USGS
science for a changing world

Upper Midwest Environmental Sciences Center

Project Status Report

2000-04

Native Freshwater Mussels of the Upper Mississippi River System

by
Marian E. Havlik and Jennifer S. Sauer

Native freshwater mussels are one of the most endangered groups of animals in North America. In the United States, 69 of 304 mussel species are listed as federally endangered or threatened. Surveys conducted over the past few decades have documented significant declines in mussel populations across the continent. Among the factors thought to be responsible for the decline are dams, pollution, siltation, commercial navigation, over harvest, and mortality caused by zebra mussel encrustation. Mussels are an important food source for muskrats, raccoons, minks, and bottom-feeding fishes. Commercially, shells of certain native mussel species are made into beads that are inserted into oysters as nuclei for cultured pearls.

Historically, 51 species have been documented in the Upper Mississippi River System (UMRS, which includes Mississippi and Illinois River mainstems), but only 44 species have been documented in surveys conducted within the past 35 years. This loss in species richness may be linked to habitat changes after the locks and dams were built. Nearly all of the species (7) not recently found in the UMRS were considered infrequent inhabitants of the UMRS mainstem by biologists in the late 19th and early 20th century, but were more commonly found in the tributaries of the UMRS.

The current conservation status of UMRS native mussels is summarized in Table 1. This table represents an update to Table 11-1 in the "Ecological Status and Trends of the Upper Mississippi River System 1998: A Report of the Long Term

Table 1. Native mussel species (Order Unionoida) in the Upper Mississippi River System. Unless otherwise noted, species have been found alive in the Mississippi or Illinois Rivers since 1995 (Havlik pers. comm., Yaeger pers. comm.).

E = endangered, **T** = threatened, **SC** = special concern, **X** = extirpated, **CS** = candidate species
TR = not presently in the Mississippi River, but alive in major tributaries of UMRS
^Wisconsin and Iowa treat these two as separate species
#Possibly extirpated from UMRS [1]Year of publication for state and federal listings

Common name	Species	Year of Last Observation	Federal 1999[1]	Illinois 1999[1]	Iowa 1995[1]	Minnesota 1996[1]	Missouri 1999[1]	Wisconsin 1997[1]
Subfamily Cumberlandinae								
Spectaclecase	*Cumberlandia monodonta* (Say, 1829)			E	E	T	SC	E
Subfamily Ambleminae								
Threeridge	*Amblema plicata* (Say, 1817)							
Purple wartyback	*Cyclonaias tuberculata* (Rafinesque, 1820)	1991		T	T	T		E
Elephantear	*Elliptio crassidens* (Lamarck, 1819)	1977		T		E	E	E
Spike	*Elliptio dilatata* (Rafinesque, 1820)			T		SC		
Ebonyshell	*Fusconaia ebena* (I. Lea, 1831)			T		E	E	E
Wabash pigtoe	*Fusconaia flava* (Rafinesque, 1820)							
Washboard	*Megalonaias nervosa* (Rafinesque, 1820)					T		SC
Sheepnose	*Plethobasus cyphyus* (Rafinesque, 1820)			E	E	E	E	E
Round pigtoe	*Pleurobema sintoxia* (Rafinesque, 1820)				E	T		SC
Winged mapleleaf (TR)	*Quadrula fragosa* (Conrad, 1835)	1921	E			E	E	E
Monkeyface	*Quadrula metanevra* (Rafinesque, 1820)					T		T
Wartyback	*Quadrula nodulata* (Rafinesque, 1820)					E	SC	T
Pimpleback	*Quadrula p. pustulosa* (I. Lea, 1831)							
Mapleleaf	*Quadrula quadrula* (Rafinesque, 1820)							
Pistolgrip	*Tritogonia verrucosa* (Rafinesque, 1820)				E	T		T
Pondhorn (TR)	*Uniomerus tetralasmus* (Say, 1831)	1919						
Subfamily Anodontinae								
Elktoe	*Alasmidonta marginata* Say, 1818					T	SC	SC
Slippershell mussel (TR)	*Alasmidonta viridis* (Rafinesque, 1820)	1883		T	E			T
Flat floater	*Anodonta suborbiculata* Say, 1831						SC	SC
Cylindrical papershell (TR)	*Anodontoides ferussacianus* (Lea, 1834)	1883			T		SC	
Rock pocketbook	*Arcidens confragosus* (Say, 1829)					E	SC	T
White heelsplitter	*Lasmigona c. complanata* (Barnes, 1823)							
Creek heelsplitter	*Lasmigona compressa* (I. Lea, 1829)	1979			T	SC		
Flutedshell	*Lasmigona costata* (Rafinesque, 1820)					SC		
Giant floater	*Pyganodon grandis* (Say, 1829)							
Salamander mussel	*Simpsonaias ambigua* (Say, 1825)	1982		E		T	SC	T
Creeper	*Strophitus undulatus* (Say, 1817)				T			
Paper pondshell	*Utterbackia imbecillis* (Say, 1829)							

Table 1 (continued from front side)

Subfamily Lampsilinae		Year of Last Observation	Federal 1999[1]	Illinois 1999[1]	Iowa 1995[1]	Minnesota 1996[1]	Missouri 1999[1]	Wisconsin 1997[1]
Mucket	*Actinonaias ligamentina* (Lamarck, 1819)					T		
Butterfly	*Ellipsaria lineolata* (Rafinesque, 1820)			T	T	T		E
Snuffbox (TR)	*Epioblasma triquetra* (Rafinesque, 1820)	1920		E		T	SC	E
Plain pocketbook	*Lampsilis cardium* Rafinesque, 1820							
Higgins eye	*Lampsilis higginsii* (I. Lea, 1857)		E	E	E	E	E	E
Fatmucket	*Lampsilis siliquoidea* (Barnes, 1823)							
^Yellow sandshell	*Lampsilis teres anodontoides* (Lea, 1831)				E	E		E
^Slough sandshell	*Lampsilis teres teres* (Rafinesque, 1820)				E			E
Fragile papershell	*Leptodea fragilis* (Rafinesque, 1820)							
#Scaleshell (TR)	*Leptodea leptodon* (Rafinesque, 1820)	1921	CS				SC	X
Black sandshell	*Ligumia recta* (Lamarck, 1819)			T		SC	SC	
Pondmussel	*Ligumia subrostrata* (Say, 1831)	1968						
Threehorn wartyback	*Obliquaria reflexa* Rafinesque, 1820							
Hickorynut	*Obovaria olivaria* (Rafinesque, 1820)					SC	SC	
Pink heelsplitter	*Potamilus alatus* (Say, 1817)							
#Fat pocketbook	*Potamilus capax* (Green, 1832)	1986	E	E			E	X
Pink papershell	*Potamilus ohiensis* (Rafinesque, 1820)							
Bleufer	*Potamilus purpuratus* (Lamarck, 1819)	1975						
Lilliput	*Toxolasma parvus* (Barnes, 1823)							
Fawnsfoot	*Truncilla donaciformis* (I. Lea, 1828)							
Deertoe	*Truncilla truncata* Rafinesque, 1820							
Ellipse (TR)	*Venustaconcha ellipsiformis* (Conrad, 1836)	1930			T	T		T

For more information on native mussels see: http://www.inhs.uiuc.edu/chf/pub/mussel_man/cover.html
http://www.umesc.usgs.gov/reports_publications/status_and_trends.html

Resource Monitoring Program." In the table, we have included all 51 species of mussels historically found in the UMRS. The conservation status of native mussels varies from state to state. Each state describes the status of a species population only within that particular state, not the UMRS as a whole. It is often difficult to interpret such a table because of the different definitions of the conservation status for each species and the variability in ranking procedures among the states.

Some species in Table 1 are not presently found in the UMRS mainstem. Species such as scaleshell and slippershell have usually been found in UMRS tributaries but only rarely in the UMRS itself. In 1913, upstream from Lock and Dam 19, mussel composition changed in part because some fishes that are obligatory hosts for mussels could not migrate past the dam. Other navigation dams built in the 1930's also affected mussels by changing the character of the river. The percent abundance of many mussel species has changed especially in pooled portions upstream of dams. For instance, the threeridge mussel is now the most abundant mussel species in the UMRS. The ebony shell (formerly composing 80% of the mussel fauna) and elephantear almost disappeared from the UMRS because populations of their primary host fish—the skipjack herring—declined sharply. Populations of other species such as the washboard, mapleleaf, flat floater, and lilliput mussels have increased in the pooled portions of the river.

Forty-four mussel species still exist in the UMRS proper and an additional 7 species survive in the immediate tributaries (within 100 miles of the UMRS). These include winged mapleleaf, snuffbox, ellipse shell, and cylindrical papershell. The UMRS and tributaries contain three species that are federally endangered (winged mapleleaf, Higgins eye, and fat pocketbook), and one species presently under federal review (scaleshell).

For further information, contact

Marian E. Havlik
Malacological Consultants
1603 Mississippi Street
La Crosse, Wisconsin 54601-4969
havlikme@aol.com
608-782-7958 (voice and fax)

Jennifer S. Sauer
USGS Upper Midwest Environmental Sciences Center
2630 Fanta Reed Rd.
La Crosse, Wisconsin 54603
608-783-7550 #64
jennie_sauer@usgs.gov

July 2000 **PSR 2000-04**

United States Department of the Interior
U.S. Geological Survey
Upper Midwest Environmental Sciences Center
2630 Fanta Reed Road
La Crosse, WI 54603
608/783-6451

BULK RATE
Postage and Fees Paid
U.S. Geological Survey
Permit No. G-790