

Conservation of native freshwater mussels as a program element of the Navigation and Ecosystem Sustainability Program (NESP)

Proposal

Once authorized and funded, the Navigation and Ecosystem Sustainability Program (NESP) should:

1. Include conservation of native freshwater mussels as a critical component of ecosystem restoration and sustainability on the Upper Mississippi River System.
2. Develop and implement a native mussel conservation program on the Upper Mississippi River System.

As guidance, the ad hoc mussel committee of the Upper Mississippi River Conservation Committee has drafted a *Conservation Plan for Freshwater Mussels on the Upper Mississippi River System* (UMRCC 2004) that could be used to help prioritize research and management needs of mussels in this system. Additionally, the Mussel Coordination Team, a team of scientists and managers from the U.S. Army Corp of Engineers, U.S. Fish and Wildlife Service, U.S. Geological Survey, National Park Service, and the natural resource agencies in Illinois, Iowa, Minnesota, Missouri, and Wisconsin, could be used to develop and implement the NESP native mussel conservation program.

Background

Historically 51 species of freshwater mussels lived in the Upper Mississippi River System (UMRS); today, 44 species have been found in mussel surveys conducted in the past 35 years (Havlik and Sauer 2000). In North America, it is estimated that 55 percent of the nearly 300 species of freshwater mussels are in danger of extinction and only 25 percent are considered stable (Williams et al. 1993). No other group of animals in North America is in such grave danger. More recently, the invasion of exotic zebra mussels (*Dreissena polymorpha*) has decimated native mussel populations in many waters including the UMRS (Mussel Coordination Team 2003).

Native mussels are an integral component of the UMRS ecosystem. Because mussels are often found in dense aggregations their shells can stabilize river substrates. Thus, unlike other groups of species, mussels provide habitat to other biotic groups including algae, plants, invertebrates and fish. As they feed and respire, they recycle nutrients and trap sediments; because adults are voracious filter feeders, they process considerable amounts of material and may provide an energy source for other trophic levels that would otherwise be unavailable. Since many species are long-lived (>30 years), they can be an important component of a long-term monitoring program. Historically, our native mussels were the basis for a thriving commercial industry in portions of the UMRS watershed. Conservation measures are needed now to protect and enhance the mussel communities and habitats remaining on the UMRS, and restore those species, populations and habitats that once occurred. A healthy and sustainable mussel community is a critical ecological component of a healthy and sustainable Upper Mississippi River System.

Conservation Plan for Freshwater Mussels of the Upper Mississippi River System

Responding to the on-going threats to native mussels, in 2004, the Upper Mississippi River Conservation Committee (UMRCC) released their *Conservation Plan for Freshwater Mussels of the Upper Mississippi River System* (UMRCC 2004). The goal of the conservation plan is to return a healthy, self-sustaining native freshwater mussel fauna to the UMRS by doing the following: (1) identify and implement the research, management, and conservation actions necessary to maintain and recover the mussel fauna; (2) increase government and public awareness of the plight of these animals and their essential ecosystems and garner support, including adequate funding, for species and habitat protection programs; (3) develop creative partnerships with representatives from academia, government, and private organizations to conserve and restore native mussels; (4) document other issues which are barriers to effective mussel resource management efforts; and (5) prescribe a strategic plan of action, which if implemented, will restore the valuable freshwater mussel resources of the UMRS.

To effectively implement the plan, Section 6.1.1 recognized the critical need to: *“Ensure that new federal programs on the UMRS include conservation of native mussels as a project objective and implement appropriate portions of this plan. Recommend that this Conservation Plan for Freshwater Mussels on the Upper Mississippi River System be included as a project feature of the Upper Mississippi River – Illinois Waterway System Navigation Study.”*

To facilitate interagency coordination, Section 6.1.3 recommended that implementation: *“Use the interagency Mussel Coordination Team (MCT) to coordinate mussel conservation activities under this Plan. The role of the MCT may include, but not be limited to, such activities as establishment of priority mussel research and management needs; collection and publication of mussel statistics; review of critical environmental issues; providing professional consultation services to the Corps and other agencies; development of uniform mussel investigation, propagation and relocation procedures, and public education programs and materials.”*

NESP Native Mussel Conservation Program

Issues and activities of the NESP Native Mussel Conservation Program might include:

- Investigate the effects of various river restoration projects on unionids (i.e. habitat rehabilitation and enhancement projects, drawdowns, fish passage)
- Conduct life history studies to determine critical physical and biological habitat needs for unionids to aid in the design of river restoration projects
- Investigate and implement methods to artificially propagate mussels for relocation into historic habitats
- Develop measures to reduce the effects of invasive species on unionids in the UMRS
- Complete bathymetry surveys for select navigation reaches to minimize impacts on mussels from ecosystem and navigation projects, to help identify potential locations for mussel restoration

- Implement a long-term monitoring program for native mussels and invasive species on the UMRS
- Assist in planning and construction of fish passage facilities to increase the opportunity for host fish to restore/maintain mussel populations in the UMRS and tributaries
- Implement a long-term GIS database for native mussels in the UMRS
- Implement an outreach program on native mussel conservation, including an Internet web site on UMRS native mussels
- Implement Endangered Species Act recovery plans for federally listed mussels
- Facilitate interagency coordination on construction-related permits, impact assessment, mussel harvest regulations, and develop partnerships on watershed issues affecting native mussels

Summary

Native mussels are a critical component of the UMRS ecosystem. Likewise, they must be an integral part of any large-scale program on ecosystem restoration, enhancement and sustainability. The Navigation and Ecosystem Sustainability Program is potentially a large-scale ecosystem program and should include conservation of native mussels as an important program element, if authorized and funded.

References:

- Havlik, M.E., and J.S. Sauer. 2000. Native freshwater mussels of the Upper Mississippi River System. Project Status Report 2000-4, U.S. Geological Survey, Upper Midwest Environmental Sciences Center, La Crosse, WI. 2pp.
- Mussel Coordination Team. 2003. Saving the Higgins eye pearl mussel (*Lampsilis higginsii*) from extinction: 2002 status report on the accomplishments of the Mussel Coordination Team. St. Paul District Corps of Engineers, St. Paul, MN. 14pp.
- Upper Mississippi River Conservation Committee. 2004. Conservation plan for freshwater mussels of the Upper Mississippi River System. Upper Mississippi River Conservation Committee. Rock Island. IL. 28pp.
- Williams, J.D., M.L. Warren, Jr., K.S. Cummings, J.L. Harris and R.J. Neves. 1993. Conservation status of freshwater mussels of the United States and Canada. Fisheries 18(9):6-22.