



Status: State Endangered

Global and State Rank: G3/S1

Family: Unionidae (Freshwater Mussels)

Synonyms: The salamander mussel has also been known as as *Simpsoniconcha ambigua* (NatureServe). It is also commonly called Simpson’s shell, mudpuppy mussel or smooth minishell (Cummings and Mayer 1992, Clarke 1981).

Total Range: The salamander mussel is found in North America from Ontario south to Tennessee. It is found in the Great Lakes Basin in the Lake St. Clair, Lake Huron and Lake Erie drainages. The salamander mussel is also found in the Ohio River system, the Cumberland River system and the upper Mississippi River system (Clarke 1981, NatureServe).

The salamander mussel is globally ranked as G3 because while it is widely distributed and abundant in some areas, it is rare throughout most of its range. In Ohio, Indiana, Kentucky, Minnesota and Wisconsin, the species is considered to be imperiled (S2). In Ontario, Michigan, Illinois, Missouri, Arkansas, West Virginia and Pennsylvania, it is considered critically imperiled (S1). In Iowa and New York, it is considered presumed

extirpated (SX) and possibly extirpated (SH), respectively. The conservation rank of the salamander mussel is currently under review in Tennessee (NatureServe).

State Distribution: The salamander mussel has historically been found at several sites in southeastern Michigan. In the 1930’s, specimens were found in the Tiffin River in Lenawee County, La Plaisance Bay in Monroe County and near Belle Isle in Wayne County. Since this time, only spent shells have been found in the Black River in Sanillac County, the Pine River in St. Clair County, near Belle Isle in Wayne County and in Macon Creek in Monroe County.

Recognition: The salamander mussel has a small, thin elliptical shell. In general, the shell is about 2 inches (42 mm) long and about 1 inch high (20 mm). The anterior and posterior are rounded, and the dorsal and ventral margins are parallel. The shell is smooth and dull. It is yellow-tan to dark brown and lacks rays. The beak of the salamander mussel is sharp and pointed forward, and it is closer to the anterior than posterior. The beak sculpture consists of three to five parallel double-looped bars.

Internally, the nacre is bluish white and iridescent. The hinge teeth are incomplete and irregular, and only one



pseudocardinal tooth is present in each valve. Lateral teeth are usually absent.

The salamander mussel is most similar to the rayed bean (*Villosa fabalis*) and purple liliput (*Toxolasma lividus*). The upwardly bowed ventral margin of the salamander mussel distinguishes it from both these mussel species.

Best Survey Time: While the salamander mussel is present in its habitat throughout the year, it may be easiest to find these mussels July through September, when water levels are typically low and turbidity may be reduced.

Habitat: The salamander mussel is found in medium to large rivers and lakes. It is usually found in silt or sand under flat stones. Although this mussel is rare, it is usually abundant in patches. Its presence is usually linked to that of the mudpuppy (*Necturus maculosus*), its host (NatureServe, Cummings and Mayer 1992, Clarke 1981).

Biology: Little is known of the biology of the salamander mussel. The sexes are separate, and fertilization is internal. Males broadcast sperm and females take in the sperm through their siphon. The eggs develop in the female into glochidia, the parasitic larval stage of mussels. In the spring or summer, these are released by the female, and attach to the gills of the mudpuppy. The salamander mussel is the only freshwater mussel with a non-fish host (Clarke 1981). After metamorphosis, the young mussels drop to the substrate, where they spend the remainder of their lives buried in the substrate.

The salamander mussel is a filter feeder, obtaining nutrition from material suspended in the water column.

Conservation/Management: Like most mussels, the salamander mussel is sensitive to river impoundment, siltation and channel disturbance. Pollution from point (industrial and residential discharge) and non-point (siltation, herbicide and surface run-off) sources is also a great threat to mussels and should be limited. It is essential to not only protect the habitat of the salamander mussel, but also mudpuppies, as they serve as hosts for the glochidia.

Research Needs: Little is known of the life history and habitat of the salamander mussel. Studies need to be completed to more definitively describe the biology and substrate and water quality preferences of this species. Additionally, a thorough survey needs to be completed to determine the current distribution of this species in Michigan. Historical sites need to be revisited to determine the extent of populations present.

Selected References:

- Burch, J.B. 1994 Mollusks: Species Accounts. Pages 395-410 in D.C. Evers, ed. Endangered and Threatened Wildlife of Michigan. University of Michigan Press, Ann Arbor, MI
- Clarke, A.H. 1981. The freshwater molluscs 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.
- NatureServe: An online encyclopedia of life [web application]. 2001. Version 1.6. Arlington, Virginia, USA: Association for Biodiversity Information. Available: <http://www.natureserve.org/>. (Accessed: February 22, 2002)

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