



## Natural Heritage & Endangered Species Program

[www.mass.gov/nhesp](http://www.mass.gov/nhesp)

Massachusetts Division of Fisheries & Wildlife

## Eastern Lampmussel *Lampsilis radiata*

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

**SPECIES DESCRIPTION:** Eastern Lampmussel (*Lampsilis radiata radiata* Gmelin, 1791) is a medium- to large-bodied mussel that rarely exceeds 5 inches in length. Shells are either subovate to subelliptical in shape. Shells are thick and valves may range in degree of inflation. Ventral-posterior end of mature females is typically broadly rounded, and females may be more ovate and inflated than males. However, some females are difficult to distinguish from males. Anterior end is rounded, and the posterior slope is broad. The beaks are not prominently raised above a slightly curved hinge line. The nacre is typically white, but may be pink or salmon too. The periostracum ranges from yellowish green (often in younger animals) to brown with numerous green or black rays. Left valves have two straight lateral teeth and two pseudocardinal teeth. The right valve has two pseudocardinal teeth and a single straight lateral tooth (Smith 1991, Bogan 2002, Nedeau 2008).

Reproduction occurs in late summer to early fall and females may be found brooding viable glochidia year round. Brooding females possess a swollen and pigmented area of the mantle immediately anterior to the

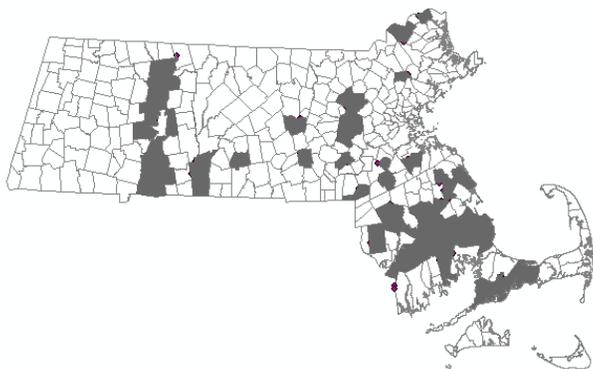


Figure 1: Massachusetts Towns with Recent or Historic Occurrences of Eastern Lampmussel



Figure 2: Female Eastern Lampmussel with characteristic rays. Photo: Peter Hazelton, MA NHESP

siphon apertures, combined with two fleshy appendages used to lure host fish closer for infection. Glochidia are rounded (C or D shaped) and lack prominent hooks. Reported host fish include: Yellow Perch (*Perca flavescens*), Largemouth Bass (*Micropterus salmoides*), Smallmouth Bass (*Micropterus dolomeiu*), Black Crappie (*Pomoxis nigromaculatus*), Rock Bass (*Ambloplites rupestris*) and Pumpkinseed (*Lepomis gibbosus*). However, rates of metamorphosis have not been reported for many of these species (Bogan 2002, Kneeland and Rhymer 2008, Nedeau 2008, NatureServe 2015).

**DISTRIBUTION AND ABUNDANCE:** Eastern Lampmussel is an Atlantic-slope endemic species, ranging from the Pee Dee River in North Carolina to the St. Lawrence River Basin, and extends as far west as Lake Ontario. In the United States, the state rank (S-rank) of Eastern Lampmussel is listed as under review (SU: Connecticut, Maryland), unranked (SNR: Maine, Washington DC, and Vermont), secure (S5: Vermont)

**A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan**

### Massachusetts Division of Fisheries & Wildlife

1 Rabbit Hill Rd., Westborough, MA; tel: 508-389-6300; fax: 508-389-7890; [www.mass.gov/dfw](http://www.mass.gov/dfw)

Please allow the Natural Heritage & Endangered Species Program to continue to conserve the biodiversity of Massachusetts with a contribution for 'endangered wildlife conservation' on your state income tax form, as these donations comprise a significant portion of our operating budget.

[www.mass.gov/nhesp](http://www.mass.gov/nhesp)

apparently secure (S4: Massachusetts, New Hampshire, New York), imperiled (S2: Pennsylvania, Maryland, New Jersey, South Carolina, Virginia), and critically imperiled (S1: North Carolina, Rhode Island). Two Canadian provinces list Eastern Lampmussel, as apparently secure (S4: New Brunswick, Ontario), one as imperiled (S2: Nova Scotia), and one not ranked (SNR: Quebec) (NatureServe 2015).

Historic and current records of Eastern Lampmussel in the state are distributed from 51 towns and 14 major basins (Figure 1). Massachusetts NHESP databases have data on 144 extant occurrences (i.e., record is less than 25 years old and contains living specimens), and fifteen records from shell only (Figure 3). While the range in Massachusetts is quite large and the species is not uncommon, it is rarely locally abundant.

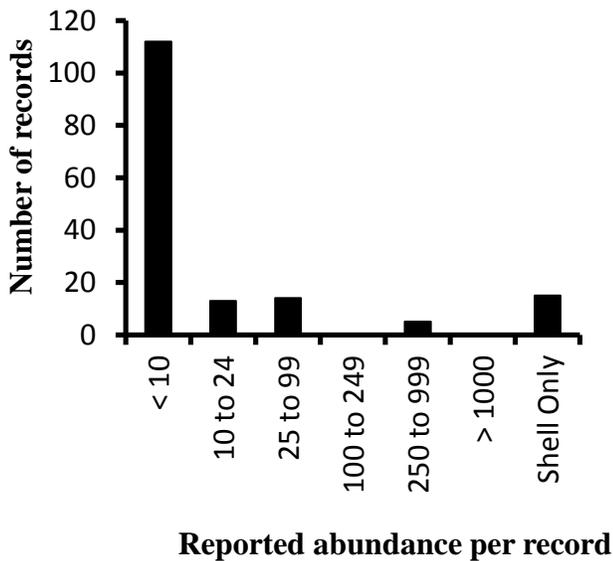


Figure 3: Distribution of Eastern Lampmussel population sizes in Massachusetts

**HABITAT DESCRIPTION:** Eastern Lampmussel is a habitat generalist, occupying a variety of waterbody types including large and medium-sized rivers, small streams, lakes, and ponds. In rivers, they can be found in a variety of substrate types from slack waters with fine depositional sediments to high velocity currents with gravel and boulder substrates (Bogan 2002, Nedeau 2008, Nedeau 2012). In lacustrine environments, they have been found in the littoral zone exposed to

considerable wave action, as well as sandy and muddy pools at depths greater than 30 feet (Nedeau 2008).

**THREATS:** Eastern Lampmussel is considered secure throughout much of its range; however, little is known about Massachusetts populations. The species is unlikely to be proposed for listing under the Massachusetts Endangered Species Act, but inhabits many of the same habitats as MESA-listed species and other Species of Greatest Conservation Need. Increased data collection may aid in identifying threats to more imperiled Unionid species, and will also be helpful for long-term conservation planning in the face of climate change.

The major threats to Eastern Lampmussel are likely related to the quality and quantity of water in its habitats. In regulated rivers, the species is often missing or found in low abundances from otherwise suitable habitat and may be affected by alterations to the natural hydrologic cycle. Even small dams may act as a barrier to dispersal for host fish. Nevertheless, dam removals require adequate protective measures to ensure that short-term changes in habitat do not affect population viability.

Changes in food availability and potential algal-toxicity in hyper-eutrophic ponds from green algae or harmful cyano-bacteria may present a threat to persistence at some sites. Current and anthropogenic sources of nitrogen and phosphorus may increase the evolution of a pond from green algae to cyano blooms, and therefore should be abated when possible. There is also some evidence that harmful algal blooms may become more common with increased surface water temperatures, longer growing seasons, and increased heavy precipitation events that can flush nutrients from the surrounding landscape. Nutrient and algal reduction through pesticides may be an effective measure to reduce risk of loss from eutrophication. However, acute and chronic toxicities of such pesticides (and herbicides used for nuisance plant control) are currently untested on freshwater mussels, and should be considered in lake management activities.

**REFERENCES:**

Bogan, A.E. 2002. *Workbook and Key to the Freshwater Bivalves of North Carolina*. North Carolina Museum of Natural Sciences, Raleigh, NC. 105pp.  
 Kneeland, S.C., and J.M. Rhymer. 2008. Determination of fish host use by wild populations of rare freshwater mussels

**A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan**

Please allow the Natural Heritage & Endangered Species Program to continue to conserve the biodiversity of Massachusetts with a contribution for 'endangered wildlife conservation' on your state income tax form, as these donations comprise a significant portion of our operating budget.

- using a molecular identification key to identify glochidia. *Journal of the North American Benthological Society* 27:150–160.
- NatureServe. 2015. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://explorer.natureserve.org> (Accessed: April 21, 2015).
- Nedeau, E.J. 2008. *Freshwater Mussels and the Connecticut River Watershed*. Connecticut River Watershed Council, Greenfield, Massachusetts. 132pp.
- Nedeau, E.J. 2012. *Freshwater Mussel Survey in the Connecticut River for the Turners Falls and Northfield Mountain Hydroelectric Projects: FERC PROJECT # 1889, 2485*. Report prepared for FirstLight Power Resources. Biodiversity, Amherst, Massachusetts. 12pp.
- Smith, D.G. 1991. *Keys to the Freshwater Macroinvertebrates of Massachusetts: including the Porifera, Colonial Cnidaria, Entoprocta, Ectoprocta, Platyhelminthes, Nematophora, Nemertea, Mollusca (Mesogastropoda And Pelecypoda), and Crustacean (Branchiopoda and Malacostraca)*. Department of Zoology, University of Massachusetts, Amherst, Massachusetts. 236pp.

Prepared by P.D. Hazelton, 2015

**A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan**

Please allow the Natural Heritage & Endangered Species Program to continue to conserve the biodiversity of Massachusetts with a contribution for 'endangered wildlife conservation' on your state income tax form, as these donations comprise a significant portion of our operating budget.

[www.mass.gov/nhesp](http://www.mass.gov/nhesp)