

Survey for Mussels Conducted at Shiawassee Refuge

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The freshwater mussels, also known as unionids, have played an important role in the Saginaw River watershed. Mussels were an important food resource for Native Americans. They also serve as “canaries in the coal mine,” indicating presence of water quality problems, including excess sedimentation, high nutrient loads, and industrial contaminants.

However, over one-third of Michigan’s 45 native freshwater mussels are state-listed as endangered, threatened, or special concern species. Historically, the Midwest boasted the most diverse collection of mussels in the world. But today, the states of Minnesota, Wisconsin, Iowa, Missouri, Illinois, Indiana, and Ohio list more than half of their 78 known mussel species as endangered, threatened, or requiring special concern. Indeed, unionids are one of the most imperiled groups of fauna in North America. It is estimated that 43% of the continent’s 300 freshwater mussel species are in danger of extinction.



Shiawassee Refuge provides habitat for a diversity of mussels. Edward De Vries/USFWS

Shiawassee National Wildlife Refuge is traversed by 18 miles of river. Consequently, the refuge may have important opportunities to contribute to unionid conservation. However, very little information existed about the refuge's mussel community. Thus, the refuge, Alpena National Fish and Wildlife Conservation Office, Genoa National Fish Hatchery (NFH), Jordan River NFH, East Lansing Field Office, and The Nature Conservancy collaborated to conduct a survey of the mussels of the refuge and upstream waters of the Saginaw Watershed.

This survey revealed many important facets of the refuge's unionid community. Twenty-three species of mussel were found in refuge waters and four additional species were found upstream. Unfortunately, eleven refuge species were only represented by shells. However, live specimens of seven of these species were found upstream. Importantly, some of the best mussel locations were located directly upstream from the refuge, but within the refuge's acquisition boundary.



USFWS biologists identify collection of mussels. Edward De Vries/USFWS

Rarities found included lilliput (*Toxolasma parvus*; state-listed endangered), pink papershell (*Potamilus ohioensis*; state-listed threatened), and ellipse (state-listed special concern species). Lilliput was previously unknown from the Saginaw watershed. Unfortunately, surveyors found both zebra mussel (*Dreissena polymorpha*) and Asian clam (*Corbicula fluminea*), but neither were common.

Noteworthy by absence was the threeridge (*Amblema plicata*). This species comprised over 90% of the mussels found in the refuge's extensive archeological sites. Further, the survey revealed one bed comprised of thousands of threeridge shells and scores of shells were found in multiple other sites. However, this survey only turned up one live threeridge. Another species that was curiously absent was spike (*Elliptio dilatata*). Hundreds of spike shells were found in one refuge bed, but the survey revealed no live individuals. Interestingly, many mapleleaf (*Quadrula quadrula*) deertoe (*Truncilla truncata*), and giant floater (*Pyganodon grandis*) were found, which are species commonly associated with threeridge and spike.



*The mapleleaf (*Quadrula quadrula*) is one of the most common unionids at the refuge. Steven Kahl/USFWS*

The complete list includes mucket (*Actinonaias ligamentina*), threeridge (*Amblema plicata*), Asian clam (*Corbicula fluminea*), zebra mussel (*Dreissena polymorpha*), spike (*Elliptio dilatata*), Wabash pigtoe (*Fusconaia flava*), plain pocketbook (*Lampsilis cardium*), fatmucket (*Lampsilis siliquoidea*), white heelsplitter (*Lasmigona complanata*), fluted-shell (*Lasmigona costata*), fragile papershell (*Leptodea fragilis*), eastern pondmussel (*Ligumia nasuta*), black sandshell (*Ligumia recta*), three-horn wartyback (*Obliquaria reflexa*), pink heelsplitter (*Potamilus alatus*), pink papershell (*Potamilus ohioensis*), kidneyshell

(*Ptychobranchnus fasciolaris*), giant floater (*Pyganodon grandis*), pimpleback (*Quadrula pustulosa*), mapleleaf (*Quadrula quadrula*), fingernail clam (*Sphaerium striatinum*), creeper (*Strophitus undulates*), lilliput (*Toxolasma parvus*), deertoed (*Truncilla truncata*), paper pondshell (*Utterbackia imbecillis*), ellipse (*Venustaconcha ellipsiformis*), and rainbow (*Villosa iris*).

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