PASSAGE ONE

An Unwelcome Newcomer

Invasion of the Zebra Mussels

The zebra mussel is a small aquatic animal with two shells like a clam, named for its striped shell. This tiny creature may look harmless, but it can cause big problems. The zebra mussel is an invasive species, a species that's brought from its native area to a new place where it thrives and causes changes in the local habitats and communities.

Zebra mussels once lived only in freshwater lakes and rivers of Europe and Asia. But in the 1980s, they appeared in the Great Lakes between the United States and Canada. Scientists think the tiny animals hitched a ride in cargo ships. Within a few years, the mussels were found along waterways from Wisconsin to Arkansas.

How do these mussels spread so quickly? A single female can lay up to one million eggs each year. Then the young mussels float easily along water currents. When they're older, they attach themselves to hard surfaces like rocks on the riverbeds and the bottom of boats. They form dense colonies, with as many as

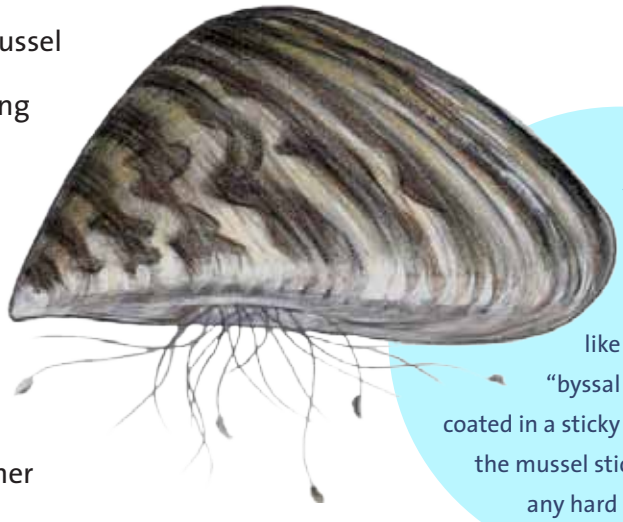
ZOOM IN

Zebra mussels pump water through their gills to filter out particles of food (primarily phytoplankton).

A ship passing under a bridge on the Hudson.

CONTINUED: INVASION OF THE ZEBRA MUSSELS

10,000 mussels in a single square foot. Each mussel clings with a mass of thread-like strands, making these colonies nearly impossible to remove.



STICK TO IT

Zebra mussels have tiny tenacle-like appendages called "byssal threads" that are coated in a sticky foam that help the mussel stick to almost any hard surface!

Zebra mussels cling to any hard surface—including native mussels and other shelled animals. These animals die because they can't feed. Zebra mussels can upset food webs in other ways, too. These filter feeders pump water through their gills and strain out microscopic animals and plants called plankton. Zebra mussels can quickly clear out huge bodies of water, removing food for the native invertebrates and small fish.

Zebra mussels can also affect humans — and cause million of dollars in damage. The mussels clog water pipes to businesses and power plants. They damage boats, docks, buoys, and other structures. And their shells wash up in huge numbers on beaches.

The Hudson River Invasion

The Hudson River flows south through New York State, from the mountains to New York City. The scientists described in this study began monitoring the river's ecosystem in 1986. At that time, no zebra mussels lived in the river. But a series of waterways

JUST THE FACTS...

- Zebra mussels usually grow to about the size of your thumbnail
- Cargo ships carry extra water (called ballast) to help balance the boat in oceans and rivers
- Zebra mussels can typically live for 2-5 years and reproduce by their second year
- Zebra mussels love to eat plankton (microscopic organisms) and survive in both cold and warm water

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CONTINUED: INVASION OF THE ZEBRA MUSSELS

UP THE RIVER

The Hudson River connects the Atlantic Ocean to the Great Lakes through a series of artificial waterways, including the Erie Canal. Hundreds of cargo ships use this "water highway" to transport important materials, like gasoline, metal, and wood.

and canals connect the river to the Great Lakes, so scientists predicted it was just a matter of time before the zebra mussel would arrive in the Hudson.

The Hudson River's ecosystem is very different from the Great Lakes. Lake water settles into layers, with cool water near the bottom and warm, clear water above. But water in the Hudson is affected by tides from the Atlantic Ocean. These tidal currents mix the water from top to bottom. Tides also stir up silt from the riverbed, making the water turbid or cloudy. Little sunlight can pass through the murky water. Less sunlight means fewer plants and phytoplankton.

Scientists wondered how zebra mussels might affect the Hudson River ecosystem. Soon they would find out.

STOP AND THINK

1. **How do you think zebra mussels might affect the Hudson River ecosystem?**
2. **What data about the river might scientists collect to investigate this question?**

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