Natural Heritage &
Endangered Species
Program

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MASSACHUSETTS ENDANGERED WILDLIFE

Dwarf Wedge Mussel
(Alasmidonta heterodon)

DESCRIPTION: The Dwarf Wedge Mussel, sometimes referred to as the Inverted Floater or Ancient Floater, belongs to the family Unionidae and is the only freshwater mussel in North America which has two lateral hinge teeth on the right valve and one on the left valve. It is also a small mussel, generally about 45 mm (1.8 inches) long, 25 mm (1 inch) high and 16 mm (0.64 inches) wide; the Dwarf Wedge Mussel reaches a maximum length of 56.5 mm (2.2 inches). Its external shell is yellowish brown, olive brown, or blackish brown in color. In general, the shell is subtrapezoidal or subrhomboidal in outline, with a thickness of 1 mm (0.04 inches), a roundly pointed posterior end, and concentric lines or rings made of calcium carbonate (which is secreted by the mussel as it grows). The Dwarf Wedge Mussel is sexually dimorphic: male shells are more ovate, compressed, and elongate, while female shells are shorter and inflated or swollen at the posterior end in order to accomodate the egg-bearing gills.

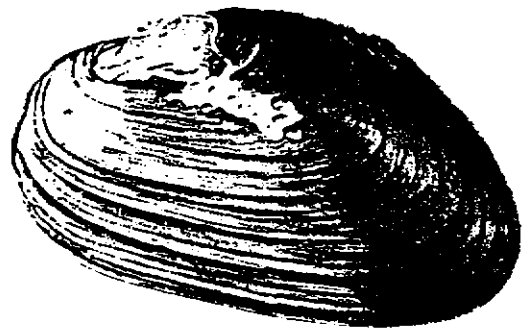
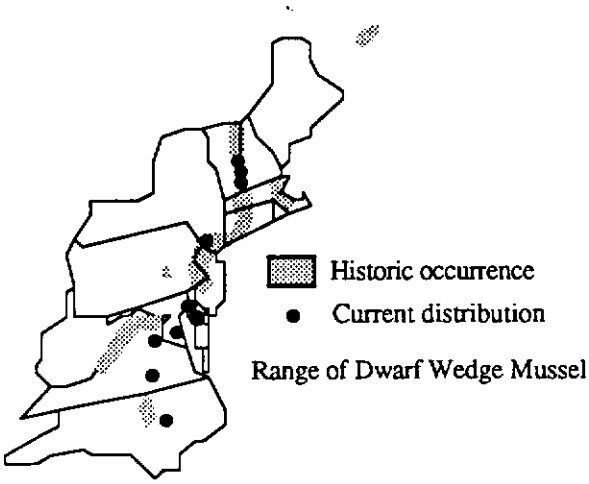
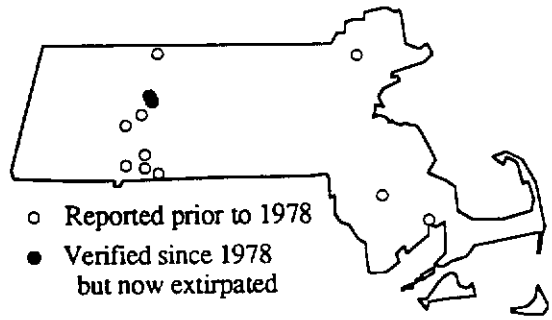


Illustration from A.H. Clarke. Smithsonian Contributions to Zoology # 326 1981.

SIMILAR SPECIES IN MASSACHUSETTS: The genus Alasmidonta is represented in Massachusetts by three species; however, neither of the other two are very similar to Alasmidonta heterodon. Small specimens of Strophitus undulatus and Elliptio complanata may superficially resemble A. heterodon. However, the Dwarf Wedge Mussel can be externally distinguished from all other mussel species by its small size, coupled with its roundly pointed posterior-basal margin, medium inflation, and dark, typically unrayed periostracum (shell covering).



Range of Dwarf Wedge Mussel



Massachusetts Distribution by Town

RANGE: The Dwarf Wedge Mussel was at one time widely distributed in large rivers along the Atlantic Slope region, from New Brunswick south to North Carolina; it was documented at 70 localities in 11 states and one Canadian province. Today, the Dwarf Wedge Mussel's range is very discontinuous, and it has been documented in only six states: New Hampshire, Vermont, New York, Maryland, Virginia and North Carolina.

HABITAT IN MASSACHUSETTS: The Dwarf Wedge Mussel inhabits well-oxygenated streams and rivers with sand, muddy sand, and gravel bottoms, slow to moderate currents, and little silt deposition; it is never found in still waters. Other mussel species often present in the same habitat are the Eastern Elliptio (Elliptio complanata) and the Squawfoot (Strophitis undulatus). In Massachusetts, Dwarf Wedge Mussels were once found in the Connecticut, Westfield, Agawam, Mill, Fort, Canoe, Scantic and Merrimack Rivers. No specimens have been documented anywhere in the state since 1983, so the species may be extirpated from Massachusetts.

LIFE CYCLE: Dwarf Wedge Mussels are bradytictic (long-term breeders); female mussels retain developing larvae in their gills throughout the year, except for mid to late summer, when reproduction occurs. Male mussels release their sperm into the river water; some of the sperm will enter the female mussels through openings in the shell and fertilize the eggs. Eggs are deposited into the gills of the female parent and are brooded until the following spring.

As with all other North American species of freshwater mussels, Alasmidonta heterodon produces glochidia larvae, which are obligate fish parasites during their early development. Once the eggs hatch in spring, the glochidia are released to seek out suitable fish hosts to complete their transformation into juvenile mussels, a process that takes 3 to 12 weeks. The host fish for this mussel is unknown, but research on this problem is now underway. It is possible that the glochidia larvae utilize multiple host species.

The Dwarf Wedge Mussel burrows through the mud or sand at the river bottom by alternately contracting and extending its muscular, tongue-like foot. It feeds by drawing in water through two openings in the rear of the shell and using its gills to strain out microorganisms and other food particles from the water.

POPULATION STATUS IN MASSACHUSETTS: The Dwarf Wedge Mussel is listed as an Endangered Species at both the state and federal levels; it is considered to be the most endangered mollusk within Massachusetts. In fact, it is uncertain if the species is still found in the state; the last observed population was seen in 1983 and was extirpated by 1988. The Dwarf Wedge Mussel has declined precipitously throughout its range since the mid-1800's as a result of habitat destruction through damming, channeling, stream flow regulation, and siltation resulting from streamside construction of roads, bridges, and rip-rap. Water pollution has also taken a great toll; Dwarf Wedge Mussels are thought to be vulnerable to chlorine, phosphorus (a common pollutant from paper mills and used irrigation water), heavy metals (which accumulate in their bodies) and other substances. A small oil spill eliminated the entire population of A. heterodon in the Mill River in Northampton.

Improvement and maintenance of water quality where this species occurs is critical to prevent its extirpation in Massachusetts. More survey work is needed to search for new occurrences and to monitor water quality. Any habitat in Massachusetts found to contain this species should be immediately protected.