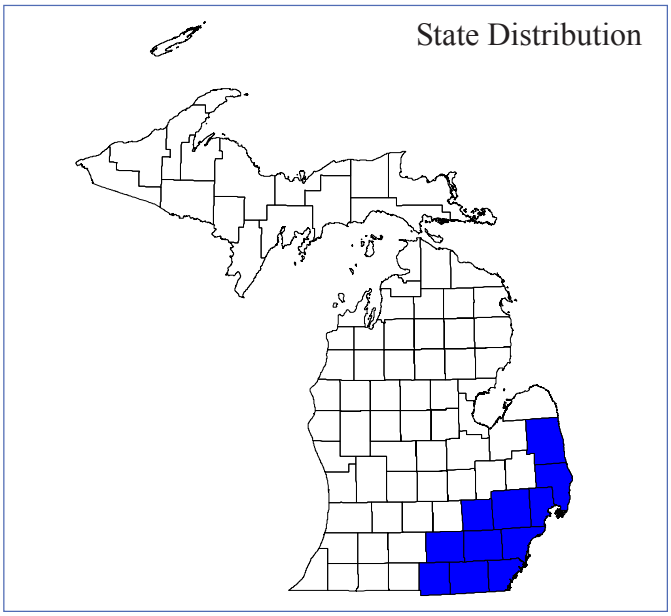
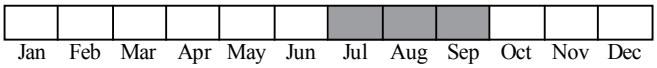
Lampsilis fasciola Rafinesque — Wavy-rayed Lampmussel

Photo by Kevin Cummings,
Illinois Natural History Survey



Best Survey Period



Status: State threatened

Global and State Rank: G4/S2

Family: Unionidae (Pearly Mussels)

Synonyms: *Ligumia fasciola*

Other Common Names: wavy-lined lampmussel

Total Range: The wavy-rayed lampmussel is discontinuously distributed in the Great Lakes tributaries of Lake Michigan, Lake Erie, Lake Huron, Lake St. Clair, and the Ohio-Mississippi and Tennessee drainage. While it was historically found frequently from Ontario to Alabama and Illinois to New York, its populations are currently declining (Watters 1993). It is seldom a common species where found, and peripheral populations are endangered. It is listed as critically imperiled in New York, Ontario, North Carolina and Alabama. It is also considered threatened in Michigan, Illinois, Indiana and Georgia (Nature Serve 2001). Populations are relatively stable in Kentucky, Tennessee and Virginia where they are reported to be more abundant within the mussel communities (S. Ahlstedt, personal communication).

State Distribution: Historically, the wavy-rayed lampmussel was found throughout southeastern Michigan streams and rivers. It is currently present in the Clinton River drainage in Macomb and Oakland Counties, the St. Joseph River in Hillsdale County, the Belle River in St. Clair County, the Huron River drainage in Washtenaw County and the River Raisin drainage in Jackson, Lenawee, and Washtenaw Counties. It was recently reported in the South Branch of the Kalamazoo River in Jackson County. Belle Isle and the Detroit River in Wayne County have historical occurances, but it is doubtful that they are still extant in these places. River Raisin records from Monroe County may also be outdated and new surveys are needed to verify these occurances.

Recognition: The wavy-rayed lampmussel has a rounded to ovate, moderately thick shell and is usually under 3.5 inches in length (7.5 cm). The shell is compressed to inflated (females) in shape. Shell color ranges from yellow to yellowish green with numerous thin wavy green rays. Anterior end is rounded, with the posterior bluntly pointed in males and rounded in females. The umbo is slightly elevated above the hinge line, and the beak sculture consists of 3-5 indistinct wavy ridges. The nacre is white, often iridescent posteriorly (Cummings 1992, Watters 1993, Burch 1994). Most similar to the plain pocketbook, *Lampsilis ventricosa,* but that species is less ovate, has highly

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protruding umbos, a heavier hinge and green rays that are broader and straighter with fewer interruptions. The plain pocketbook also grows much larger in size (to 6 inches).

Best Survey Time: The wavy-rayed lampmussel is typically found in shallow, gravel riffle areas throughout the year, but it is easiest to find these mussels July through September when water and turbidity levels are typically low.

Habitat: The wavy-rayed lampmussel occurs in small-medium sized shallow streams, in and near riffles, with good current. It rarely occurs in medium rivers. The substrate preference is sand and/or gravel (Watters 1993).

Biology: Males and females are dimorphic. The breeding season of the wavy-rayed mussel is long-term, extending from early-August to the following July. Males release sperm into the water column and females siphon in the sperm by chance to fertilize awaiting eggs in brood pouches. Females can produce >100,000 eggs in a spawning season (Clarke 1981). Successful fertilization depends on males and females living in close proximity. Females are reported to hold glochidia (the parasitic larval stage of mussels) internally over winter for release through pores of their marsupial gills in the spring and summer. This release of glochidia coincides with host fish appearing in the shallow riffles (Zale and Neves 1982). To increase their effectiveness in parasitizing fish with their glochidia, wavy-rayed lampmussels, as well as other species in the Lampsilinae, attract predatory fish to their marsupial gills with a minnow-like mantle flap (Kreamer 1970). When fish approach and bite at the minnow lure, glochidia are released to infect the gills. *Lampsilis fasciola* glochidia resemble small purses without spines (0.24mm long and 0.29mm in height) (Clarke 1981). The single fish host of the wavy-rayed lampmussel is reported to be the smallmouth bass, *Micropterus dolomieu* (Zale and Neves 1982, Watters 1993). During a study to identify potential host fish species, most innoculated non-host fish sloughed off the glochidia within 2-6 days (Zale and Neves 1982). Wavy-rayed lampmussel glochidia underwent metamorphosis on infected smallmouth bass in 30-47 days and 666 juveniles were recovered (Zale and Neves 1982). After completing the parasitic stage, juvenile wavy-rayed lampmussels drop from the host and grow relatively sessile within gravel substrate on the river bottom, probably not moving more that 100 meters in a lifetime. At this stage juveniles are vulnerable to predation by crustaceans, worms and other bottom feeders. Later in life, adult mussels are eaten by turtles, otters, fish, raccoons and primarily muskrats. The lifespan of the wavy-rayed mussel is not known. Like all mussels, the wavy-rayed lampmussel is a filter feeder, siphoning water and extracting particulate organic matter, algae and diatoms from the river currents.

Conservation/Management: Conservation of the watersheds surrounding the streams that the wavy-rayed mussel inhabits is essential for its protection. Like most mussels, the wavy-rayed lampmussel is sensitive to river impoundment, siltation and channel disturbance. Because they prefer riffles and shallow areas with moderate flow and high oxygen content, they are often the first to be affected by 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. Non-point source pollutants have been the primary reason for population declines in the Midwest. Watters (1993) reported that this species now occurs only in clean streams in Ohio, such as Big Darby Creek. Because of the critical link to the fish host (smallmouth bass) for propagation, the ability to maintain good populations of the fish fauna in the streams inhabited by this mussel is as crucial as suitable habitat.

Photo by David Stagliano, MNFI

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Research Needs: A thorough survey needs to be completed to determine the current distribution of this species in Michigan and throughout its range. A new occurrence was reported in 2000 from a watershed not previously reported to contain this species (Stagliano 2000). Thus, systematic surveys may turn up new populations that are not currently known. In order to better protect and manage current populations, life history data, and more thorough fish host relationships need to be evaluated.

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