



Invasive Mussel Collaborative

Invasive zebra and quagga mussels (*Dreissena polymorpha* and *D. rostriformis bugensis*, respectively) cause ecological and economic impacts to invaded systems. The scope of these impacts has increased as they continue to spread from the Great Lakes across North America, from the Hudson River in the east to Lake Mead in the west. They alter ecosystem dynamics and affect industrial, municipal and recreational water users. The negative impacts of dreissenid mussels drove scientists to search

for effective control methods beginning in the early 1990s. Recent advancements in biocontrol technology present exciting new options to effectively manage invasive mussels. In light of these new opportunities, common management goals must be identified and understood, and knowledge gaps addressed in order to move forward with a joint and strategic approach to managing invasive mussels. Further investigation is needed to address uncertainties in the use of biocontrol, such as potential effects on invertebrates and ecosystems, and optimal application procedures. In addition, the coordinated and integrated application of multiple control tools is a proven effective management strategy for other invasive species. Consequently, research should continue to identify new tools (e.g., spawning inhibitors and microparticles) and options for combining methods to increase effectiveness. Managers and scientists need a forum in which to communicate and coordinate this work using an iterative and collaborative process.



Effects of biocontrol application

A colony of zebra mussels attached to a native mussel. The native mussel survives the application of biocontrol; the zebra mussels do not.

A Collaborative Approach

The **Invasive Mussel Collaborative** provides a framework for communication and coordination, identifying the needs and objectives of resource managers, prioritizing the supporting science, recommending communication strategies, and aligning science and management goals into a common agenda for invasive mussel control.

The founding members of the collaborative are the U.S. Geological Survey, Great Lakes Commission, National Oceanic and Atmospheric Administration and the Great Lakes Fishery Commission. The Great Lakes Commission provides coordination and neutral backbone support for the collaborative. A broad membership base of states, provinces, tribal and other entities and a well-organized communication network facilitates the exchange of information between scientists, managers and stakeholders, and provide ongoing guidance and feedback within an adaptive management framework. Strong connections with other regions are also established to provide a conduit for application elsewhere.

Core Team

Great Lakes Commission
Great Lakes Fishery Commission
National Oceanic & Atmospheric Administration
U.S. Geological Survey

Steering Committee

Representatives of 29 U.S. and Canada Federal, Tribal, state, provincial and local agencies; non-government organizations; industry and academic groups

Science Team

Representatives of 12 research agencies and institutions

Inform decision-making and management activities

Inform science and research activities

Backbone support and coordination (Great Lakes Commission)

Mission

Advance scientifically sound technology for invasive dreissenid mussel control to produce measurable ecologic and economic benefits.



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Goal

The goal of the Invasive Mussel Collaborative is to develop and guide the implementation of a long-term adaptive strategy that establishes and prioritizes an agenda for developing effective dreissenid mussel control methods that can be applied at a variety of spatial scales and environments to suppress or eradicate dreissenid mussels and support the restoration of biodiversity, and ecosystem functions and services.

Objectives

Develop and evaluate cost-effective treatment technologies that enhance the probability of successful control to enable suppression efforts at multiple scales.

Establish and facilitate the use of common metrics to understand and quantify dreissenid mussel control efforts and treatment variables.

Address existing uncertainties around ecosystem response, including direct and indirect ecological impacts of changes in dreissenid mussel populations. Investigate these impacts as a component of a science agenda and post-control treatment monitoring to help understand and quantify the effects of dreissenid population reduction.

Investigate direct and indirect social and economic impacts of dreissenid mussel control efforts and associated ecosystem responses, including impacts to recreational and commercial fisheries; recreational water uses (e.g., beaches, swimming, etc.), facilities and equipment; and industrial and municipal water uses, equipment, facilities and operations

Establish, promote, and utilize information-sharing and communication tools

Provide information and tools to facilitate dreissenid mussel response and control decision-making and implementation

Activities

Communication Network

Website featuring invasive mussel information, contacts, and management strategies

Webinar series featuring case studies in prevention, response, management and control

Email list with more than 400 subscribers and featuring a **biweekly newsletter**

Management Strategy

Inform, coordinate and prioritize ongoing **investments**

Five goals for zebra and quagga mussel management and control

Objectives to address information needs, enhance progress, and increase capabilities toward achieving the goals

Flexible and adaptive approach to **implementation**

Projects and Products

Reference Guide for Methods of Decontaminating Gear and Equipment

Summary of Methods for Controlling Invasive Zebra and Quagga Mussels

Demonstration Project: Sleeping Bear Dunes Lakeshore Dreissenid Mussel Control Trials