



2019 Zebra/Quagga Mussel Early Detection Monitoring Results

Columbia River Basin Team Meeting
January 22, 2020

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

Co-Partners

| Sampler | Water Body | Reservoir |
|---------------|----------------|---------------------------|
| Chelan PUD | Columbia River | Rocky Reach/Entiat |
| Douglas PUD | Columbia River | Pateros |
| Grant PUD | Columbia River | Priest Rapids and Wanapum |
| Spokane Tribe | Columbia River | Roosevelt |

Risk Assessment Scoring

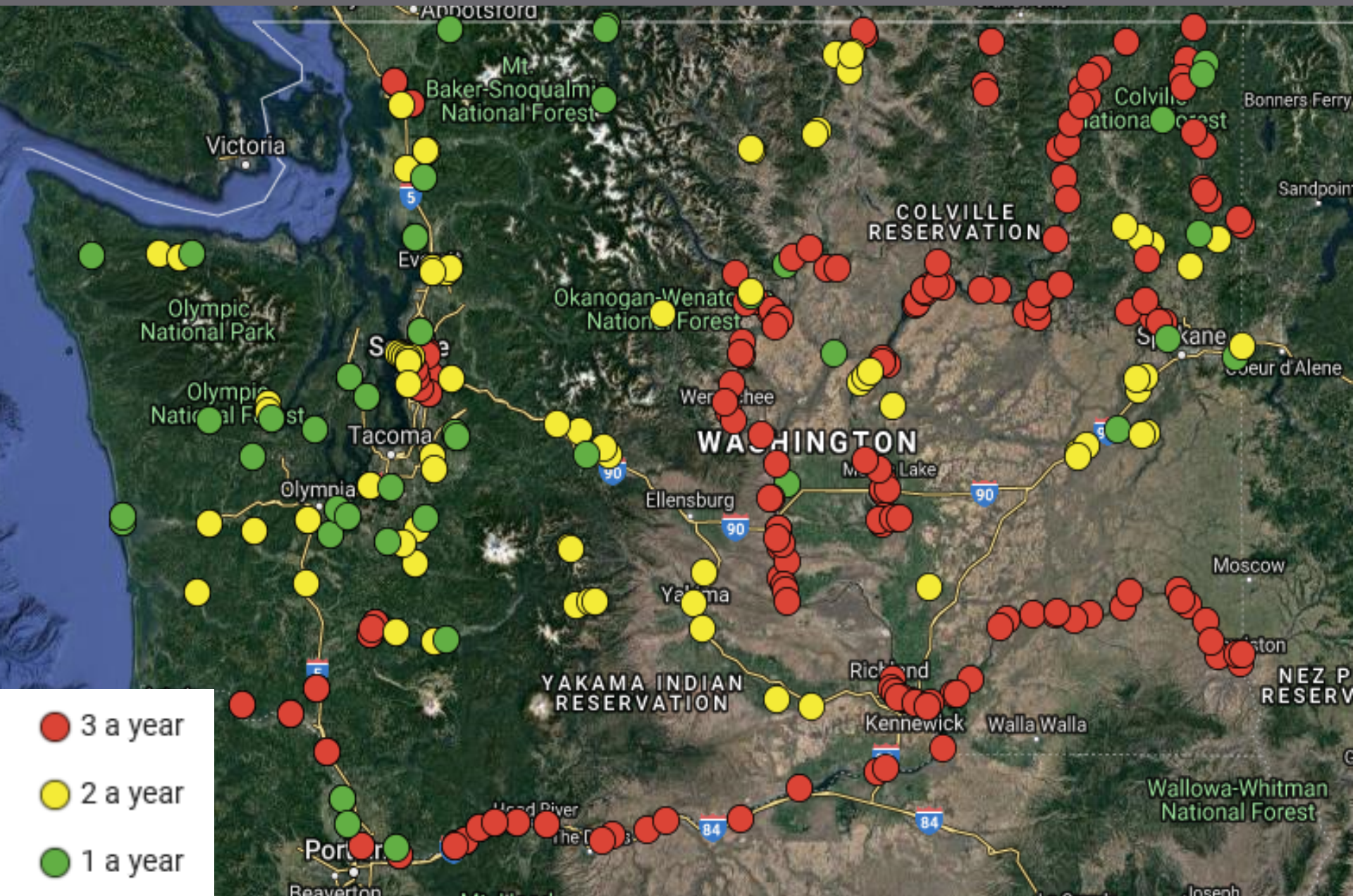
| Scoring | 0 Point | 1 Point | 2 Point | 3 Point | 4 Point |
|---------|---------|---------|---------|---------|---------|
|---------|---------|---------|---------|---------|---------|

| Establishment | | | | | |
|--------------------------|------------------------|------|-------|-------|------------|
| Dissolved Calcium (mg/L) | 0-4 (no monitoring) | 5-11 | 12-15 | 16-24 | 25 or more |

| Introduction | | | | | |
|-----------------------------------|-----------------------|--|-------------------------------|--|--|
| Public | No (no monitoring) | | | | Yes |
| # Boat Ramps | 0 (no monitoring) | 1 | 2 | 3 | 4 or more |
| Boat Ramp Paved | No | | | | Yes |
| Boat Ramp w/Dock | No | Yes | | | |
| Motorized Watercraft Allowed | No | | | | Yes |
| Speed Limit > 10mph | No | | | | Yes |
| Moorage | No | | | | Yes |
| Private Docks | No | | | | Yes |
| Access Year Around | No | Yes | | | |
| Ease of Access | | Foot | Ferry | Gravel road | Paved road |
| In Columbia River Basin | No | Yes | | | |
| Water Body Size | | 0-10 | 11-49 | 50-99 | 100 or more |
| Fish Stocked | No | Yes | | | |
| Hatchery/Net Pens | No | | | | Yes |
| Fishing Tournaments | No | 1-2 | 3-4 | 5-6 | 7 or more |
| Motorized Watersports Tournaments | No | | | | 1 or more |
| Boatyard | No | | | | Yes |
| Hydropower/Flood Control | No | | | | Yes |
| Irrigation | No | | | | Yes |
| Municipal Water | No | | | | Yes |
| Proximity to Source Population | | No drainages west of continental divide | West of continental divide | Nearby, but may not be as easily assessable | Downstream, connected, or within easy drive |

| Monitoring Frequency | | | | | |
|----------------------|--------------------|--------------------|-------------|--------------|--------------|
| 0 | 1-20 | 21-34 | 35-39 | 40-49 | 50 or more |
| No monitoring | Once every 3 years | Once every 2 years | Once a year | Twice a year | Three a year |

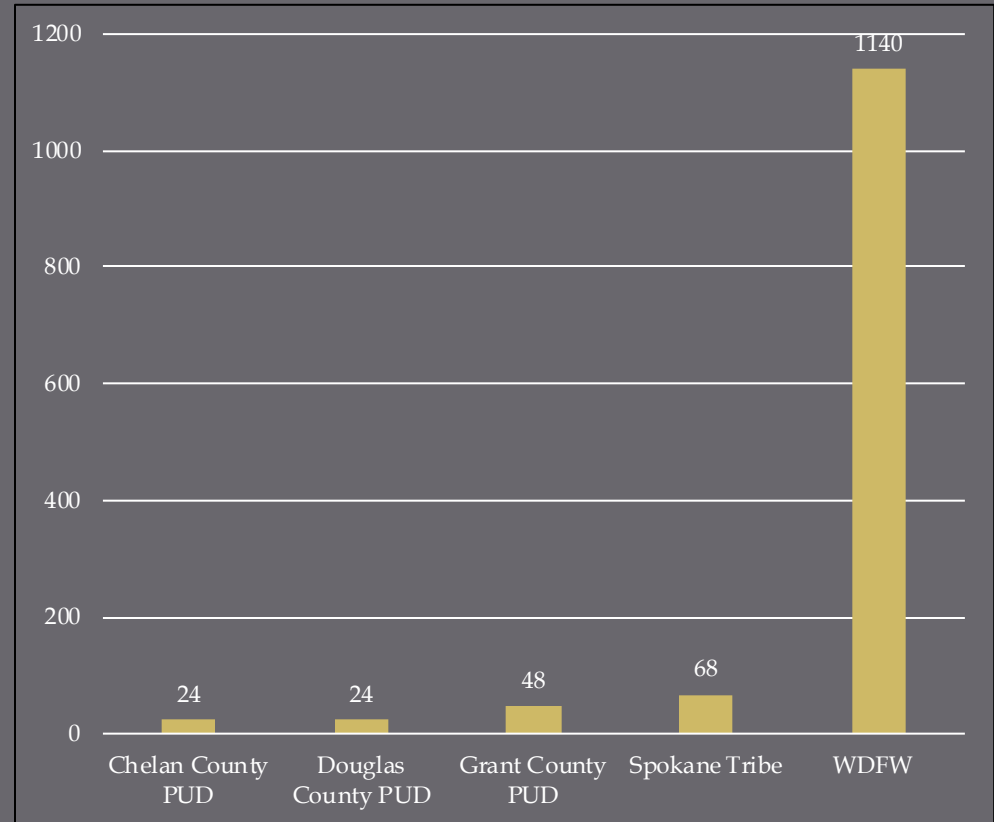
2019 Sites (119 water bodies 313 sites)



Early Detection Zebra/Quagga Mussel Monitoring

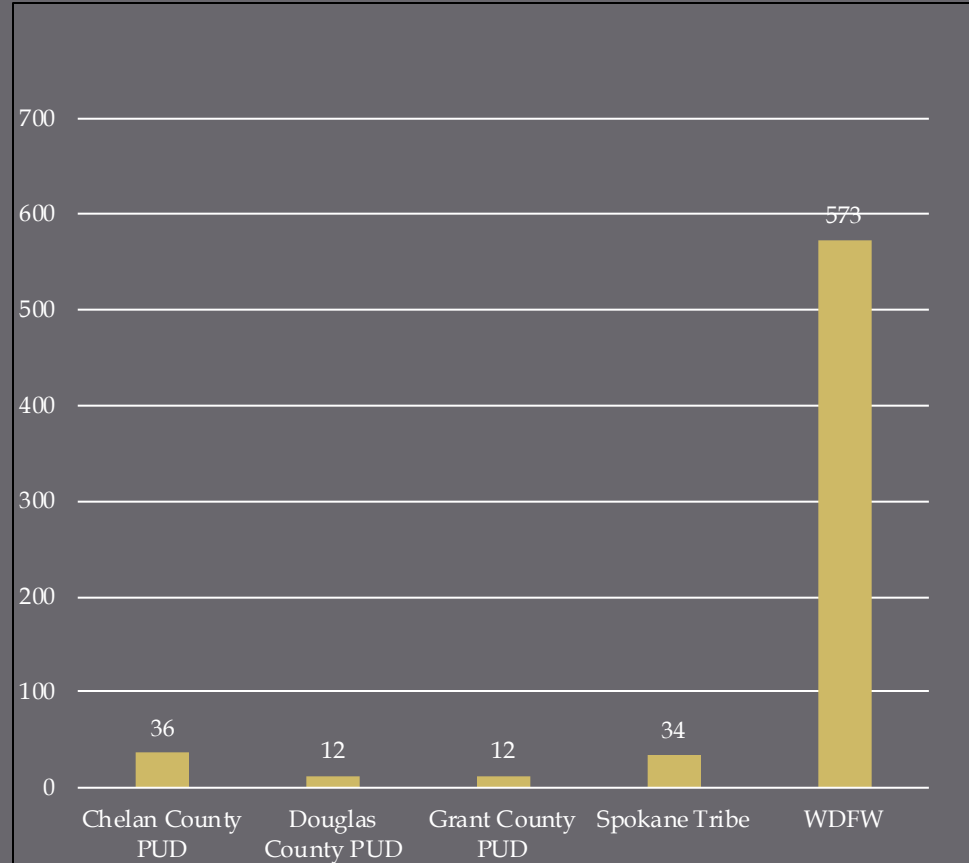
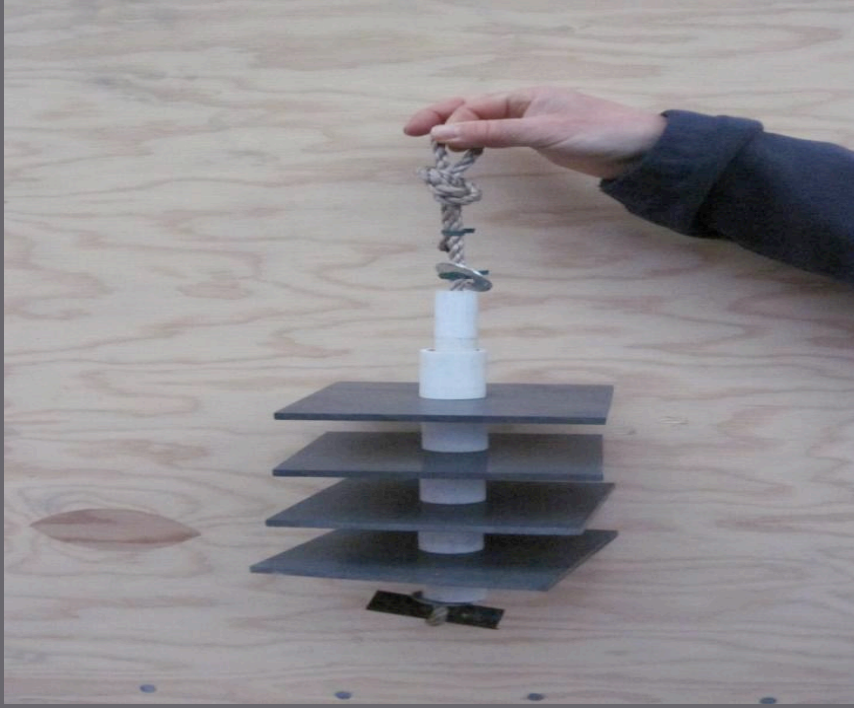
- Vertical and horizontal plankton net tows
- Artificial substrates
- Visual shoreline
- Water quality including calcium
- eDNA
- Ponar grab sampler

Vertical and Horizontal Plankton Net Tows



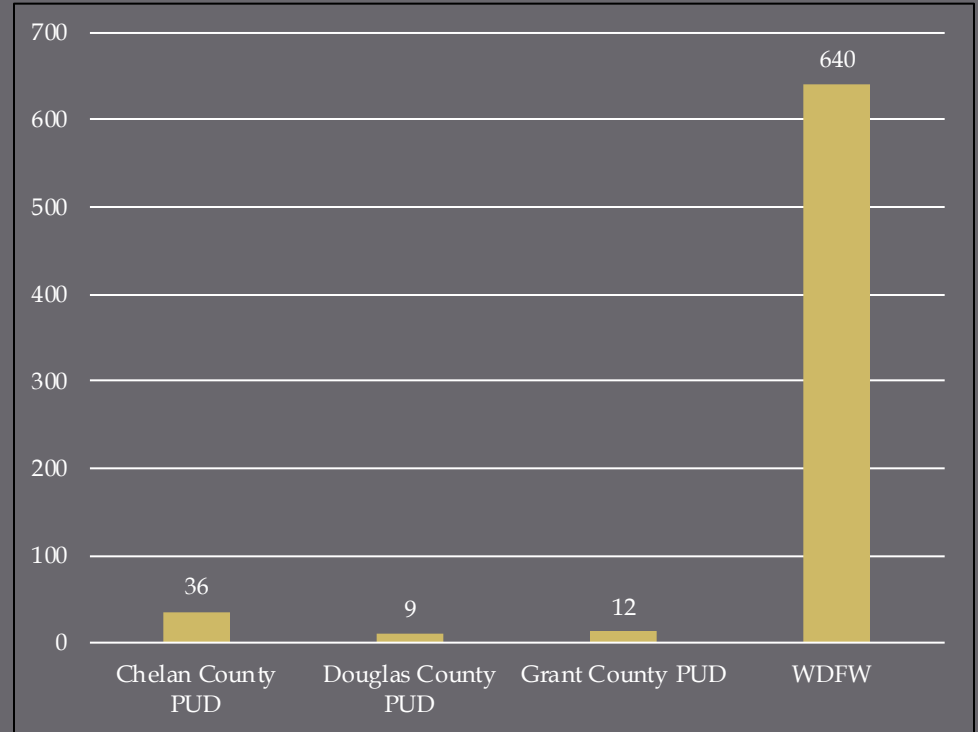
- 1304 tows
- 108 water bodies
- 284 sites
- Analysis conducted by Cameron Lange and Steve Wells
- 121 Asian clam samples at 29 water bodies, 71 sites

Artificial Substrates



- 667 monitoring visits
- 112 water bodies
- 267 sites
- 1st New Zealand mudsnails detection

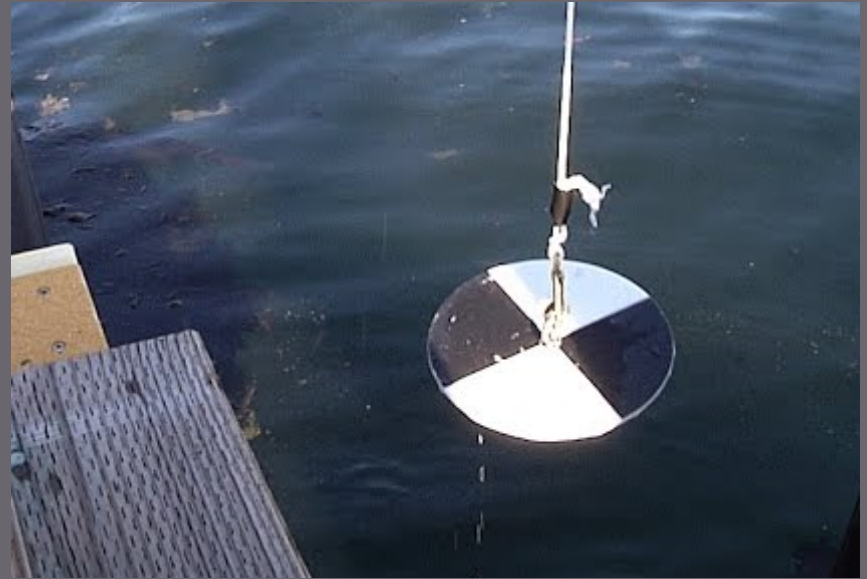
Visual Shoreline



- 697 surveys
- 118 water bodies
- 293 sites
- 257 Asian clam detections at 38 water bodies, 129 sites
- 9 Chinses mystery snail detections at 7 water bodies, 7 sites

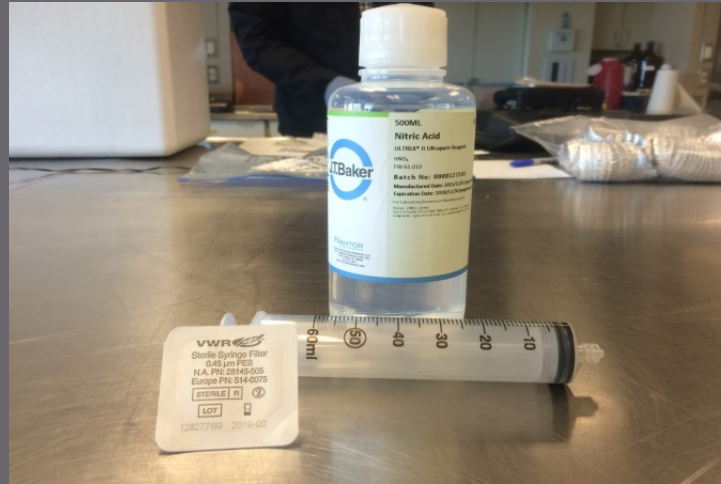
Water Quality

Hanna Multiparameter HI9829



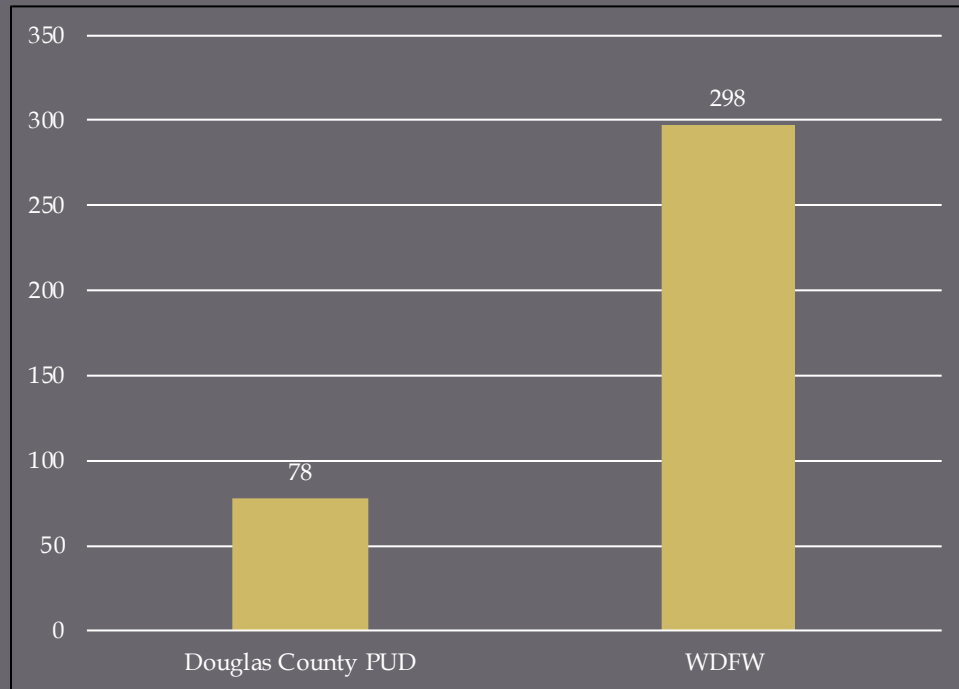
- Salinity, pH, temperature, and visibility
- 643 measurements
- 118 water bodies
- 297 sites

Calcium



- 643 samples
- 118 water bodies
- 297 sites
- Analysis conducted by Eastern Washington University
Carmen Nezat

eDNA



- 376 samples
- 119 water bodies
- 309 sites
- Analysis conducted by WDFW Genetics Lab Sarah Brown for zebra/quagga mussels, northern pike, and NZMS for WDFW
- Analysis conducted by USFS Rocky Mountain Research Station Lab for zebra/quagga mussels and northern pike for Douglas County PUD

eDNA Northern Pike



- Douglas County PUD
 - Positive sample Okanogan River 5/10/19
 - 5 additional samples all negative
- Grant County PUD
 - 8 samples
 - 2 water bodies
 - 4 sites
 - Analysis conducted by USFS Rocky Mountain Research Station Lab

Ponar Grab Sampler

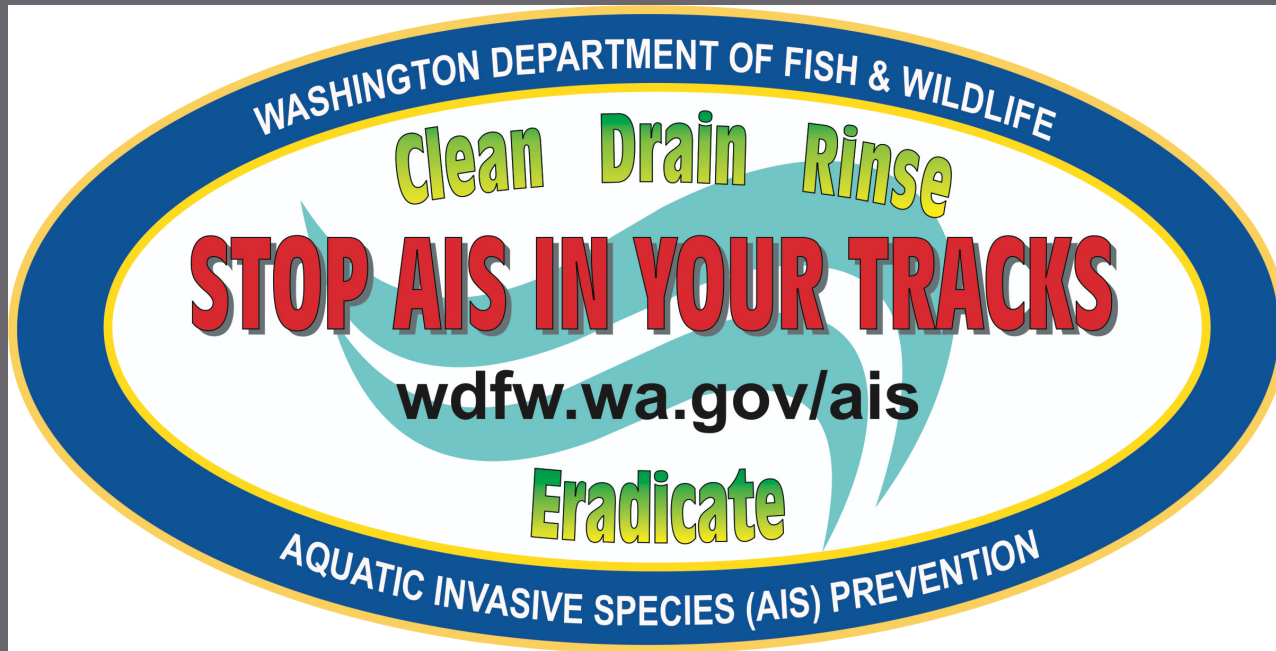


- 580 samples
- 109 water bodies
- 284 sites
- 78 Asian clam detections at 24 water bodies, 57 sites

Summary

- 2019
 - Teams
 - June 12 – November 6
 - Eastern WA Spokane 2 person team (perfect)
 - Western WA Olympia 1 person team relied on internal staff to volunteer (not perfect)
 - eDNA expensive and creates a lot of waste
- 2020
 - Teams
 - May 4 – October 30
 - 2 person team Eastern and Western WA
 - Decrease eDNA sampling
 - Increase all other sampling
 - Lake Chelan dissolved calcium study proposal

Thanks



WDFW AIS Unit

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