



Natural Heritage & Endangered Species Program

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Massachusetts Division of Fisheries & Wildlife

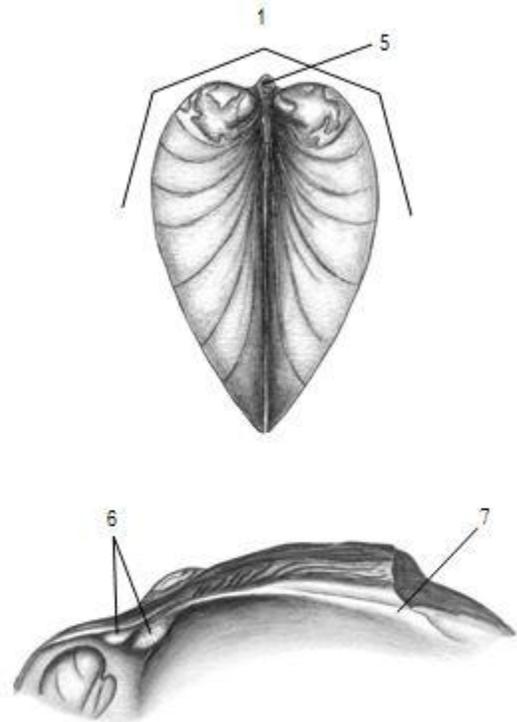
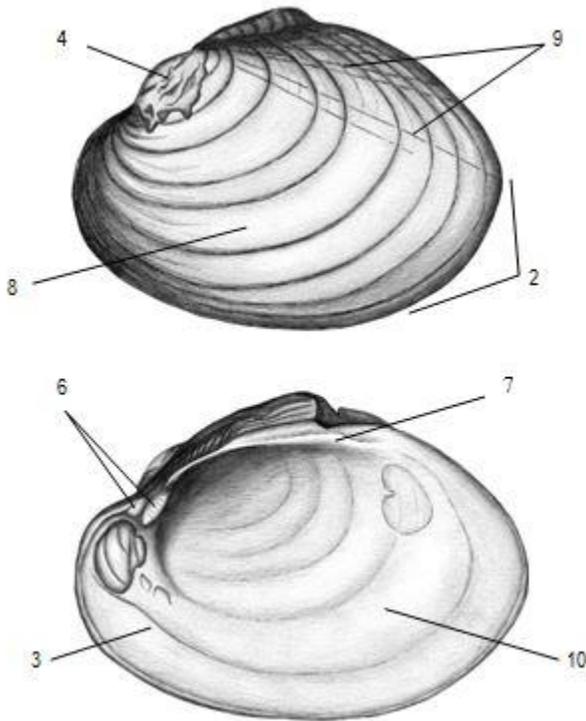
Yellow Lampmussel *Lampsilis cariosa*

State Status: **Endangered**
Federal Status: **None**

DESCRIPTION: The Yellow Lampmussel is a medium-sized to large mussel that is usually less than 5.25 inches (134 mm) in length. The shape is ovate and the shells are laterally inflated (1). Shells of sexually mature females are usually more rounded toward the posterior ventral margin (2), and thus more distinctly oval-shaped, than males or adolescent females. The shells are thick and very strong, particularly toward the anterior end (3). Beaks (4) are prominent and raised above the hinge line (5). Pseudocardinal teeth are well developed; the left valve has two and the right valve has two or three (6). Pseudocardinal teeth are usually stout, with distinct striations on the surface, and are located nearly directly under the beak. Lateral teeth are also well

developed; the left valve has two and the right valve has its luster and become darker with age. Most individuals (particularly young ones) have faint green rays (9) on the periostracum, especially toward the dorsal-posterior portion of the shell. The nacre (10) is usually white or bluish-white.

SIMILAR SPECIES IN MASSACHUSETTS: It is often very difficult to distinguish this species from the Tidewater Mucket, especially for the novice. Compared to the Tidewater Mucket, the Yellow Lampmussel is larger, it has a thicker shell, and it has more robust hinge teeth. Its shell is much more shiny and yellow than the shell of the Tidewater Mucket. The nacre of the Yellow



Illustrations by Ethan Nedean

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Lampmussel is white or bluish-white, whereas it is usually pinkish or salmon-colored in the Tidewater Mucket. Other differences are described in Nedeau et al. 2000 and Nedeau 2008. The only place in Massachusetts where these two species overlap is the Connecticut River.

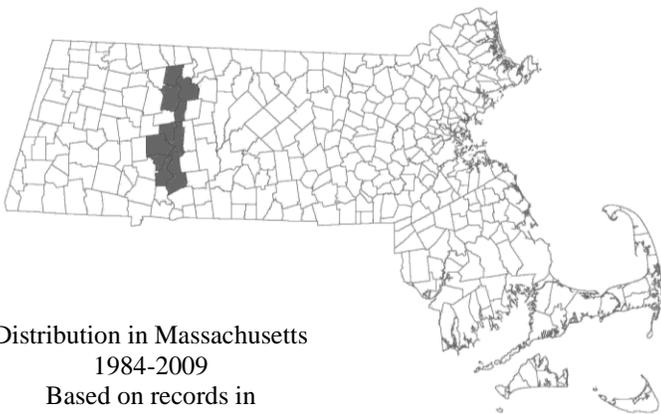
RANGE: The Yellow Lampmussel is distributed throughout the Atlantic coastal watersheds from Georgia to Nova Scotia and Cape Breton Island. Its range in New England is confined to only four major watersheds: the Connecticut River, Kennebec River, Saint George River, one (7). The periostracum (8) of young healthy specimens is often a bright shiny yellow, but may lose and Penobscot River, with the latter three all in Maine (Nedeau et al. 2000, Nedeau 2008). The Yellow Lampmussel occurs in the Connecticut River in Connecticut and Massachusetts.

HABITAT: Within the limited range of the Yellow Lampmussel in the Connecticut River, it has been found in shallow sandbars less than three feet deep and in areas more than 30 feet deep, usually in slow to moderate flow conditions. Studies conducted in 2005 in the Connecticut River found that it was more abundant in shallow sandbars than it was in nearby areas that were deeper and had a rocky or muddy substrate. In contrast, the other two species consistently found with it—the Eastern Elliptio and Alewife Floater—were more common in nearby deeper rockier habitats and in muddy habitats near banks. Outside of the Connecticut River watershed, the Yellow Lampmussel has been found in medium to large rivers and lakes, including free-flowing rivers with

rocky substrates and a mussel fauna more characteristic of smaller rivers (Strayer and Fetterman 1999, Nedeau et al. 2000). For example, it was found alongside the Eastern Pearlshell, Brook Floater, Creeper, and Triangle Floater in several rivers in Maine (Nedeau et al. 2000). Thus, the limited range of habitats that the Yellow Lampmussel occupies in Massachusetts is uncharacteristic for the species and may be the result of historic pollution, loss of habitat, or perhaps natural limiting factors.

BIOLOGY: Yellow Lampmussels are essentially sedentary filter feeders that spend most of their lives partially burrowed into the bottoms of rivers and streams. Like all freshwater mussels, larvae (called glochidia) of the Yellow Lampmussel must attach to the gills or fins of a vertebrate host to develop into juveniles. Spawning females have a mantle margin with bright pigmentation, a swollen appearance, and fleshy lobes that are used to lure host fish toward them. A dark “eyespot” near the inhalent aperture makes the display look even more fish-like. Wick (2003) found that females displayed their mantle lure actively at night and postulated that this was an adaptation to take advantage of piscivorous fish that move into shallow areas to feed at night. Their reliance on the visual acuity of their fish hosts also indicates the potential importance of turbidity in interfering with reproduction. White Perch and Yellow Perch may be the primary hosts, but recent studies in Maine have identified the following potential hosts: Banded Killifish, Chain Pickerel, White Sucker, Smallmouth Bass, and Largemouth Bass (Kneeland and Rhymer 2008). The Striped Bass is closely related to the White Perch (in the genus *Morone*) and has made a recent resurgence in the Connecticut River. If the Striped Bass is a host, it is possible that the recent range expansion of the Yellow Lampmussel in the Connecticut River, particularly the discovery of young Yellow Lampmussels in Connecticut, is related to the resurgence of the Striped Bass.

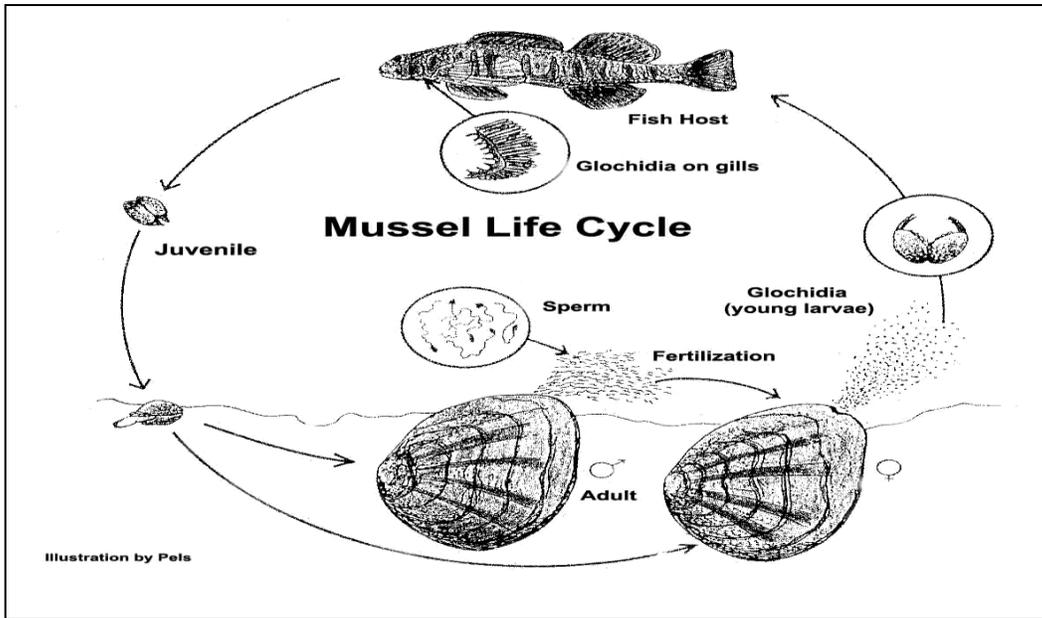
POPULATION STATUS IN MASSACHUSETTS: The Yellow Lampmussel is listed as Endangered in Massachusetts. For several years, biologists thought it had been eliminated from the mainstem Connecticut River. Since then, exhaustive surveys in the Connecticut River have documented fairly large populations. The sizes and shell condition of the more than 300 animals that have been observed in the last few years indicate that the species is successfully reproducing. More



Distribution in Massachusetts
1984-2009
Based on records in
Natural Heritage Database

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animals are now being encountered outside of the core range and these tend to be younger animals; this suggests that new recruits are now dispersing into new areas. For example, the Yellow Lampmussel was not observed in Connecticut for more than 75 years but at least three young animals were discovered in 2006 (Nedeau 2008). There is reason to be optimistic about the potential for recovery of the Yellow Lampmussel in the Connecticut River. Nevertheless, it will remain critically imperiled in coming decades because it exists in a relatively small area and it is vulnerable to catastrophic events.

THREATS: Because Yellow Lampmussels are essentially sedentary filter feeders, they are unable to flee from degraded environments and are vulnerable to the alterations of water bodies. Primary threats to the mainstem Connecticut River where the Yellow Lampmussel occurs include bank erosion and sedimentation, pollution (especially stormwater runoff and combined sewer overflows), alteration of natural flow regimes, encroachment of river corridors by development, habitat fragmentation caused by dams, and a legacy of land use that has greatly altered the natural dynamics of river corridors (Nedeau 2008). In addition, the long-term effects of regional or global problems such as acidic precipitation, mercury, and climate change are considered severe but little empirical data relates these stressors to mussel populations.

CONSERVATION AND MANAGEMENT RECOMMENDATIONS:

Discovery and protection of viable mussel populations is critical for the long-term conservation of freshwater mussels. Currently, much of the available mussel occurrence data are the result of limited presence/absence surveys. In addition, regulatory protection under MESA only applies to rare species occurrences that are less than 25 years old. Surveys are critically needed to monitor areas of the Connecticut River where Yellow Lampmussels are known to occur, evaluate habitat, locate new populations, and assess population viability so that conservation and restoration efforts, as well as regulatory protection, can be effectively targeted. A better understanding of host fish relationships for the Yellow Lampmussel is needed; this information might help guide fisheries management at the fishways located at the major hydropower dams in the lower Connecticut River and its principal tributaries. The NHESP has produced *Freshwater Mussel Habitat Assessment and Survey Guidelines* and has been working with qualified experts to conduct surveys. Other conservation and management recommendations include:

- Maintain or restore naturally variable river flow;
- Identify, mitigate, or eliminate sources of pollution to water bodies;

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- Addressing the problems of combined sewer overflows and the other effects of urban, industrial, and agricultural runoff in the Connecticut River;
- Identify host fish and encourage the dispersal of these fish in the Connecticut River and its major tributaries;
- Maintain adequate vegetated riparian buffer along river;
- Understand and mitigate the effects of shoreline development, bank stabilization, docks and marinas, bridge maintenance, and other projects that might threaten Yellow Lampmussels.

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