

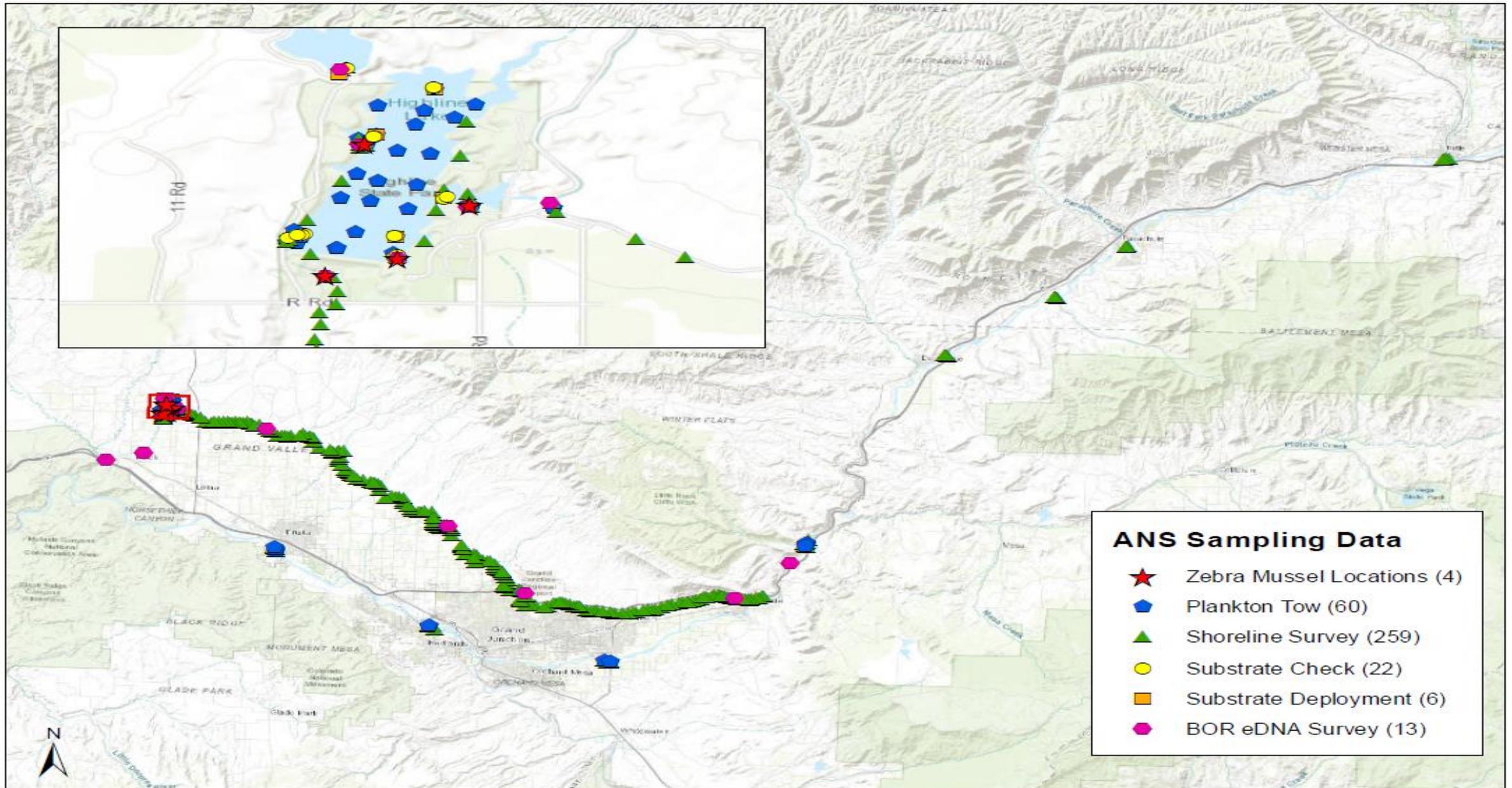
Zebra Mussels @ Highline Lake

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2022 ANS Sampling Around Highline Lake Post Zebra Mussel Detection

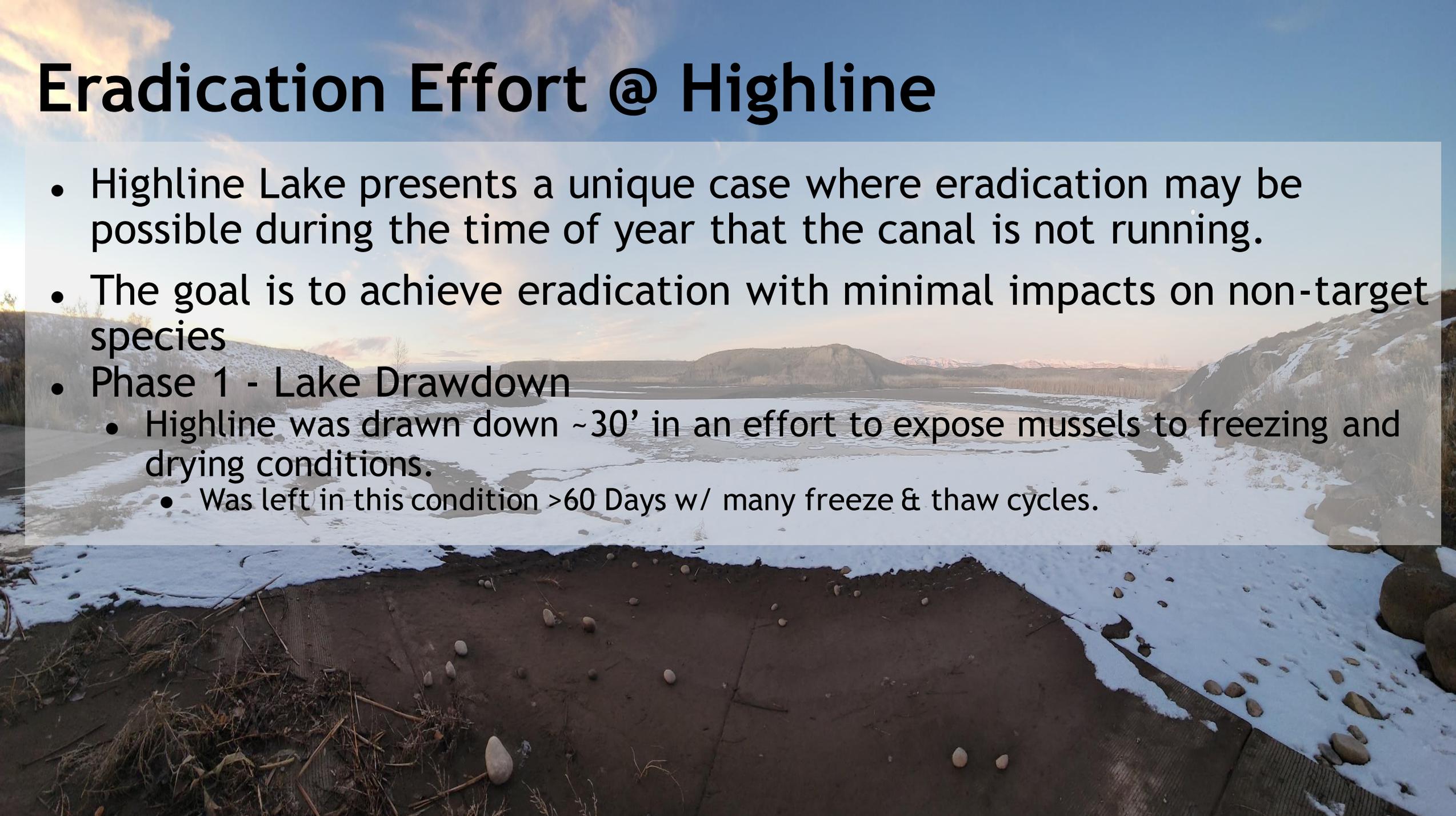


Map Produced by:
Colorado Parks and Wildlife Invasive Species Program, 11/18/2022

0 4.25 8.5 17 Miles

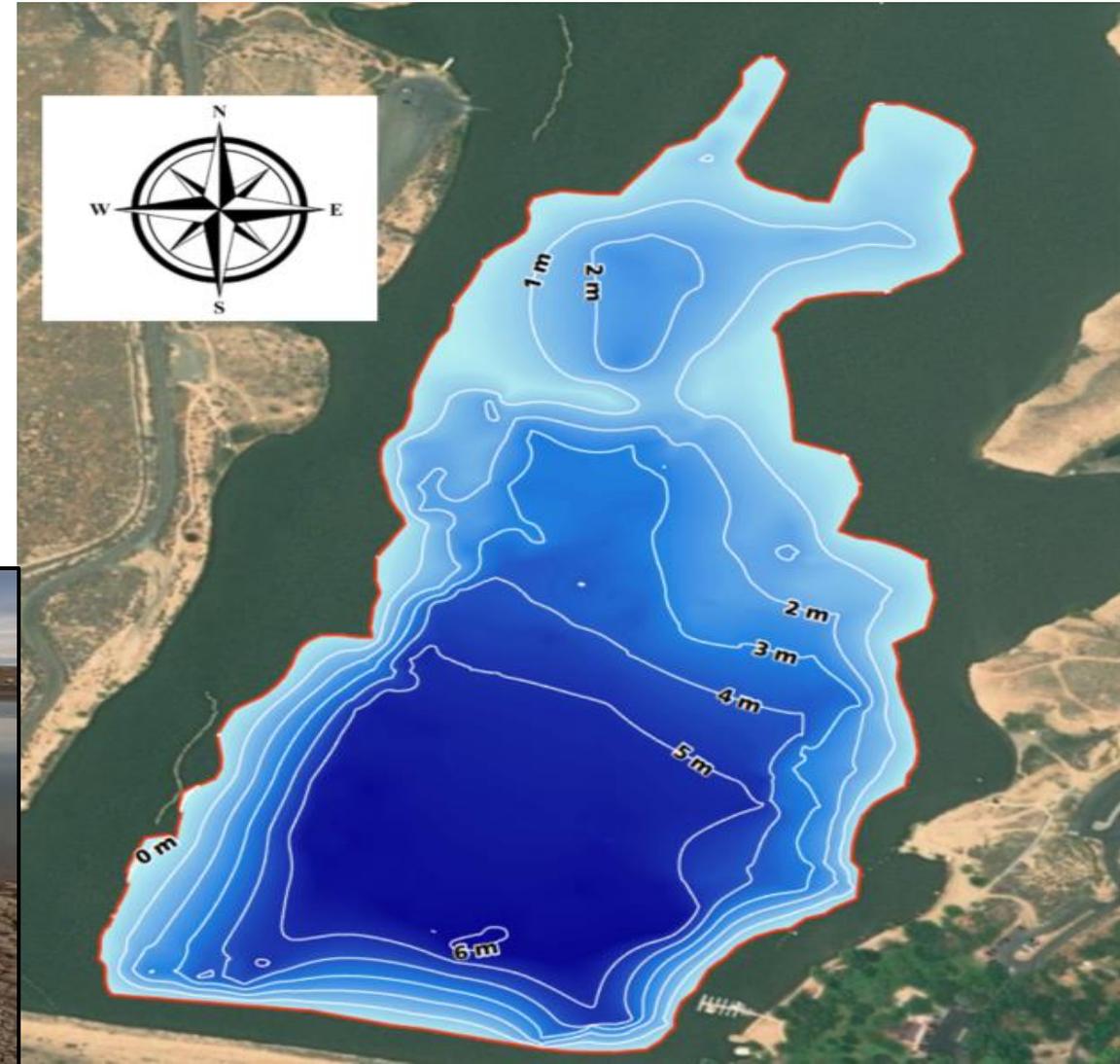
Eradication Effort @ Highline

- Highline Lake presents a unique case where eradication may be possible during the time of year that the canal is not running.
- The goal is to achieve eradication with minimal impacts on non-target species
- Phase 1 - Lake Drawdown
 - Highline was drawn down ~30' in an effort to expose mussels to freezing and drying conditions.
 - Was left in this condition >60 Days w/ many freeze & thaw cycles.



Mapping of Highline Lake following drawdown of Reservoir

- Created a bathymetric map of Highline Lake using depth & location data
 - The remaining pool had a surface area of 56.5 acres and a volume of 533.9 acre-feet
 - 66% reduction in size by area, ≈80% reduction in size by volume



Eradication Effort @ Highline

- Phase 2 - Application of EarthTech QZ Molluscicide.
 - EarthTec QZ is a copper-based EPA registered molluscicide.
 - 3 Treatments, 2 Weeks Apart.
 - Goal is to maintain toxic concentrations for a minimum of 30 days.
 - Application will be performed by CPW Staff.
- This is the first attempt of its kind in Colorado and possibly first ever attempt that has combined a drawdown and pesticide application.

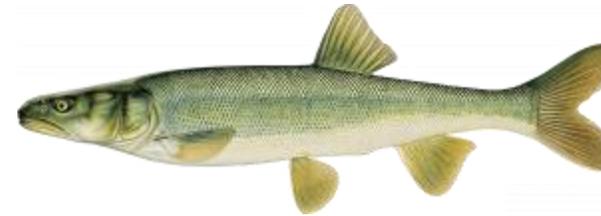


Phase 2: Molluscicide Application

- Challenges:
 - Laws & Regulations
 - Pesticide Label
 - NPDES
 - Water Quality Standards
 - Threatened & Endangered Fish Species in Colorado River
 - Weather & Water Temperatures



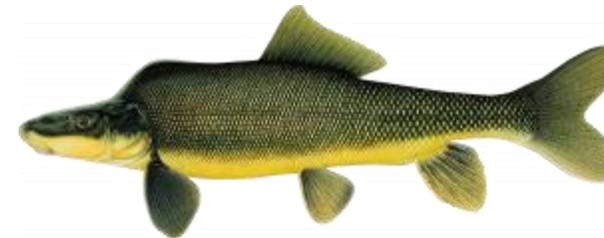
Humpback Chub



Colorado Pikeminnow



Bonytail



Razorback Sucker



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Phase 2: Molluscicide Application

- A 25-person crew applied molluscicide in Highline Lake on March 1 and March 15
 - 5 jet boats, one raft, and backpack sprayers were used for the application
 - The crew consisted of personnel from NW Aquatics, Area 7, ANS, Highline Lake State Park, NW Region, Aquatic Research, and the Water Section
 - A total of 1,376.5 gallons of Earthtec QZ was applied



Round 1 Application Crew



Round 2 Application Crew



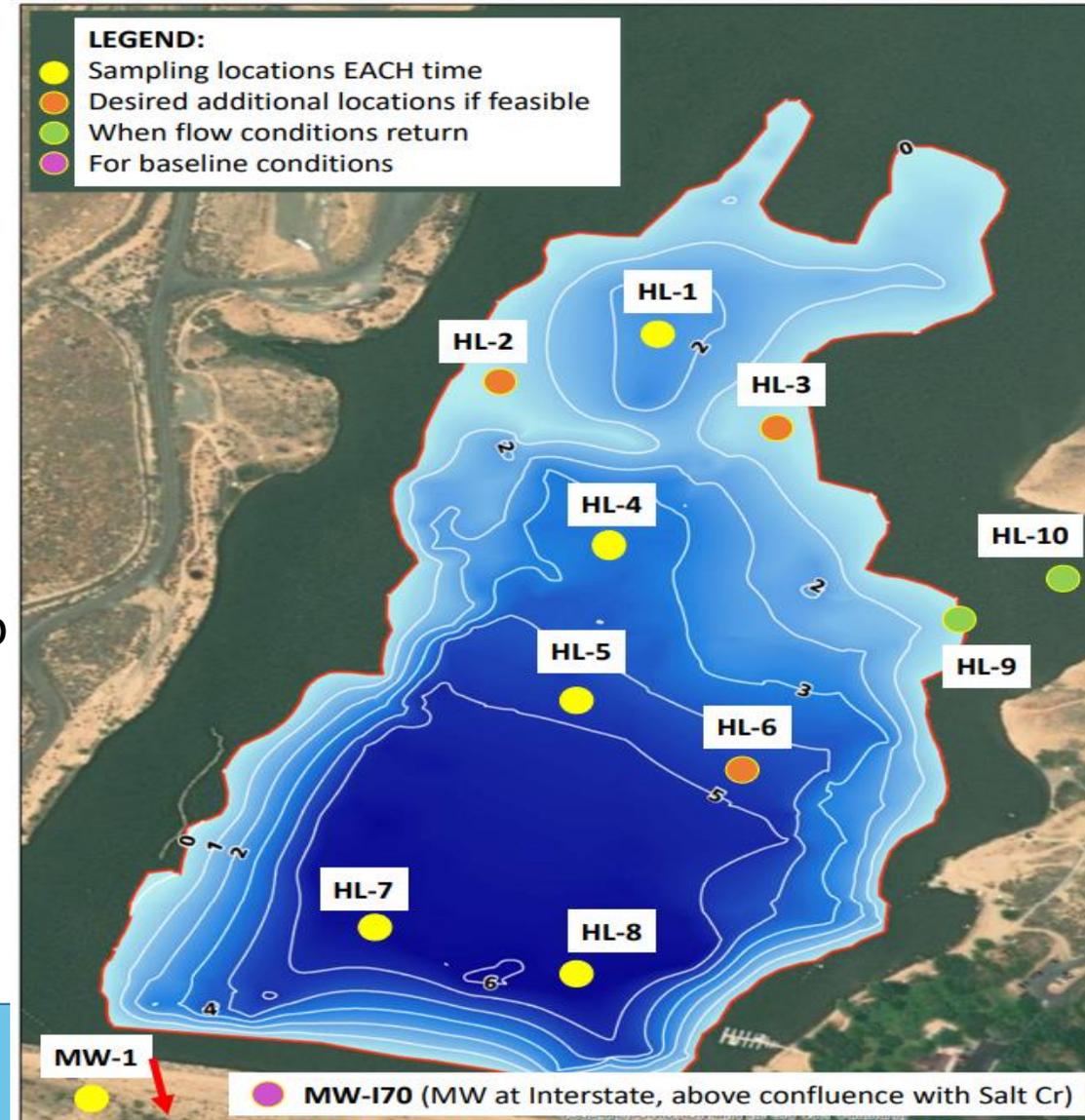






Water Quality Monitoring

- Water quality was monitored at 9 sites within Highline Lake
 - Temperature, copper, and dissolved oxygen are being monitored by ANS staff and the Water Section
 - Sentinel Asian Clams were deployed at each water sampling location
 - No Zebra Mussels were found following the drawdown so we needed a surrogate species to assess project effectiveness



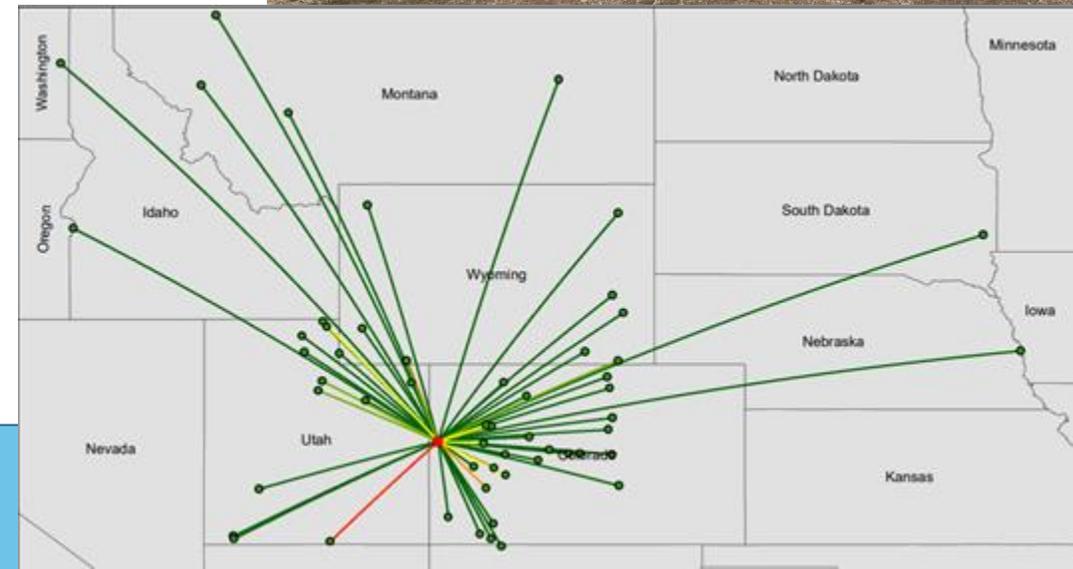
2023 Monitoring Plan

- Monthly Sampling of Highline By ANS Sampling & Monitoring Team
 - Additional Substrates Have Been Deployed in Highline & Mack Mesa
- Shared Containment Specialist Technician
 - Performing weekly surveys
- Additional downstream & upstream monitoring
- eDNA PCR Assays Developed at CPW Aquatic Animal Health Lab
 - The presence of DNA does not necessarily indicate the presence of a live viable organism.



2023 Containment Effort

- Infrastructure Improvements
 - East Boat Ramp Closed To Trailered & Motorized Watercraft
 - Bollards Installed Across the Ramp - \$5,000
 - Temporary Decontamination Capacity Expansion @ West Boat Ramp - \$80,000 - \$100,000
 - Portable On-Demand System - \$50,000
 - Concrete Pads For Decontamination - \$20,000
 - Water & Propane Tanks - \$10,000
 - Highline State Park Expansion Beginning In 2024 Will Include Significant ANS Related Upgrades
- Every Boat Leaving Highline in 2023 Will Be Decontaminated.
 - Additional Staffing Required To Handle Decontamination Load.
 - Estimated Cost - +\$75,000 Annually



Questions?

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