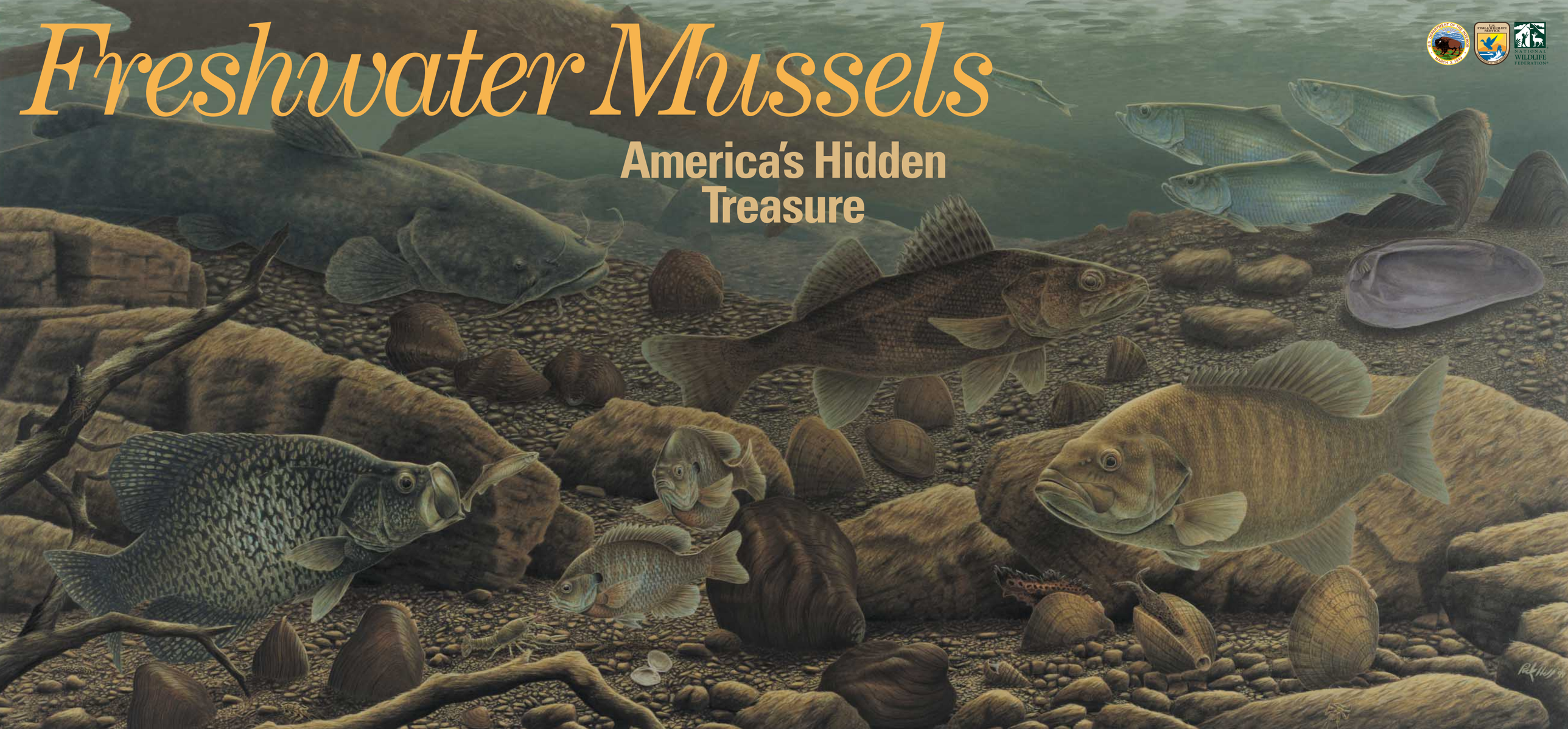
Freshwater Mussels

America's Hidden Treasure



Discover *Freshwater Mussels*

America's Hidden Treasure

They make no sound. They cannot see. Some may live for decades, but seldom move from a secure spot. Yet, freshwater mussels are causing a stir, becoming noticed and making us ponder their future as we make plans for our own.

For the Record
No other country in the world equals the United States in freshwater mussel variety. While all of Europe supports only 12 species, nearly 300 kinds live here, mostly within the vast watershed of the Mississippi River.

Unfortunately, these animals may be the most troubled natural resources in this country. It's estimated that 70% (Williams, et al, 1993) of our freshwater mussels are extinct, endangered, or in need of special protection. Many of their problems stem from how they live and changes that have occurred to their habitat during the past 200 years.

Life Down Under
Most freshwater mussels live burrowed in sand and gravel at the bottom of rivers and streams. Only a few are adapted to the quiet water and muddy depths of lakes, ponds, and reservoirs.

Unlike most animals, which must travel in search of food, their food drifts to them, mainly tiny plants and animals called plankton suspended in the water. By drawing water inside their shells through a siphon, their gills filter out food and take in oxygen.

Mussels usually don't move much, but a muscular "foot" helps them burrow and allows limited travel if disturbed by floods or drought.

The foot also helps anchor them against strong currents and may prevent a hungry muskrat from tugging them out for its dinner! A mussel's shell, however, provides its main protection from predators.

Their hard, calcium-based shells consist of two halves joined by a hinge. Unique names like "monkeyface," "threehorn wartyback," and "pink heelsplitter" refer to the wide range of shell size, color, shape, and texture found among mussel shells.

Something "Fishy"
Freshwater mussels need a lot of luck to successfully reproduce. Their unusual life cycle begins when eggs held inside the female are fertilized by sperm drawn inside her while siphoning water. For some, if a male of her kind isn't nearby upstream, she can't reproduce. For a few, this is not a problem because they seem able to fertilize themselves.

Once fertilized, the eggs develop into a larval stage inside the female before they are released into the water to begin a parasitic stage. With little time to waste, these youngsters, called glochidia, must attach themselves to a host fish or perish. For some mussels, the host is limited to only a few fish species. This generally harmless parasitic stage lasts a matter of weeks before the larvae transform into young mussels and are ready to drop off the fish and begin a life in the stream bottom.





Built-in Fish Lure

To increase the chances of their young making contact with a fish host, some females "go fishing." By displaying specially adapted tissues that look like fish prey, they try to lure fish to swim near them. Sensing a fish nearby, the female releases her young into the water, ready to clamp onto the fish.

Mussel Aches
Our native freshwater mussels face greater problems today than they did just a few years ago. Some problems aren't new. Although water quality has improved in some areas, pollution, especially non-point source pollution, causes the greatest threat to native mussels. Also sedimentation continues to take a serious toll. Habitat losses through channelization, clearing of riparian and streambank vegetation, dredging, and dam construction still persist. Mussels are impacted by loss of fish hosts from fish kills or dams that prevent fish migration. However, in some parts of the country, it's a non-native mussel causing the most concern.

Zebra Mussel Invasion
In 1988, the first zebra mussels were spotted in Lake St. Claire near Lake Erie in Ohio. Assumed to be stowaways in the ballast water of a trans-Atlantic ship, this native of eastern Europe is now widespread throughout waterways in the eastern half of the United States. Besides other problems, zebra mussels have nearly eliminated native mussels in some locations.

Unlike native mussels, the much smaller zebra mussel (less than 2" in length) does not use a host animal in its life cycle, and reproduces at a tremendous rate. They can attach themselves to hard surfaces with thread-like structures called byssal threads. In zebra mussel-infested waters, it is not unusual for native mussels to be completely covered by zebra mussels. Competition for food and oxygen weakens and eventually starves native mussels.



Encrusted Native Mussel

They Lose, We Lose
Freshwater mussels have played a long and varied role in people's lives. Native Americans used them for food, tools, and jewelry. From about 1890 until the invention of plastics around 1950, mussel shells supported this country's button industry. More recently, the world's cultured pearl industry relies on implant beads made from the superior shells of North American mussels. In states where mussel collecting is legal, harvesting provides jobs and income to residents along rivers.



Buttons from Days Past

Mussels have other values more difficult to measure. In the rivers and lakes where they live, their filtering ability makes them natural water purifiers. They play an important role in the aquatic food chain as a food source for wildlife including muskrats and otters.



Midden with Muskrat

They also can tell us something about the health of the environment on which we both depend. Mussels respond to changes in water quality. Gradual mussel die-offs or sudden mussel kills are reliable indicators of water pollution problems and other environmental health concerns. Stable, diverse mussel populations generally indicate clean water and a healthy aquatic environment.

If we lose our freshwater mussels, we lose more than a biological legacy unmatched in the world. We lose a part of our cultural heritage, we lose an economic resource, and we lose an environmental health maintenance and warning system. Fortunately, there are efforts being made to avoid these losses and things everyone can do to help save our freshwater mussels.

Mussels in our Future
Biologists from the U.S. Fish and Wildlife Service (Service) and the U.S. Geological Survey along with other Federal, State, and private agencies are working together to find solutions to problems facing our mussels. These partners have developed a National Strategy for the Conservation of Freshwater Mussels, which will serve as a blueprint for native mussel restoration.

Mussels and their habitats are being surveyed, monitored and restored. The Service's endangered species program is working to conserve these species and their habitat. Some mussels facing extinction in the wild have been removed and brought to the Service's National Fish Hatcheries and State facilities for safe-keeping. Hatcheries are developing techniques for propagating rare mussels for release. We are beginning to reestablish mussel populations into restored streams and rivers. The Service's Fishery Resources Offices help by providing technical assistance on habitat restoration and enhancement for mussels. Aquarium and zoo personnel are also assisting with conserving endangered freshwater mussels through efforts such as research and education programs. The National Wildlife Federation has a long history of working to enhance national water quality and protect endangered species through advocacy, education, and on-the-ground programs. These efforts—including the "Keep the Wild Alive" campaign, which celebrates endangered species protection efforts worldwide—are helping to improve conditions for imperiled freshwater mussels.But there's more that needs to be done and you can help.



Surveying Mussels

There are ways that you can help to provide a secure future for mussels. For instance, avoid contributing to water pollution. Follow application directions and don't use fertilizers and pesticides excessively. Leave stream sides vegetated even if it means giving up part of the view. Keep cattle and other livestock out of streams. Report suspected pollution problems to authorities. Get involved with land use planning in your community. In the long run, freshwater mussels will benefit from improvements in water quality. And so will you!

U.S. Department of the Interior
U.S. Fish & Wildlife Service
http://www.fws.gov

National Wildlife Federation
http://www.nwf.org