



Economic Evaluation of Activities Associated with Invasive Mussel Management

Research Bulletin S&T Project 8142

Mission Issue

Invasive mussels pose a serious threat to water resources, hydropower infrastructure, and operations.

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Problem

Invasive mussels pose a serious threat to water resources, hydropower infrastructure, and operations, additionally, they completely alter aquatic systems; threatening the diversity and abundance of native species; and damage industrial, agricultural, and recreational activities dependent on surface waters. Reclamation invests millions of dollars in mussel prevention strategies with partners, early detection monitoring, and research efforts as well as encumbering the costs associated with any modifications to operations and/or additional maintenance associated with invasive mussels post infestation. The numerous costs associated with the various impacts at facilities and within the aquatic ecosystem are often vague or not specific to large western reservoir systems and their management. The ambiguous nature of costs associated with invasive mussel management make it difficult to determine if one management strategy or another is most cost effective.

Solution

This study focused on exploring the costs associated with two areas of invasive mussel management in the west- prevention (for this study is defined as implementing measures to reduce the probability of the spread of mussels from infested waterways to un-infested waterways) and control (for this study defined as activities primarily to mitigating damages at hydropower plants, not other water delivery facilities) to better understand these costs in western systems.

In order to fully compare and complete an economic benefit-cost (B/C) analysis of measures to prevent the spread of invasive mussels versus measures to control post-invasion impacts, it was determined that this study would also need to include the value of lost ecosystem benefits due to a mussel infestation. However, because of limited literature pertaining to the various ecological impacts on western waters, the focus of this study shifted to the collection and comparison of financial costs related to increased investment and O&M activities related to prevention and control of invasive mussels.

"This information will be helpful for a project we are conducting that is developing a bioeconomic model of mussel invasion for the Missouri River Basin."

Timothy Counihan
Research Fish Biologist
US Geological Survey

More Information

<https://www.usbr.gov/research/projects/detail.cfm?id=8142>

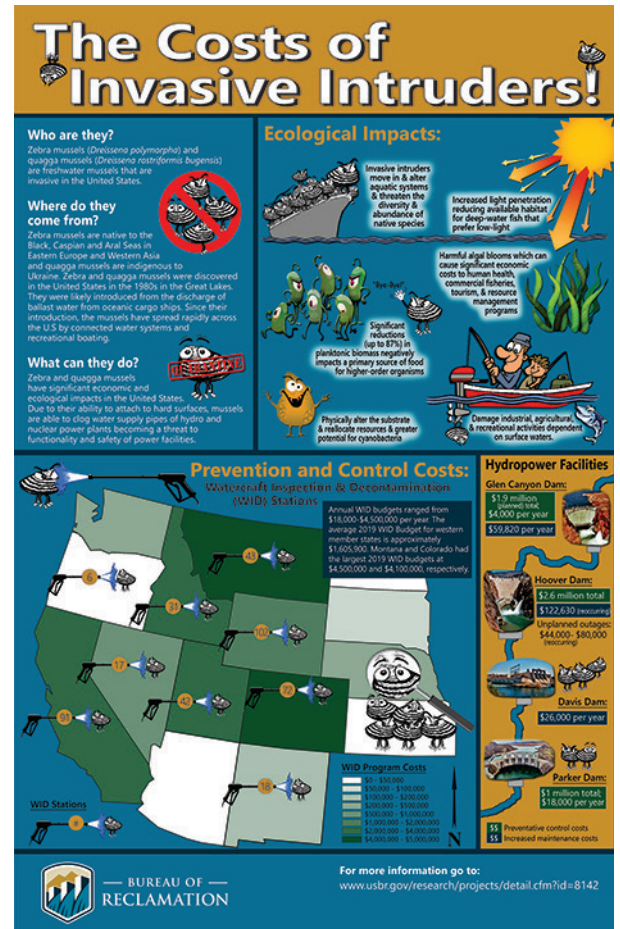
Application and Results

This study can provide water resource managers with critical data to develop and fund adequate prevention, containment, and eradication programs and provides additional metrics for understanding the costs included in a Reclamation-wide approach for mussel management.

The 2019 average annual Watercraft inspection and decontamination budget was approximately \$1,605,900. Data collected through a survey from S&T Project 1876 showed that surveyed hydropower facilities experienced negative economic impacts related to control or mitigation of mussel-related damages. Facilities surveyed spent approximately \$10 million in total on preventative control measures since mussel infestation and \$464,000 annually on increased maintenance. Total reoccurring maintenance costs were \$650,000 per occurrence and approximately \$88,000 in total annually on monitoring. Including cost associated with the ecological impacts of mussels is critical to understanding the full realm of economic impacts experienced at facilities and the potential ecological/economic damages to waterbodies and will need to be addressed in future studies.

Future Plans

This study serves as an initial effort to understand the costs associated with invasive mussel management in the west. To build on the information established in this report it is recommended that efforts be made to improve accounting measures in hydropower facilities to more accurately identify increased costs related to invasive mussels. Future research should start to explore ways to identify and quantify the impact of invasive mussels on ecosystem services, begin to identify the most prevalent means by which invasive mussels spread and infest new water systems and start to identify and quantify the success of WID stations to minimize the rate of mussel invasions into additional water systems.



Infographic created as part of this research project.