

Fish Program Biodiversity Package Update

Marie Winkowski

Native Freshwater Fish and Freshwater Shellfish Specialist, Inland Fish Program

Aaron Dufault

Puget Sound Shellfish Manager

Laura Heironimus

Sturgeon, Smelt, Lamprey Unit Lead, Columbia River Division



Fish Program Biodiversity Package Update

WDFW Biodiversity Proviso funding designed to:

- Combat statewide declines in biodiversity
- Implement State Wildlife Action Plan and recovery efforts
- Develop and implement action plans

Agency received 12M direct dollars per fiscal year

What is biodiversity?

Biodiversity is the full range of life in all its forms. This includes the environment in which life occurs, the ways that species and habitats interact with each other, and the physical environment and the processes necessary for those interactions. Biodiversity measures an ecosystem's complexity, richness, and resiliency.

Biodiversity can be measured in several different ways and at several different scales:



- **Genetic diversity** – is there enough variation within a species, or geographically distinct population, to provide resilience to disease, environmental change, and genetic abnormalities?

- **Species diversity** – how many different species of plants, animals, fungi, and microorganisms exist within a given geographical area?

- **Ecological diversity** – how many different ecosystems exist in a given area, and how do different species and habitats connect and interact with each other?

Generally, biodiversity is viewed as an indicator of how healthy – or damaged – an ecosystem is. Biodiverse ecosystems have a high variety of plants, animals, and other organisms that interact with one another and the environment in complex and varied ways, making these ecosystems better able to adapt to environmental changes. Ecological functions like pollination, water purification, nutrient cycling, seed dispersal, pest control, climate regulation, and many more rely on biodiverse ecosystems.

Protecting and restoring Washington's biodiversity +

Climate change poses enormous threats to biodiversity +

How you can help +

<https://wdfw.wa.gov/species-habitats/biodiversity>

Fish Program Biodiversity Package Update

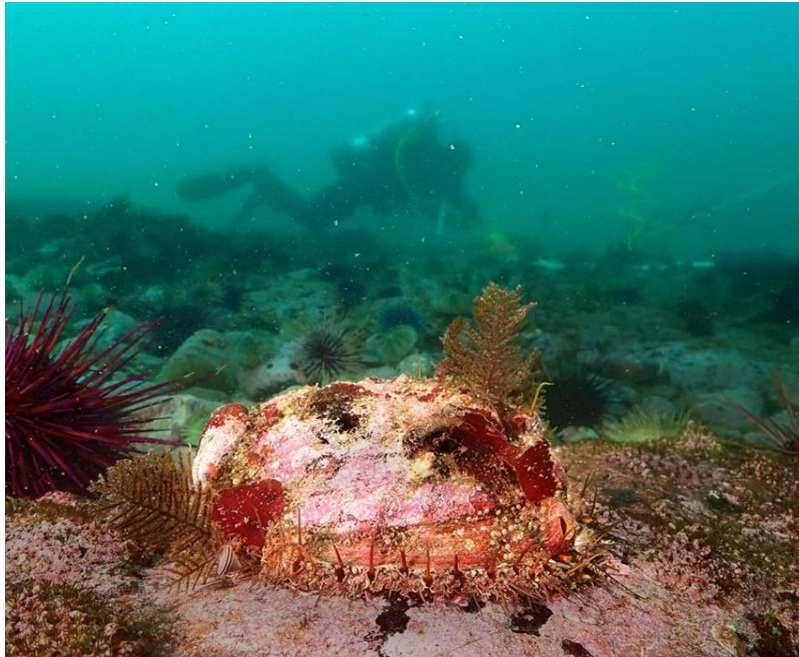
Pinto abalone/Olympia oyster

Sturgeon monitoring/Columbia River smelt

Aquatic Biodiversity Project



White Sturgeon sampled in Snohomish River, WA



Pinto Abalone

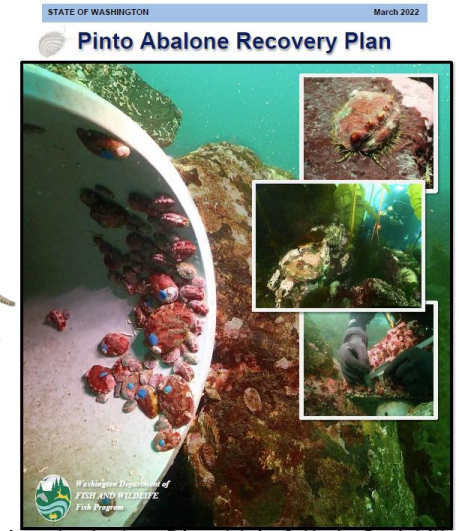
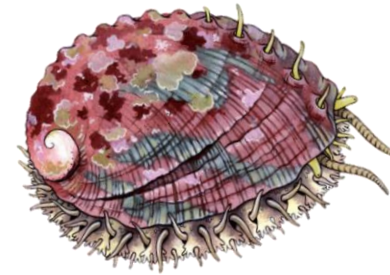


Speckled dace in Chehalis River, WA

Pinto abalone/Olympia oyster Restoration

Pinto abalone

- Large subtidal marine gastropod
- Population decline linked to historical overfishing - added to state endangered list in 2019
- Resources needed to implement Pinto Abalone Recovery Plan (2022) – increased hatchery production, outplants and monitoring, advance tribal partnerships



Scientific illustrations by Andrea Dingeldein & Katie Craighill

Olympia Oysters

- Only native oyster in WA – intertidal distribution
- Currently population only a fraction of historical range and abundance – State candidate species since 1997
- History of Olympia oyster restoration work – Puget Sound Restoration Fund (PSRF)
- Dedicated/ongoing resources needed to make restoration progress – evaluate restoration techniques
 - Pass-through funding to PSRF



Pinto Abalone



- Expanded WDFW Field Capacity
 - New Diver Positions + Equipment
 - 4 dive teams (WDFW, PSRF, Samish, Seattle Aquarium)
- Hatchery Production - PSRF
 - 25k abalone reared and outplanted since 2023 (1/3 of total outplants since 2009!)
 - 3 grow-out sites - PSRF Chew Center/NOAA, Seattle Aquarium, PT Science center and another is on the way
 - Multiple research projects to optimize abalone rearing and restoration
- Tribal Grants
 - RFP grant funding provided to Lummi, Makah, and Samish Indian Nations – **Expanding partnerships critical for long-term success**
 - Actively participating in population surveys, eDNA testing, site selection and outplanting



Olympia Oysters



Pass through funding to Puget Sound Restoration Fund

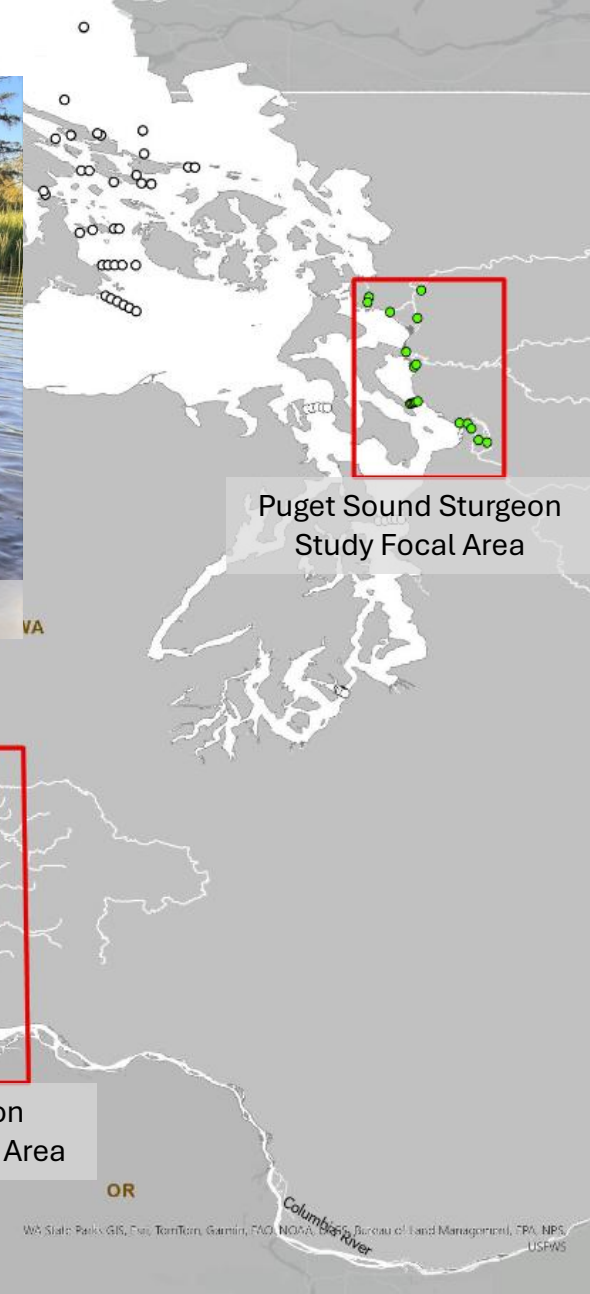
- 26 Acres of Olympia oyster habitat and seed enhancements since 2023
- Expanded recruitment monitoring – now 48 recruitment sites throughout PS!
- Continued monitoring of 7 previous restoration sites - 5 additional restoration sites evaluated
- Completed bay-wide population survey of Fidalgo bay – 5.5 million oysters (densities >1000 per sq meter)
- Research projects, collaborations (9 tribes actively participating)

Sturgeon Monitoring

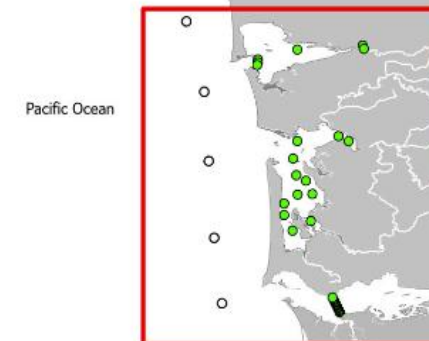
- Combined funding from Biodiversity and Sturgeon/Smelt provisos.
- This project will inform sturgeon conservation, recovery, and management for the first time in the Puget Sound, coastal estuaries, and freshwater tributaries.
- 2024 surveys sampled sturgeon in the Chehalis, Snohomish, Skagit, and Stillaguamish rivers, and nearly all sites found at least one fish that originated in the Columbia River.
- 2025 surveys will include additional surveys within the focal areas, and acoustic tagging fish to assess movements between areas.
- To learn more, visit our website: wdfw.wa.gov/sturgeon-pugetsound-coastal



White Sturgeon captured in Skagit River, WA



Puget Sound Sturgeon Study Focal Area



Coastal Washington Sturgeon Study Focal Area

Columbia River Smelt

- Combined funding from Biodiversity and Sturgeon/Smelt provisos.
- Columbia River Smelt (i.e., Eulachon) were listed as a threatened species under U.S. Endangered Species Act in 2010.
- This funding maintains the Columbia River spawning stock biomass survey, which provides the baseline estimate of run size.
- Overall, this work supports the cultural traditions of Northwest tribes and informs recovery objectives and sustainable harvest for recreational and commercial fisheries.
- To learn more, visit our website: wdfw.wa.gov/fishing/regulations/smelt



Larval smelt sampling net



Larval smelt (magnified image)



Adult smelt swimming upriver to spawn



Recreational harvesters



Post-spawn adult smelt

Aquatic Biodiversity Project

Covers large number of freshwater fishes and shellfish
50 species of native freshwater fish and four freshwater mussel groups

- Over 20 are Species of Greatest Conservation Need (SGCN)
- Several State Sensitive and Candidate species
- Federal listing, petitions

Limited data available to inform management decisions, implement State Wildlife Action Plans (SWAP)

- Distribution, habitat use, abundance
- Lacking statewide database



Aquatic Biodiversity Project

Phase one: Describe species distributions across the state

- Rerunning previously collected environmental DNA samples for all aquatic species, including our native fishes and mussels
- Collecting new eDNA samples systematically across the state in addition to electrofishing and snorkeling
- Cover the state over 7-year cycle
 - 2024 Willapa Bay and Wenatchee
 - 2025 Yakima and eastern Olympic Peninsula



Torrent sculpin



Speckled dace



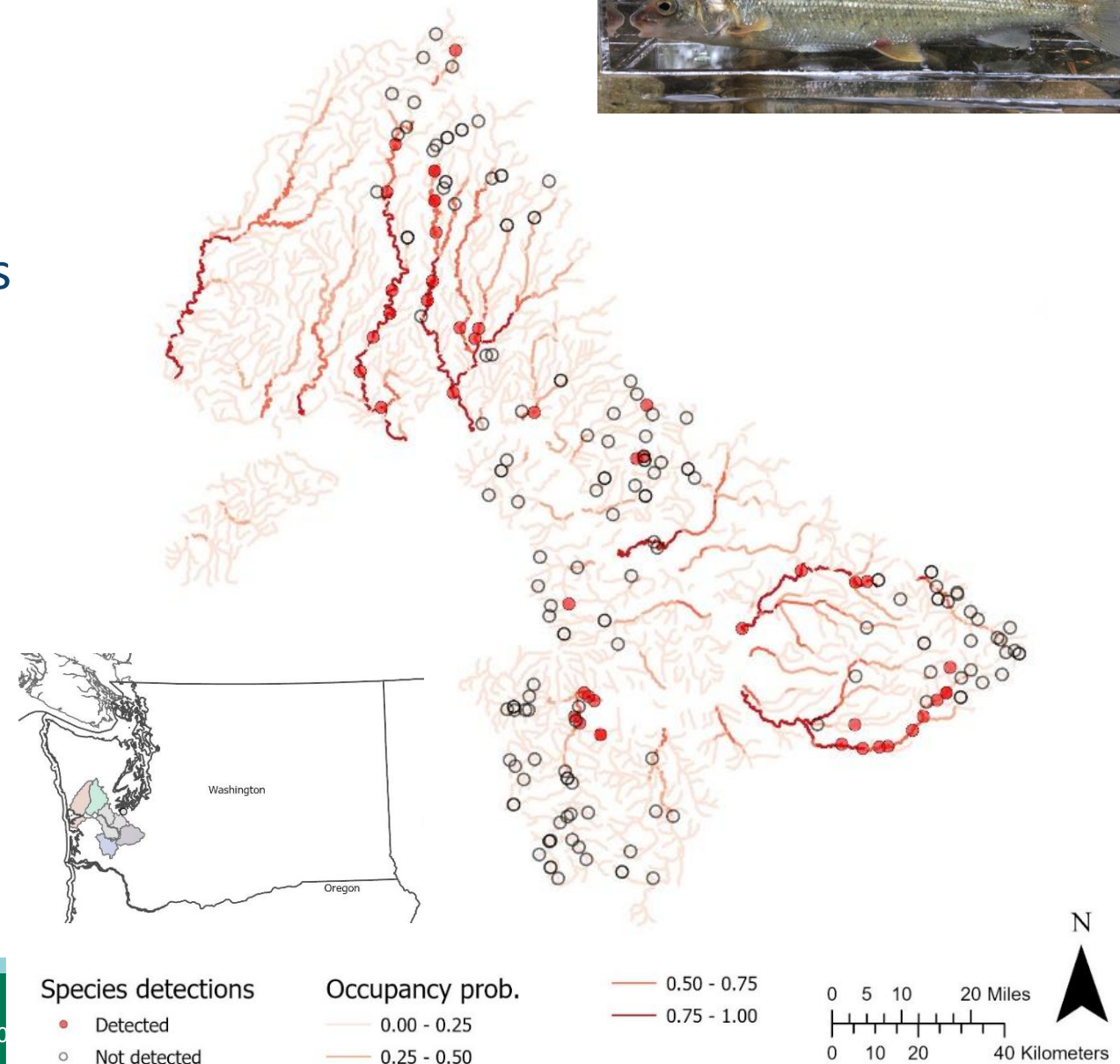
Western ridged mussel



Aquatic Biodiversity Project

Outcomes: Distribution maps showing spatially continuous probability of occupancy

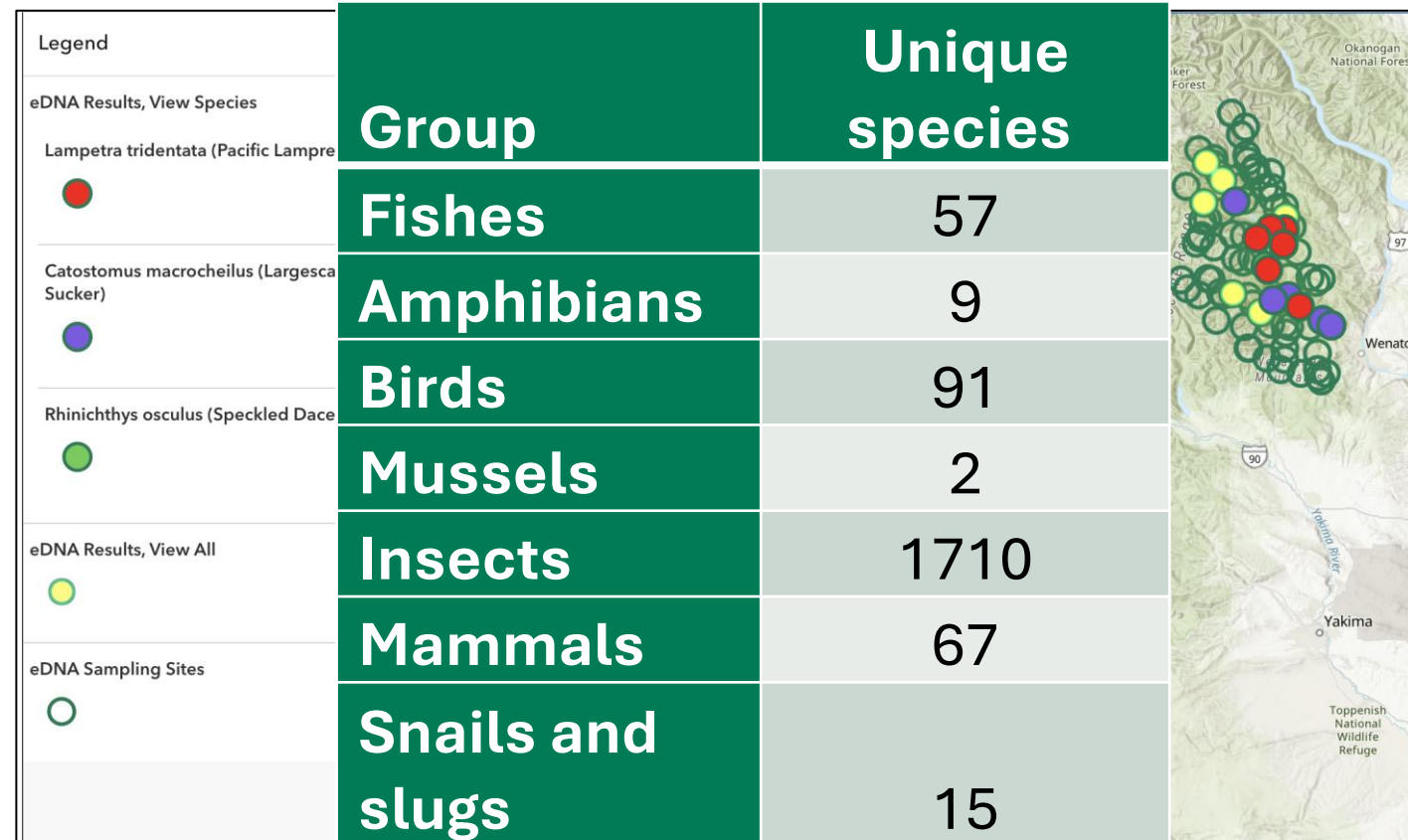
- Compare fish occupancy among species
- Illustrate species richness
- Evaluate and compare detection probabilities
- Describe species-habitat relationships



Aquatic Biodiversity Project

Outcomes: Create statewide atlas for fish and shellfish distributions, habitat use, and abundance

- Developing database and online map
- Tool to guide management, restoration planning, targeting or avoiding areas with certain species (e.g., non-natives, ESA listed)
- Broad taxonomic coverage: Non-native fishes, aquatic invertebrates, amphibians
 - Example from 2024 COI data



Fish Program Biodiversity Package Looking Forward

Phased in over future biennia

Pinto abalone/Olympia oyster

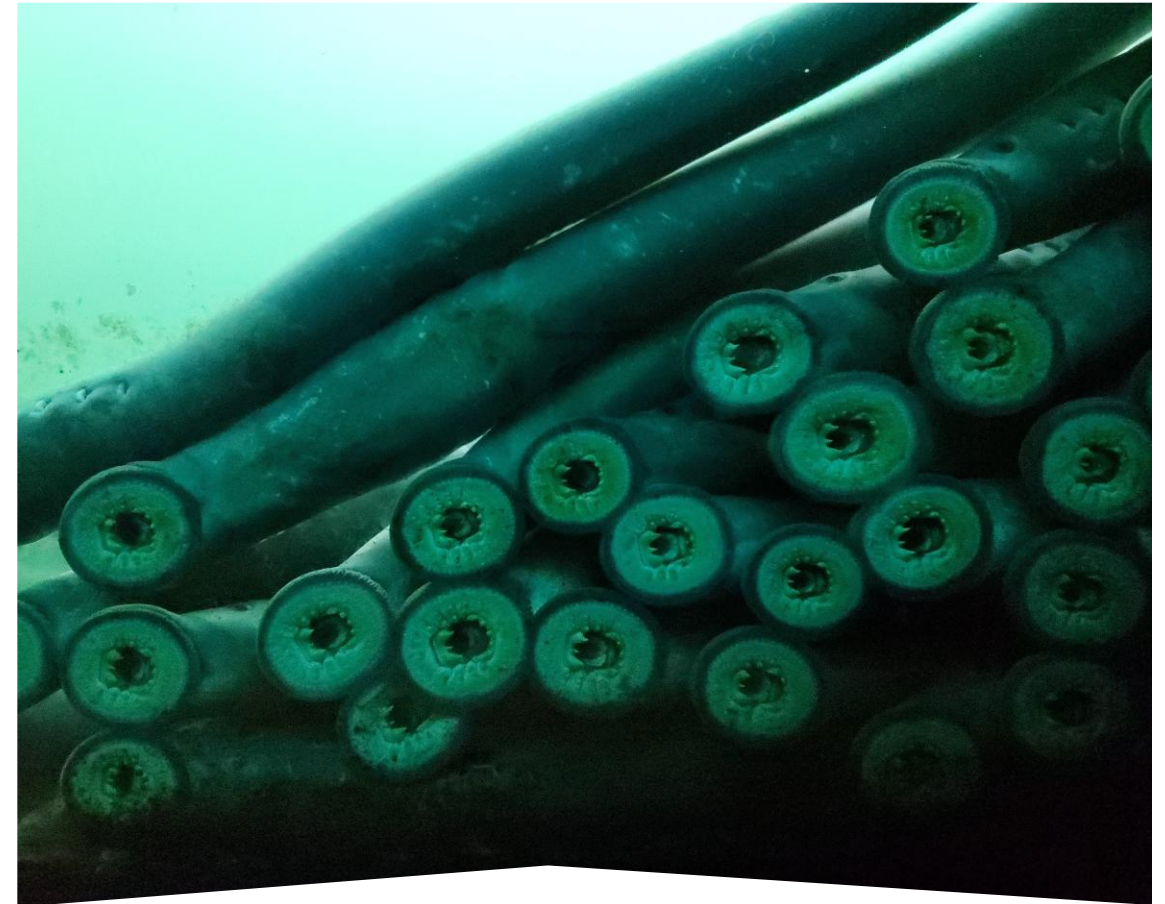
- Initial requested funding fully implemented
- Continue hatchery and restoration work towards recovery plan goals

Sturgeon monitoring and Columbia River smelt

- Expanded larval smelt genetic analyses for species identification
- Additional capacity for sturgeon monitoring across two regions

Aquatic Biodiversity Project

- Abundance, age, growth, mortality, movement
- Dedicated lamprey biologist



Pacific Lamprey in the Fish Passage Window at Bonneville Dam



Questions?

Marie Winkowski: ElizabethMarie.Winkowski@dfw.wa.gov

Aaron Dufault: Aaron.Dufault@dfw.wa.gov

Laura Heironimus: Laura.Heironimus@dfw.wa.gov

Request this information in an alternative format or language at wdfw.wa.gov/accessibility/requests-accommodation,
833-885-1012, TTY (711), or CivilRightsTeam@dfw.wa.gov.