

Freshwater mussels discovered in urban Delaware river

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Scientists working with the Partnership for the Delaware Estuary and The Academy of Natural Sciences have made an important discovery in the Delaware River between Chester, Pennsylvania, and Trenton, New Jersey: beds of freshwater mussels. This includes several uncommon species, two of which were previously believed to no longer exist in both Pennsylvania and New Jersey.

"Freshwater mussels are very sensitive to a variety of problems, including pollution, dams, water flows, loss of forests, and harvesting for their shells and as bait," said Dr. Danielle Kreeger, science director at the Partnership for the Delaware Estuary. "We have so few mussels left in almost all of our streams in the area, so to find seven [species](#) living together in dense communities right near Philadelphia was unexpected and cause for celebration."

Freshwater mussels are the most imperiled of all plants and animals in North America. Nearly three-quarters of the continent's 300 species are in decline, and many are either extinct or headed toward extinction. In the Delaware River Basin, most of the one dozen native species are classified as reduced, threatened, or locally extinct. One of the basin's species is considered endangered at the federal level and others are listed as endangered at the state level. [Water pollution](#) and degraded habitats are the most common reasons for these declines. That is why scientists are so excited to find them in this stretch of the river.

One reason freshwater mussels may be doing better in the Delaware River compared to surrounding tributaries is the fact that the Delaware is the longest free-flowing river east of the Mississippi. Dams often block fish from swimming up the river, and this can interrupt the complicated breeding processes of freshwater mussels. Mussels rely upon fish to carry their babies, or larvae, around, including upstream. Whenever

dams block these fish, they fail to deliver their payload of mussel [larvae](#) to new areas where they can grow and thrive. Pennsylvania has more dams than any other state, and many of these are located in streams throughout the Delaware Valley. The lone exception is the Delaware River.

"Until this discovery, our surveys for freshwater mussels in southeastern Pennsylvania during the past 10 years have painted a grim picture. Only one species seems to still be prevalent in the area's streams, and even that species is found in only a handful of locations anymore," said Roger Thomas, staff scientist at the Academy of Natural Sciences' Patrick Center for Environmental Research in Philadelphia. These recently discovered beds of mussels can be used to help support mussel reintroduction into other areas where they have been lost."

Dr. Kreeger and others are in the process of expanding a fledgling mussel-restoration effort with support from a number of funders. These include ConocoPhillips, the National Fish and Wildlife Foundation, and the Pennsylvania Coastal Resources Management Program. She believes it is now possible to increase mussel populations throughout the Delaware River Basin by either breeding them in a hatchery or relocating adults during breeding season by releasing them in targeted streams. She and her colleagues at the Academy of Natural Sciences have been working with Cheyney University, the U.S. Fish and Wildlife Service, and the U.S. Geological Survey to experiment with different methods since 2007. They call their effort the Freshwater Mussel Recovery Program.

The Partnership for the Delaware Estuary is restoring mussels for many reasons, not just the fact that these animals are rare and endangered.

"Dense beds of mussels filter pollutants and make conditions better for fish and other aquatic life,

improving water quality downstream in the estuary," said Jennifer Adkins, executive director of the Partnership for the Delaware Estuary. "We may have these beds of mussels to thank for keeping certain types of pollution, like nutrients, low in this part of the river. This helps make our waters more inviting for everyone."

Restoring freshwater mussels won't be easy or fast, however. Although freshwater mussels can help to boost water quality, they are also some of the most sensitive animals to polluted water. Therefore, some area streams may not be able to sustain mussels until water quality is further improved or riverside woodlands are replanted. Also, freshwater mussels live to be up to 100 years old and are slow growing. But this does not concern Dr. Kreeger, who said, "We've made tremendous strides in improving some environmental conditions needed to support healthy ecosystems. That said, we know our job won't be complete until we see the return of these long-lived sentinels of healthy waterways."

Of the seven species of native freshwater mussels discovered this past summer,

- Two species were thought to be extinct in Pennsylvania and New Jersey: the alewife floater, or *Anodonta implicata*, and the tidewater mucket, or *Leptodea ochracea*.
- Two species are considered critically-imperiled: the pond mussel, or *Ligumia nasuta*, and yellow lampmussel, or *Lampsilis cariosa*.
- Two species are considered vulnerable: the creeper, or *Strophitus undulates*, and the eastern floater, or *Pyganodon cataracta*
- One species is listed as common: the eastern elliptio, or *Elliptio complanata*

Provided by Academy of Natural Sciences

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