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October 8, 2019

### MEMORANDUM

**TO:** Council Members

**FROM:** Kendall Farley

**SUBJECT:** Aquatic invasive species early detection monitoring and mapping in Washington state

### BACKGROUND:

**Presenter:** Jesse Schultz, Biologist, Aquatic Invasive Species Unit, Washington Department of Fish and Wildlife and Justin Bush, Executive Coordinator, Washington Invasive Species Council (WISC)

**Summary:** This presentation will provide a briefing on results of a new waterbody risk analysis to better prioritize waterbodies across Washington for quagga and zebra mussel early detection monitoring, provide an overview of statewide monitoring efforts and partnerships, and explain how this early detection monitoring is providing protection against the further spread of other aquatic invasive species such as northern pike.

**Relevance:** 2014 Fish and Wildlife Program emerging priority #4: Preserve program effectiveness by supporting: (1) expanded management of predators,... (3) and aggressively addressing non-native and invasive species.

**Background:** Invasive species pose a significant threat to salmon and steelhead recovery across the Columbia Basin. Invasive species include non-native organisms that cause economic or environmental harm and are capable of spreading to new areas of the state. The Washington Invasive Species Council provides policy level direction, planning, and coordination for combating harmful invasive species throughout the state and preventing

the introduction of others that may be potentially harmful. The WISC works with WDFW as the lead state agency for regulating, detecting, and managing aquatic invasive species.

The WDFW Aquatic Invasive Species Unit is responsible for early detection monitoring efforts statewide to look for invasive freshwater mussels in Washington's waters using a variety of monitoring techniques. Quagga and zebra mussels pose a huge threat to the environment and economy and across the basin and Columbia Basin states and Canadian provinces are working together to keep invasive mussels out of the Pacific Northwest. However, no effort to prevent invasive mussels is perfect and it is possible that invasive mussels could slip into the Basin. Invasive mussels aren't the only threat to fish and wildlife in the Columbia River Basin. Northern pike (*Esox lucius*) are non-native and considered to be invasive species in parts of British Columbia (where non-native), in all of Washington, and all of Oregon.

In Washington state, northern pike were first identified in the Columbia River in 2004 when they were found in the reservoir behind Box Canyon Dam. Since then, northern pike have continued their spread and are now two dams away from important Columbia River salmon spawning habitat, where billions have been invested in salmon and steelhead recovery.

The ISAB's 2019 Review of Predation Impacts and Management Effectiveness for the Columbia River Basin report stressed the importance of early detection monitoring and swift rapid response to being key in minimizing the loss and damage of northern pike predation to the Basin.



WASHINGTON STATE  
RECREATION AND CONSERVATION OFFICE

Washington Invasive  
Species Council



# Aquatic Invasive Species Early Detection Monitoring and Mapping in Washington State

Justin Bush, Executive Coordinator  
Washington Invasive Species Council

Jesse Schultz, Aquatic Invasive Species Biologist  
Washington Department of Fish and Wildlife



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# Statewide Approach

2015-2020

## Strategic Plan

*and 2019-2020 Work Plan*

WASHINGTON INVASIVE SPECIES COUNCIL



## Areas of Work:

- Leadership and Coordination
- Prevention
- Education and Outreach
- Early Detection and Rapid Response
- Containment, Eradication, and Control

<https://go.usa.gov/xVFKj>



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# Management Priorities



Northern Pike



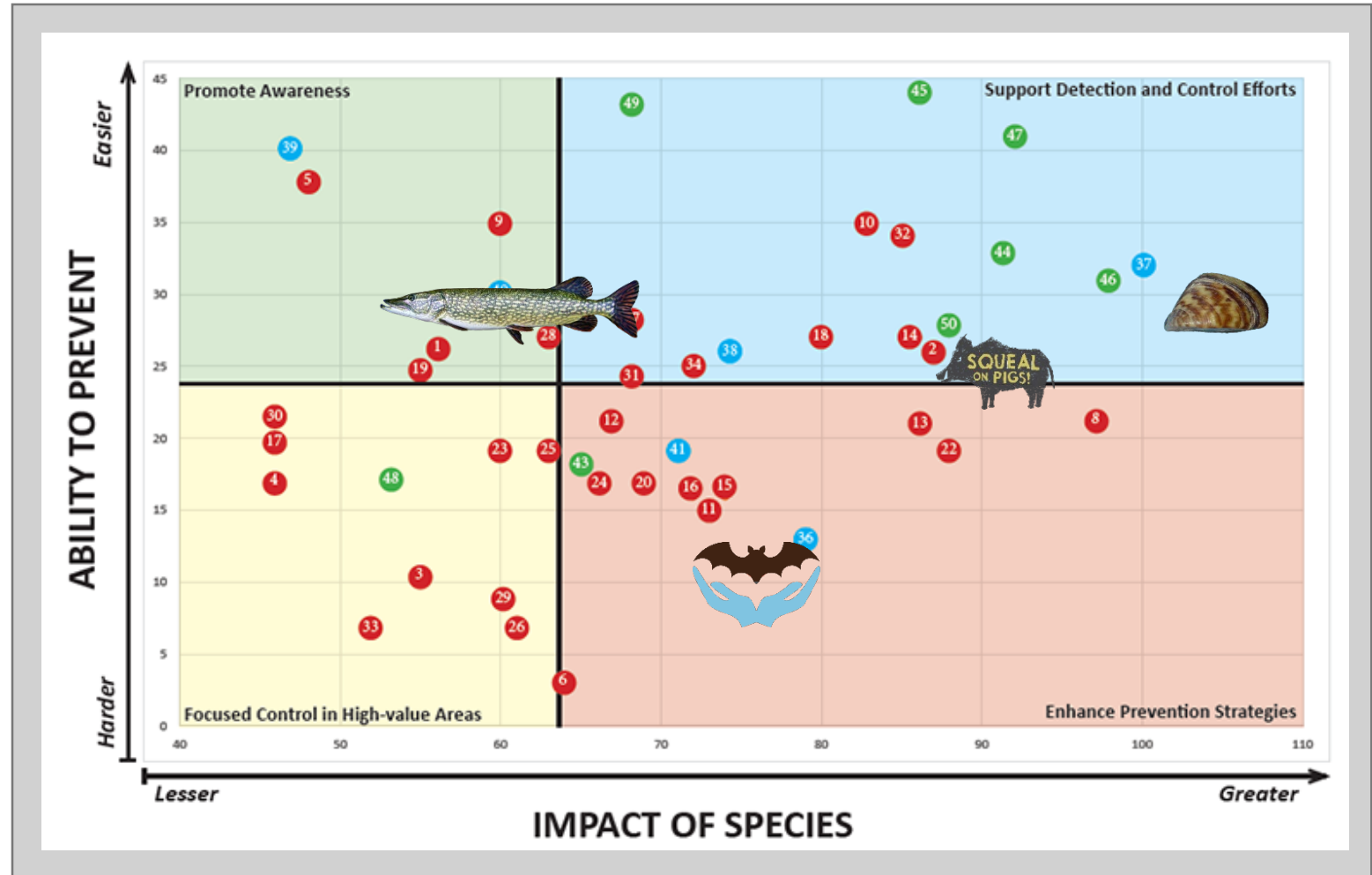
Feral Swine




Zebra/  
Quagga Mussels



White-nose Syndrome




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**Invasive Species Impact and Prevention/Early Action Assessment Tool**

Species/Guild Name: \_\_\_\_\_

Through the Gate?	Here	Near	Far
Summary of Scores			
	Potential	Max.	Score
Ecological Impacts	40	_____	_____
Economic Impacts	40	_____	_____
Human Health Impacts	10	_____	_____
Invasive Potential	33	_____	_____
Difficulty of Control	10	_____	_____
	TOTAL IMPACT	133	_____
Feasibility of Prevention/Early Action	50	_____	_____

Number of 'Unknown' Scores Recorded: \_\_\_\_\_

Level of Certainty in Assessment: High Medium Low

Invasive species – plants, animals, insects, and pathogens – are a threat to Washington’s environment and economy, exacting a high price for their presence. These biological invaders can produce serious, often irreversible effects on

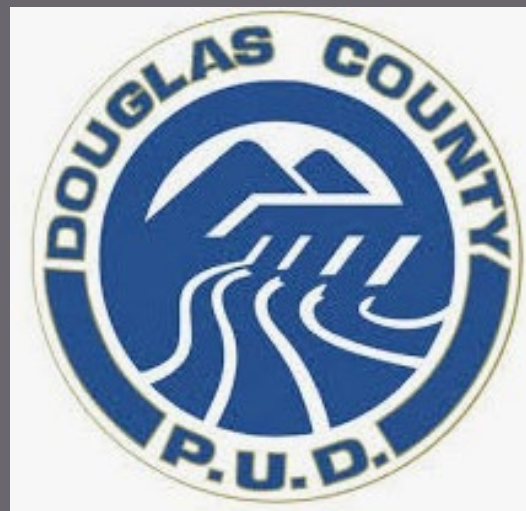


# Zebra and Quagga Mussel and Northern Pike Early Detection Monitoring Program

Northwest Power and Conservation Council  
October 15, 2019

Washington Department of Fish and Wildlife  
Aquatic Invasive Species Unit  
Jesse Schultz

# Co Partners





# Sample Methods

- Vertical and horizontal plankton net tows
- Artificial substrates/collection plates
- Visual shoreline
- Water quality including calcium
- eDNA
- Ponar grab sampler

# Criteria for Water Bodies

- Water bodies are determined by the potential for introduction of zebra/quagga mussels through human activities:
  - Boatyards capable working on large commercially hauled watercraft.
  - Private/public entities transporting equipment (docks, heavy equipment, etc.) that is not watercraft for hydro power facilities and agriculture.
  - The “usual suspects” – all watercraft usage including water sports wakeboarding tournaments, commercial, government, pleasure, recreational fishermen, and walleye and bass tournament anglers.
  - Calcium.

# Criteria for Sites Within Water Bodies

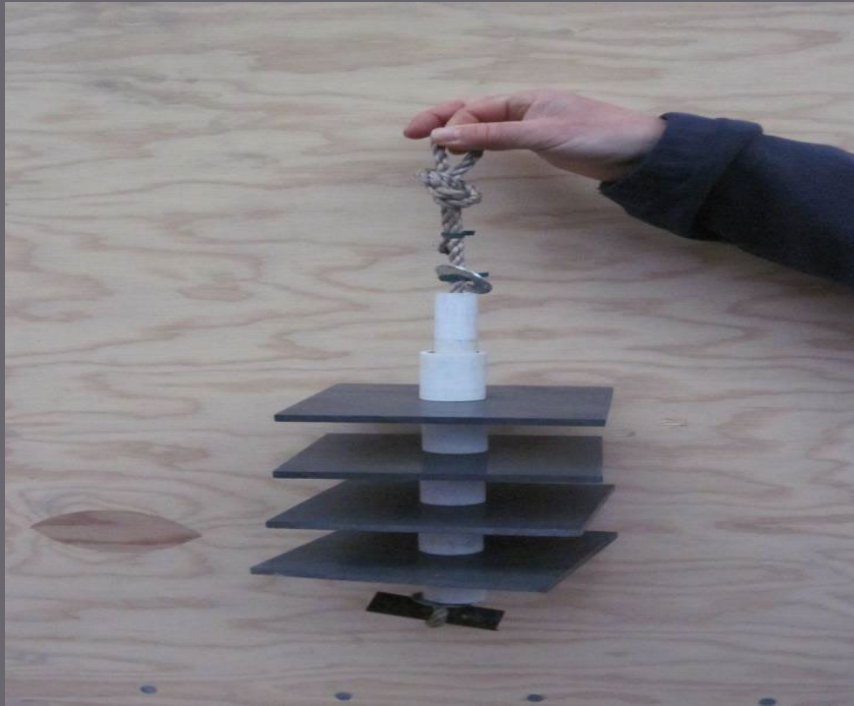
- Sites within the water body are determined by where the most usage occurs:
  - Launches/boat ramps.
  - Marinas.
  - Boatyards.
  - Hydro power facilities.
  - Agriculture.
  - Veliger drifting patterns.

# Vertical and Horizontal Plankton Net Tows



- Water temperatures greater than 10 C (spawning) typically May - November
- For juveniles/veligers
- Horizontal and vertical tows for 1 composite sample per site visit
- Analysis conducted by private consultants Cameron Lange and Steve Wells

# Artificial Substrates/Collection Plates



- Can be left in water year around
- For post-settled juveniles and adults
- Typically 1 per site
- Analysis conducted by staff in the field unless possible AIS taken to lab

# Visual Shoreline

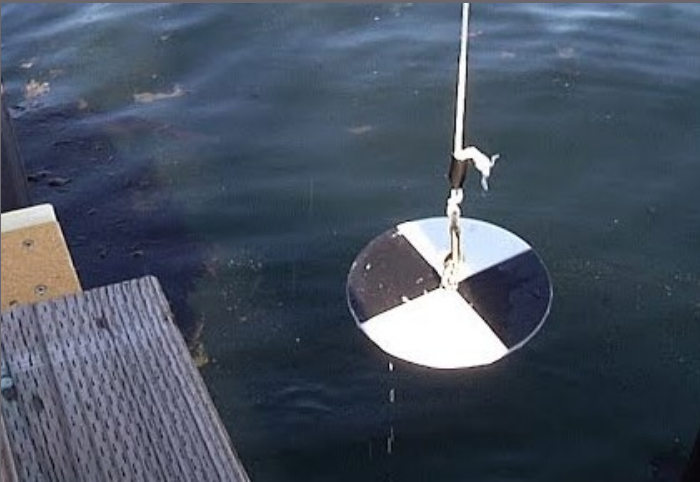


- Can be conducted year around
- For post-settled juveniles and adults
- Standardized by time – 10 minutes
- Analysis conducted by staff in the field unless possible AIS taken to lab

# Water Quality



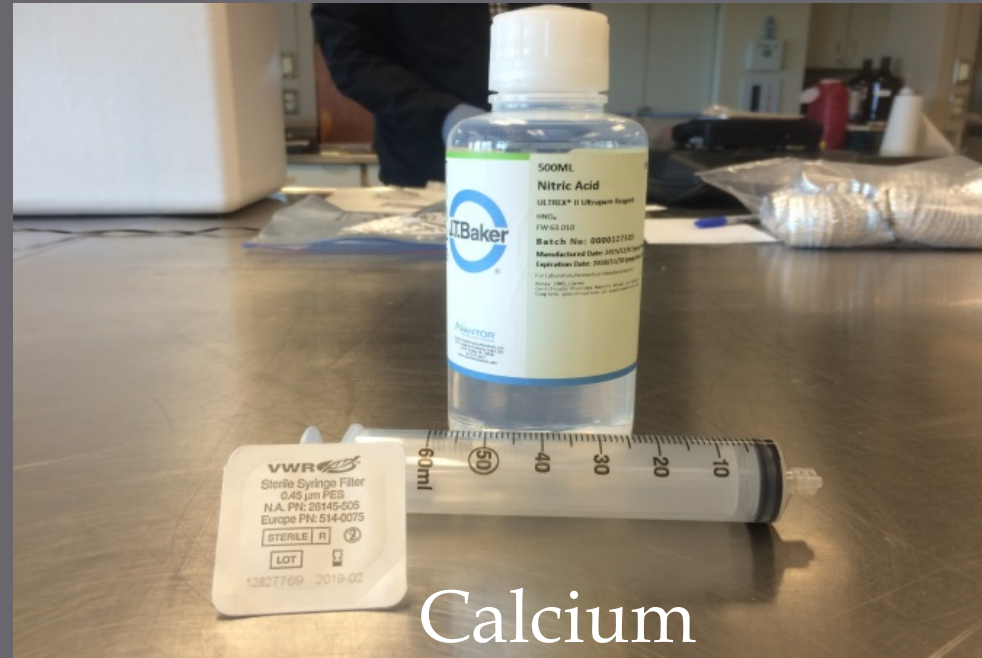
Hanna Multiparameter HI9829



- Salinity
- pH
- Temperature
- Dissolved Oxygen
- Visibility

- Conducted every site visit

# Water Quality



- Conducted during the summer when calcium is at “highest” and spring when at “lowest”
- Trying to conduct year around
- Analysis conducted by Eastern Washington University  
Carmen Nezat



# eDNA



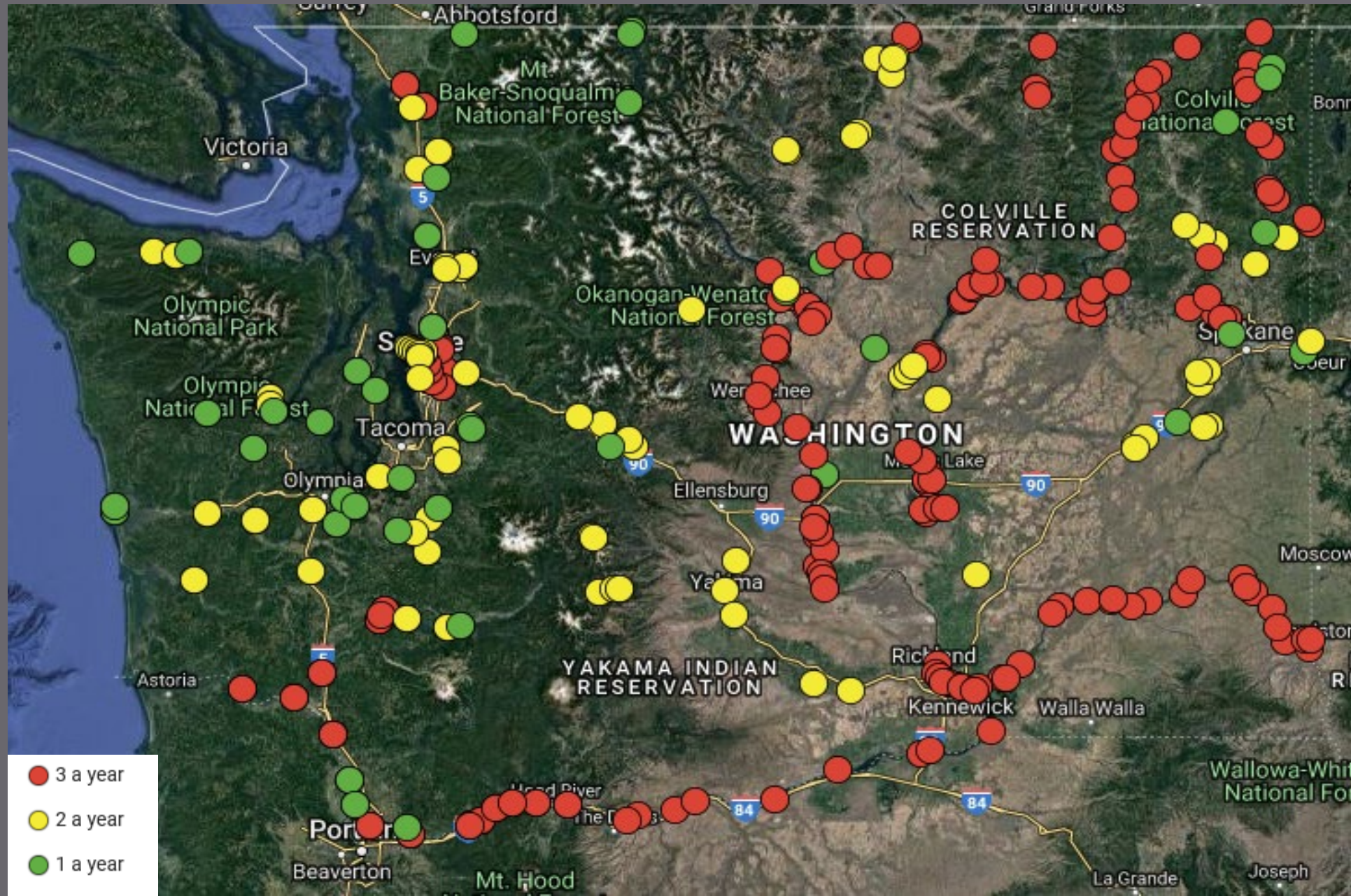
- Started in 2017 for zebra/quagga mussels only
- In 2018, added New Zealand mudsnails (NZMS)
- In 2019, for zebra/quagga mussels, NZMS, and Northern Pike
- Can be conducted year around
- Typically one samples per site
- Smith Root Inc. ANDe backpack filter
- Analysis conducted by WDFW Genetics Lab Sarah Brown

# Ponar Grab Sampler



- Starting in 2019, goal of 750 conduct at 250 sites

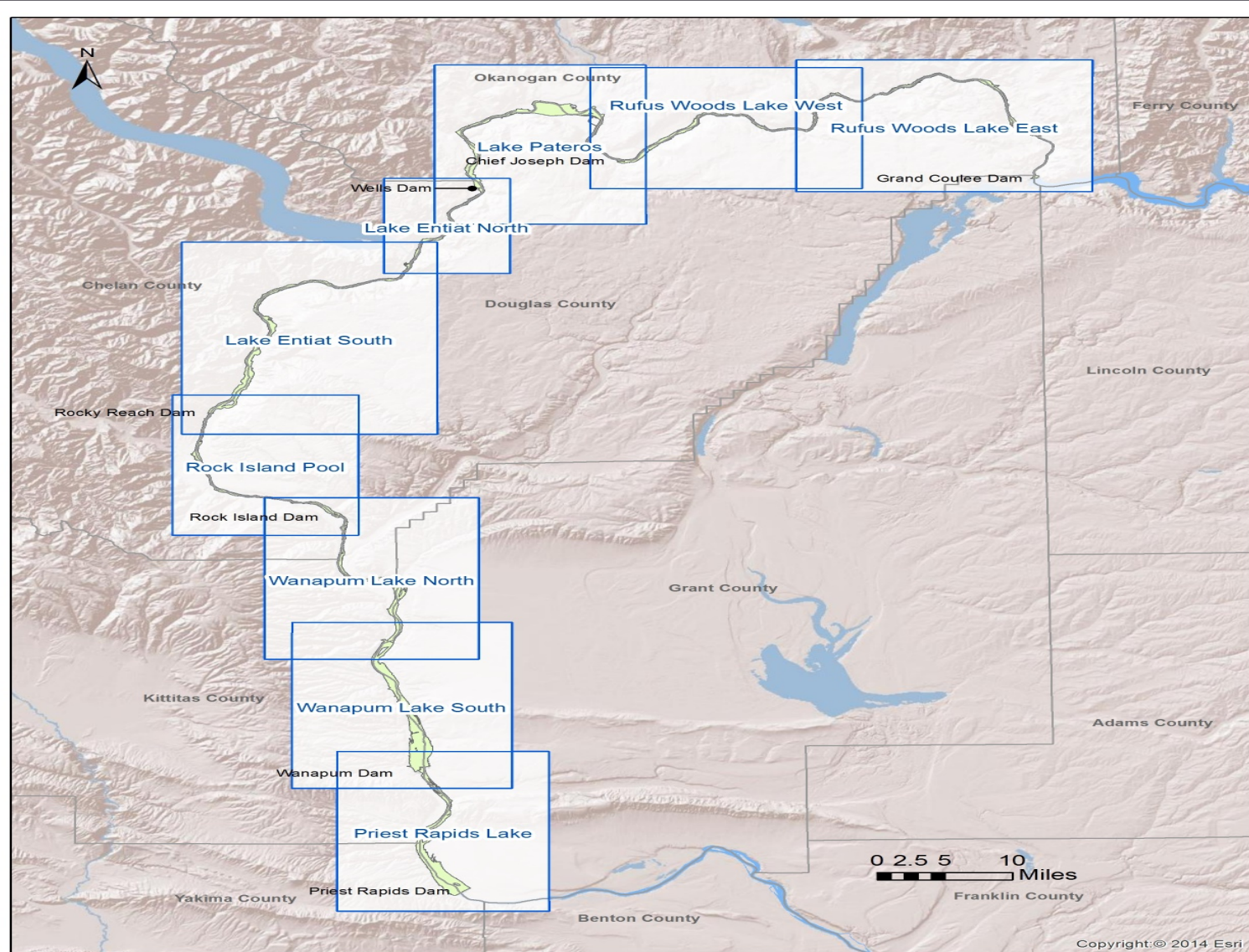
# 2019 Sites

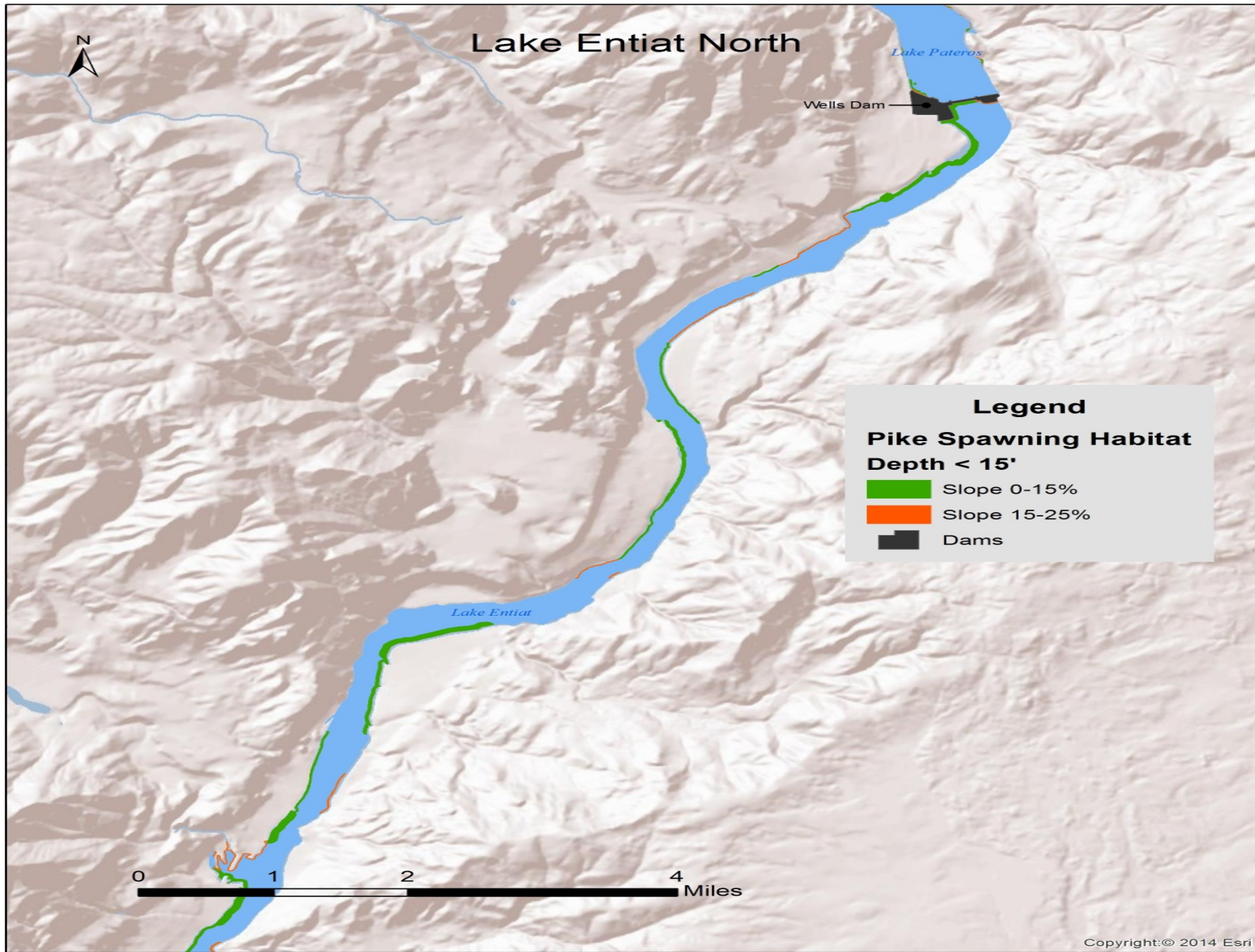


# Northern Pike Emphasis

# WDFW Habitat Suitability Maps

Chuck Lee Region 1 Fish and Wildlife Biologist

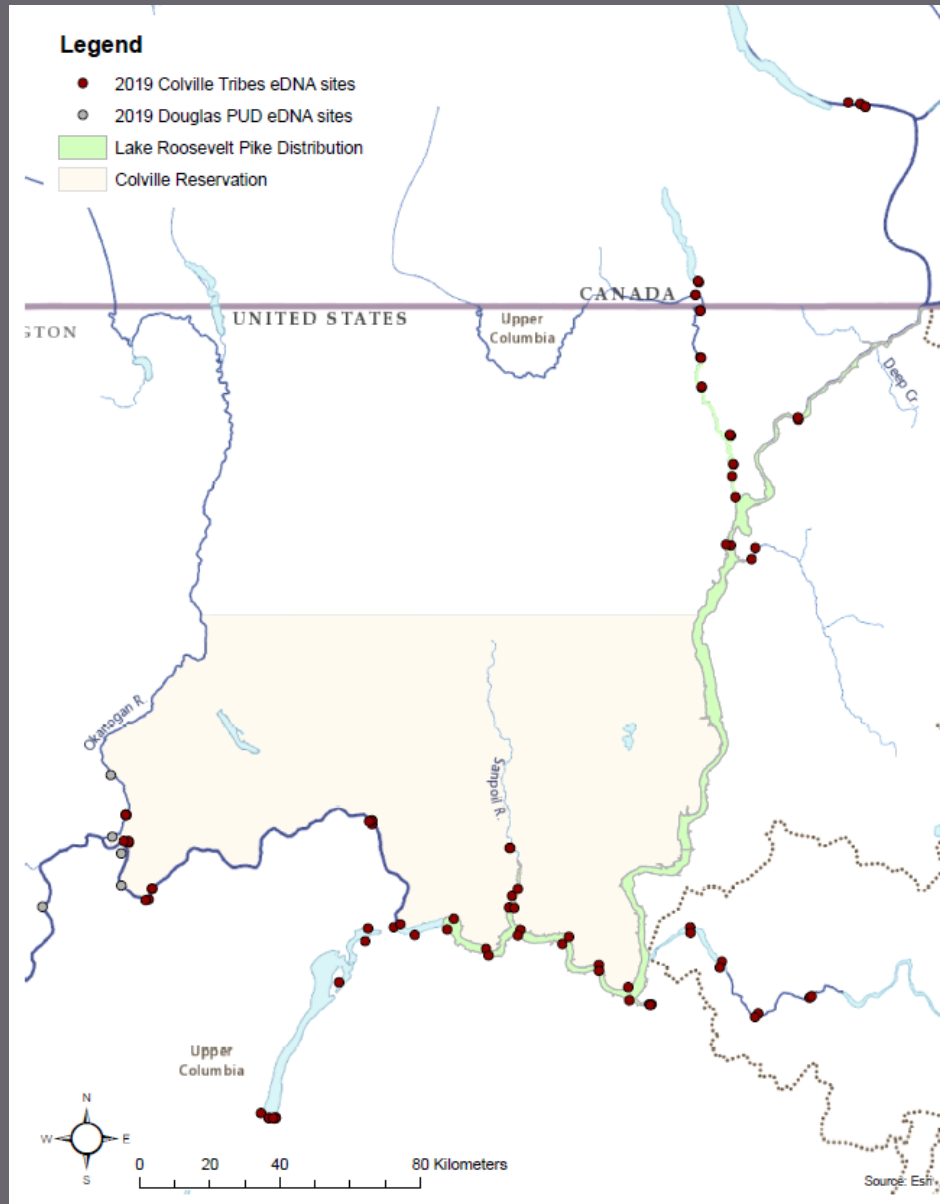




<u>Water Body</u>	<u>Mean Slope</u>	<u>Total Acres</u>
Rufus Woods Lake	< 15%	661
	<25%	923
Wells Pool	< 15%	2,238
	<25%	2,363
Lake Entiat	< 15%	69
	<25%	123
Rock Island Pool	< 15%	2,490
	<25%	2,593
Wanapum Lake	<15%	1,330
	<25%	1,330
Priest Rapids Pool	<15%	1,172
	<25%	1,222

# The Confederated Tribes of the Colville Reservation

Holly McLellan Principal Biologist



- CCT has over 70 sites
- Columbia, Okanogan, and Kettle Rivers, and Banks Lake
- Sample twice a year
- May spawning and September low flow



# Douglas County PUD

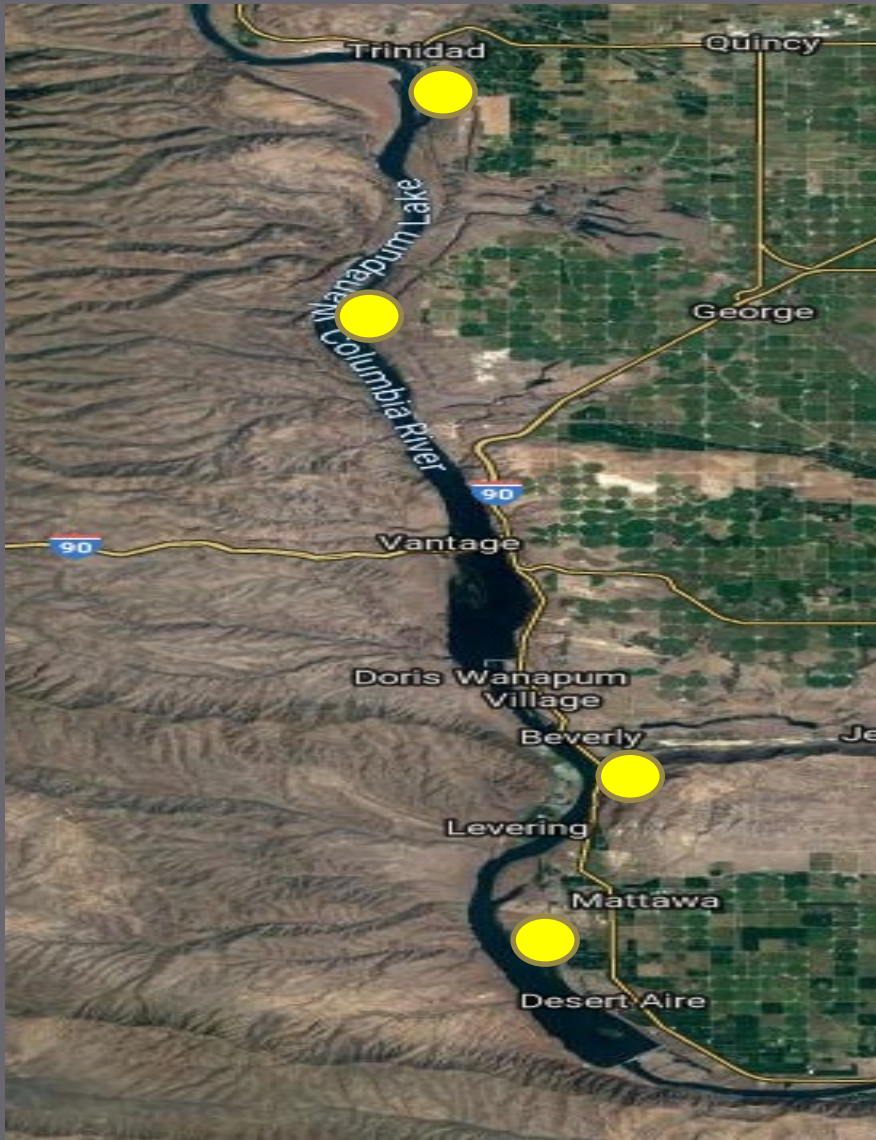
Chas Kyger Aquatic Resource Biologist



- 10 sites
- Columbia and Okanogan, Rivers
- Sample once a month  
March to October

# Grant County PUD

Carson Keeler Senior Biologist



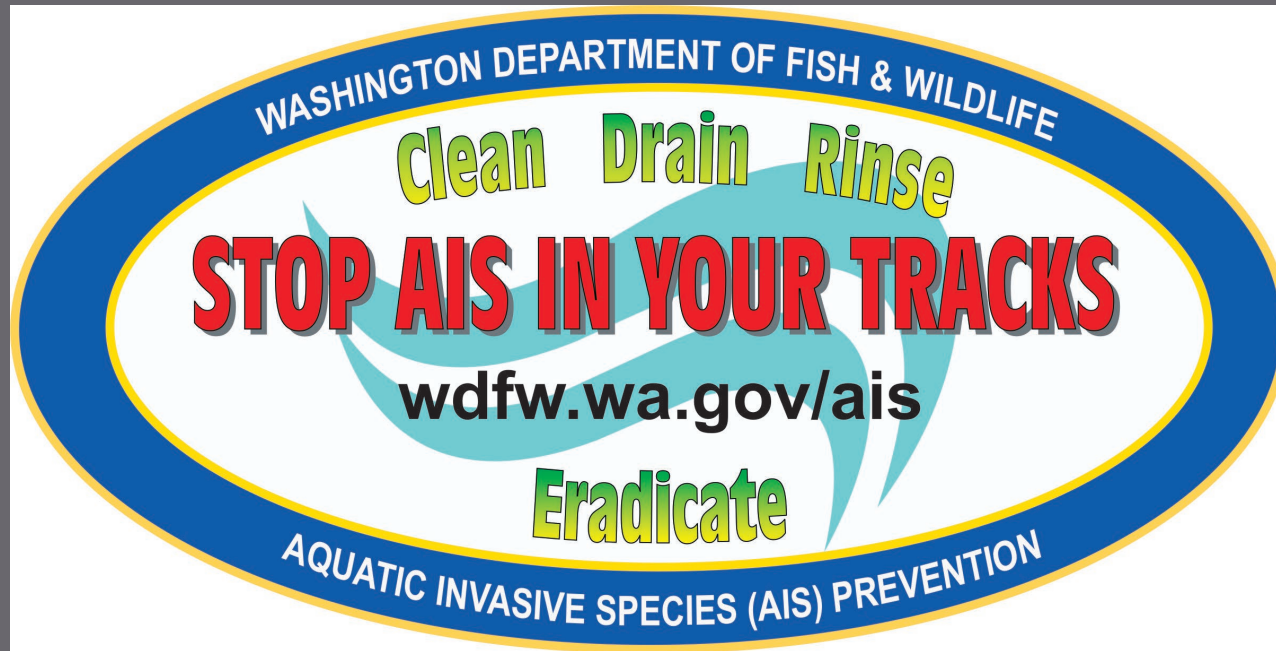
- 4 sites
- Columbia River
- Sample three times a year  
July to October

# Lake Entiat Douglas County July 17, 2019



- July 17<sup>th</sup> Wednesday angler reported seeing a adult northern pike while fishing.
- July 22-23<sup>rd</sup> Monday and Tuesday Lake Entiat sampled using all methods at existing sites and reported northern pike site.
- July 25<sup>th</sup> Thursday evening samples mailed to NRB.
- August 1<sup>st</sup> Thursday eDNA samples delivered to lab for analysis.
- August 5<sup>th</sup> Monday analysis completed and all eDNA samples NEGATIVE.

# Thanks



**WDFW AIS Unit**

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