

BEST PRACTICES



Freshwater Mussels: A Species in Danger

A Type of Mollusk

Freshwater mussels are mollusks that live in our lakes, ponds and streams. They have two mirror image shells. The inside of the shell is lined with a smooth mother-of-pearl material called nacre. Nacre is the inner shimmery layer found in mollusks shells, like in abalone, and is prized for its decorative uses. Freshwater mussels have a “foot” used for feeding and for moving, although they do not travel far on their own. Like other bivalves, freshwater mussels are filter feeders. They draw water in and filter food from the water, then push out the cleaned water.



The Many Uses of Mussels

Mollusks are the second most diverse group of animals in the world, which includes approximately 100,000 freshwater, marine and terrestrial species. Freshwater mussels are found worldwide, but are most diverse in North America—making up approximately one third of the world’s population. Native Americans and early pioneers used them for food, as tools and as jewelry, for both adornment and trade. Prior to the invention of plastic, mussel shells were used for buttons and continue to be used today. Mussel shells are also used to form freshwater pearls by inserting small pieces of mussel shell into the shell of live oysters.

Population Decline

Some species of freshwater mussels can live longer than 150 years, making them one of the longest-lived animals on Earth. Since the late 1800’s, freshwater mussels have been in decline. Thirty-five species are believed to be extinct, and 70% of mussels worldwide are facing extinction. Urban development threatens freshwater mussel populations due to polluted stormwater run-off, poor water quality, and loss of habitat. In some areas, their loss is also due to overfishing for the production of freshwater pearls.

Natural Filters & Indicators of Water Quality

Freshwater mussels help improve water quality in our freshwater lakes and streams by filtering the water as they eat and breathe. Freshwater mussels filter out suspended particles, algae, bacteria and other pollutants. Some of these pollutants can accumulate in their bodies. Scientists use mussels as indicators of water quality. A sudden increase in mortality of freshwater mussels can indicate toxic contamination. Scientists can also measure the amount of pollution found in their shells and tissue. Mussels are very important to aquatic (water) food webs, nutrient cycling and habitat quality in freshwater ecosystems.

Life Cycle

Freshwater mussels depend on fish such as Pacific salmon for part of their life cycle to help spread their larvae throughout watersheds. For most of their lives, mussels live partially buried in the sediment filtering the water. During reproduction, the male releases sperm into the water and the females take in the sperm through their filtration system, like with food. The embryos develop into larvae called glochidia, which the female releases like its waste products. The released larvae must then find a host fish to further its development. The larvae of native freshwater mussels are external parasites of fish, attaching themselves to their gills or fins. Some mussels are specific to a fish species that they parasitize. The length of time it takes for the larvae or glochidia to develop may take days or months for maturity depending on the mussel species.

During this development phase, the mussels are dispersed as the host fish migrate throughout the watershed to spawn. Once ready, the juvenile mussels will drop off from their host, falling to the bottom of the stream, burrowing into the sediment and beginning their lifecycle again.

Where to Find Mussels

Freshwater mussels are confined to permanent water bodies, including lower gradient creeks, rivers, ponds, and lakes. They are not usually found in the steeper, swifter headwater streams, as the water velocity is likely to be too strong for the juvenile mussels to stay attached and become established. Mussels that live in ponds and lakes are more tolerant of muddy substrates, low dissolved oxygen, and warmer water temperatures. Mussels can also be found in freshwater tidal habitats, such as the lower Columbia and Kalama Rivers. Stream species are more diverse and prefer the gravelly substrates and sediment found in streams with stable stream flows and year-round water. Like many species, the effects of climate change, such as lower stream flows, loss of habitat and host fish, will have a dramatic effect upon their survival.

Population Surveys

Population surveys to determine freshwater mussels' abundance and loss are being conducted throughout the United States. Specifically, this is required by the U.S. Fish and Wildlife Service to preserve populations concerning federal, state and local transportation and dredging projects. In some local areas, such as Portland, Oregon, volunteers assist in collecting valuable population information in specific watersheds. For further information on the importance and life cycle of freshwater mussels and population surveys, visit bit.ly/3Akgc5x.

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