Southern DPS Eulachon: Current Population Status and Recovery Plan Implementation Efforts

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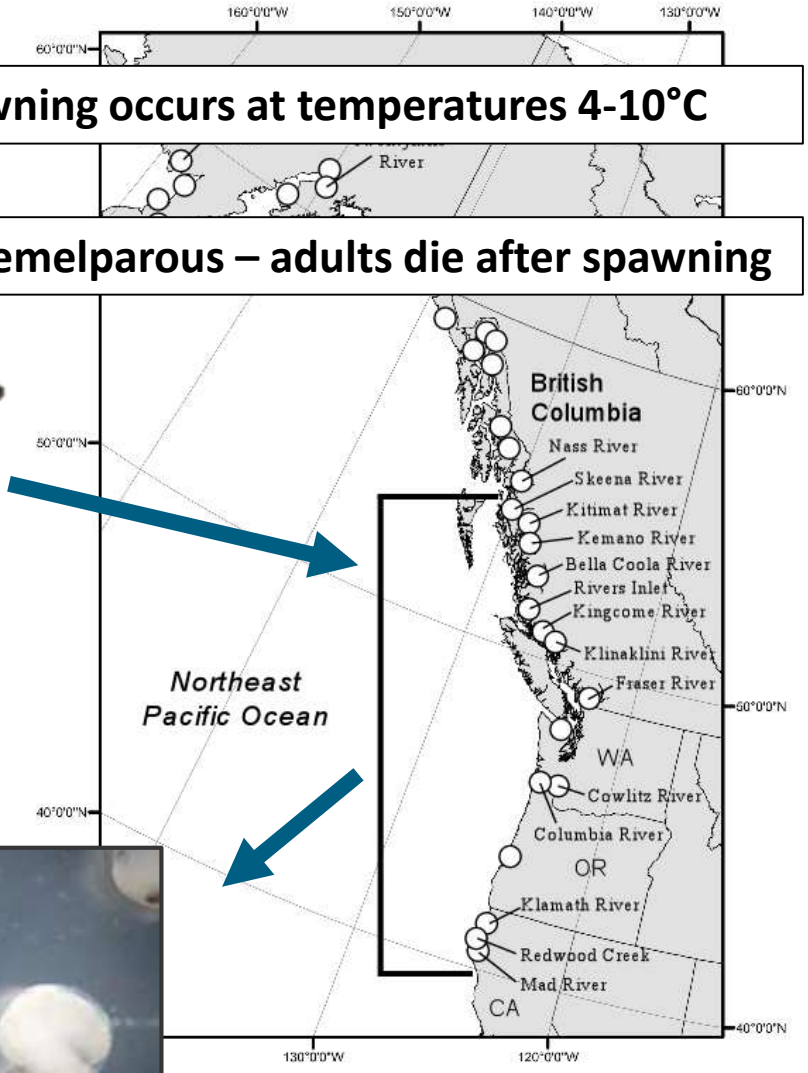
Life History

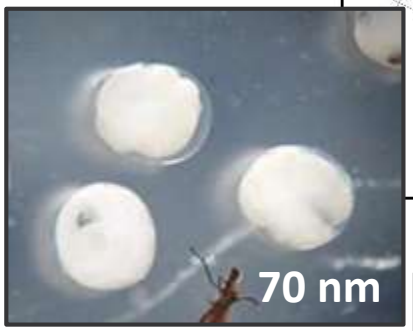
Spawning occurs at temperatures 4-10°C

Semelparous – adults die after spawning



2–5 years in saltwater

4–7 mm



"mobile incubation" – eggs incubate and develop while drifting downstream

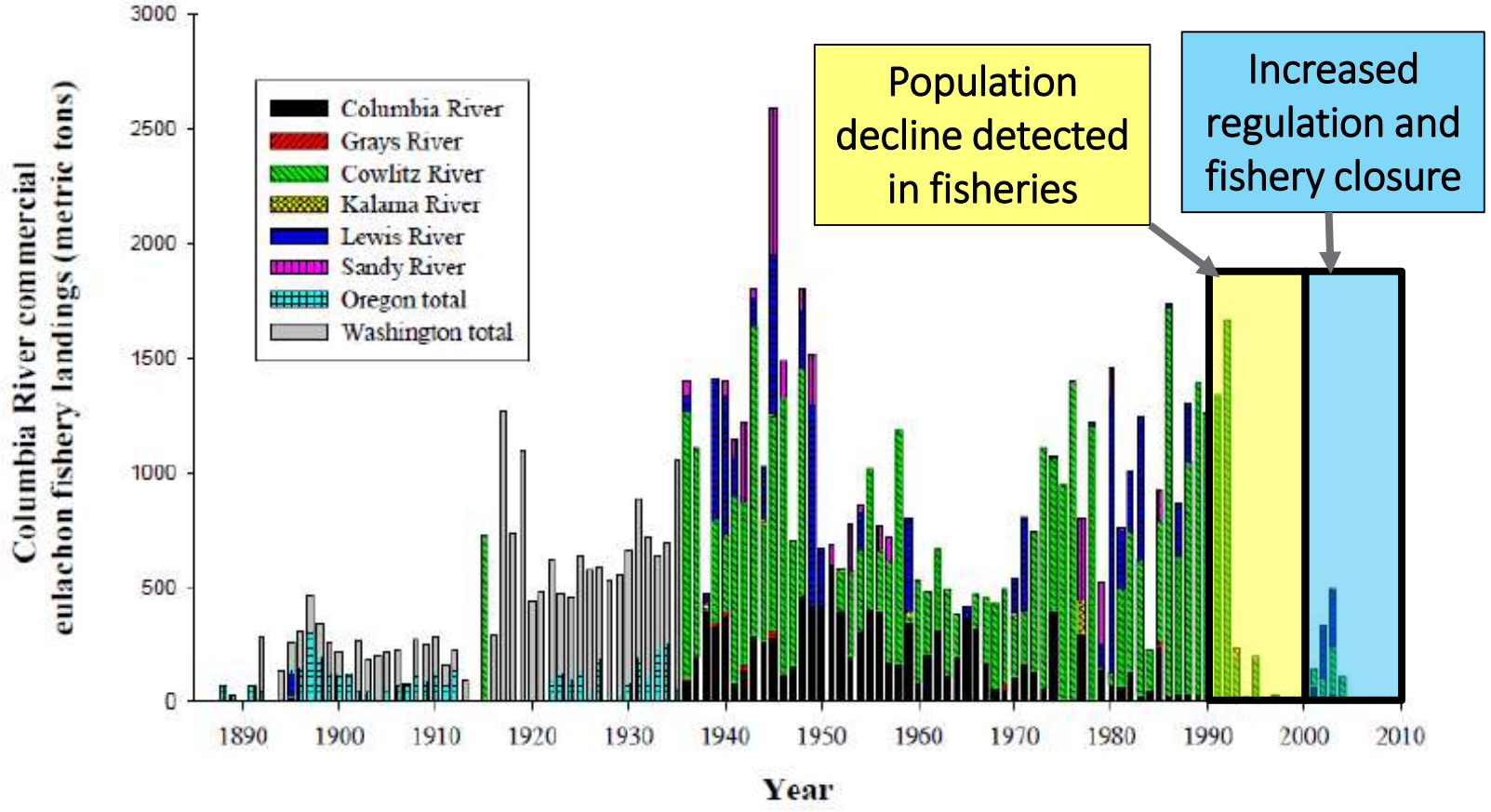
Ecosystem Role, forage fish

Commercial Fisheries

- Local communities honored and celebrated the smelt arrival.
  - Longview Smelt Festival and Smelt Queens
- Washington State landings have accounted for most of the commercial smelt harvest since the late-1800s.
  - Commercial landings data are the only way to assess historical abundance.
  - Landings data can be very biased due to variation in fishing effort and market demands.

Fishery Monitoring

- Fisheries declined in mid-1990s which prompted management action.
- The Washington Oregon Eulachon Management Plan was implemented in 2001.
- Eulachon listed as a threatened species under ESA on March 18, 2010.



Recreational Fisheries

- Recreational dipping generally occurs along the Cowlitz River in Washington and Sandy River in Oregon.
- According to the 1978 creel survey, the sport tributary harvest was estimated as similar in magnitude to the commercial tributary harvest.
- In 2016, there was an estimated 16,700 angler trips and 141,000 pounds of smelt harvested in a single day.

Factors of Decline

Top 5 Factors of Decline in the Columbia River:

1. Climate change impacts on ocean conditions
2. Eulachon by-catch
3. Climate change impacts on freshwater habitats
4. Dams/water diversions
5. Water quality

*Eulachon qualitative threats rankings by subpopulation (BRT 2010)

Without Lights

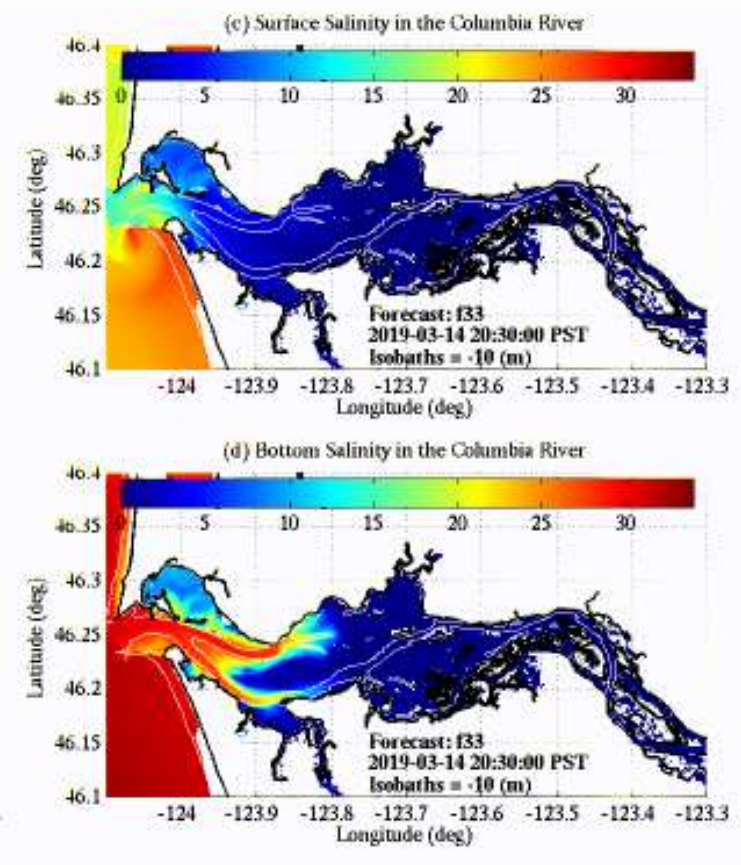
With LED Lights

Factors of Decline

Effects of the Federal Columbia Hydropower System:

- Hydrograph – significantly altered timing, magnitude, and duration.
- Columbia River Plume – reduced in size, shape, and intensity.
- Migration – Bonneville Dam impedes migration to historical spawning habitat above the dam (Hood River and Klickitat River).

*Recovery Plan for Southern DPS Eulachon (NMFS 2017)



Center for Coastal Margin Observation & Prediction
www.stccmop.org

Recovery Priority Actions

Continue to implement limited-opportunity fisheries to:

- Provide essential context for interpreting historical harvest data
- Filling critical information gaps
- Support the cultural traditions of Northwest tribes
- Provide commercial and recreational fishery to maintain connection between people and the resource.

Recovery Priority Actions

- Develop outreach and education strategies
- Foster stewardship of the marine ecosystem
- Expand funding and research partnerships
- Increase involvement of regional organizations

- Develop a recovery team to implement recovery actions
  - Eulachon Technical Recovery and Implementation Team

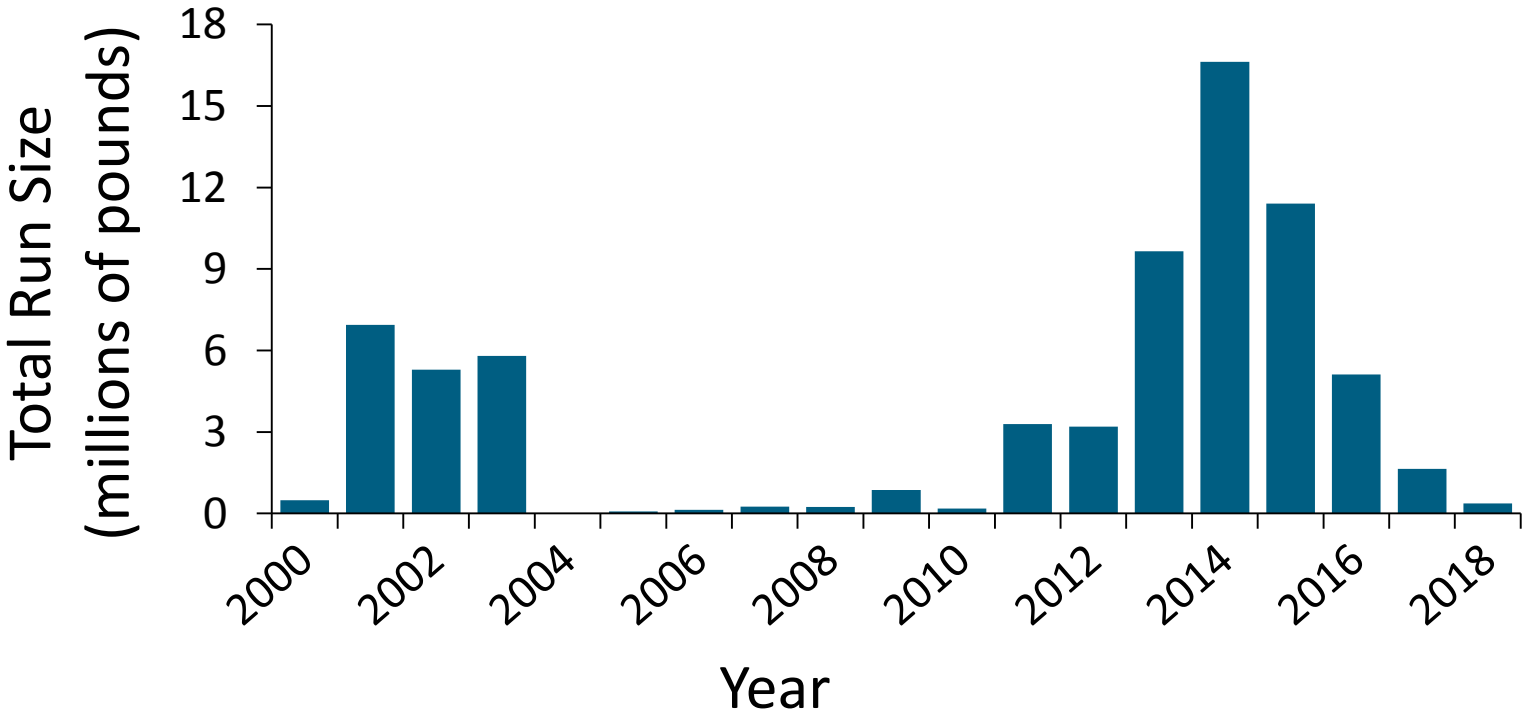
State Monitoring

- **Fishery Dependent Data:**
  - Commercially harvested smelt are purchased for biological data
  - Recreationally dipped smelt are sampled through a creel survey
  - Sex Ratio, length, weight, fecundity
  - Total pounds harvested
- **Fishery Independent Data:**
  - Plankton Tows
    - Egg and larvae densities
  - Pilot studies in coastal rivers and tributaries, 1996-2018
  - Standardized transect in Columbia River at RM 34, 2000-2019

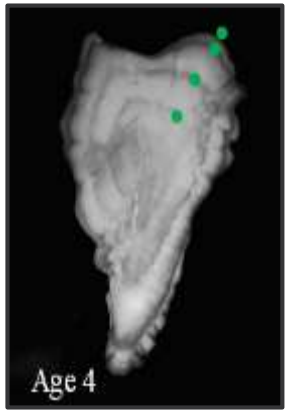
Run Size Estimate

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

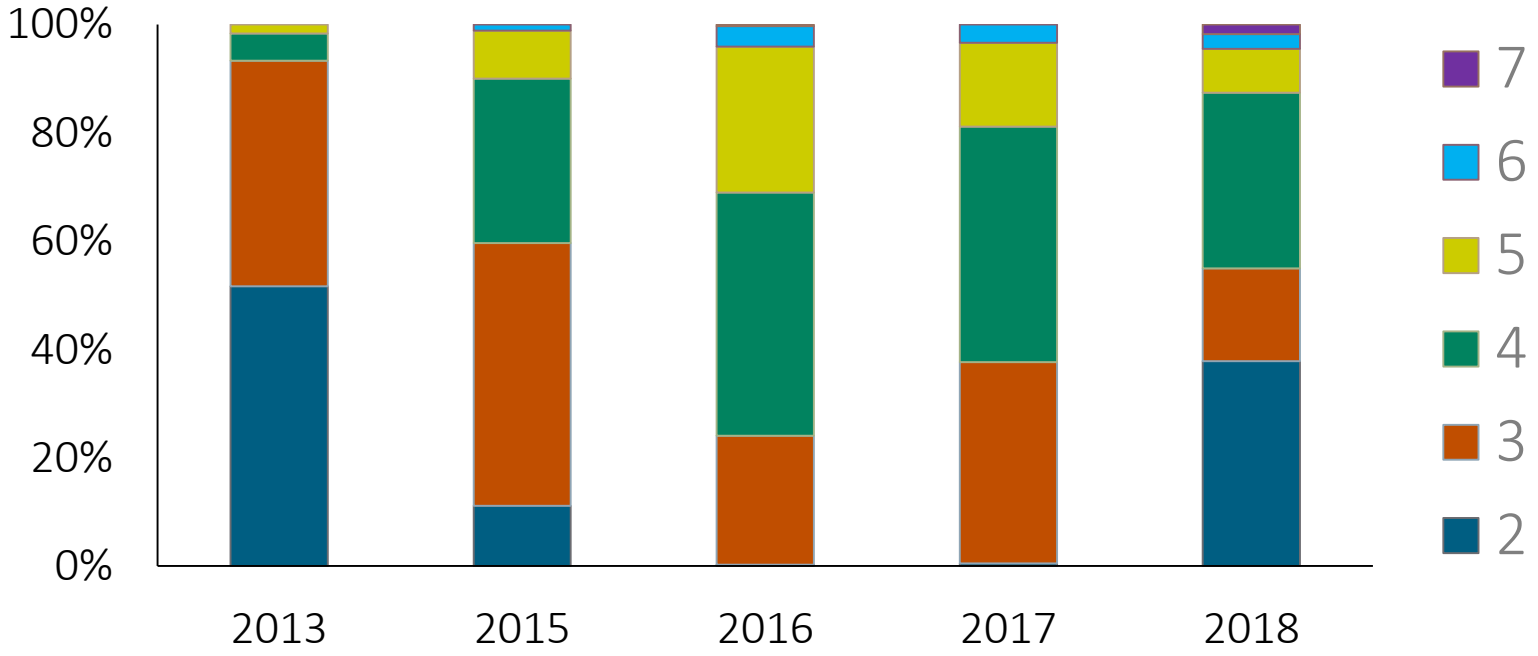
Run Size = SSB + Fishery Harvest Data



Age Evaluation

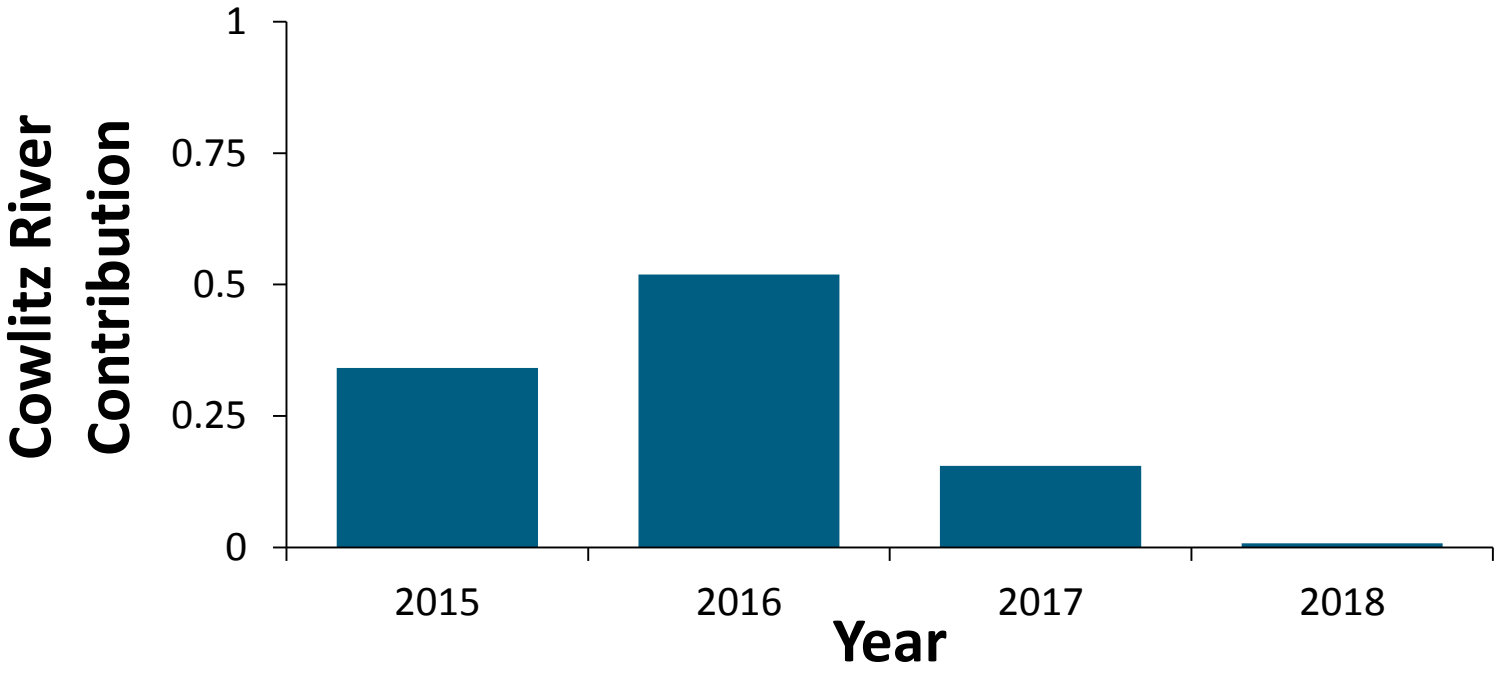


Improves our understanding in age-at-length and the contribution of different age-classes represented within a spawning run.



Cowlitz Tribe Monitoring

Cowlitz River SSB: When evaluated as a proportion of the Columbia River SSB, this information may be used to evaluate spawning habitat selection and variability.



NOAA Research

Trawl surveys used to live capture to support WDFW SSB estimates and address critical uncertainties in recovery:

- Fishery-independent run timing
- Representative sampling of age, size, fecundity, genetics, sex ratio
- Live specimens (e.g. tagging)
- Estuary habitat use
- Preliminary evidence:
  - changing size distribution
  - Sex ratios close to 1:1

Trawl vessel *R/V Murrelet*

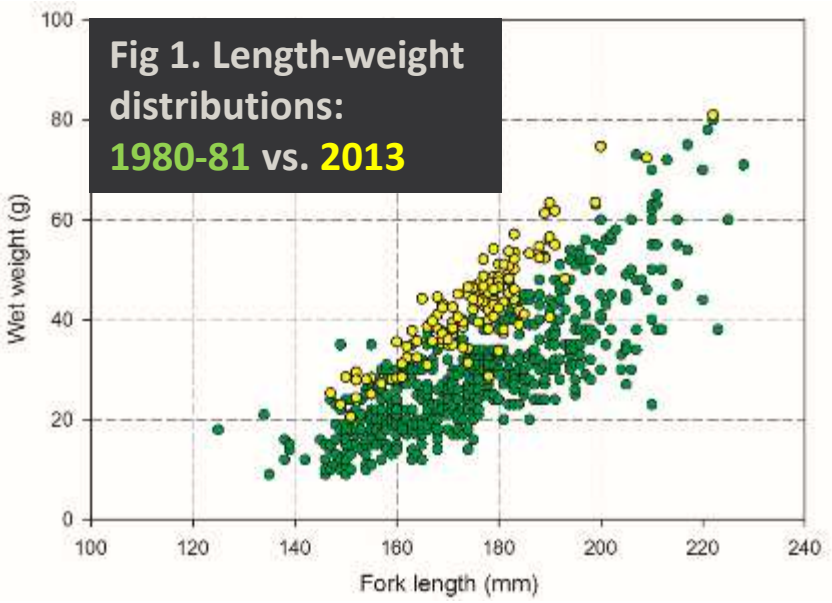


Fig 1. Length-weight distributions: 1980-81 vs. 2013

NOAA Research

Pilot study in 2020 to explore potential acoustic biomass:

- Proven technique for many managed forage fish stocks
- Provides data on run-timing, distribution, biomass, size composition
- Preliminary images of:
  - Single-species, bottom-oriented shoals during upstream migration
  - Well-defined aggregation boundaries

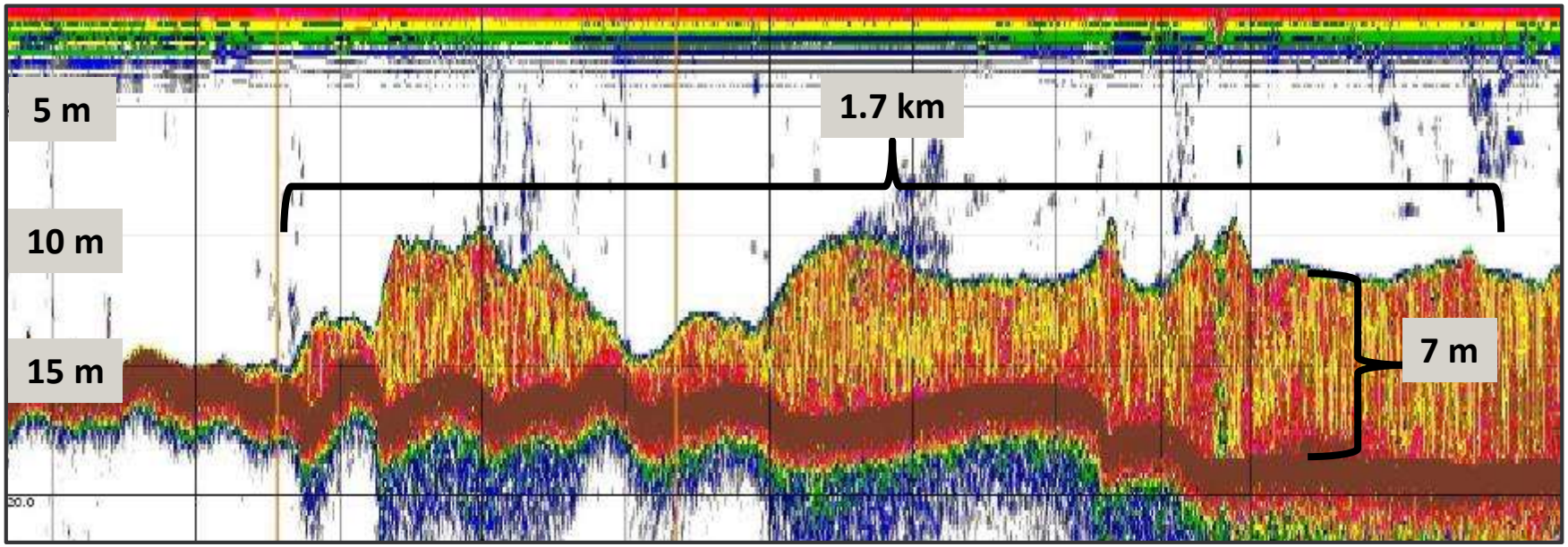


Image of eulachon shoal, 07 Mar 13, 1329 local time, near Wauna, OR – Columbia Mainstem

Biological Monitoring

- Commercial and recreational test fisheries aid in biological monitoring.
- Tribal, state, and federal partners work together to identify funding for baseline biological monitoring to assess run size.
- No consistent funding has been identified to aid in monitoring eulachon.

WDFW Recommendations

- Update the F&W Program measures and language to reflect NOAA's eulachon recovery plan.
- Include eulachon spawning stock biomass as the first high-level indicator for this species, and fund annual monitoring of eulachon spawning stock biomass.
- Add eulachon in the emerging program priorities and address critical uncertainties/questions for this species