March 30, 2021

MEMORANDUM

TO: **Fish and Wildlife Committee**

FROM: **Mark Fritsch**

SUBJECT: **Eulachon – Status Update**

BACKGROUND:

Presenters: Laura Heironimus, *Sturgeon, Smelt, and Lamprey Unit Lead*, Washington Department of Fish and Wildlife (WDFW), and
Robert Anderson, National Marine Fisheries Service (NMFS), West Coast Region, Protected Resources Division, NOAA Fisheries Service.

Summary: Laura and Robert will report on the Columbia River Subpopulation of Eulachon (*Thaleichthys pacificus*), including a brief overview of:

- run summary and forecast for Eulachon;
- update on research and monitoring efforts; and
- update on implementation of recovery plan actions priorities, 5-year status review, and proposed regulations.

Relevance: The presentation supports the Eulachon strategy in the 2014 Program and 2020 amendment. This information is relevant to our high-level indicators. It gives the region a status report on smelt populations and a preview for what is expected for smelt returns in the coming year. The Program is not currently funding any Eulachon work.

Background: The 2014 Program called for the Council, in collaboration with Bonneville, the Corps, National Oceanic and Atmospheric Administration (NOAA)

Fisheries, and agencies and tribes, to help organize and facilitate a science/policy forum in 2015 to address the biological requirements of eulachon, combined with related inquiries into the relationship between flow, current hydropower dam operations, and the biological requirements of lamprey and sturgeon. The *Columbia River Eulachon* (smelt) *State of the Science and Science to Policy Forum* was held in August 2015. The goal was to report to the region on the state of the science, the reasonable next steps in the assessment process, and a recommendation for how to incorporate those steps into the recovery plan.

The information generated from this forum was used to help inform NOAA's Eulachon Recovery Plan which was approved by NMFS in September 2017. In the 2014 and 2019 FCRPS/CSRO biological opinions, to promote eulachon conservation and address uncertainties, NMFS has included the following recommendations to the Action Agencies addressing adverse effects.

1. Productivity and abundance:

    - Monitor eulachon abundance in the Columbia River via annual spawning stock biomass surveys.

2. Larval and juvenile survival in the estuary, plume, and ocean:

    - Monitor and evaluate temporal and spatial species composition, abundance, and foraging rates of juvenile eulachon predators at representative locations in the estuary and plume.

    - Monitor, and evaluate shifts in the timing, magnitude, and duration of the hydrograph of the Columbia River, and migration/behavior characteristics affecting survival of larval eulachon during their first weeks in the plume-ocean environment.

    - Monitor and evaluate the ecological importance of the tidal freshwater, estuary, plume, and nearshore ocean environments to the viability and recovery of the Columbia River subpopulation of eulachon.

More Info:

- NOAA Eulachon web site and 2017 NOAA's Final Eulachon Recovery Plan
- 2015 Eulachon Forum final report

Southern DPS Eulachon

Laura Heironimus
Washington Department of Fish and Wildlife
Ridgefield, WA

Ecosystem Role, forage fish

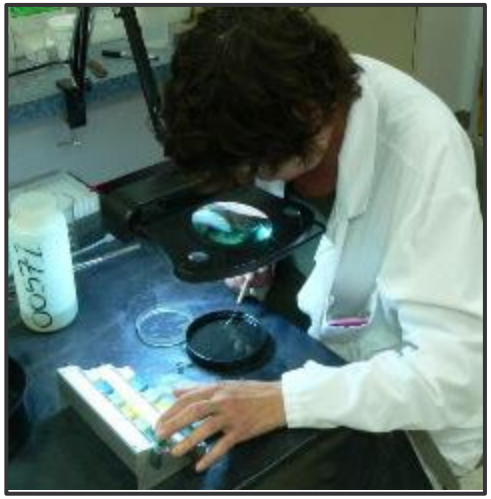
WDFW Goals for 2021

- Monitor the 2021 Eulachon spawning run:
  - Evaluate sex ratios, age and size distribution, fecundity, run timing, and spatial distribution of adult Eulachon.
  - Evaluate egg and larval outflow in main channel.
  - Estimate minimum adult run size (Spawning Stock Biomass).
- Set research-level commercial and recreational fisheries:
  - Address monitoring questions
  - Provide sustainable fishing opportunity.
- Seek partnerships and funding for improved recovery and management efforts.

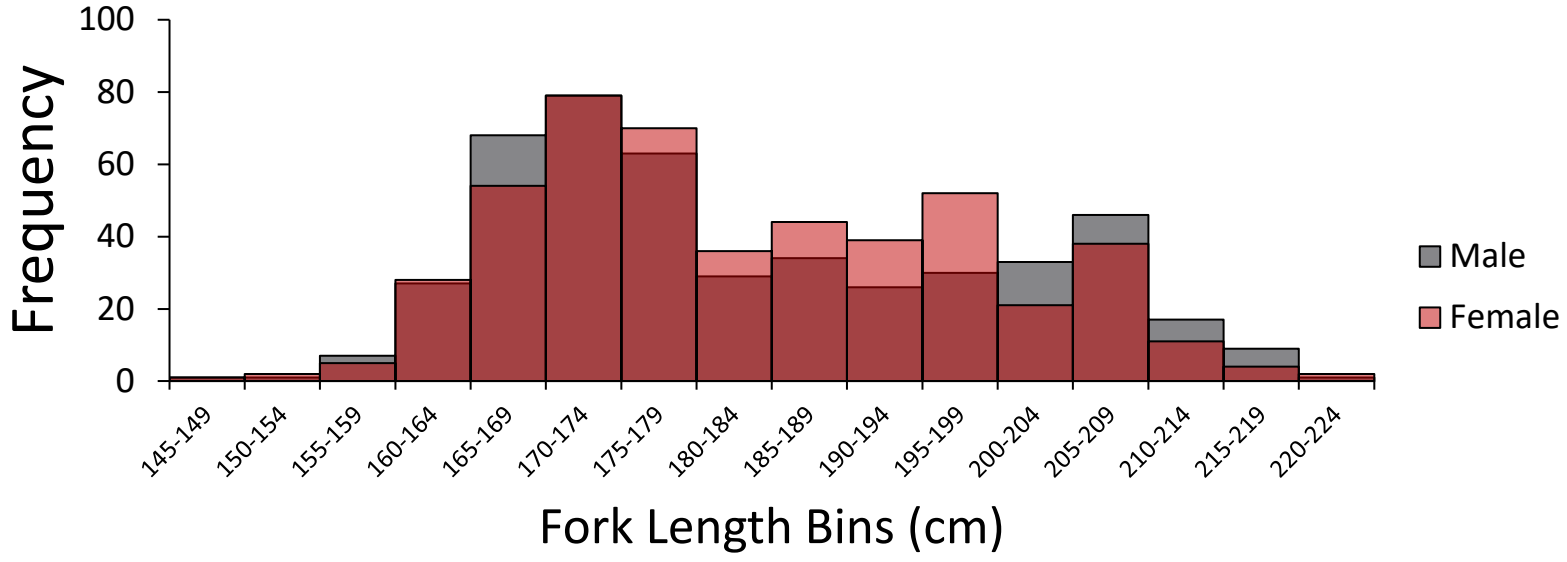
Current Monitoring

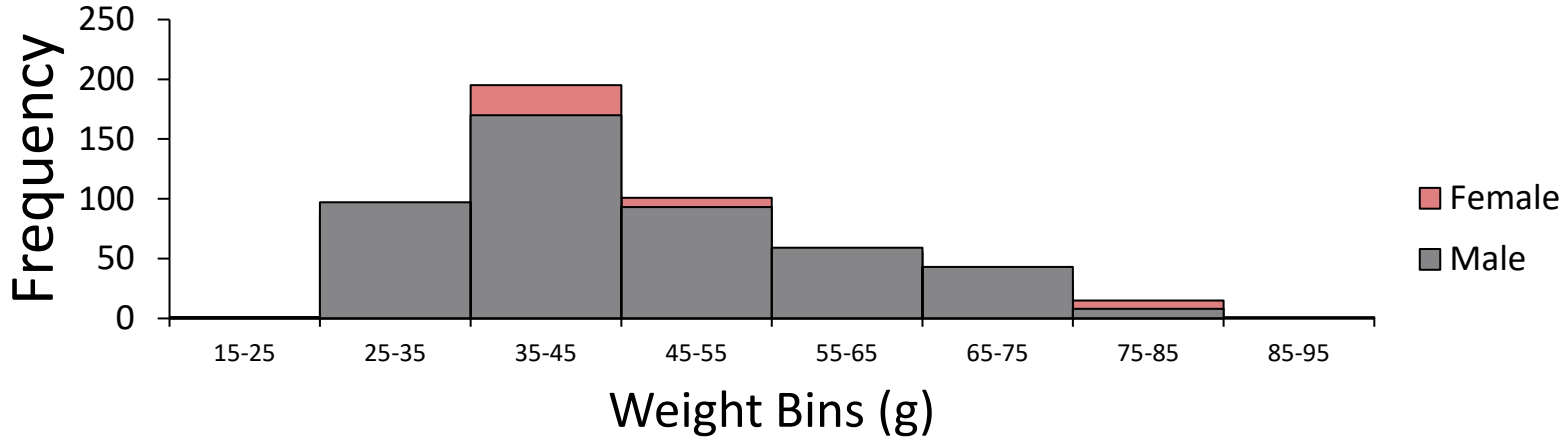
- WDFW
  - Sampling fishery and research caught adults in the Columbia and Cowlitz rivers
  - Plankton tows for eggs and larvae in mainstem Columbia River
  - Communicating throughout basin on smelt and predator presence

- Cowlitz Tribe
  - Efforts focused on Cowlitz River
  - Sampling adults, eggs, and larvae to evaluate and compare with mainstem collection.



2021 Adult Sampling Data

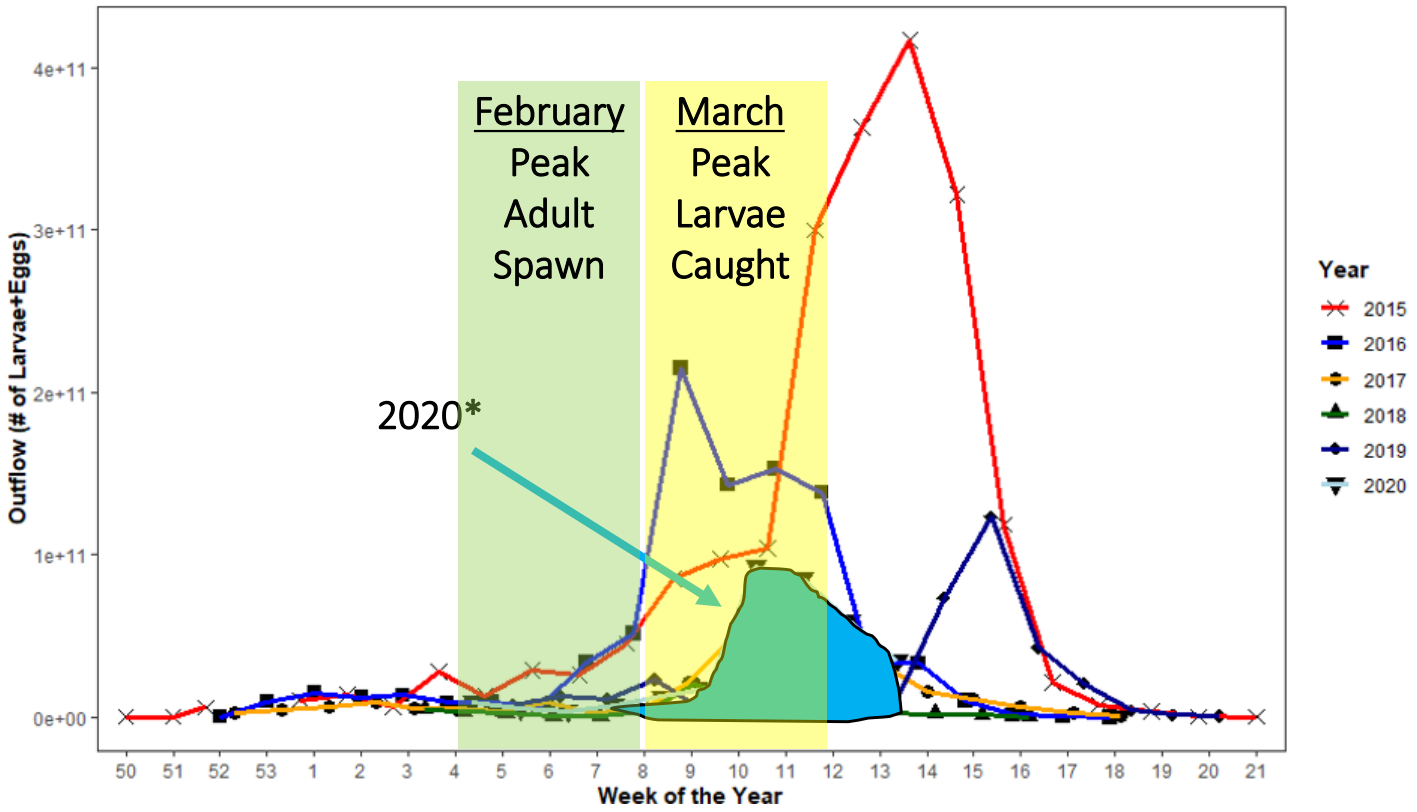




Spawning Stock Biomass

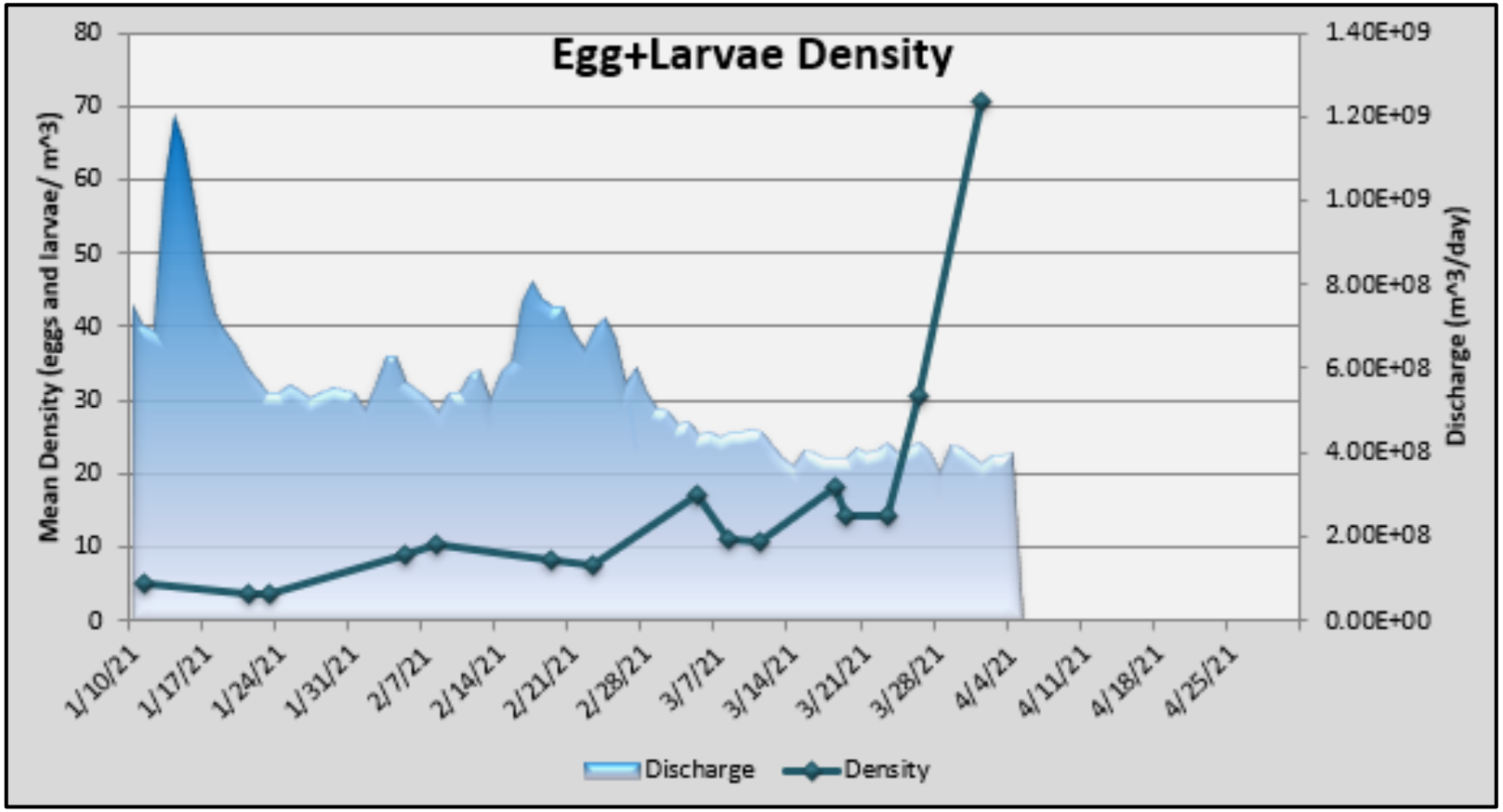
Spawning Stock Biomass (SSB): An estimate of the minimum number of spawning adults needed to have produced the eulachon larval outflow observed.

*2020 Sampling was cut short due to the COVID-19 Pandemic.



2021 Sampling

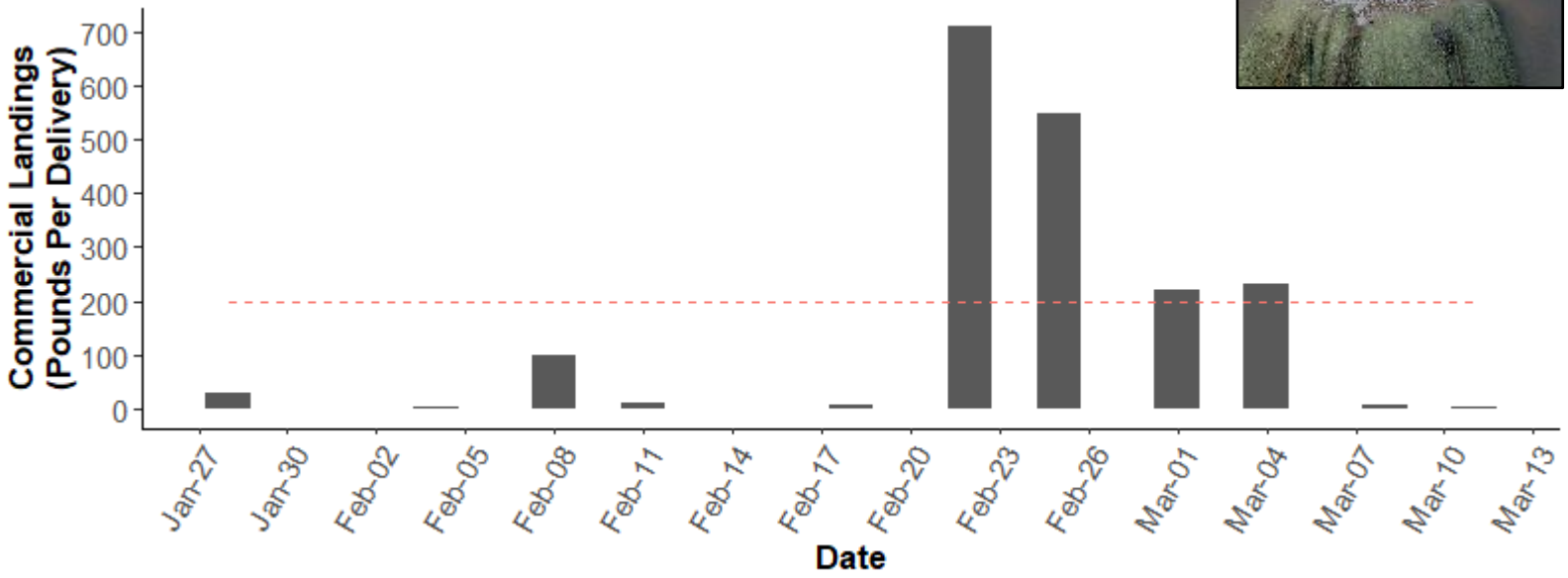
2021 sampling is in progress, early SSB data indicates a run size of over 4 million pounds and larval counts are still increasing.



2021 Commercial Fisheries

- Research-level commercial fisheries
  - 13 fishing periods on Mondays and Thursdays, January 28-March 11, 2021.
  - 12 hr fishing periods, tidal dependent.

- Important source of run status data:
  - Landings per delivery (CPUE) provides a rough estimate of in-season run strength.



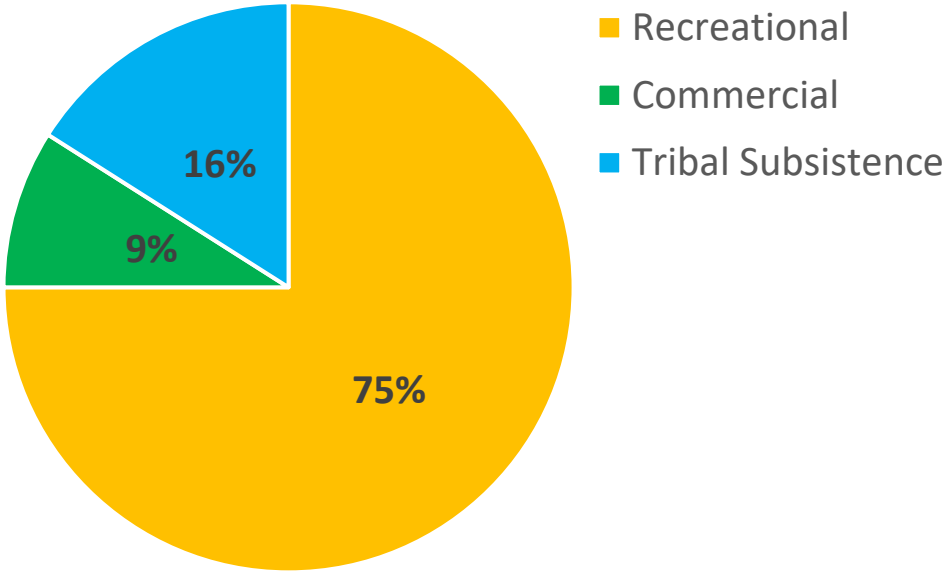
2021 Recreational Fisheries

- One day of sport fishing opened in Cowlitz River.
  - Five-hour opener, 8am-1pm on Tuesday March 2nd.
- This popular fishery meant we additional challenges presented by COVID-19 pandemic. WDFW worked with county health officials and the Governor's office to set safe fishing guidelines and open fishery.
- Angler and harvest effort estimated by boat count and interviewing anglers at sampling stations.

2021 Harvest Totals

2021 Fisheries	Estimated Catch (lbs)
Recreational	91,000
Commercial	11,000
Tribal Subsistence	20,000
Total	122,000

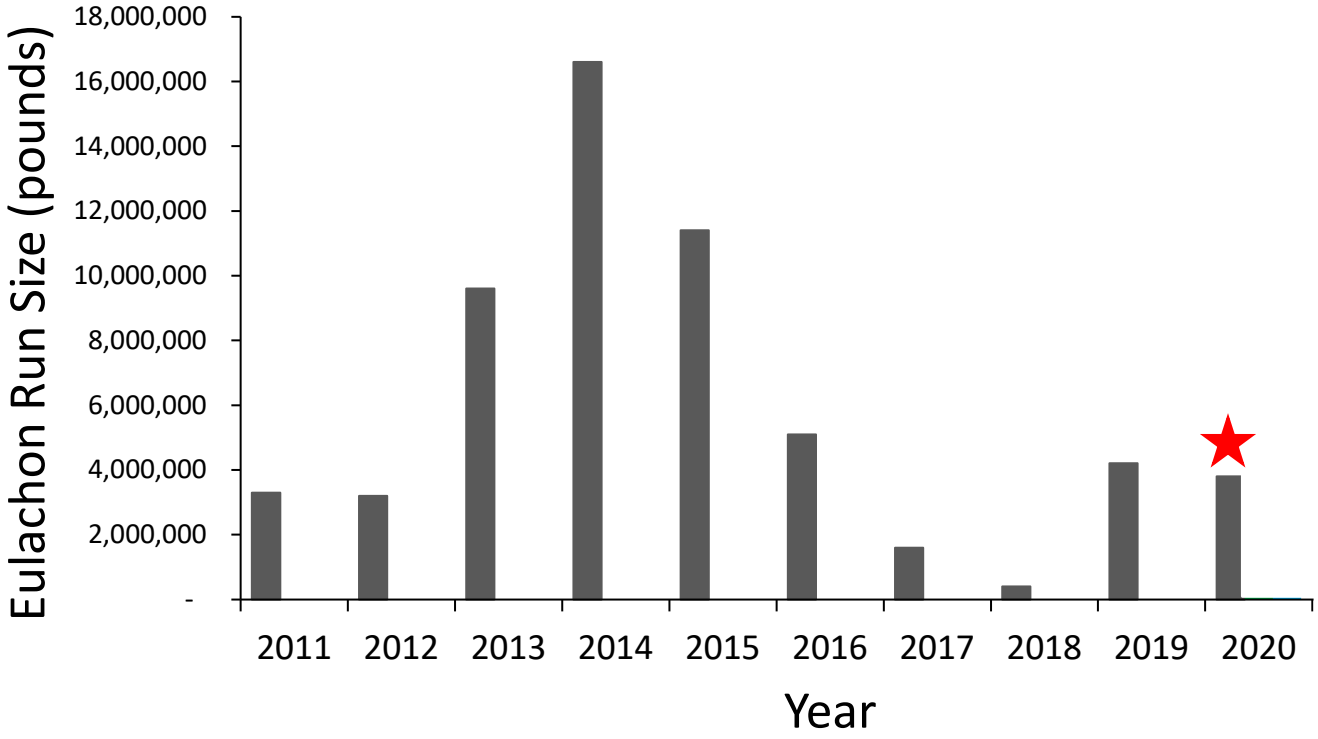
**Preliminary estimates*



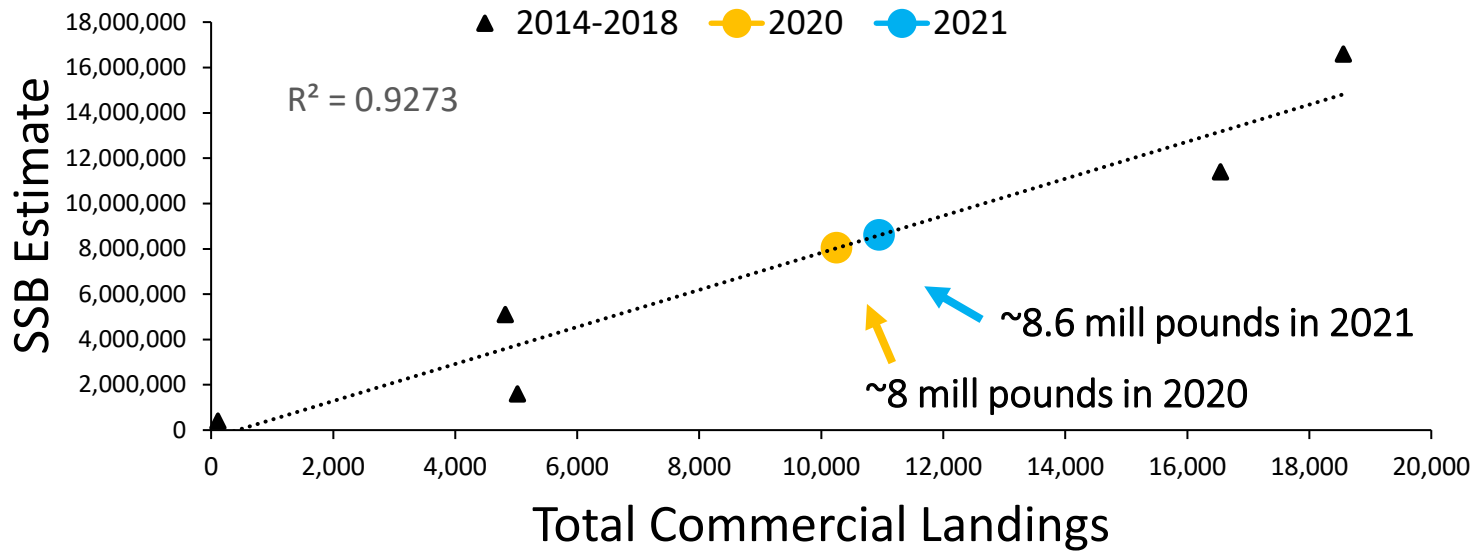
Run Size Estimate

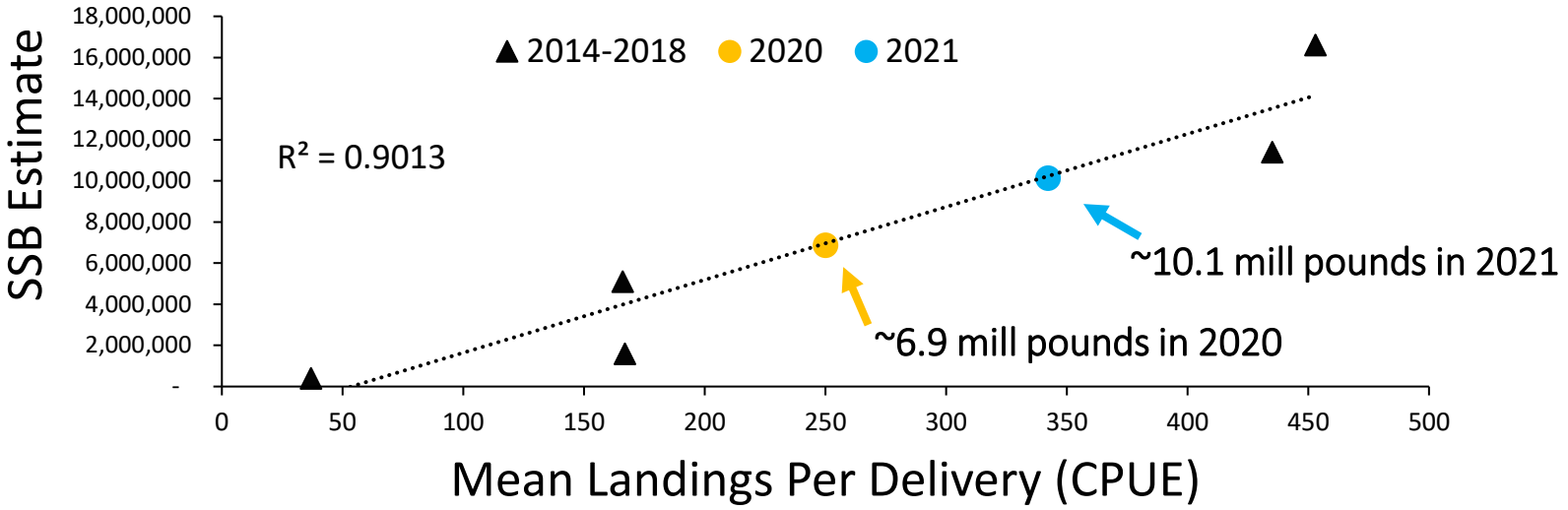
Total Run Size = SSB + Known Harvest

★ 2020 larval sampling was incomplete



Predicting Run-Size

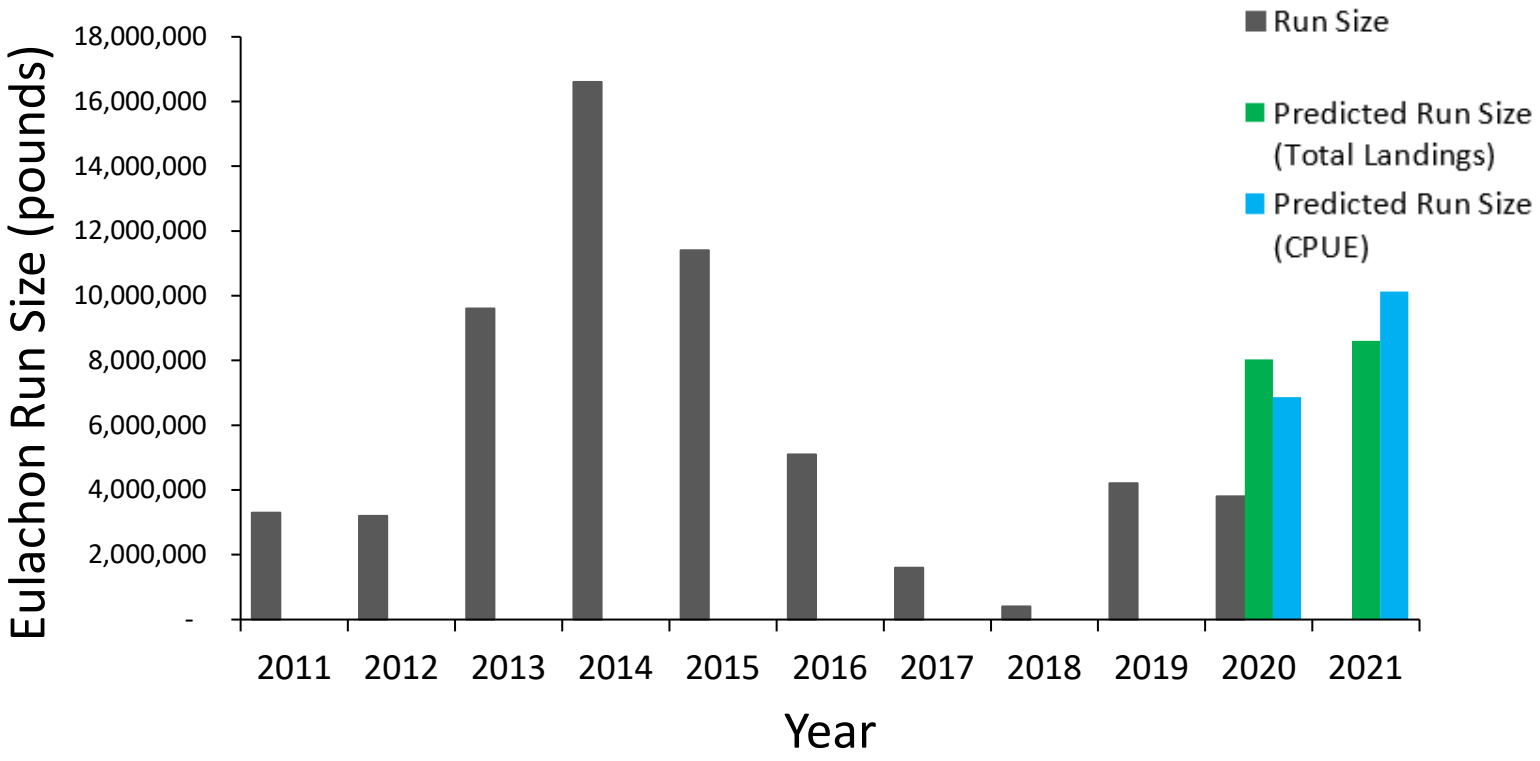




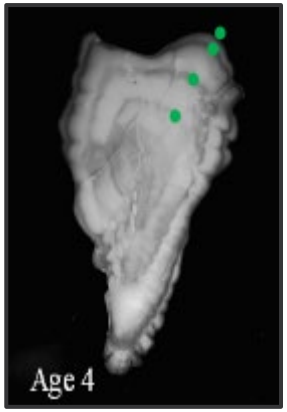
Predicted Run Size

2020 and 2021 run size predicted from commercial landings data.

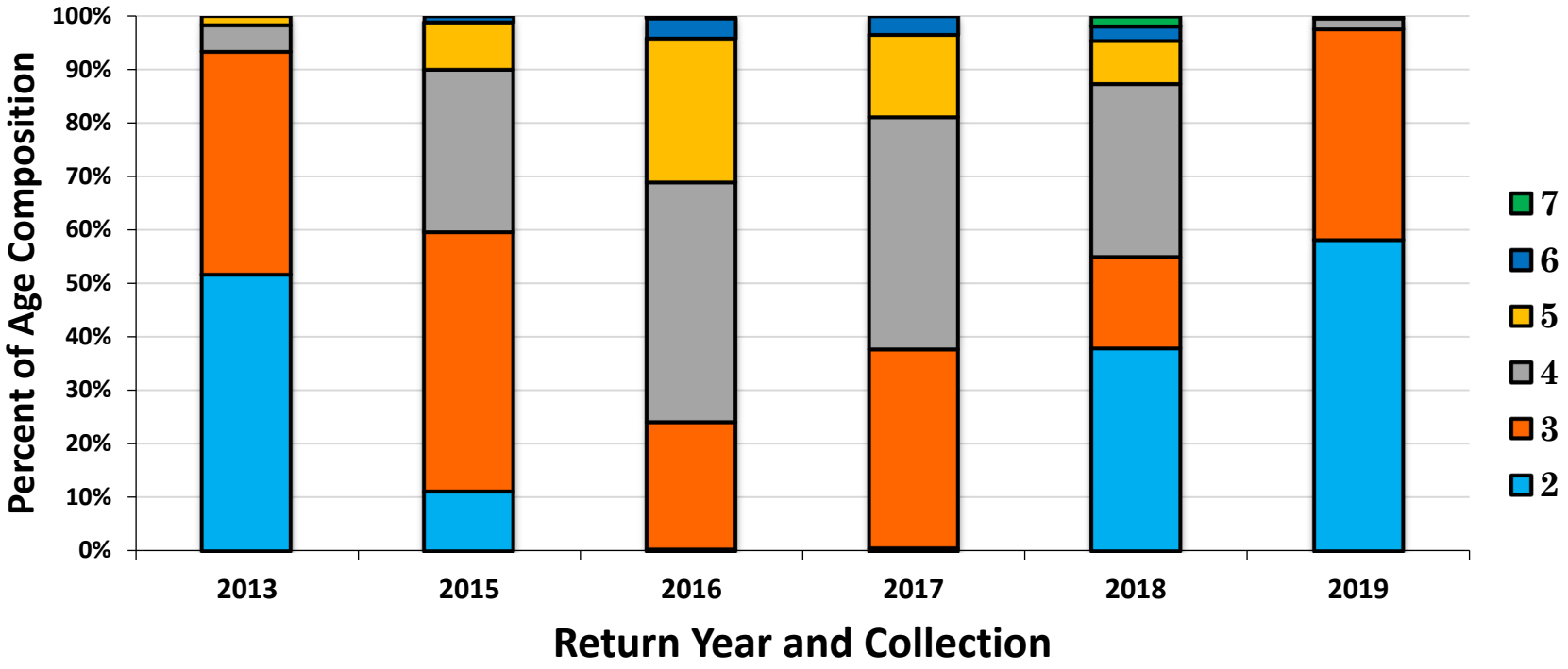
2021 harvest rate is estimated between 1.2-1.4%



Age Variability



- In the Columbia River, we see a variable proportion of age-class contribution year-to-year.
- This data is paired with freshwater and marine environmental data to forecast future run size.
- 2020 and 2021 otoliths are in process, the 2022 forecast is not yet available.



Future Management Plan

- The 2001 Washington and Oregon Eulachon Management Plan needs to be updated; we plan to initiate revisions to the management plan starting in 2021.

WDFW Recommendations:

- Support measures identified in the 2014 Program and 2020 amendment.
- Contribute funding for the annual monitoring of eulachon spawning stock biomass and to address critical uncertainties/questions for this species.

Science, Service, Stewardship

Eulachon Status Updates

Northwest Power and Conservation Council

April 2021

Photo Credit: *Michele Cornelius*

April 6, 2021

Robert Anderson
National Marine Fisheries Service
West Coast Region

NOAA FISHERIES SERVICE

Eulachon Status Updates

- Recovery Plan Implementation
  - Recovery Plan Finalized in September 2017
- Columbia River Basin Fish and Wildlife Program, Conservation Recommendations for Eulachon in the 2014 Supplemental Federal Columbia River Power System, and the 2019 Columbia River System Operations Biological Opinions
- Eulachon 5-Year Status Review
- Proposed Rules and Regulations for Eulachon

Eulachon Recovery Plan Implementation
Initiated, Ongoing, Completed

- Conduct annual in-river spawning stock biomass surveys in spawning areas with a high-to-moderate spawning frequency to develop long-term, high resolution abundance estimations for each subpopulation of eulachon.
- Conduct a gap analysis to identify the data needs to develop a genetic mixed stock baseline analysis of eulachon spawning subpopulations.
- Conduct a gap analysis to identify the data needs to develop a genetic mixed stock baseline analysis of eulachon in the marine environment.
- Conduct a gap analysis to identify the data needs to develop a method to correlate in-river and marine abundance estimations of eulachon.
- Conduct a gap analysis to identify the data needs to develop an ocean ecosystem indicators model of eulachon marine survival in the California Current Ecosystem.
    - Develop an ocean ecosystem indicators model of eulachon marine survival in the California Current Ecosystem to determine how short-term and long-term variability in ocean conditions affect eulachon abundance and productivity for each subpopulation.
- Establish a eulachon technical recovery and implementation team to develop an overall framework for funding, prioritization, implementation, and reporting of recovery actions.
- Develop outreach and education strategies regarding the ecological, economic, and cultural values of eulachon; foster stewardship of the marine ecosystem; expand funding and research partnerships; and increase involvement of existing regional and international organizations.
- Continue to work with the ocean shrimp trawl fisheries and the states of California, Oregon, and Washington to implement actions, e.g., fleet-wide implementation of light emitting diode lights, rigid grate bycatch reduction devices, and additional gear-type or operational modifications, to further reduce bycatch of eulachon in the ocean shrimp trawl fisheries.
- Develop and implement a fishery management and evaluation plan to ensure that exploitation rates do not negatively impact subpopulation productivity.

Columbia River Basin Fish and Wildlife Program - Eulachon

General Measures

- The Council supports measures to implement the two eulachon conservation recommendations found in the 2014 Supplemental Federal Columbia River Power System Biological Opinion (Columbia River Basin Fish and Wildlife Program, 2014, pages 97-98).

- Upon completion of a recovery plan for eulachon, the Council will incorporate appropriate information regarding eulachon into the program and reflect the importance of this species and the need for protection and mitigation to the extent affected by the hydropower system.

2014 Supplemental Federal Columbia River Power System 2019 Columbia River System Operations Biological Opinions

ESA Section 7(a)(1) Conservation Recommendations for Southern DPS Eulachon

1. To promote eulachon conservation and address uncertainties regarding changes in the hydrograph of the Columbia River and adverse effects on eulachon productivity and abundance, the Federal Columbia River Power System Action Agencies should:
   - Monitor eulachon abundance in the Columbia River via annual spawning stock biomass surveys.

2. To promote eulachon conservation and address uncertainties regarding changes in the hydrograph of the Columbia River and adverse effects to eulachon larval and juvenile survival in the estuary, plume, and ocean, the Federal Columbia River Power System Action Agencies should:
   - Monitor and evaluate temporal and spatial species composition, abundance, and foraging rates of juvenile eulachon predators at representative locations in the estuary and plume.
   - Monitor, and evaluate the causal mechanisms, e.g., shifts in the timing, magnitude, and duration of the hydrograph of the Columbia River, and migration/behavior characteristics affecting survival of larval eulachon during their first weeks in the plume-ocean environment.
   - Monitor and evaluate the ecological importance of the tidal freshwater, estuary, plume, and nearshore ocean environments to the viability and recovery of the Columbia River sub-population of eulachon.

Eulachon 5-Year Status Review

On March 5, 2020, the National Marine Fisheries Service announced the initiation of a 5-year review for southern distinct population segment of eulachon, listed as threatened under the Endangered Species Act. The purpose of this review is to ensure the accuracy of the listing classifications of this threatened species. The 5-year review will be based on the best scientific and commercial data available at the time of the review, and will analyze new relevant information on eulachon that has become available since the species' status was last updated (2016). Based on the results of this 5-year review, we will make the requisite determinations under the Endangered Species Act.

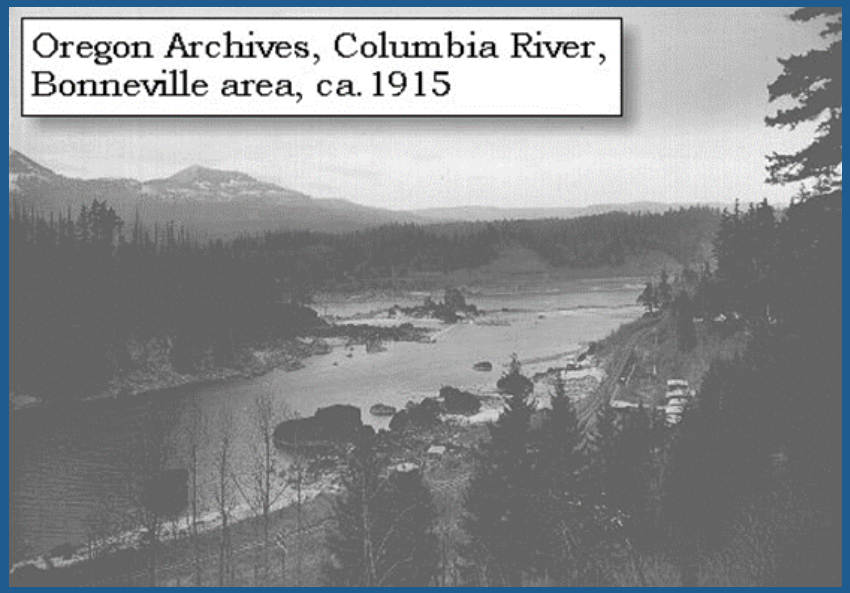
- During the past 5 years, the abundance of eulachon in the Columbia River Basin decreased markedly relative to the 2016 status review.
  - For the years 2011 through 2015, the 5-year Spawning Stock Biomass estimations average (mean values) was 97,968,020 spawners in the Columbia River Basin. For the years 2016 through 2020, the 5-year Spawning Stock Biomass estimations average (mean values) was 33,241,673 spawners in the Columbia River Basin.

- Interestingly, in the Fraser River, eulachon abundance increased somewhat markedly relative to the 2016 status review.
  - For the years 2011 through 2015, the 5-year Spawning Stock Biomass estimations average (standard 7-week survey period, was 2,767,506 spawners). For the years 2016 through 2020, the 5-year Spawning Stock Biomass estimations average (standard 7-week survey period) was 5,321,114 spawners in the Fraser River.

Eulachon - Proposed Rules and Regulations

Under section 4(d) of the Endangered Species Act, the Secretary of Commerce is required to adopt such regulations, if deemed necessary and advisable for the conservation of species listed as threatened.

Questions


Oregon Archives, Columbia River,
Bonneville area, ca. 1915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Bonneville Dam. 62