



# WHAT'S ALL THE FUSS ABOUT MUSSELS?

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Over the past decade, research on freshwater mussels at MSU has been funded by 40 grants and contracts, totaling \$1.3 million. The work resulted in 50 publications and reports, 20 master's theses, more than 100 presentations at professional meetings, and several million mussels released into rivers. What's all the fuss about mussels? Read on to find out more.

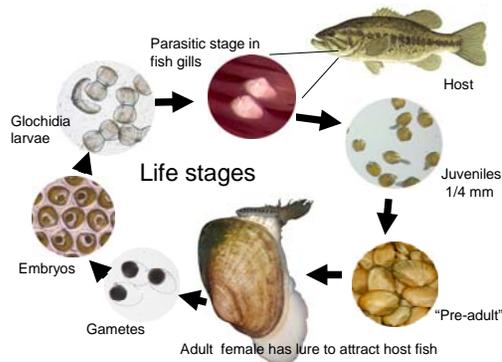
## Significance of native mussels

Freshwater mussels (Unionoida) are a diverse group of filter-feeding mollusks with more than 800 species worldwide, 300 species in North America, and 62 species in Missouri.

**Ecological role:** Mussels are inconspicuous but surprisingly important- they can literally outweigh all other animals in rivers. Mussels filter water and capture bacteria, algae, and other tiny particles, making this food energy available to other animals.

**Water quality:** The allowable levels of toxic pollutants are based upon the most sensitive organisms. Recent research shows that mussels are extremely sensitive to some pollutants, such as ammonia, copper, and some pesticides. This information will eventually lead to more stringent regulations and cleaner, safer water.

**Conservation significance:** Many mussel species are in danger of extinction. The US Endangered Species Act, US Clean Water Act and related state laws require that government agencies take action to prevent extinctions. Research and conservation actions to restore and protect populations of endangered species are funded by a variety of federal and state agencies.



## Mussels and fish - a symbiosis

Mussel larvae are microscopically small. They are non-harmful parasites on the gills of fins of fish, where they live briefly and metamorphose to the juvenile stage. Some of our projects aim at understanding the relationship between mussels and their hosts. Mussels and fish are a very useful system for study of parasitism. Research questions span immunology, behavior, and ecology.



## Mussel propagation

Naturally everybody wants more mussels! Much of our work is aimed at developing methods for propagation and captive culture of mussels. Cultured mussels are used for research on ecology and toxicology. Others are released back into rivers to augment and restore populations of endangered species. Ultimately, we hope to prevent further extinctions and to restore the abundance and ecological function of aquatic communities.



## Collaborations

Work on bivalves at MSU has attracted visitors from China and Europe as well as other programs in the US. Many organizations are involved in freshwater conservation efforts, and we collaborate with a variety of agencies including the US Fish and Wildlife Service, Kansas City Zoo, Columbia Environmental Research Center, Missouri Department of Conservation, Alabama Aquatic Biodiversity Center, Virginia Aquatic Wildlife Conservation Center, Illinois Natural History Survey, and the Arizona-Sonora Desert Museum. Our graduate students enter careers in resource management, science, and education.



## Sustainability, rivers, and mussels

Work to preserve endangered species and ecosystems is one of the most important efforts in "sustainability". North American rivers are a treasure trove of biological diversity. Rivers are also among the most threatened natural environments, because practically everything that we excrete, flush, spill, dump, and otherwise dispose of eventually ends up in the water.



## Putting mussels to work

We've developed methods and equipment for caging juvenile mussels in rivers, where they can be monitored for growth and survival and serve as biomonitors of water pollution. Laboratory toxicology studies at MSU and in other labs using propagated juvenile mussels are helping to inform the USEPA and other agencies that recommend the allowable limits of pollutants. Endangered mussel species also facilitate funding for habitat restoration, benefiting other species, including people!

## Acknowledgements

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