**Eastern Pondmussel**

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**Scientific Name**  
*Ligumia nasuta*  
(Say, 1817)

**Family Name**  
Unionidae  
Unionid Mussels

**Did you know?**  
Because of its relatively thin shell, this species has suffered greatly from the zebra mussel (*Dreissena polymorpha*) invasion (Strayer and Jirka 1997).

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**Summary**

**Protection**  
Not listed in New York State, not listed federally.

This level of state protection means: The species is not listed or protected by New York State.

**Rarity**  
G4, S2S3

A global rarity rank of G4 means: Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.

A state rarity rank of S2S3 means: Imperiled or Vulnerable in New York - Very vulnerable to disappearing from New York, or vulnerable to becoming imperiled in New York, due to rarity or other factors; typically 6 to 80 populations or locations in New York, few individuals, restricted range, few remaining acres (or miles of stream), and/or recent and widespread declines. More information is needed to assign a single conservation status.

**Conservation Status in New York**

This species has been heavily impacted by the zebra mussel invasion in the St. Lawrence River basin, Hudson River estuary, lower Great Lakes and elsewhere throughout the state (Strayer and Jirka 1997).

**Short-term Trends**

Although not widespread in the state, *L. nasuta* can still be encountered regularly, and is sometimes abundant (Strayer and Jirka 1997). Average densities in the tidal Hudson River prior to the zebra mussel invasion were 0.08/sq. meter (Strayer et al. 1994), but densities were not reported post invasion. Only 3 individuals of this species were found in a late 1980's survey of 52 sites in many watersheds in the Lake Erie and Ontario basins (Strayer et al. 1991).
Long-term Trends

This species was once a major component of the lower Great lakes drainage basin, but is now virtually absent owing to the zebra mussel invasion. Ligumia nasuta comprised about 5% of the pre-1960 Unionid records in the lower Great Lakes in Ontario, but dropped to 2.5% of the records post-1960. Between 1930 to 1982 this species was the second most common Unionid in western Lake Erie (Nalepa et al. 1991), but by 1991 it had disappeared (Schloesser and Nalepa 1994). All of the records of live animals from the St. Lawrence drainage basin in New York are pre-1970.

Conservation and Management

Threats

The single most important cause of the decline of freshwater mussels during the last century is the destruction of their habitat by siltation, dredging, channelization, impoundments, and pollution. A healthy fish assemblage is critical to viable mussel populations and dams have resulted in heavy losses of mussels, mainly due to elimination of host fish species. Erosion due to deforestation, poor agricultural practices and the destruction of riparian zones, causes an increase in siltation and shifting substrates that can smother mussels. Domestic sewage, effluents from paper mills, tanneries, chemical industries and steel mills, acid mine runoff, heavy metals, and pesticides have all been implicated in the destruction of native mussel fauna. The zebra mussel invasion has dramatically lowered population numbers of this species, particularly in the lower Great Lakes basin (Metcalfe-Smith 1997). Owing to its thin shell, this species appears to be one of those most heavily affected by shell fouling by invasive zebra mussels. Unionids undergo tissue degrowth as a result of starvation, they become top-heavy, tip over and are unable to right themselves. Death is from starvation and complications arising from improper orientation.

Conservation Strategies and Management Practices

It may be difficult to control the impacts of established zebra mussel populations, but managers can work to prevent the spread of this invasive species to river systems and smaller lakes not yet invaded. The effects of PCB's and other toxic chemicals, and general water pollution, should be investigated for their potential role in the decline of this species. Ligumia nasuta had the highest body burden of PCB's among 6 different mussel species studied by Muncaster et al. (1990), possibly due to its small size. When feasible, the removal of impoundments in order to restore rivers to their natural flow would be beneficial since these structures negatively effect required fish host species as well as the mussels themselves.

Research Needs

There is still much to learn about this species, especially determination of the host fish species. Details about habitat requirements (current speed, water depth, substrate grain size, substrate stability, water temperature, and water quality factors) also need work. However, Strayer et al. (1994) found that the distribution of Unionids was not related to these typical physical habitat qualities, but instead was related to long term stability of the substrate (i.e., flow refuges) and other large-scale habitat variables such as riparian zone vegetation (i.e., grassy vs. forested). Both large and smaller scale forces promoting the
patchy occurrence of Unionid mussel beds is an active area of research (Strayer et al. 2004).

**Habitat**

The eastern pondmussel appears to be somewhat of a habitat generalist, but it is most often found in quiet waters in estuaries, lakes, canals, or slow streams, and has also been found in the slackwater areas of larger rivers such as the Niagara, as well as in protected areas of small lakes (Clarke 1981, Strayer and Jirka 1997).

**Associated Ecological Communities**

**Canal**
The aquatic community of an artificial waterway or modified stream channel constructed for inland navigation or irrigation.

**Riverside Sand/gravel Bar**
A meadow community that occurs on sand and gravel bars deposited within, or adjacent to, a river channel. The community may be very sparsely vegetated, depending on the rates of deposition and erosion of the sand or gravel.

**Associated Species**

- Triangle Floater (*Alasmidonta undulata*)
- Brook Floater (*Alasmidonta varicosa*)
- Threeridge (*Amblema plicata*)
- Alewife Floater (*Anodonta implicata*)
- Eastern Elliptio (*Elliptio complanata*)
- Eastern Lampmussel (*Lampsilis radiata*)
- Fatmucket (*Lampsilis siliquoidea*)
- Eastern Floater (*Pyganodon cataracta*)
- Giant Floater (*Pyganodon grandis*)
- Creeper (*Strophitus undulatus*)

**Identification Comments**

The shell of the eastern pondmussel is elongate, subelliptical, with a distinct posterior ridge, medium thick, most often < 75 mm long. The posterior end of the shell is drawn out into a well defined blunt point near the midline of the shell. Its beak sculpture is double-looped, the periostracum dark, green to brown, sometimes with fine rays over the posterior part of the shell. Its hinge teeth are well-developed, sharp and delicate; the nacre is a bluish to creamy white (Strayer and Jirka 1997).

**Identifying Characteristics**

The long shell, with its distinctive posterior end, makes this species easy to recognize (Strayer and Jirka 1997).
Best Life Stage for Identifying This Species

Adult.

Behavior

Adults of this species are sessile with only limited movement in the substrate. Passive downstream movement may occur when they are displaced from the substrate during floods. More major dispersal occurs while glochidia are encysted on their as yet, unknown host(s). Being ectothermic, activity levels of mussels are presumably reduced greatly during colder months of the year. Gravid females of Ligumia display marginal papillae to attract fish hosts for their parasitic larvae. The moving displays attract fish (bass, sunfish, darters), which readily attack displaying females, causing them to release glochidia onto the gills of the fish. These displays slow in low light and stop in the dark, so highly turbid waters may affect the reproductive biology of this species (Corey et al. 2006).

Diet

Adult mussels are filter feeders. Algae, detritus and bacteria are all important food sources. Mussels in turn are eaten by muskrats, raccoons, fish, and birds. The glochidial (larval) host fish species has not been determined, but several Centrachid (sunfish) species as well as bass seem to be suitable (Strayer and Jirka 1997, Corey et al. 2006).

The Best Time to See

Little is known about the activity periods of Unionid mussels but they are presumed to be greatly reduced during cold times of the year. Freshwater mussels are most often easiest to locate during late summer when water levels are lowest. This species breeds from August until the following June (Clarke 1981).

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Active
Reproducing

The time of year you would expect to find Eastern Pondmussel in New York.

Similar Species

**Black Sandshell(*Ligumia recta*):** Ligumia recta has a smoother periostracum, heavier hinge teeth, and a more rounded posterior end.

**Eastern Elliptio(*Elliptio complanata*):** Elliptio species usually have shorter shells and much heavier hinge teeth.

Taxonomy

NYNHP Conservation Guide - Eastern Pondmussel (*Ligumia nasuta*)
Kingdom Animalia
  Phylum Mollusks (Mollusca)
    Class Bivalves (Bivalvia)
      Order Freshwater Mussels (Unionoida)
        Family Unionidae (Unionid Mussels)

Additional Resources

Links

NatureServe Explorer
  http://natureserve.org/explorer/servlet/NatureServe?searchName=LIGUMIA+NASUTA

Google Images
  http://images.google.com/images?q=LIGUMIA+NASUTA

The Unio Gallery
  http://unionid.missouristate.edu/

The Ohio State Division of Molluscs
  http://www.biosci.ohio-state.edu/~molluscs/OSUM2/

References


