

Protecting Biodiversity

Freshwater Mussels in Connecticut

Freshwater mussels—immobile mollusks that burrow in sediment at the bottoms of rivers and streams—are among the most imperiled animals in the world. In North America, where mussels have been most diverse and abundant, more than 70 percent of the nearly 300 species are considered extinct, endangered, or in need of special protection.

The loss of freshwater mussels would be a biological tragedy. These organisms help to maintain their ecosystems. Because they extract food from the water that moves past them, mussels act as natural water filters. In addition, because they are sensitive to changes in water quality, sediment, and physical habitat, mussels serve as biological monitors, indicating the health of ecosystems, both past and present. They are also a major food source for raccoons, otters, and other wildlife, and their lustrous interiors have made them valuable in the cultured pearl and jewelry industries.

Mussels have been threatened by the combined effects of changes in their habitats, pollution, overharvesting, and invasive species. For example, the construction of dams has destroyed many free-flowing water habitats in which mussels thrive, devastating populations both upstream and downstream of the dams. Exposure to pollutants, such as fertilizers, herbicides, and pesticides in runoff, also reduces mussel populations. These combined stresses result in isolated and vulnerable populations.

Mussels are generally found in large aggregates, called *mussel beds*. These beds, which may be more than a mile long and may contain thousands of mussels, are patchily distributed. Researchers have found that the patchy distribution is controlled by several environmental factors, including water speed, channel characteristics, and sediment stability. However, the relationships between environmental factors and habitat preferences are still poorly understood.



Piyumi Obeysekara looks for freshwater mussels in the upper watershed of the Willimantic River.

We need a better understanding of mussel habitat requirements and environmental stresses so that we can develop effective conservation and recovery plans. This research contributes to that understanding by integrating the disciplines of stream ecology and fluvial geomorphology. Stream ecology concentrates on the distribution and abundance of living organisms in rivers. Fluvial geomorphology focuses on the evolution of land forms in relation to rivers.

This research will help to ensure the preservation of essential mussel habitat as part of the recovery plans for these valuable organisms in the watersheds of the Thames and Connecticut rivers.

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