Washington's Native Lampreys

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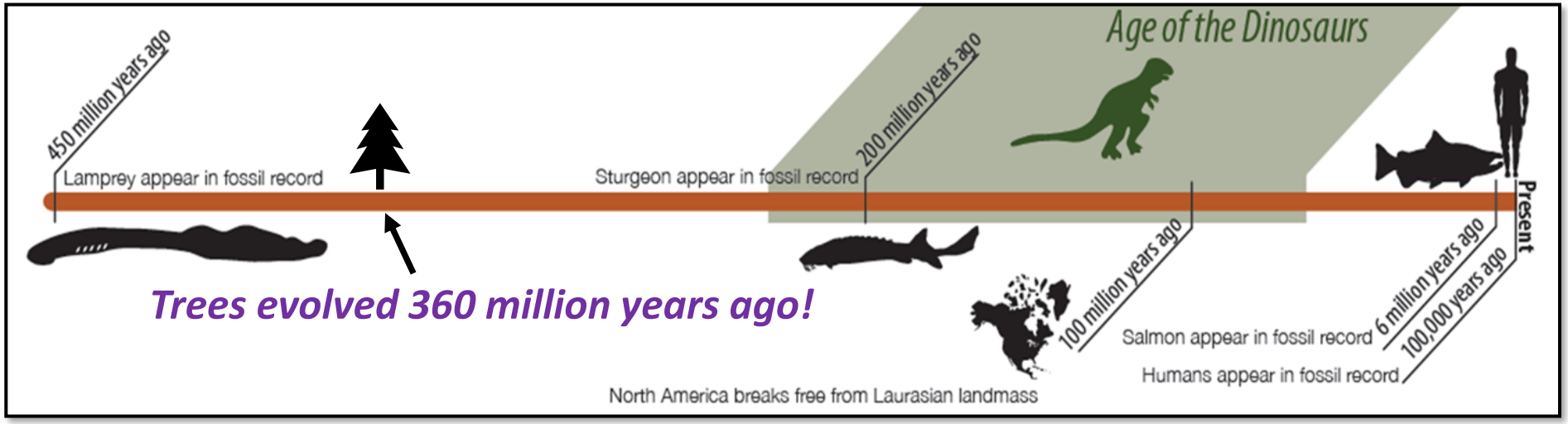
Washington Department of FISH and WILDLIFE

Understanding Lampreys

- Lamprey biology and species diversity
- Conservation history and actions
- Aquatic biodiversity study

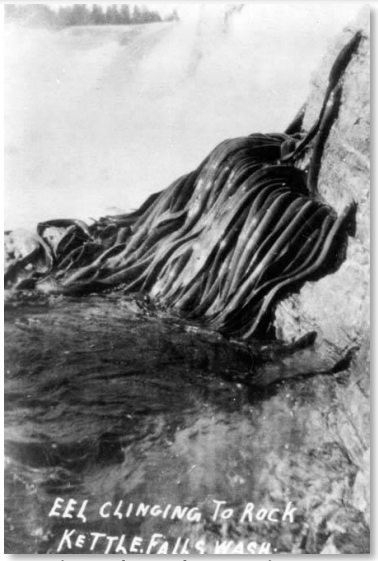
Jeremy Monroe- Freshwaters Illustrated

Lamprey Biology: Ancient Jawless Fish



CRITFC

Clackamas County Historic Society



National Park Service

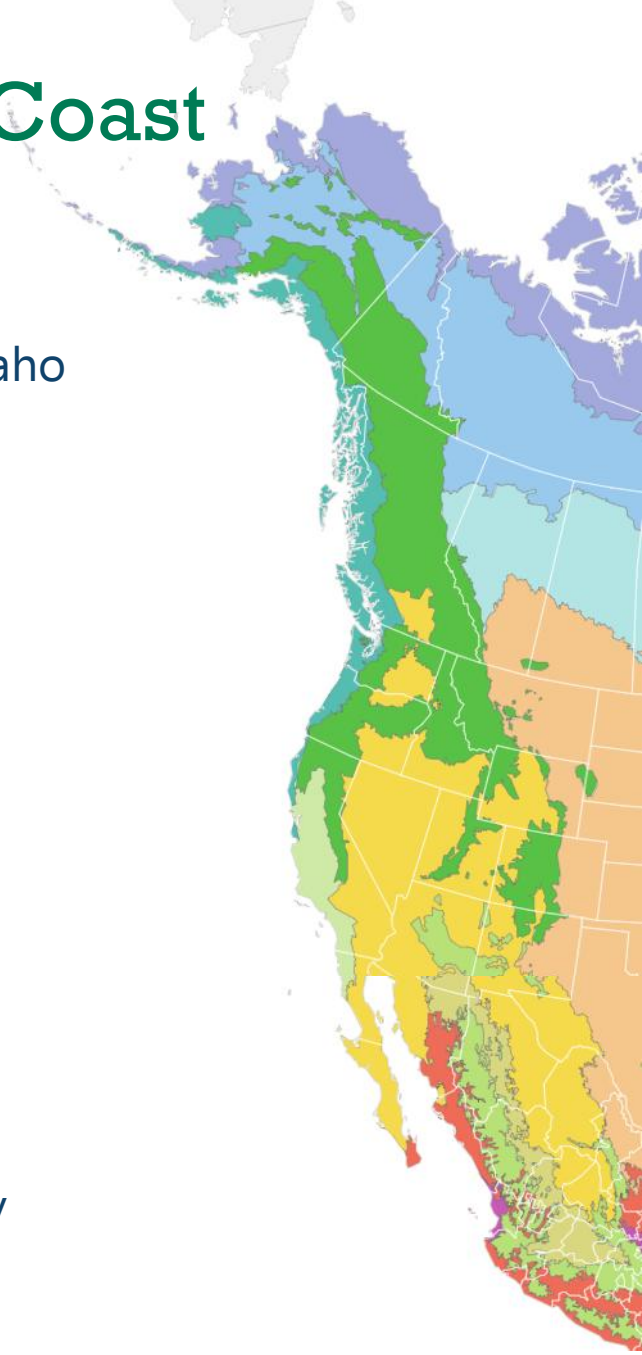
Lamprey Diversity on the West Coast

~ 15 species of native Lampreys

- 2 wide ranging from California to Alaska, inland to Idaho
- 2 Alaska and Northern Canada
- 1 Vancouver Island
- 1 Clackamas/Willamette Oregon
- 6 Klamath River/Pit River Basins
- 1 (possibly more) California
- 2 Mexico

Multiple life history strategies

- Resident – not parasitic, freshwater
- Parasitic – anadromous, adfluvial, lacustrine
- Predatory – anadromous, adfluvial
- Single species – both resident and parasitic/predatory



Lamprey Biology: Washington Lampreys – Species of Greatest Conservation Need

Anadromous and Parasitic

Yakama Nation Fisheries

Pacific Lamprey (> 13”)

Entosphenus tridentatus

Anadromous/ Adfluvial and Parasitic

WDFW

Western River Lamprey (<13”)

~~Lampetra~~ Occidentis ayresii

Resident and Non-parasitic

WDFW

Western Brook Lamprey (≤ 7”)

~~Lampretra richardsoni~~ Occidentis ayresii

New genus for 3 West Coast Lampreys species previously described as *Lampetra*

Carim et al. 2023, Carim et al. 2024

Lamprey Biology: Unique Characteristics

No jaws, scales, bones, swim bladder, or paired fins

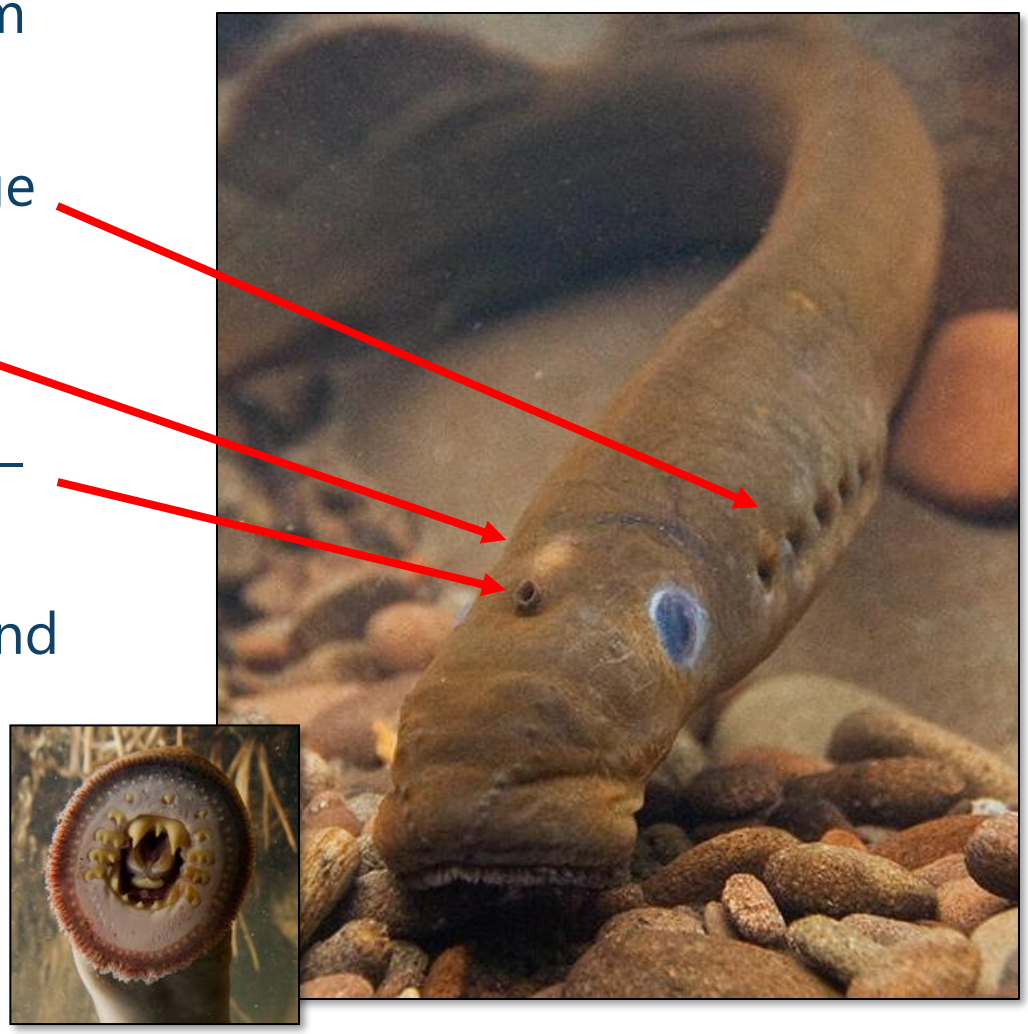
7 gill pores for gas exchange

Lamprey have a third eye – senses light and dark

Super good sense of smell – single nostril

Efficient swimmers - slow and steady

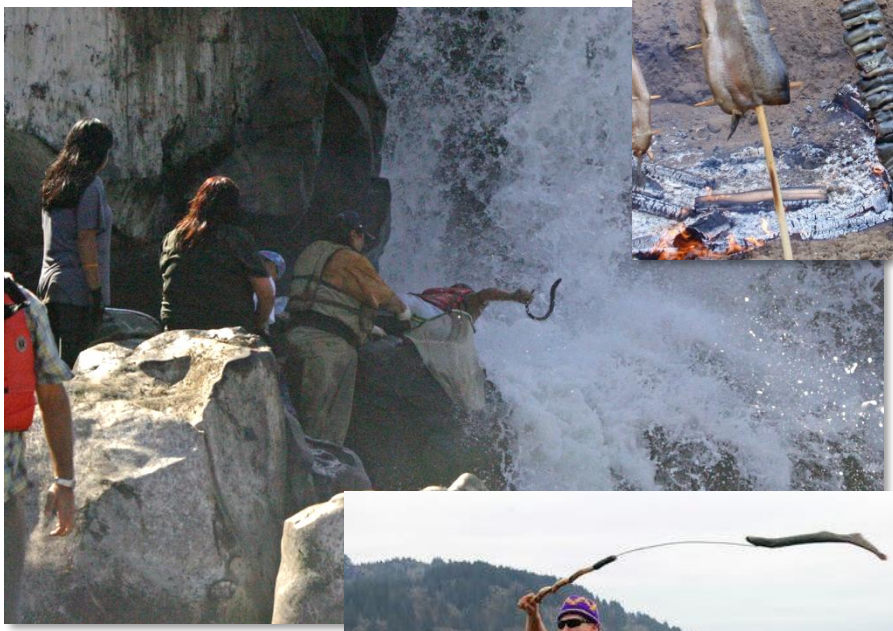
Can't jump but Pacific Lamprey can climb vertical surfaces



Lamprey Biology: Pacific Lamprey Climbing

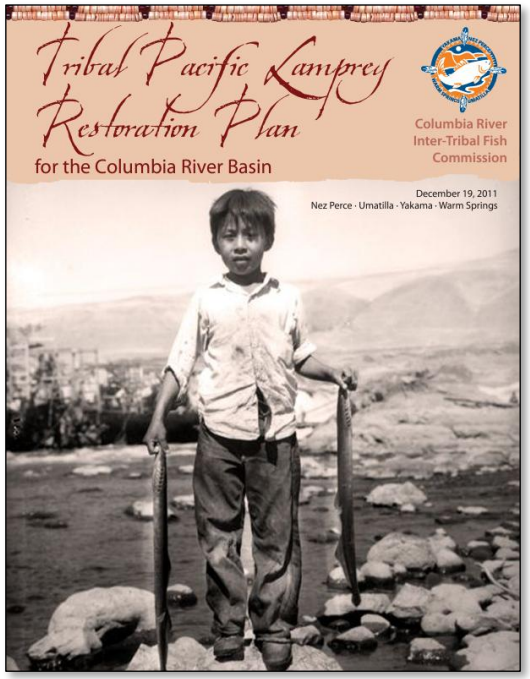
Conservation Actions: Tribal Cultural Significance

Tom Banse/NW News Network



CRITFC

Jim Wilson/New York Times

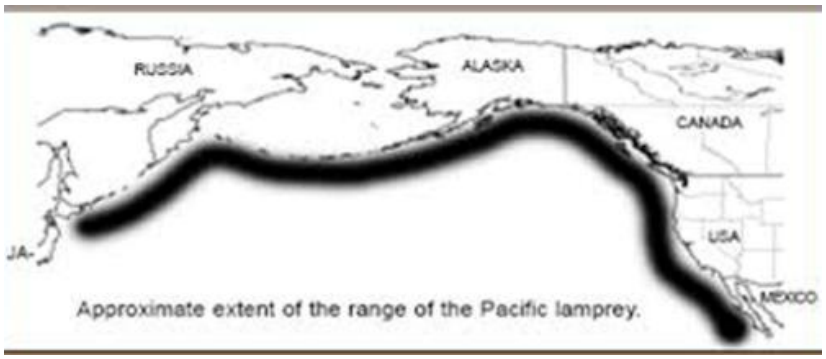


Conservation Actions: ESA Petition

2003 – Four Species of Lamprey petitioned for ESA listing: Pacific, Western Brook, Western River, Kern Brook Lampreys

2004 – "Not Warranted" listing decision

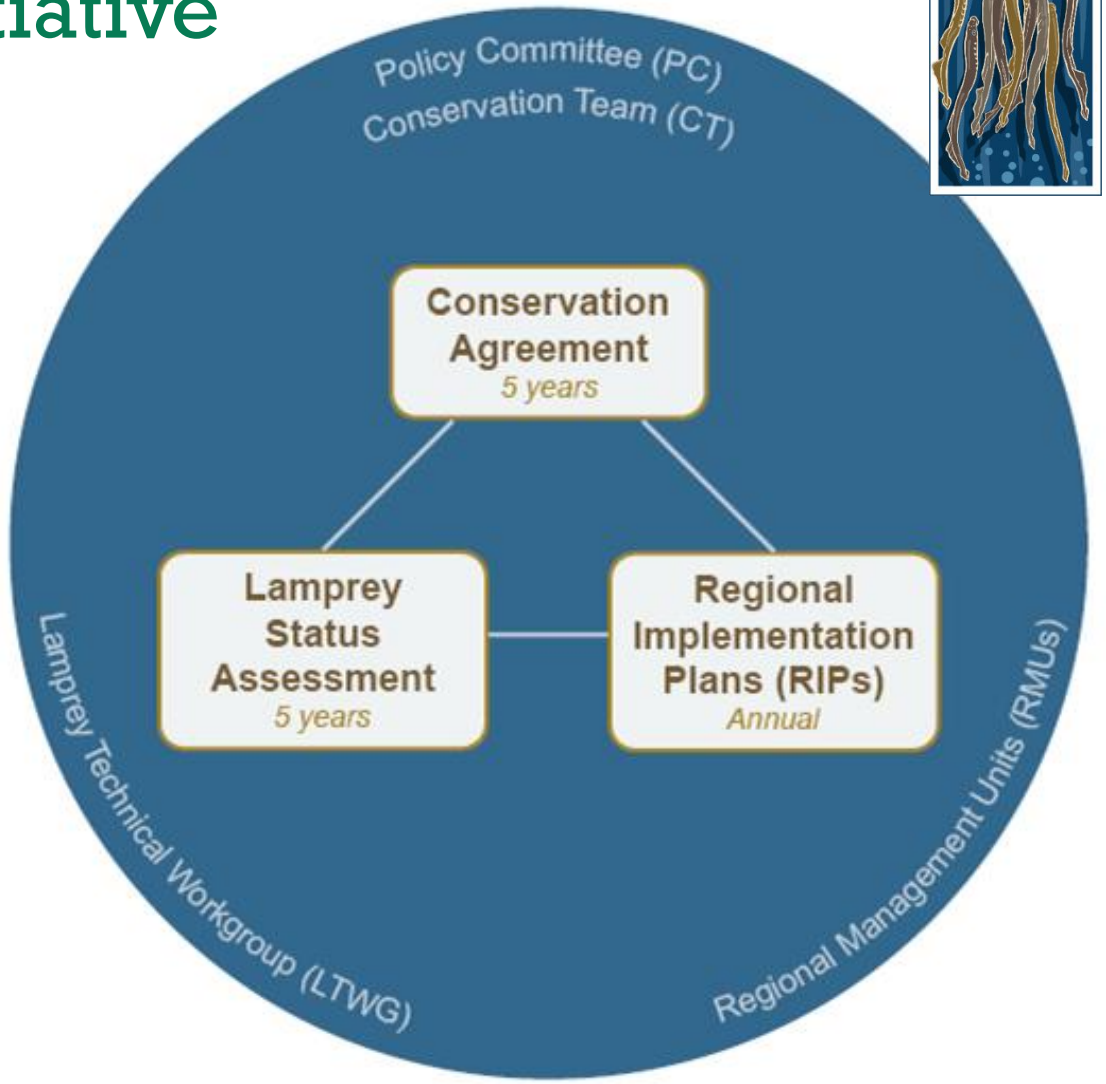
- » Insufficient information
- » **Rapidly Declining Populations**
- » No defined listable entity (DPS/ESU)



Conservation Actions: Pacific Lamprey Conservation Initiative

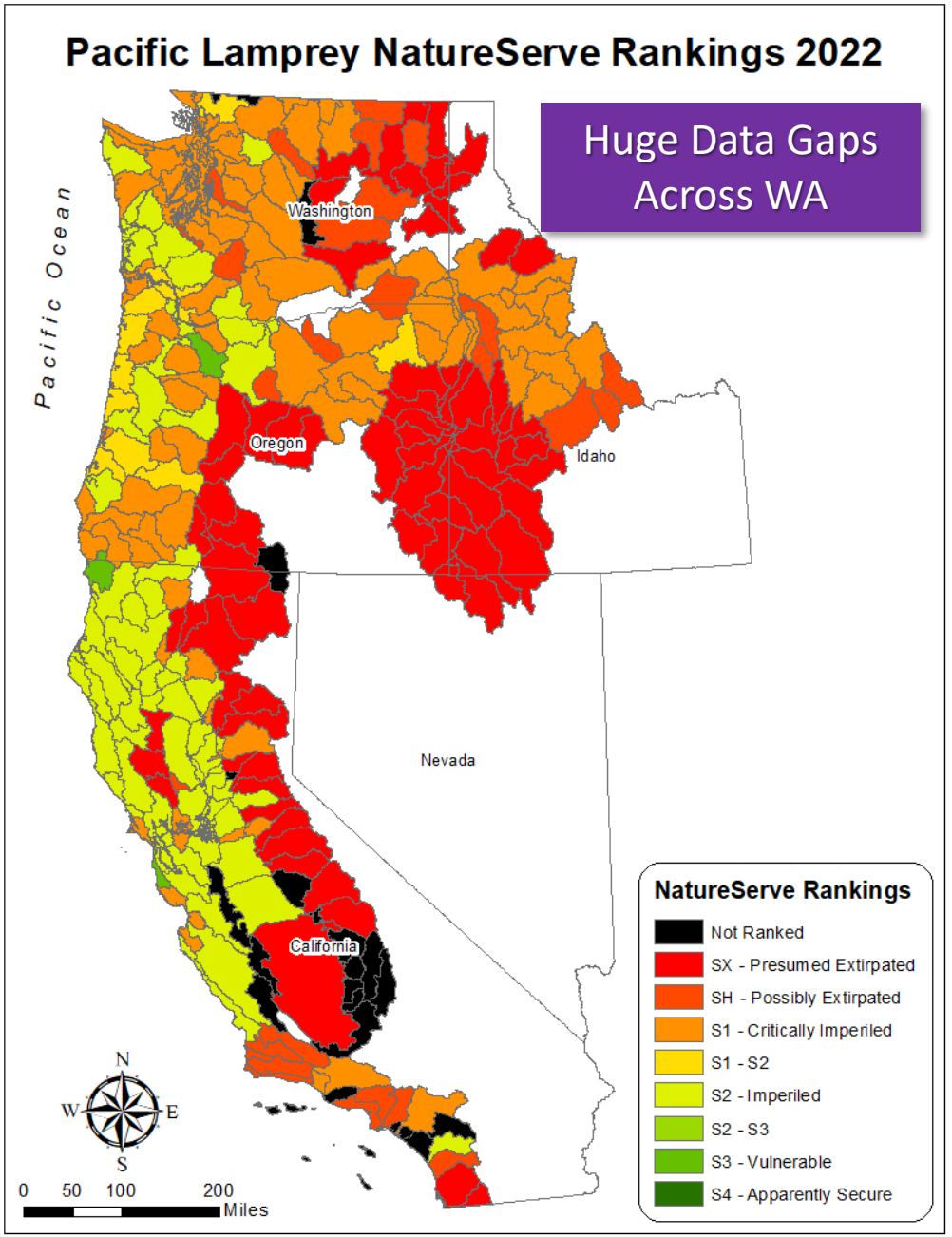
2008 Conservation Agreement:

- 53 signatories and supporters
- Tribes, agencies, non-profits
- Voluntary actions to conserve and protect lampreys



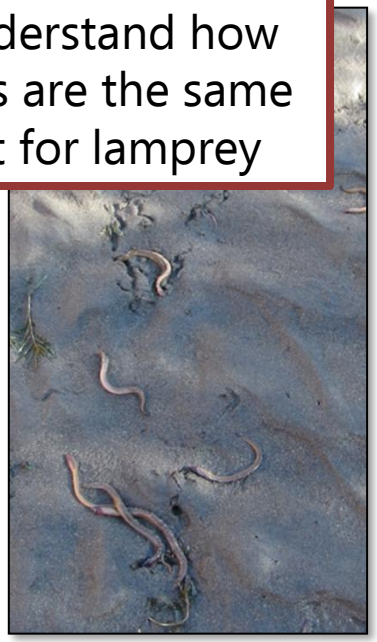
Conservation Action: Pacific Lamprey Assessment

- Characterizes conservation risk
- Flexible for **data poor** species and includes **demographic** and **threat** parameters
- Used to guide **identification** and **prioritization** of **conservation actions**



Conservation Actions: Threats to Lampreys

- Stream and Floodplain Degradation
- Passage Barriers
- Dewatering and Flow Management
- Water Quality
- Predation
- *Climate Change*
- Lack of Awareness!



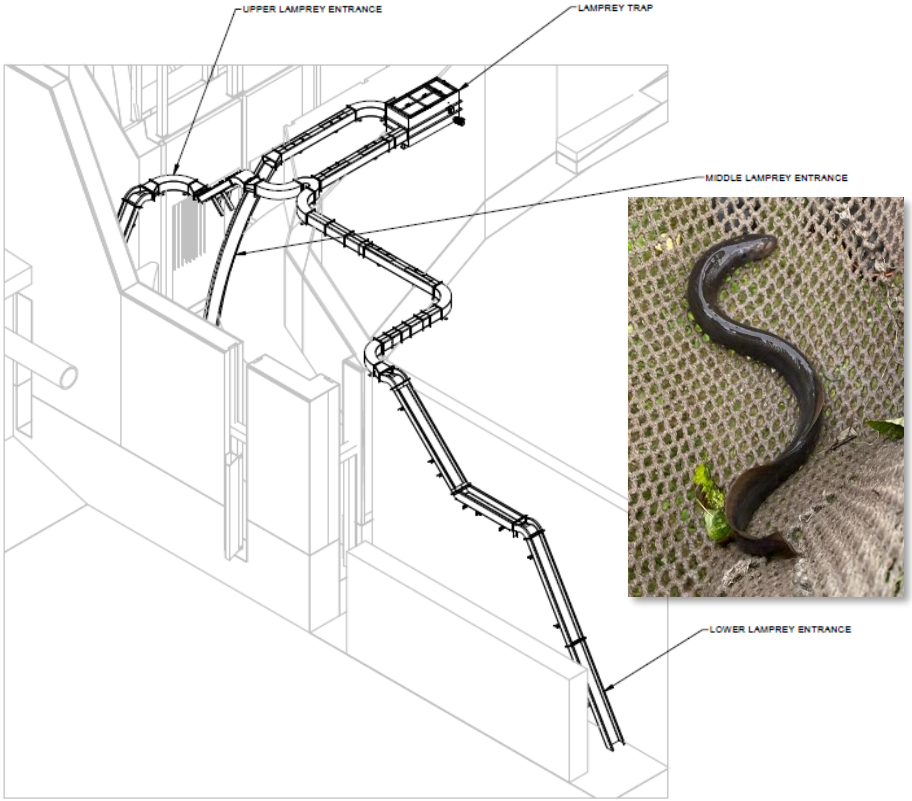
Need to understand how these threats are the same or different for lamprey

Conservation Actions: Identify Challenging Infrastructure

Ralph Lampman – Yakama Nation

Conservation Action: Restoration and Passage

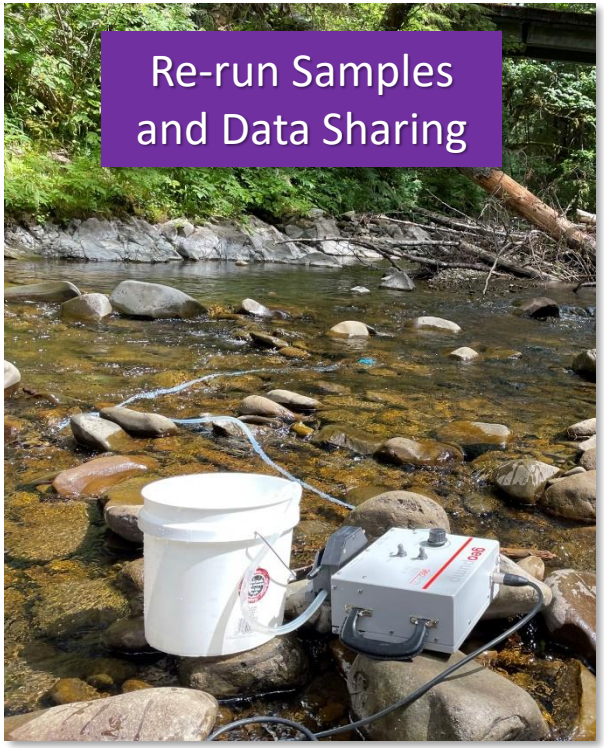
WDFW Habitat Biologists and Engineers work with restoration practitioners to include lampreys in project planning, design, and implementation

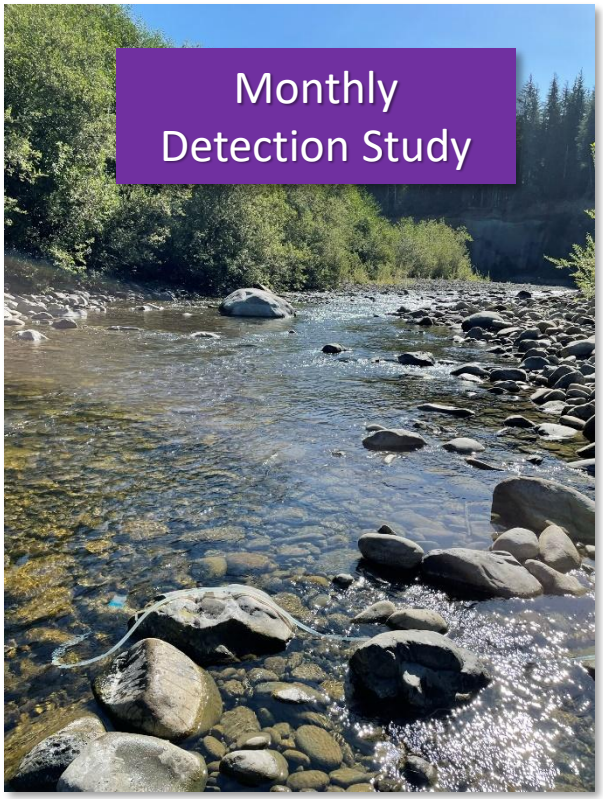


USACE 10% schematic conceptual drawing

Conservation Action: Environmental DNA Surveys

Extensive data collection and collaboration with USFS and many local partners





Aquatic Biodiversity Study

- Rerunning previously collected eDNA samples for all aquatic species, including lamprey
- Collecting new eDNA samples systematically across the state
- Creating statewide atlas for fish and shellfish distributions, abundance, and habitat use


Pacific Lamprey

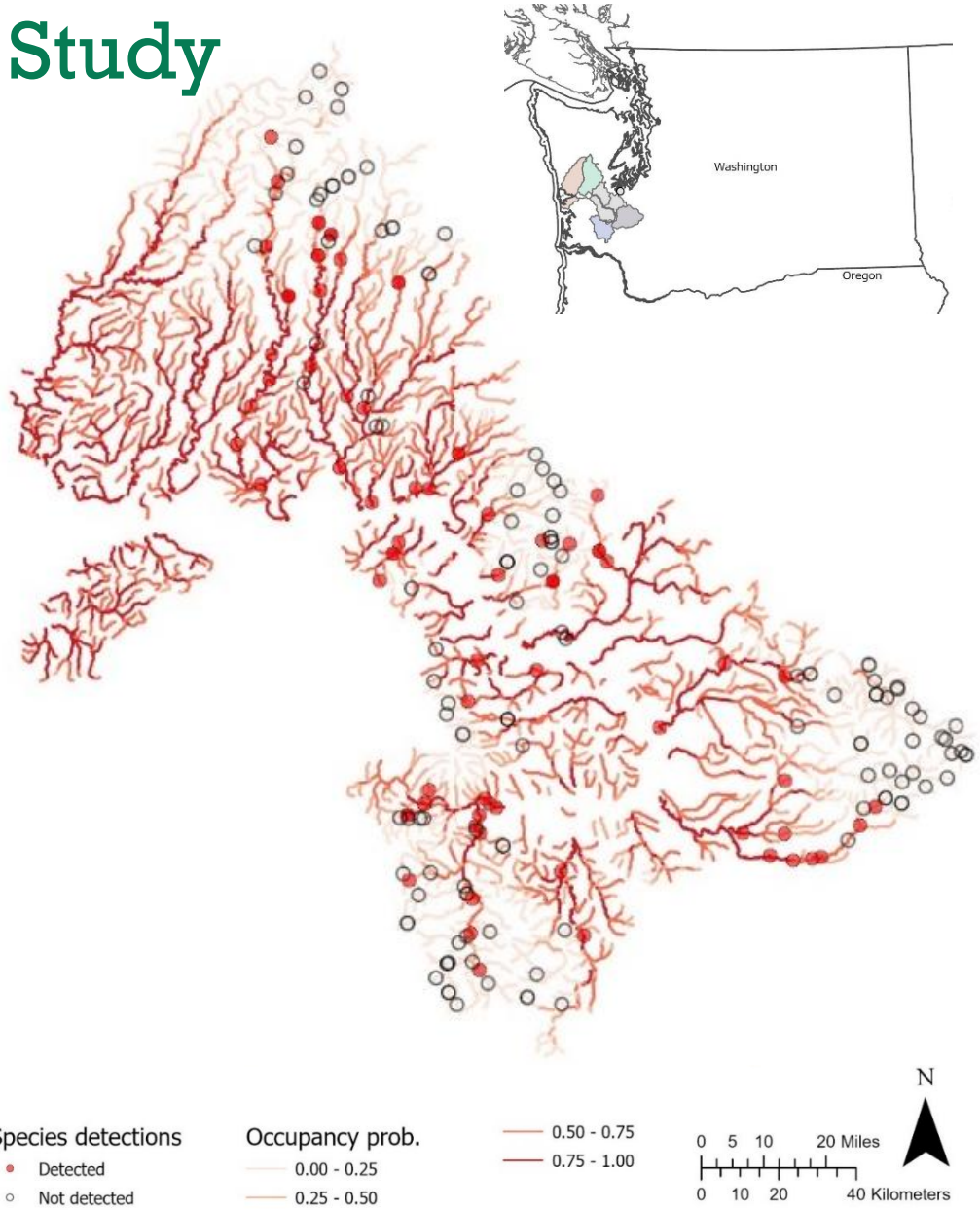

Reticulate Sculpin


Largescale Sucker

Aquatic Biodiversity Study

Developing easily accessible tool (WDFW online database) to inform and prioritize conservation plans, restoration planning, in-water work permitting (e.g., HPAs)

Distribution and spatially continuous probability of occupancy maps

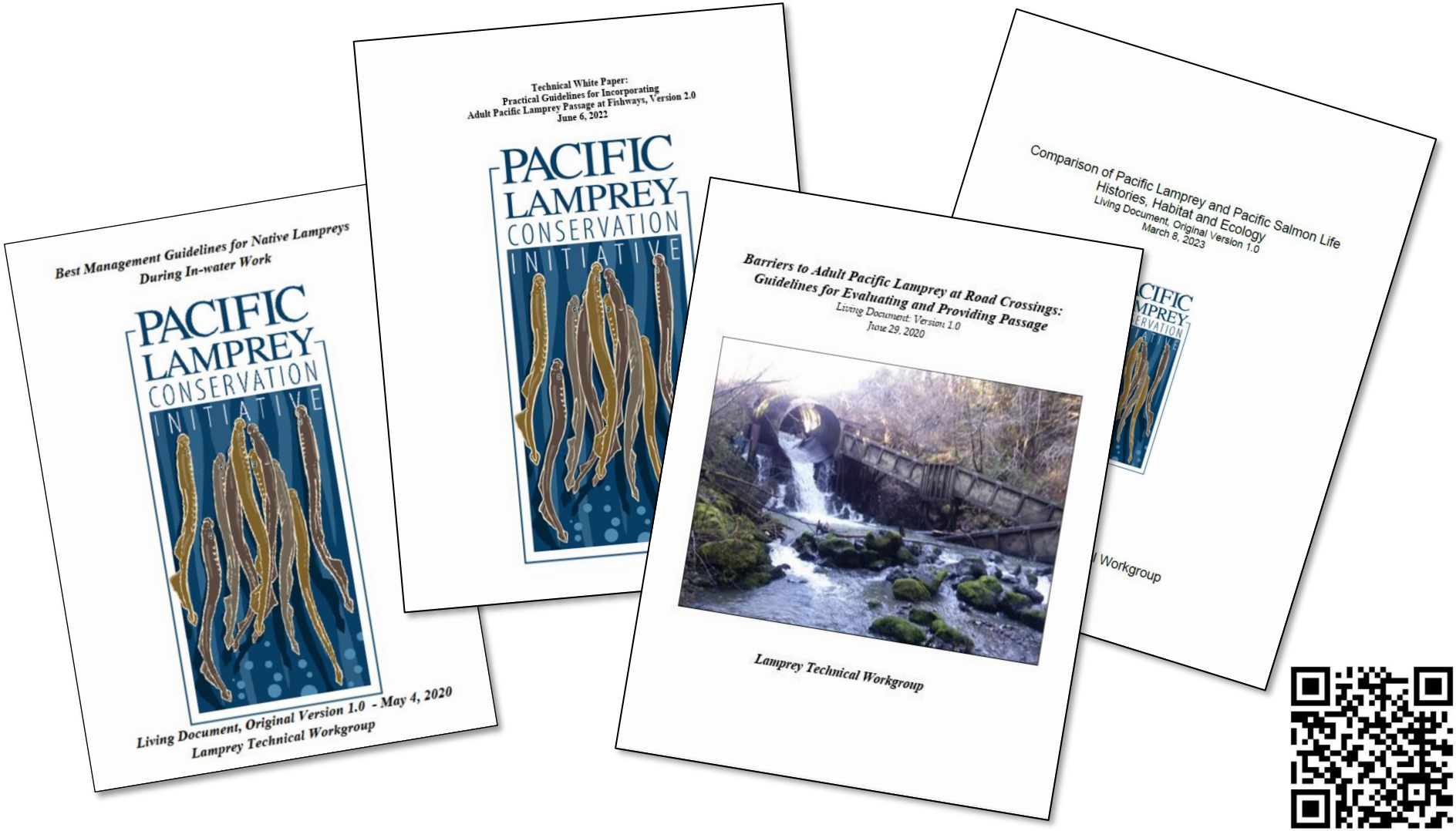


Looking Towards the Future

So much more to learn about these fascinating species!

– Expand our understanding of WA aquatic biodiversity
  - Expand monitoring of lampreys and other under studied aquatic species
  - Expand conservation efforts targeted towards lamprey, freshwater mussels, and other species

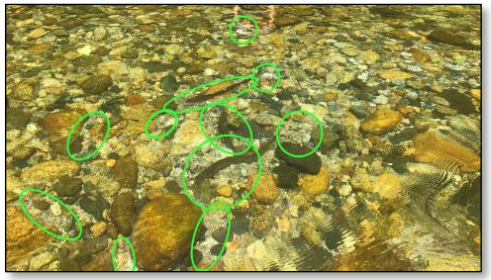
Online Resources: PacificLamprey.org
Lamprey Technical Workgroup

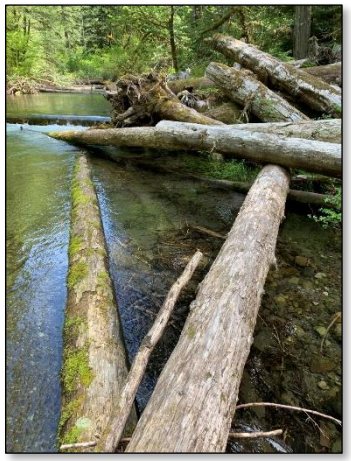


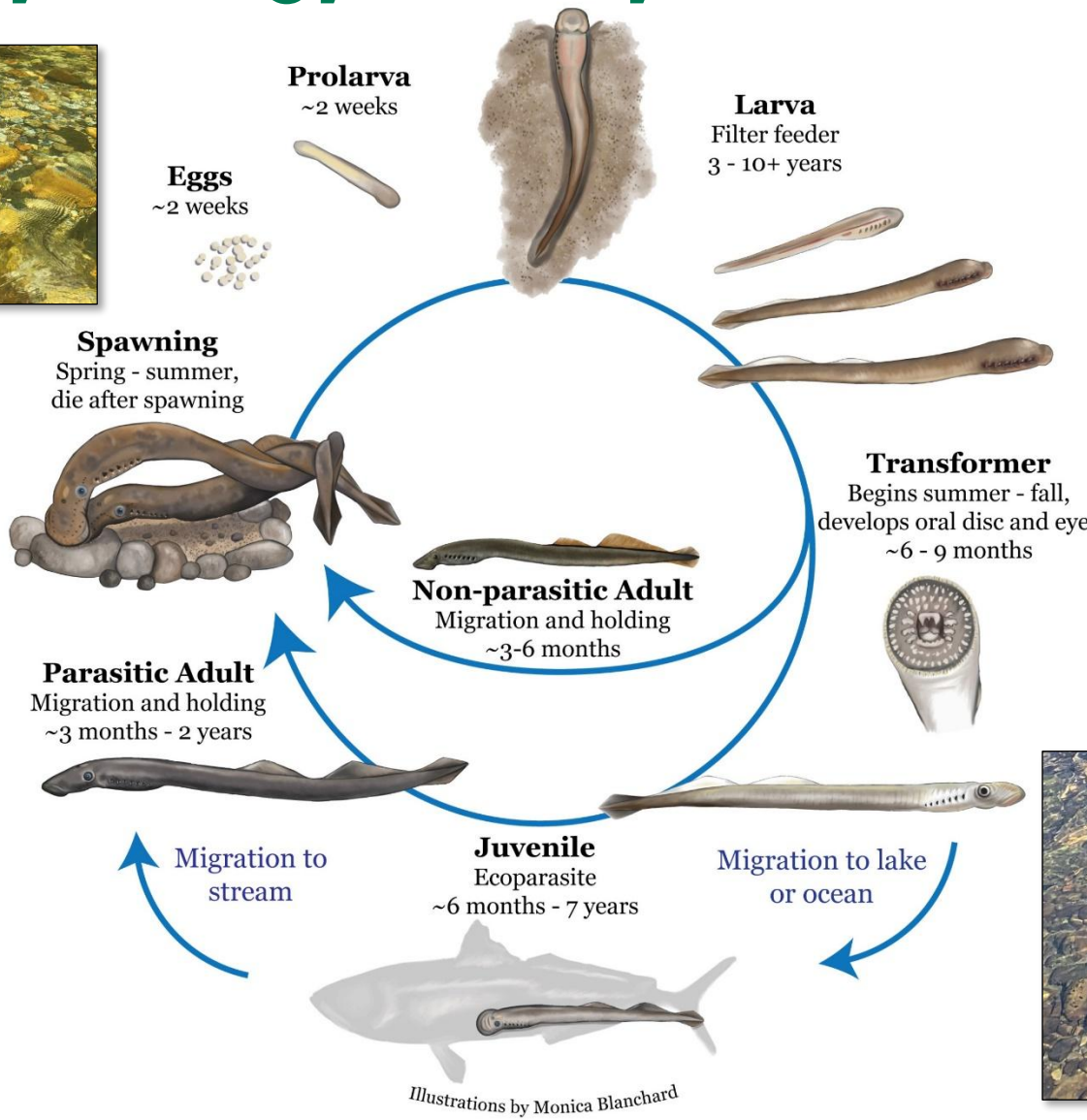
Questions?

Contact your Communications Manager
for help and review of your PowerPoint.

Lamprey Biology: Life Cycle







Sea Lamprey PR Challenge

Pacific Lamprey are native on the West Coast and co-evolved with the ecosystems here

- Sea Lampreys are not native to the Great Lakes – impacted fish including 4 native lamprey species
- Human-made issue connecting the Atlantic Ocean to the Great Lakes

Native Lampreys - Ecosystem Engineers

Lampreys are native on the West Coast and co-evolved with the ecosystems

***Larval* Lamprey Impacts**:

Oxygenation of Bed Material
Decrease Sediment Hardness
Nutrient Cycling

***Adult* Lamprey Impacts**:

Bioturbation
Increased drift forage
Lower velocity areas

- Salmonid fry use
- Amphibian egg mass

Marine Derived Nutrients – late season

All lampreys - nutrient and calorie dense food resource

Predation buffer

National Park Service

Shirakawa et al., 2013
Boeker and Geist, 2016
Georgakakos, dissertation UC Berkley, 2020

Native Lamprey Workshops

Funded 7 WA workshops along with 3 future AK workshops

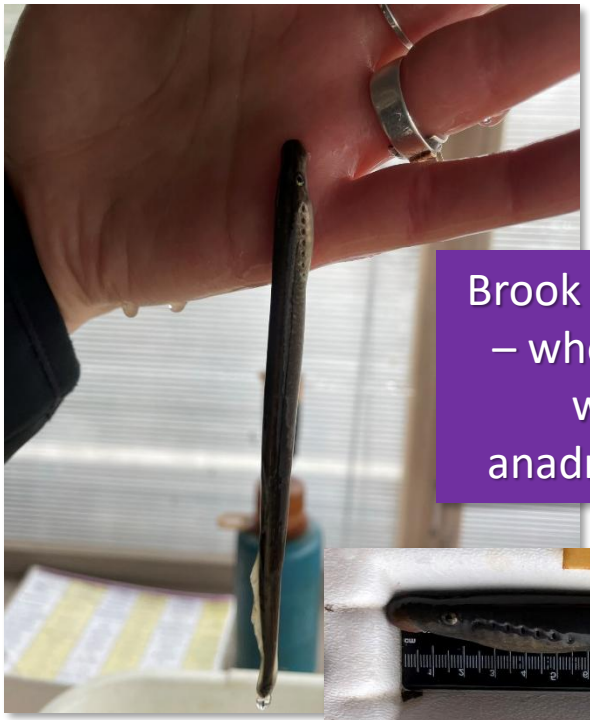
Additional outreach to City, County, PUDs, RFEGs, and WDFW staff

Bonneville POWER ADMINISTRATION

NATIONAL FISH HABITAT PARTNERSHIP

DNA Samples

Partnering with CRITFC and USFS to understand lamprey ecotypes



WDFW

Brook vs. River Lamprey – where are they and what triggers anadromy/migration?

WDFW

Ocean vs. Stream maturing Pacific Lamprey – when are they migrating?

A. Voloshin – Stillaguamish Tribe