



Status: State threatened

Global and state ranks: G4G5/S2S3

Family: Unionidae (Pearly mussels)

Synonyms: The slippershell mussel has also been known as *Alasmidonta calceolus* and *Alasmidonta minor* (NatureServe). It has been referred to commonly as the brook wedge mussel (Clarke 1981).

Total range: The slippershell mussel occurs from southern Ontario south to Alabama, and from South Dakota and Kansas east to New York, Virginia and North Carolina. In the Great Lakes Basin, it is found in the Lake Michigan, Lake Huron, Lake St. Clair and Lake Erie drainages. It is also present in the Mississippi River System from the Ohio River drainage to the Tennessee River drainage (Clarke 1981).

The slippershell mussel is listed as rare throughout much of its range. Although it is ranked as apparently secure (S4) in Kentucky, in Ontario and Tennessee it is considered vulnerable (S3). In Indiana, Illinois and Wisconsin, it is ranked as imperiled (S2), and in Iowa, Arkansas, Alabama, North Carolina, Virginia and New York, it is considered critically imperiled (S1). In Kansas, the slippershell mussel is presumed extirpated

(SX). The slippershell mussel is reported (SR) from South Dakota and remains unranked (S?) in Ohio and Missouri (NatureServe).

State distribution: In Michigan, the slippershell mussel is primarily found in the southwestern part of the state. Recent surveys have discovered live slippershell mussels in the Pine River in Gratiot County, the Looking Glass River in Clinton County, the Maple River and Shiawassee River in Shiawassee County, the Red Cedar River in Ingham County, and the St. Joseph River (Maumee River drainage) in Hillsdale County (Badra and Goforth 2001). Live slippershell were found in the Muskegon River drainage in Missaukee and Osceola Counties in the summer of 2002. The only other records currently known for slippershell mussels are of spent shells found in the Thornapple River in Eaton County, the Grand River in Ionia County, the Kalamazoo River in Allegan and Jackson Counties, and the St. Joseph River (Lake Michigan drainage) in Berrien, St. Joseph, and Branch Counties (Badra and Goforth 2002, Goforth et al. 2001).

Recognition: The slippershell mussel is a small mussel, usually around one and a half inches long. The posterior end of the shell is square while the anterior end is rounded. The ventral margin of the shell is straight. The shell is smooth, except for growth lines



and beak sculpturing of three to four ridges or loops. The exterior of the shell is yellowish-brown, marked with fine green rays.

Internally, the nacre of the slippershell mussel is white, often iridescent towards the posterior end of the shell. The cardinal teeth are triangular, with one in the right valve and two in the left valve. The lateral teeth are irregular and poorly developed.

In Michigan, the slippershell mussel could be confused with the elktoe. The elktoe has ribs on its posterior ridge.

Best survey time: Surveys for the slippershell mussel are best conducted in the summer when water levels are lowest and water clarity is high. Low water levels expose muskrat middens that often contain empty freshwater mussel shells. In rivers that are less than two feet deep, a glass-bottomed bucket is an efficient tool for finding live freshwater mussels. The slippershell mussel is often missed in surveys because of its small size and burrowing habit (Watters 1995).

Habitat: The slippershell mussel is typically found in creeks and headwaters of rivers, but has also been reported in larger rivers and in lakes (Clarke 1981). It usually occurs in sand or gravel substrate, but is occasionally found in mud (Clarke 1981). Suitable habitat for fish host species must be present in order for slippershell mussel reproduction to be successful.

Biology: Relatively little is known about the biology of the slippershell mussel. Like most freshwater mussels of the family Unionidae, the slippershell mussel requires a fish host to complete its life cycle. Sperm is released into the water, then taken in through the female's siphon for fertilization. Eggs develop into larvae within the female. The slippershell mussel is probably a long-term (bradyctictic) breeder, holding the larvae internally for about a year (Oesch 1984). These larvae, called glochidea, then are released into the water and must attach to a suitable fish host in order to survive. The fish hosts for the slippershell mussel include the johnny darter (*Etheostoma nigrum*) and the mottled sculpin (*Cottus bairdi*) (Clarke 1981). Glochidea typically remain on fish hosts for a couple of weeks to several months depending on mussel species and other factors, although duration for the slippershell is unknown. During this time the mussel transforms

into the adult form then drops from the host fish. The mussel then spends the remainder of its life in the substrate. The life span of the slippershell mussel is not known.

Like all freshwater mussels, the slippershell mussel is a filter feeder, obtaining nutrition by filtering particles, such as algae, zooplankton and debris, from the water column.

Conservation/Management: The slippershell mussel requires clear, clean water and substrates for survival. Therefore, any practices that lead to increased siltation and poor water quality will decrease the quality of the habitat of the slippershell. Pollution from agricultural runoff and alteration to waterways, including drain clean-outs and the construction of impoundments, increase siltation and alter the natural flow of the river.

Conservation of the slippershell mussel, as with other unionids, requires an approach that recognizes the interdependence of the different communities and habitats within ecosystems. The slippershell mussel cannot reproduce unless its fish host is present. Conservation efforts should aim to maintain the composition of associated fish communities, including fish habitat and food resources such as aquatic insects.

The zebra mussel (*Dreissena polymorpha*) and the Asian clam (*Corbicula fluminea*) are non-native mollusks from Eurasia that have spread quickly throughout the eastern U.S. While the Asian clam has few documented harmful effects on native mussels, the zebra mussel has had a dramatic effect on native mussel communities in habitats where it has been introduced. Zebra mussels require stable, hard substrates to attach to, and often, these substrates are native mussels. Native mussels are sometimes colonized with enough zebra mussels that they cannot reproduce or feed normally, effectively killing the native mussel. The continued range expansion of the zebra mussel into slippershell mussel habitat poses a serious threat to the long-term viability of this species.

Research needs: The historical and current range of the slippershell mussel needs to be determined in Michigan. A thorough review of literature and museum records needs to be completed to detail the historical distribution of the slippershell mussel in Michigan. Historical sites then need to be revisited to determine



the extent of populations still present. Finally, sites with potential habitat for the slippershell mussel need to be surveyed to determine any additional populations present in the state.

A better understanding of the relationship between surrounding land use, sediment, and freshwater mussel habitat quality is needed in order to ensure that slippershell mussel habitat quality is maintained or improved. Finally, methods for preventing or minimizing the spread of zebra mussels into slippershell mussel habitat are needed.

Related abstracts: White catspaw (*Epioblasma obliquata perobliqua*), Northern riffleshell (*Epioblasma torulosa rangiana*), Snuffbox (*Epioblasma triquetra*), Rayed bean (*Villosa fabalis*), Wavy-rayed lampmussel (*Lampsilis fasciola*), Round hickorynut (*Obovaria subrotunda*), Clubshell (*Pleurobema clava*).

Selected references:

- Badra, P.J. and R.R. Goforth. 2002. Surveys of native freshwater mussels in the lower reaches of Great Lakes tributary rivers in Michigan. Report for Michigan Department of Environmental Quality, Coastal Zone Management Unit. Michigan Natural Features Inventory Technical Report 2002-02.
- Badra, P.J. and R.R. Goforth. 2001. Surveys for the clubshell (*Pleurobema clava*) and other rare clams in Michigan: Final Report – 2000. Report for the U.S. Fish and Wildlife Service. Michigan Natural Features Inventory Technical Report 2001-07.
- Clarke, A.H. 1981. The freshwater mollusks of Canada. National Museum of Natural Sciences. Ottawa. 439 pp.
- Cummings, K.S. and C.A. Mayer. 1992. Field guide to freshwater mussels of the Midwest. Illinois Natural History Survey. Manual 5. 194 pp.
- Goforth, R.R., D.M. Stagliano, J.G. Cohen, M.R. Penskar, Y. Lee and J.L. Cooper. 2001. Biodiversity Analysis of Selected Riparian Ecosystems within a Fragmented Landscape. Report for Michigan Great Lakes Protection Fund and Michigan Dept. of Environmental Quality, Office of the Great Lakes. Michigan Natural Features Inventory report number 2001-06. 148 pp.

NatureServe Explorer: An online encyclopedia of life [web application]. 2001. Version 1.6 . Arlington, Virginia, USA: NatureServe. Available: <http://www.natureserve.org/explorer>. (Accessed: March 20, 2002).

Oesch, R.D. 1984. Missouri naiads: a guide to the mussels of Missouri. Conservation Commission of the State of Missouri. 270 pp.

Watters, G.T. 1995. A guide to the freshwater mussels of Ohio, 3rd Ed., Ohio Department of Natural Resources, Division of Wildlife. 122pp.

Abstract Citation: Carman, Stephanie M. 2002. Special Animal Abstract for *Alasmidonta viridis* (Slippershell mussel). Michigan Natural Features Inventory. Lansing, MI. 3 pp.

Updated April 2009.

Copyright 2002 MSU Board of Trustees.

MSU Extension is an affirmative-action, equal opportunity organization.

Funding for this abstract provided by Michigan Department of Natural Resources - Forest, Mineral, and Fire Management Division.

