



Decontamination 101



Brianna Widner
Recreation and Conservation Office

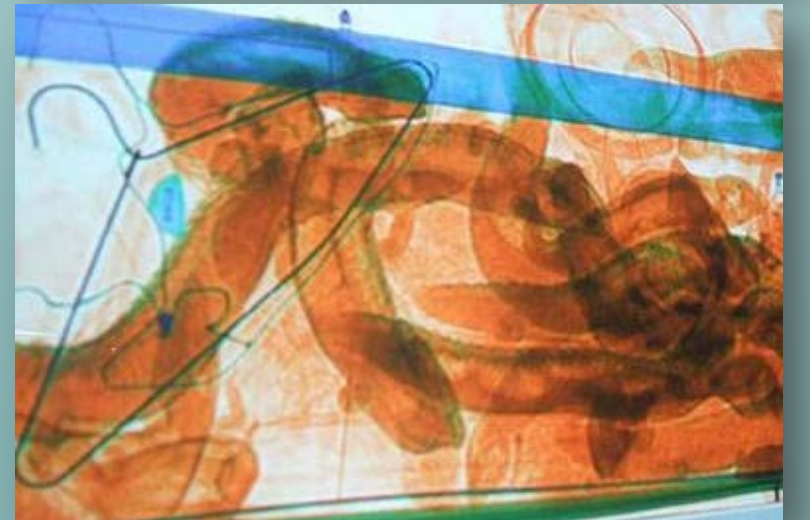
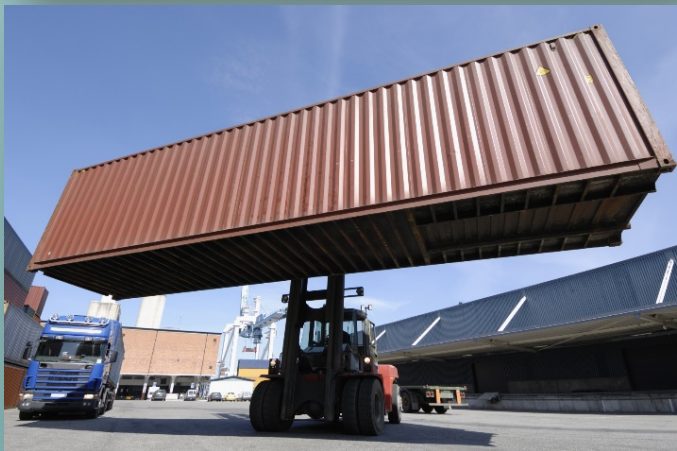




How many New Zealand mudsnails do you think were found on these boots?

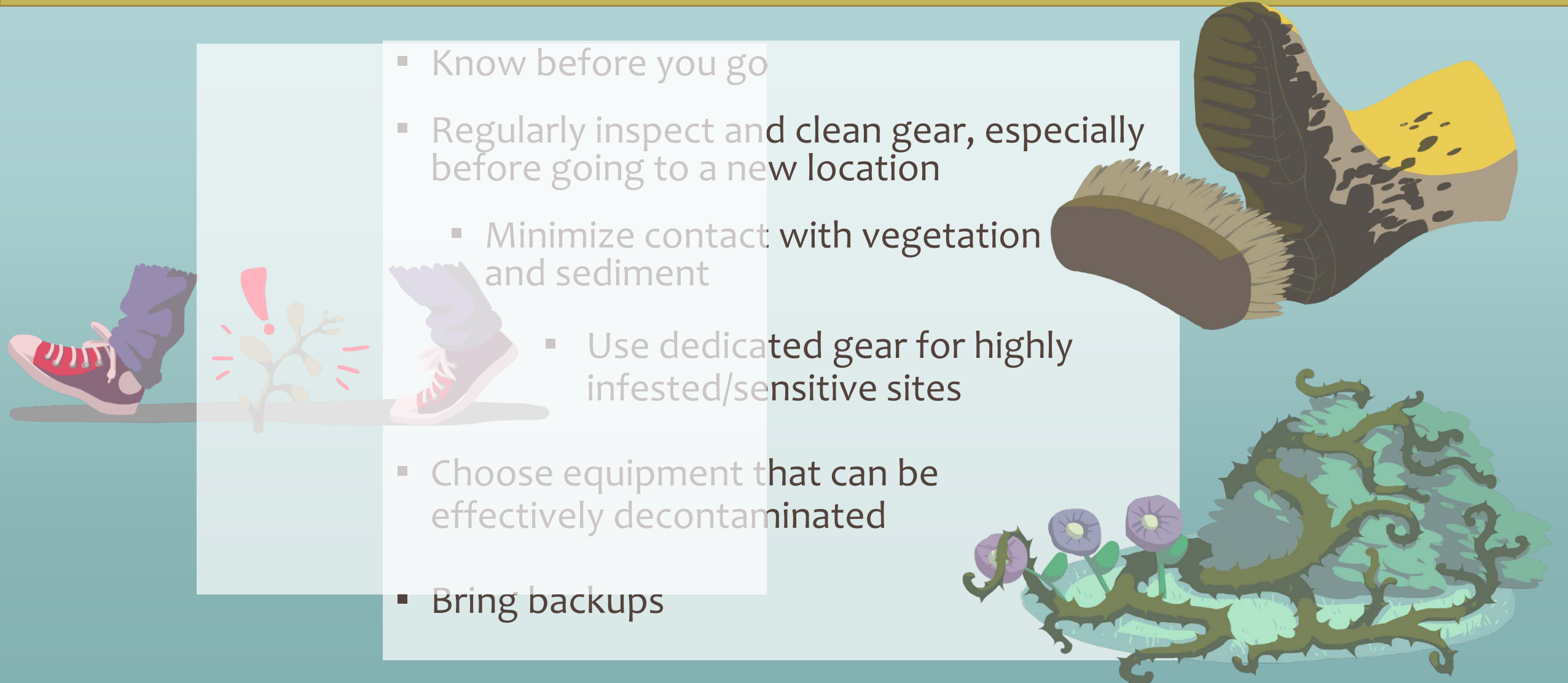


HOW DO THEY SPREAD?



BASIC INVASIVE SPECIES MANAGEMENT TIPS

- Know before you go
- Regularly inspect and clean gear, especially before going to a new location
 - Minimize contact with vegetation and sediment
- Use dedicated gear for highly infested/sensitive sites
- Choose equipment that can be effectively decontaminated
- Bring backups



CONSIDERATIONS FOR CONSTRUCTION AND RESOTRATION PROJECTS



- Use weed-free materials
- Assess your site for existing invasive species
- Minimize disturbing vegetation
- Train project team





DECONTAMINATION

- Two levels of decontamination
- Level 1: Remove
 - Reduces risk of spreading majority of invasive species
- Level 2: Eradicate
 - Kill all remaining invasive species after Level 1 removal

DECONTAMINATION: LEVEL 1

- Clean
 - Remove all sediment, organisms, or debris from equipment
- Drain (aquatic situations)
 - Remove all water collected in equipment from that site
- Rinse
 - Wash off your equipment using clean water



DECONTAMINATION: LEVEL 1

- Basic equipment
 - Stiff boot brush with a mud pick
 - Rinse water
 - Tote
 - Optional: Dog brush





DECONTAMINATION: LEVEL 1, CONT.

Tip: Make a boot-buddy



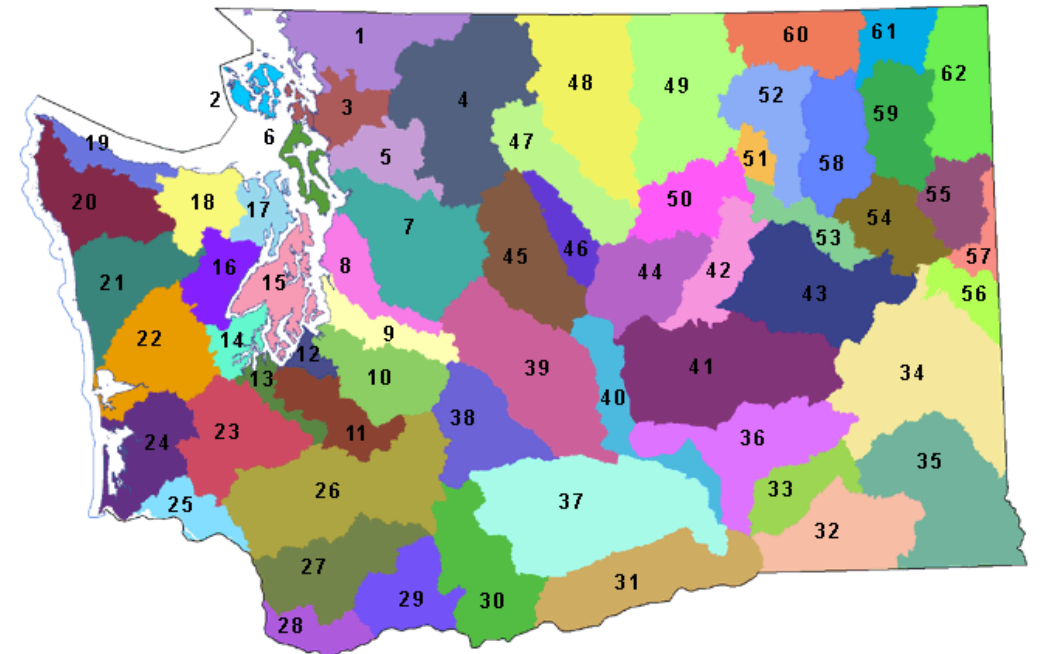
Photo: Erin Haley, King County Noxious Weed Program



DECONTAMINATION: LEVEL 2

- Conduct AFTER Decontamination Level 1
- Objective: Eradicate
 - Kill all remaining invasive species after Level 1 removal
- Conduct Decontamination Level 2...
 - After working in infested water
 - Between WRIA/geographic basins
 - Before sensitive areas

Water Resource Inventory Area (WRIA) Map



Treatment	Concentration or Temperature	Exposure Time	Comments
Virkon Aquatic	2%	20 minutes, then rinse with clean water	Dispose of rinse water according to label directions
Hot Water Wash or Soak	60°C (140°F)	5 minutes for felt-soled boots and nets; 10 seconds for all other equipment	Ensure all parts of the equipment reach temperature for the full exposure time
Cold/Freezing	-4°C	4 hours minimum	Time starts after the equipment reaches -4°C.
Drying	Low humidity, in sunlight is best	48 hours, on average	Time starts AFTER the equipment is thoroughly dry.
Formula 409 (must contain quaternary ammonia)	100% (full strength)	10 minutes	Follow proper procedures for storage and handling.
Quat 128	4.6%	10 minutes	Follow proper procedures for storage and handling.
Hydrogen Peroxide	3% (30,000 ppm)	15 minutes	Spray until soaked, then keep damp for contact time (cover or place gear in a dray bag)

Decontamination protocols developed by the Washington Department of Ecology, Environmental Assessment Program

Decontamination Level 2 Option: Hot Water



- 140°F / 60°C at 15 seconds or 5 minutes
 - Environmentally friendly

Decontamination Level 2 Option: Virkon Aquatic



10 Pound Tub



- 2% for 20 minutes bath
- Equipment must be rinsed with potable water
- Rinse water must be captured and properly disposed according to the label
- Vendor Western Chemical @ 1-800-283-5292



BOATERS

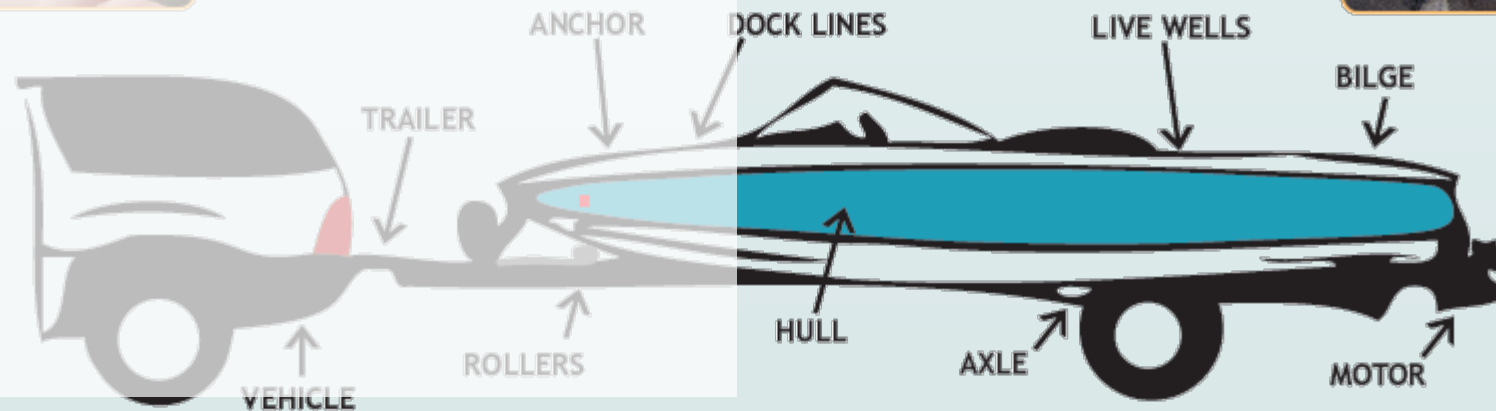
CLEAN, DRAIN, AND DRY YOUR BOAT

- One extra step: DRY
- Minimum of 30 days recommended for drying boats from infested waters, varies by temperature and humidity



LOOK FOR MUSSELS HERE

YOU CAN PREVENT THE SPREAD OF QUAGGA AND ZEBRA MUSSELS.
CHECK YOUR WATERCRAFT BEFORE ENTERING A WATERWAY!



Credit: Sonoma County Water Agency

DECONTAMINATION STATIONS

- Stations at Ephrata and Spokane





STOP AT MANDATORY CHECK STATIONS

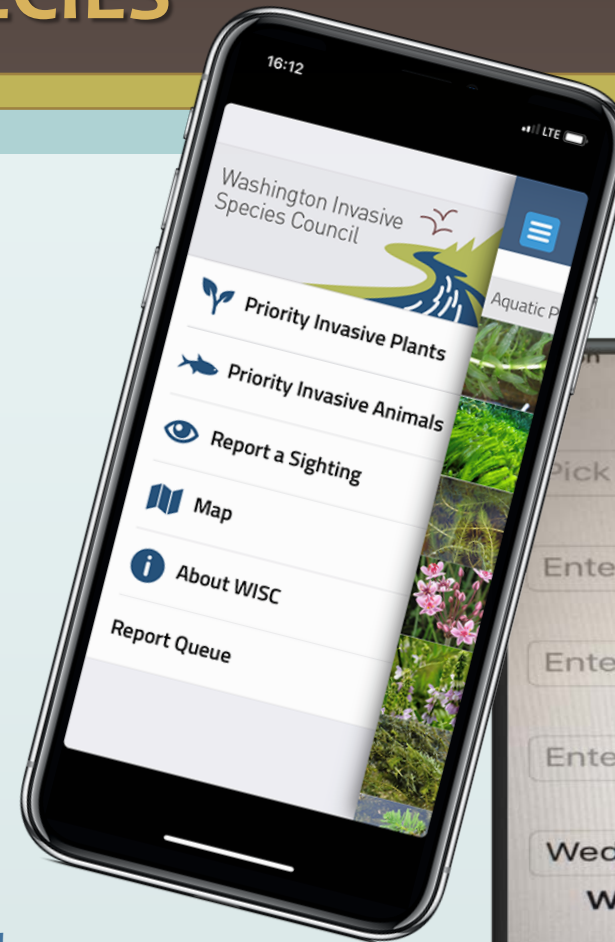
- Designed to be outreach and educational
- Only takes a few minutes
- You are immune from aquatic invasive species citations at check stations if all department directives are followed
- Spokane and Plymouth Locations, along with some roving stations





REPORTING AN INVASIVE SPECIES

- See it? Say something!
- **1) Phone**
 - Emergency Aquatic Invasive Species Hotline
 - 1-888-WDFW-AIS
 - WA/OR/ID Feral Swine Hotline
 - 1-888-268-9219
- **2) Mobile apps**
 - WA Invasives for iOS and Android
 - NAS Sighting Report:
<https://nas.er.usgs.gov/mobilesightingreport.aspx>
- **3) Website**
 - <http://www.invasivespecies.wa.gov/report.shtml>
 - <http://wdfw.wa.gov/ais/reporting/>



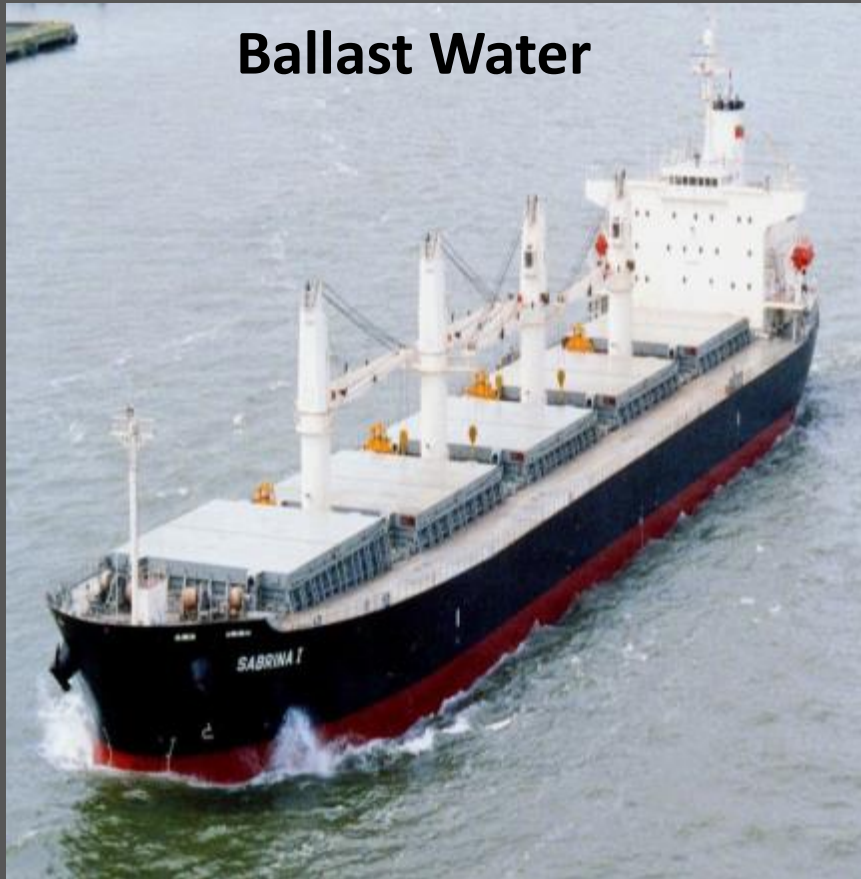
11:59 AM
NAS Sighting Report
Type:
Pick a Type
Common Name:
Enter the Common Name
Genus (if known):
Enter the Genus
Species (if known):
Enter the Species
When it was found:
Wednesday, February 1, 2017
Who made the observation:
Name:
Enter Name
Email:
Enter Email Address
Telephone Number:



Aquatic Invasive Species (AIS) Unit



Ballast Water



Zebra/Quagga Mussels



**Washington Department of Fish and
Wildlife**

What is a successful Aquatic Invasive Species (AIS)

- Introduced organism nonnative to ecosystem
- Example of invasive from other areas
- Highly adaptive
- Rapid reproduction
- Must find niche
- Outcompetes native species
- Alters ecosystems
- Reduce recreation
- Negatively impact human and pet health
- Aesthetic value of nature
- **Cost a lot of \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$**

Beneficial Nonnatives

Most common oyster and clams harvested.



- Pacific oyster



- Manila clams

Revised Code of Washington 77.135

- **RCW 77.135.020** – the department is lead agency for managing invasive species of the animal kingdom statewide

WDFW AIS Unit Permanent Staff

Fish Program

AIS Coordinator
Allen Pleus – Olympia

Ballast Water Inspector
La Connor

Ballast Water Inspector
Vancouver

Ballast Water Support
Olympia

Biologist
Jesse Schultz – Olympia

Biologist
Richard Visser - Olympia

Scientific Technician
Michael Wilkinson - Spokane

Enforcement Program

Captain
Eric Anderson – Western WA

Sergeant
Pamela Taylor – Spokane

WDFW AIS Unit Temporary Staff

Fish Program

Scientific Technician
1- Spokane

Scientific Technician
1- Olympia

Enforcement Program

Watercraft Inspectors
10- Spokane

Watercraft Inspectors
5- Plymouth

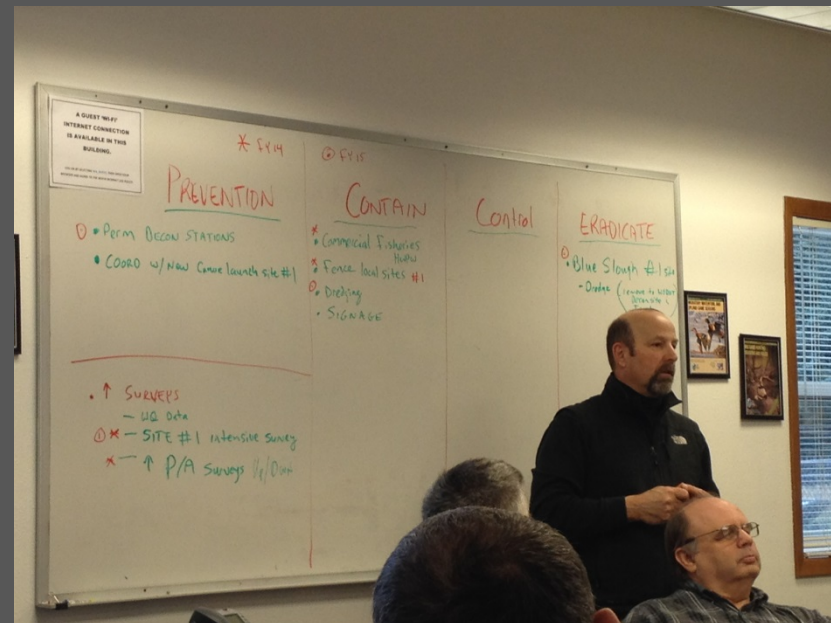
Ballast Water

- Established in 2000
- Minimize AIS risk
- Funded through Aquatic Lands Enhancement Account (ALEA)



Everything Else Besides Ballast Water

- Established mid 1990's
 - Zebra/quagga mussels
 - European green crab
 - Atlantic salmon
- Prevent spread and establishment of AIS
- Budget
 - Started in 2005, boats registered in Washington pay \$2
 - Started in 2018, AIS Prevention Permit. Boats registered outside of Washington pay \$24

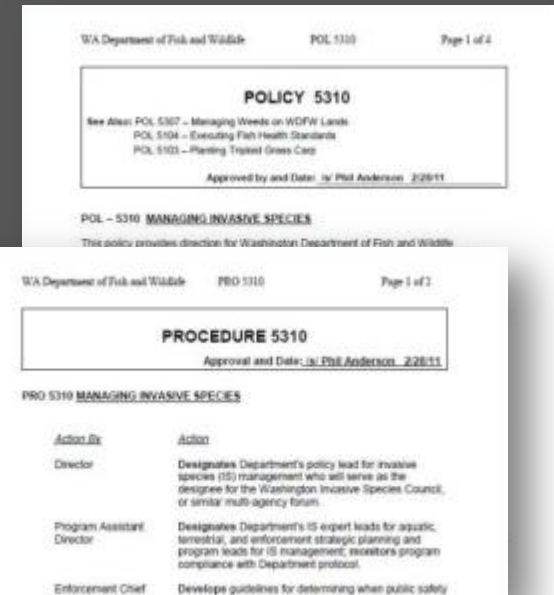


How Does WDFW Prevent And Monitor For AIS

- Internal decontamination policy
- Regional coordination
- Outreach and education
- AIS laws
- Early detection monitoring
- Incident response

Internal Decontamination Policy

- **Policy & Procedure 5310**
 - Effective 28 February 2011
 - Agency-wide directive to “adopt and actively maintain science-based protocols for minimizing the risk that field and property management activities will contribute to the spread of invasive species”
- **Protocols**
 - Effective July 26, 2011
 - Applies Best Available Science
- **Hydraulic Project Approval (HPA)**
- Effective 1943
- Construction projects or activities in or near state waters



Regional Coordination

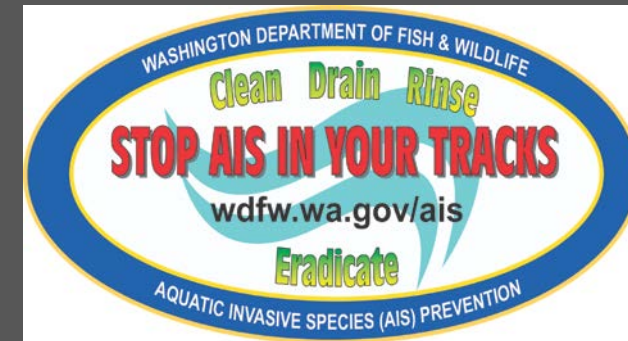
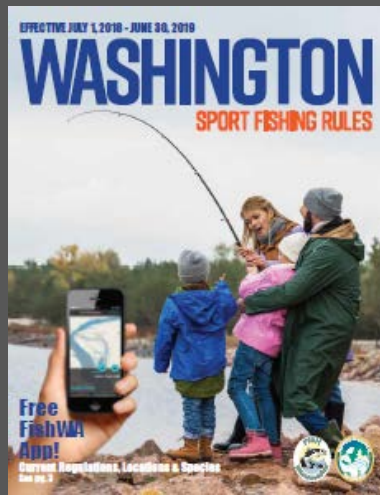
The Columbia River Basin Team

- Cooperative effort between local, state, provincial, tribes, federal agencies, and private entities to prevent the introduction of **zebra/quagga mussels** and other AIS in the Columbia River Basin



Outreach and Education

- Brochures/ID cards
- Presentations/trainings
- Signage
- Sportsmen shows/fairs
- www.wdfw.wa.gov/ais/reporting/
- 1 888 WDFW AIS hotline
- Videos



TRANSPORTATION OF WATERCRAFT
CARRYING
AQUATIC INVASIVE SPECIES
IS PROHIBITED

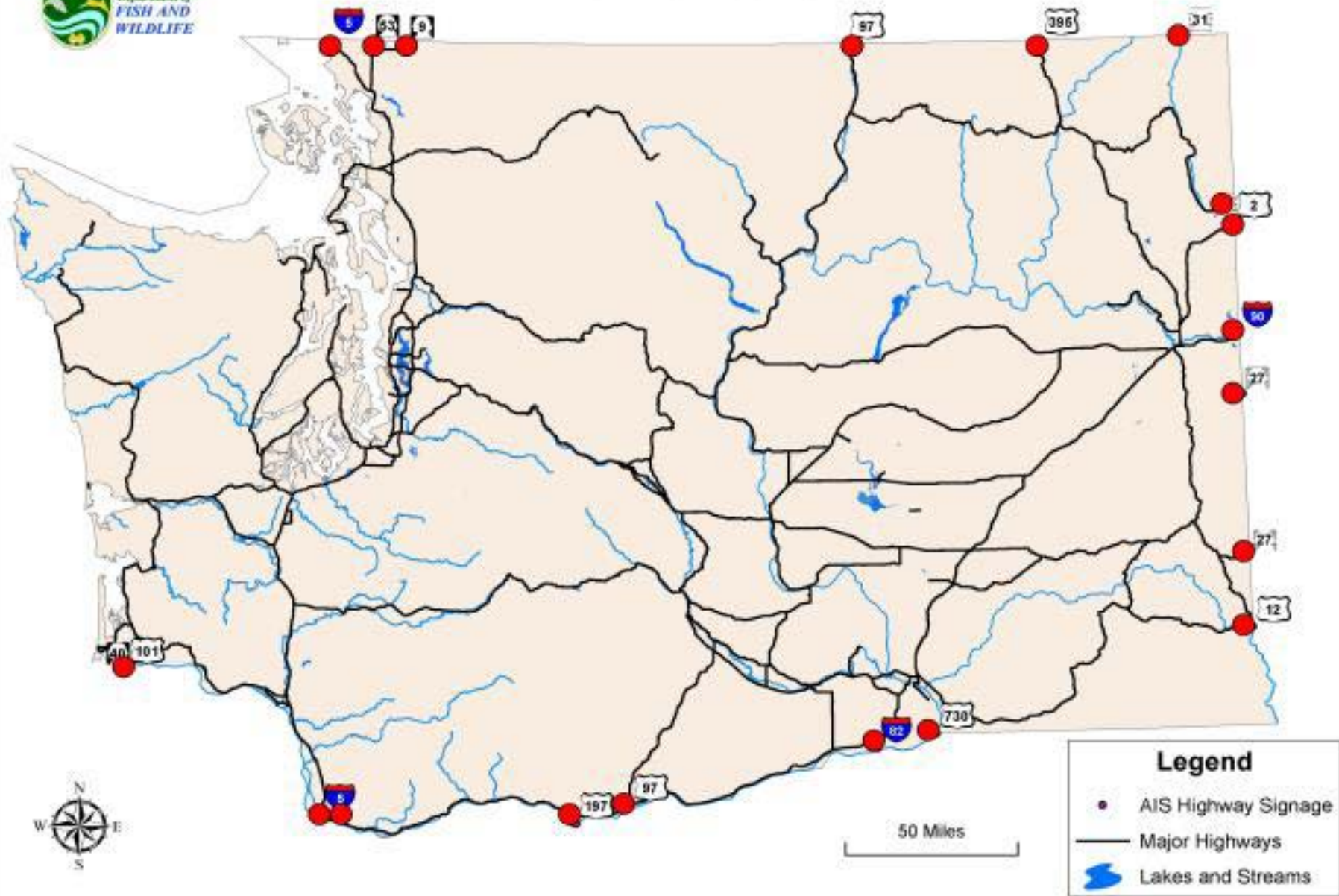


PROTECT STATE WATERS - AVOID FINES

FREE INSPECTION INFO - REPORT SIGHTINGS
1-888-933-9247 OR WDFW.WA.GOV



AIS Highway Signage



Outreach and Education to Pathways



Recreational Watercraft



Commercially Hauled Watercraft



Equipment Dock



Ballast Water



Float Planes



Aquaculture



Live Seafood Trade



Pet Trade



Bank Fisherman



Fish Stocking

STATE OF WASHINGTON
Department of Fish and Wildlife

Mailing Address: 600 Capitol Way N • Olympia WA 98501-1091 • (360) 902-2200; TDD (360) 902-2207
Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia WA

August 17, 2012

The Honorable Randy Dorn
Superintendent of Public Instruction
Post Office Box 47200
Olympia, Washington 98504

RE: Permit for Limited Use of Live Prohibited Crayfish in Washington State 2012-2013 School Science Curriculum

Dear Superintendent Dorn:

The Washington Department of Fish and Wildlife (WDFW) has a long history of commitment to using native crayfish in schools. The permit provided last year for the use of native Signal crayfish (*Pacifastacus lenosinus*) was a significant step in this effort.

Although the Crayfish in Schools program is still in its early stages, the Department will continue to work with schools and educators to develop a full transition to native crayfish. Over the next year, the Department will issue a new permit for the use of native crayfish to ensure that teachers have the resources they need.

We look forward to continuing our work with schools and educators to prevent the release of any live crayfish into the wild. Please contact Allen Pleus, the Department's Crayfish Coordinator, at (360) 902-2724 if you or your staff have any questions.

Sincerely,

Philip Anderson
Director

WDFW continues the continued dedication to using native crayfish in Schools work. This permit is a key component of our transition strategy for using only native crayfish in schools.

To bridge this gap, the Department will issue a new permit for the use of native crayfish to ensure that teachers have the resources they need.

For more information on the Crayfish in Schools program, please contact the Crayfish Coordinator, at (360) 902-2724.

Schools



Public and Private Surveyors



Non Motorized Watercraft



Commercial Fishing Equipment



Public Works



Heavy Equipment

AIS Laws

Revised Code of Washington 77.135

- RCW 77.135.040 – prohibited and regulated species
- RCW 77.135.110 – aquatic conveyance clean and drain requirements
- RCW 77.135.120 – conduct mandatory aquatic conveyance check stations
- RCW 77.135.210 – aquatic invasive species prevention permit for operators of watercraft and seaplanes
- RCW 77.135.220 – aquatic invasive species prevention permit for commercial transporters of watercraft

Important Notice: Washington State

Aquatic Invasive Species (AIS) Prevention Permit Required for:

- Non-Resident Boats (not registered in Washington State) before operating on state waters. Exemptions - see "More information" web link below.
- Commercial Transporters of Boats before transporting boats into the state.
- Seaplanes (resident or non-resident) before operating on state waters.

Purchase: Online: fishhunt.dfw.wa.gov (scroll down/click AIS Prevention Permit link)
Visit: WDFW license vendors (fishhunt.dfw.wa.gov/licensing/vendors)

Thank You!
**Funds Used to Protect
State Waters from AIS!**

More information:

- \$24 - valid 365 days.
- Call: 888-WDFW-AIS or 360-902-2700
M-F 8AM-5PM
- Email: ais@wdfw.wa.gov
- Web: wdfw.wa.gov/licensing/ais_prevention/.



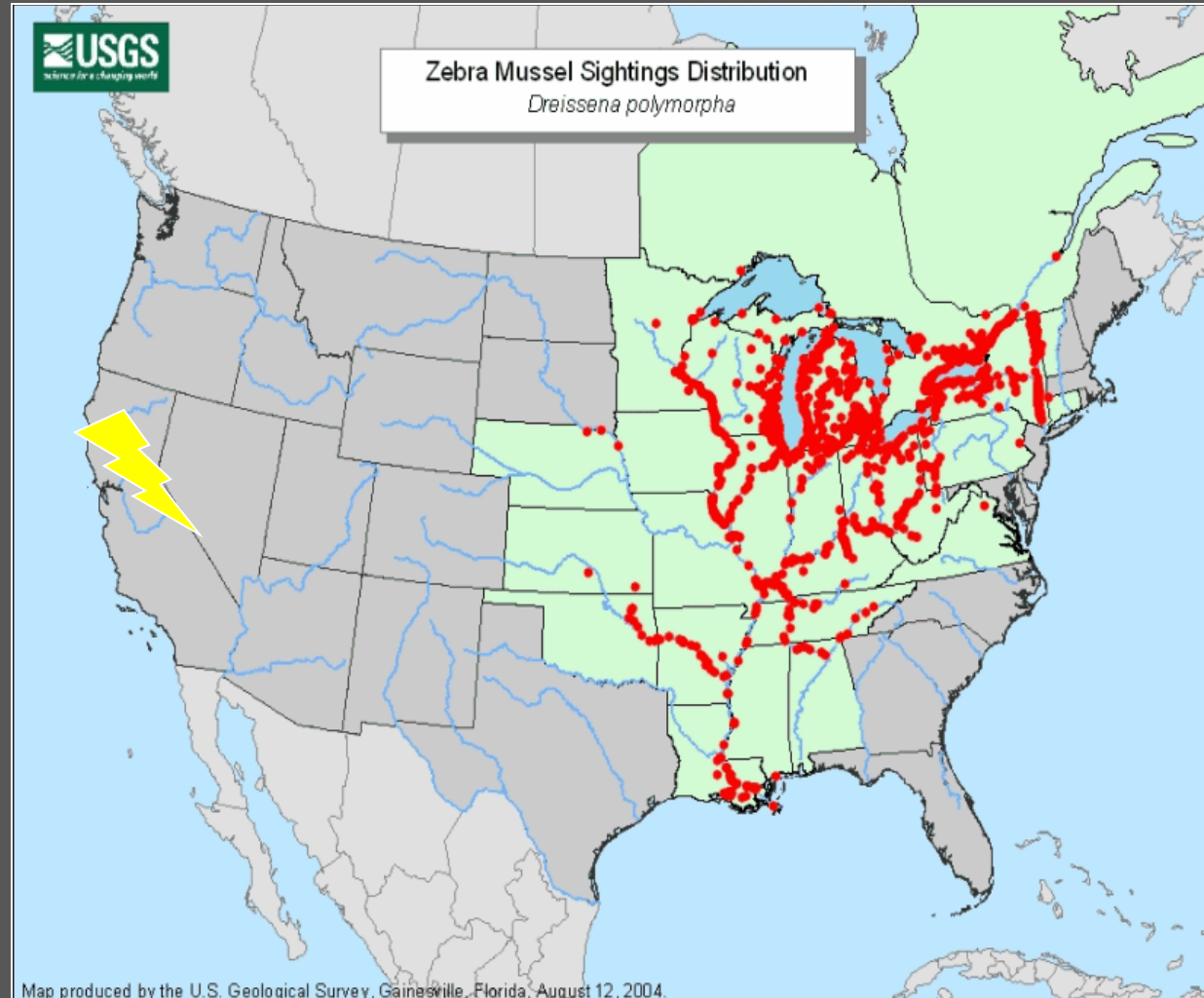
Failure to have an AIS Prevention Permit may result in a \$150 fine (RCW 77.15.160)

Early Detection Monitoring Washington's Top Priority



January 2007 “Lightning Strikes” A 1000 Mile Jump!

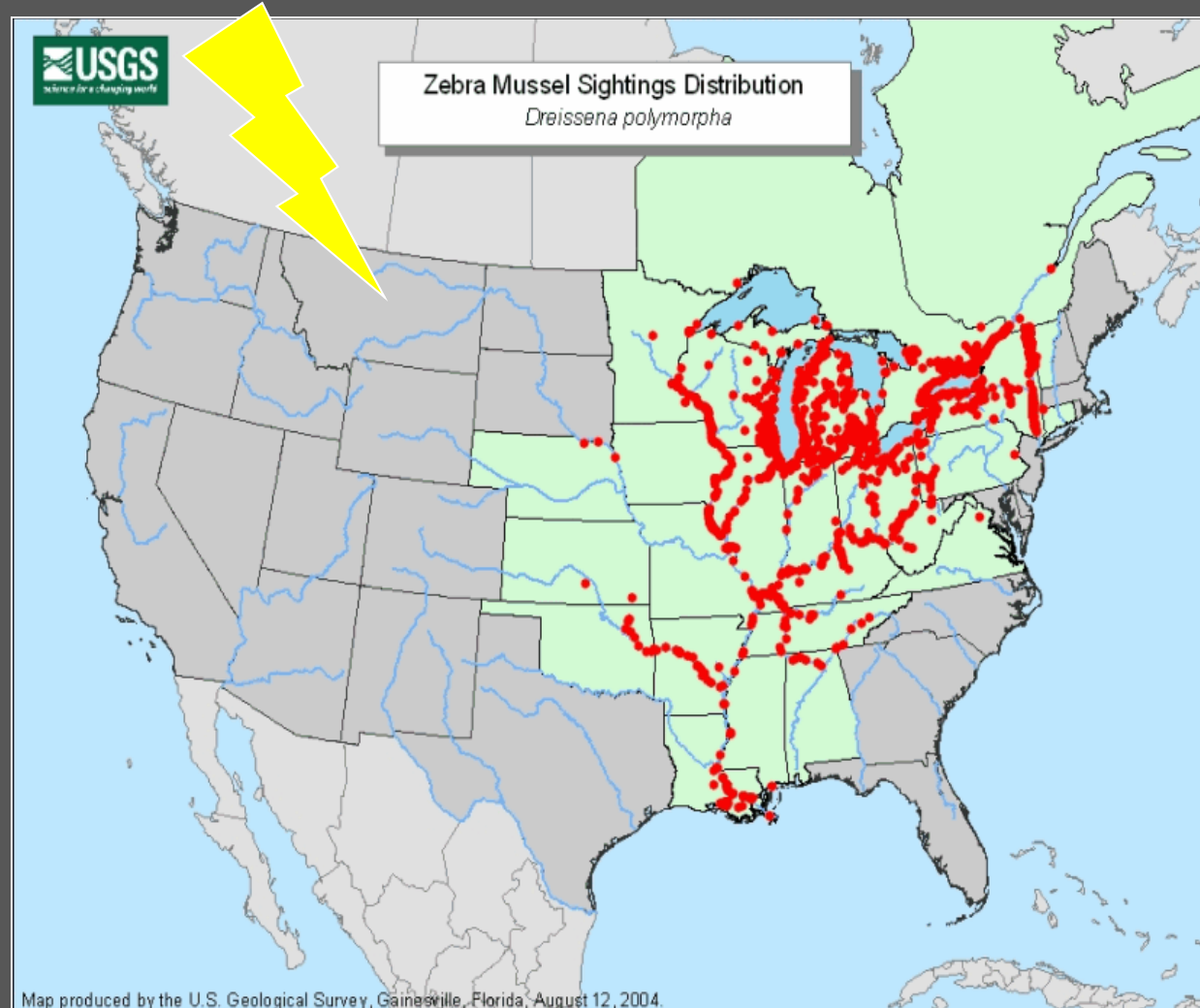
- Zebra/Quagga mussels are discovered at Lake Mead!
- Nevada, California & Arizona!



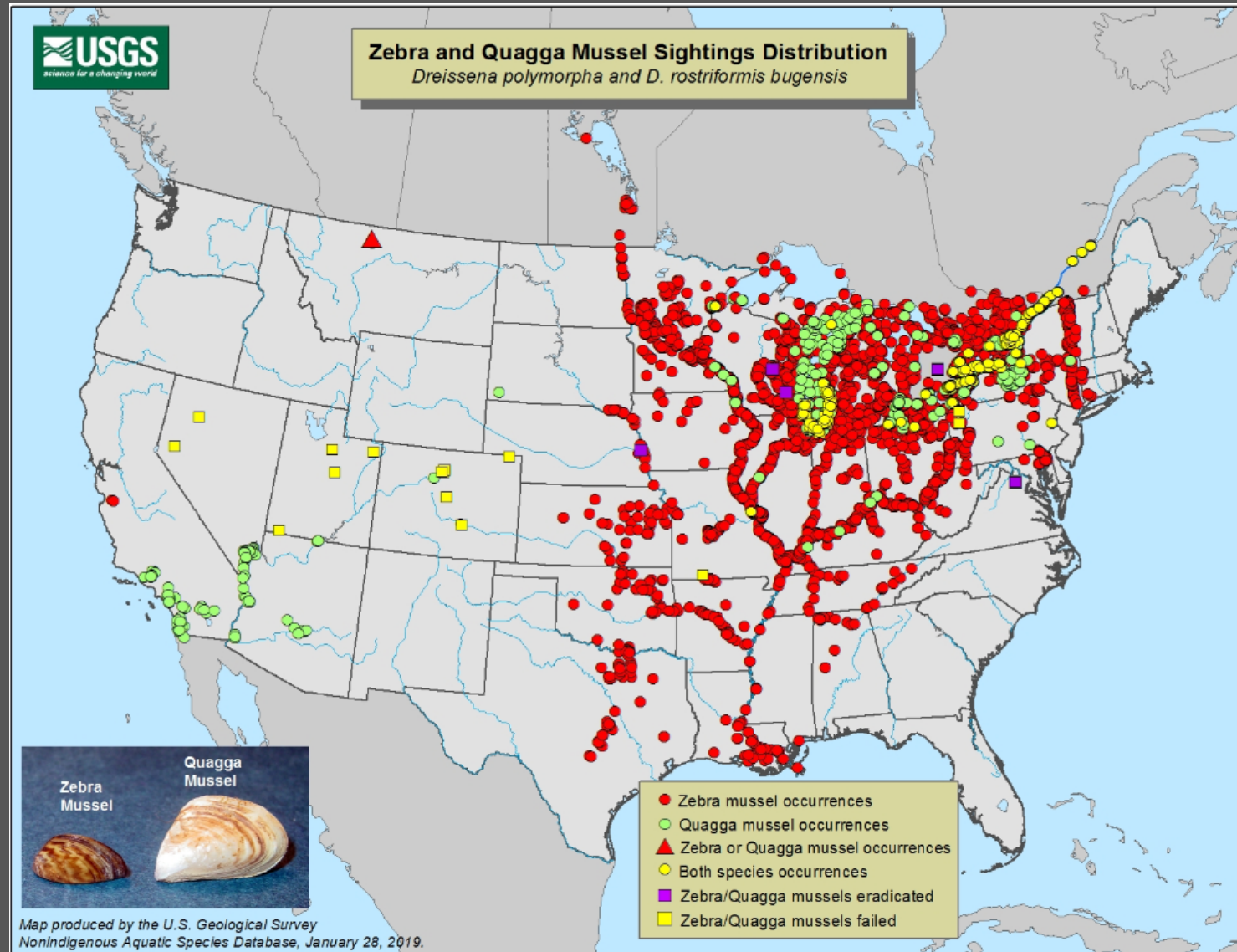
November 2016 “Atomic Bomb Drops”

75 Miles MT to WA

- Tiber Reservoir tested positive for veligers and Canyon Ferry Reservoir “suspect”
- NO confirmed adults



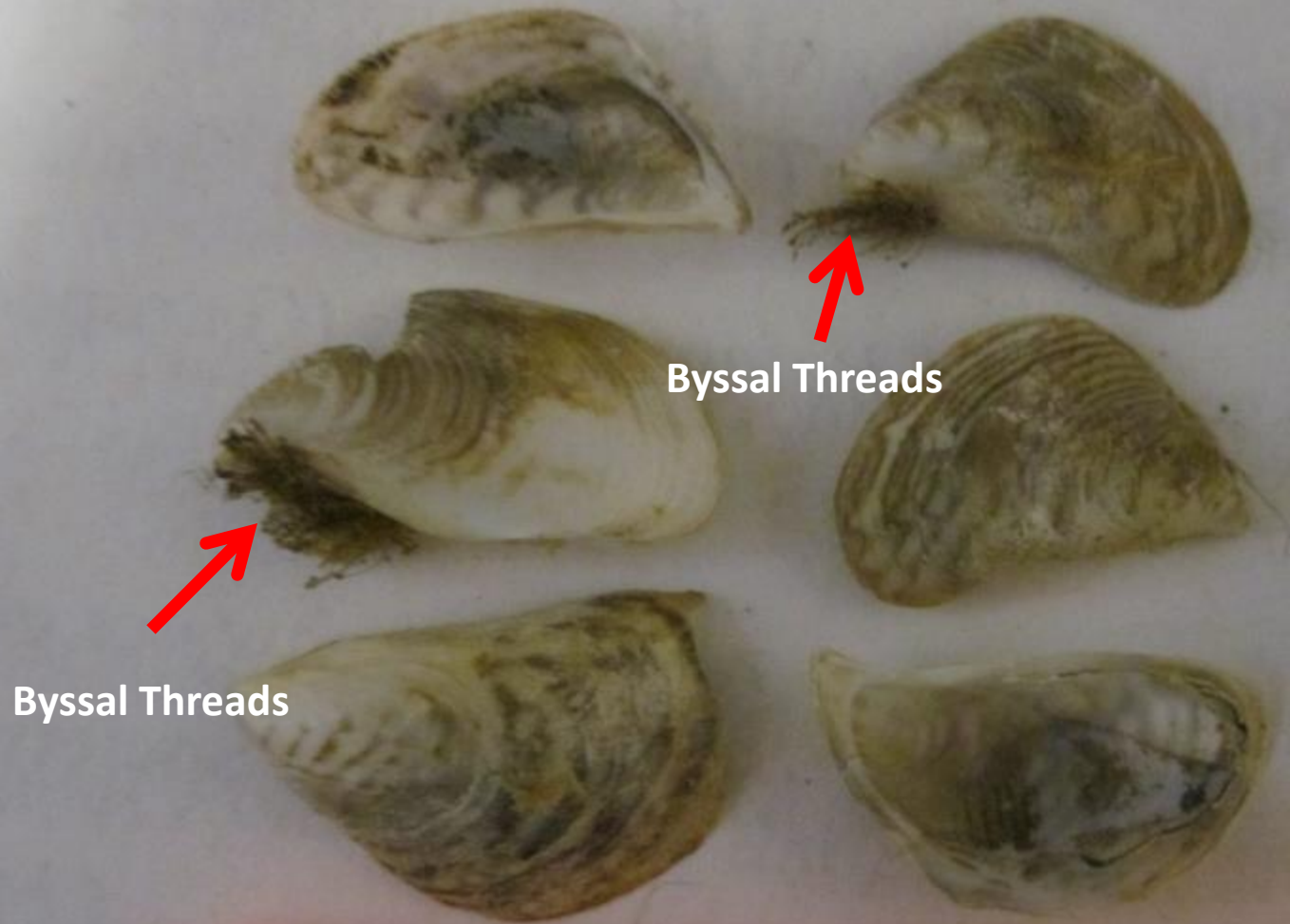
CURRENT DISTRIBUTION OF ZEBRA/QUAGGA MUSSELS



Zebra/Quagga Mussels Identification

- NO NATIVE FRESHWATER MUSSEL HAS BYSSAL THREADS IN WASHINGTON.
- Color varies (may have stripes)
- Adults Avg. $\frac{3}{4}$ inch length however some as large as 2 inches
- Post-settled juveniles are the size of a BB and feel similar to sand paper

Zebra/Quagga Mussels



Native Mussels



Early Detection Zebra/Quagga Mussel Monitoring

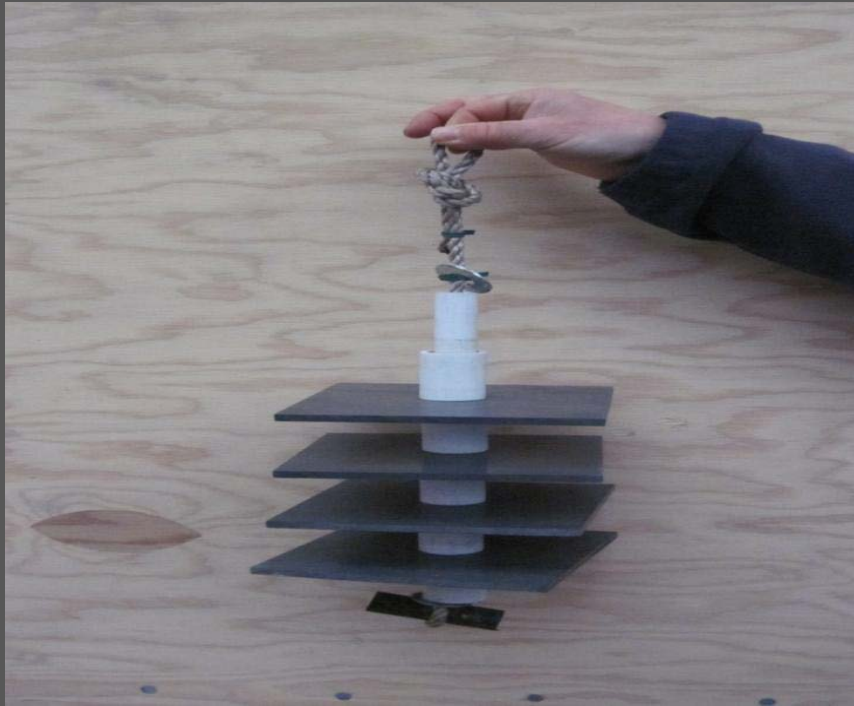
(conducted April – November)

- Vertical and horizontal plankton tows
- Artificial substrates/collection plates
- Visual shoreline
- Water quality including calcium
- eDNA
- Ponar grab sampler starting in 2019

Early Detection Zebra/Quagga Mussel Monitoring Criteria

- Water bodies are determined by the potential for introduction of zebra/quagga mussels through human activities such as boating, recreational fishing, tournament fishing, infrastructure, high calcium, etc....
- Sites within the water body are determined by where the most usage occurs (launches and marinas) and veliger drifting patterns.

Artificial Substrate



- In water year around
- For post-settled juveniles and adults
- 616 artificial substrates monitored for 2018

Horizontal and Vertical Plankton Tows



- Water temperatures greater than 10 C (spawning)
- For juveniles/veligers
- 514 of each tow for 2018

Visual Shoreline



- For post-settled juveniles and adults
- 10 minutes per site surveying artificial and natural structure
- 708 surveys for 2018

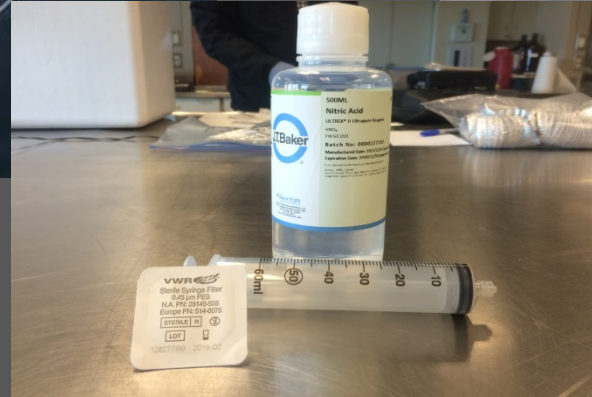
Water Quality



- Visibility



- Temperature
 - pH
 - Salinity
 - Dissolved Oxygen
- (645 data sets for 2018)



- Calcium

(642 samples for 2018)

Environmental DNA



- Starting in 2019, monitoring for zebra mussels, quagga mussels, New Zealand mudsnails, and northern pike
- 236 samples for 2018

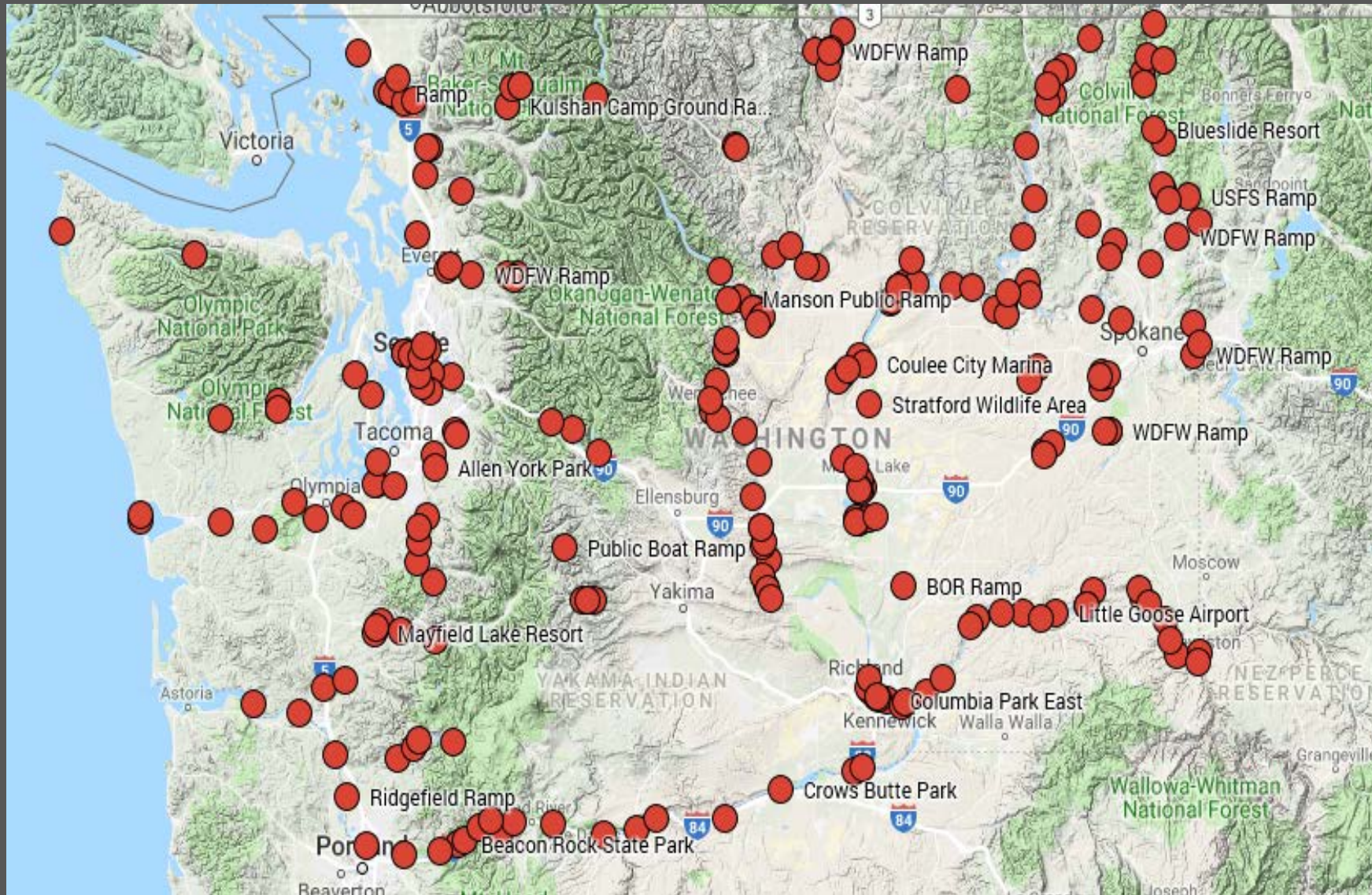
Ponar Grab Sampler



- Starting in 2019
- For post-settled juveniles and adults in deep water

2018 Sites

(100 water bodies and 235 sites)



2018 Analysis

<u>Sample Method</u>	<u>Laboratory Analysis</u>
Vertical and horizontal plankton tows	Private consultant Cameron Lange and Steve Wells
Artificial substrates	Field staff
Visual shoreline survey	Field staff
Water quality (temperature, pH, and D.O.)	Hanna HI9829 handheld multiparameter
Water quality (calcium)	Eastern Washington University Professor Carmen A. Nezat, Ph.D.
eDNA	WDFW Molecular Genetics Lab Scientist Sarah K. Brown, Ph.D.

2018 Monitoring Partners

<u>Sampler</u>	<u>Water Body</u>	<u>Reservoir</u>
Chelan County PUD	Columbia River	Rocky Reach
City of Everett and Snohomish PUD	Sultan River	Spada
Douglas County PUD	Columbia River	Pateros
Grant County PUD	Columbia River	Priest Rapids and Wanapum
National Park Service	Columbia River	Roosevelt
Spokane Tribe	Columbia River	Roosevelt

- NO zebra or quagga mussels have ever been detected in Washington at any water body

Incident Response

Nutria



African Clawed Frog

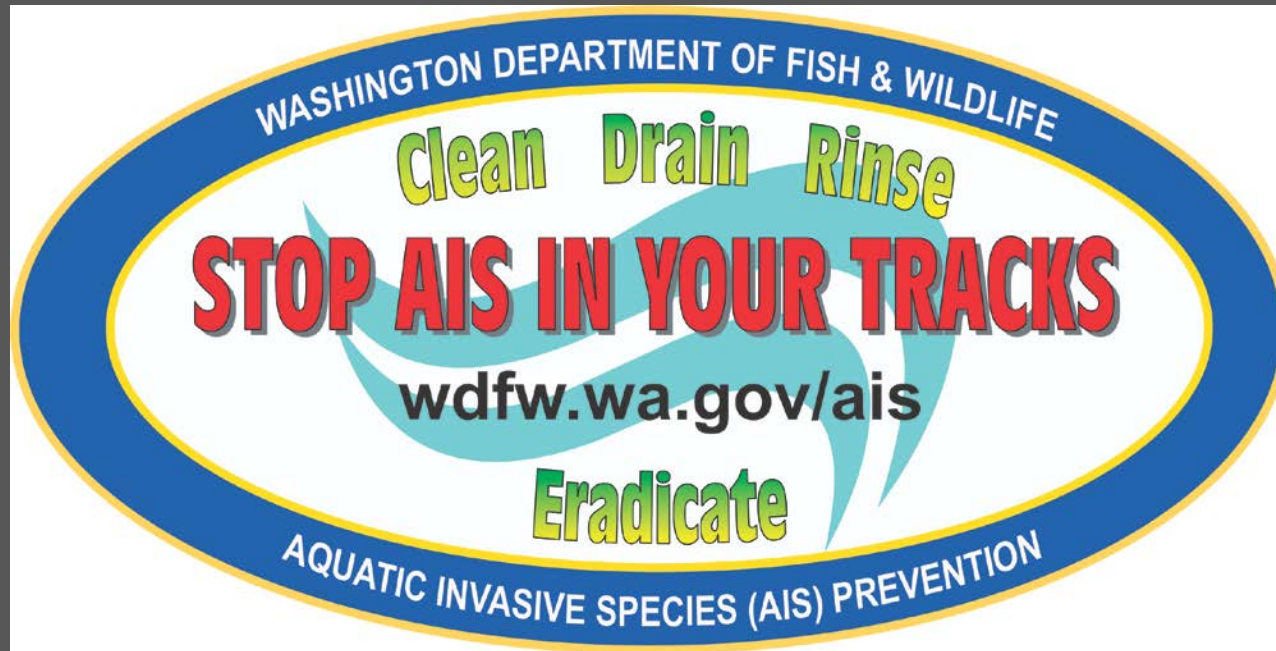


Common Snapping Turtle



European Green Crab

How Can I Help



WDFW AIS Biologist

Jesse Schultz- (360) 902-2184

Jesse.Schultz@dfw.wa.gov