January 7, 2021

MEMORANDUM

TO: **Council Members**

FROM: **Leslie Bach and Erik Merrill**

SUBJECT: **NOAA status review update for ESA listed salmon: where we are in the process**

BACKGROUND:

Presenter: Mike Ford, Conservation Biology Division, NOAA Northwest Fisheries Science Center and Rob Markle, Protected Resources Division, NOAA West Coast Region.

Summary: NOAA Fisheries staff will provide an overview of the current status of the Endangered Species Act (ESA)-listed salmon and steelhead in the Columbia Basin and report on progress in completing the current 5-year ESA status review.

Relevance: The NOAA Fisheries 5-year status review provides critical information on the status and condition of the Columbia Basin salmon and steelhead populations addressed in the Council's Fish and Wildlife Program. The 2014 Program specifically requests that NOAA share with the Council the results of the status reviews of Columbia Basin salmon and steelhead as the reviews are completed. The viability criteria evaluated in the status review and their associated targets are incorporated in the Program performance objectives and strategy performance indicators described in the 2020 Addendum.

Background: The ESA, under section 4(c)(2), directs the Secretary of Commerce to review the listing classification of threatened and endangered species at least once every five years. After completing this review, the Secretary

must determine if any species should be: (1) removed from the list; (2) have its status changed from threatened to endangered; or (3) have its status changed from endangered to threatened. Previous reviews of Columbia Basin salmon and steelhead occurred in 2005, 2011 and 2016.

NOAA is currently in the process of completing its most recent status review for Columbia Basin salmon and steelhead. In October 2019 NOAA published a notice in the Federal Register soliciting information on the status of the species for the current review. NOAA will consider the comments received as well as additional data solicited from state and tribal agencies to complete the review in 2021. The analysis utilizes information on abundance, productivity, spatial structure and diversity to assess species viability. In support of the review, the NOAA Science Center is preparing a report on the biological status of the associated species. The NOAA West Coast Region's findings on the ESA listing status will consider the Center's report along with all other relevant information.

More Info: Previous 5-Year Status Review

Endangered Species Act 5-year Reviews for West Coast Salmon and Steelhead

Michael Ford, Northwest Fisheries Science Center

Rob Markle, West Coast Region

NOAA FISHERIES

Review is in progress - results in this presentation are preliminary

Contributing authors

- NWFSC: Chris Jordan, Mari Williams, Katie Barnas, Jim Myers, Laurie Weitkamp, Mindy Rowse, Martin Liermann, Eli Holmes, Damon Holzer

Acknowledgements

- NPT, SBT, CCT, YN, CTUIR, WDFW, ODFW, IDFG, ACoE, and PGE (Portland), StreamNet, Coordinated Assessments.

ESA Requirements for 5-Year Reviews

- Section 4 of the ESA requires Secretary to:

  At least once every five years, review the list of T&E species and determine based on that review whether the species should:

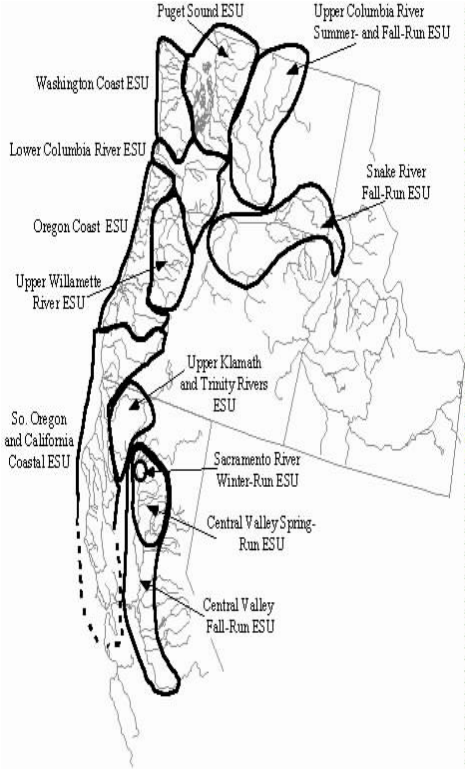
  – Retain its current listing status;
  – Be removed from the list;
  – Be changed from an endangered to a threatened species; or
  – Be changed from a threatened to an endangered species.

5 year status review process

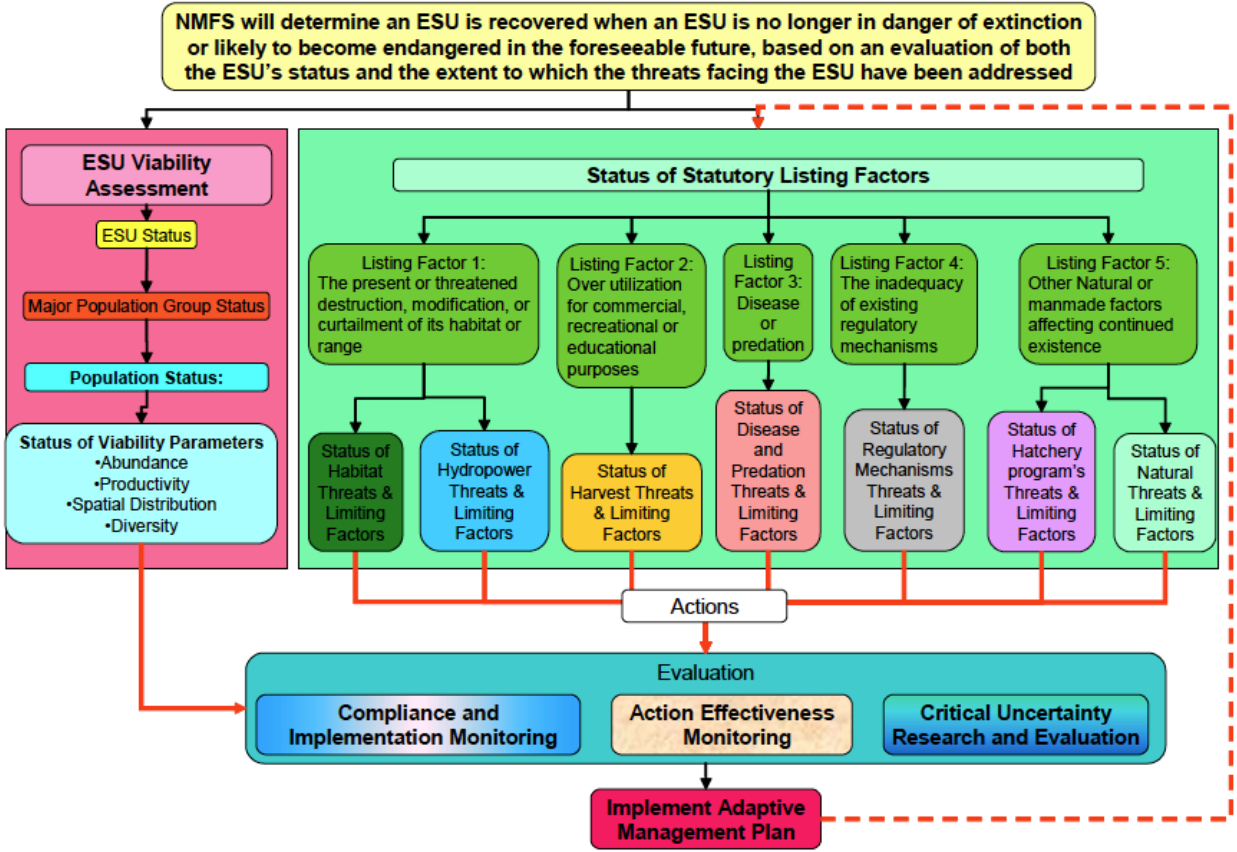
- Previous reviews in 2005, 2011, 2016
- FRN in October 2019 soliciting new information for the 2020/21 review – submission due May 22, 2020
- Primary Components
  - Science Centers report on biological status
  - West Coast Region findings report (expected Fall 2021)

What is “status” ?

- Endangered Species Act:
  - Low risk of extinction (not warranted for listing)
  - Endangered = at risk of extinction
  - Threatened = likely to be at risk of extinction in the foreseeable future
- Recovery/viability goals:
  - Abundance (example: 500 – 2000 natural spawners)
  - Productivity (compensatory recruitment at low abundance)
  - Spatial structure (occupied habitat, natural processes)
  - Diversity (natural processes, proportion natural fish)



NMFS Listing Status Decision Framework



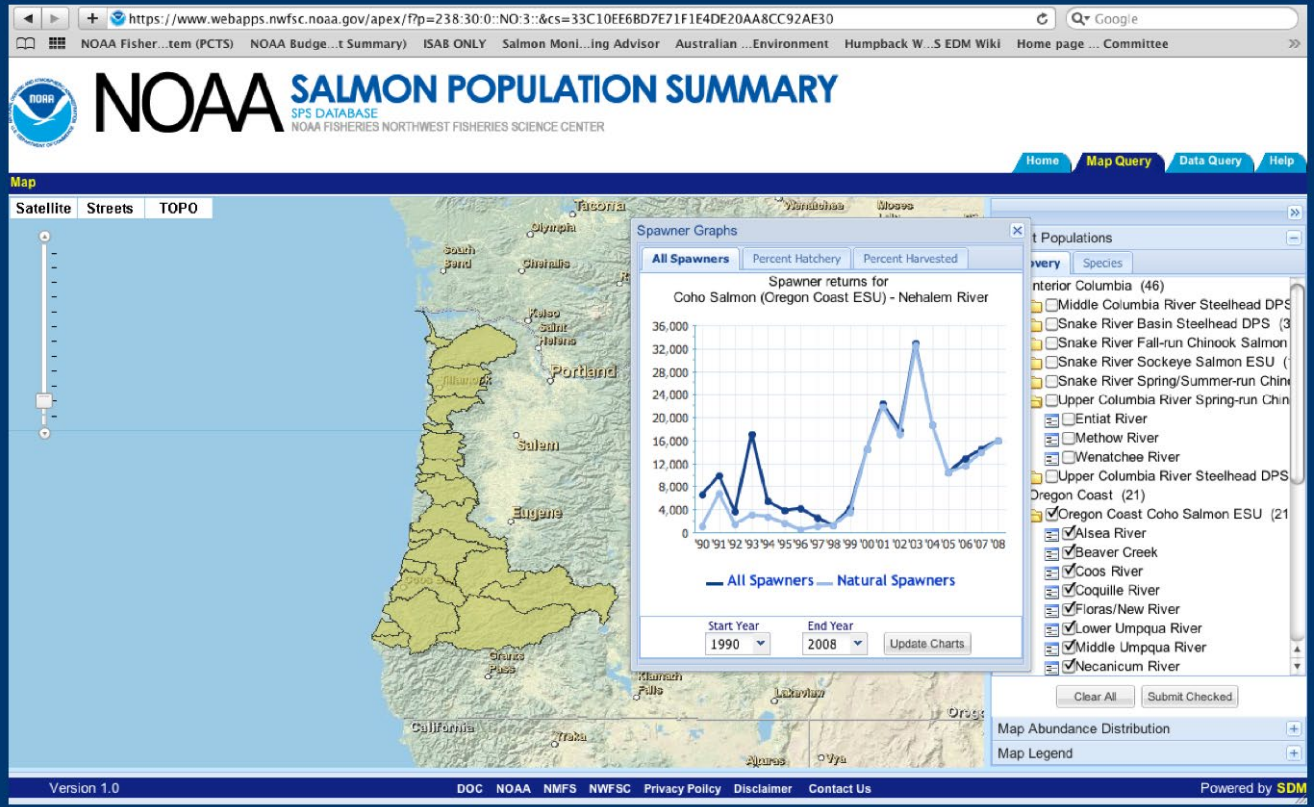
Science Center report content

- Update and summarize Abundance, Productivity, Spatial Structure, Diversity for all Pacific NW listed salmon/steelhead
- Summarize large scale environmental (FW and marine) trends for context
- Summarize trends in exploitation rates and hatchery/wild composition and hatchery releases

Science Center Report Process

- 2021 report is an update of the 2015 report - similar form and content
- Population data (abundance, etc.) solicited from State and Tribal agencies
- Data analyzed and reported in a uniform manner across listed species
- Some ESU/DPS – specific analysis related to recovery goals

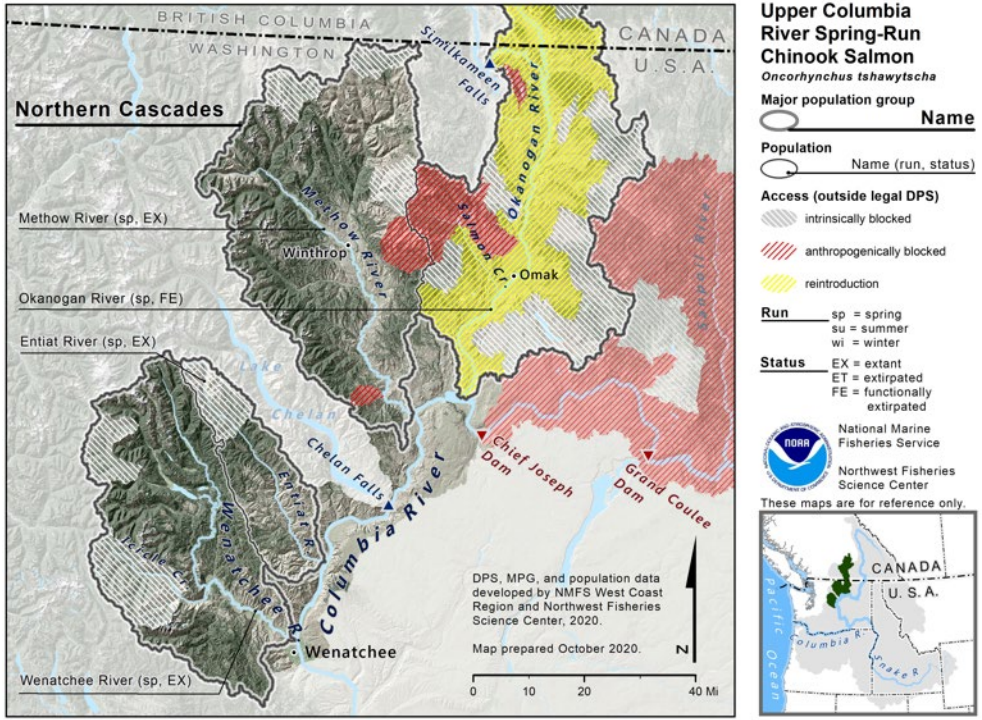
Spawning Abundance and Composition



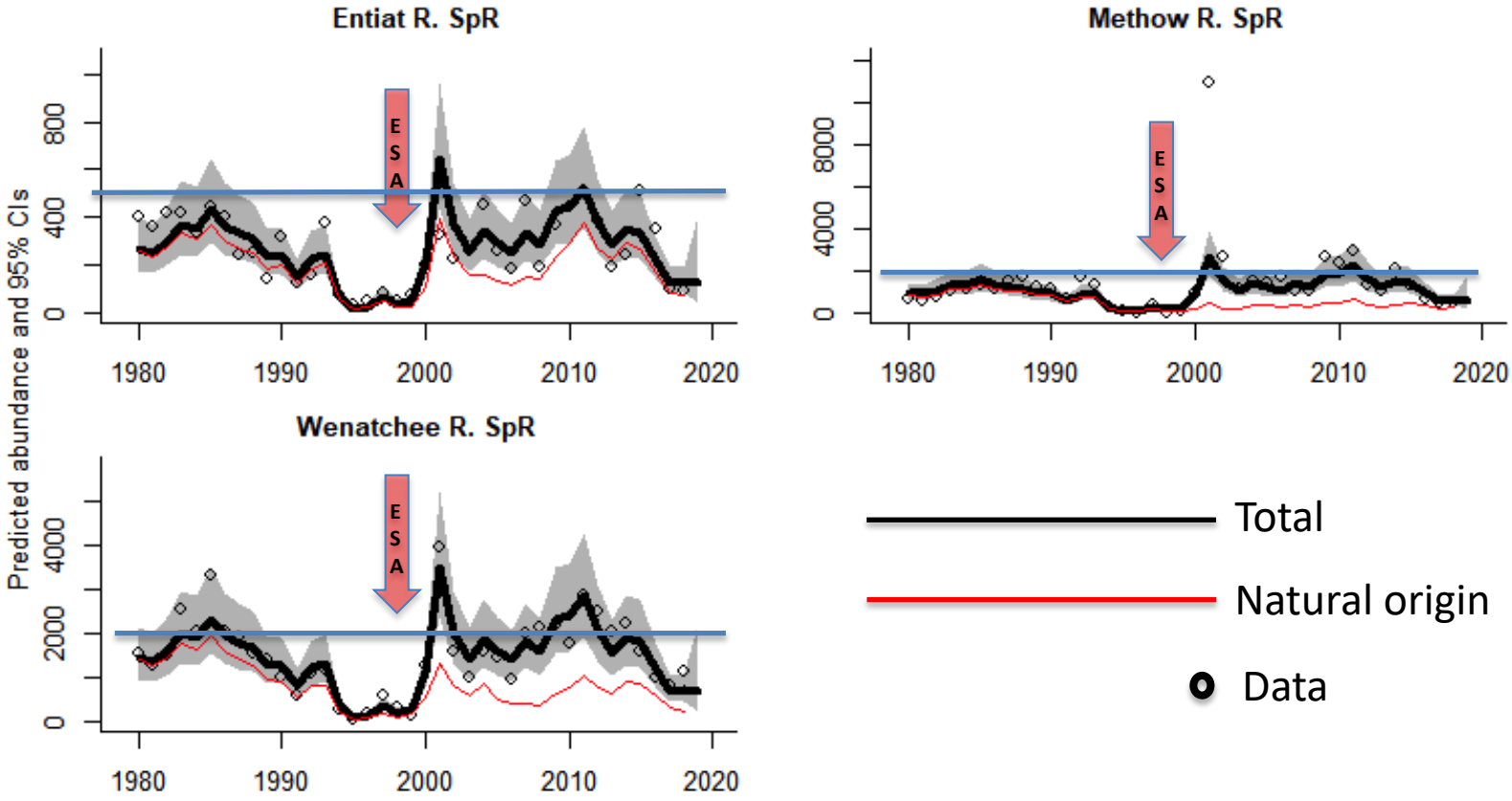
https://www.webapps.nwfsc.noaa.gov/apex/f?p=238:1:0::NO:::

Example: Upper Columbia River spring Chinook salmon

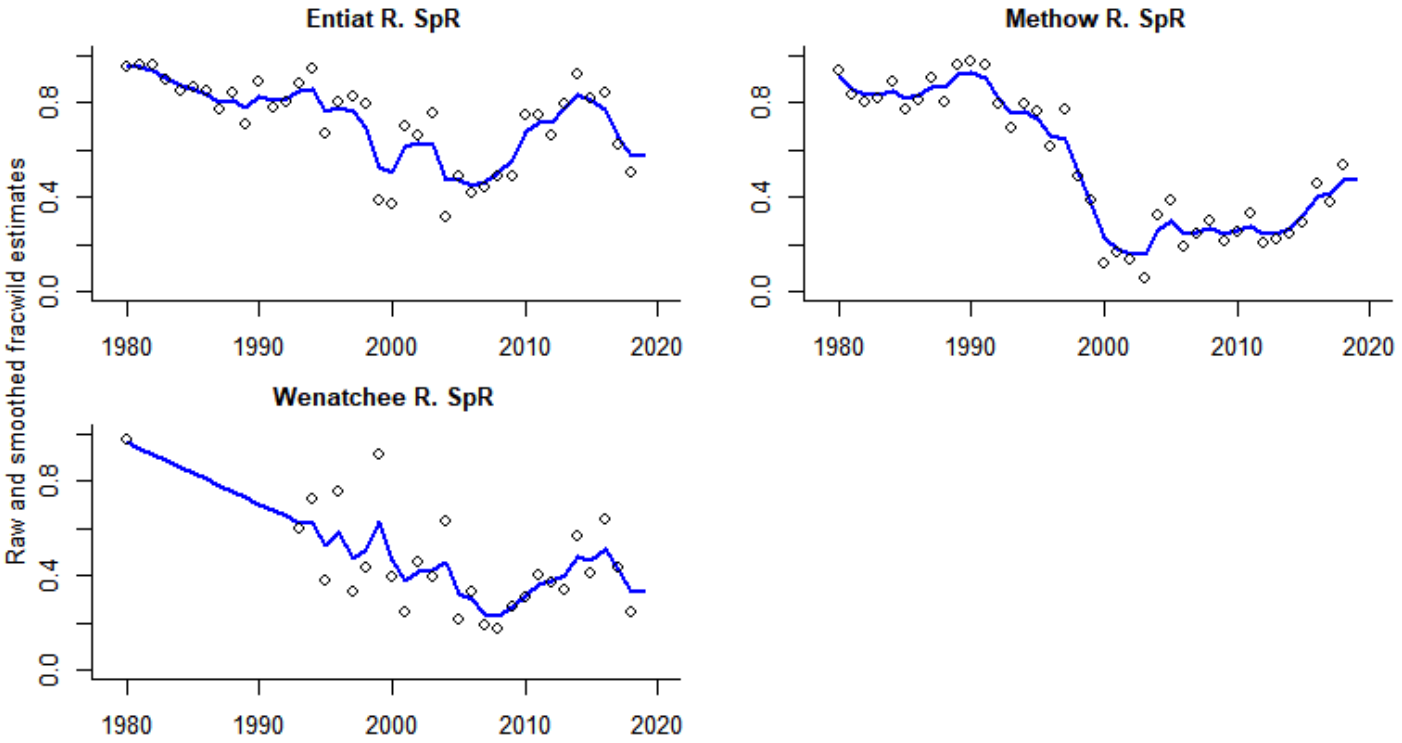
- Upper Columbia Spring Chinook (1998)
  - 3 extant populations
    - Wenatchee
    - Entiat
    - Methow
  - 1 reintroduced population
    - Okanogan



Status trends: spring Chinook natural spawning abundance



Status trends: spring Chinook proportion natural origin spawners



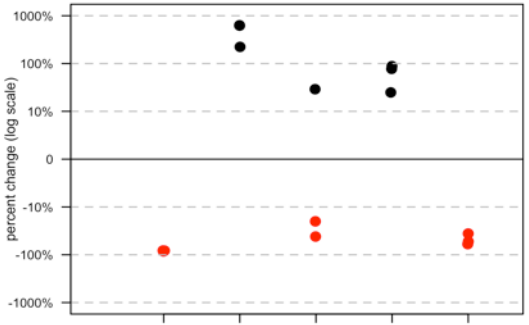
Summary – Interior Chinook salmon ESUs

Abundance

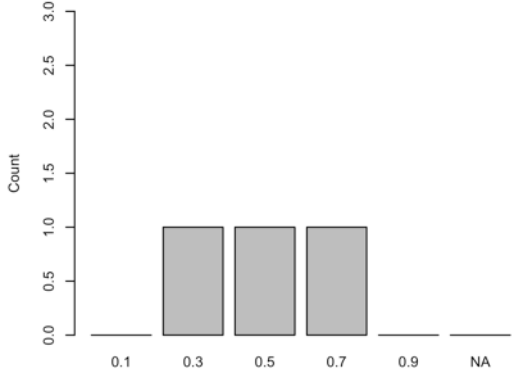
Increasing

Decreasing

Upper Columbia Sp



1990 2019



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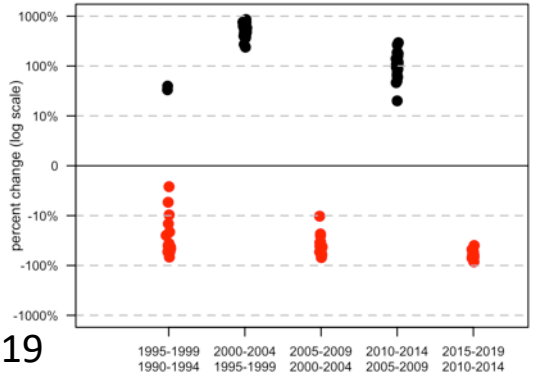
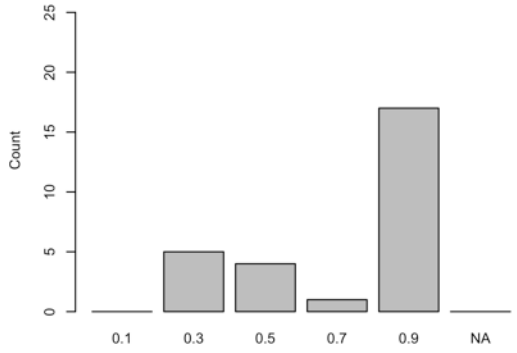
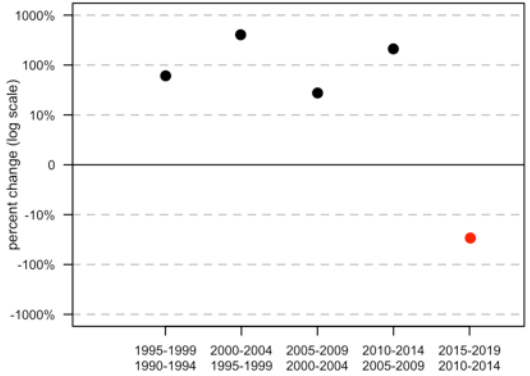
Snake River Sp/Su

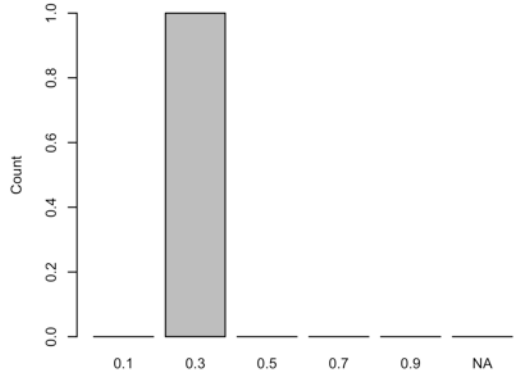




Proportion natural

Snake River Fall





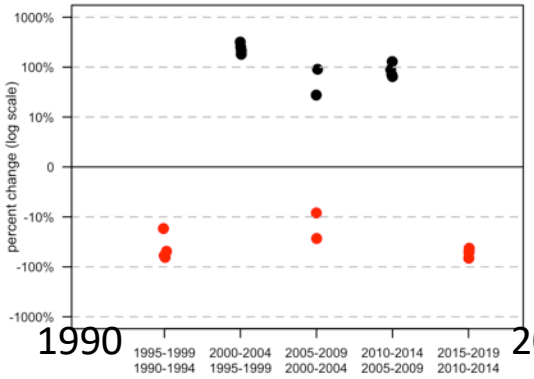
Summary – Interior Steelhead DPS

Abundance

Increasing

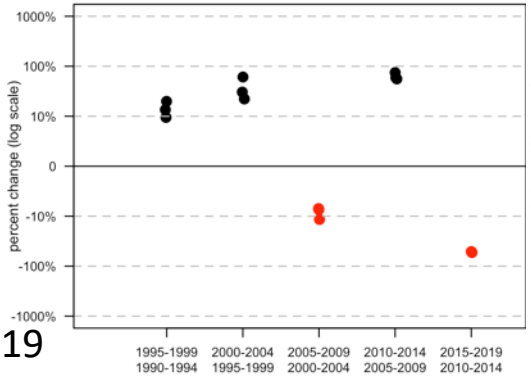
Decreasing

Upper Columbia

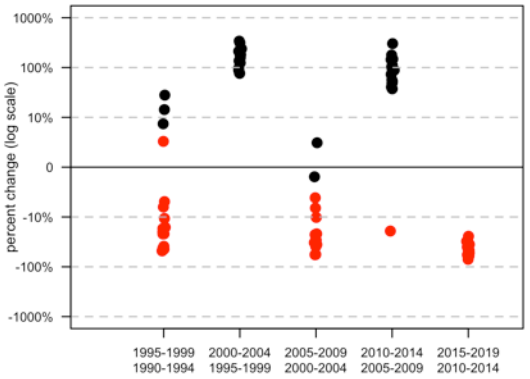


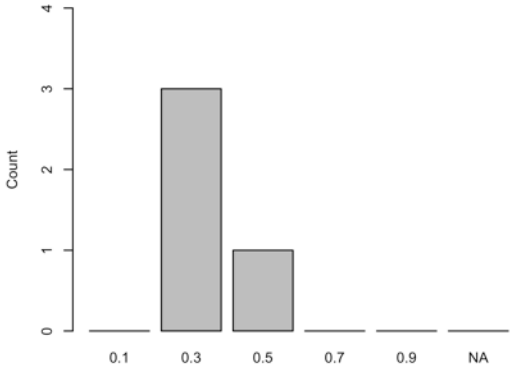
1990 2019

Snake River



Mid-Columbia





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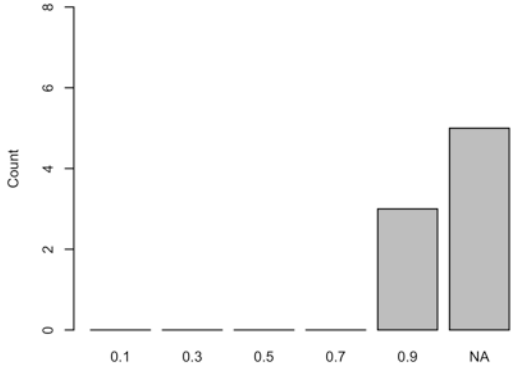
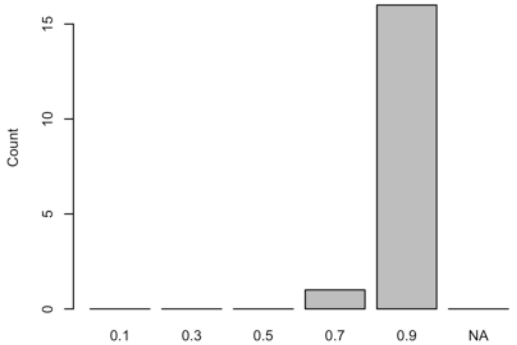


Proportion natural



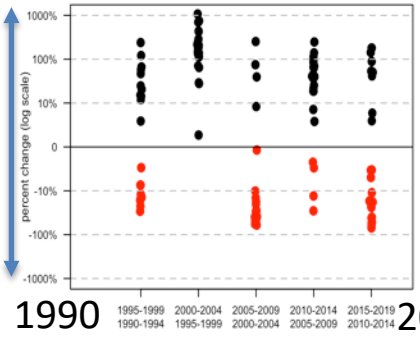
Lower Columbia salmon and steelhead

Abundance

Increasing

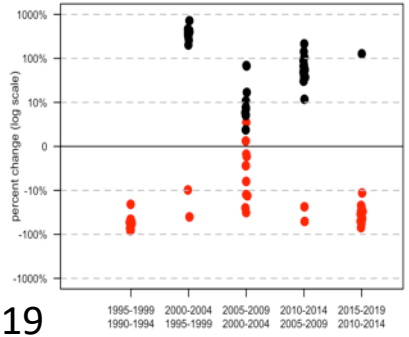
Decreasing

Chinook



1990 2019

Coho



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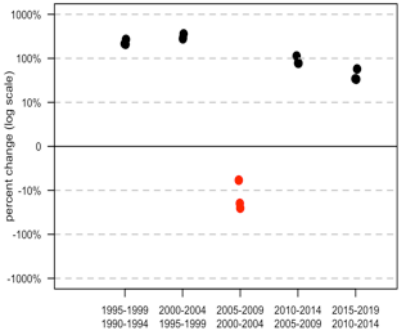
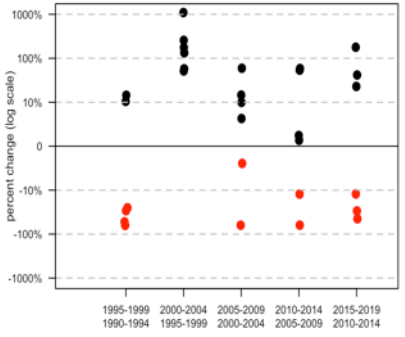
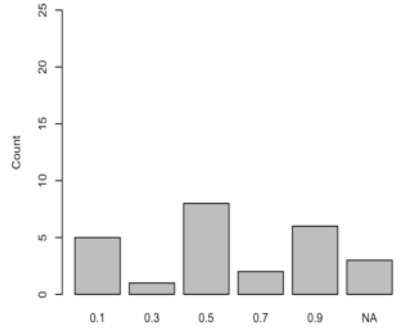
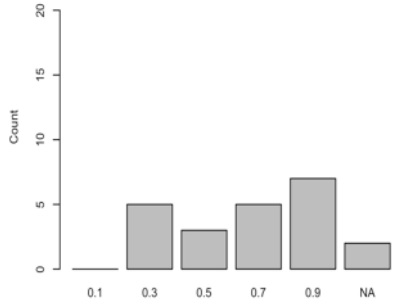
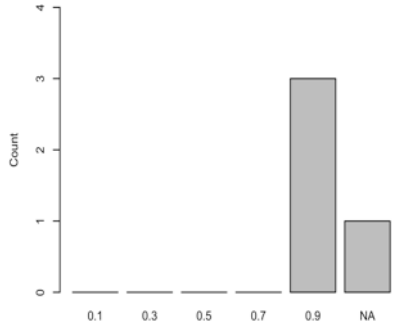


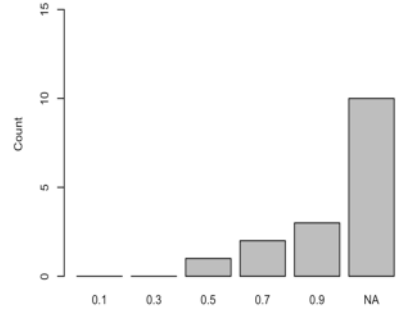
Steelhead











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Proportion natural

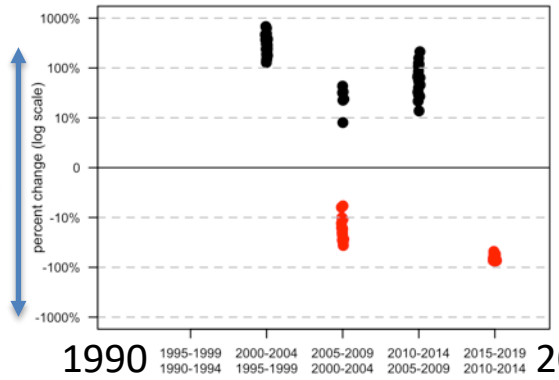
Coastal

Abundance

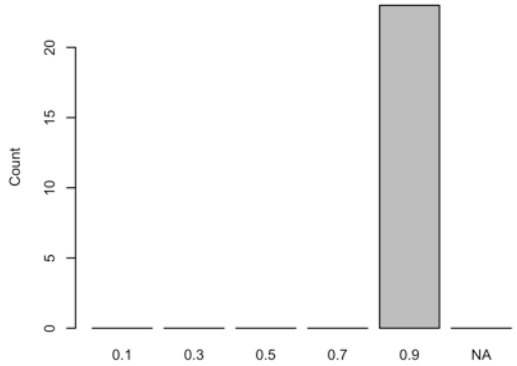
Increasing

Decreasing

Oregon Coast coho



1990 2019



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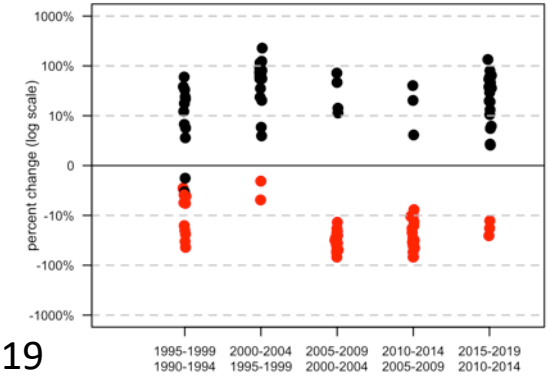
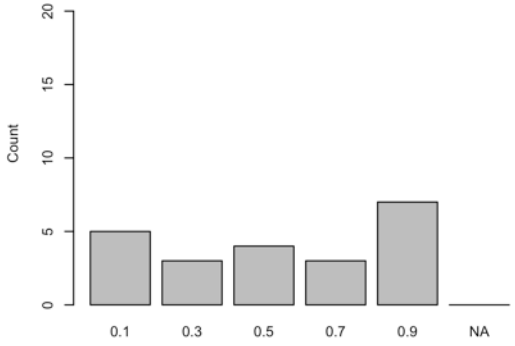
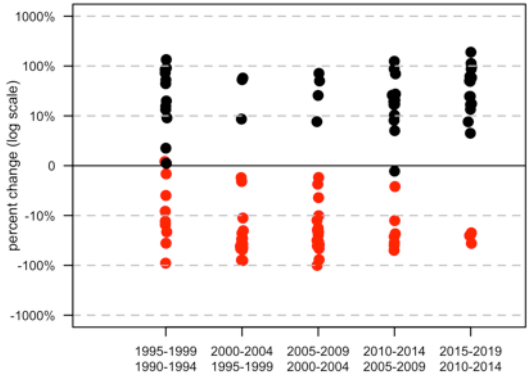
Puget Sound Chinook

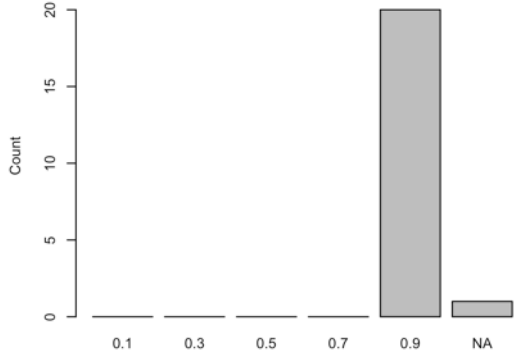




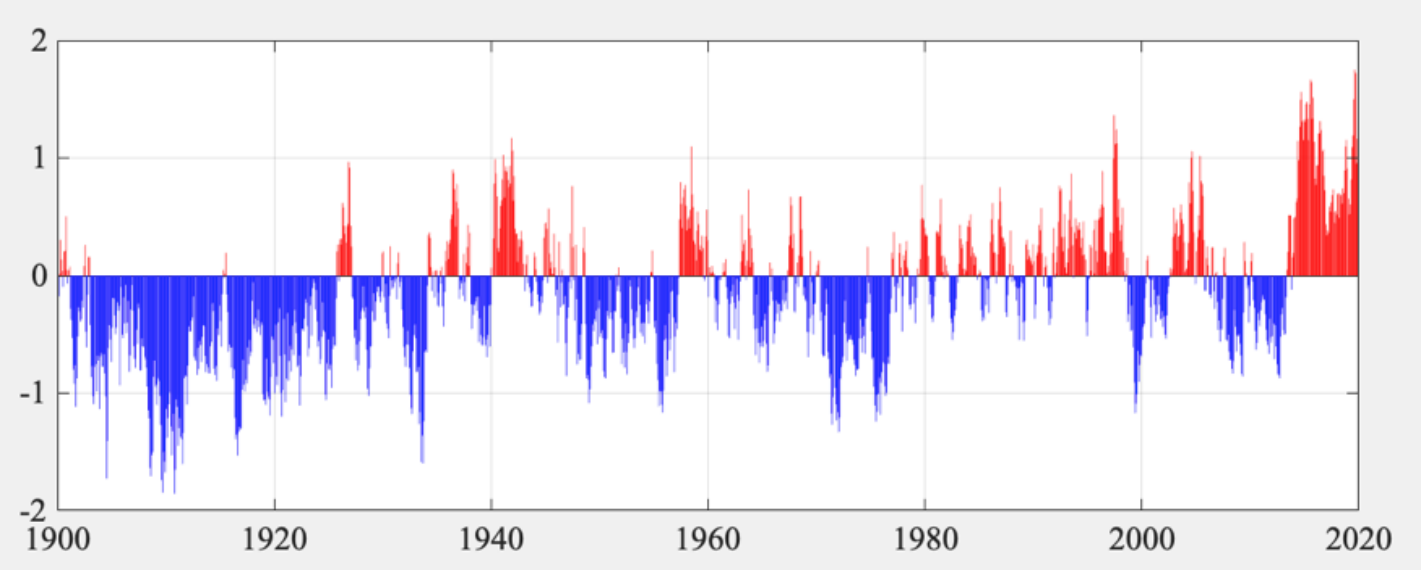
Proportion natural

Puget Sound steelhead





Environmental trends



Monthly average sea surface temperature anomaly time series (in Degrees C) for the NE Pacific Arc pattern defined by Johnstone and Mantua (2014).

Environmental trends

Ecosystem Indicators	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
PDO (Sum Dec-March)	19	6	3	13	7	21	12	17	14	9	5	1	16	4	2	8	10	22	20	18	11	15
PDO (Sum May-Sept)	10	4	6	5	11	17	16	18	12	14	2	9	7	3	1	8	20	22	21	15	13	19
ONI (Average Jan-June)	21	1	1	7	14	16	15	17	9	12	3	11	18	4	6	8	10	19	22	13	5	20
SST NDBC buoys (°C; May-Sept)	17	6	8	4	5	11	22	12	2	14	1	10	3	7	9	16	20	19	18	13	15	21
Upper 20 m T (°C; Nov-Mar)	21	11	8	10	6	15	16	13	12	5	1	9	18	4	3	7	2	22	20	19	14	17
Upper 20 m T (°C; May-Sept)	16	11	13	4	1	3	22	19	8	10	2	5	17	7	6	18	20	9	14	12	15	21
Deep temperature (°C; May-Sept)	22	6	8	4	1	10	12	16	11	5	2	7	14	9	3	15	21	19	13	18	20	17
Deep salinity (May-Sept)	21	3	11	4	5	18	19	12	7	1	2	16	20	15	14	13	22	17	9	8	6	10
Copepod richness anom. (no. species; May-Sept)	20	2	1	7	6	15	14	19	16	10	8	9	18	4	5	3	11	21	22	17	13	12
N. copepod biomass anom. ($mgC\ m^{-3}$; May-Sept)	20	15	11	12	4	17	14	21	16	13	7	10	9	1	3	5	6	18	22	19	8	2
S. copepod biomass anom. ($mgC\ m^{-3}$; May-Sept)	22	2	5	4	3	15	16	21	14	10	1	7	17	9	8	6	11	19	20	18	13	12
Biological transition (day of year)	19	11	6	7	8	15	12	20	14	3	1	2	17	4	9	5	10	21	21	18	13	15
Nearshore Ichthyoplankton Log($mgC\ 1,000\ m^{-3}$; Jan-Mar)	17	4	11	6	1	21	22	16	8	18	3	13	2	7	5	10	19	14	15	12	9	20
Nearshore & offshore Ichthyoplankton community index (PCO axis 1 scores; Jan-Mar)	11	6	5	9	8	13	16	20	1	14	3	12	15	4	2	7	10	18	21	22	17	19
Chinook salmon juvenile catches (no. km^{-3}; June)	20	4	5	17	8	12	18	21	13	11	1	6	7	16	2	3	10	14	19	22	15	9
Coho salmon juvenile catches (no. km^{-3}; June)	20	8	14	6	7	3	17	21	18	4	5	10	11	16	19	1	13	9	15	22	2	12
Mean of ranks	18.5	6.3	7.3	7.4	5.9	13.9	16.4	17.7	10.9	9.6	2.9	8.6	13.1	7.1	6.1	8.3	13.4	17.7	18.3	16.6	11.8	15.1
Rank of the mean rank	22	4	6	7	2	15	17	19	11	10	1	9	13	5	3	8	14	19	21	18	12	16
Ecosystem Indicators not included in the mean of ranks or statistical analyses																						
Physical Spring Trans. UI based (day of year)	3	7	21	18	4	13	16	22	13	1	6	2	8	11	19	9	20	10	5	17	11	13
Physical Spring Trans. Hydrographic (day of year)	21	3	13	8	5	12	15	22	6	9	1	9	19	3	11	2	17	7	18	20	15	14
Upwelling Anomaly (April-May)	11	3	18	7	10	15	14	22	11	5	8	9	16	18	16	13	20	1	2	21	6	4
Length of Upwelling Season UI based (days)	6	2	20	13	1	15	11	22	5	3	9	3	17	19	17	16	21	12	8	14	7	10
Copepod Community Index (MDS axis 1 scores; May-Sept)	21	3	5	8	2	16	14	20	17	10	1	7	13	9	6	4	11	19	22	18	12	15

The “stoplight” chart of ocean indicators used to predict salmon return returns. Rank scores derived from ocean ecosystem indicators data and color-coded to reflect ocean conditions for salmon growth and survival (green = good; yellow = intermediate; red = poor). Based on Peterson et al. 2014.

Some preliminary thoughts

- Many population declined over past 5 years
  - Some exceptions: Lower Columbia and Puget Sound more variable among populations than Interior Columbia
- Ocean conditions have been generally poor in recent years
- Overall biological status has probably not changed dramatically in most cases compared to prior review

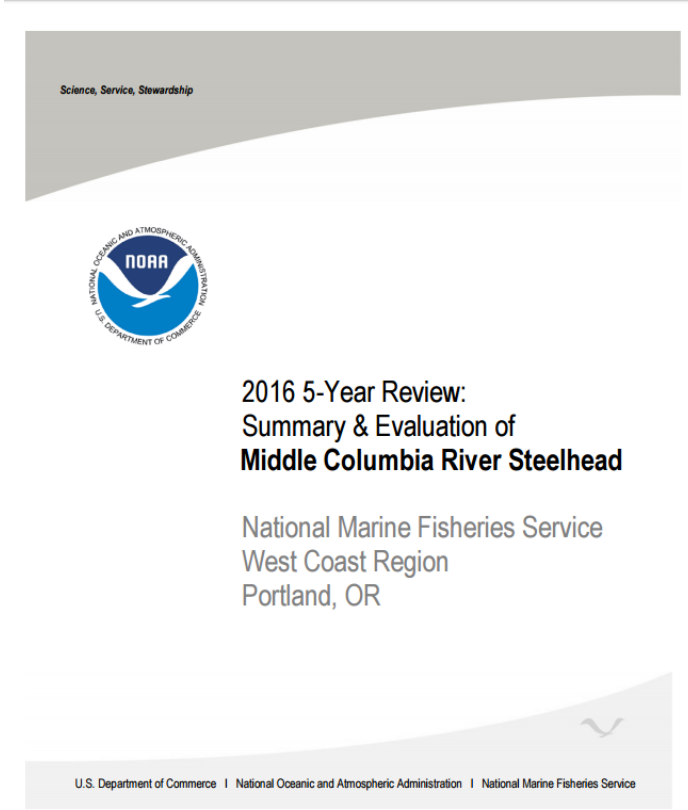
5-Year Review Findings Report (WCR)

Each report contains:

- Any recommended ESU/DPS adjustments
- Summary of updated viability information
- Recommended changes to ESU/DPS hatchery membership
- Evaluation of Sec. 4(a)(1) listing factors
- Listing classification conclusion
- Recommendations for recovery priorities

Example:

Middle Columbia River Steelhead
https://www.fisheries.noaa.gov/resource/document/2016-5-year-review-summary-evaluation-middle-columbia-river-steelhead



Findings Report Timeline