	101.0	45.6	36.4	56.7

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		Preseason Abundance Forecasts					
		2014	2015	2016	2017	2018	2019
Washington Coast							
Willapa Bay Fall	Natural	2.9	3.8	3.3	4.2	3.8	4.3
	Hatchery	29.5	31.0	36.2	34.3	40.3	23.8
Quinault Spring/Summer	Natural	NA					
Grays Harbor Fall	Natural	--	--	--	--	16.4	NA
	Hatchery	--	--	--	--	4.8	NA
Quinault Spring/Summer	Natural	NA	NA	NA	NA	NA	NA
	Hatchery	--	--	--	--	4.8	NA
Quinault Fall	Natural	6.0	8.1	5.5	5.9	5.2	3.7
	Hatchery	10.3	4.0	5.3	4.4	3.1	2.7
Queets Spring/Sum	Natural	0.5	0.4	0.5	0.5	0.5	NA
Queets Fall	Natural	3.6	4.3	4.9	3.7	3.3	NA
	Hatchery	0.9	1.5	1.7	0.9	0.6	0.5
Hoh Spring/Summer	Natural	0.9	0.8	0.9	1.0	1.1	1.0
Hoh Fall	Natural	2.5	2.6	1.8	2.7	2.6	2.5
Quillayute Spring	Hatchery	2.0	1.7	1.8	2.2	2.1	2.1
Quillayute Sum/Fall	Natural	7.6	8.5	7.5	7.6	8.0	7.9
Hoko[c/]	Natural	2.7	3.3	2.9	1.5	1.5	2.8
North Coast Totals							
Spring/Summer	*Natural*	*1.4*	*1.2*	*1.4*	*1.5*	*1.6*	*1.7*
Fall	*Natural*	*19.7*	*23.5*	*19.7*	*19.9*	*19.1*	*16.5*
Spring/Summer	*Hatchery*	*2.0*	*1.7*	*1.8*	*2.2*	*2.1*	*2.1*
Fall	*Hatchery*	*11.2*	*5.5*	*7.0*	*5.3*	*3.7*	*3.2*

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		Preseason Abundance Forecasts					
		2014	2015	2016	2017	2018	2019
Puget Sound summer/fall[d/]							
Nooksack/Samish	Hatchery	43.9	38.6	27.9	21.2	24.6	21.3
East Sound Bay	Hatchery	1.2	1.2	0.7	0.8	0.7	0.3
Skagit[e/]	Natural	18.0	11.8	15.1	15.8	13.3	13.6
	Hatchery	0.3	0.6	0.4	0.4	0.3	0.3
Stillaguamish[f/]	Natural	1.6	0.5	0.5	1.5	1.6	0.9
Snohomish[f/]	Natural	5.3	4.2	3.3	3.4	3.5	3.7
	Hatchery	5.4	3.3	5.0	4.8	6.5	7.2
Tulalip[f/]	Hatchery	4.7	1.3	1.4	5.3	7.5	12.7
South Puget Sound	Natural	4.8	3.8	4.5	4.7	4.8	8.4
	Hatchery	96.7	62.4	43.1	80.4	123.6	99.9
Hood Canal[e/]	Natural	3.5	3.1	2.3	2.5	3.9	1.2
	Hatchery	80.6	59	42.7	48.3	57.6	66.0
Strait of Juan de Fuca Including Dungeness spring run[e/]	Natural	3.8	4.9	3.7	3.1	6.0	8.3

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, forecasts are for Puget Sound run size (4B) available to U.S. net fisheries. Does not

e/ Terminal run forecast.

f/ Includes a mixture of runsize types including escapement without fishing and terminal run. 2019 values are escapement w/out fishing for Tulalip and Snohomish natural, and terminal runsize for Stillaguamish and Snohomish hatchery.

https://www.pcouncil.org/salmon/stock-assessment-and-fishery-evaluation-safe-documents/preseason-reports/

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		Preseason Ocean Abundance Forecasts 2014	2015	2016	2017	2018	2019
OPI Area Total Abundance (California, Oregon Coasts, and Columbia River)		1,213.7	1,015.0	549.2	496.2	349.0	1,009.6
OPI Public	Hatchery	983.1	808.4	396.5	394.3	294.1	933.5
Columbia River Early		526.6	515.2	153.7	231.7	164.7	545.0
Columbia River Late		437.5	261.8	226.9	154.6	121.5	360.6
Coastal N. of Cape Blanco		4.8	6.9	5.5	3.5	3.3	12.0
Coastal S. of Cape Blanco		14.2	24.4	10.4	4.5	4.6	15.9
Lower Columbia River	Natural	33.4	35.9	40.0	30.1	21.9	36.9
Oregon Coast (OCN)	Natural	230.6	206.6	152.7	101.9	54.9	76.1
Washington Coast							
Willapa	Natural	58.9	42.9	39.5	36.7	20.6	63.4
	Hatchery	41.0	57.7	28.1	55.0	44.5	94.0
Grays Harbor	Natural	108.8	142.6	35.7	50.0	42.4	71.5
	Hatchery	65.4	46.6	22.9	36.4	51.4	64.3
Quinault	Natural	25.0	44.2	17.1	26.3	25.4	13.9
	Hatchery	24.7	24.9	19.8	29.4	29.6	26.9
Queets	Natural	10.3	7.5	3.5	6.5	7.0	11.1
	Hatchery	15.7	11.3	4.5	13.7	10.8	13.2
Hoh	Natural	8.9	5.1	2.1	6.2	5.8	7.0

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		Preseason Ocean Abundance Forecasts 2014	2015	2016	2017	2018	2019
Quillayute Fall	Natural	18.4	10.5	4.5	15.8	10.6	14.7
	Hatchery	12.6	8.0	6.4	17.6	16.5	17.0
Quillayute Summer	Natural	2.0	1.2	0.3	1.5	2.7	1.2
	Hatchery	3.2	2.2	1.4	3.4	3.3	3.4
North Coast Independent Tributaries	Natural	15.2	11.7	1.9	6.5	4.1	8.1
	Hatchery	11.6	11.9	2.5	0.2	7.9	12.5
WA Coast Total	*Natural*	*247.5*	*265.6*	*104.6*	*149.5*	*118.7*	*191.0*
	Hatchery	*174.2*	*162.6*	*85.6*	*155.6*	*164.1*	*231.3*
Puget Sound							
Strait of Juan de Fuca	Natural	12.5	11.1	4.4	13.1	7.2	8.8
	Hatchery	17.3	11.1	3.9	15.4	10.6	16.8
Nooksack-Samish	Natural	20.8	28.1	9.0	13.2	20.6	25.1
	Hatchery	61.7	50.8	28.8	45.6	61.3	59.8
Skagit	Natural	112.4	121.4	8.9	11.2	59.2	57.9
	Hatchery	15.8	19.5	4.9	7.6	13.1	9.9
Stillaguamish	Natural	32.5	31.3	2.8	7.6	19.0	23.8
	Hatchery	6.0	0.0	0.0	1.5	0.0	2.2
Snohomish	Natural	150.0	151.5	20.6	107.3	65.9	62.6
	Hatchery	78.2	53.9	16.7	62.0	38.3	43.7
South Sound	Natural	62.8	63.0	9.9	20.2	15.0	30.4
	Hatchery	150.7	180.2	27.1	102.4	103.0	180.4
Hood Canal	Natural	82.8	61.5	35.3	115.6	59.5	40.1
	Hatchery	47.6	108.4	83.5	74.9	84.5	87.9
Puget Sound Total	*Natural*	*473.8*	*467.9*	*91.0*	*288.3*	*246.4*	*248.8*
	Hatchery	*377.3*	*423.9*	*165.0*	*309.3*	*310.8*	*400.7*

2019 Puget Sound Summer/Fall Chinook Preseason Forecasts (exludes age 2 fish)

Region	Watershed	Notes	Forecast Type	Hatchery	Supplmt	Wild	Total	Comp Chinook Management Criteria RER[1]	Comp Chinook Management Criteria Low Abundance Thresholds[2 3]
Strait	Hoko		Escape w/o fishing	896		1,734	2,630		
	Dungeness		Terminal	657		282	939		
	Elwha		Terminal	7,066		333	7,399		
	Morse Creek		0	0			0		
	Region total			***8,619***		***2,349***	**10,968**		
North Sound	Glenwood Springs		Terminal	321			321		
	Nooksack/Samish		Terminal	21,300			21,300		
	Skagit		Terminal	309		13,825	14,134		
	Stillaguamish		Terminal run w/ fishing	566		378	944		
	Snohomish		Escapement w/o fishing	7,225		3,696	10,921		
	Tulalip		Escapement w/o fishing	12,745			12,745		
	Region total			***42,466***	***0***	***17,899***	***60,365***		
Upper South Sound	Lake Washington								
	Issaquah		Terminal	4,266			4,266		
	Cedar		Terminal			955	955		
	Sammamish		Terminal			108	108		
	Subregion total			***4,266***		***1,063***	***5,329***		
	Green River								
	Soos Creek Hatchery		Terminal	20,423			20,423		
	Icy Creek		Terminal	537			537		
	Mainstem/Newaukum		Terminal			4,833	4,833		
	Subregion total			***20,961***		***4,833***	***25,794***		
	Grovers		Terminal	2,880			2,880		
	East Kitsap (Gorst, Dogfish)		Terminal	7,705			7,705		
	Subregion total			***10,585***			***10,585***		
	Puyallup River		Terminal	13,007		1,724	14,731		
	Upper South Sound Total			***48,819***		***7,620***	***56,439***		

Management Objectives TBD

2019 Puget Sound Summer/Fall Chinook Preseason Forecasts (continued)

Region	Watershed	Notes	Hatchery	Supplmt	Wild	Total	Comp Chinook Management Criteria RER[1]	Comp Chinook Management Criteria Low Abundance Thresholds[3]
Lower South Sound	Carr Inlet	Terminal	13,693			13,693		
	Deschutes	Terminal	16,730			16,730		
	Nisqually	Terminal	20,223		824	21,047		
	Chambers	Terminal	421			421		
	Lower South Sound Total		***51,067***		***824***	***51,891***		
	South Sound Total		**99,886**	**0**	**8,444**	**108,330**		
Hood Canal	Skokomish w/George Adams	Terminal	37,160		520	37,680		
	12B Naturals	Terminal			285	285		
	12C/12H/12D	Terminal	28,911		298	29,209		
	Hood Canal Total		**66,071**	**0**	**1,103**	**67,174**		
	Puget Sound Total		**217,042**	**0**	**29,796**	**246,837**		

Management Objectives TBD

Footnotes

1. RER = Recovery Exploitation Rate (interim management ceiling during recovery phase).
2. Level of spawning abundance that triggers additional management action.
3. Threshhold expressed as natural origin spawners

Puget Sound Spring Chinook 2019 Preseason Forecasts

Notes	Forecast Type	Hatchery	Supplmt	Wild	Total	RER	Low Abundance Thresholds
Nooksack River							
North Fork	Terminal	2,674	1,260	171	**4,105**		
South Fork	Terminal	3,134		77	**3,211**		
Skagit River	Terminal	4,113		2,003	**6,116**		
White River							
Minter Creek	Terminal	1,469			**1,469**		
White River Hatchery	Terminal	154			**154**		
Buckley Trap	Terminal		1,553	573	**2,126**		
Total White River Springs					**3,749**		
Total		**11,544**	**2,813**	**2,824**	**17,181**		

Management Objectives TBD

Washington Coast 2019 Chinook Preseason Forecasts

	Forecast Type	Hatchery	Wild	Total	Natural Escapement Goal
North Coast					
Quillayute River					
Spring	Terminal	2,091		***2,091***	200
Summer	Terminal		1,301	***1,301***	1,200
Fall	Terminal		6,645	***6,645***	> of 3,000 or 60% of run
Hoh					
Spring/Summer	Terminal		1,023	***1,023***	>of 900 or 69% of RS
Fall	Terminal		2,536	***2,536***	>of 1,200 or 60% of RS
Queets					
Spring/Summer	Terminal	-	-		>of 700 or 70% of RS
Fall	Terminal	484	2,292	**2,776**	>of 2,500 or 60% of RS
Quinault					
Fall	Terminal	2,713	3,700	***6,413***	
North Coast totals Summer/Falls:		***3,197***	***16,474***	***19,671***	
Spring/Summers:		***2,091***	***1,023***	***3,114***	22,785
Grays Harbor					
Chehalis springs	Terminal		581	*581*	1,400
Chehalis falls	Terminal	2,390	17,781	*20,171*	9,753
Humptulips falls	Terminal	2,467	6,207	*8,674*	3,573
Subregion Falls Total		***4,857***	***23,988***	***28,845***	
Willapa Bay - Fall Chinook	**Terminal**	***23,806***	***4,309***	***28,115***	
Coast total		**33,951**	**46,375**	**80,326**	

2018 and 2019 Washington Coho Forecast Summary[1]

Last updated: 02/22/19

Production unit	2018 Hatchery	2019 Hatchery	2018 Wild	2019 Wild	2018 Total	2019 Total
Dungeness R	9,087	9,760	505	2,290	9,592	12,050
Elwha R	242	3,433	718	1,363	960	4,796
Eastern Strait (excl. Dung, Elwha)			800	2,301	800	2,301
Western Strait			6,368	6,499	6,368	6,499
West/East sub-total excl. Dung, Elwha			**7,168**	**8,800**	7,168	8,800
West/East Strait sub-total	**9,329**	**13,193**	**8,391**	**12,453**	**17,720**	**25,646**
Nooksack R	50,797	57,686	18,629	18,308	69,426	75,994
Lummi Ponds	10,459	2,104			10,459	2,104
7B net pens	0	0			0	0
Indian Slough Hatchery	0	0			0	0
Samish R			1,162	4,857	1,162	4,857
Misc 7&7A (incl. San Juans CoOps)			783	1,968	783	1,968
Nook/Samish R sub-total	**61,256**	**59,790**	**20,574**	**25,133**	**81,830**	**84,923**
Skagit R sub-total	**13,101**	**9,917**	**59,196**	**57,933**	**72,297**	**67,850**
Stillaguamish R sub-total	**0**	**2,234**	**18,950**	**23,820**	**18,950**	**26,054**
Snohomish R	7,092	7,709	65,925	62,600	73,017	70,309
Tulalip Bay	31,211	35,043			31,211	35,043
Area 8A Misc. Hatchery		899			0	899
Snohomish R sub-total	**38,303**	**43,651**	**65,925**	**62,600**	**104,228**	**106,251**
Lake Washington	12,984	10,790	2,018	2,770	15,002	13,560
Green River	48,032	68,680	3,320	3,001	51,352	71,681
Elliot Bay Net Pens		23,797			0	23,797
Misc. Area 10,11,10E		14,637	1,429	3,136	1,429	17,773
Puyallup R	17,985	32,220	4,964	9,349	22,949	41,569
Mid-Sound sub-total	**79,001**	**150,124**	**11,731**	**18,256**	**90,732**	**168,380**
Area 13A-K wild, exc. Deschutes			1,976	6,776	1,976	6,776
Area 13A Hatchery (Minter CR)	7,340	7,543			7,340	7,543
Nisqually R	952	10,298	1,268	4,816	2,220	15,114
Deschutes R			59	574	59	574
Area 13D net pens (Squaxin Island)	15,718	33,039			15,718	33,039
Deep South Sound sub-total	**24,010**	**50,880**	**3,303**	**12,166**	**27,313**	**63,046**
Mid+Deep South Sound sub-total	**103,011**	**201,004**	**15,034**	**30,422**	**118,045**	**231,426**
Area 9A (Port Gamble)	12,680	13,783	579	539	13,259	14,322
Area 12A - Quilcene R	49,605	52,237	995	800	50,600	53,037
Area 12A - Quilcene Net Pens		-		-	0	0
Area 12/12B		-	27,693	13,860	27,693	13,860
Area 12C/12D (exc. Skokomish R)		-	30,503	15,265	30,503	15,265
Skokomish R	20,690	20,510	1,334	11,015	22,024	31,525
Area 12/12B-12D/Skok. R sub-total	20,690	27,347	59,530	40,140	80,220	67,487
Hood Canal sub-total	**82,975**	**86,530**	**61,104**	**41,479**	**144,079**	**128,009**
Puget Sound Total	**307,975**	**416,319**	**249,174**	**253,840**	**557,149**	**670,159**
Willapa Bay	44,542	94,019	20,645	63,448	65,187	157,467
Grays Harbor	51,414	64,345	42,379	71,527	93,793	135,872
Quinault R	29,622	26,904	25,442	13,888	55,064	40,792
Queets R	10,814	13,175	6,964	11,100	17,778	24,275
North Coast Indept. Tribs					0	0
Hoh R			5,816	6,963	5,816	6,963
Quillayute R summer	3,313	3,428	2,743	1,181	6,056	4,609
Quillayute R fall	16,505	16,953	10,557	14,607	27,062	31,560
Coast total	**156,210**	**218,824**	**114,546**	**182,714**	**270,756**	**401,538**

Production unit	2018 Hatchery	2019 Hatchery	2018 Wild	2019 Wild	2018 Total	2019 Total
Columbia Hatch/WA Wild Early [2]	152,523	527,976	4,519	9,846	157,042	537,822
Columbia Hatch/WA Wild Late [2]	111,774	340,897	8,393	18,286	120,167	359,183
Columbia Oregon Wild [3]	-	-	8,990	8,814	8,990	8,814
Columbia total	**264,297**	**868,873**	**21,902**	**36,946**	**286,199**	**905,819**
Grand Total	**728,482**	**1,504,016**	**385,622**	**473,500**	**1,114,104**	**1,977,516**

Notes:

1) Ocean Age 3 (OA3) abundance

2) Columbia Early and Late Production Unit hatchery forecast categories include hatchery production from all states, Columbia Early and Late Wild Production Unit forecasts contain Washington-origin stocks only.

3) Oregon Wild Production Unit category is summarized separately from Columbia Early and Late categories because it is considered by ODFW to account for entire fall coho return on Oregon side of river.

CHUM, PINK, AND SOCKEYE SALMON
CO-MANAGER RUNSIZE FORECASTS FOR THE 2019 RETURN YEAR

CHUM - SUMMER

	HATCHERY	WILD	TOTAL	FORECAST METHOD
Puget Sound				
Central Sound		1,381	1,381	R/S
South Sound		27,039	27,039	R/S
Hood Canal*		10,315	10,315	Ocean indicator regression
Strait of Juan de Fuca		1,684	1,684	Ocean indicator regression
Puget Sound Total		**40,419**	**40,419**	

* Wild forecast includes supplementation returns.

CHUM - FALL

	HATCHERY	WILD	TOTAL	FORECAST METHOD
Puget Sound				
Nooksack/Samish	21,840	74,896	96,736	R/S
Skagit	282	11,454	11,736	Fry based
Stillaguamish	435	4,758	5,193	Fry based
Snohomish	7,487	4,583	12,070	Fry based
Central Sound	51,504	75,933	127,437	R/S
South Sound	30,217	232,954	263,171	R/S
Hood Canal	349,412	169,233	518,645	R/S
Strait of Juan de Fuca	481	366	847	PDO regression
Puget Sound Total	**461,658**	**574,177**	**1,035,835**	

CHUM - WINTER

	HATCHERY	WILD	TOTAL	FORECAST METHOD
Puget Sound				
South Sound	10,199	25,653	35,852	R/S Runsize>40K
Puget Sound Total	**10,199**	**25,653**	**35,852**	

CHUM - FALL

	HATCHERY	WILD	TOTAL	FORECAST METHOD
Coastal				
Grays Harbor		66,816	66,816	PDO model harvest adjustment
Willapa	822	51,383	52,205	R/S and PDO adjustment
Coastal Total	**822**	**118,199**	**119,021**	

PINK

	HATCHERY	WILD	TOTAL	FORECAST METHOD
Puget Sound				
Nooksack		24,476	24,476	Fry based
Skagit		114,769	114,769	Fry based
Stillaguamish		47,919	47,919	Fry based
Snohomish		128,362	128,362	Fry based
Green		141,130	141,130	Fry based
Puyallup		47,905	47,905	Fry based
Nisqually		25,380	25,380	Fry based
South Sound Misc.		143	143	R/S
Hood Canal	4,200	66,475	70,675	Fry and R/S Avg
Strait of Juan de Fuca	42	7,587	7,629	Ocean inicator regression
Puget Sound Total	**4,242**	**604,146**	**608,388**	

SOCKEYE

	HATCHERY	WILD	TOTAL	FORECAST METHOD
Puget Sound				
Baker River*		33,737	33,737	NPGO and sibling relationship
Lake Washington	9,340	5,813	15,153	Sibling relationships
Puget Sound Total			**48,890**	

* Forecast contains hatchery and wild production

SOCKEYE

	HATCHERY	WILD	TOTAL	FORECAST METHOD
Columbia River				
Wenatchee River		18,300	18,300	Adult-cohort relationships
Okanogan River		74,500	74,500	Adult-cohort relationships
Columbia River Total		**92,800**	**92,800**	

Fraser River Forecasts (from Fisheries and Oceans Canada)

Sockeye Salmon	4,795,000		p50
Pink Salmon	5,018,600		Fry based and salinity

2019 Salmon Season Setting
NORTH of FALCON

Washington Department of FISH and WILDLIFE

2019 Coastal Forecasts: Coho, Chinook, and Chum

Chinook

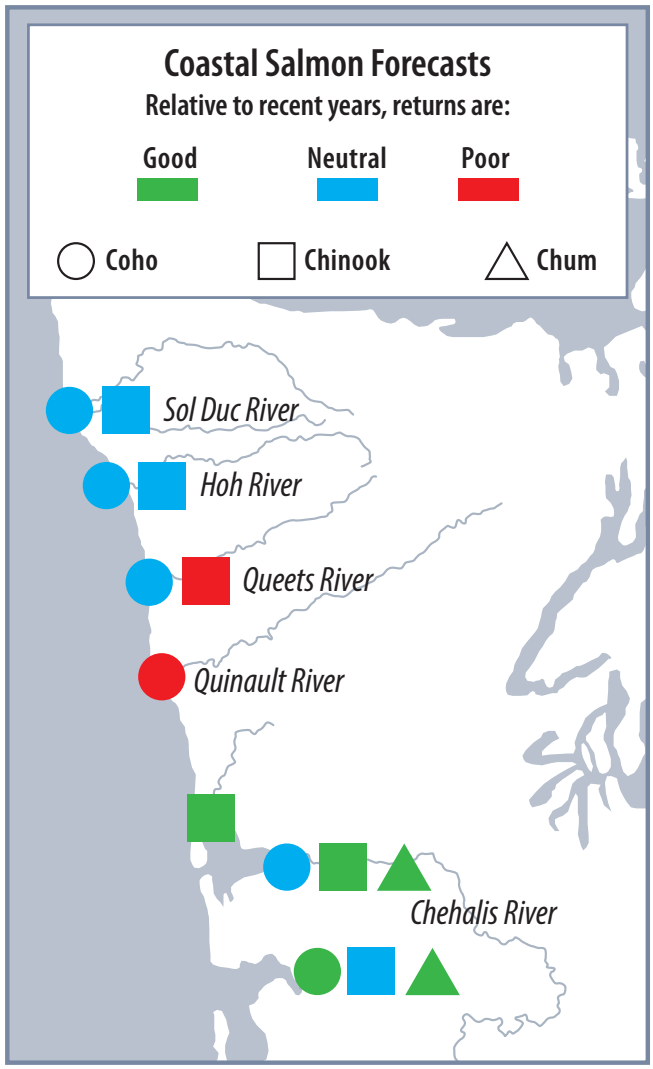
- The forecast for chinook returns to the coast is slightly above the most recent 10-year average. Chinook fisheries will likely be similar to those in 2018.

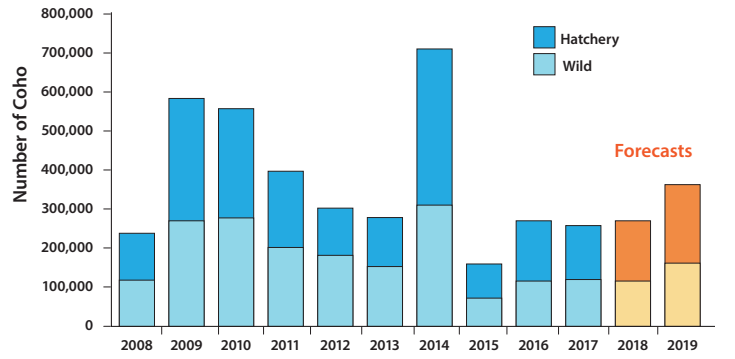
Coho

- Both hatchery and wild coho returns are projected to exceed forecasted returns for 2018.
- The number of coho returning to Grays Harbor is forecasted at 135,900 fish, up from 93,800 in 2018. Fishery managers expect coho fisheries in Grays Harbor will be more robust in 2019 than last year
- However, returns to the Quinault River and the Quillayute River (summer run) are expected to be lower than last year.

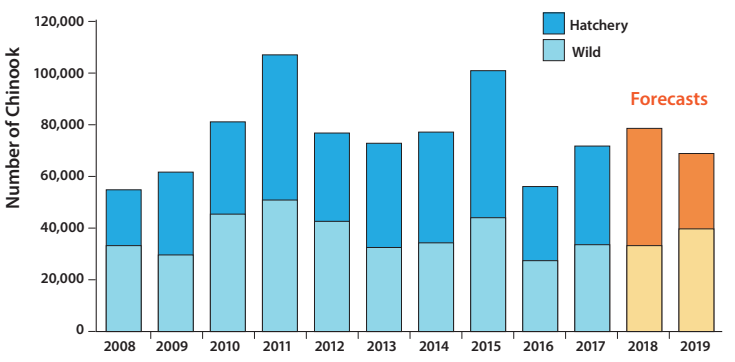
Chum

- The overall forecast for chum of 125,000 fish is up from a forecast of 101,100 chum last year, and should provide some good fishing opportunities.
- The projected return of chum to Grays Harbor is up 89 percent over the 10-year average, while the forecasted return to Willapa Bay is up 37 percent over the same timeframe.

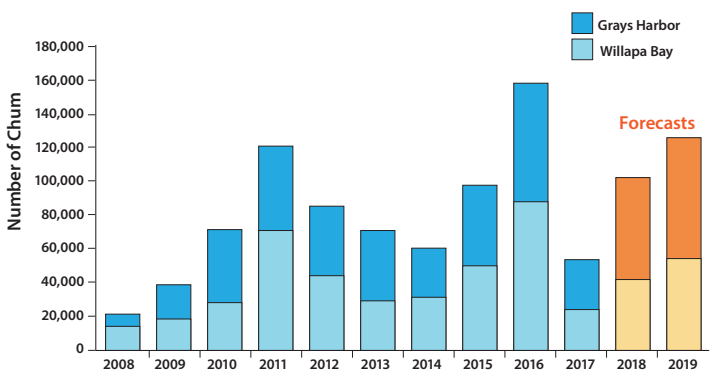




Coastal hatchery vs. wild coho forecasts and recent returns



Coastal hatchery vs. wild chinook forecasts and recent returns



Coastal hatchery vs. wild chum forecasts and recent returns

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26 FEBRUARY 2019