

Idaho Invasive Species Program Mid-Snake River Response



IDAHO
STATE DEPARTMENT
OF AGRICULTURE

INVASIVE
SPECIES
OF
IDAHO

Invasive Mussels

- One mussel can produce 30,000 to 1,000,000 veligers per year.
 - 82 to 2739 per day
- These veligers will move downstream with currents for up to 30 days as a veliger before it settles.
- Hair-like byssal threads allow them to attach to surfaces.
- Filter-feeders that consume nutrients at a rapid rate.
- Extreme disruption to the base of the food web, reducing some populations to such low levels that they can no longer survive or fulfill their role in the ecosystem.



Invasive mussel Impacts

- Infrastructure
 - Hydropower
 - Irrigation
 - Municipal
 - Water delivery
- Ecological impacts
 - Outcompete
 - Toxic algae
 - Endangered species
 - Overgrowth
- Recreation



Quagga Mussel Spread



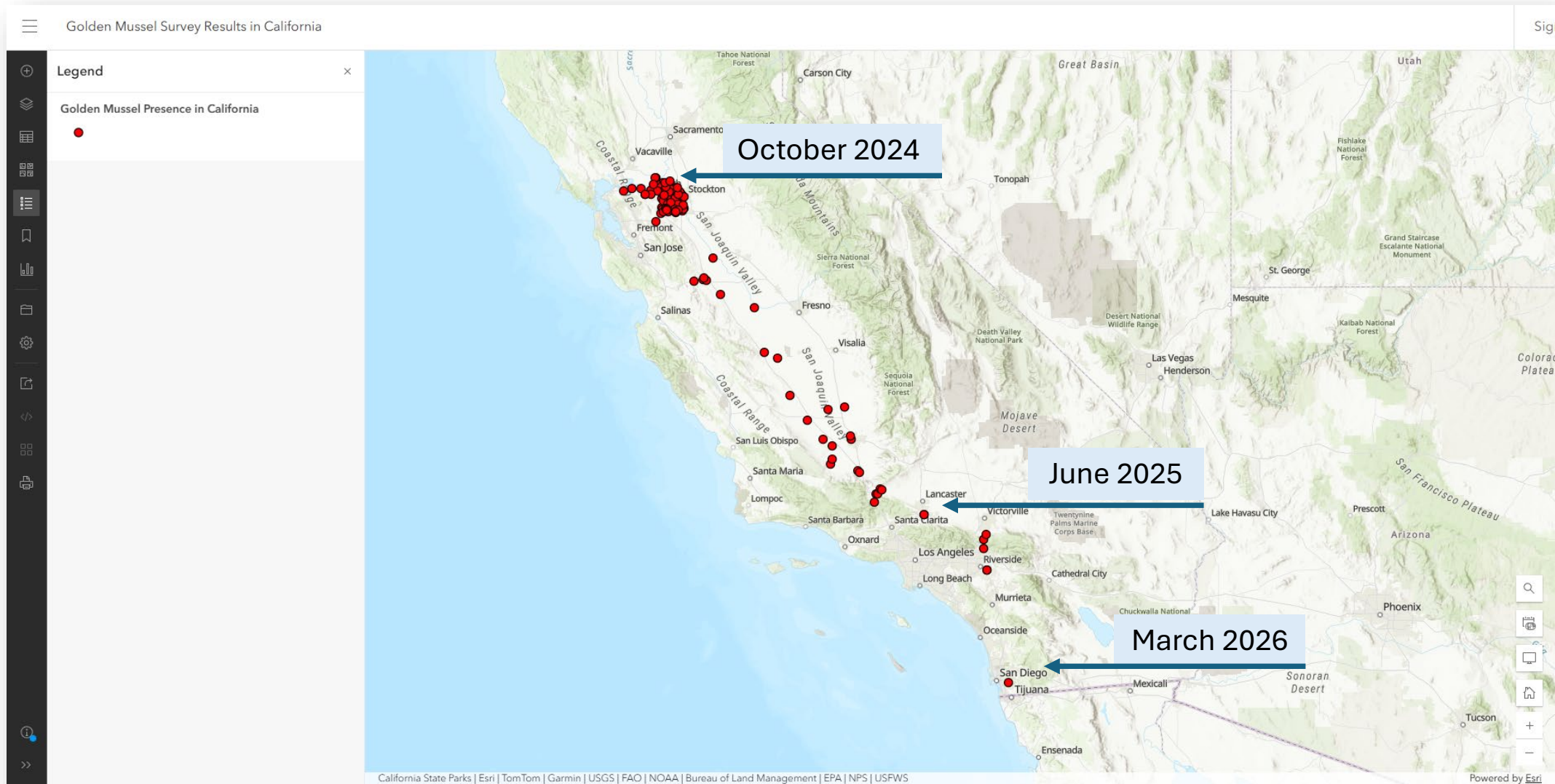
These data are preliminary or provisional and are subject to revision. They are being provided to meet the need for timely best science. The data have not received final approval by the U.S. Geological Survey (USGS) and are provided on the condition that neither the USGS nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the data.

Zebra Mussel Spread



These data are preliminary or provisional and are subject to revision. They are being provided to meet the need for timely best science. The data have not received final approval by the U.S. Geological Survey (USGS) and are provided on the condition that neither the USGS nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the data.

Golden mussel Distribution (March 2026)



Golden mussel



Golden mussel



Rapid Response Plan

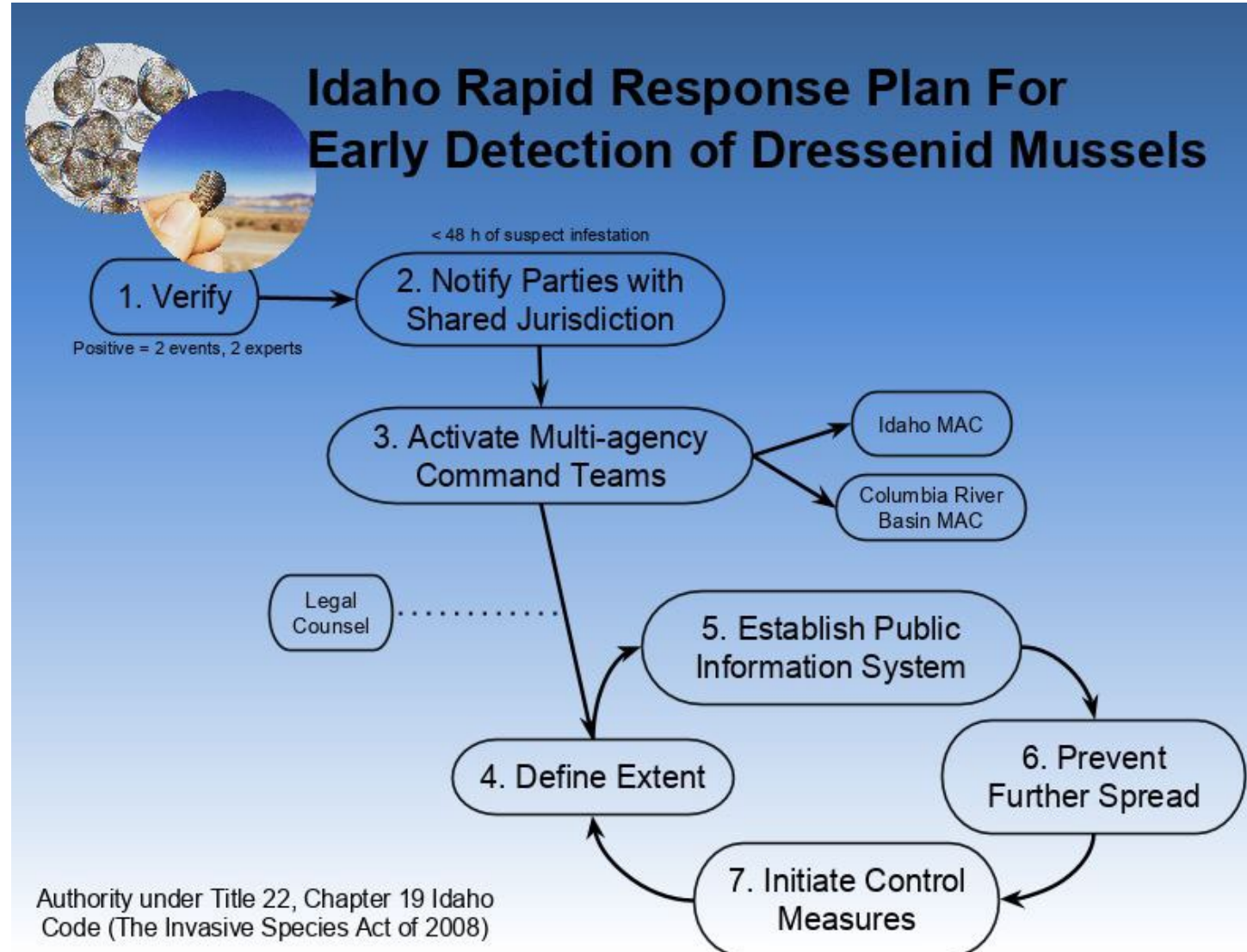
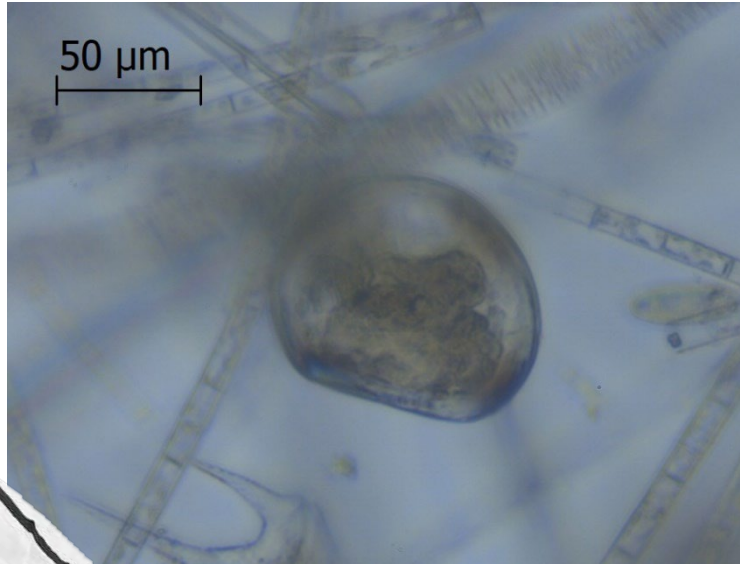
- Developed and updated since 2009
- Outlines points for decision making to identify infested waterbodies and communicate to stakeholders
- DOES NOT contain the details of what a treatment would be
- Invasive Species statutes provide authority, emergency funding availability
- Early Detection/Rapid Response in Rule



Detection Verification

Invasive Mussel Verification

- Multiple sample events
- Multiple specimens per sample
- qPCR genetic verification



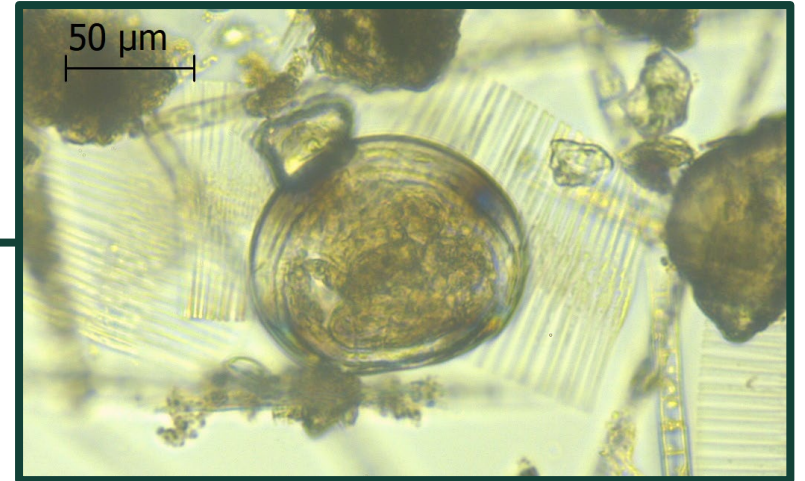
2023 and 2024

2023

- Detection: Sept. 18 — first live quagga mussel detection in the Columbia River Basin after 15 years of sampling
- Immediate quarantine and delimiting initiated; notifications issued
- Treatment conducted Oct. 3–13 using chelated copper (Natrix)
- First treatment of this type and scale ever attempted in North America

2024

- Legislature approved \$6.5 million to expand invasive species efforts
 - Sampling, station hours, partnerships, outreach, etc.
- Statewide monitoring doubled — over 3,000 samples
- Detection: Sept. 24 — Shoshone Falls pool, Pillar Falls, and Twin Falls Reservoir
- Treatment utilized chelated copper followed by potassium chloride



Snake River Rapid Response

- Initial finding in 2023
 - Veligers confirmed positive- Microscopy & qPCR
 - Briefing with Governor – w/in 2 hours
 - Governor’s Cabinet Meeting – w/ in 2 hours
 - Initial stakeholder calls – same day
 - Initial press release – same day
 - Staff and Invasive Species Council – same day
 - Delimit Sampling – SAMPLE, SAMPLE, SAMPLE – define the affected area, sample upstream and downstream, and sample again...
 - Define quarantine area

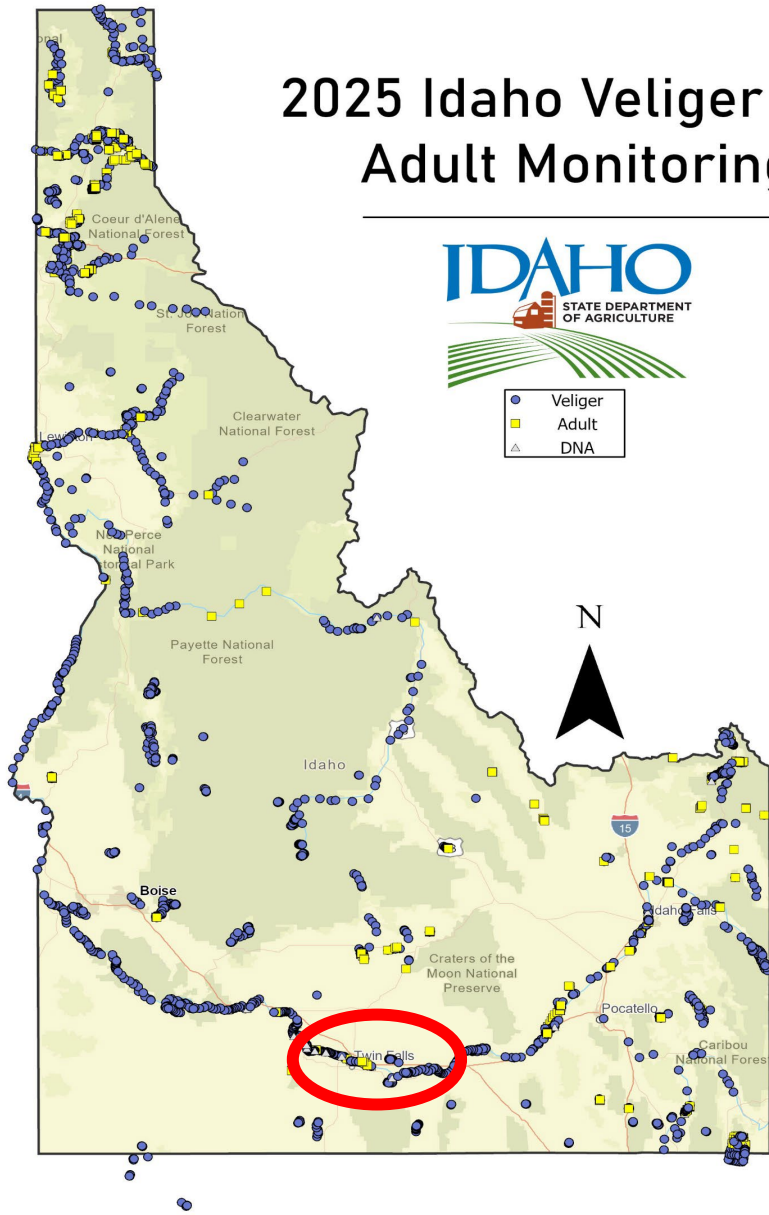
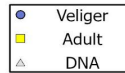
Containment

- Mandatory Decontamination for all watercraft accessing Snake River between Hanson Bridge and Broken Bridge (Yingst Grade)
- Mid-Snake Stations (year-round)
 - Twin Falls Park- Idaho Power
 - Shoshone Falls- City of Twin Falls
 - Centennial Park- Twin Falls County
- Hours of operation when Park is open to public
- Uniform Minimum Protocols and Standards (UMPS IV-2021)

Idaho Snake River Quagga Mussel Closure Interactive Map



2025 Idaho Veliger and Adult Monitoring



Expanded Lab Capacity in 2025

- Cross Polarized Light Microscopy (CPLM)
 - Aquaticus (Chiefland, Florida)
 - Eco Analyst (Moscow, Idaho)
 - ISDA Bureau of Labs (Boise/Twin Falls, Idaho)- New for 2025
- Visual confirmation
 - Multiple subject matter experts
- Molecular confirmation
 - Pisces Molecular (Boulder, Colorado)
- eDNA
 - Pisces Molecular (Boulder, Colorado)
 - Cramer Fish Sciences (West Sacramento, CA)- New for 2026
 - University of Idaho Aquatic Research Institute (Hagerman, Idaho)

Delimiting Surveys

- Initial veliger plankton tow delimit from Twin Falls Reservoir to Centennial Park
 - Start upstream, new net, tow across flow
- Extended delimit upstream to American Falls
 - Is there anything upstream?
- Extended delimit downstream to CJ Strike
 - Downstream movement?



2024 Areas of Active Veliger Presence



Warm Creek

Centennial Park

Pillar Falls

Shoshone Falls

Twin Falls

Perrine Coulee

Twin Falls

Snake River

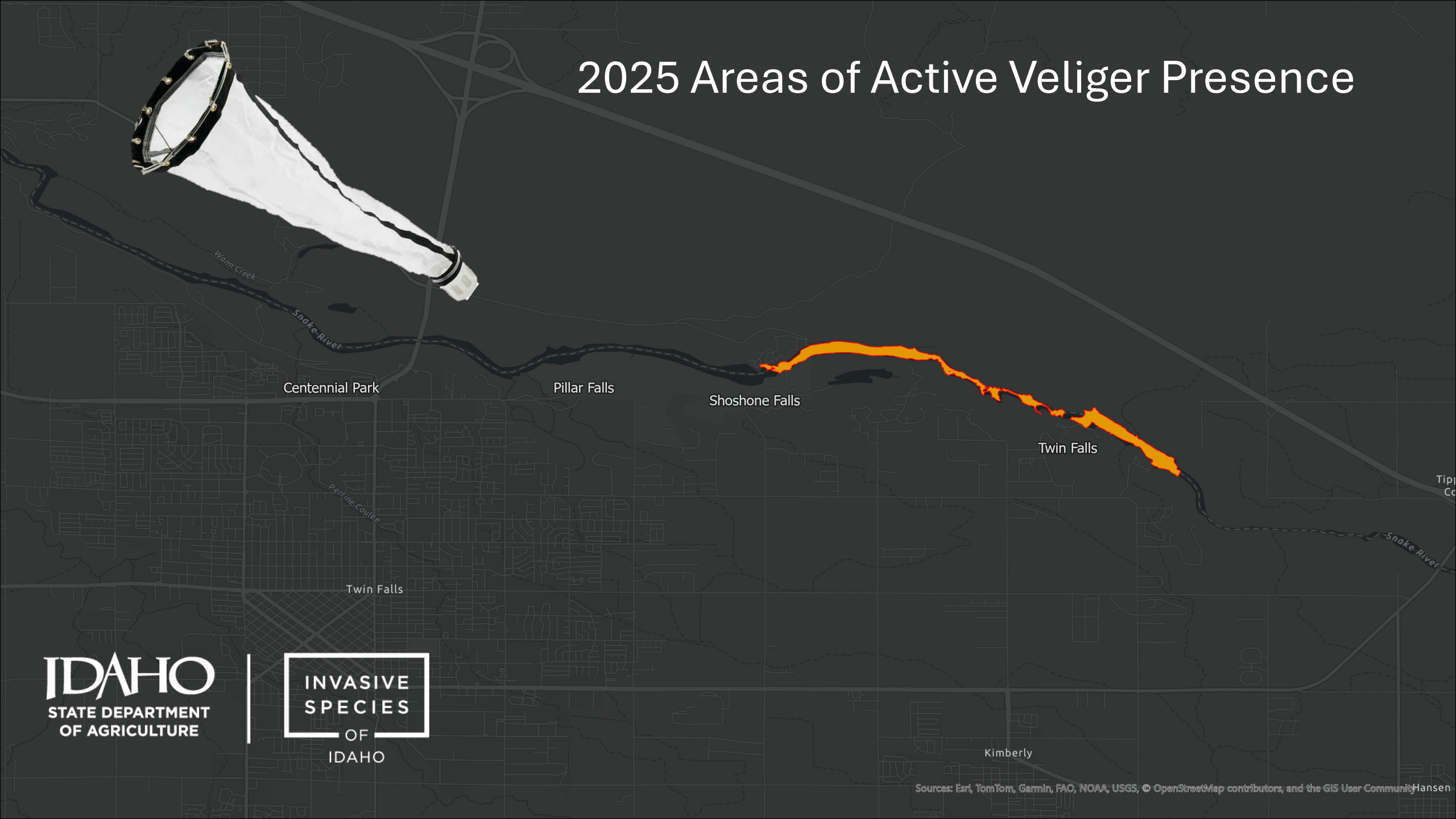
Kimberly

IDAHO
STATE DEPARTMENT
OF AGRICULTURE

INVASIVE
SPECIES
OF
IDAHO

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

2025 Areas of Active Veliger Presence



IDAHO
STATE DEPARTMENT
OF AGRICULTURE

INVASIVE
SPECIES
OF
IDAHO

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community Hansen

2025 Quagga Treatment

- Sage View to Twin Falls – 83.32 Acres
- Twin Falls to Shoshone Falls – 113.74 Acres



Specimen Label

Natrix[®]

For the control of mollusks in still or flowing aquatic sites including: golf course ponds, ornamental ponds, fish ponds, irrigation and fire ponds and aquaculture including fish and shrimp; fresh water lakes, ponds, and fish hatcheries; potable water reservoirs; and crop and non-crop irrigation and drainage systems (canals, laterals and ditches) and chemigation systems.

Active Ingredient

Copper Ethanolamine Complex[†] (Mixed CAS#'s 82027-59-6 & 14215-52-2).....28.2%

Other Ingredients.....71.8%

TOTAL.....100.0%



EPA Doublecheck for Labeling and Use

US EPA

RE: Crisis Exemption 40 CFR part 166, subpart C

The Idaho State Department of Agriculture is requesting consideration of a crisis exemption for the treatment of the first discovered infestation of Quagga Mussel, *Dreissena bugensis*, near Twin Falls Idaho, on a dam-controlled section of the Snake River. Between the upstream edge of Shoshone Falls to downstream mitigation area of Niagara Springs.

Immediate control of the Quagga mussel is needed due to the ecological, environmental, and real-world financial impacts this species will cause to the Snake River and Columbia River Basin if left unchecked. The Project of controlling these mussels during the initial stages of infestation are imperative to and stop any further spread. Idaho has spent more than 20 years and millions of dollars to get this organism out of Idaho and unfortunately it has found a way in. It is necessary to have a response time to enact control on the mussels due to their ability to reproduce rapidly and propagents which leads to infestations spreading rapidly (see attached map). A treatment is needed to stop any further spread of the mussels. The crisis exemption is due to the fact that although the mussels are not yet widespread, they have clearly defined Rivers or reservoirs.

The Plan ISDA has requested a crisis exemption for the use of *Matrix*®.

For the purpose of this crisis exemption, use section 166.10 of the Code of Federal Regulations on ISDA's proposed project.

The following waters, use section 166.10 of the Code of Federal Regulations as described below:

The confirmed location of adult mussel infestation

The acre treatment area
Average depth of 22.36 feet

- Flow rate of 300 CFS
- Two (2) treatments using *Matrix*®
 - Treatment 1- Target Rate of 1ppm for a duration of 96 hours as per the label
 - Treatment 2- Target Rate of 1ppm for a duration of 96 hours as per the label
 - The second treatment will not start until a full 96 hours after Treatment 1 has

- Flow rate of 300 CFS
- One (1) treatment using *Matrix*®
 - Treatment 1- Target Rate of 1ppm for a duration of 96 hours as per the label



ISDA plans to incorporate two (methods) of applying the *Matrix*® to the water. First, using 275 Gallon totes of product with a metered control box to drip in the product at water mix points at a rate of 1.25 gallons per minute (75 gallons per hour) for the duration of the 96 hour treatment. This method is to maintain the labeled 1 part per million (ppm) through out the duration of the treatment time. The Second Method is to utilize an application watercraft with a weighted hose to apply *Matrix* into existing deeper water areas that area present in the bathymetry. There are five (5) of these areas. Two (2) are in the Shoshone to Pillar area, and 3 are in the Pillar to Centennial Park area. By treating these standing deep pools it will allow ISDA to more accurately maintain the 1 ppm target rate by bringing these large areas of potential dilution up to target rates.



Applicator Services

Clean Lakes Inc.

- Contracted for application of Natrix to treatment areas
- Responsible for:
 - Ordering and delivery of Natrix, to treatment areas
 - Application through metered totes or watercraft applications
 - Triple rinsing and coordination of recycling empty product totes
- Was a part of the '23 & '24 quagga treatments

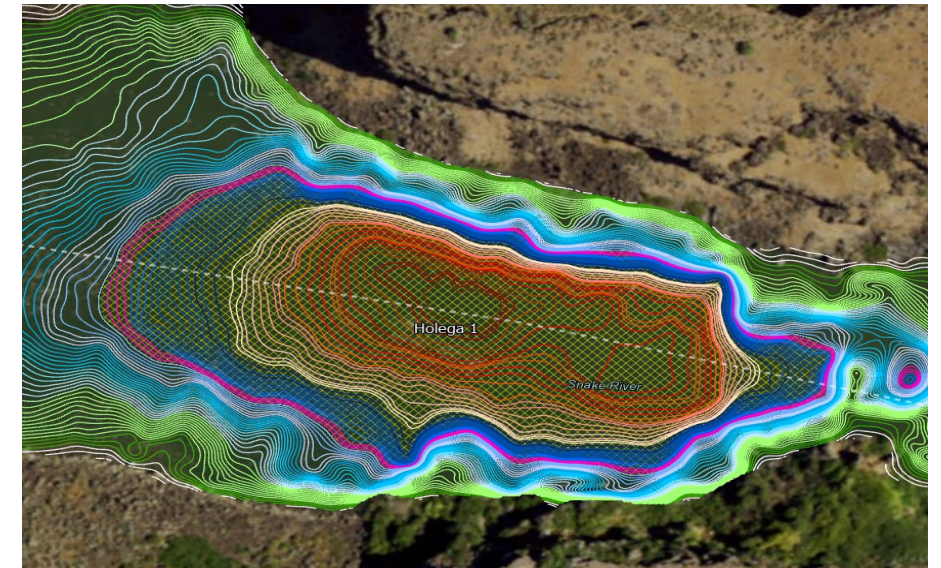
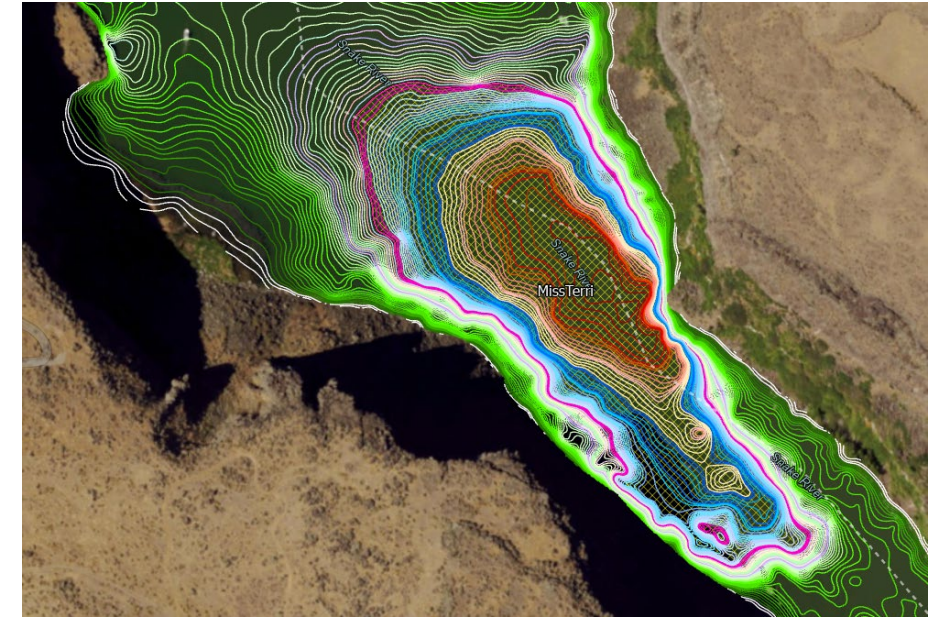
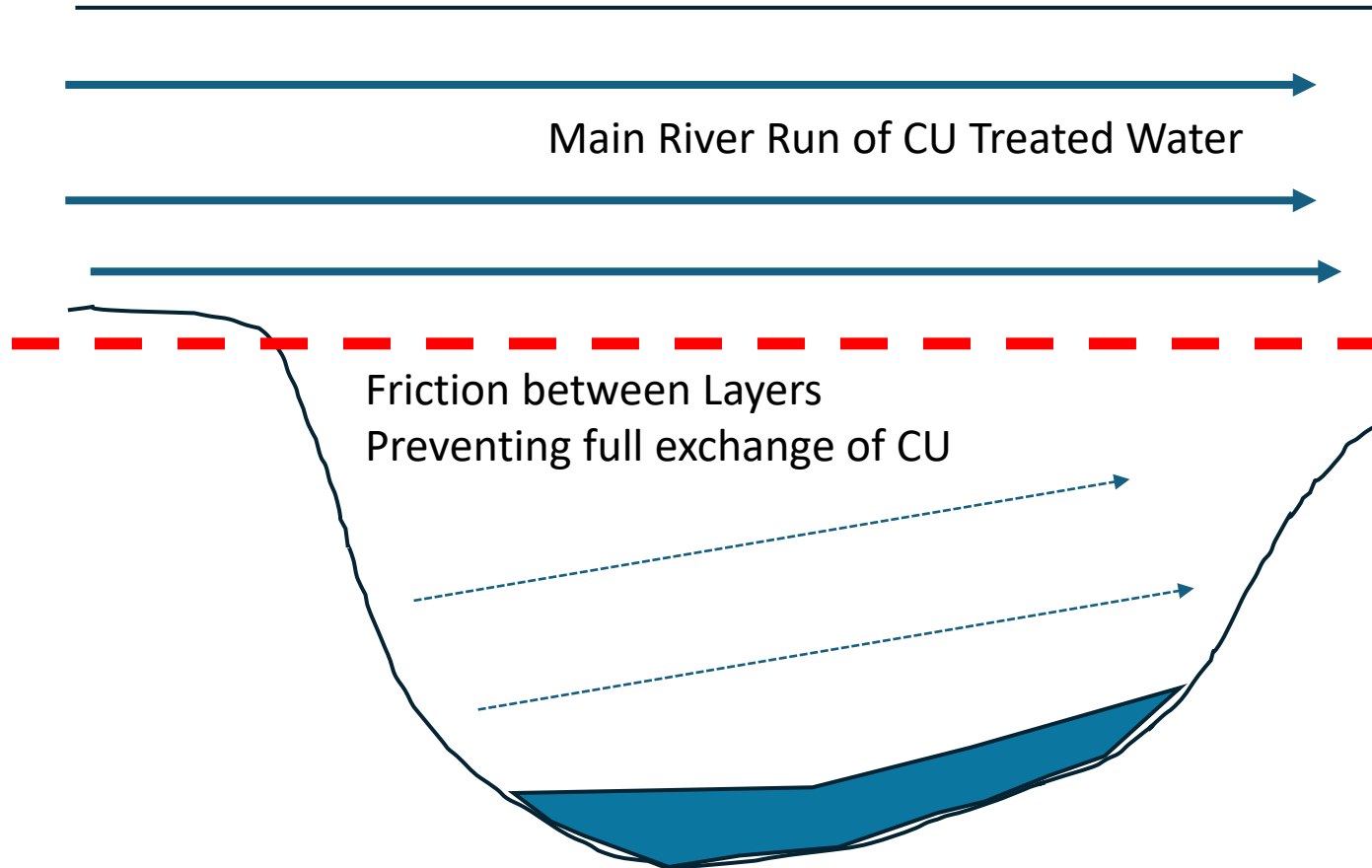




2025 Quagga Treatment

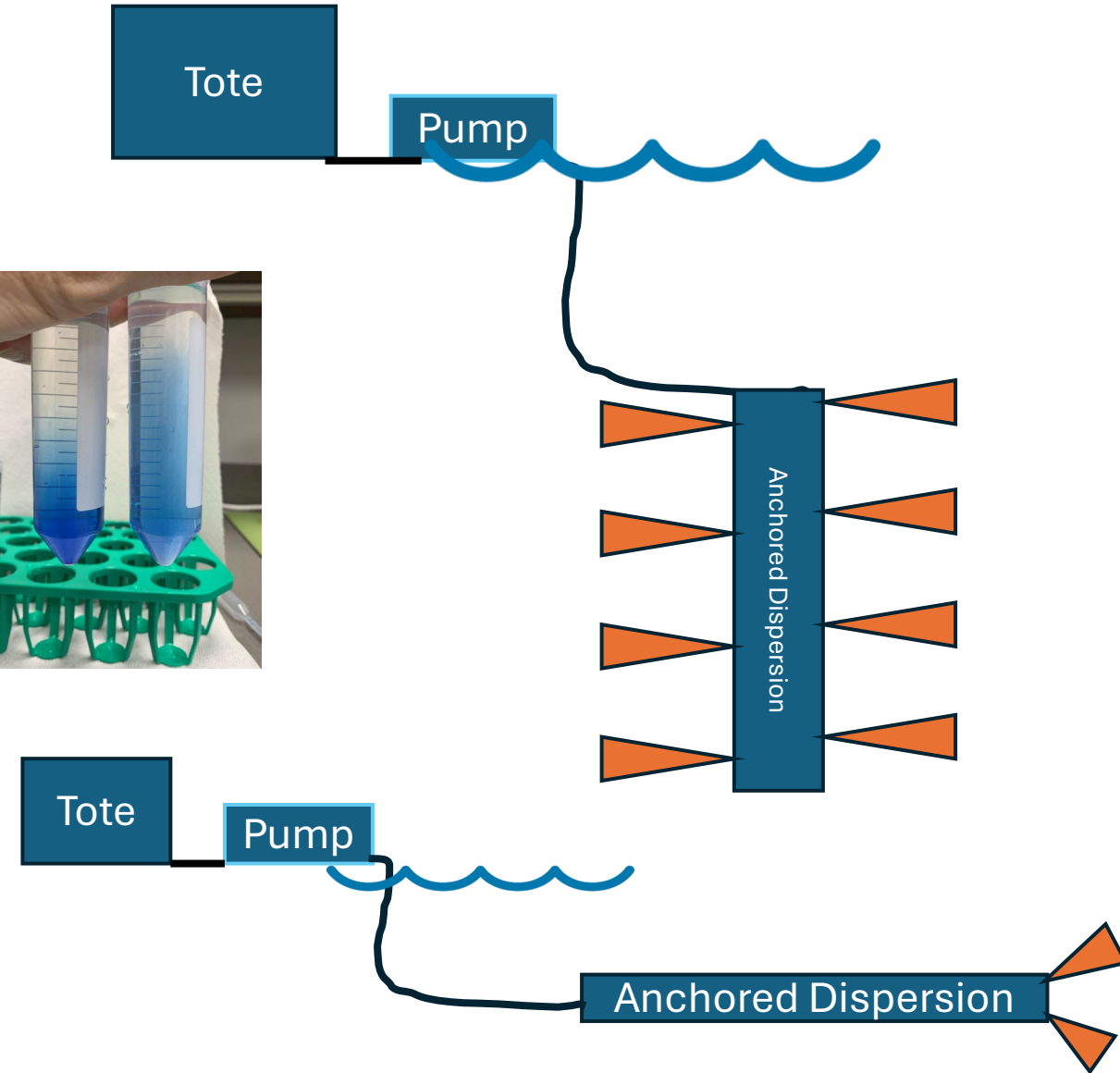
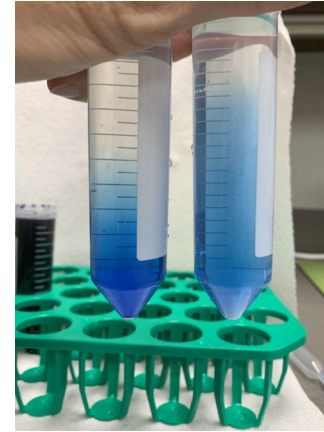
- Treatment Started September 30, 2025
- 200 Hour Exposure period targeting 1ppm
- Treatment Completed October 12, 2025
- Total Natrix Applied 63,525 gallons

Laminar flow creating a friction
layer not conducive to mixing
with bottom bathymetry

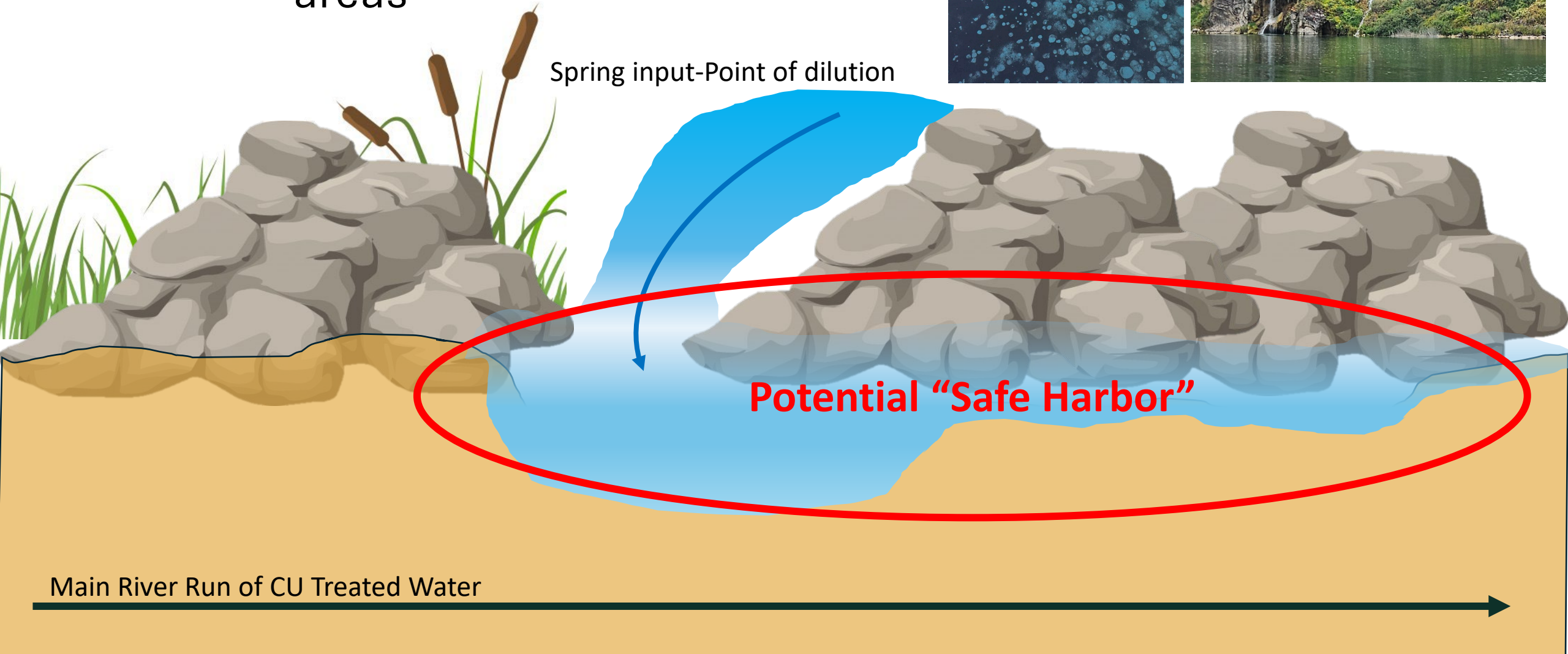


Deep Hole Pump Injection

- Application tote placement on shoreline
- A pump driven system to compensate for pressure differential, injecting product.
- An anchored Underwater Boom Sprayer to deliver to target band at a 70/30 mix of Natrix and water at a target depth.



Springs above and below
river's surface providing points
of dilution in active treatment
areas



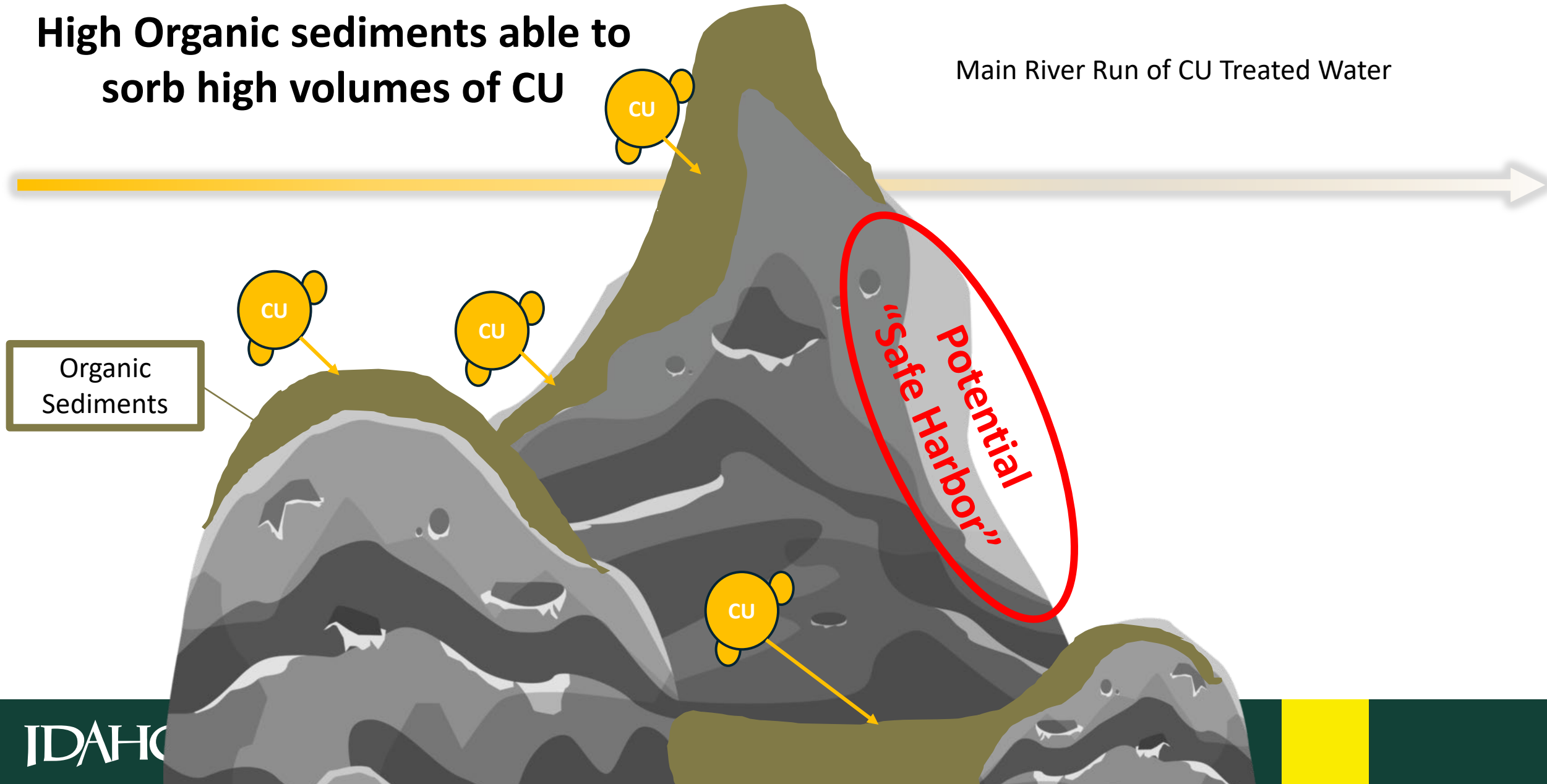
Springs = Dilution

- A total of 18 springs have been identified as potential sources of dilution for the treatment areas
 - 3 Irrigation returns 
 - 1 Controlled spring 
 - 14 Natural springs 



High Organic sediments able to
sorb high volumes of CU

Main River Run of CU Treated Water



Shoreline Treatments

- Shoreline treatments every 24 hours after pre-treatment and initial turn on of metered totes.
- After initial application shorelines where monitored, areas falling below target levels where bump treated every 24 hours.
- Treatments will target 1ppm at a mix of 50/50 Natrix and Water. All applications will take place below the highwater mark as an aquatic application.
- Application will be a 2-part process.
 - Directed application of mix to Shoreline waters edge along rocks, cliffs, and organic vegetation
 - Flush of river water to just above the waterline to wash any overspray back into water to ensure all areas of low exchange receive targeted treatment to prevent additional “Safe harbors.”



An aerial photograph of a pothole pond in Snake River Canyon. The pond is a dark, irregularly shaped pool of water nestled within a rocky, light-colored canyon floor. The surrounding terrain is rugged with visible rock formations and some green vegetation. In the background, a river flows through a similar canyon, with a small dam or bridge visible. The sky is clear and blue.

Pothole Treatments

- Isolated ponds in the treatment area are a unique geologic feature of the Snake River Canyon. These ponds are left when high water recedes and disconnects these ponds from the river.
- These ephemeral ponds were treated earlier in 2025 with potash, during which treatments specific ponds were identified as not having any connectivity between them and the river.
- These sites are at Twin Falls, Shoshone Falls, and Pillar Falls. Treatment at 1ppm.

Copper Monitoring Sites

- Target Concentration- 1 ppm
- Copper Sampling in Active Treatment Area
 - Run of River- 44 samples, every 24 hours
 - Deep hole sampling every 12 hours
 - Shoreline sampling every 24 hours
- Quagga Mussel Monitoring
- Downstream Copper Sampling for ESA

★ Deep Sample
★ Mid-Sample

9/29/2025

← River Flow Direction



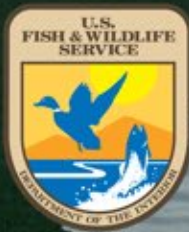
Copper (ppm)



Lessons learned

- Value of local stakeholder group
- Technical advisory group
- EPA & USFWS Consultation
 - Label and permitting
 - ESA
- Emergency Declaration- Is it needed?
- Contract and procurement
 - Roles and Responsibilities – Who is doing what?
 - Funding
- Workload and Scheduling- Short and Long Term
- Monitoring the Treatment product
 - In field, in house, contractor
 - Maintaining target concentrations in dynamic systems
- Monitoring Quagga (in-house & contracting)
 - Veliger
 - Adult
 - eDNA





US Army Corps
of Engineers®



BUREAU OF
RECLAMATION



IDAHO



STATE DEPARTMENT
OF AGRICULTURE

