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# ENVIRONMENTAL Fact Sheet

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29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • [www.des.nh.gov](http://www.des.nh.gov)

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## Freshwater Mussels in New Hampshire: Hidden Treasures of Our Lakes

Countless species of aquatic organisms live in the lakes, ponds and streams of New Hampshire. Most dwell along the shorelines or swim in the deeper waters, contributing to the complex aquatic web of life. One organism, however, lives burrowed in the bottom sediment, almost motionless and unnoticed. This organism is the freshwater mussel, a species that has been on Earth for at least 240 million years and plays a critical role in the health of freshwater ecosystems.

### What Are Freshwater Mussels?

Freshwater mussels belong to the mollusk family, and North America is home to more species of mussels than any other place on Earth. New Hampshire alone houses at least ten species of freshwater mussels. On average, mussels live between ten and 15 years, and, reportedly, some North American mussel species can live up to 100 years! Mussels spend most of their lives as relatively stationary filter feeders and are usually found attached to substrates or burrowed beneath the sand in cool, shallow or moving waters. They continuously filter water through fine gills to obtain bacteria, protozoans and other organic particles for food.



The reproductive cycle of the mussel is one of the most interesting in the freshwater ecosystem. Using a unique symbiotic relationship with certain fish species, mussel larvae attach themselves to a fish host, where they develop into juvenile mussels and eventually drop off the host. They then sink to the bottom of the water and begin to develop into full-grown mussels. This relationship has no significant negative effect on the fish host, but is critical for the survival of the young mussel.

### Why Are Mussels Important?

Throughout history, freshwater mussels have been used by humans as important components of tools and jewelry. Native Americans also used freshwater mussels as a supplemental food source. Although most species are edible, freshwater mussels are not as tasty as their saltwater relatives. In addition, since they are long-lived filter feeders, pollutants can easily settle and build up inside them, making them distasteful and potentially unhealthy for human consumption. However, freshwater mussels are eagerly consumed by other members of the food chain, including raccoons, otters and aquatic birds. Mussels also serve the aquatic

ecosystem by filtering debris out of water, making the aquatic environment more suitable for other freshwater life.

One of the most important attributes freshwater mussels bring to our lakes, ponds and streams is that they are especially susceptible to many pollutants and contaminants. This means that the presence of mussels in our freshwater bodies can potentially indicate healthy water quality. It also means that the decline of an existing mussel population could indicate a water quality problem. In fact, mussels can indicate a water quality issue long before even the most sophisticated scientific equipment can detect a problem. For these reasons, mussels are an excellent indicator species.

### A Threatened Resource



It is estimated that 70% of all freshwater mussel species in North America are listed as threatened or endangered, and at least two of the mussel species found in New Hampshire, the dwarf wedge mussel (*Alasmidonta heterodon*) and the brook floater (*Alasmidonta varicosa*), are on this list. Common threats to mussel populations include natural processes such as predation, competition, floods and droughts. However, humans increasingly affect mussel habitats through pollutants such as chemical spills, agricultural runoff and industrial contaminants. Habitats are being devastated by siltation caused by road construction, damming, logging, removal of shoreline plants and general shoreline activity. Besides bringing in pollutants, the introduction of sediment and removal of shoreline plants can decrease oxygen levels, increase turbidity and change temperature levels in surface waters. Not only are mussels especially sensitive to pollutants, oxygen levels and temperature levels, but sediment also easily clogs mussel gills, making it very difficult for them to survive. In addition to these factors, native freshwater mussel populations can also decline due to the introduction of exotic species such as zebra mussels or Asian clams. Although neither of these exotics has been found in New Hampshire, they have no natural predators in the state and, if introduced, could easily outcompete native species.

### What Can Be Done?

- Reestablish vegetation along lake and tributary shorelines, in order to provide surface waters with a natural filtering system for potential sediments and pollutants.
- In shallow lake waters, it is helpful to reduce heavy boating traffic, which can stir up lake bottoms and make water more turbid. These activities can help keep mussel gills clean and functioning.
- Fertilizers and pesticides on shoreline lawns should only be used according to the provisions of the Shoreline Protection Act. This will help to reduce the chance of imposing pollutants building up inside mussel bodies.
- Keeping in mind a mussel's unique and delicate life cycle, it is also important to protect their potential fish hosts. Keeping healthy plants and minimizing sedimentation of surface waters can ensure appropriate oxygen levels and suitable breeding grounds for fish.
- To reduce the chance of unnatural predation from exotic species, such as zebra mussels or Asian clams, boats and recreational equipment should be washed both before and after use in a particular water body.

By implementing these steps, lake residents and recreationists can help to ensure that freshwater mussels remain a treasure of New Hampshire's freshwater ecosystems!

\* Photos taken from: Lee, JS. "Freshwater Mollusks" British Columbia Ministry of Environment, Lands and Parks, photo copyright Hannah Nadel, March 20