



2017 North of Falcon

Salmon Forecasts

2017 Forecast Meeting Schedule

9:00 – 9:30	<u>Introduction</u>		
	<ul style="list-style-type: none">• Welcome and Introduction• North of Falcon – Setting Salmon Fisheries in 2017		Kyle Adicks
9:30-10:00	<u>Habitat Presentation</u>		Jeff Davis
10:00 – 11:00	<u>Salmon Forecasts 2017</u>		
	<ul style="list-style-type: none">• 2017 Environmental Outlook• Columbia Salmon Stocks• Puget Sound and Coast Chinook, Coho, Pink, Chum, Sockeye Stocks• PFMC Salmon Technical Team Review		Marisa Litz Ron Roler Aaron Dufault Wendy Beeghley
11:00 - Noon	<u>Regional Discussion Sessions</u>		
	<ul style="list-style-type: none">• Puget Sound Recreational• Columbia River & Ocean• Coastal• Puget Sound Commercial	Room GA Aud. NRB 682 NRB 630 Room SLO 03	Mark, Ryan, Aaron Kyle(s), Wendy, Ron R Annette Kirt, Kendall, Kwasi, Marisa
Noon – 1:00 pm	Lunch Break		
1:00 – 3:00	<u>Regional Discussion Sessions Continued</u>		

2017 NOF Meeting Schedule

Date	Purpose	Time/Location
Feb. 28	NOF Forecast Meeting	9AM, Olympia
Mar. 7	Grays Harbor Advisory Group	6-8pm, Montesano City Hall
Mar. 14	Willapa Bay Advisory Group	6-8pm, Raymond High School Library
Mar. 15	N. Sound Rec. Fisheries	6-8pm, WDFW Mill Creek
Mar. 16	Puget Sound Rec. Fisheries Sequim	6-8pm, Trinity Methodist Church, Sequim
Mar. 17	NOF Public Meeting #1	9am-3pm, GA Auditorium, Olympia
Mar. 23	Willapa Bay Public Meeting	6-8pm, Raymond Elks
Mar. 24	Columbia R. and Ocean Fisheries Disc. Public Hearing on Ocean Salmon	9am-3pm, Vancouver Water Resources Center
Mar. 27	Mgmt Options	7pm, Chateau Westport
Mar. 28	Mid-Columbia R. Fisheries Disc.	6-8pm, Chelan PUD
Mar. 28	Grays Harbor Fisheries Discussion	6-8pm, Montesano City Hall
Mar. 29	Mid-Columbia/Snake Fisheries Disc.	6-8pm, Walla Walla Community College
Mar. 30	Columbia R. Fisheries Disc.	6-8pm, Benton PUD Auditorium
Mar. 30	Willapa Bay Fisheries Disc.	6-8pm, Raymond High School Library
Apr. 4	NOF #2	9:30-5pm, Lynnwood Embassy Suites
Apr. 5	Columbia R./Ocean Fisheries Disc.	9am-1pm, Office Building 2 Auditorium, Olympia
April 7-12	PFMC #2	Double Tree Sacramento

<http://wdfw.wa.gov/fishing/northfalcon/>

Handouts

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

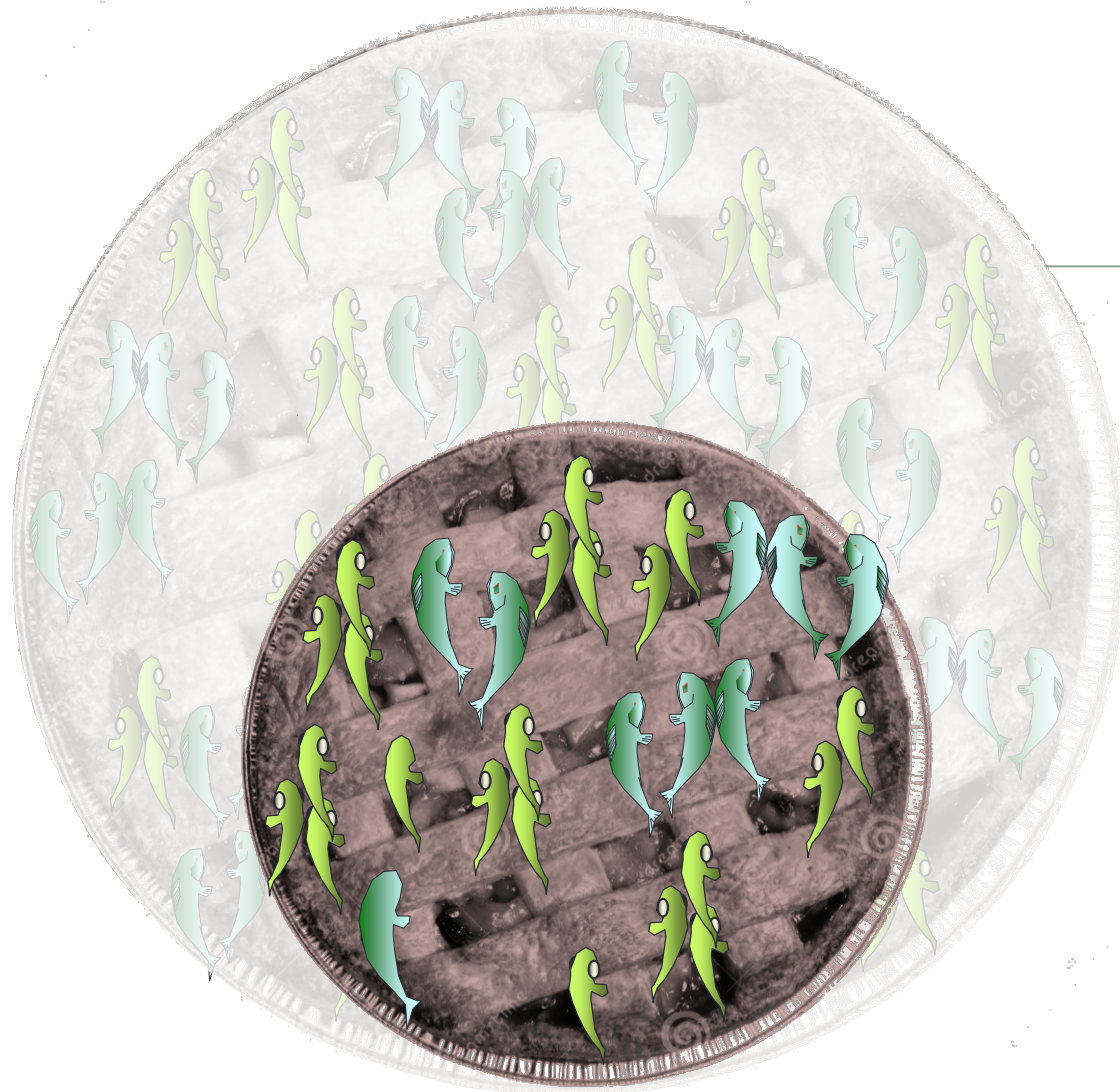


WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

Habitat Program

Jeff Davis | Assistant Director

Fishery is smaller



Decades ago

How do we get there – the critical “H”?

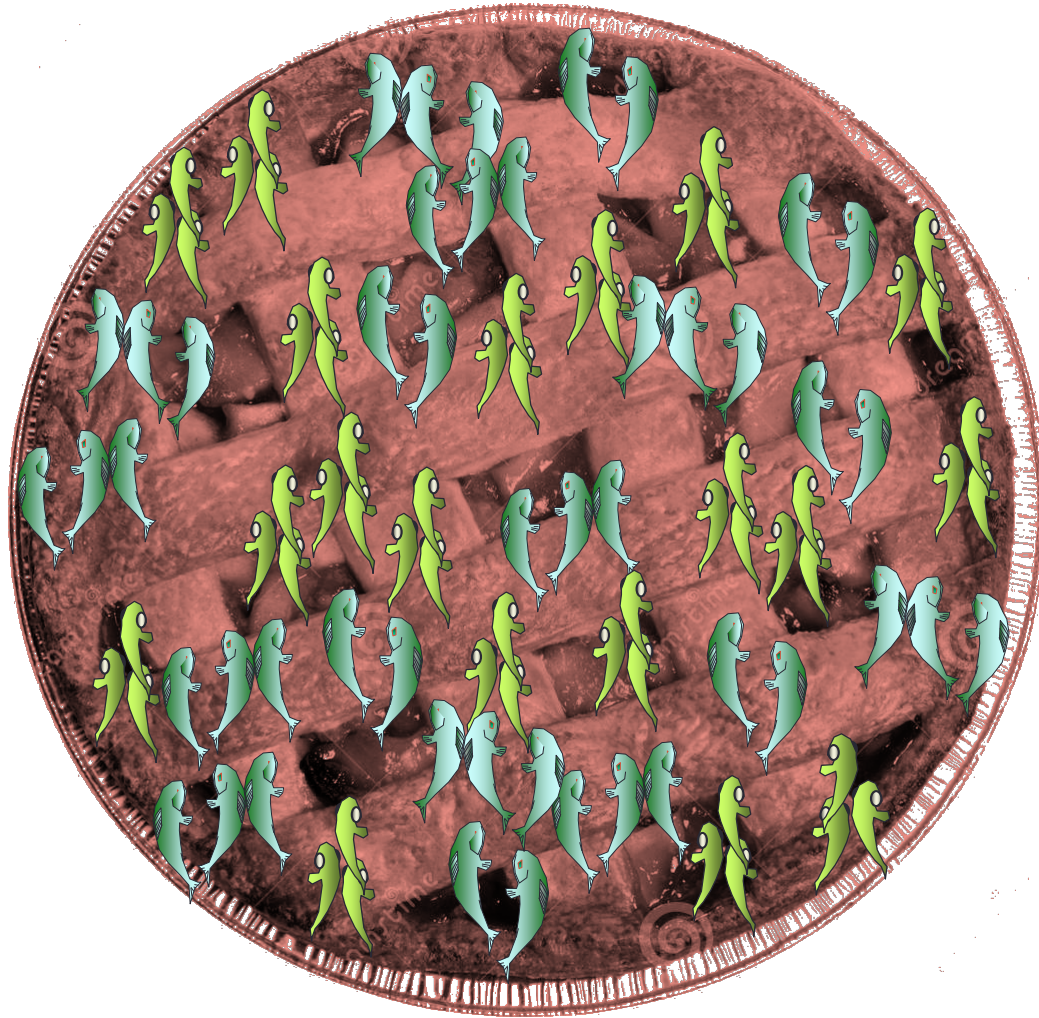
Protect existing habitat

+

Restore degraded habitat

Examples – HB 1428/SB 5466 and Capital Budget

What's the goal?



Making way for salmon



- <https://www.youtube.com/watch?v=X7z5anXzm0k>

Ocean Conditions in the NE Pacific from 2015-2017



*Washington
Department of*
**FISH and
WILDLIFE**

Marisa Litz and Aaron Dufault

Acknowledgements:
Laurie Weitkamp, NOAA Fisheries

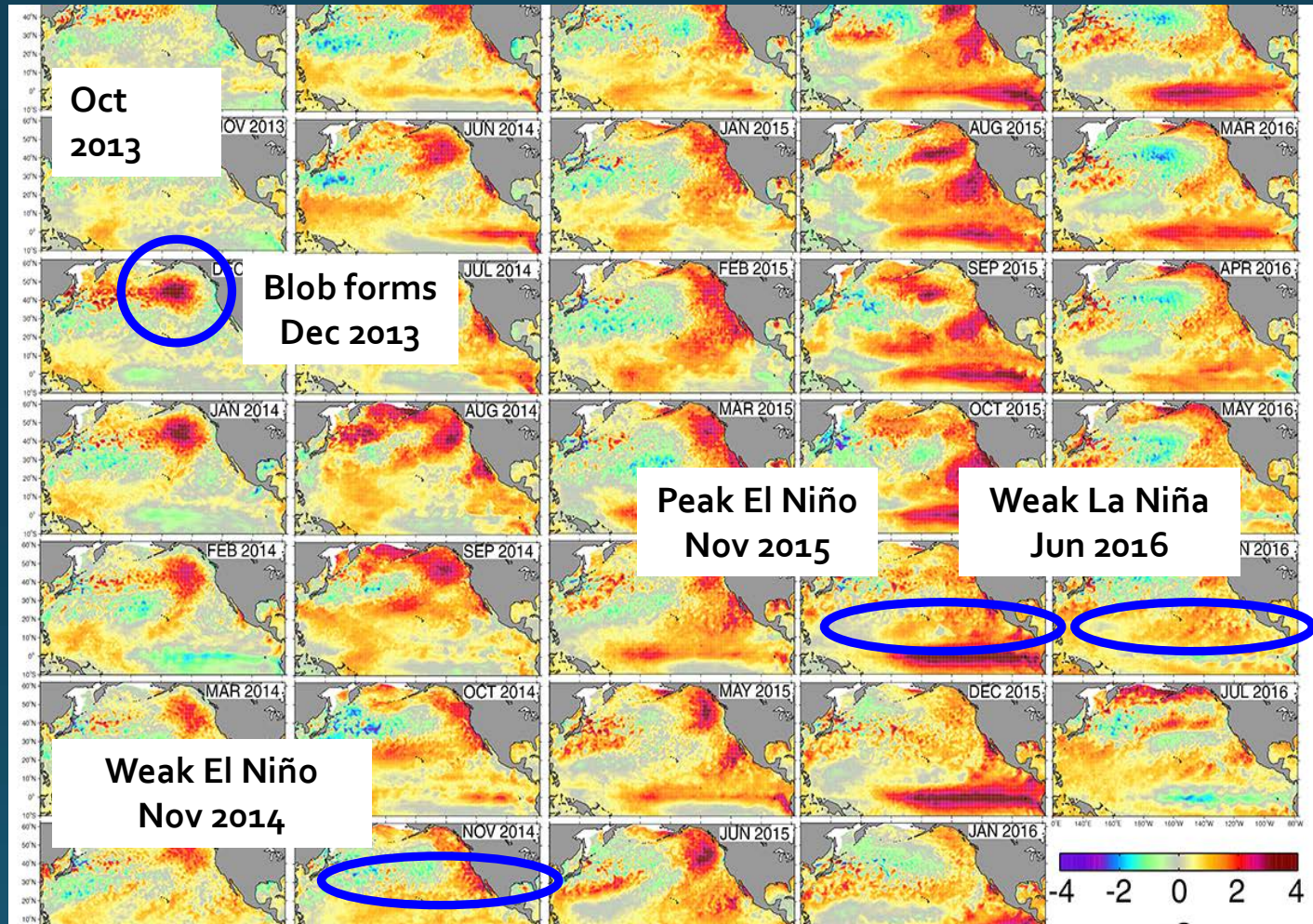
Outline

- Update on the Warm Blob, El Niño, and La Niña
- Physical and biological observations
- NWFSC environmental indicators (stoplight chart)
- Short-term forecast

Take-Home Messages:

- Warm ocean conditions since 2014 are starting to cool off
- Cold wet winter in 2016/2017 is good for freshwater habitat
- Impacts of warm ocean will persist for the next year or two

Sea Surface Temperature Anomalies

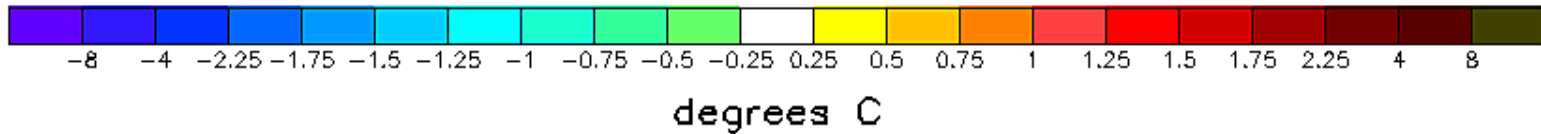
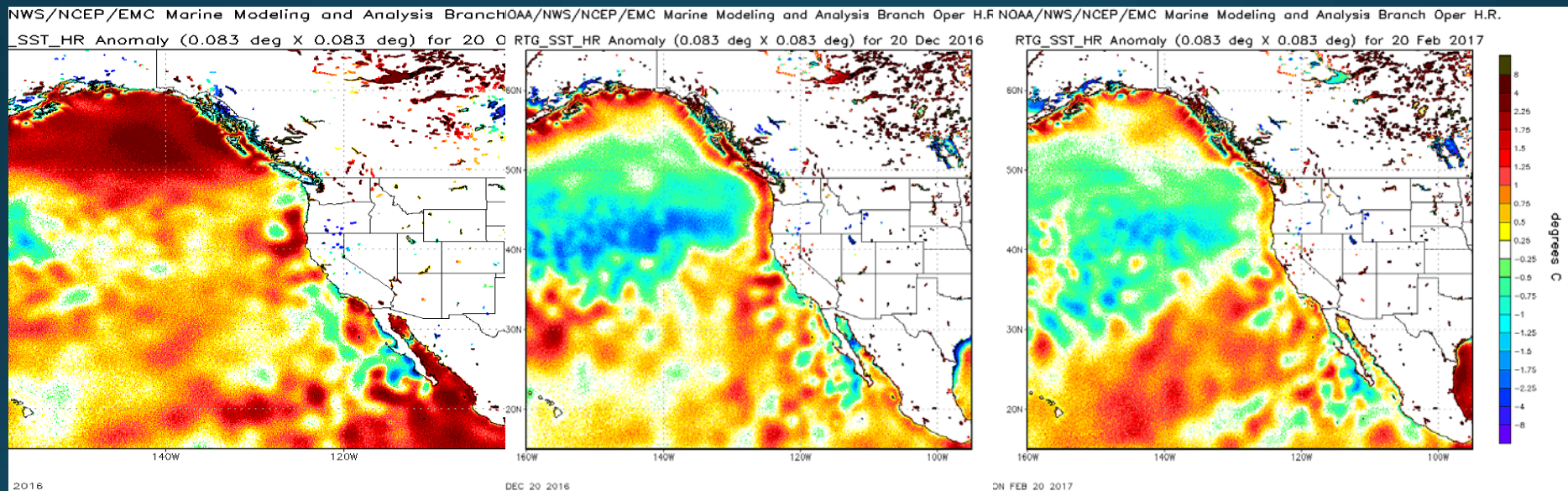


North Pacific cools during fall 2016

Oct 20, 2016

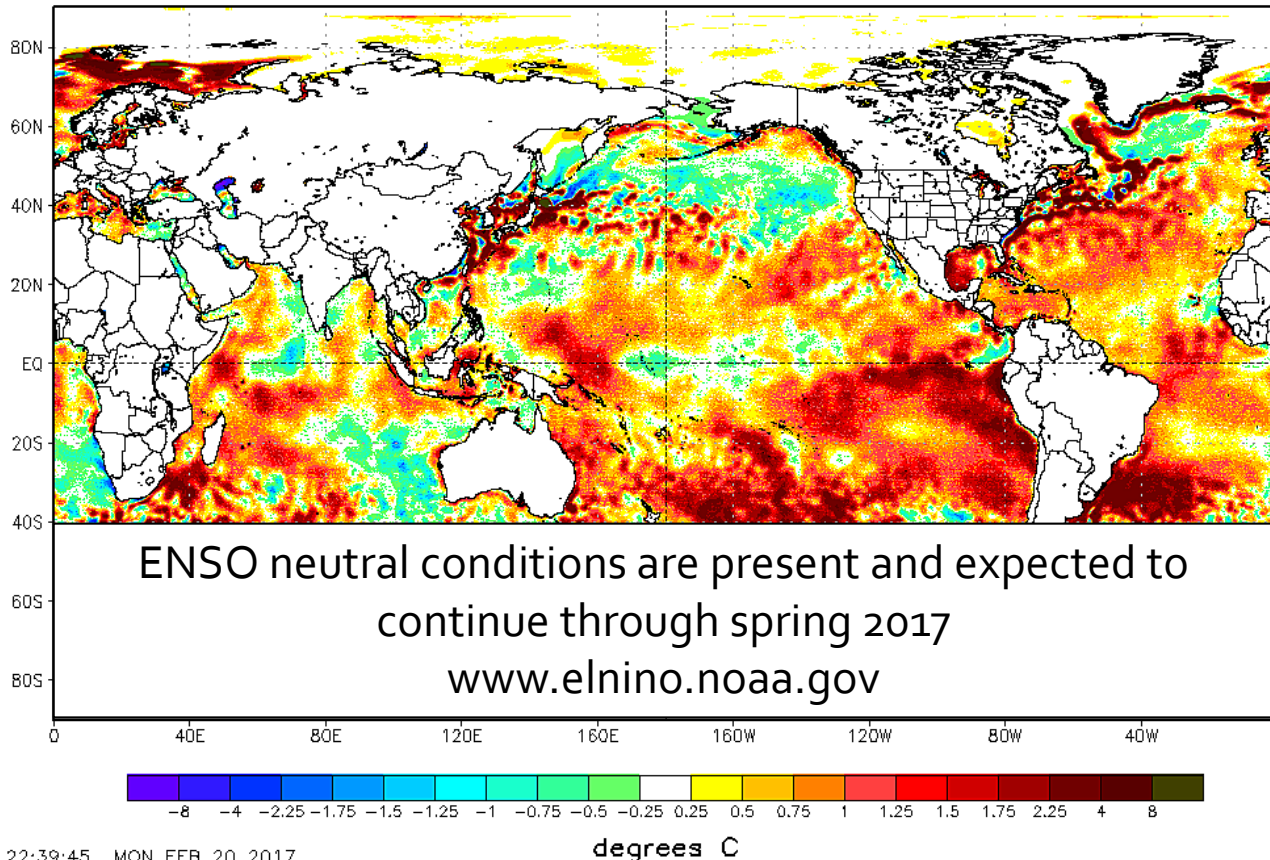
Dec 20, 2016

Feb 20, 2017

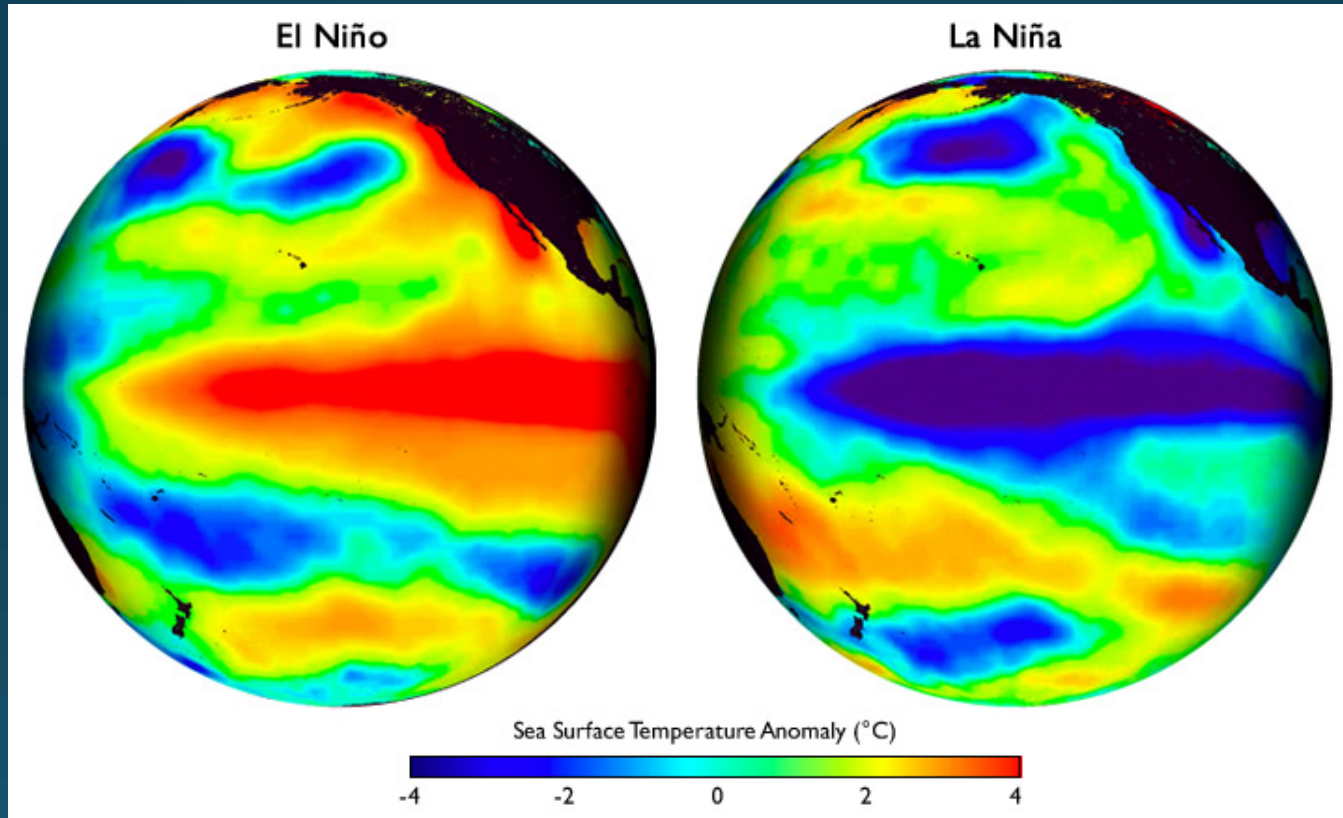


SST Anomaly February 20, 2017

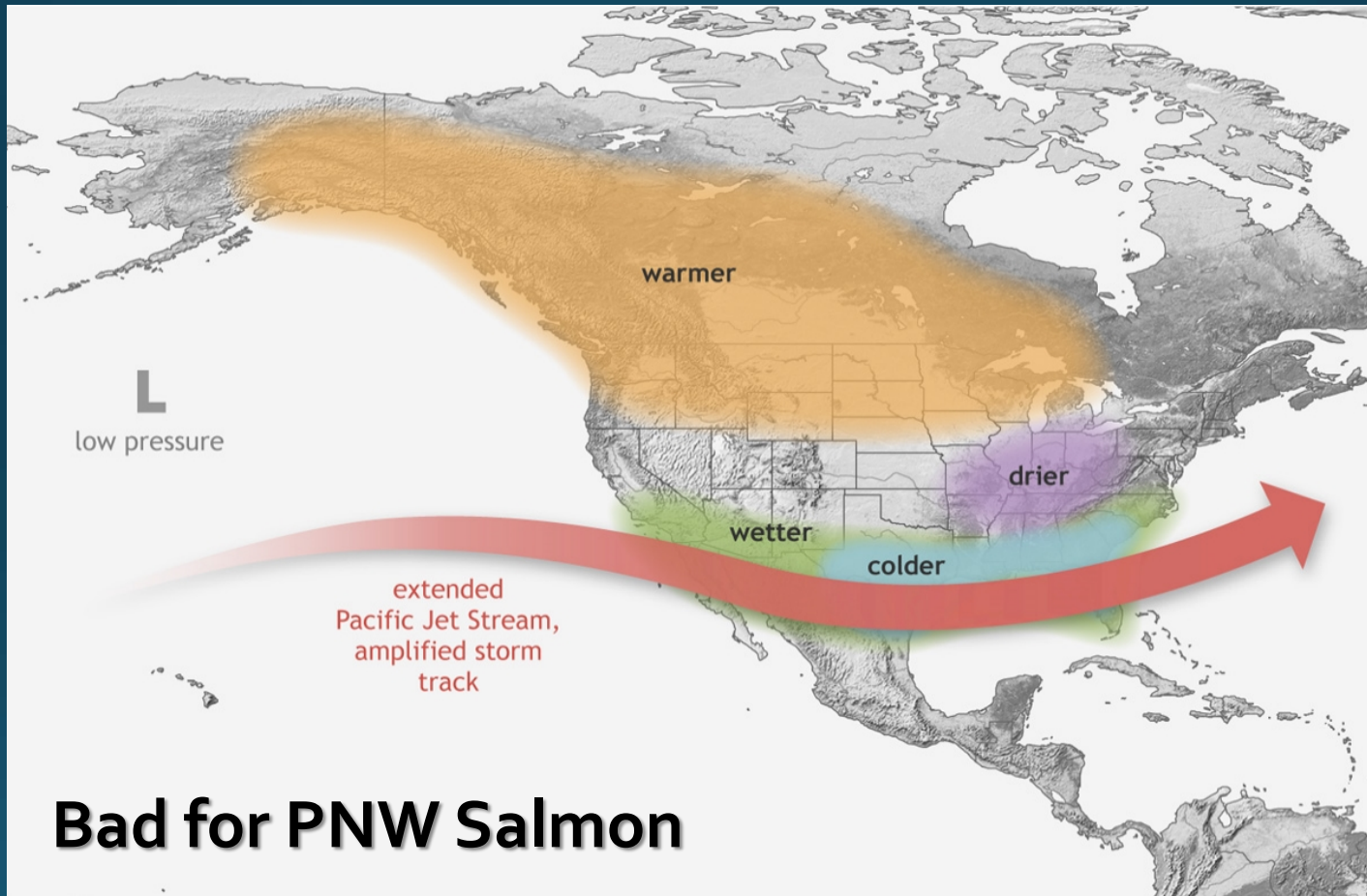
NOAA/NWS/NCEP/EMC Marine Modeling and Analysis Branch Oper H.R.
RTG_SST_HR Anomaly (0.083 deg X 0.083 deg) for 20 Feb 2017



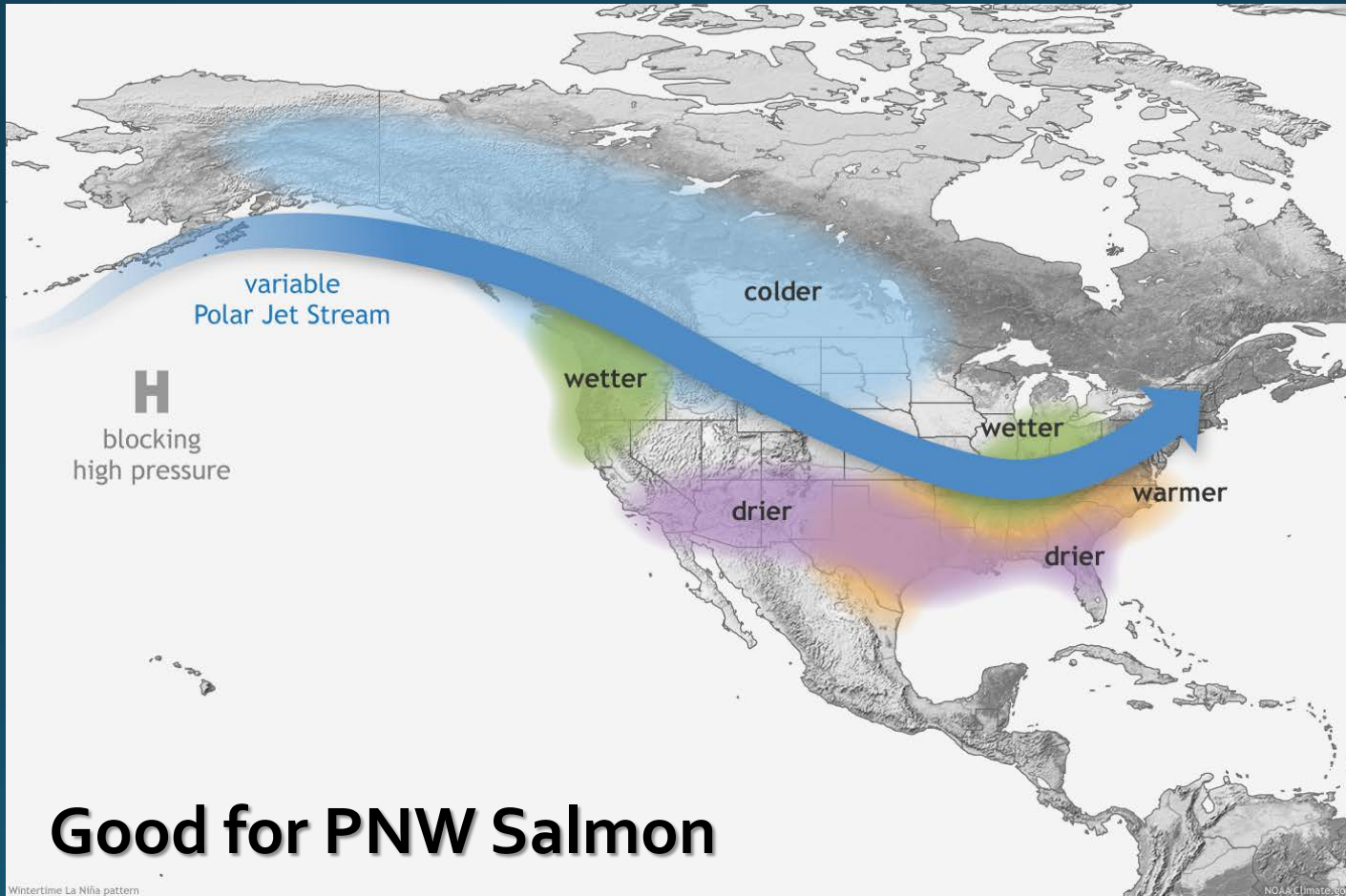
2015/2016 El Niño and 2016/2017 La Niña



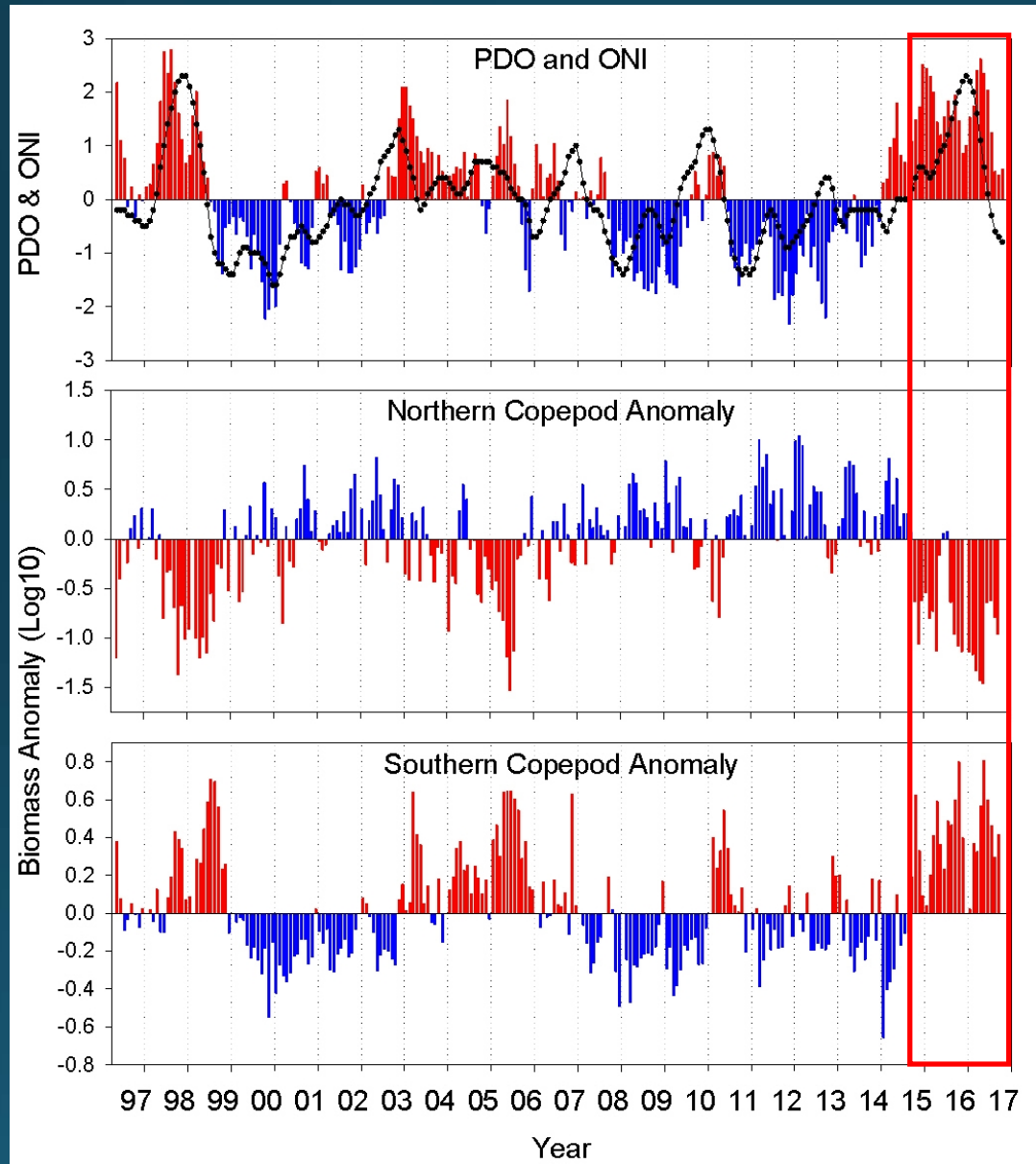
Typical El Niño Pattern



Typical La Niña Pattern



Environmental Indicators 1997-present

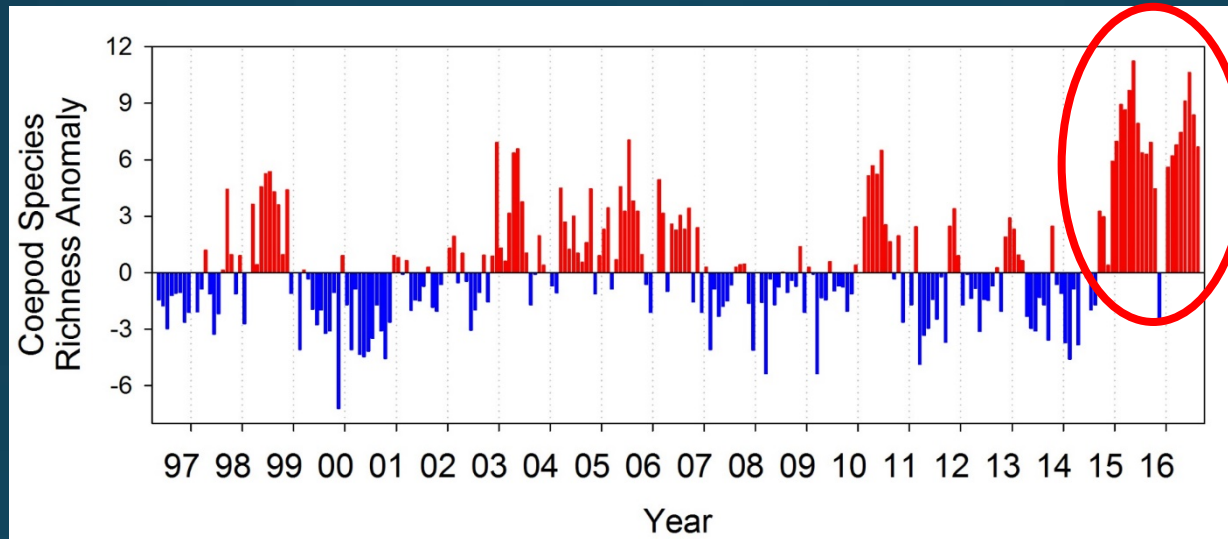


Low biomass of lipid-rich copepods



High biomass of lipid-poor copepods

NH-5 Copepod Species Richness



17 new to the central OR Coast copepod species
observed in 2014-2016,
many are Transition Zone/North Pacific Current species

Figure courtesy of B. Peterson and J. Fisher

Environmental Indicators: www.nwfsc.noaa.gov

Basin-scale
physical
indices

Regional
physical
indices

Regional
biological
indices

Ecosystem Indicators	Year																			
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
PDO (Sum Dec-March)	16	6	3	12	7	18	11	15	13	9	5	1	14	4	2	8	10	19	17	
PDO (Sum May-Sept)	10	4	6	5	11	15	14	16	12	13	2	9	7	3	1	8	17	19	18	
ONI (Average Jan-June)	18	1	1	6	12	14	13	15	8	11	3	10	16	4	5	7	9	17	19	
46050 SST (°C; May-Sept)	15	8	3	4	1	7	19	14	5	16	2	9	6	10	11	12	13	18	17	
Upper 20 m T (°C; Nov-Mar)	18	11	8	10	6	14	15	12	13	5	1	9	16	4	3	7	2	19	17	
Upper 20 m T (°C; May-Sept)	15	11	13	4	1	3	19	17	7	8							18	9	14	
Deep temperature (°C; May-Sept)	19	6	8	4	1	10	12	16	11	5							18	17	13	
Deep salinity (May-Sept)	18	3	8	4	5	15	16	9	6	1							19	14	7	
Copepod richness anom. (no. species; May-Sept)	17	2	1	7	6	13	12	16	14	10							11	18	19	
N. copepod biomass anom. (mg C m ⁻³ ; May-Sept)	17	13	9	10	3	15	12													
S. copepod biomass anom. (mg C m ⁻³ ; May-Sept)	19	2	5	4	3	13	14													
Biological transition (day of year)	17	11	6	7	8	12	10	16	15	3	1	2	14	4	9	5	13	19	19	
Ichthyoplankton biomass (log (mg C 1000 m ⁻³); Jan-Mar)	19	10	2	6	8	17	16	12	15	14	1	11	3	13	9	7	18	4	5	
Ichthyoplankton community index (PCO axis 1 scores; Jan-Mar)						10	18					14	15							
Chinook salmon juvenile catches (no. km ⁻¹ ; June)						13	17					6	7							
Coho salmon juvenile catches (no. km ⁻¹ ; June)					2	15						9	10							
Mean of ranks	16.4	7.0	5.7	6.9	5.8	11.9	14.6	15.5	11.0	8.7	2.7	8.1	11.8	7.9	6.3	7.4	12.0	15.3	15.3	
Rank of the mean rank	19	6	2	5	3	13	15	18	11	10	1	9	12	8	4	7	14	16	16	



Winter Ichthyoplankton Biomass

1998 = Worst Score

2005 = 2nd Worst Score

2015 + 2016 = tied for 3rd Worst Score

Fish abundance, condition, and unusual pelagic community

- Salmon CPUE low in the ocean in 2015 and 2016
- Body condition low in 2015, high in 2016
- Unusual fish community in the ocean

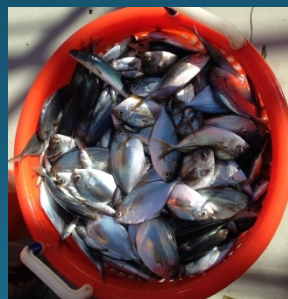
Water jellies



Juvenile Rockfish



Pompano



Jack mackerel



High condition



skinny fish 2015



Terrestrial impacts on salmon production



Atmosphere-ocean influences terrestrial system

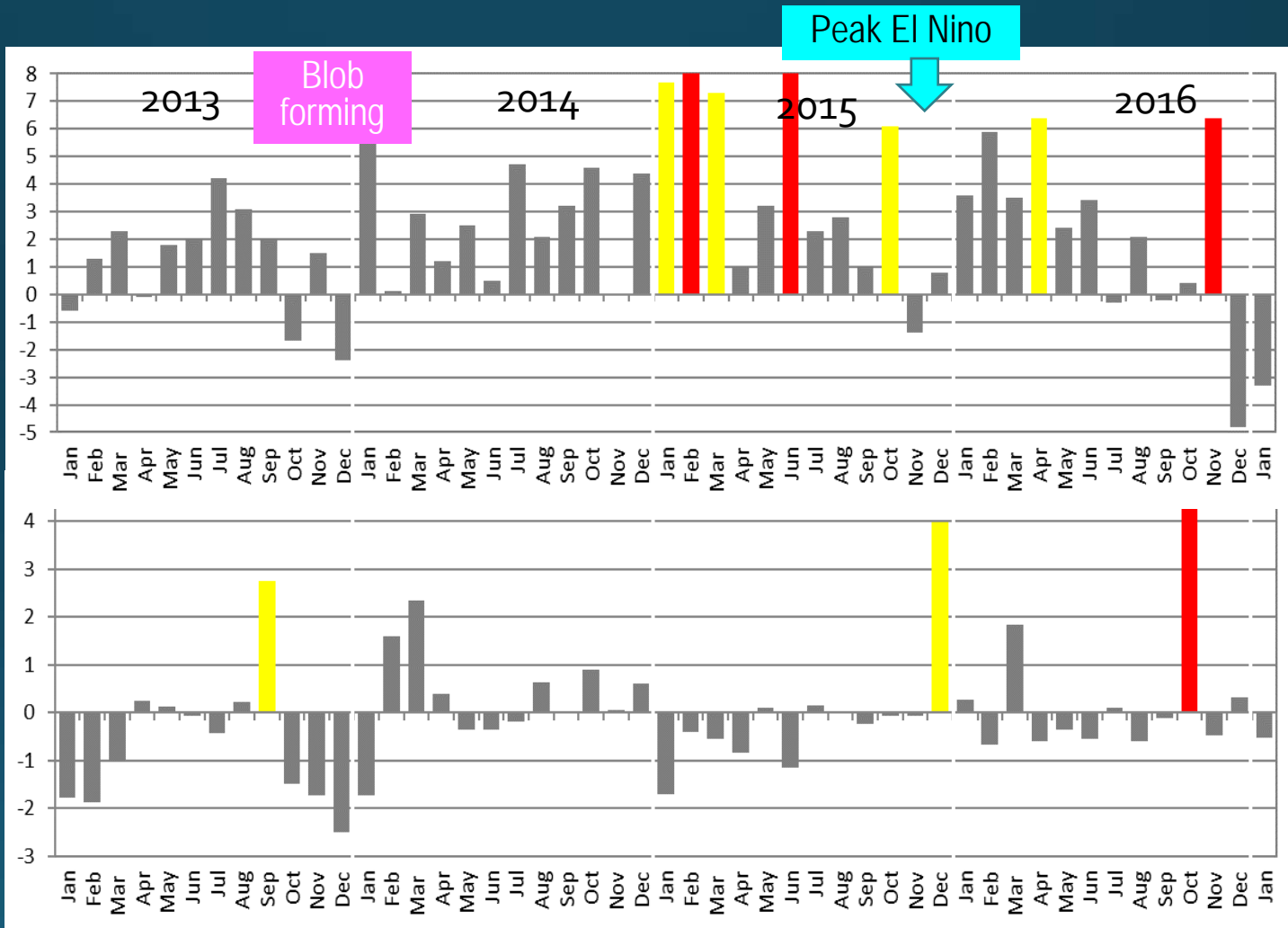
Monthly WA-OR-ID temperature and precipitation anomalies, 2013-2017

Temperature anomaly (°F)

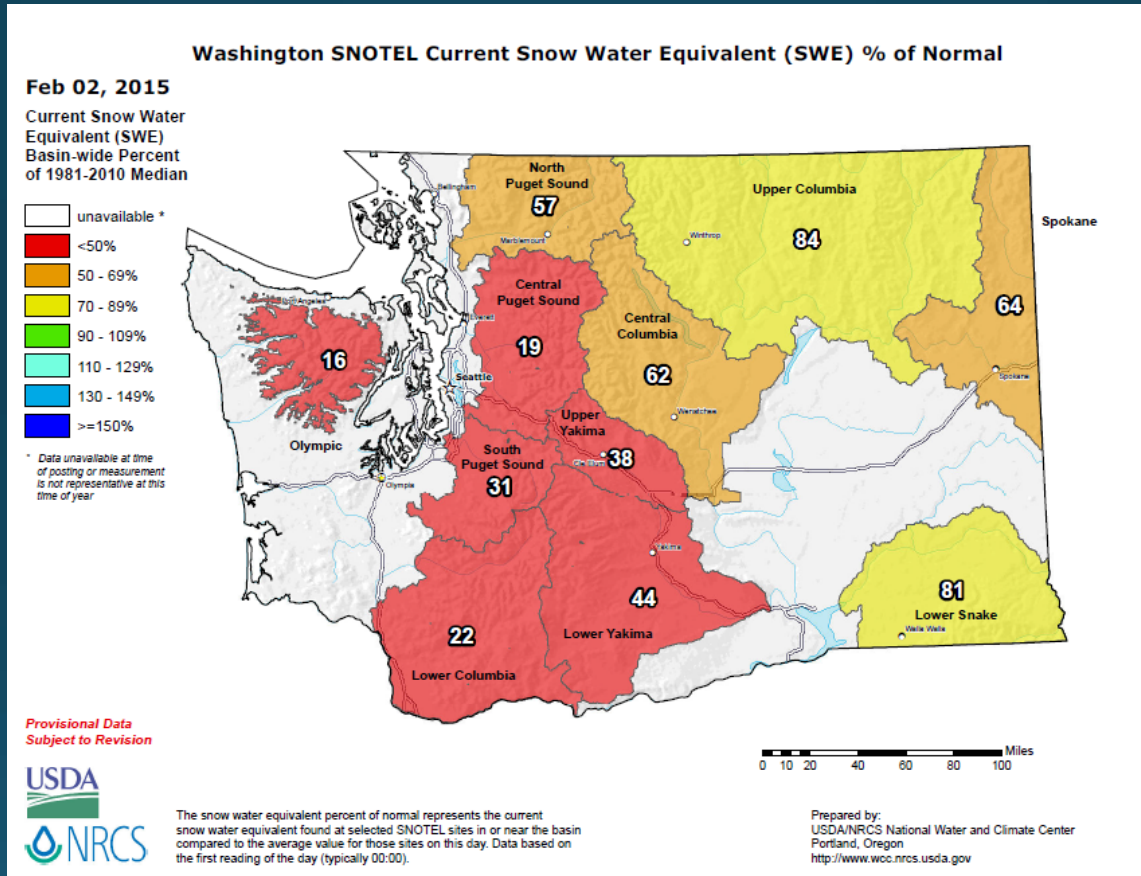
Highest on record (1895-2017)

Extreme 5%

Precipitation anomaly (in.)

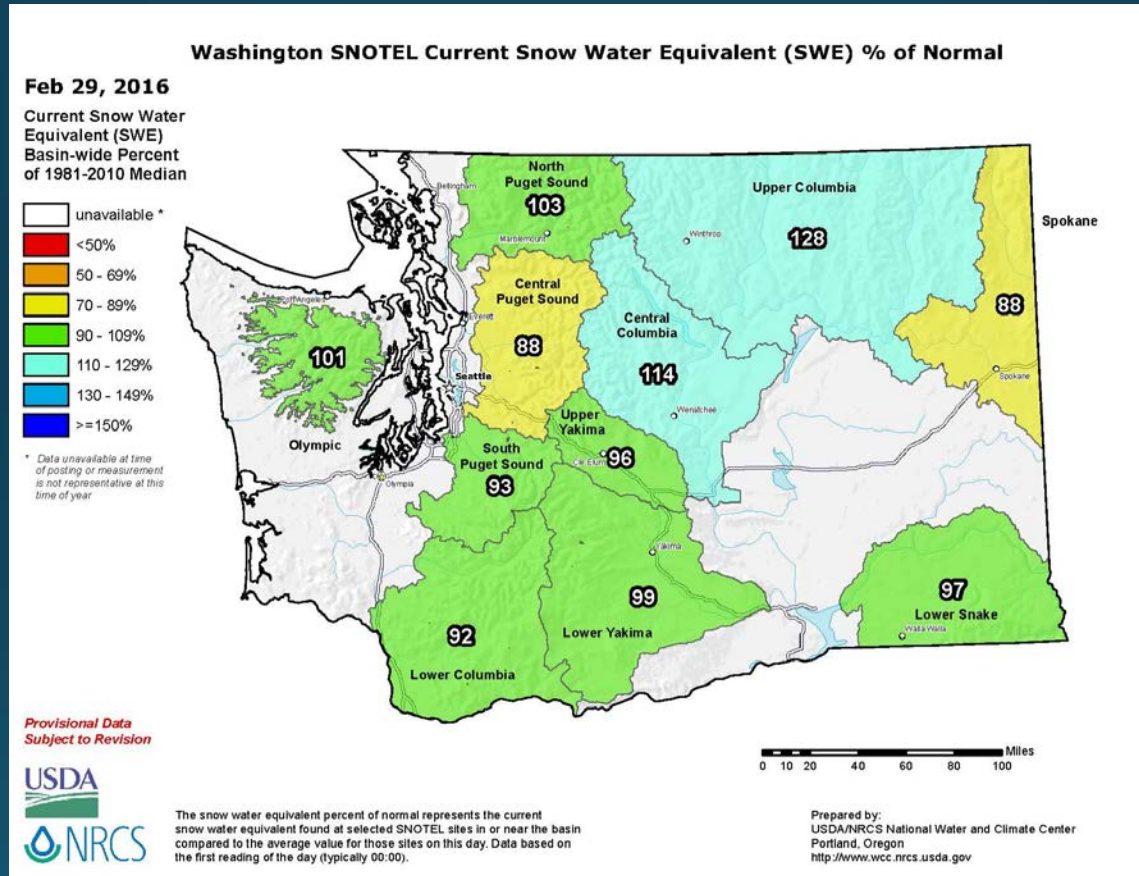


Snowpack – Feb 2015



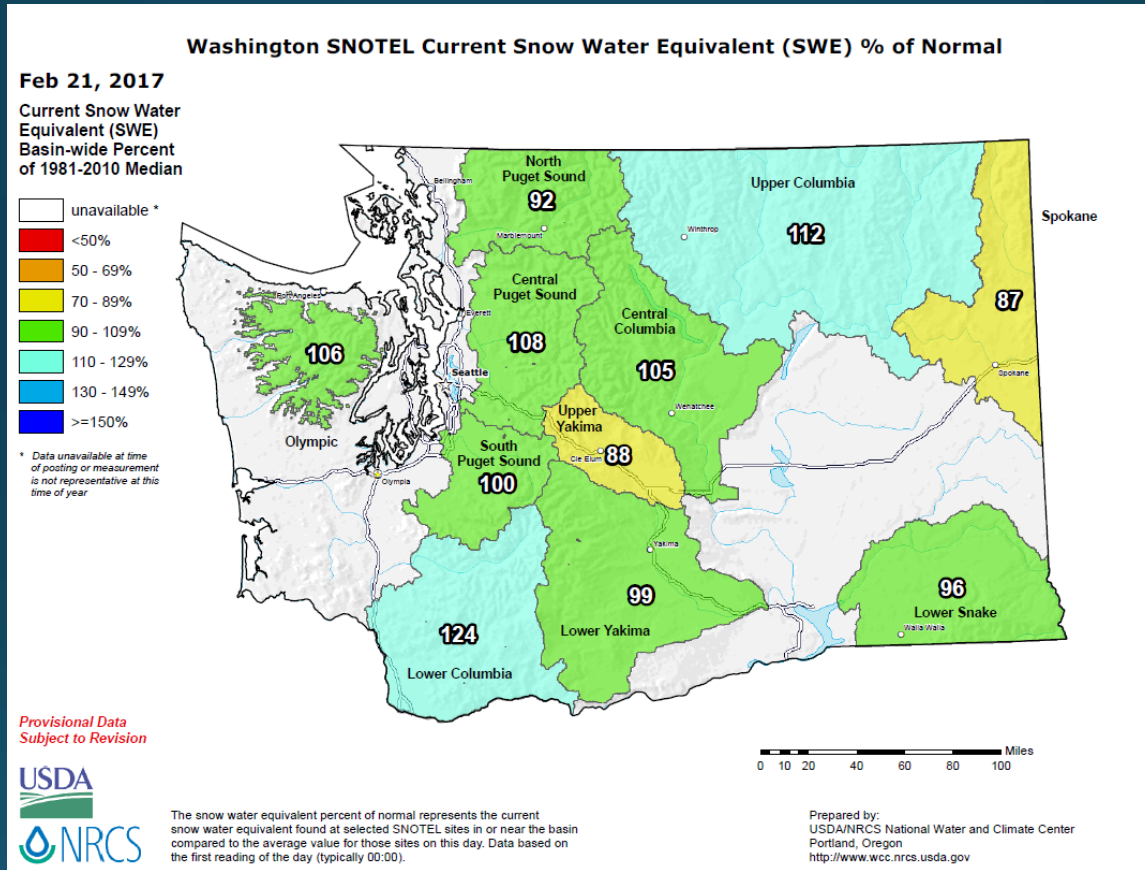
Record low snowpack in the PNW

Snowpack – Feb 2016



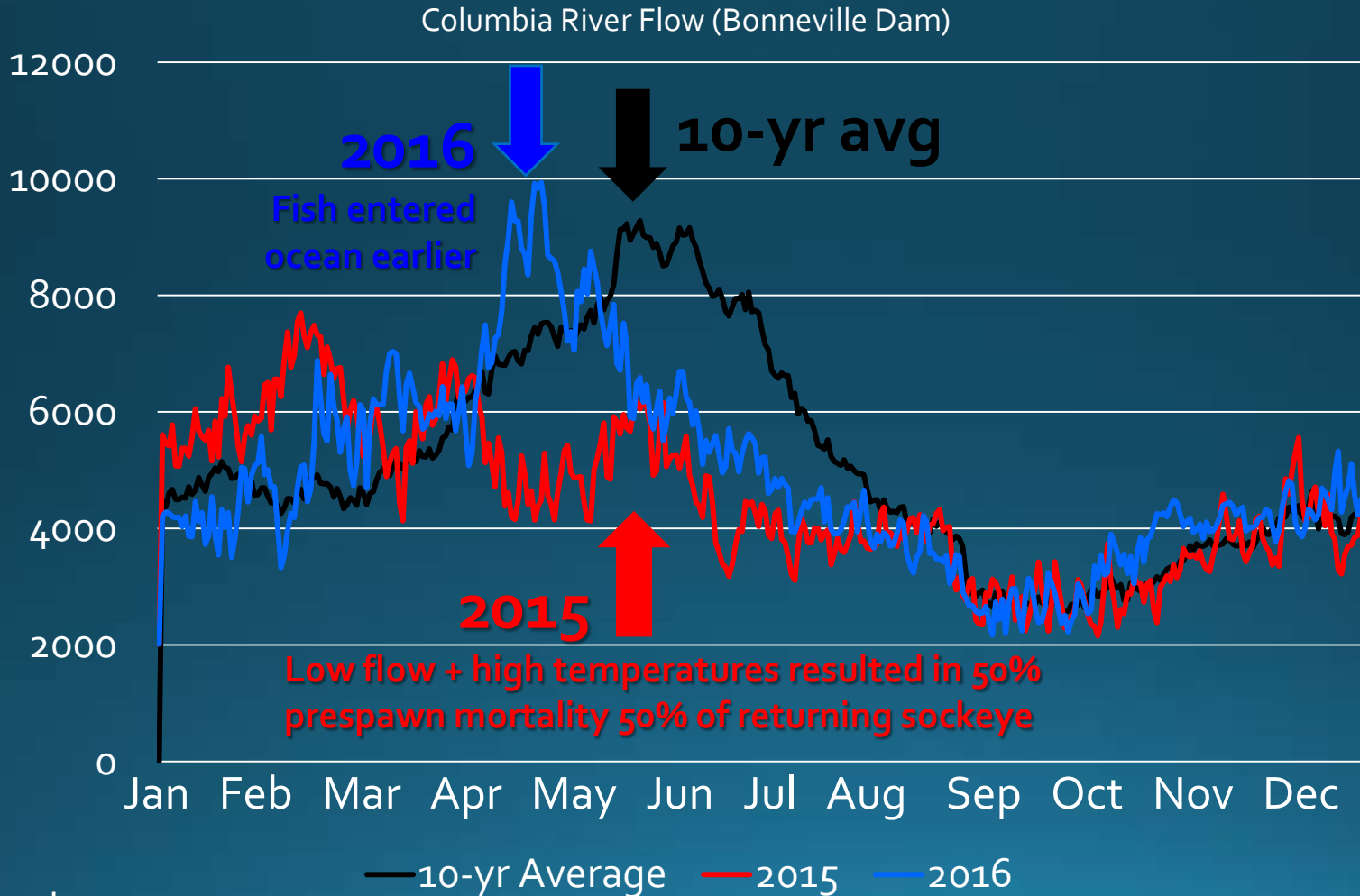
Average snowpack + warm spring = low snowpack

Snowpack – Feb 2017

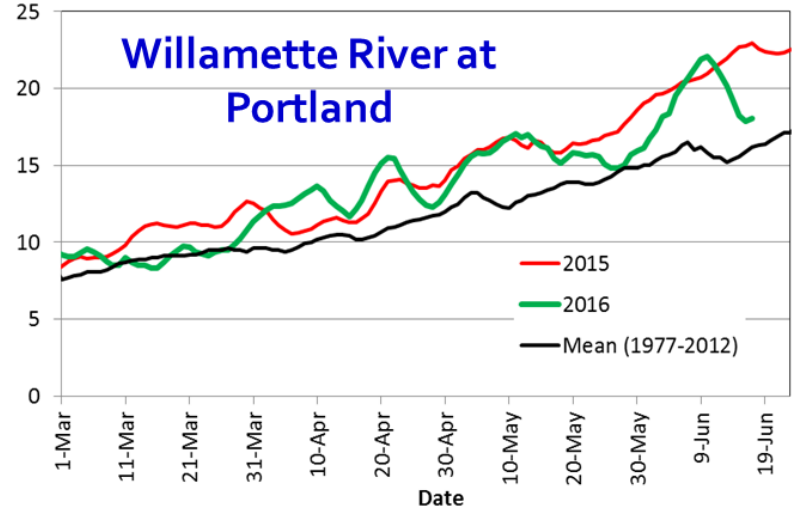
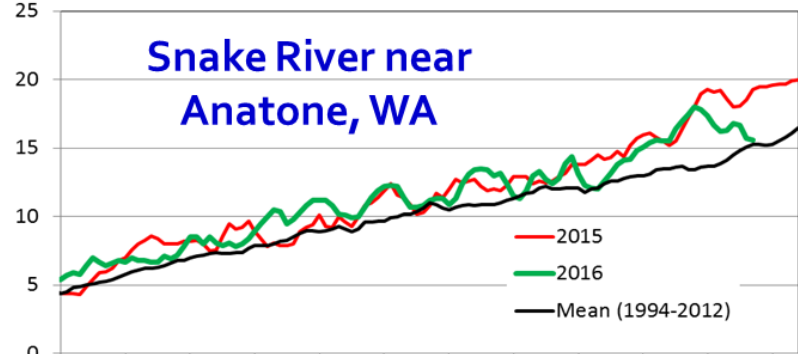
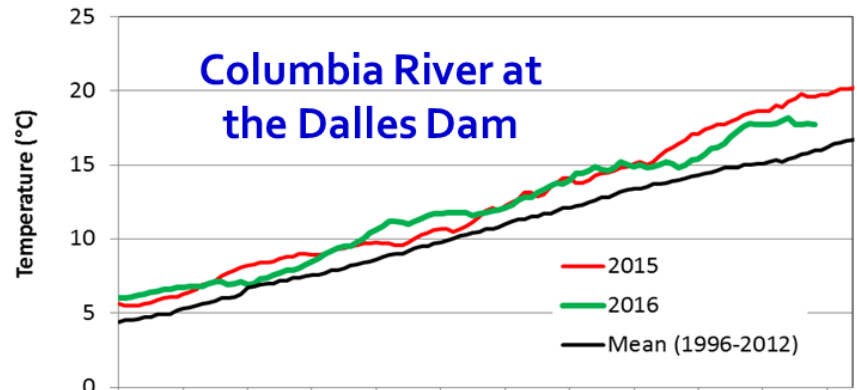
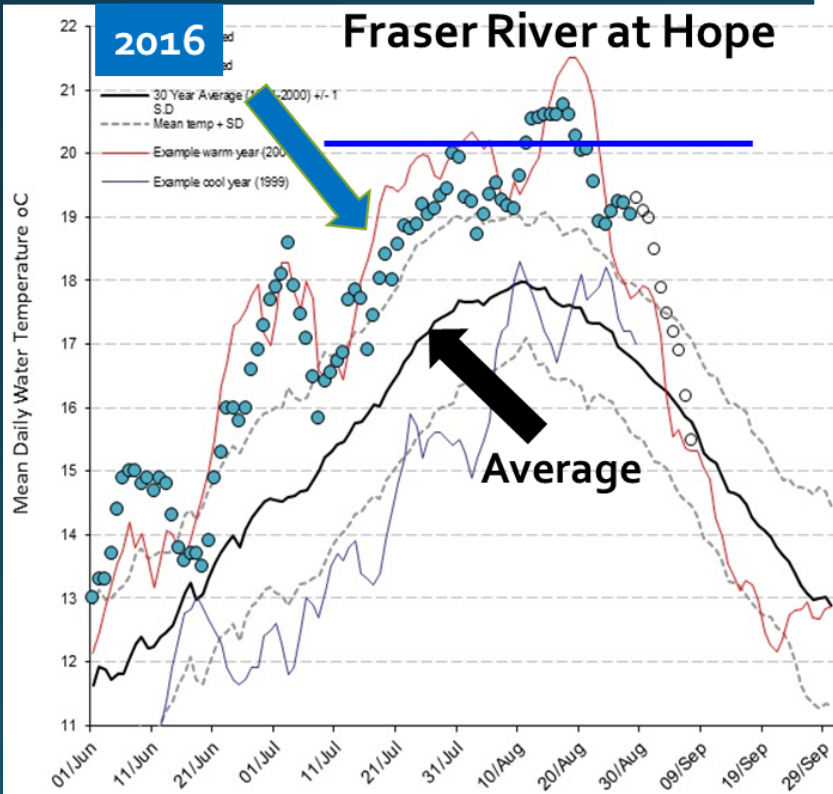


Average conditions at current time

Columbia River flow low in 2015, peaked early in 2016, and was similarly low after mid-May as 2015



Spring 2016 river temperatures are nearly as hot as they were in 2015!

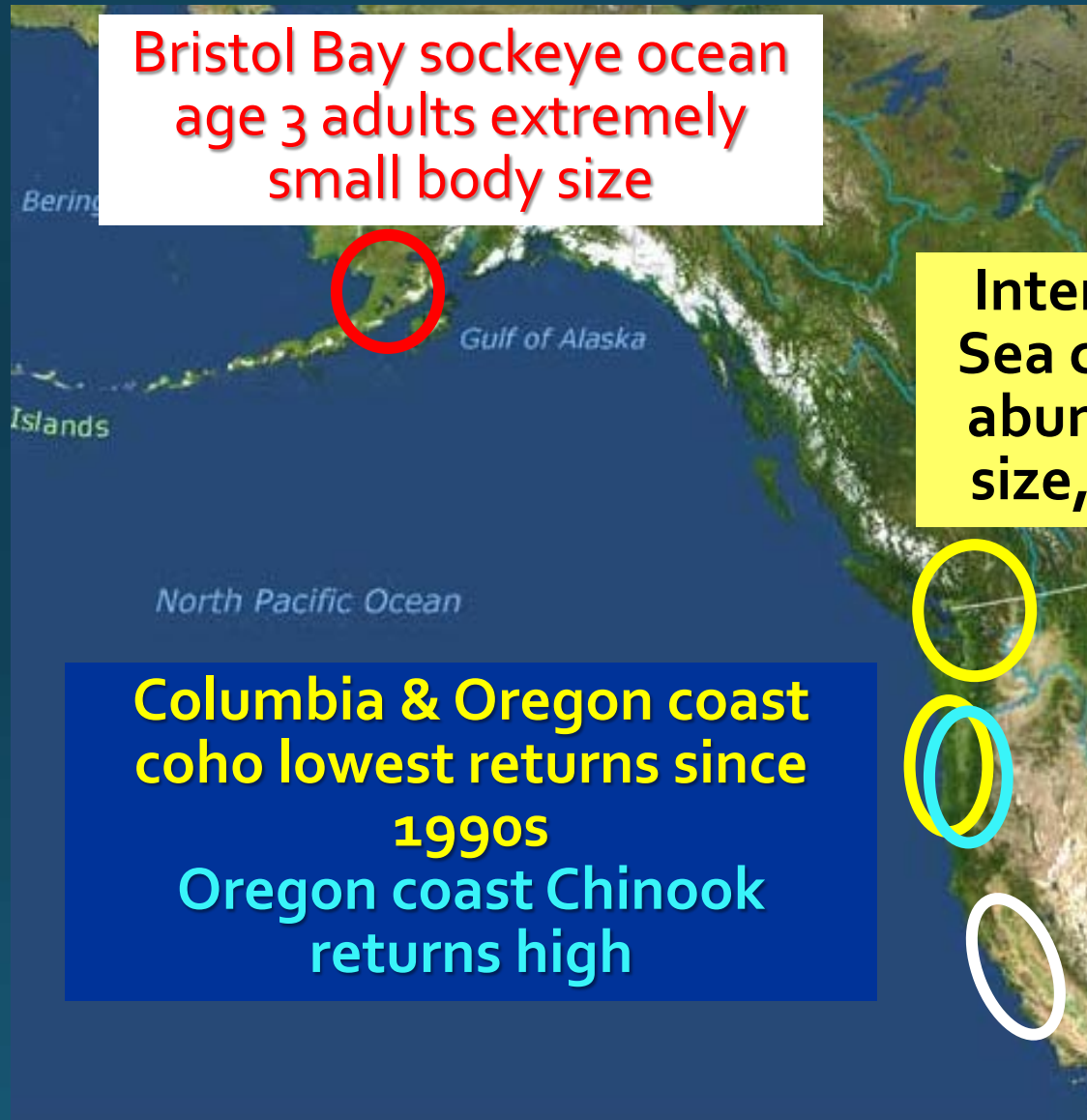


2015-2017: *Pseudo-nitzschia* diatom blooms

- Neurotoxin (domoic acid) produced by algae can be fatal to mammals (amnesiac shellfish poisoning)
- Domoic acid detected in hundreds of marine mammals and sea birds along the West Coast
- Large blooms closed recreational and commercial clam and crab fisheries in WA, OR, and CA



Unusual salmon observations in 2015



Bristol Bay sockeye ocean age 3 adults extremely small body size

Interior Fraser & Salish Sea coho extremely low abundance, small body size, and low fecundity

Columbia & Oregon coast coho lowest returns since 1990s
Oregon coast Chinook returns high

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

Unusual salmon observations in 2016

Alaska pinks: lowest returns in memory



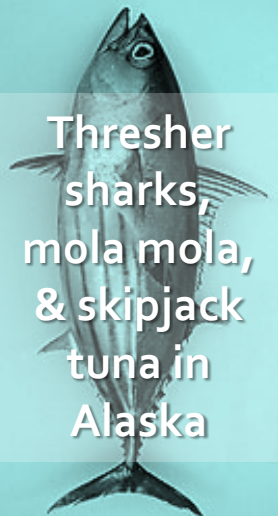
Fraser sockeye
lowest on record

Fraser chum
highest in
20 years

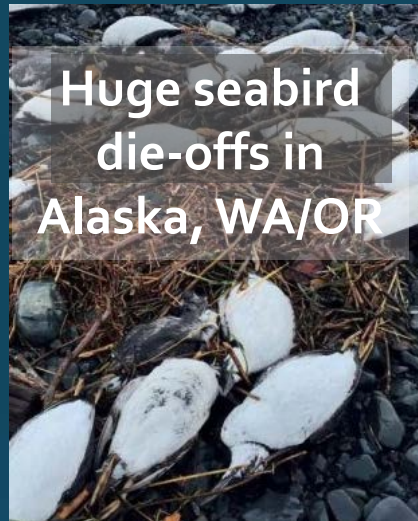
High chum returns WA &
OR coasts, Columbia

Unusual sightings 2015-2016

Warm water species off WA/OR seen before but earlier or unusually abundant



Thresher sharks, mola mola, & skipjack tuna in Alaska



Huge seabird die-offs in Alaska, WA/OR



Ocean sunfish in AK



Jack & Pacific mackerel



Pacific butterfish



Tropical fish off Vancouver Island, Oregon Coast



Swordfish off Oregon



Extremely abundant sea lions in PNW; 1st time females seen

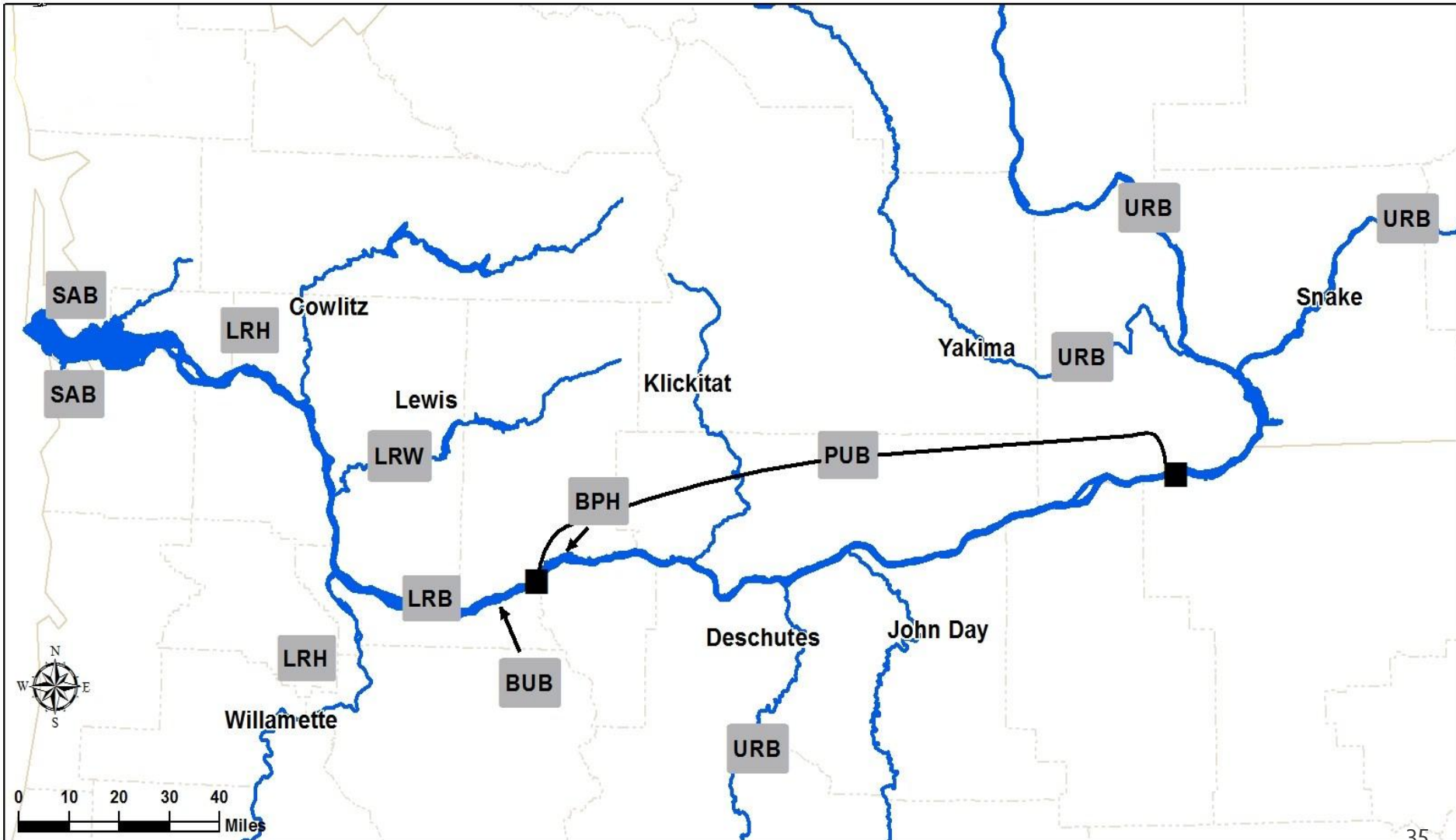
2017 Columbia River Fall Chinook and Coho Forecasts



Columbia River Fall Chinook

- Six major stock groups
 - SAB – Select Area Brights
 - LRH – Lower River Hatchery (tule stock)
 - LRW – Lower River Wild
 - MCB – Mid-Columbia Brights (3 sub components)
 - BPH – Bonneville Pool Hatchery (tule stock)
 - URB – Upriver Bright
- Most constraining stock recently is LRH, which is used to represent Lower Columbia River Natural (LCR) tule stock.

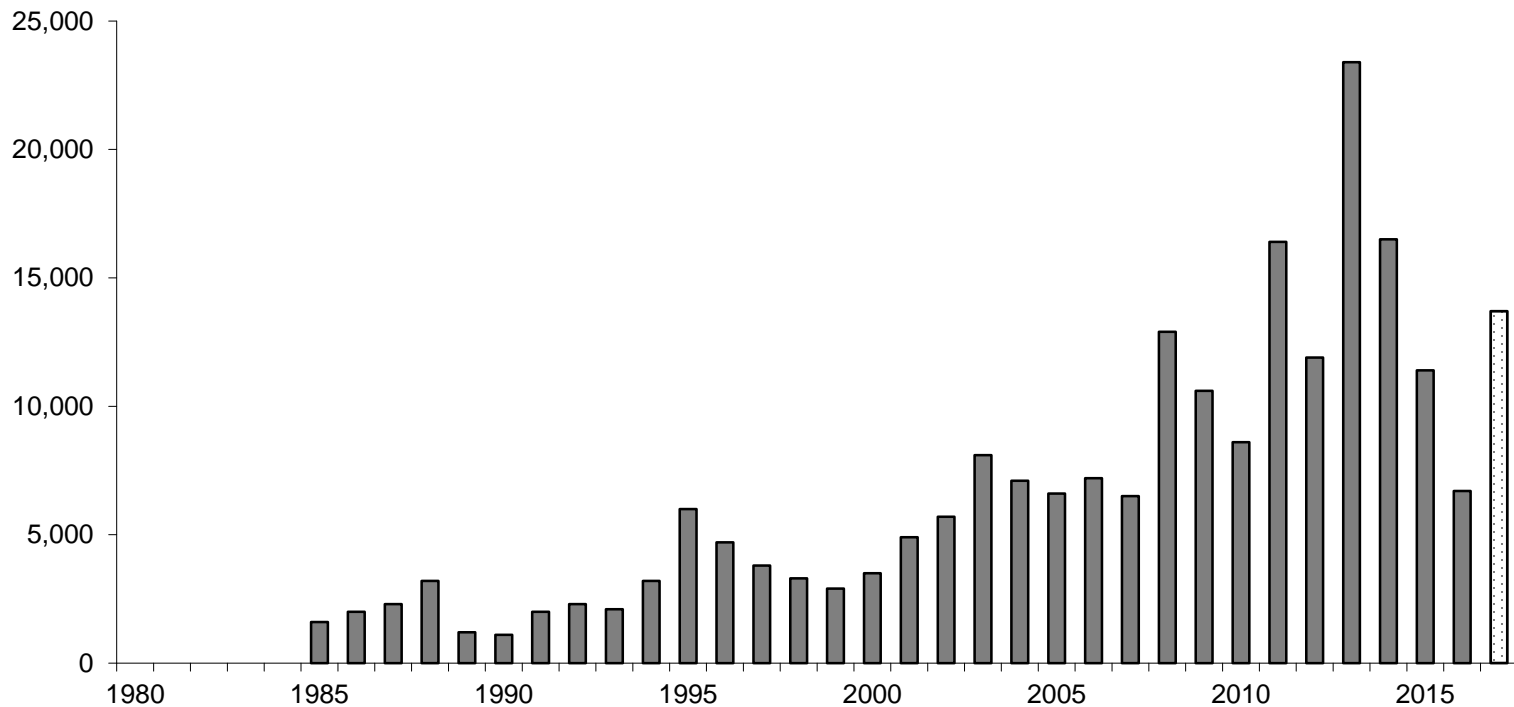
Fall Chinook Stocks and General Destination



Select Area Brights (SAB) Fall Chinook

2016 Forecast: 15,800
2016 Return: 6,700

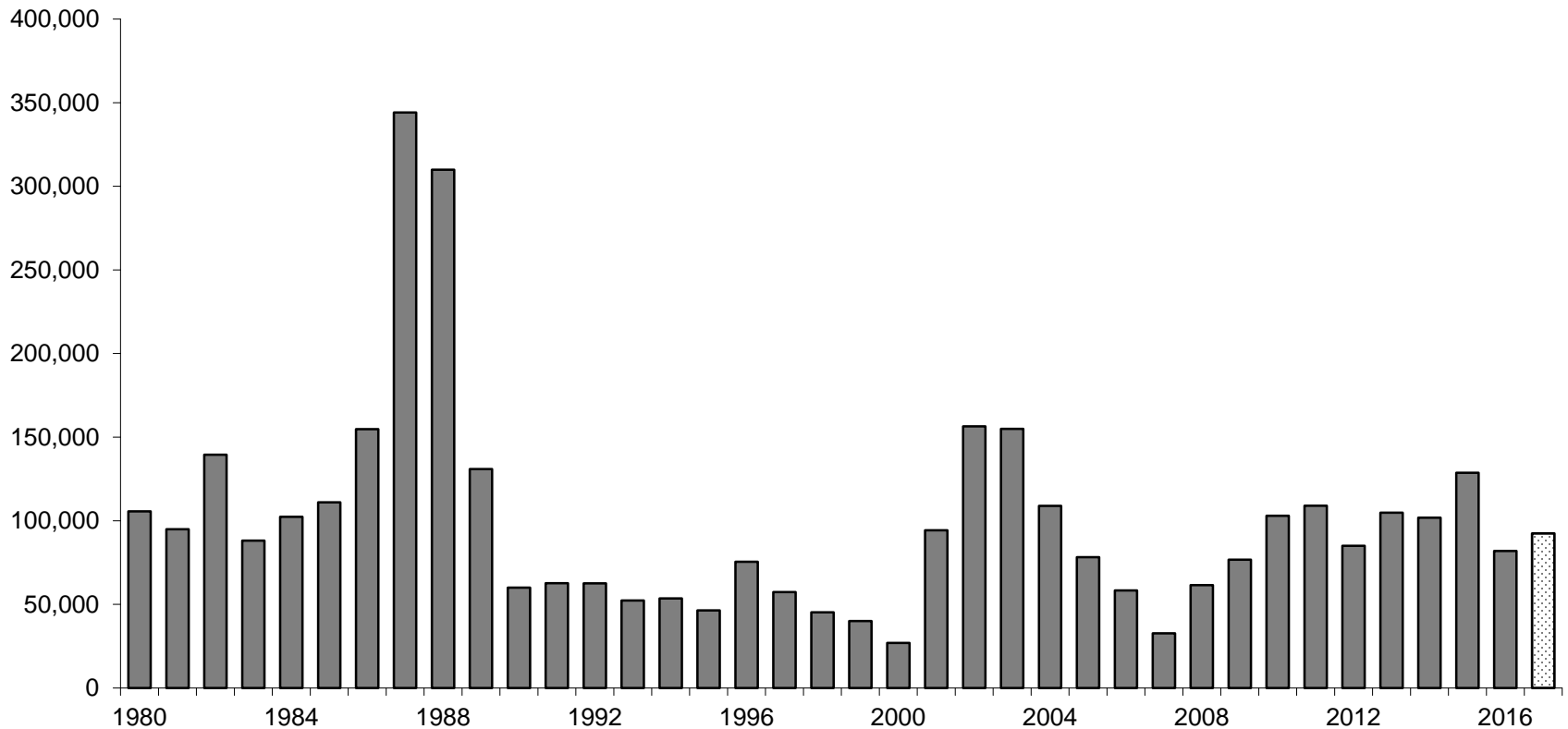
2017 Forecast:
13,700



Lower River Hatchery (LRH) Fall Chinook

2016 Forecast: 133,700
2016 Return: 81,900

2017 Forecast:
92,400



LCR Tule Exploitation Rate Matrix

LRH Run Size

- <30,000
- 30,000 – 40,000
- 40,000 – 85,000
- **>85,000**

LCR Tule ER

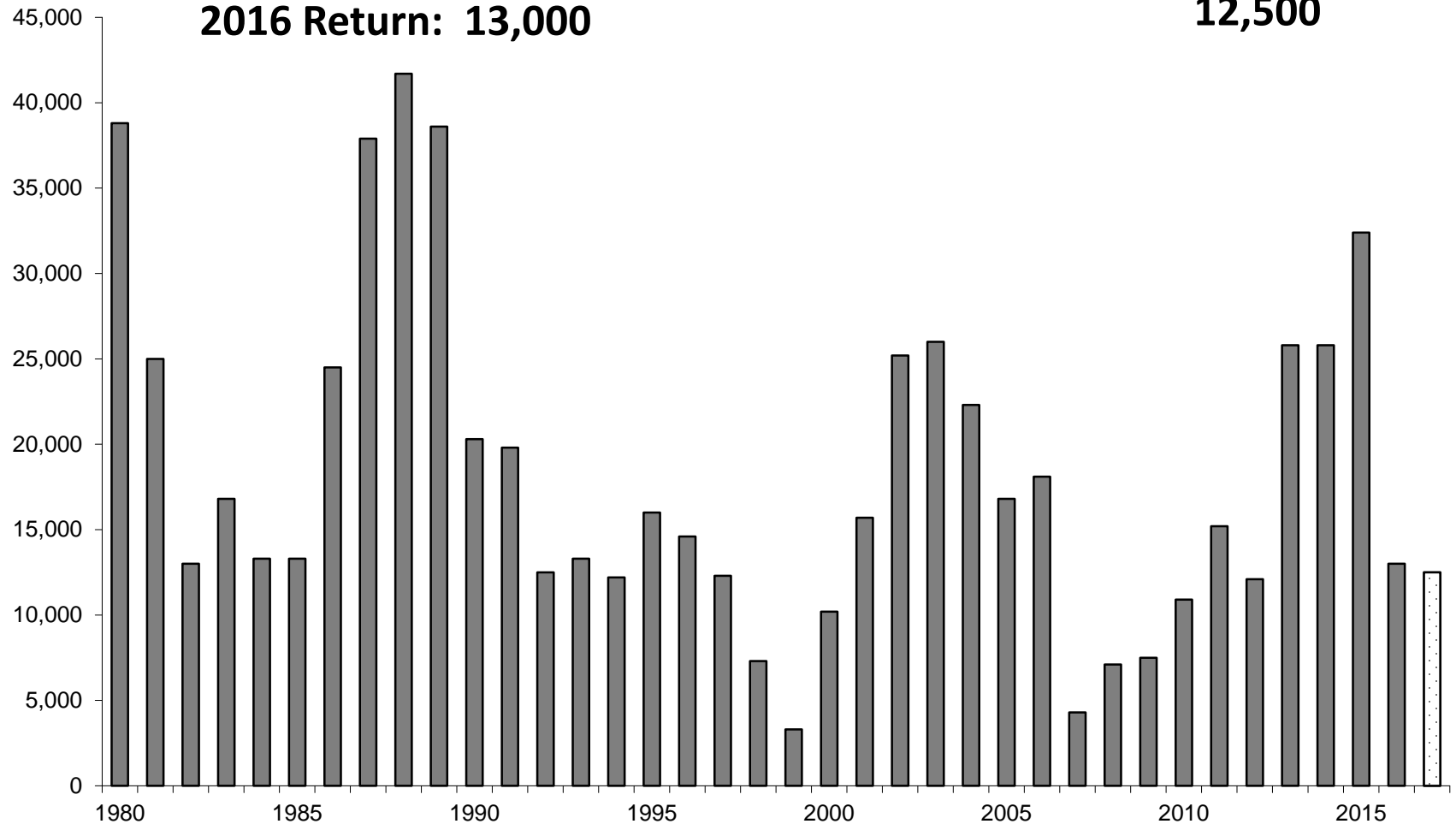
- 30%
- 35%
- 38%
- **41%**

Based on 2017 LRH forecast of 92,400 fish, ocean and in-river fisheries will be managed to not to exceed a 41% exploitation rate (ER)

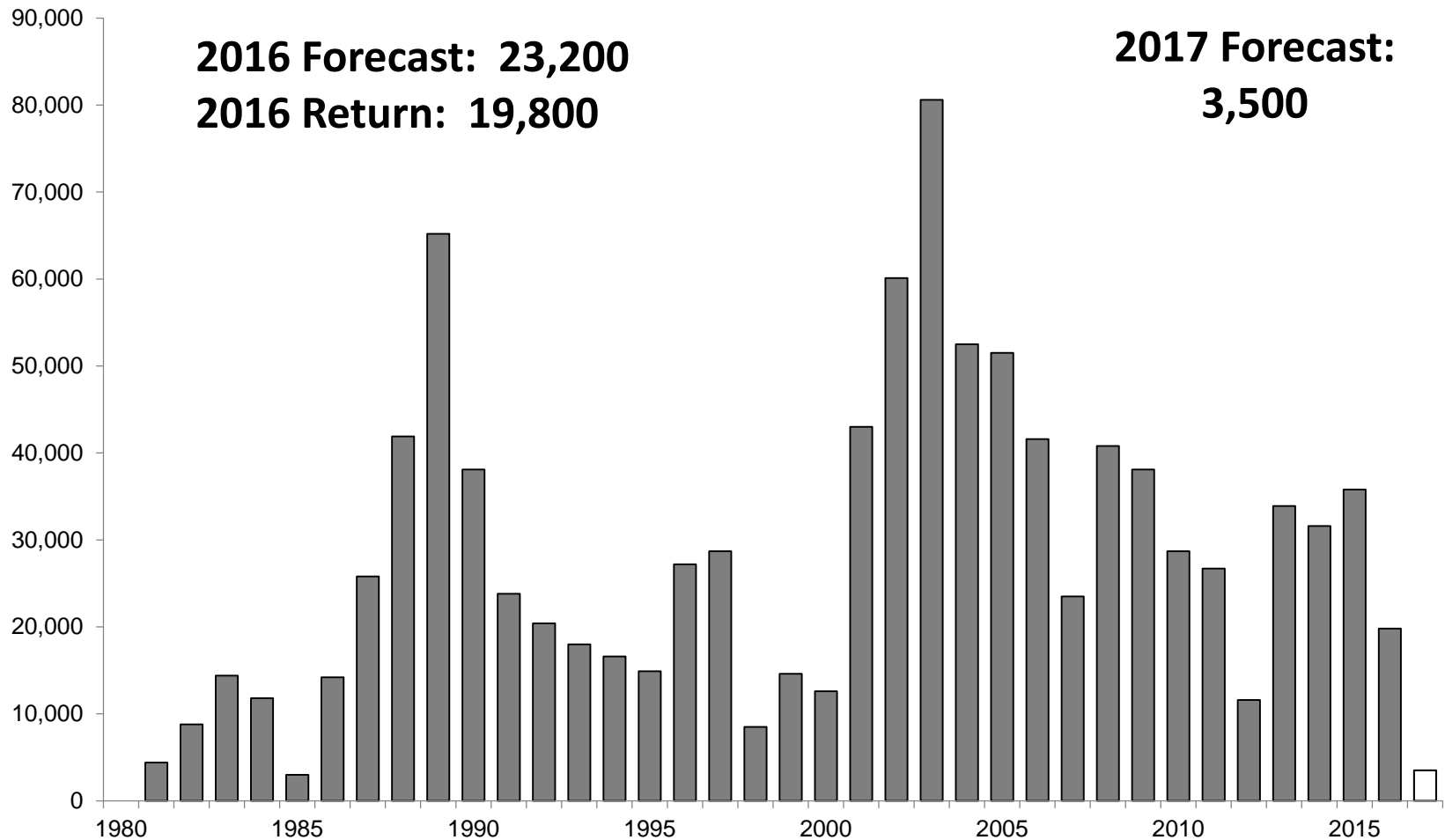
Lower River Wild (LRW) Fall Chinook

2016 Forecast: 22,200
2016 Return: 13,000

2017 Forecast:
12,500



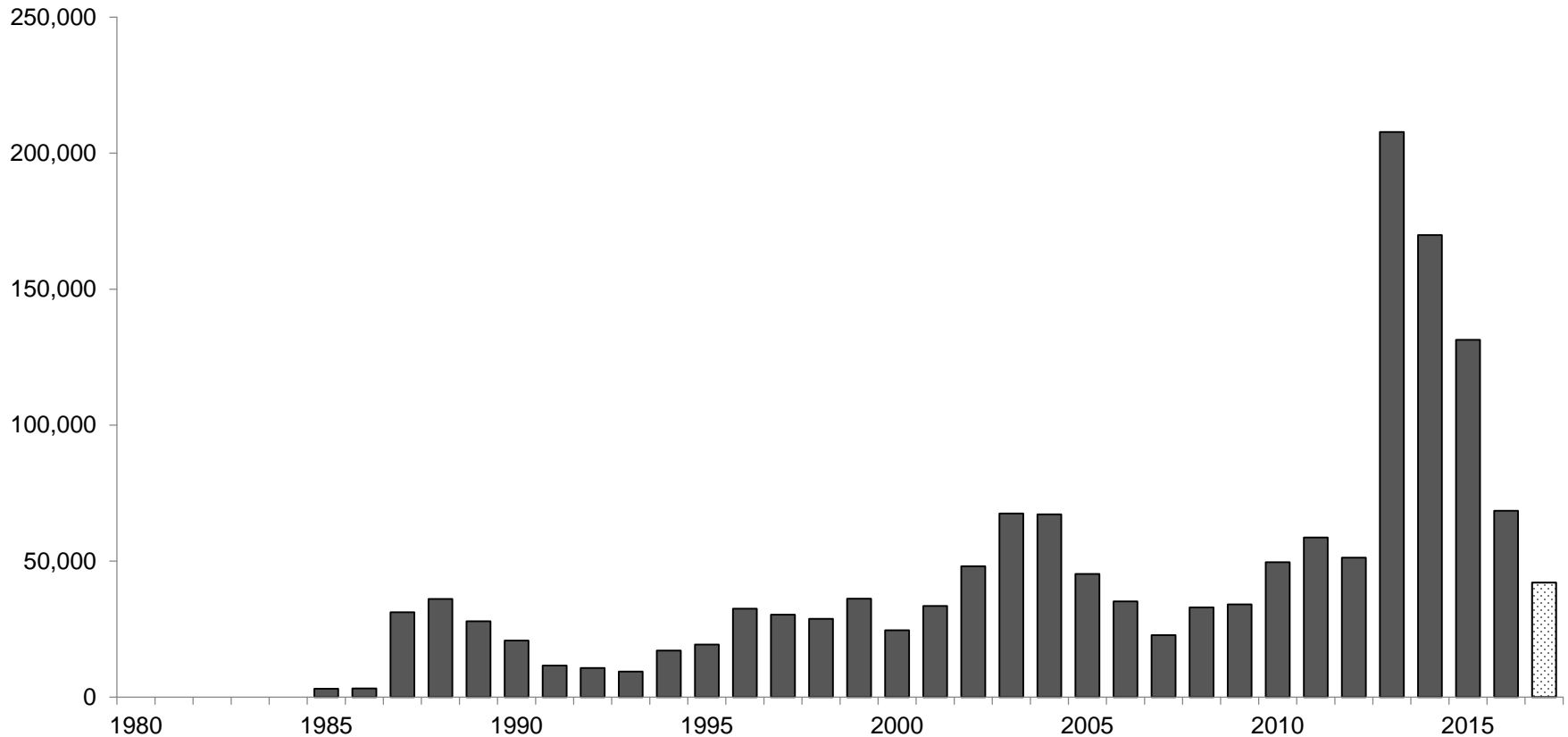
Bonneville Upriver Bright (BUB) Fall Chinook



Pool Upriver Bright (PUB) Fall Chinook

2016 Forecast: 77,800
2016 Return: 68,500

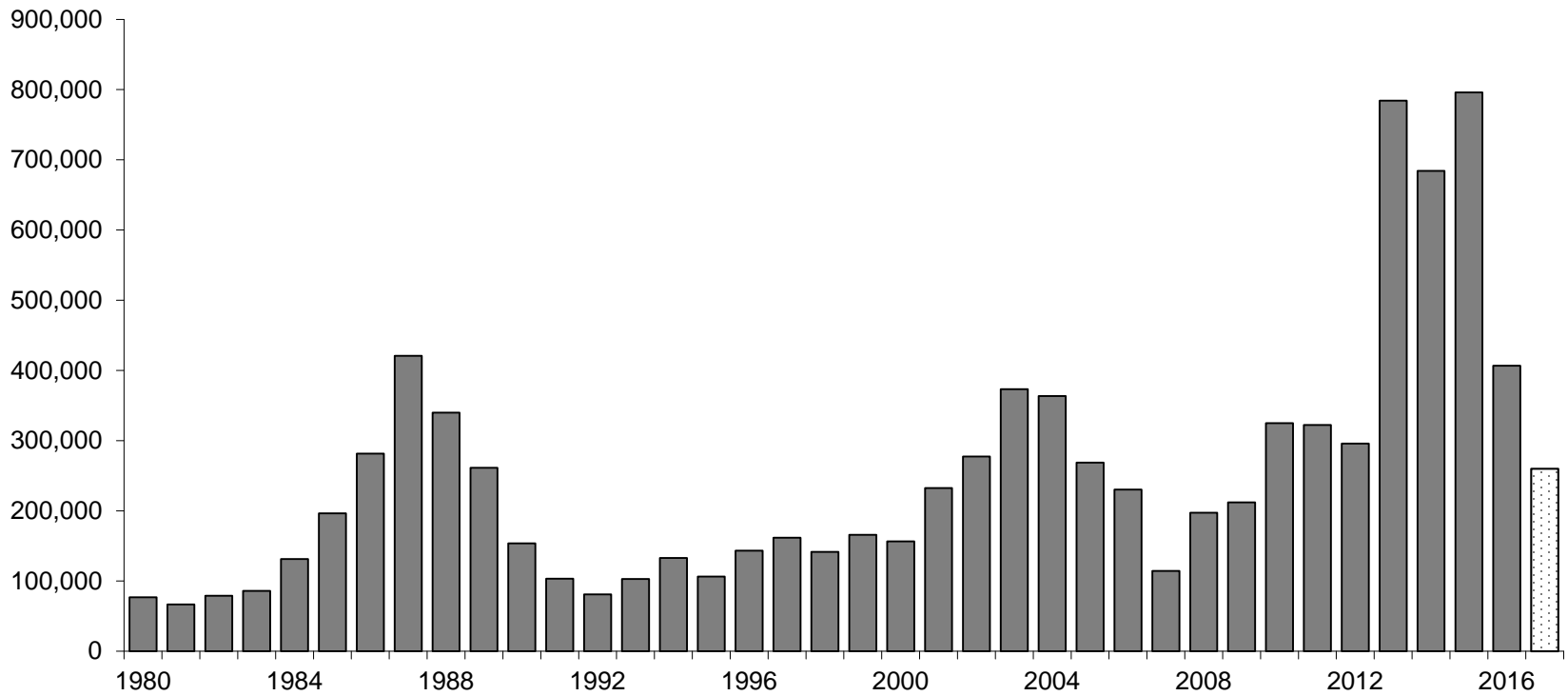
2017 Forecast:
42,100



Upriver Bright (URB) Fall Chinook

2016 Forecast: 589,900
2016 Return: 406,600

2017 Forecast:
260,000

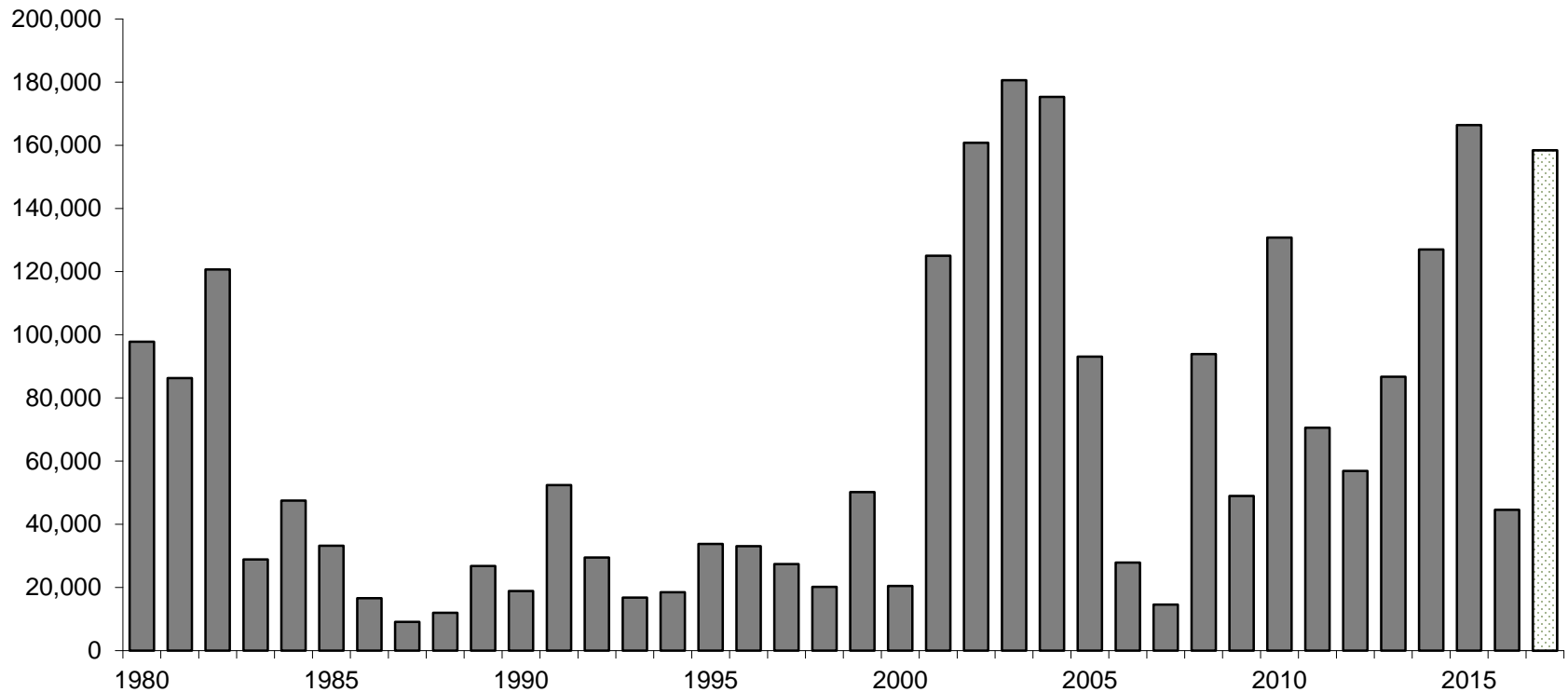


Bonneville Pool Hatchery (BPH)

Fall Chinook

2016 Forecast: 89,500
2016 Return: 44,600

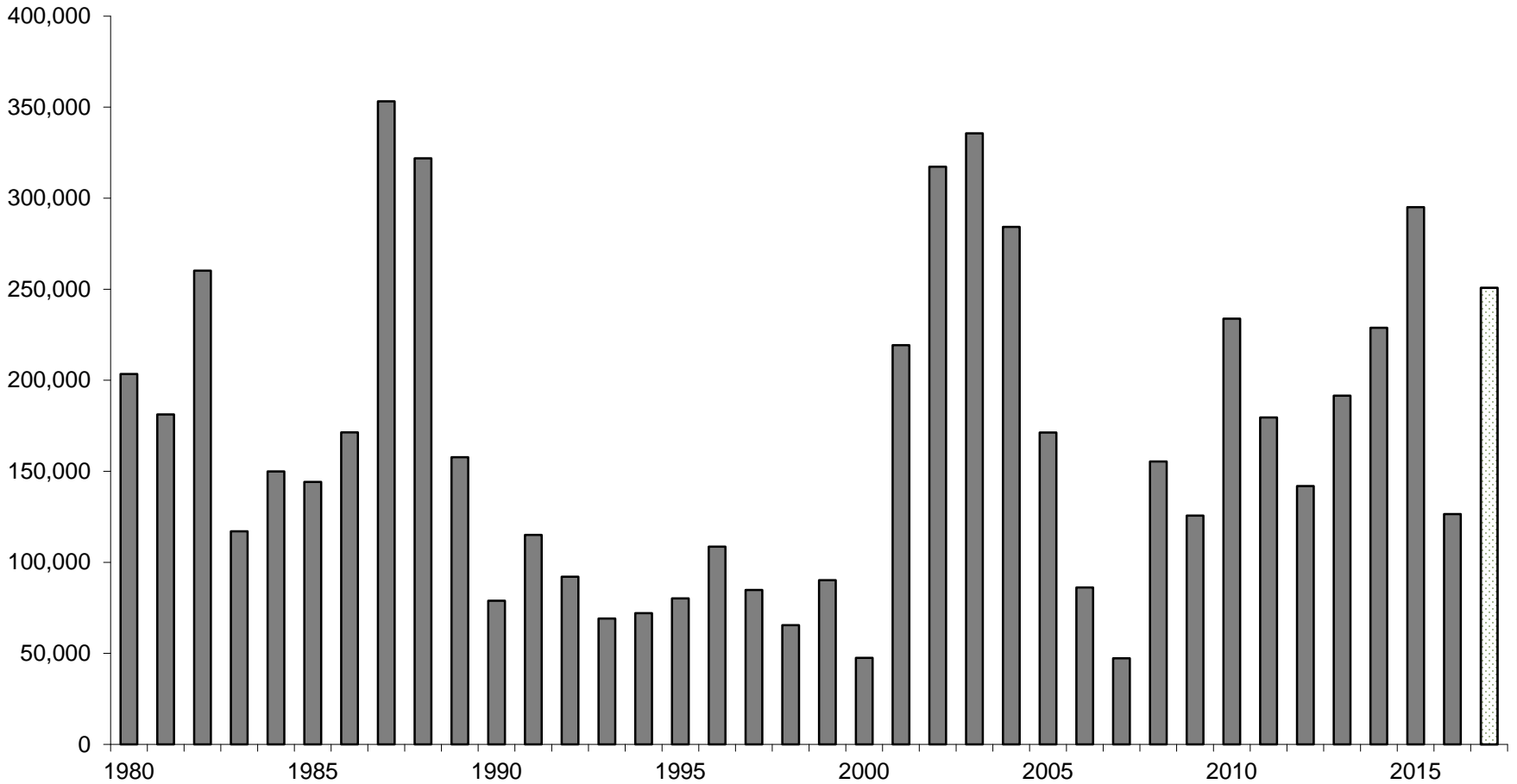
2017 Forecast: 158,400



Total Tule Fall Chinook

2016 Forecast: 223,200
2016 Return 126,500

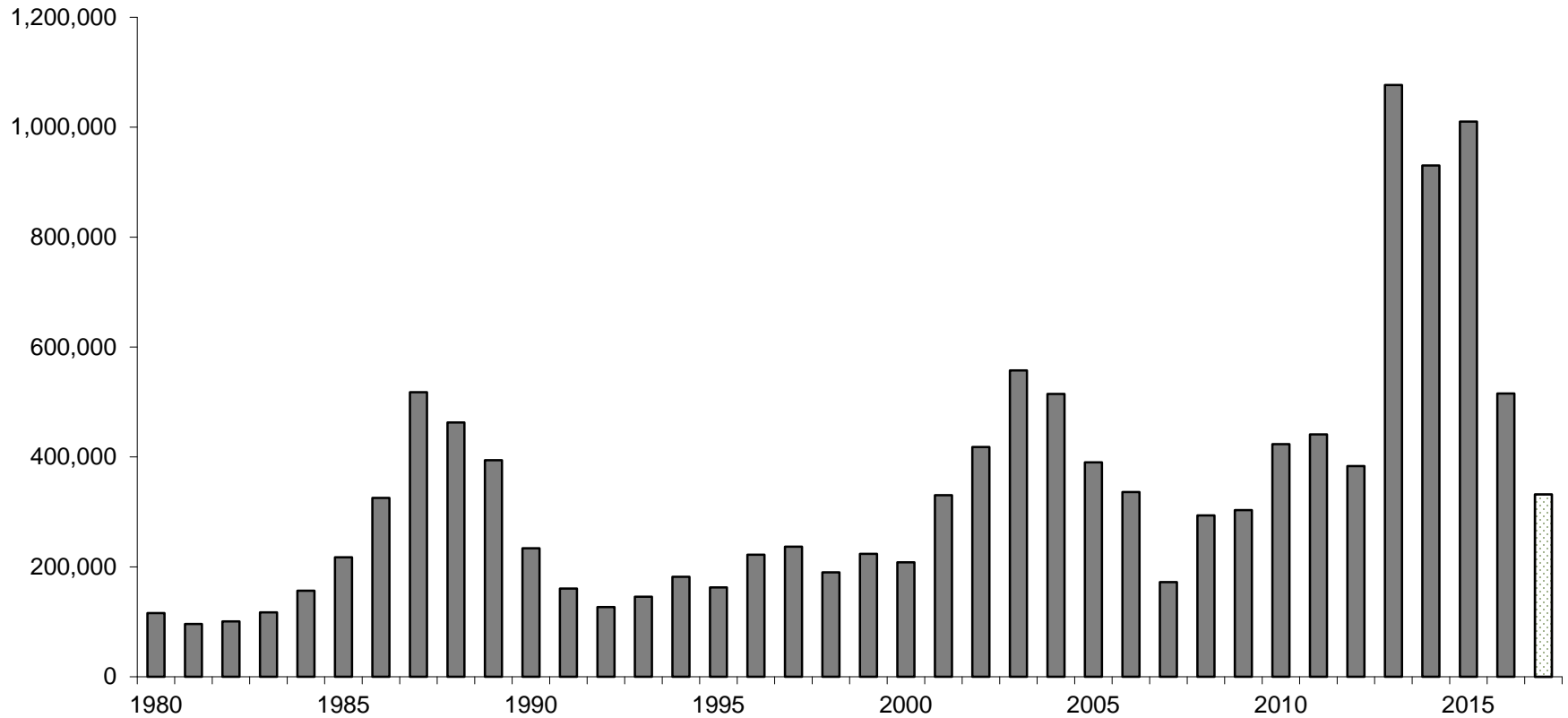
2017 Forecast:
250,800



Total Bright Fall Chinook

2016 Forecast: 728,800
2016 Return: 515,400

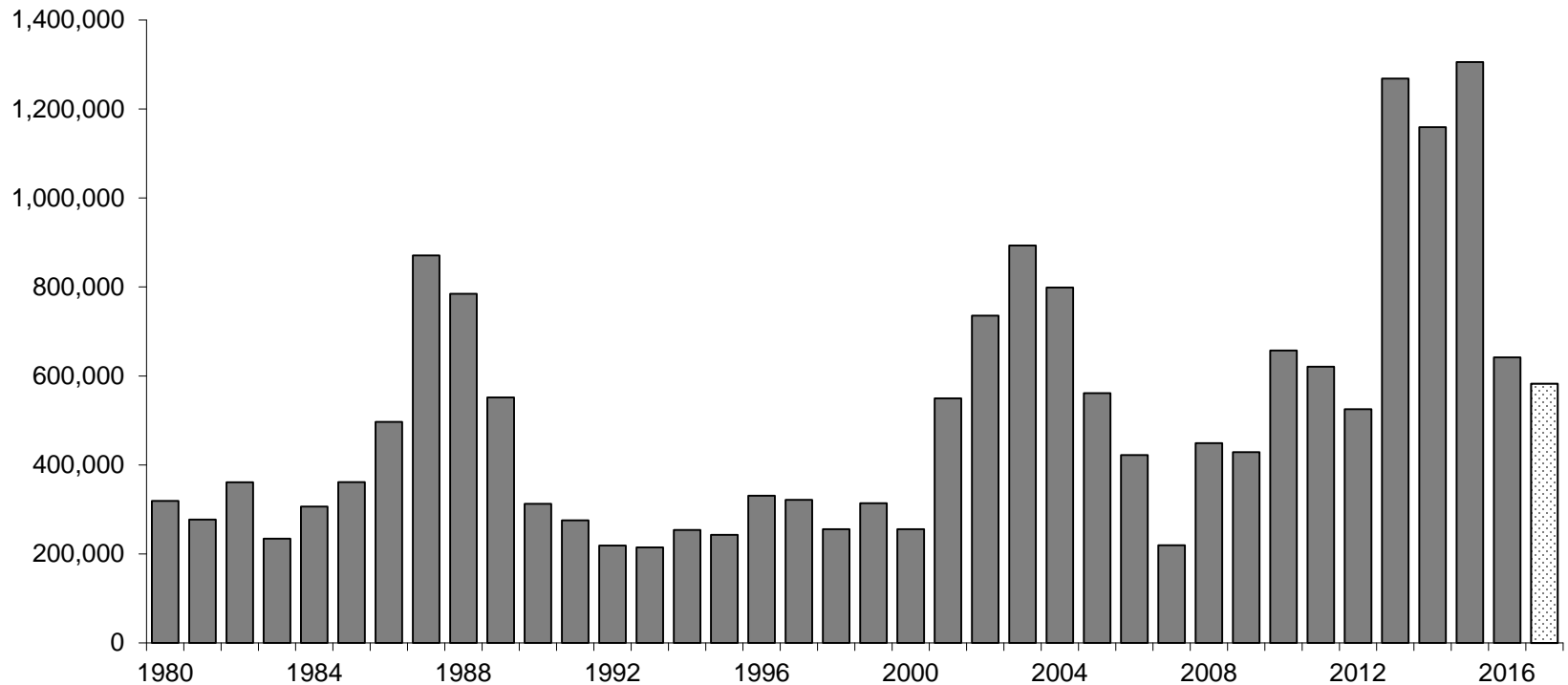
2017 Forecast:
332,000



Total Fall Chinook

2016 Forecast: 951,200
2016 Return: 641,900

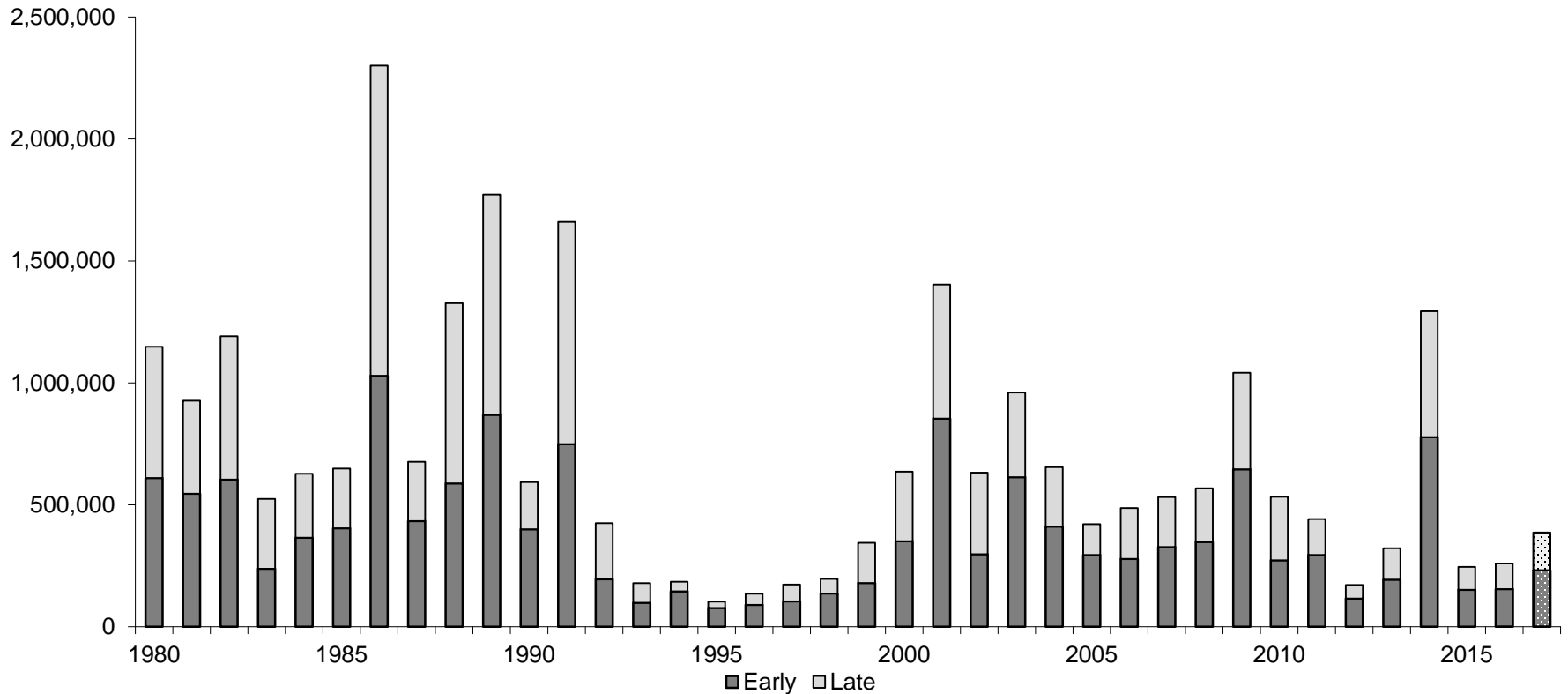
2017 Forecast:
582,600



Columbia River Coho Ocean Abundance

2016 Forecast: 380,600
2016 Return: 259,000

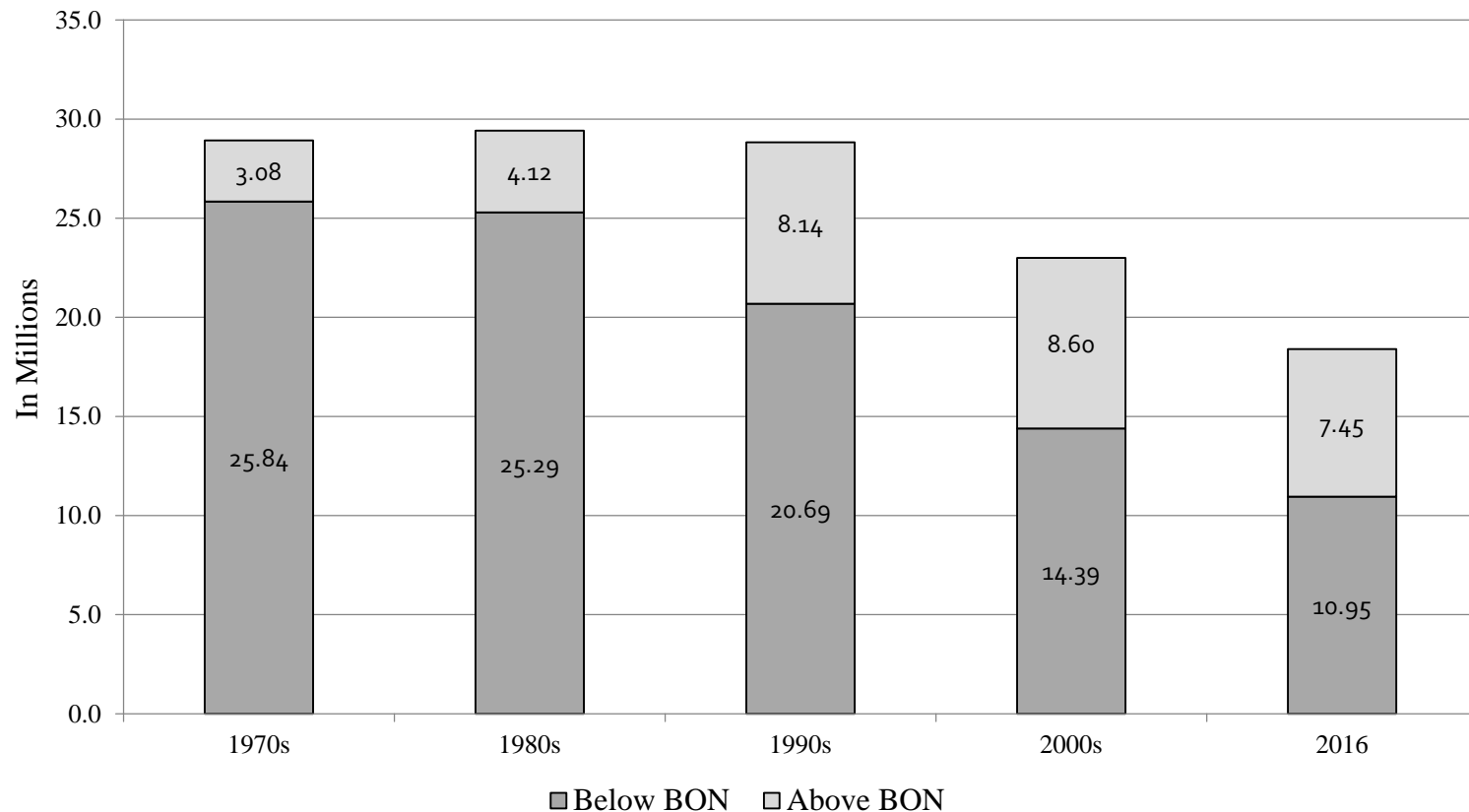
2017 Forecast: 386,300
Early Stock: 231,700
Late Stock: 154,600



LCN Coho Exploitation Matrix

- Marine Survival Index
(Hatchery Jack returns per smolt released)
 - Very Low $\leq 0.06\%$
 - Low $\leq 0.08\%$
 - Medium $\leq 0.17\%$
 - High $\leq 0.40\%$
 - Very High $> 0.40\%$
- Allowed Exploitation Rate:
 - Very Low 10%
 - Low 15%
 - Medium 18%
 - High 23%
 - Very High 30%
- The marine survival index is 0.13% (medium) and the average 'seeding' for the indicator populations is 100% - well above the 30% minimum.
- Based on this information, the allowable exploitation rate for 2017 is 18%.

Columbia River Coho Releases *(in millions of fish)*



Columbia River Coho - recap

- Survival rates have remained relatively stable in the 2000's (albeit, relatively low in 2016).
- Upriver coho releases increased steadily during 1970-1998, and have stabilized since.
- Lower Columbia River hatchery Coho releases have decreased overall since 1990's.
- Based on the new Coho matrix, the allowable exploitation rate in 2017 is 18%.

2017 Bottom Line

- Good Fall Chinook return forecasted
 - Below recent average returns forecasted for most stocks
 - Estimate 582,600 adults, still a good return
- Fair Columbia River Coho ocean forecast
 - Below average returns forecasted for both stocks
 - Forecast is about 71% of the 10 year average
 - Estimate 386,300 adults (60% 'S' stock)

Questions?

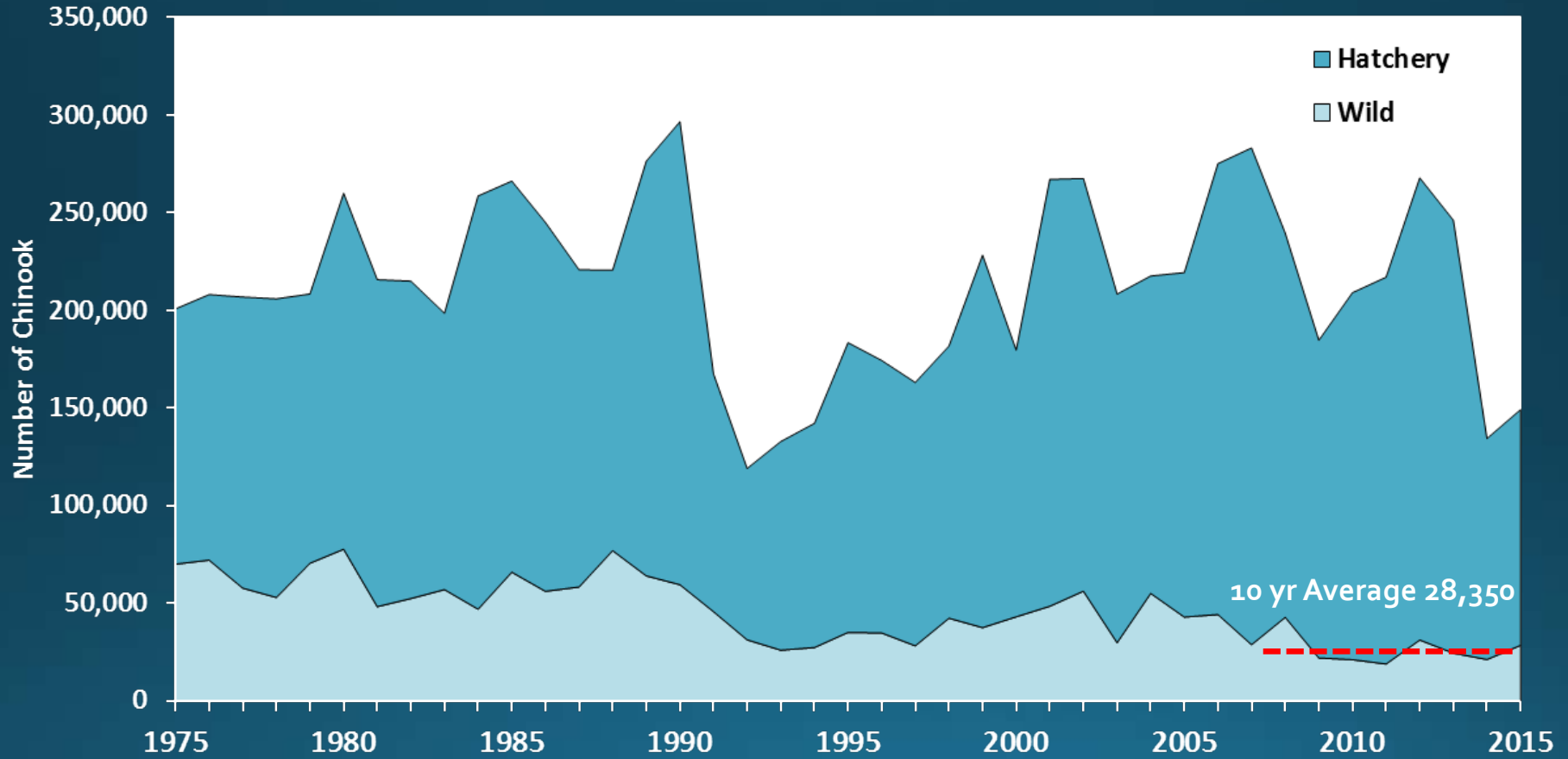


WA Coast and Puget Sound 2015 Returns and 2016 Forecasts

Chinook Salmon



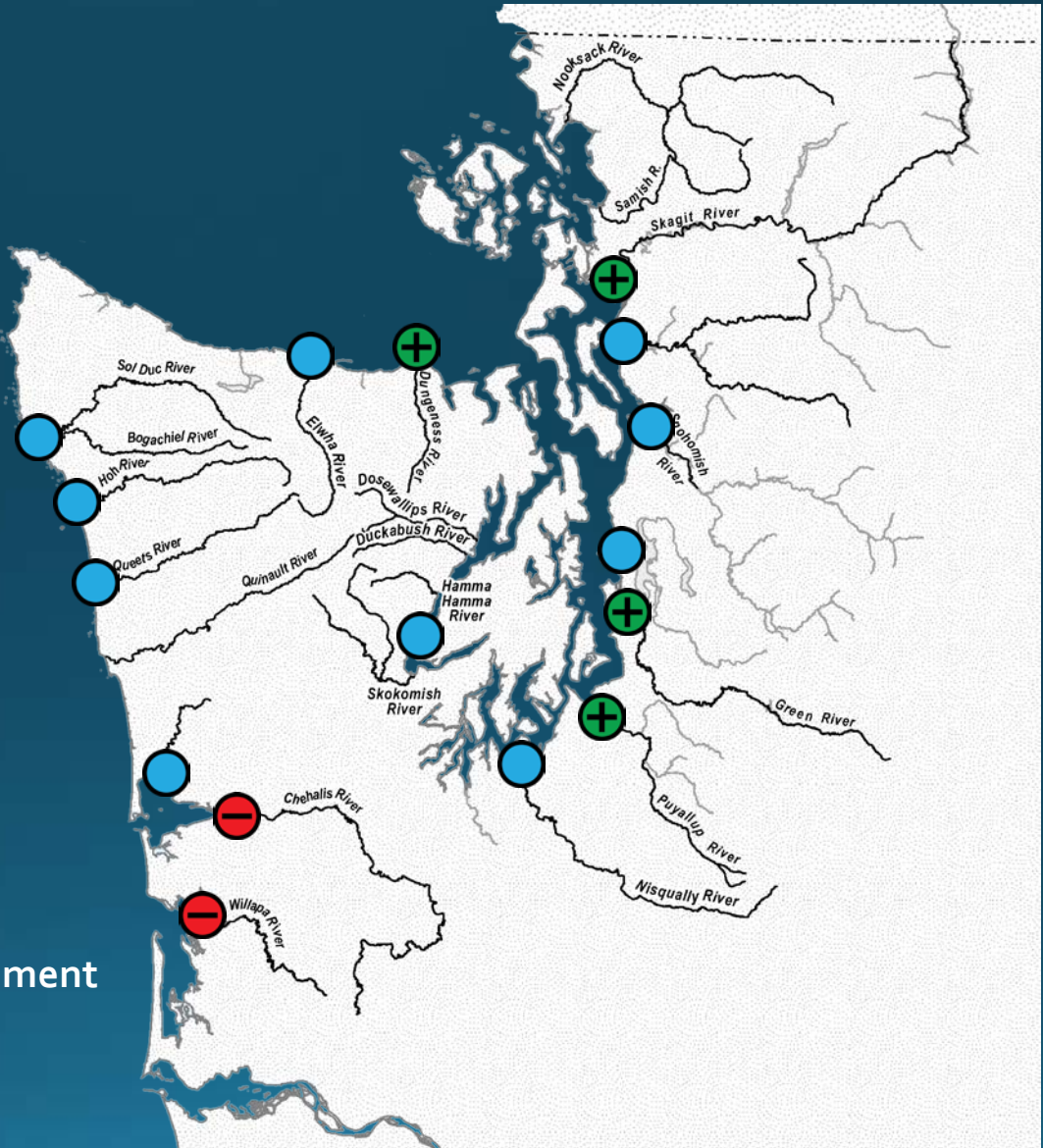
Chinook Historical Runsize – Puget Sound



2016 Wild Fall Chinook Returns



- All returns are preliminary
- Returns range from **Good** to **Poor**
- All Puget Sound rivers **Neutral to Good**



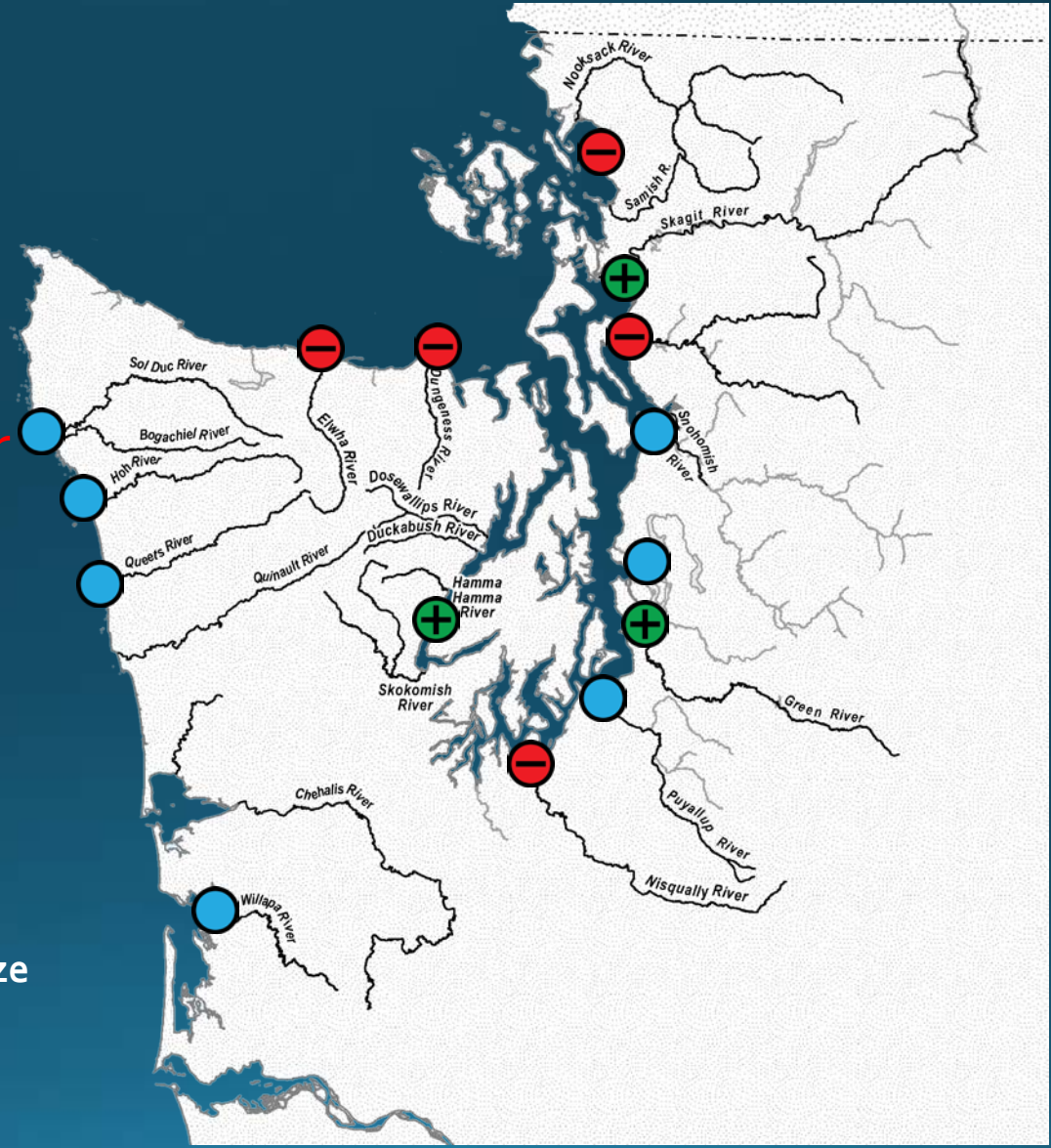
Relative to Recent 10yr Avg. Escapement

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

2017 Wild Fall Chinook Forecasts



- Forecasts in Puget Sound and Coast range from **Poor** to **Good**
- Coastal forecast are all **Neutral**
 - (Chehalis and Quinault forecasts not included)

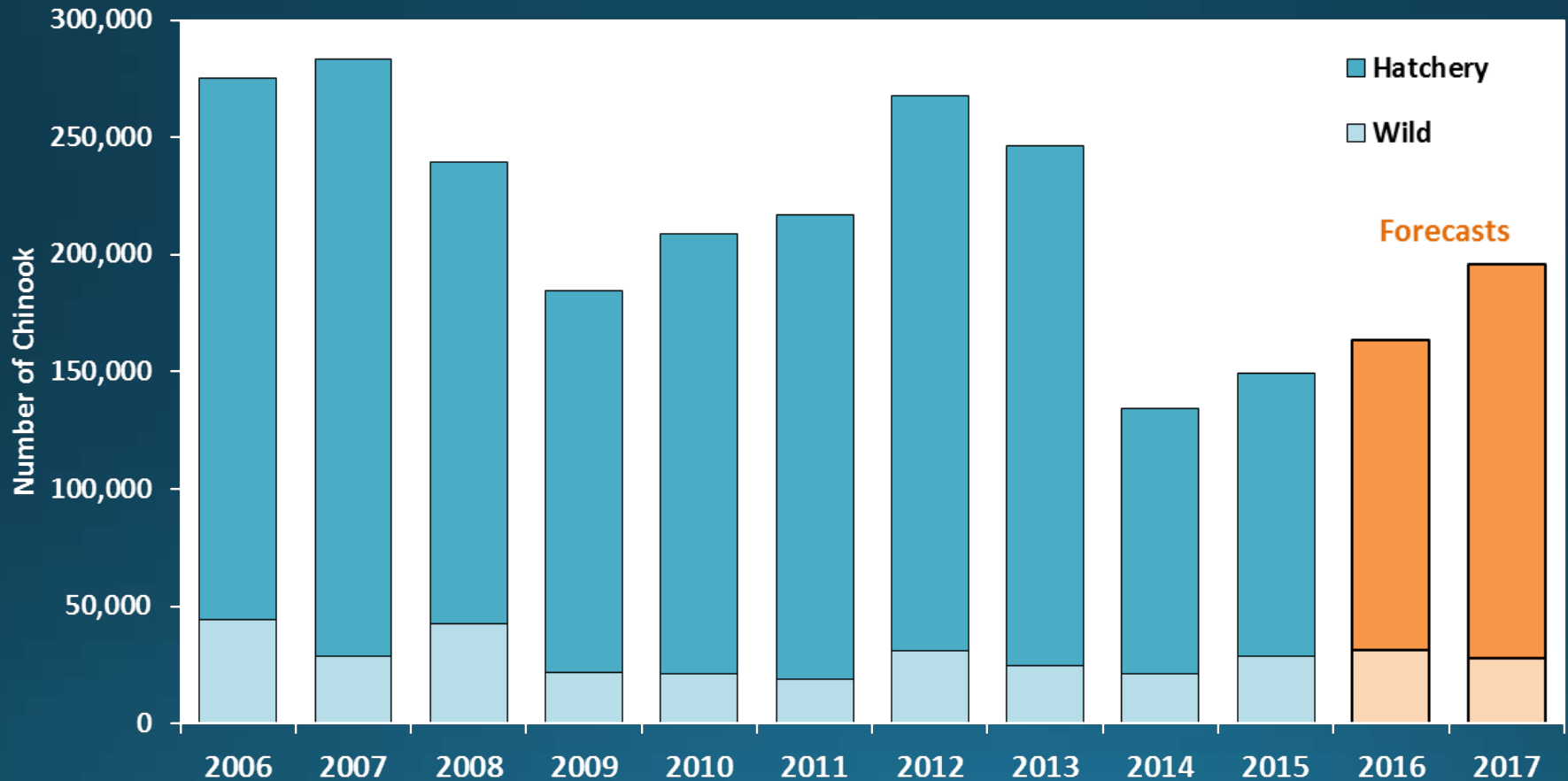


Relative to Recent 10yr Avg. Runsize

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

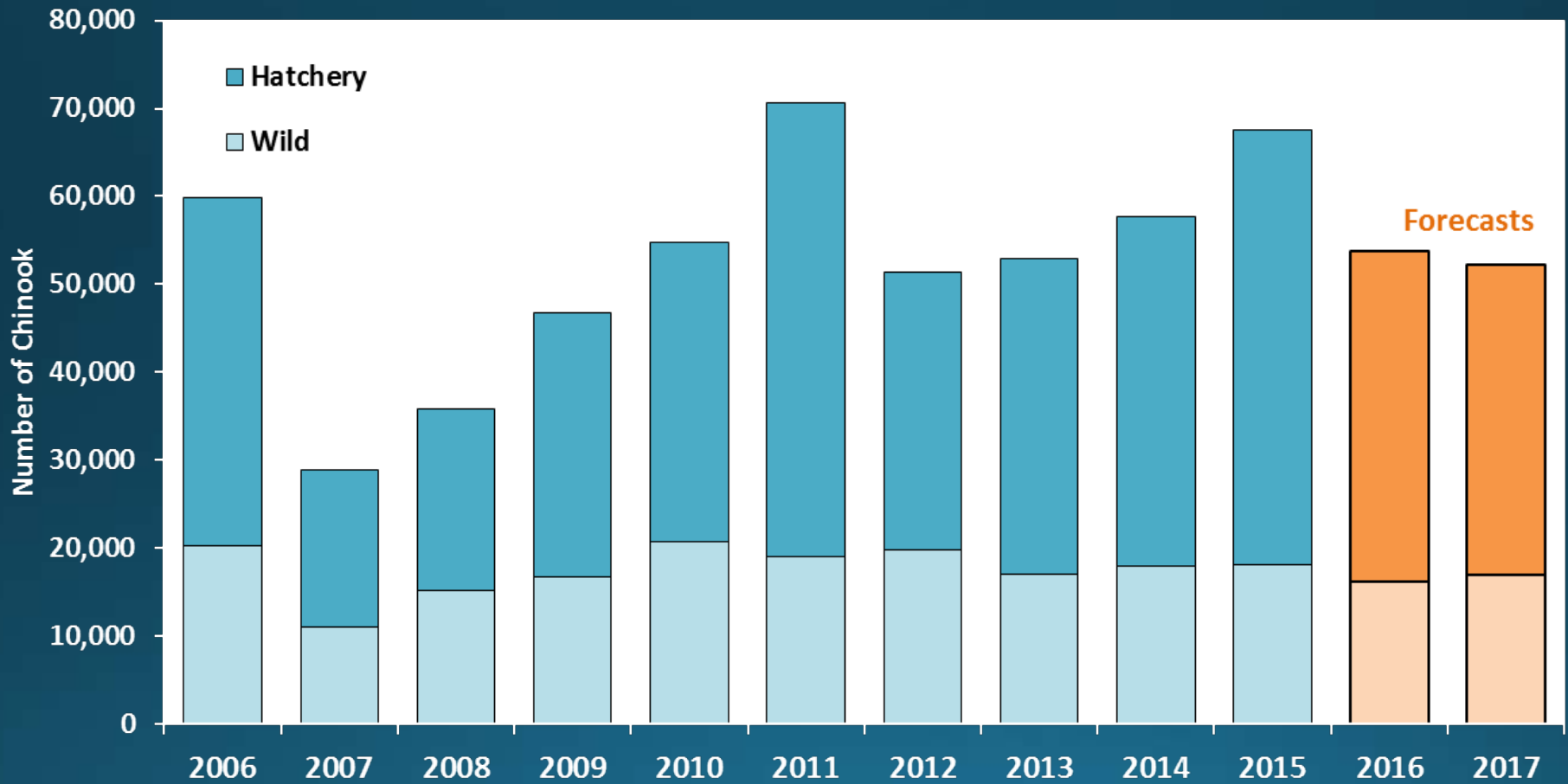
P. Sound Hatchery Chinook Forecasts

Puget Sound hatchery Chinook forecast ↓13% from recent 10 year avg
(↑27% from 2016 forecast)



Coastal Chinook Forecasts

The Coastal Chinook forecast is equal to the recent 10 year avg.



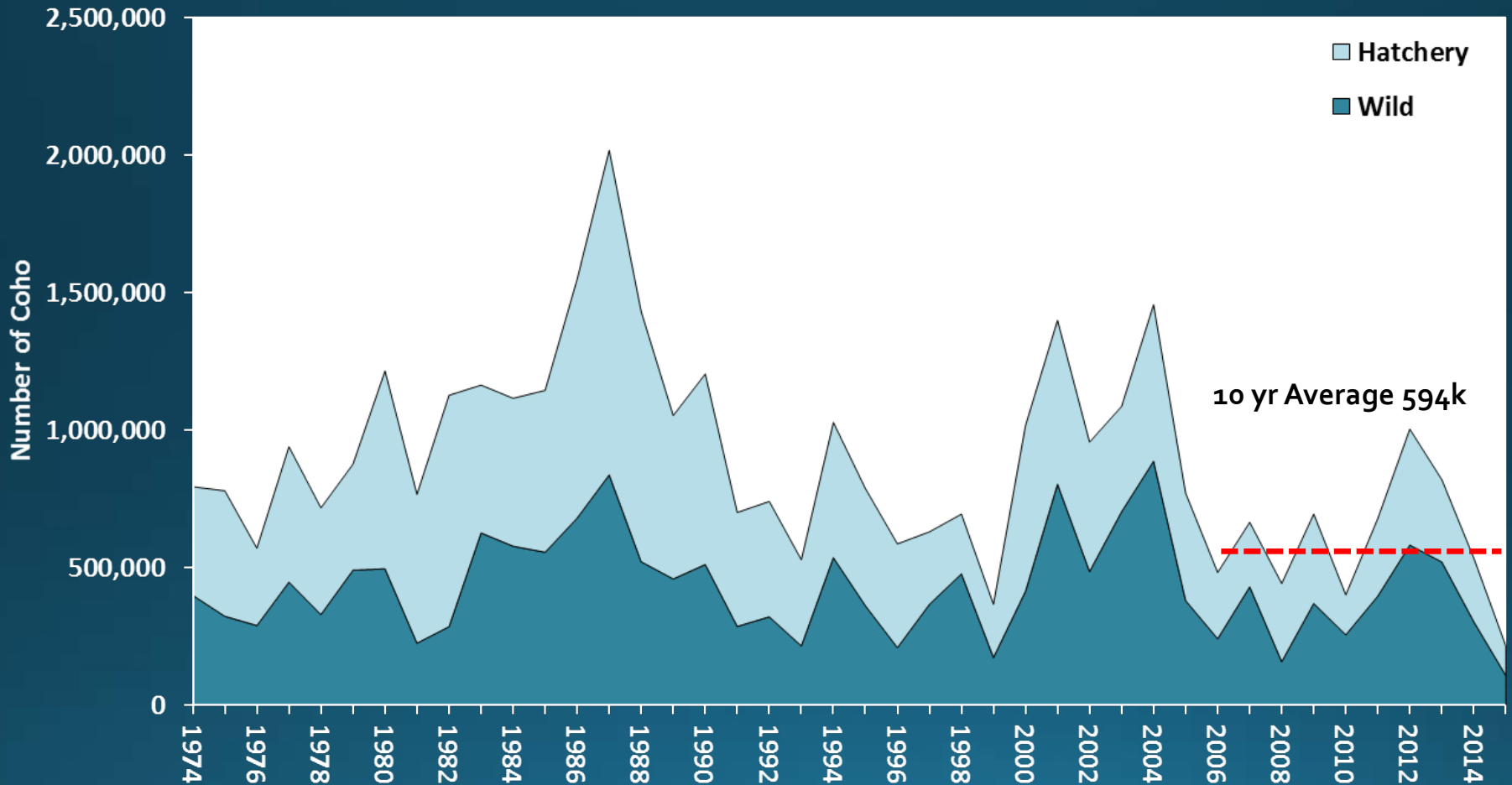
*Excludes Grays Harbor and Quinault

Coho



Thomas Kline

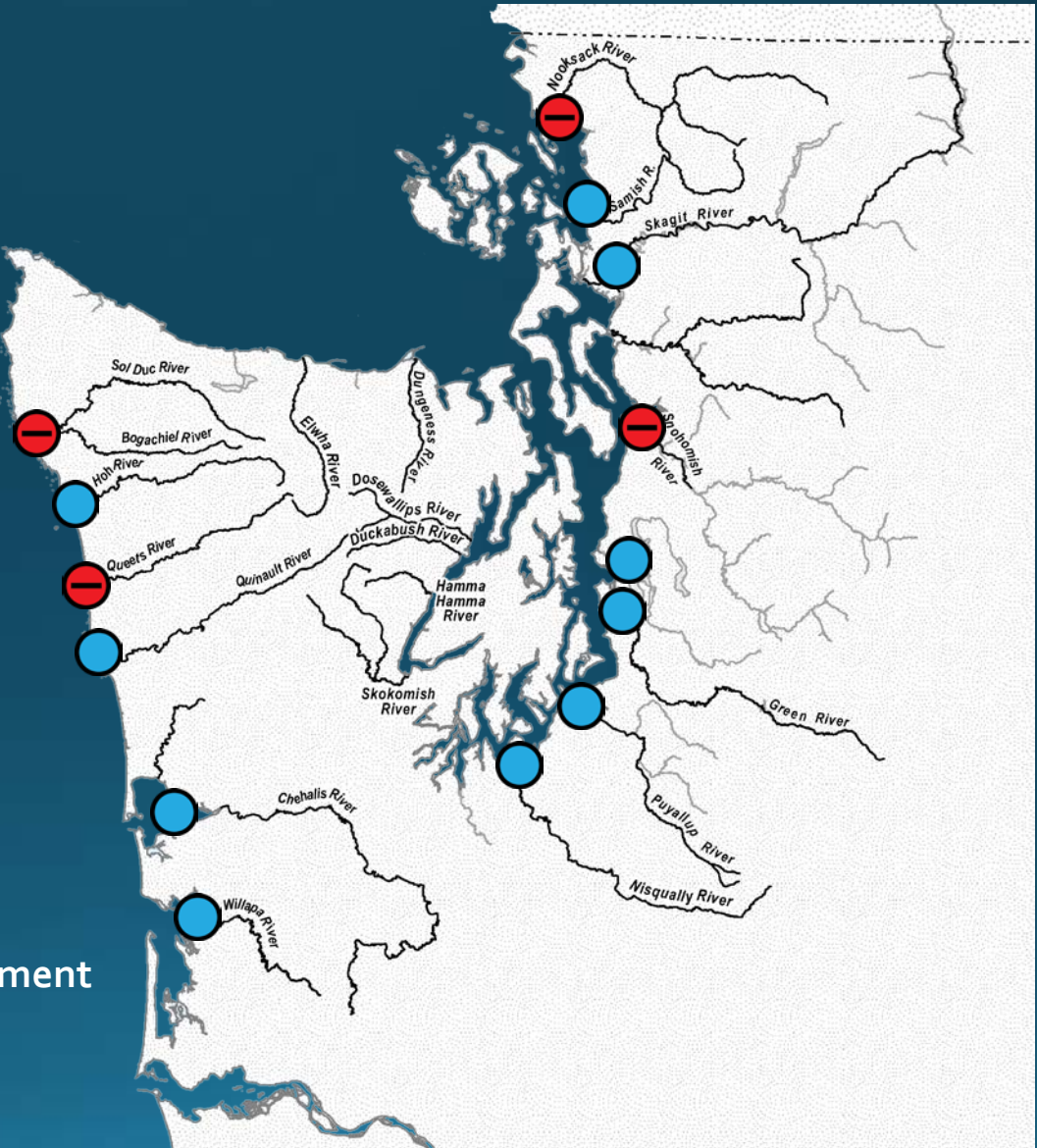
Coho Historical Runsize – Puget Sound



2016 Wild Coho Returns



- Returns ranged from **Poor** to **Neutral** Puget Sound and Coast
- No data available for several stocks



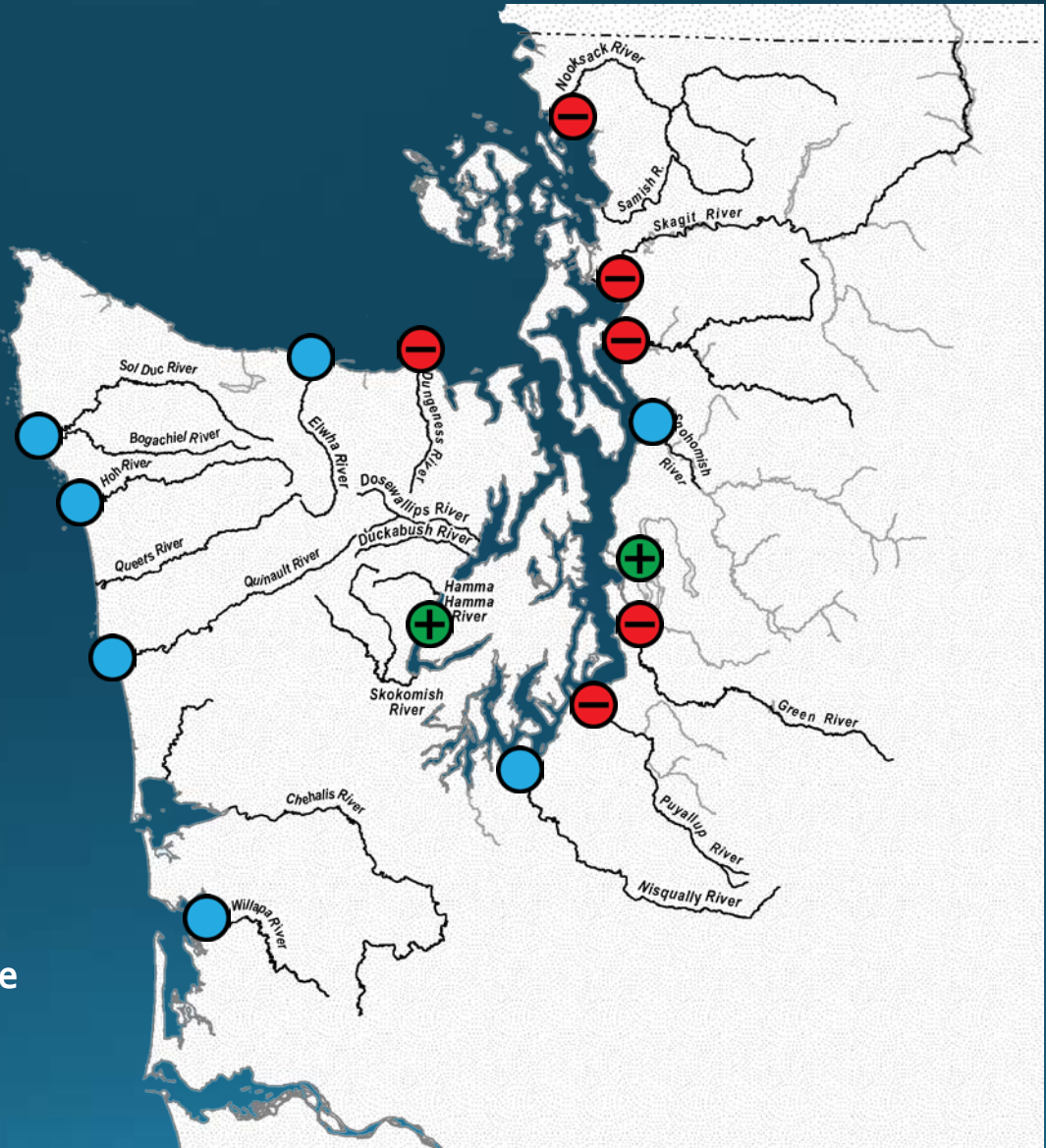
Relative to Recent 10yr Avg. Escapement

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

2017 Wild Coho Forecasts



- Forecasts range from **Poor** to **Good** across Puget Sound and coast
- Several N. Sound rivers expecting poor returns

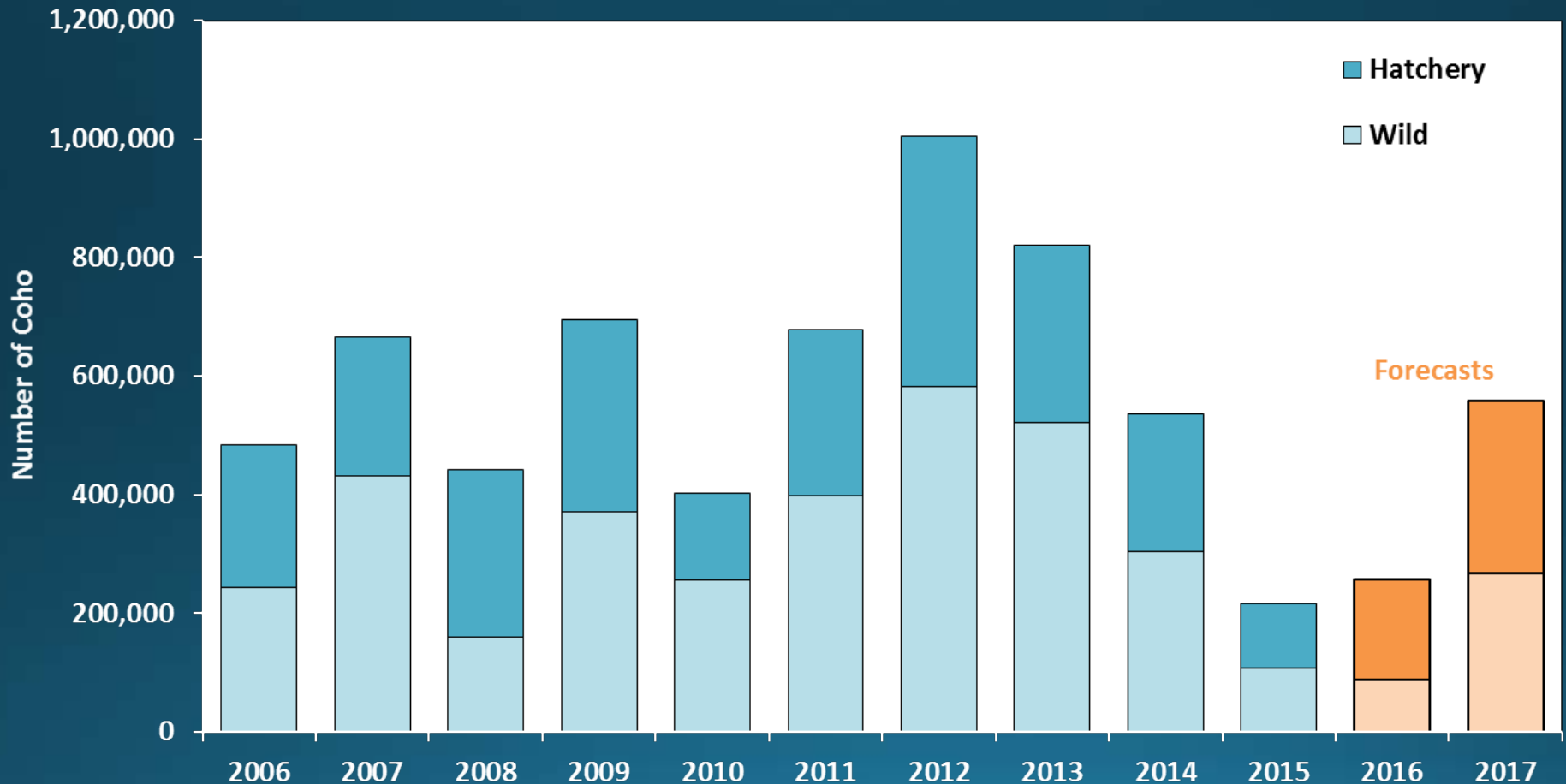


Relative to Recent 10yr Avg. Runsize

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

P. Sound Coho Forecasts

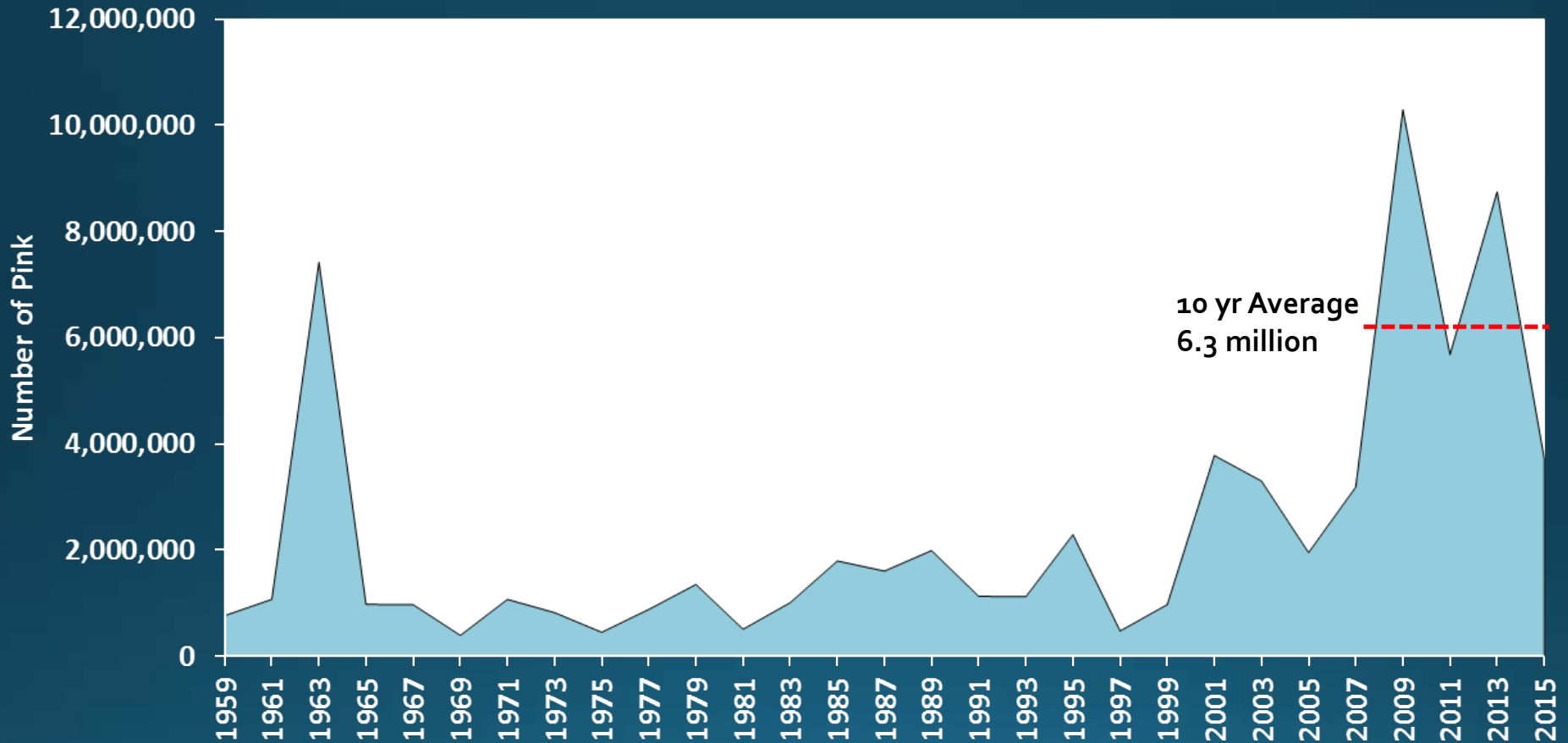
Aggregate Puget Sound Coho forecast ↓ 6% from recent 10 year avg.
(118% above 2016 forecast)



Pink



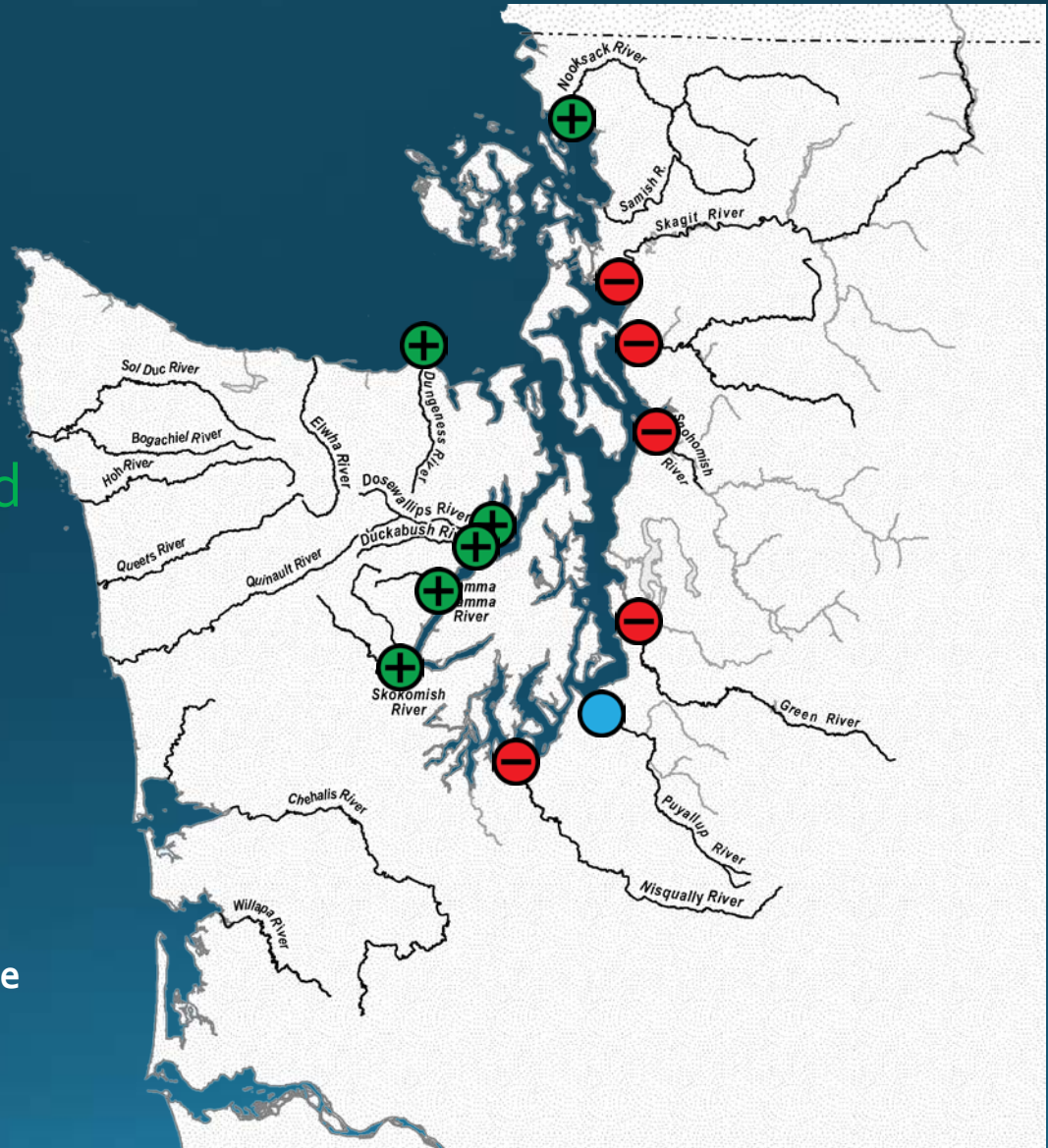
Pink Historical Runsize



2015 Pink Returns



- Returns ranged from **Good** to **Poor**
- Small body size common
- Returned during drought, followed by floods



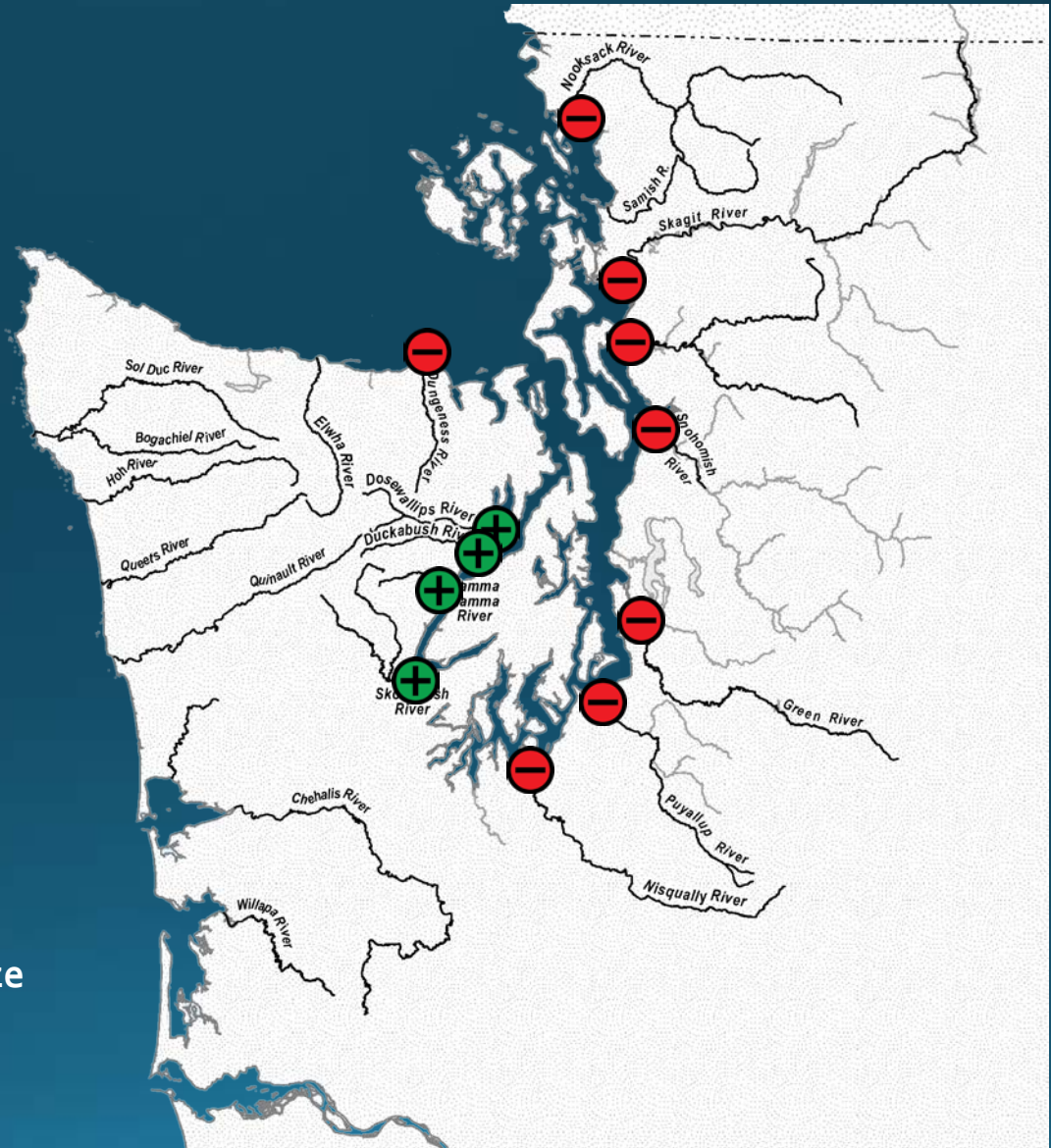
Relative to Recent 10yr Avg. Runsize

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

2017 Pink Forecasts



- Forecasts are mostly **poor**, except for Hood Canal
- Very poor outmigrating fry numbers from most systems

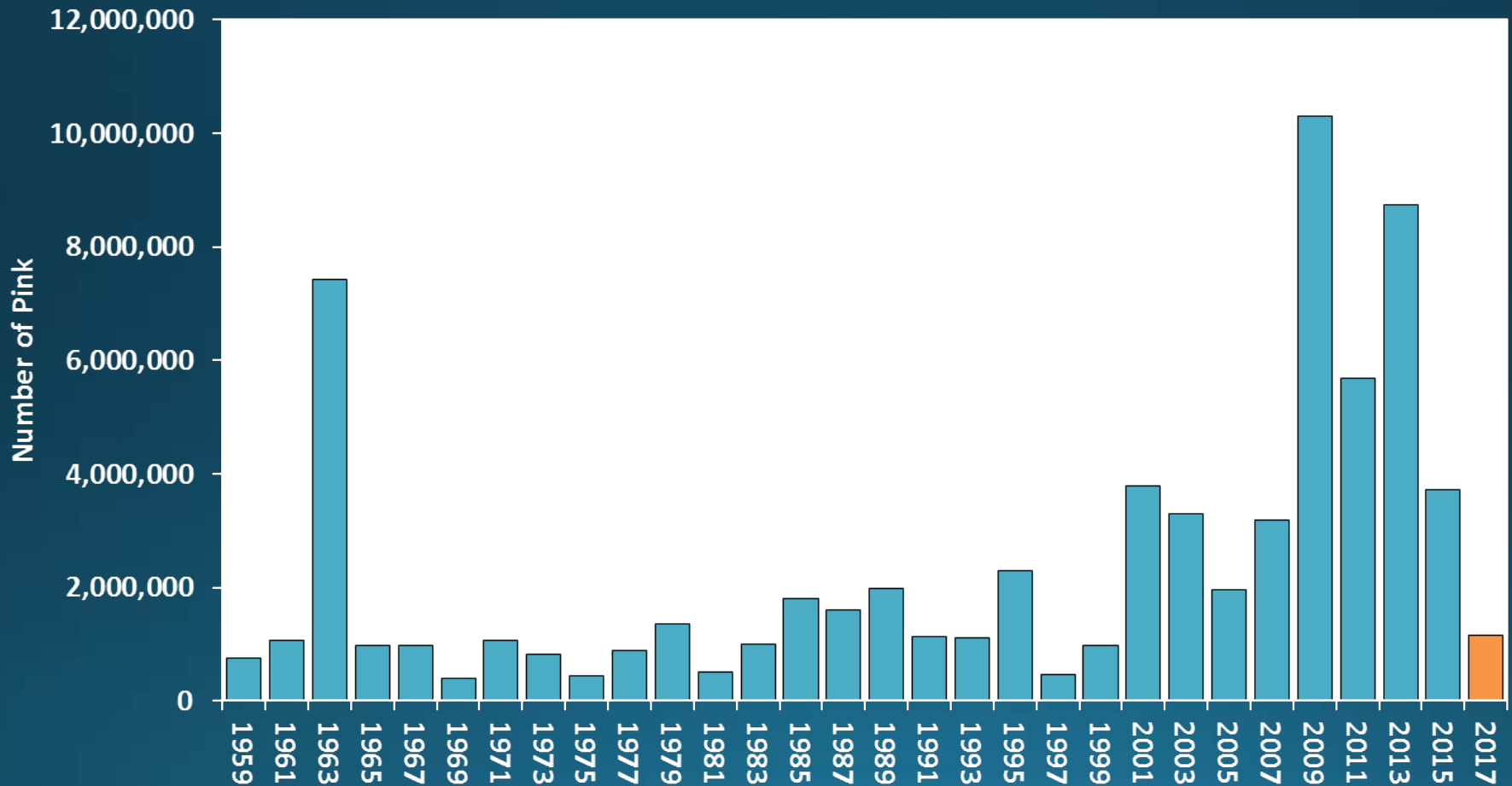


Relative to Recent 10yr Avg. Runsize

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

2017 Pink Forecasts

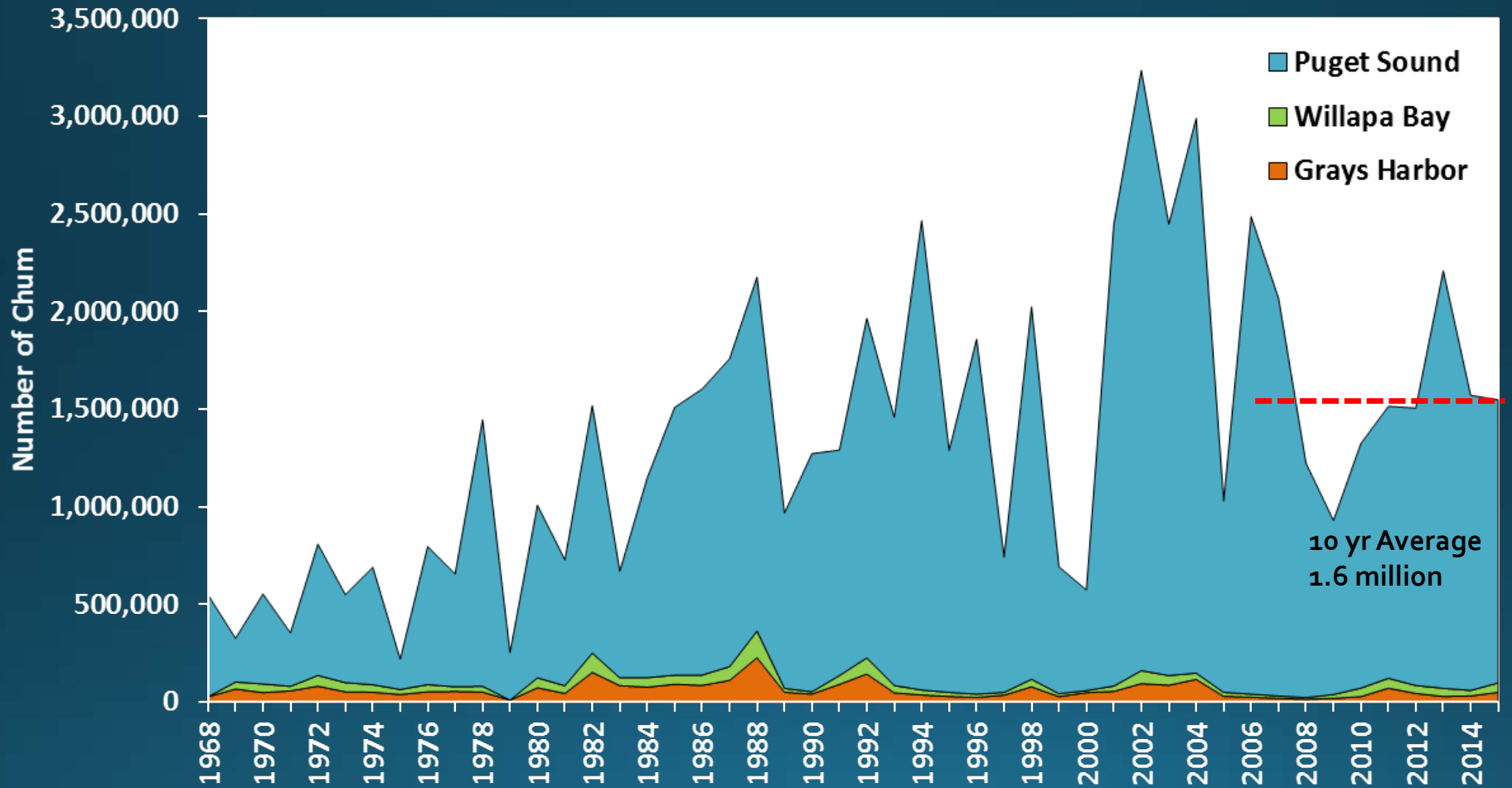
Puget Sound Pink forecast ↓ 82% from recent 10 year avg.



Chum



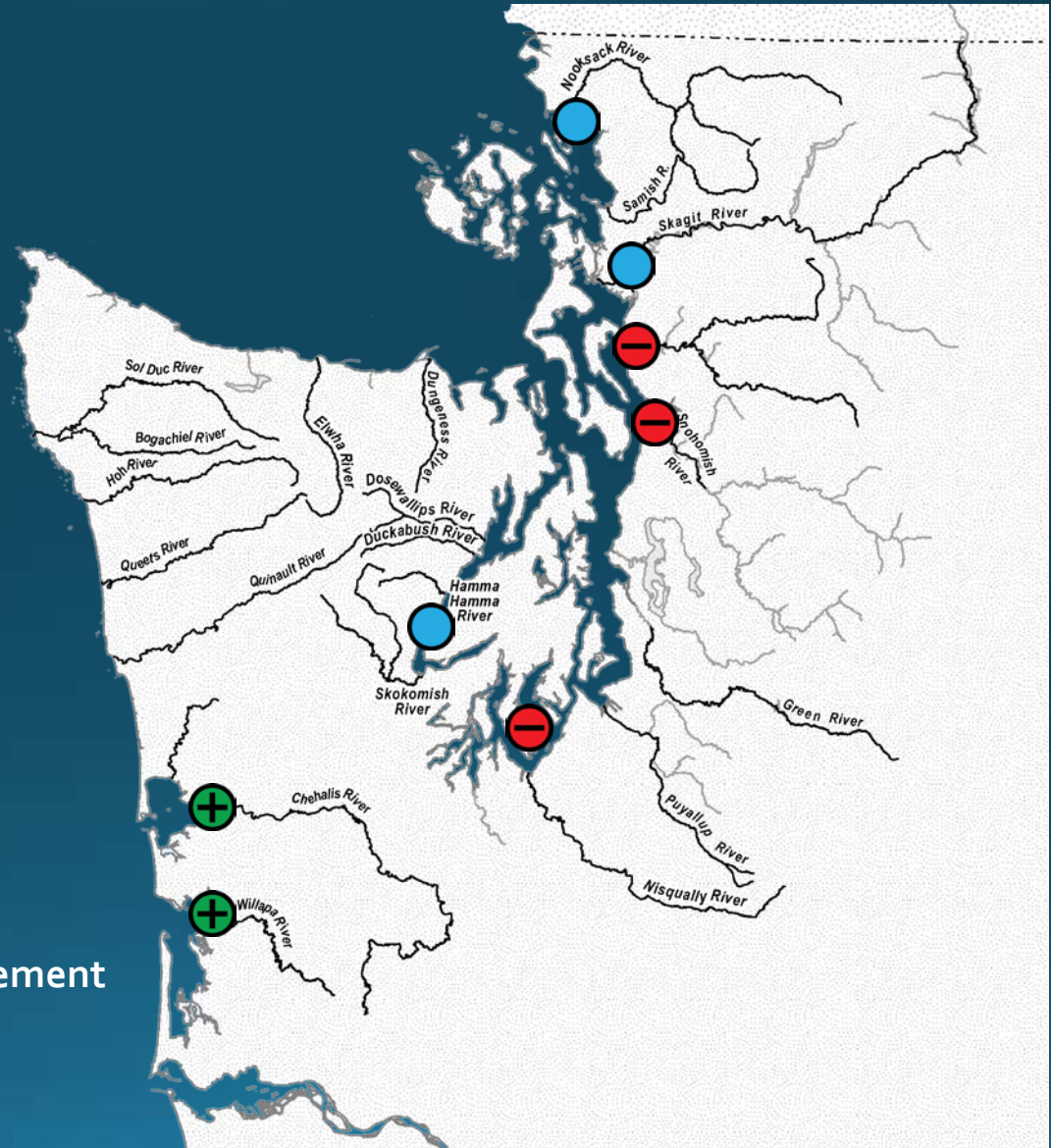
Chum Historical Runsize



2016 Fall Chum HOR/NOR Returns



- Returns ranged from **Good** to **Poor**
- Hood Canal and S. Puget Sound are relative to in-season updated runsizes, not escapement



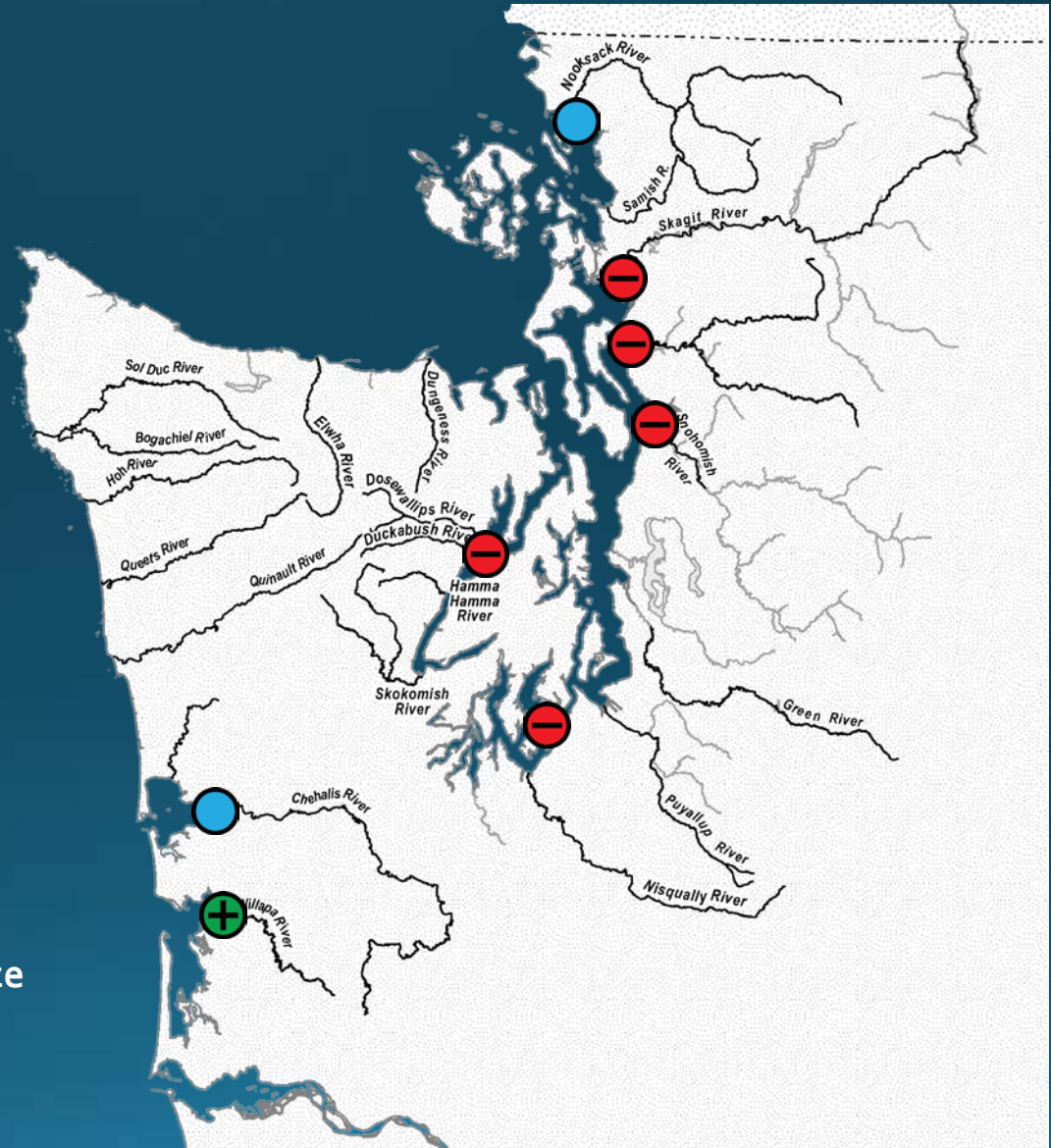
Relative to Recent 10yr Avg. Escapement

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

2017 Fall Chum HOR/NOR Forecast



- Forecasts range from **Good** to **Poor**
- Hood Canal - 493k
- Central/S. Sound - 433k
- Coast - Willapa - 58k
Grays H - 31k

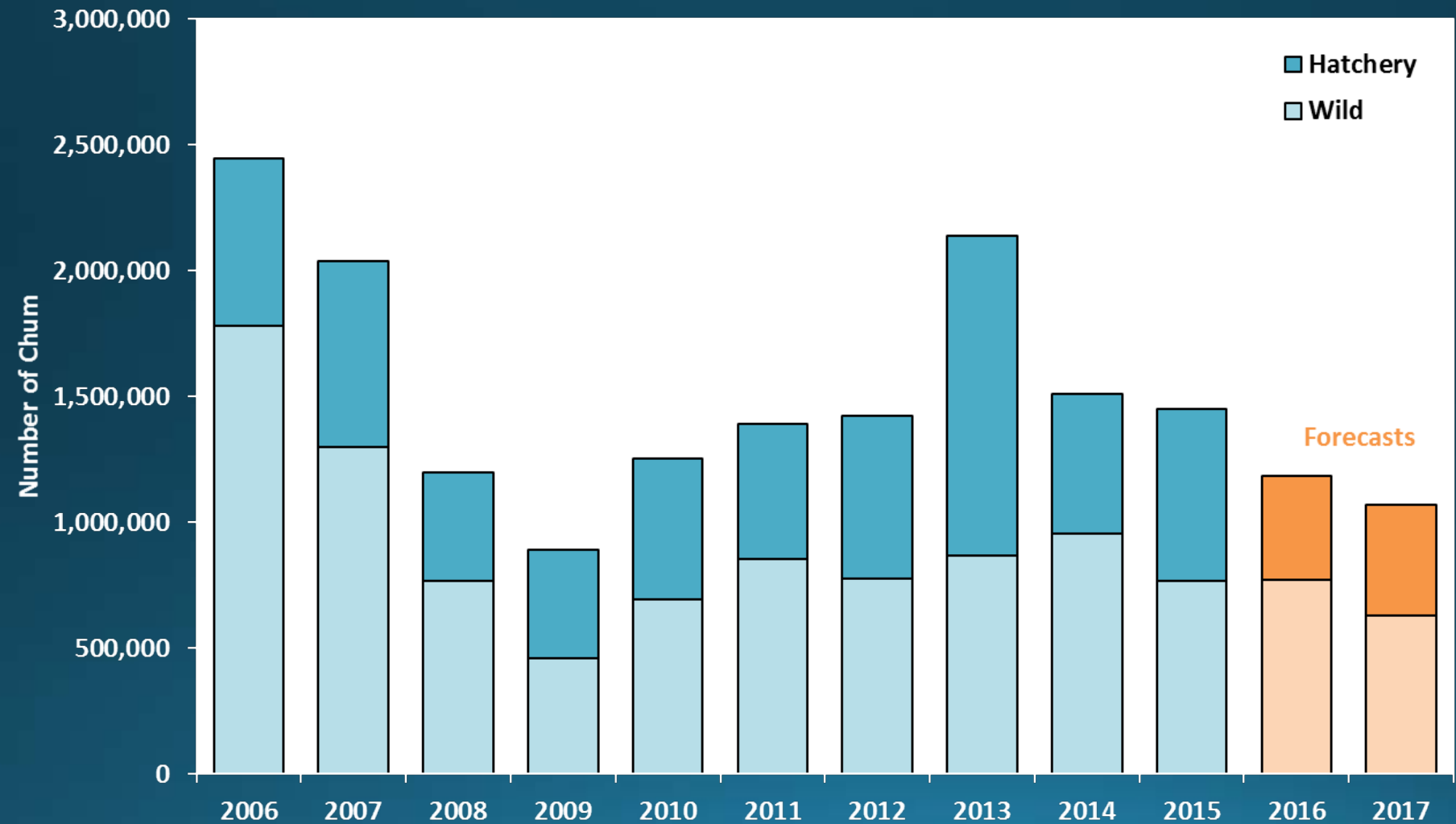


Relative to Recent 10yr Avg. Runsize

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

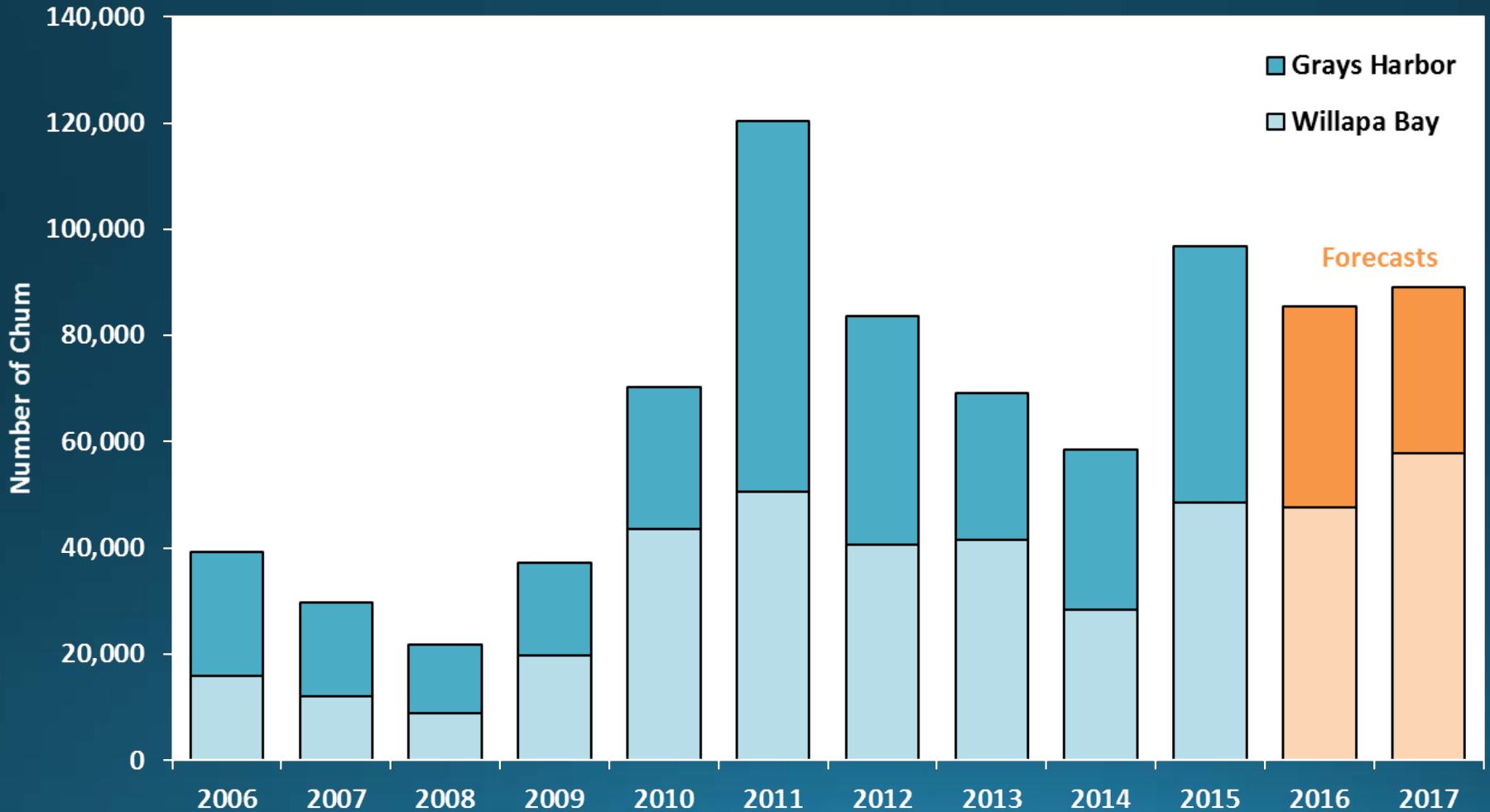
Puget Sound Chum Forecasts

Hatchery ↓ 33% and Wild ↓ 32% over recent 10 year avg.



Coastal Chum Forecasts

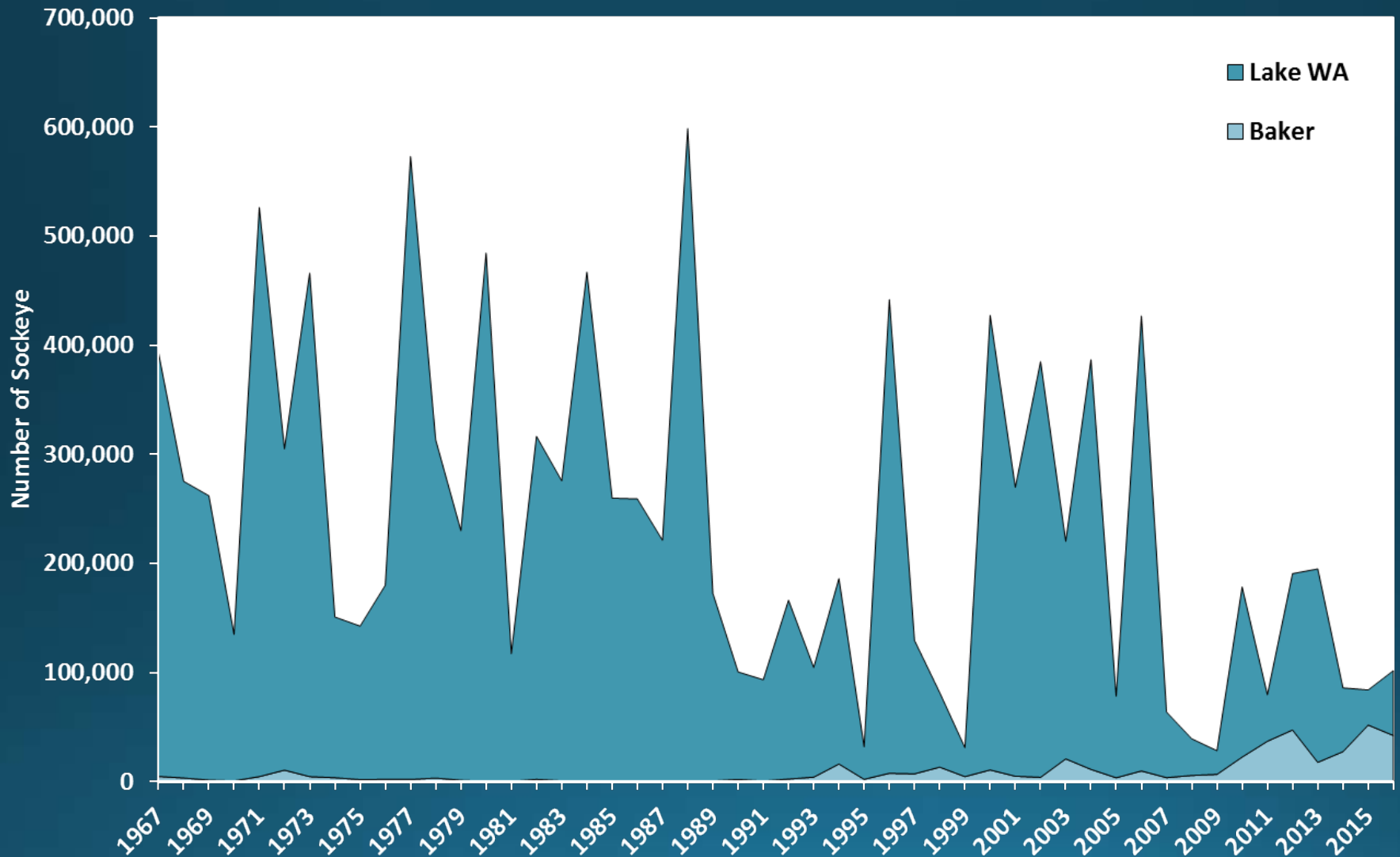
Willapa Bay \uparrow 86% and Grays Harbor \downarrow 1% over recent 10 year avg.



Sockeye



Puget Sound Sockeye Runsize



2016 Sockeye HOR/NOR Returns



- Returns ranged from **Good** to **Poor**



Relative to Recent 10yr Avg. Escapement

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

2017 Sockeye HOR/NOR Forecast



- Baker Lake – 47k
- Lake WA – 77k
- Columbia river - 192k

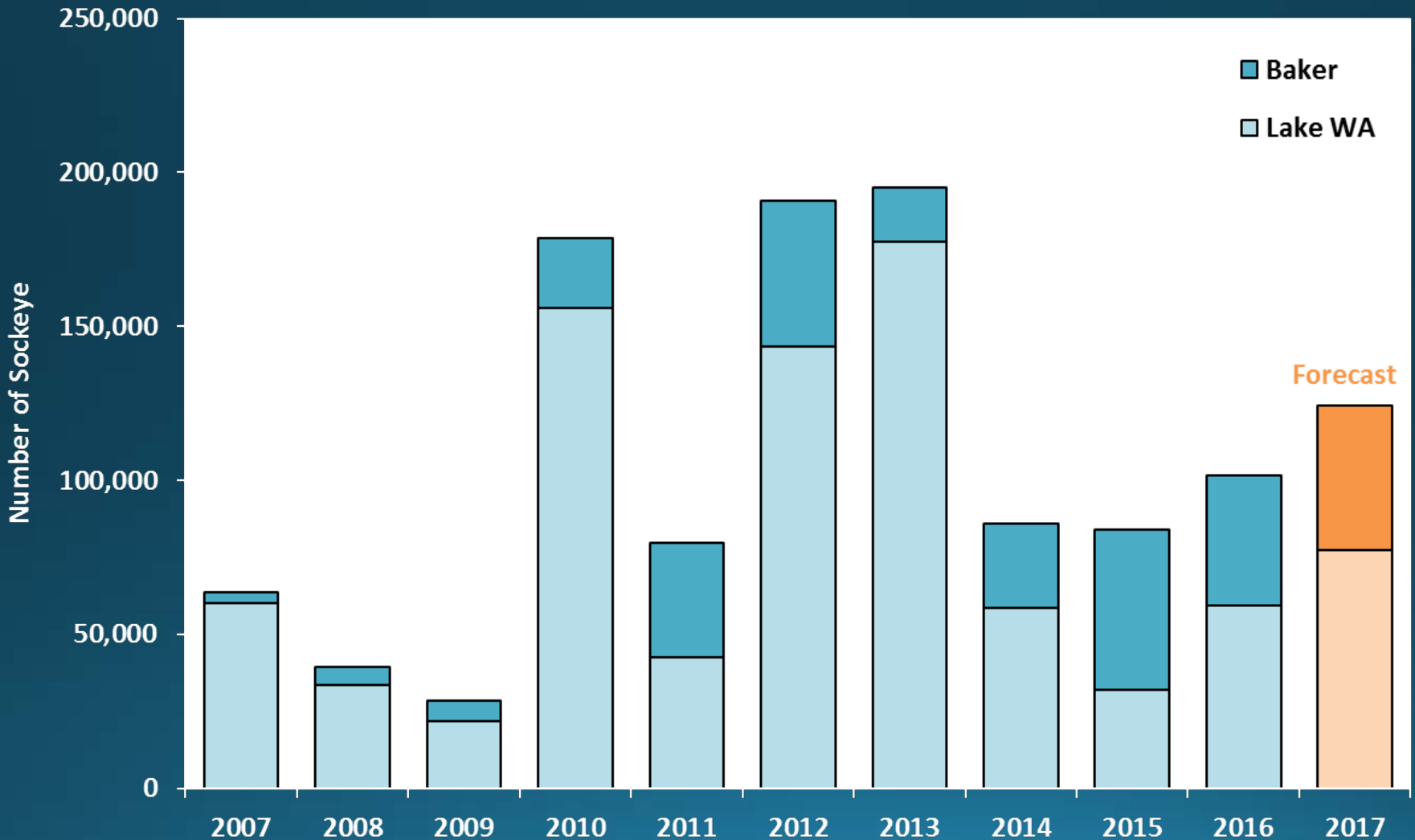


Relative to Recent 10yr Avg. Runsize

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

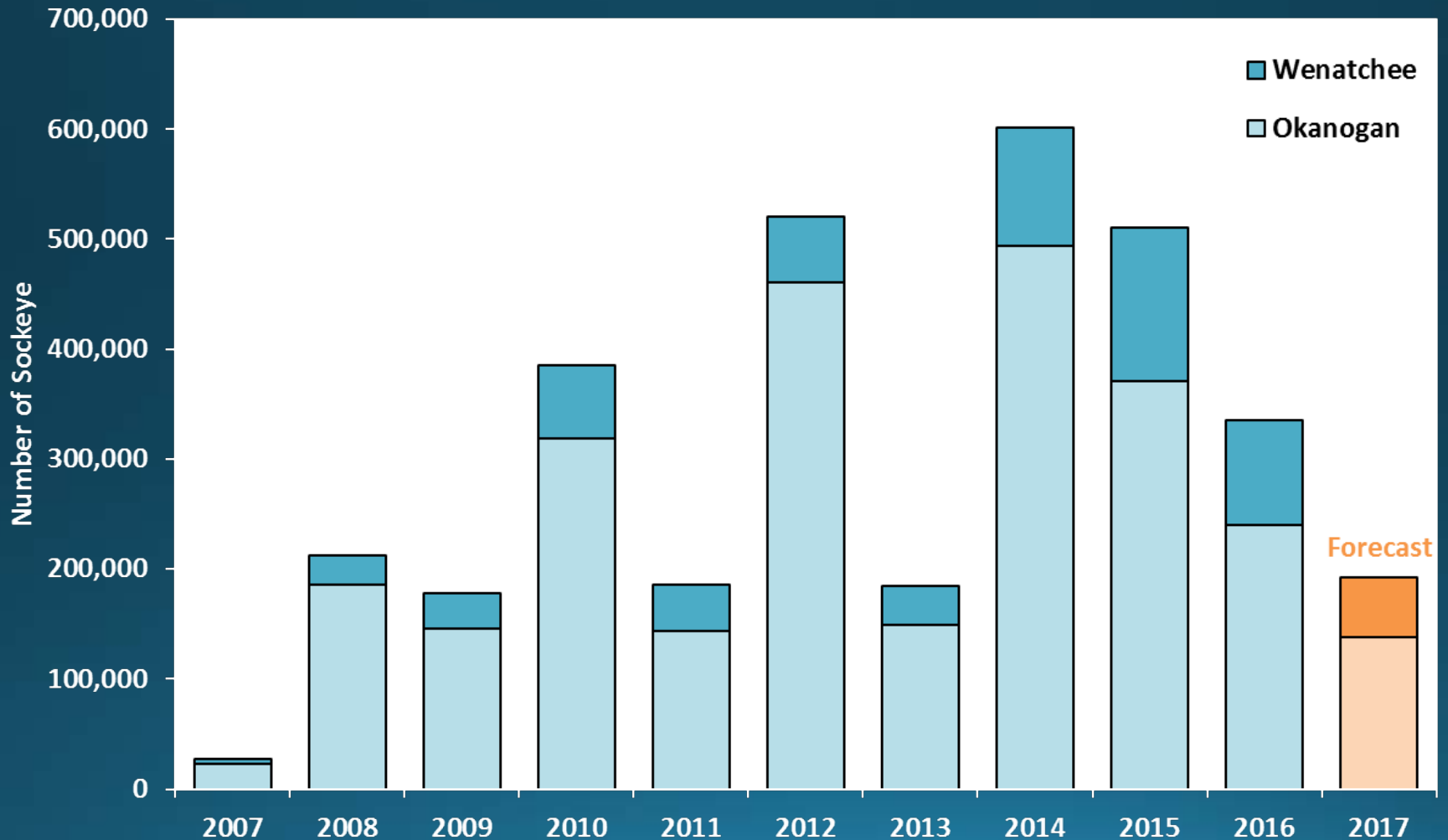
Puget Sound Sockeye Forecasts

Lake WA ↓ 1% and Baker ↑ 79% over recent 10 year avg.



Columbia Sockeye Forecasts

Lake Wenatchee ↓ 11% and Okanogan ↓ 41% over recent 10 year avg.



Questions?

Salmon Technical Team Pre I Table 1 – Preseason Chinook Forecasts

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

Production Source and Stock or Stock Group	2009	2010	2011	2012	2013	2014	2015	2016	2017	Methodology for 2017 Prediction and Source
Sacramento Index										
Fall	122.2	245.5	729.9	819.4	834.2	634.7	652.0	299.6	230.7	Log-log regression of the Sacramento Index on jack escapement from the previous year, accounting for lag-1 autocorrelated errors. STT.
Klamath River (Ocean Abundance)										
Fall	505.7	331.5	371.1	1,651.8	727.7	299.3	423.8	142.2	54.2	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)										
Upriver Spring ^{a/}	298.9	470.0	198.4	314.2	141.4	227.0	232.5	188.8	160.4	Log-normal sibling regressions of cohort returns in previous run years. Columbia River TAC.
Willamette Spring	37.6	62.7	104.1	83.4	59.8	58.7	55.4	70.1	38.1	Age-specific linear regressions of cohort returns in previous run years. ODFW staff. Forecasts include jacks.
Sandy Spring	5.2	3.7	5.5	4.8	6.1	5.5	5.5	NA	3.6	
Cowlitz Spring	4.1	12.5	6.6	8.7	5.5	7.8	11.2	25.1	17.1	Age-specific linear regressions of cohort returns in previous run years. WDFW.
Kalama Spring	0.9	0.9	0.6	0.7	0.7	0.5	1.9	4.9	3.1	Age-specific linear regressions of cohort returns in previous run years. WDFW.
Lewis Spring	2.2	6.0	3.4	2.7	1.6	1.1	1.1	1.0	0.7	Age-specific linear regressions of cohort returns in previous run years. WDFW.
Upriver Summer ^{b/}	70.7	88.8	91.9	91.2	73.5	67.5	73.0	93.3	63.1	Log-linear brood year sibling regressions or average return (4-ocean fish). Columbia River TAC subgroup.
URB Fall	259.9	310.8	398.2	353.5	432.5	973.3	500.3	589.0	260.0	Age-specific average cohort ratios or brood year sibling regressions. Columbia River TAC subgroup and WDFW.
SCH Fall	59.3	169.0	116.4	63.8	38.0	115.1	160.5	89.6	158.4	Age-specific average cohort ratios or brood year sibling regressions. Columbia River TAC subgroup and WDFW.
LRW Fall	8.5	9.7	12.5	16.2	14.2	34.2	18.9	22.2	12.5	Age-specific average cohort ratios or brood year sibling regressions. Columbia River TAC subgroup and WDFW.
LRH Fall	88.8	90.6	133.5	127.0	88.0	110.0	94.9	133.7	92.4	Age-specific average cohort ratios or brood year sibling regressions. Columbia River TAC subgroup and WDFW.
MCB Fall	94.5	72.6	100.0	90.8	105.2	360.1	113.3	101.0	45.6	Age-specific average cohort ratios or brood year sibling regressions. Columbia River TAC subgroup and WDFW.

STT - Pre I Table 1 – Chinook Forecasts Page 2

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

Production Source and Stock or Stock Group		2009	2010	2011	2012	2013	2014	2015	2016	2017	Methodology for 2017 Prediction and Source
Willapa Bay Fall	Natural	2.0	2.0	2.0	5.2	4.9	2.9	3.8	3.3	4.2	Return per spawners applied to 3-6 year olds (brood years 2011-14) adjusted by brood year performance. Return per spawners applied to 3-6 year olds (brood years 2011-14) adjusted by brood year performance.
	Hatchery	34.8	31.1	31.1	40.5	22.2	29.5	31.0	36.2	34.3	
Quinault Fall	Natural	6.9	7.6	5.9	7.7	4.0	6.0	8.1	5.5	NA	
	Hatchery	7.8	5.5	4.7	3.8	3.1	10.3	4.0	5.3	NA	
Queets Spring/Sum Queets Fall	Natural	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.5	Forecast by age; age breakout is based on the fall stock. Natural-origin fall Chinook age 3 and 7 forecast are based on recent year average return/spawner. Age 4-6 forecast are based on sibling regressions. Age specific indicator stock forecast are based on recent year average return/smolt adjusted by brood performance.
	Natural	4.5	4.1	2.7	5.8	3.8	3.6	4.3	4.9	3.7	
	Hatchery	1.2	9.8	1.9	1.8	0.9	0.9	1.5	1.7	0.9	
Hoh Spring/Summer	Natural	1.1	0.8	1.0	1.0	0.9	0.9	0.8	0.9	1.0	Spawner/Recruit all years geometric mean for each age class
Hoh Fall	Natural	2.6	3.3	2.9	2.7	3.1	2.5	2.6	1.8	2.7	Spawner/Recruit of recent 3 years adjusted by previous brood performance for all ages
Quillayute Spring	Hatchery	2.0	1.5	1.4	1.5	2.1	2.0	1.7	1.8	2.2	Recent 2 year mean adjusted by previous performance.
Quillayute Sum/Fall	Natural	6.8	7.5	8.8	7.4	6.6	7.6	8.5	7.5	7.6	Summer: Recent 5 year mean for all ages except age-3. Used the regression of age-3 to escapement. Fall: Recent 5 year means; adjusted for previous 5 year forecast performance
Hoko ^{df}	Natural	1.0	1.8	0.6	1.9	1.2	2.7	3.3	2.9	1.5	Includes supplemental. 2017 Recruits for age-3's 5 year average return, age 4-6 sibling regression
North Coast Totals											
Spring/Summer	Natural	1.5	1.2	1.4	1.4	1.3	1.4	1.2	1.4	1.5	
Fall	Natural	20.8	22.5	20.3	23.6	17.5	19.7	23.5	19.7	14.0	
Spring/Summer	Hatchery	2.0	1.5	1.4	1.5	2.1	2.0	1.7	1.8	2.2	
Fall	Hatchery	9.0	15.3	6.6	5.6	4.0	11.2	5.5	7.0	0.9	
Puget Sound summer/fall^{df}											
Nooksack/Samish	Hatchery	23.0	30.3	37.5	44.0	46.3	43.9	38.6	27.9	21.2	Two year average observed terminal run
East Sound Bay	Hatchery	0.1	2.3	0.4	0.4	1.9	1.2	1.2	0.7	0.8	Average of previous two years
Skagit ^{df}	Natural	23.4	13.0	14.3	8.3	12.9	18.0	11.8	15.1	15.8	Hierarchical Bayesian model to estimate the spawner-recruit dynamics.
	Hatchery	0.6	0.9	1.5	1.3	0.3	0.3	0.6	0.4	0.4	Recent 4 year average terminal smolt to adult return rate to estimate age classes 3 – 5

STT - Pre I Table 1 – Chinook Forecasts Page 3

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

Production Source and Stock or Stock Group		2009	2010	2011	2012	2013	2014	2015	2016	2017	Methodology for 2017 Prediction and Source
Stillaguamish ^{e/}	Natural	1.7	1.4	1.8	0.9	1.3	1.6	0.5	0.5	1.5	Natural plus Hatchery. Multiple regression environmental model (EMPAR).
Snohomish ^{e/}	Natural	8.4	9.9	7.4	2.8	3.6	5.3	4.2	3.3	3.4	Multiple regression environmental model (EMPAR) Average terminal run.
	Hatchery	4.9	5.6	5.2	3.9	6.9	5.4	3.3	5.0	4.8	
Tulalip ^{e/}	Hatchery	4.0	3.4	3.5	5.9	10.9	4.7	1.3	1.4	5.3	Multiple regression environmental model (EMPAR)
South Puget Sound	Natural	17.2	12.7	8.9	8.9	5.0	4.8	3.8	4.5	4.7	Puyallup R. average return per spawner applied to brood years contributing ages 3-5. For Nisqually, 3 year average SAR age specific survival. For Green, 3-year average return/out-migrant rate for each age.
	Hatchery	93.0	97.4	118.6	95.8	102.0	96.7	62.4	43.1	80.4	Average return at age multiplied by smolt release for Green, Nisqually, Puyallup, Carr Inlet, and Area 10E.
Hood Canal ^{d/}	Natural	2.5	2.4	2.2	2.9	3.4	3.5	3.1	2.3	2.5	Natural fish based on the Hood Canal terminal run reconstruction-based relative contribution of the individual Hood Canal management units in the 2014-2016 return years
	Hatchery	40.1	42.6	38.4	43.9	65.7	80.6	59	42.7	48.3	Brood 2013 fingerling lbs released from WDFW facilities in 2014, multiplied by the average of post-season estimated terminal area return rates for the last 3 years (2014-2016).
Strait of Juan de Fuca Including Dungeness spring run ^{d/}	Natural	2.4	1.9	2.5	2.9	3.1	3.8	4.9	3.7	3.1	Natural and hatchery. Dungeness and Elwha hatchery estimated by recent return rates time average releases. Dungeness wild estimated by smolts times average hatchery return rate. Elwha wild estimated using recent 3 year returns from otolith and CWT.

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/ Unless otherwise noted, forecasts are for Puget Sound run size (4B) available to U.S. net fisheries. Does not include fish caught in troll and recreational fisheries.

d/ Terminal run forecast.

e/ Expected spawning escapement without fishing.

STT - Pre I Table 2 – Coho Forecasts Page 1

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

Production and Stock or Stock Group	Source										Methodology for 2017 Prediction and Source	
		2009	2010	2011	2012	2013	2014	2015	2016	2017		
OPI Area (Total Abundance) (California and Oregon Coasts and Columbia River)		1,284.7	556.0	624.5	632.7	716.4	1,213.7	1,015.0	549.2	496.2		
												Abundance of all OPI components based on cohort reconstruction including all fishery impacts using Mixed Stock Model (MSM); prior to 2008 only fishery impacts south of Leadbetter Point were used (traditional OPI accounting). OPITT, see Chapter III for details.
OPI Public	Hatchery	1,073.1	408.0	375.1	341.7	525.4	983.1	808.4	396.5	394.3		OPIH: 1969-2015 Columbia River jacks adjusted for delayed smolt releases and total OPI jacks regressed on 1970-2016 adults. Columbia/Coastal proportions based on jacks; Columbia early/late proportions based on jacks; Coastal N/S proportions based on smolts.
Columbia River Early		672.7	245.3	216.0	229.8	331.6	526.6	515.2	153.7	231.7		
Columbia River Late		369.7	144.2	146.5	87.4	169.5	437.5	261.8	226.9	154.6		
Coastal N. of Cape Blanco		7.3	4.4	3.6	6.4	5.6	4.8	6.9	5.5	3.5		
Coastal S. of Cape Blanco		23.4	14.1	9.0	18.1	18.7	14.2	24.4	10.4	4.5		
Lower Columbia River	Natural	32.7	15.1	22.7	30.1	46.5	33.4	35.9	40.0	30.1		Oregon: recent two year average return; Washington: natural smolt production multiplied by 2014 brood marine survival rate. Abundance is subset of early/late hatchery abundance above.
Oregon Coast (OCN)	Natural	211.6	148.0	249.4	291.0	191.0	230.6	206.6	152.7	101.9		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 return.
Washington Coast												
Willapa	Natural	33.5	20.4	47.8	81.3	58.6	58.9	42.9	39.5	36.7		
	Hatchery	59.4	78.7	64.7	88.8	37.1	41.0	57.7	28.1	55.0		
Grays Harbor	Natural	59.2	67.9	89.1	150.2	196.8	108.8	142.6	NA	NA		
	Hatchery	63.5	33.3	44.0	47.8	85.2	65.4	46.6	22.9	36.4		
Quinalt	Natural	16.3	16.7	22.9	27.3	32.1	25.0	44.2	17.1	26.3		
	Hatchery	26.2	26.6	35.5	35.4	42.0	24.7	24.9	19.8	29.4		A variety of methods were used for 2017, primarily based on smolt production and survival. See text in Chapter III for details.
Queets	Natural	31.4	21.8	13.3	37.2	24.5	10.3	7.5	3.5	6.5		
	Hatchery	13.5	11.9	16.3	25.3	19.8	15.7	11.3	4.5	13.7		
Hoh	Natural	9.5	7.6	11.6	14.3	8.6	8.9	5.1	2.1	5.8		

STT - Pre I Table 2 – Coho Forecasts Page 2

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

Production and Stock or Stock Group	Source											Methodology for 2017 Prediction and Source
		2009	2010	2011	2012	2013	2014	2015	2016	2017		
Quillayute Fall	Natural	19.3	22.0	28.2	33.5	17.2	18.4	10.5	4.5	15.8	A variety of methods were used for 2017, 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	39.5	17.7	31.0	16.9	12.4	12.6	8.0	6.4	17.6		
Quillayute Summer	Natural	2.2	2.8	2.8	5.7	0.5	2.0	1.2	0.3	1.5		
	Hatchery	12.9	3.2	5.4	4.3	3.3	3.2	2.2	1.4	3.4		
North Coast Independent												
Tributaries	Natural	11.1	4.2	21.6	15.7	17.8	15.2	11.7	1.9	6.5		
	Hatchery	14.1	5.7	11.8	11.4	6.3	11.6	11.9	2.5	0.2		
WA Coast Total	Natural	182.5	163.4	237.3	365.2	356.1	247.5	265.6	NA	NA		
	Hatchery	229.1	177.1	208.7	229.9	206.1	174.2	162.6	85.6	155.6		
Puget Sound												
Strait of Juan de Fuca	Natural	20.5	8.5	12.3	12.6	12.6	12.5	11.1	4.4	13.1		
	Hatchery	7.0	7.8	15.2	18.6	17.6	17.3	11.1	3.9	15.4		
Nooksack-Samish	Natural	7.0	9.6	29.5	25.2	45.4	20.8	28.1	9.0	13.2		
	Hatchery	25.5	36.0	45.7	62.8	49.2	61.7	50.8	28.8	45.6		
Skagit	Natural	33.4	95.9	138.1	48.3	137.2	112.4	121.4	8.9	11.2		
	Hatchery	11.7	9.5	16.7	14.9	16.3	15.8	19.5	4.9	7.6		
Stillaguamish	Natural	13.4	25.9	66.6	47.5	33.1	32.5	31.3	2.8	7.6		
	Hatchery	0.0	5.4	0.6	4.1	3.1	6.0	0.0	0.0	1.5		
Snohomish	Natural	67.0	99.4	180.0	109.0	163.8	150.0	151.5	20.6	107.3		
	Hatchery	53.6	24.5	55.0	45.7	111.5	78.2	53.9	16.7	62.0		
South Sound	Natural	53.6	25.3	98.9	43.1	36.0	62.8	63.0	9.9	20.2		
	Hatchery	188.8	186.4	173.3	162.9	151.0	150.7	180.2	27.1	102.4		
Hood Canal	Natural	48.6	33.2	74.7	73.4	36.8	82.8	61.5	35.3	115.6		
	Hatchery	52.0	51.2	74.9	62.6	68.6	47.6	108.4	83.5	74.9		
Puget Sound Total	Natural	243.5	297.8	600.1	359.1	464.9	473.8	467.9	91.0	288.3		
	Hatchery	338.6	320.8	381.4	371.6	417.3	377.3	423.9	165.0	309.3		

Find 2017 Preseason I Report at:

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

9:00 – 9:30	<u>Introduction</u>	Kyle Adicks
	<ul style="list-style-type: none"> • Welcome and Introduction • North of Falcon – Setting Salmon Fisheries in 2015 	
9:30-9:45	<u>Habitat Presentation</u>	Jeff Davis
9:45 – 10:45	<u>Salmon Forecasts 2016</u>	
	<ul style="list-style-type: none"> • 2016/17 Environmental Conditions • Columbia River Salmon Stocks • Puget Sound and Coast Chinook & Coho Salmon Stocks • Puget Sound Pink, Chum and Sockeye Salmon Stocks • PFMC Salmon Technical Team Review 	<p>Marisa Litz</p> <p>Ron Roler</p> <p>Aaron Dufault</p> <p>Aaron Dufault</p> <p>Wendy Beeghley</p>
10:45 - Noon	<u>Regional Discussion Sessions</u>	
	<ul style="list-style-type: none"> • Puget Sound Recreational Room GA Aud. • Columbia River & Ocean NRB 682 • Coastal Room 630 • Puget Sound Commercial Room SLO 03 	<p>Mark, Ryan, Aaron</p> <p>Kyle(s), Wendy, Ron R.</p> <p>Annette</p> <p>Kirt, Kendall, Marisa, Kwasi</p>
Noon – 1:00 pm	Lunch Break	
1:00 – 3:00	<u>Regional Discussion Sessions Continued</u>	

FISH AND WILDLIFE COMMISSION

POLICY DECISION

POLICY TITLE: 2017-2018 North of Falcon

POLICY NUMBER: C-3608

Supersedes: C-3608, 2015-2016

Effective Date: January 13, 2017

Termination Date: December 31, 2018

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

Approved by:  Chair
Washington Fish and Wildlife Commission, January 13, 2017

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.
- 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 Lake Washington sockeye, the first 200,000 non-treaty harvest will be provided to recreational fishers. If the allowable non-treaty harvest is greater than 200,000, commercial harvest directed at this stock may be considered.
- 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).

Willapa Bay

- Willapa Bay will be managed consistent with the Commission's Willapa Bay Salmon Management Policy (POL-C3622).

Columbia River

- The Fish and Wildlife Commission's policy on Columbia River Salmon Management (POL- C3620) 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 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.

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.

2017 Puget Sound Summer/Fall Chinook Preseason Forecasts

Region	Watershed	Notes	Forecast Type	Hatchery	Supplmt	Wild	Total	Comp Chinook Management Criteria	
								RER ¹	Low Abundance Thresholds ^{2,3}
Strait	Hoko		Escape w/o fishing	876		606	1,482	<10% So. U.S.	500 spawners
	Dungeness		Terminal	296		77	373	<10% So. U.S.	500 spawners
	Elwha		Terminal	2,631		153	2,784	<10% So. U.S.	1,000 spawners
	Morse Creek		Terminal	225			225		
	Region total			4,028		836	4,864	4,258	
North Sound	Glenwood Springs		Terminal	772			772		
	Nooksack/Samish		Terminal	21,225			21,225		
	Skagit		Terminal	411		15,837	16,248	50% total	4,800 spawners
	Stillaguamish		Esc. w/o fishing	1038		438	1,476	25% total	700 spawners
	Snohomish		Extreme Terminal w/ harvest	4,780		3,412	8,192	21% total	2,800 spawners
	Tulalip		Terminal Run w Harvest	5,296			5,296		
	Region total			33,522	0	19,687	53,209		
Upper South Sound	Lake Washington								
	Issaquah		Terminal	3,722			3,722		
	Cedar		Terminal			811	811	15% preterm So. U.S., 1,680 esc goal	200 spawners
	Sammamish		Terminal			137	137		
	Subregion total			3,722		948	4,670		
	Green River								
	Soos Creek Hatchery		Terminal	13,347			13,347		
	Icy Creek		Terminal	641			641		
	Mainstem/Newaukum		Terminal			2,374	2,374	12% preterm So. U.S.	
	Subregion total			13,988		2,374	16,362		
Grovers		Terminal	2,598			2,598			
East Kitsap (Gorst, Dogfish)		Terminal	6,288			6,288			
Subregion total			8,886			8,886			
Puyallup River		Terminal	3,804		945	4,749	50% total	500 spawners	
Upper South Sound Total			30,400		4,267	34,667			

2017 Puget Sound Summer/Fall Chinook Preseason Forecasts (continued)

Region	Watershed	Notes	Hatchery	Supplmt	Wild	Total	Comp Chinook Management Criteria	
							RER ¹	Low Abundance Thresholds ³
Lower South Sound	Carr Inlet	Terminal	8,219			8,219	52% ERC	700 spawners
	Deschutes	Terminal	18,341			18,341		
	Nisqually	Terminal	22,191		478	22,669		
	Chambers	Terminal	1,229			1,229		
	Lower South Sound Total		49,980		478	50,458		
	South Sound Total		80,380	0	4,745	85,125		
Hood Canal	Skokomish w/George Adams	Terminal	25,773		1,956	27,729	50% ERC	1,300 spawners ⁴
	12B Naturals	Terminal			326	326	12% PTSUS CERC	400 spawners
	12C/12H/12D	Terminal	22,532		177	22,709		
	Hood Canal Total		48,305	0	2,459	50,764		
Puget Sound Total			166,235	0	27,727	193,962		
Footnotes	1. RER = Recovery Exploitation Rate (interim management ceiling during recovery phase). 2. Level of spawning abundance that triggers additional management action. 3. Threshold expressed as natural origin spawners 4. Aggregate for combined hatchery and wild spawners							

Puget Sound Spring Chinook 2017 Preseason Forecasts

Notes	Forecast					RER	Low Abundance Thresholds
	Type	Hatchery	Supplmt	Wild	Total		
Nooksack River							
North Fork	Terminal	2,866	1,066	193	4,125	Under Development	1000 spawners ¹
South Fork	Terminal	1,084		32	1,116	Under Development	1000 spawners ¹
Skagit River	Terminal	2,610		2,785	5,395	38% total	576 spawners
White River							
Minter Creek	Terminal	522			522		
White River Hatchery	Terminal	1,494			1,494		
Buckley Trap	Terminal		1,124	593	1,717	20% total	200 spawners
Total White River Springs					3,733		
Total		8,576	2,190	3,603	14,369		
1. Supplementation number is hatchery-origin acclimated fish expected to spawn in the wild. 2. Forecast of SF Nooksack stock origin chinook. 3. Forecast of returns to the hatchery rack only. 4. Includes naturally produced spring and fall chinook returns and acclimation pond production.							

Washington Coast 2017 Chinook Preseason Forecasts

		Hatchery	Wild	Totals	Natural Escapement Goal
North Coast					
Quillayute River					
Spring	Terminal	2,152		2,152	200
Summer	Terminal		1,132	1,132	1,200
Fall	Terminal		6,433	6,433	> of 3,000 or 60% of run
Hoh					
Spring/Summer	Terminal		1,000	1,000	>of 900 or 69% of RS
Fall	Terminal		2,725	2,725	>of 1,200 or 60% of RS
Queets					
Spring/Summer	Terminal		-	-	>of 700 or 70% of RS
Fall	Terminal	900	3,692	4,592	>of 2,500 or 60% of RS
Quinault					
Fall	Terminal	0	0	0	
North Coast totals Summer/Falls:		900	10,290	11,190	
Spring/Summers:		2,152	1,000	3,152	14,342
Grays Harbor					
Chehalis springs	Terminal		0	0	1,400
Chehalis falls	Terminal	0	0	0	9,880
Humtulpis falls	Terminal	0	0	0	3,620
Subregion Falls Total		0	0	0	
Willapa Bay - Fall Chinook	Terminal	34,328	4,178	38,506	
Coast total		37,380	15,468	52,848	

2016 and 2017 Washington Coho Forecast Summary¹

Last updated: 02/26/17

Production unit	2016 Hatchery	2017 Hatchery	2016 Wild	2017 Wild	2016 Total	2017 Total
Dungeness R	2,915	10,203	116	918	3,030	11,121
Elwha R	740	1,308	153	359	894	1,667
Eastern Strait (excl. Dung, Elwha)	-	-	541	2,762	-	2,762
Western Strait	-	-	3,886	10,296	3,886	10,296
West/East sub-total excl. Dung, Elwha	-	-	4,427	13,058	4,427	13,058
West/East Strait sub-total	3,655	11,510	4,696	14,335	7,810	25,845
Nooksack R	19,815	39,041	4,750	6,291	24,565	45,332
Lummi Ponds	8,010	6,568	-	-	8,010	6,568
7B net pens	0	0	-	-	0	0
Indian Slough Hatchery	0	0	-	-	0	0
Samish R	-	-	3,473	6,209	3,473	6,209
Misc 7&7A (incl. San Juans CoOps)	964	0	765	735	1,729	735
Nook/Samish R sub-total	28,789	45,609	8,987	13,235	37,776	58,845
Skagit R sub-total	4,947	7,551	8,912	11,160	13,859	18,711
Stillaguamish R sub-total	0	1,520	2,770	7,622	2,770	9,142
Snohomish R	1,809	9,452	16,740	107,325	18,549	116,777
Tulalip Bay	18,564	51,626	-	-	18,564	51,626
Area 8A Misc. Hatchery	252	880	-	-	252	880
Snohomish R sub-total	20,625	61,958	16,740	107,325	37,365	169,283
Lake Washington	3,502	18,218	912	2,160	4,414	20,378
Green River	8,012	39,924	958	3,852	8,970	43,776
Elliot Bay Net Pens	3,270	0	-	-	3,270	0
Misc. Area 10,11,10E	2,096	6,831	600	1,728	2,696	8,559
Puyallup R	7,606	19,951	1,576	7,560	9,182	27,511
Mid-Sound sub-total	24,486	84,924	4,046	15,300	28,532	100,224
Area 13A-K wild, exc. Deschutes	-	-	4,352	1,575	4,352	1,575
Area 13A Hatchery (Minter CR)	85	6,546	-	-	85	6,546
Nisqually R	735	871	1,486	3,290	2,221	4,161
Deschutes R	-	-	48	67	48	67
Area 13D net pens (Squaxin Island)	1,798	10,017	-	-	1,798	10,017
Deep South Sound sub-total	2,618	17,434	5,886	4,932	8,504	22,366
Mid+Deep South Sound sub-total	27,105	102,358	9,932	20,232	37,036	122,590
Area 9A (Port Gamble)	14,766	10,883	-	-	14,766	10,883
Area 12A - Quilcene R	41,553	29,813	-	-	41,553	29,813
Area 12A - Quilcene Net Pens	3,034	2,349	-	-	3,034	2,349
Area 12/12B	-	-	14,924	35,276	14,924	35,276
Area 12C/12D (exc. Skokomish R)	-	-	16,439	38,854	16,439	38,854
Skokomish R	24,112	17,749	3,959	19,705	28,071	37,455
Area 12/12B-12D/Skok. R sub-total	24,112	17,749	35,322	93,835	59,434	111,585
Hood Canal sub-total	83,465	60,794	35,322	93,835	118,787	154,629
Puget Sound Total	168,585	291,301	87,359	267,745	255,403	559,045
Willapa Bay	28,093	54,998	39,516	36,720	67,609	91,718
Grays Harbor	22,890	NA	4,951	NA	27,841	NA
Quinalt R	19,821	29,435	17,100	26,300	36,921	55,735
Queets R	4,492	NA	3,494	NA	7,986	NA
North Coast Indept. Tribes	2,541	132	1,924	6,460	4,465	6,592
Hoh R	0	0	2,066	5,799	2,066	5,799
Quillayute R summer	1,368	3,376	285	1,468	1,653	4,844
Quillayute R fall	6,443	17,619	4,468	15,808	10,911	33,427
Coast total	85,648	105,560	73,804	92,555	159,452	198,115

Columbia Hatch/WA Wild Early ²	136,200	222,800	11,900	5,100	148,100	227,900
Columbia Hatch/WA Wild Late ²	199,900	133,500	26,100	20,600	226,000	154,100
Columbia Oregon Wild ³	-	-	6,500	4,400	6,500	4,401
Columbia total	336,100	356,300	44,500	30,100	380,600	386,401
Grand Total	590,333	753,161	205,663	390,400	795,455	1,143,562

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 2017 RETURN YEAR**

CHUM - SUMMER

	HATCHERY	WILD	TOTAL	FORECAST METHOD
Puget Sound				
Central Sound		2,702	2,702	R/S, recent perform adj.
South Sound		31,014	31,014	R/S, recent perform adj.
Hood Canal*		34,188	34,188	4-year avg.
Strait of Juan de Fuca		11,094	11,094	4-year avg.
Puget Sound Total		78,998	78,998	

* Wild forecast includes supplementation returns.

CHUM - FALL

	HATCHERY	WILD	TOTAL	FORECAST METHOD
Puget Sound				
Nooksack/Samish	20,511	88,826	109,337	R/S
Skagit	438	6,528	6,966	Fry based
Stillaguamish	367	5,614	5,981	Fry based
Snohomish	15,255	5,280	20,535	Fry based
Central Sound	40,527	101,312	141,839	R/S
South Sound	25,798	265,559	291,357	R/S
Hood Canal	336,156	156,736	492,892	R/S
Strait of Juan de Fuca	373	1,688	2,061	R/S-Ocean indicators adjusted
Puget Sound Total	439,425	631,543	1,070,968	

CHUM - WINTER

	HATCHERY	WILD	TOTAL	FORECAST METHOD
Puget Sound				
South Sound	13,594	23,102	36,696	R/S Regression, perform adj.
Puget Sound Total	13,594	23,102	36,696	

CHUM - FALL

	HATCHERY	WILD	TOTAL	FORECAST METHOD
Coastal				
Grays Harbor	1,200	30,100	31,300	R/S-brood perform adjustment
Willapa	1,273	56,453	57,726	R/S-brood perform adjustment
Coastal Total	2,473	86,553	89,026	

PINK

	HATCHERY	WILD	TOTAL	FORECAST METHOD
Puget Sound				
Nooksack	19	96,199	96,218	Fry based
Skagit		85,600	85,600	Fry based
Stillaguamish		40,205	40,205	Fry based
Snohomish		171,632	171,632	Fry based
Green		118,689	118,689	Fry Based
Puyallup		382,301	382,301	Fry Based
Nisqually		21,463	21,463	Fry Based
South Sound Misc.		1,319	1,319	R/S
Hood Canal	3,034	226,406	229,440	Fry and R/S Avg
Strait of Juan de Fuca		3,655	3,655	R/S-Ocean indicators adjusted
Puget Sound Total	3,053	1,147,469	1,150,522	

SOCKEYE

	HATCHERY	WILD	TOTAL	FORECAST METHOD
Puget Sound				
Baker River*		47,000	47,000	Avg. smolt/adult return rates
Lake Washington	14,673	62,619	77,292	Sibling relationships
Puget Sound Total			124,292	

* Forecast contains hatchery and wild production

SOCKEYE

	HATCHERY	WILD	TOTAL	FORECAST METHOD
Columbia River				
Wenatchee River		54,200	54,200	Adult-cohort relationships
Okanogan River		192,100	192,100	Adult-cohort relationships
Columbia River Total		246,300	246,300	

Fraser River Forecasts (from Fisheries and Oceans Canada)

Sockeye Salmon	4,432,000
Pink Salmon	8,693,000



Recreational Discussion – 2/28/2017

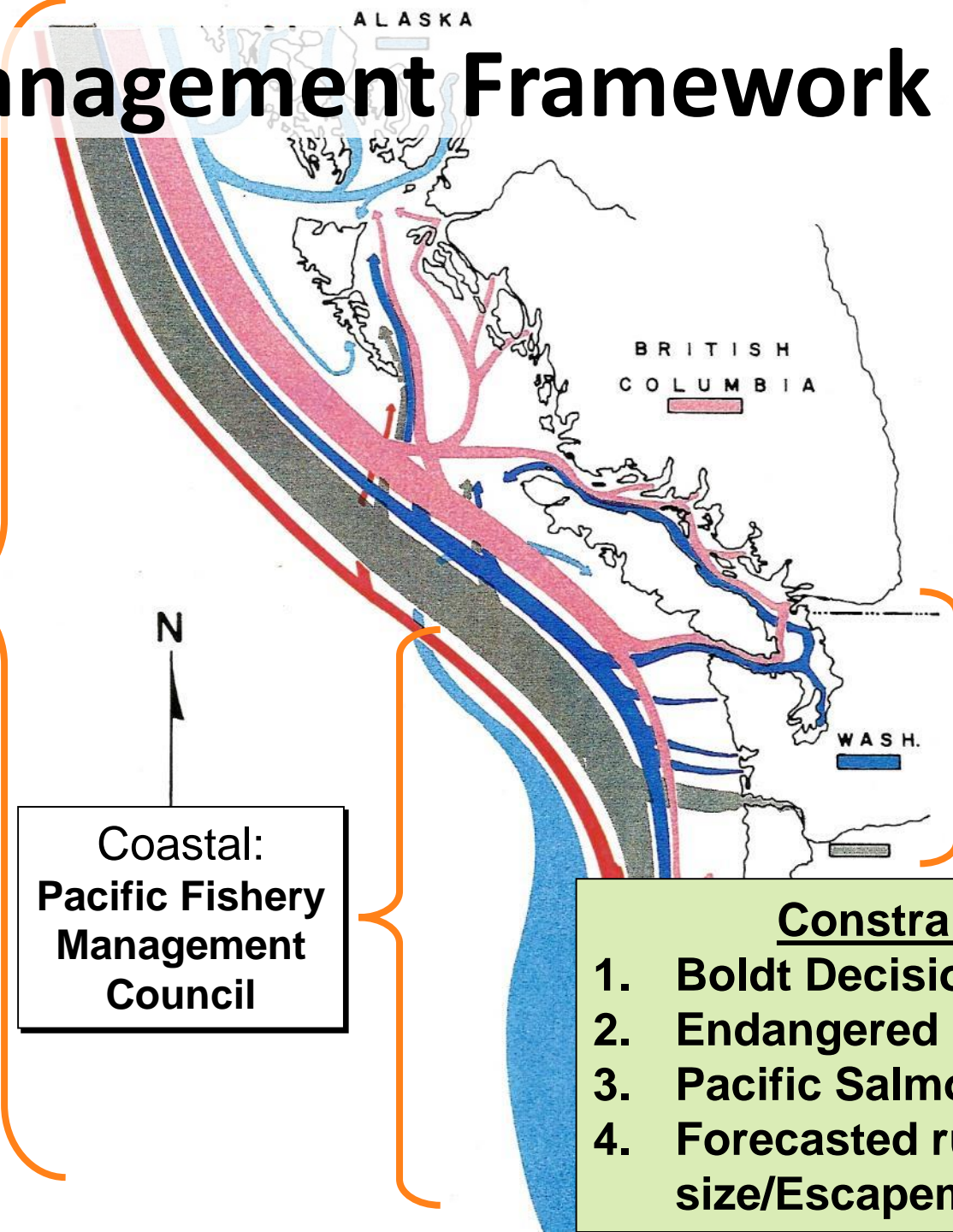


Outline of Presentation

A photograph of a fishing net being hoisted on a boat. A large salmon is visible inside the net, curled up. The background shows the water and a distant shoreline under a hazy sky.

- **Salmon Management Framework**
 - North of Falcon
- **Issues List**
- **Public Comment**

Management Framework



Coast wide:
**Pacific
Salmon
Commission**

Coastal:
**Pacific Fishery
Management
Council**

Inside:
**WDFW,
ODFW,
Tribes**

- Constraints**
- 1. Boldt Decision**
 - 2. Endangered Species Act**
 - 3. Pacific Salmon Treaty**
 - 4. Forecasted run size/Escapement Goals**

North of Falcon Process

1. Forecast the abundance of each stock.
2. Determine if there is a harvestable surplus.
3. Propose fisheries - predict what we will catch.
4. Model fisheries to determine which stocks are of conservation concern, constraining fisheries.
5. Negotiate with tribes and other states for fair sharing of catch and stocks that are constraining.
6. Final agreed-to State and Tribal salmon fisheries (ocean, Puget Sound) are described in the "List of Agreed Fisheries" document.

Puget Sound Chinook Forecast Comparisons

Basin	Wild		
	2016	2017	Comparison
Hoko	2,032	606	0.30
Dungeness	88	77	0.88
Elwha	175	153	0.87
Nooksack springs	340	225	0.66
Skagit springs	1,994	2,785	1.40
Skagit summer/falls	15,132	15,837	1.05
Stillaguamish	299	438	1.46
Snohomish	3,339	3,412	1.02
Lake Washington	1,135	948	0.84
Green	2,228	2,374	1.07
Puyallup	353	945	2.68
White River springs	811	593	0.73
Nisqually	762	478	0.63
Skokomish	1,835	1,956	1.07
Mid Hood Canal	320	326	1.02
Total (others included)	34,158	31,330	0.92

Puget Sound Coho Forecast Comparisons

Basin	Wild		
	2016	2017	Comparison
Dungeness	116	918	7.91
Elwha	153	359	2.35
other Strait	4,427	13,058	2.95
Nooksack/Samish	8,987	6,291	0.70
Skagit	8,912	11,160	1.25
Stillaguamish	2,770	7,622	2.75
Snohomish	16,740	107,325	6.41
Lake Washington	912	2,160	2.37
Green	958	3,852	4.02
Puyallup	1,576	7,560	4.80
Nisqually	1,486	3,290	2.21
Deschutes	48	67	1.40
Skokomish	3,959	19,705	4.98
other Hood Canal	31,363	74,130	2.36
Total (others included)	52,037	267,745	5.15

Coho Forecast vs Returns

<u>Year</u>	<u>Forecast</u>	<u>Run Size</u>	<u>Comparison</u>
2012	732,363	1,002,557	1.37
2013	882,134	836,494	0.95
2014	872,848	467,779	0.54
2015	891,854	215,081	0.24
2016*	225,403	~390k	1.74
Avg.	720,920	583,019	0.81
2017	559,045	-	-

**preliminary estimate*

Puget Sound Pink Forecast Comparisons

Basin			
	2015	2017	Comparison
Nooksack	281,979	96,218	0.34
Skagit	603,385	85,600	0.14
Stillaguamish	210,062	40,205	0.19
Snohomish	1,625,306	171,632	0.11
Green	626,102	118,689	0.19
Puyallup	837,967	382,301	0.46
Nisqually	979,298	21,463	0.02
Hood Canal	312,576	229,440	0.73
Strait of Juan de Fuca	1,299,356	3,655	0.002
Total (others included)	6,778,025	1,150,522	0.17

2015 Pink

Forecast: 6.8 mil

Return: 3.7 mil

0.53

Recreational Issues

- Timely agreement
- New Chinook FRAM base period
- In-season action (primarily winter seasons)
- Meaningful angler opportunity
 - Coho
 - Pink
 - Catch-and-release seasons
- Skokomish

A person wearing a white cap and a blue jacket is leaning over the side of a boat, holding a fishing rod. A large fish is being pulled out of the water, splashing. The background is a body of water with ripples.

Public Comment

On-line commenting – March-April

<http://wdfw.wa.gov/fishing/northfalcon/>

Puget Sound Sport Fishing Advisory Group

<http://wdfw.wa.gov/about/advisory/pssfag/>

Public Meetings

March 15 – Mill Creek WDFW, 6 pm

March 16 – Sequim Trinity Church, 7 pm

March 17 – North of Falcon #1, Olympia, 9 am

April 4 – North of Falcon #2, Lynnwood Embassy Suites, 9:30 am

April 7-11 – PFMC #2, Double Tree Sacramento