U.S. Department of the Interior
Bureau of Reclamation
Environmental Compliance Division

Invasive Mussels

Invasive Mussel Early Detection and Monitoring Program

Reclamation's invasive mussel early detection and monitoring program was started in 2009 to stay ahead of mussel infestations and to help guide prevention and mitigation measures for reservoirs determined to be most at risk of mussel exposure and infestation. The aim is to detect the earliest stages of mussel exposure or infestation at Reclamation reservoirs, so that response planning and budgeting for protective measures can be initiated. Early detection of microscopic mussel larvae can provide managers several years to implement response actions prior to full infestation of facilities. Early detection also triggers immediate containment action to prevent the spread of mussels to other water bodies.

Currently, Reclamation, in partnership with western states and other agencies, is monitoring over 223 water bodies, in 16 western states, and receives approximately 1,500 early detection samples per year. Reclamation regional and area offices have selected target reservoirs based on:

1. The potential for a mussel infestation to complicate, impair, or significantly increase the cost to provide critical Reclamation mission activities.
2. The annual number of boats and other crafts or equipment that are moved into the reservoir from other locations.
3. The local habitat suitability for mussel survival and reproduction.

Reclamation has developed several standard operating procedures for early detection sample collection and analysis. All early detection samples received by the Ecological Research Laboratory (Eco Lab) are analyzed by cross-polarized light microscopy, a method used to highlight microscopic mussel larvae (veliger) shells, making them easier to detect. If a mussel veliger is detected, a photograph under high magnification will be captured to confirm taxonomic identification. Genetic testing, including polymerase chain reaction (PCR) and gene sequencing will be performed on the mussel veliger and the rest of the water sample to confirm the species identification. Once a veliger is detected in a water body it goes on a priority watch list and all future samples from that water body will be genetically analyzed for the presence of invasive mussel DNA in addition to microscopic analysis. Test results are shared with Reclamation Mussel Task Force Representatives and State Invasive Species Coordinators.

The Eco Lab also provides taxonomic and genetic identification of other invasive and endangered species along with other services related to environmental monitoring, restoration and research.