

**STATE
THREATENED**

Tidewater Mucket

(*Leptodea ochracea*)



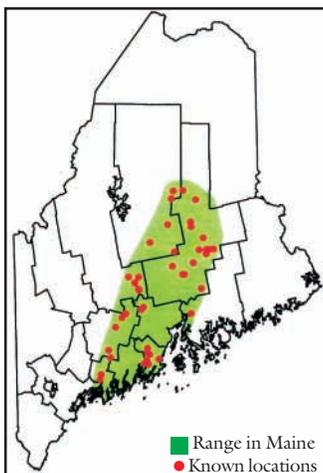
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Description

The tidewater mucket is a medium-sized (usually less than 3-inch) freshwater mussel that superficially resembles a marine clam. Its shell is rounded or oval in outline, and is usually yellowish or greenish-brown tinged with bronze or reddish-yellow. Fine green rays are sometimes evident, especially in younger specimens. The nacre, or pearly lining of the inside of the shell, is translucent pinkish or salmon color. This species can be confused with the yellow lampmussel, which is of similar shape and coloration but lacks the bronze tinge. The structure and placement of the hinge teeth, plus color of the nacre, help to distinguish these two rare species. (For more detailed information on identification, see MDIFW's book, *The Freshwater Mussels of Maine*.)

Range and Habitat

The tidewater mucket is found in Atlantic coastal drainages from Georgia to Nova Scotia. In Maine it is known only from Merrymeeting Bay, and the Penobscot, St. George, lower Kennebec, and lower Androscoggin River watersheds. Its distribution is very similar to that of the yellow lampmussel, and they are often found together.



Despite its name, the tidewater mucket can be found quite far inland – as far north as Millinocket Lake in the Mt. Katahdin region.

This species prefers coastal lakes, ponds, and slow-moving portions of rivers, and will tolerate impoundments. It occurs in a variety of bottom types, including silt, sand, gravel, cobble, and occasionally clay.

Life History and Ecology

Freshwater mussels have a curious way of reproducing that depends on the presence of fish. The tidewater mucket breeds in late summer, when males release sperm into the water and females filter it out of the water with their gills. Once the eggs are fertilized, females brood the growing larvae, called glochidia, in a modified portion of their gills called a marsupium.

The following spring, each larvae-bearing female releases thousands of mature glochidia. At this stage, glochidia require fish hosts to transform into the subadult form of a mussel. They can only survive for a short time on their own and must quickly encounter a suitable host fish. They then attach to the fish's fins or gills (without apparent harm to the fish) for a period of weeks or months before transforming into a tiny mussel and dropping off to settle in the bottom. Each mussel species requires one or more fish species to serve as suitable hosts. Currently, the host fish for the tidewater mucket is unknown. Because of the mussel's coastal distribution, it seems likely that at least one of its hosts is an anadromous fish (which migrates from salt to fresh water to reproduce). However, in the upper Penobscot River watershed there are no anadromous fish, and other species must serve as hosts.

Freshwater mussels grow rapidly during their first 4-6 years of life, before they become reproductively mature. Longevity of the tidewater mucket is likely 15 years or more. Mussels continually filter vast quantities of water and consume bacteria, algae, and plant and animal debris. They burrow into the bottom and anchor themselves with a muscular foot. They have a limited ability to move slowly around the lake or river bottom to find the best sites for feeding and reproducing. Mussels are an important food item for some aquatic mammals, especially otters, muskrats, and raccoons, as evidenced by piles of shells (middens) often seen along shorelines.

Threats

Freshwater mussels are the most endangered group of animals in North America. Of the nearly 300 species native to North America, approximately 75 percent are state or federally listed as endangered, threatened, possibly warranting listing status, or already extinct. Their population declines are the result of more than a century of industrialization and development of our waterways, causing alteration and loss of habitat and degradation of water quality.

The tidewater mucket has declined throughout its range and has been extirpated from many rivers in the Northeast. The specific reasons for its decline are unknown, but probably reflect the cumulative effects of habitat degradation and pollution. Unlike many species of mussels, however, the tidewater mucket does seem able to survive in impoundments.

Another serious threat to native mussels is the exotic zebra mussel, which was accidentally introduced to the Great Lakes and is spreading across North America. It carpets the bottom of lakes and rivers, and out-competes native mussels for space and food. Although it has not been found in Maine, the zebra mussel could represent a major threat to tidewater mucket populations if introduced here. The largest population of tidewater muckets known in the Northeast, located in the lower Hudson River, was nearly eliminated by the zebra mussel.

Conservation and Management

Population declines have been documented for the tidewater mucket throughout much of its range, prompting many states to add it to their lists of endangered and threatened species. In 1997, the species was listed as threatened in Maine. It is known from only four watersheds in the state, and is usually only found in low numbers at most sites.

Conservation of mussels requires identification and protection of their habitats, and suitable populations of their fish hosts. MDIFW completed a seven-year survey of the state's freshwater mussels in the 1990s. Populations of tidewater muckets are well documented and information is being provided to towns, land trusts, and lake and watershed associations. In 2001, research was initiated at the University of Maine to document the fish host(s), population size and structure, and genetic uniqueness of populations. Monitoring is needed to assess population trends, and additional life history studies are needed to learn more about the species' habitat requirements, reproduction, and interaction with fish host populations.

Maine has some of the largest remaining populations of tidewater muckets in the East, and will play an important role in the species' conservation. Protection of clean, unaltered, forested watersheds and associated forested riparian areas is necessary for the long-term existence of this species. The tidewater mucket shares much of its habitat in Maine with the yellow lampmussel (threatened), shortnose sturgeon (federally threatened), Atlantic salmon (federally endangered), and other rare species like the brook floater (mussel), wood turtle, and New England

bluet (damselfly). Adhering to state wetland and Shoreland Zoning laws and water quality Best Management Practices contributes greatly to maintaining the quality of aquatic habitats for this species. Shoreland zoning and LURC zoning standards provide protection of habitat up to 250 feet from larger rivers. Some forest companies voluntarily extend the conservation of intact, forested riparian zones to 330-600 feet for larger rivers.

Recommendations:

- ✓ Prior to land development or forest harvesting near waterways providing habitat for threatened and endangered species, consult with a biologist from MDIFW to assist with planning.
- ✓ Municipalities should strive to maintain areas adjacent to waterways providing habitat for rare mussels in a low-density, rural setting and identify these areas in comprehensive plans. Consider protecting waterways and a 250-foot upland buffer as Resource Protection Districts.
- ✓ Use voluntary agreements, conservation easements, conservation tax abatements and incentives, and acquisition to protect important habitat for threatened and endangered species.
- ✓ Follow Shoreland Zoning and LURC standards.
- ✓ To preserve water quality and river functions, maintain contiguous, forested riparian habitats at least 250 feet from waterways providing habitat for threatened and endangered species.
- ✓ Avoid placing roads, houses, yards, and other developments within 250 feet of waterways providing habitat for threatened and endangered species.
- ✓ When projects are proposed within 250 feet of waterways providing habitat for endangered or threatened species, adhere to forestry Best Management Practices (handbook available from the Maine Forest Service, SHS #22, Augusta, ME 04333) and Maine Erosion and Sediment Control Recommendations (available from the Maine Department of Environmental Protection, SHS #17, Augusta, ME 04333).
- ✓ Avoid road crossings or use of heavy equipment in streams or rivers.
- ✓ Avoid stream alteration projects (water withdrawals, dredging, rip-rap, channelization, pipeline crossings, dams) that would alter flow or remove natural stream features such as riffles and pools.
- ✓ Avoid the use of broad-spectrum pesticides within ¼ mile of waterways providing habitat for threatened and endangered species.
- ✓ To maintain or improve water quality, conduct thorough reviews of dam and wastewater discharge proposals. Avoid land uses that would contribute to non-point sources of pollution.
- ✓ It is illegal to introduce fish species. Such introductions could alter aquatic invertebrate communities and affect host fish populations. 🐝