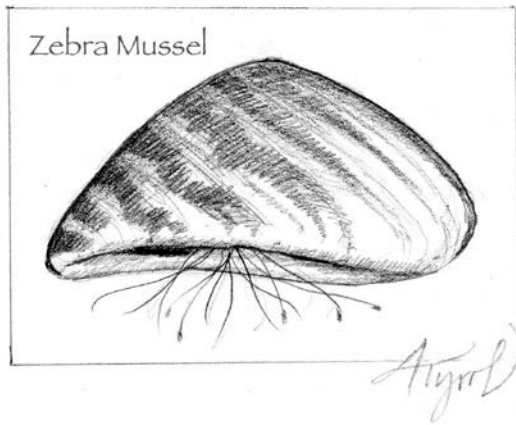


The Outside Story



Zebra Mussels

By: Declan McCabe

Invasive species have earned their bad reputations. English sparrows compete with native birds from Newfoundland to South America. Australian brown tree snakes are well on their way to exterminating every last bird from the forests of Guam. And I don't think anyone can fully predict how Columbia's rivers will change in response to drug lord Pablo Escobar's escaped hippopotamus population.

While our climate protects us from rampaging hippos, the Northeast has plenty of exotic species in its waterways, including some that cause serious damage. Zebra mussels are possibly the most familiar of these. They were first discovered in Lake Champlain in 1993 by a precocious 14 year old, Matthew Toomey, who recognized one based on an identification card he'd received at school. Since then, the mussels have

spread throughout the lake and their effects have been well chronicled. They kill native mussels; coat surfaces with razor-sharp shells; foul anchor chains; block water intake pipes; and steal plankton and other food from native fish.

With all of the negative press regarding the species, you might find it jarring to read anything positive about zebra mussels, particularly anything written by a biologist. Discussing positive effects of invaders is practically taboo. We don't speak ill of the dead; we never praise invasive species. I'm certainly not advocating zebra mussel propagation, but like them or not, they are here to stay. These mussels are an important part of European ecosystems, and it's interesting to consider what native organisms benefit from their presence.

Zebra mussels are voracious filter feeders. A single mussel can suck a liter of water through its body daily. All of this filtration removes plankton and particles from lake waters, but these particles don't just disappear. The phrase immortalized in Minna Unchi's children's book *Everybody Poops* applies. Along with excrement, unpalatable particles rejected by zebra mussels are mixed with mucus and dropped on the lake floor. Mussel excrement and mucus might not sound appetizing, but it's a smorgasbord for lake floor invertebrates and fish.

In addition to covering rocky surfaces, zebra mussels often carpet lake floor sand and silt. Formerly soft sediments that

provided foraging grounds for sturgeon and other fish can become a tangled mess of living and dead mussels several inches thick. Not surprisingly, fish such as log perch, bullhead, and sculpins have difficulty finding their insect prey amongst the clutter of shells layered over their sandy habitats. When given the choice, juvenile sturgeon avoid zebra mussels and spend their time on sandy or rocky areas.

What's bad for these predators may be good for their prey. To figure out just how good or bad zebra mussels could be for Lake Champlain invertebrates, we ran experiments under 30 feet of water in sandy areas of Appletree Bay. When my colleagues Ellen Marsden, Mark Beekey, and I fenced off lake floor patches with and without zebra mussels, twice as many invertebrates colonized areas with zebra mussels. More species also moved in. After a month, the number of species in experiments with added mussels doubled and included some species more typical of rocky lake floors. Nooks and crannies between zebra mussel shells seem to act like very small, natural shark cages that protect tiny insects from hungry fish. And when we placed insects and fish in aquariums, far more invertebrates survived with zebra mussels than without.

On balance, I would rather have a lake without zebra mussels than with them. But unless ways are found to eliminate them, it will remain important to understand how they affect native species. In Lake Champlain, the zebra

mussel population grew rapidly and has since fallen below peak numbers, as often happens with this species in a new location. This month, for the first time in recent years, we pulled up a lake floor sample in Burlington Bay that entirely lacked zebra mussels. Perhaps we are reaching a new equilibrium?

Declan McCabe teaches biology at Saint Michael's College. His work with student researchers on insect communities in the Champlain Basin is funded by Vermont EPSCoR's Grant EPS-1101317 from the National Science Foundation. The illustration for this column was drawn by Adelaide Tyrol. The Outside Story is assigned and edited by Northern Woodlands magazine and sponsored by the Wellborn Ecology Fund of New Hampshire Charitable Foundation: wellborn@nhcf.org

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