

Mussel Bound in Minnesota —2000 *by Dan Kelner*

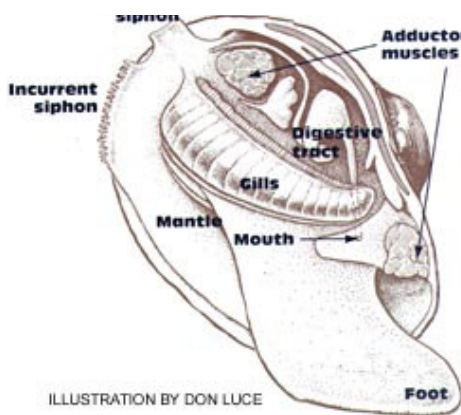
Have you ever heard of a purple wartyback, pink heelsplitter, black sandshell, or lilliput? All are Minnesota mussels.

Imagine these mussels: hickory nut, snuffbox, and spectaclecase. Or these: washboard, pistolgrip, and pimpleback. Butterfly, elephant-ear, monkeyface, elktoe, deerto, and fawnsfoot live here too. As their names suggest, mussels can be eye-catching, yet they remain unfamiliar to most people because they spend their lives partially buried in river and lake bottoms, where they can be mistaken for rocks.



Fat mucket (left) and plain pocketbook mussels.

Freshwater mussels live on every continent except Antarctica. North America has the most--nearly 300 species, including Minnesota's 48 (two of which have disappeared from the state). These animals provide food for fish and wildlife, they clean water by filtering out particles to eat, and they show a river's health by reacting to pollution and other changes in the water.



An Inside Look

What Kind of Animal is it? Freshwater mussels belong to the world's second largest group of animals, called mollusks. Minnesota mollusks also include snails, slugs, and clams.

A mussel is a bivalve mollusk: A hinge holds together its two hard shells, or valves. Inside the valves, a sheet of tissue called the mantle surrounds the body. A mussel has a single large foot and no head or eyes.

What's in a Name? Minnesotans often mistakenly use the term clam when referring to a freshwater mussel.

Freshwater mussels and clams are both bivalve mollusks, but they differ in important ways. Mussels make pearls, but clams do not. Freshwater mussels have parasitic young, but clams do not. Minnesota has only a few species of tiny clams--peaclams and fingernail clams.

How Does a Mussel Move? The mussel opens its shells, sticks out its foot, and slowly pulls itself along, leaving a snakelike track.

How Does it Eat? Mussels prefer streams, rivers, and lakes with wind-driven currents because the flowing waters help bring in food particles and oxygen and carry away wastes. A mussel can bury itself in the river or lake bottom with only its siphons poking up into the water. Its valves open to extend its incurrent siphon to take in water, oxygen, and microscopic food particles--plankton and detritus. The food sticks to the lining of its gills, and hairlike cilia slowly sweep the tidbits into its mouth. Its excurrent siphon expels filtered water and waste back into the river.

What Eats Mussels? Muskrats, raccoons, and other wildlife eat mussels. Native American Indians ate lots of freshwater mussels, but the tastier mussels and clams people eat today come from the ocean.

How Long Do They Live? Some species can grow older than 100 years. Some only live a few years. Most live 10 to 40 years. Much like counting the rings on a tree, you can estimate a mussel's age by counting the rings, or annuli, that form on its shell each winter when growth slows or stops.

Threats to Mussels



If you see lots of mussels in a stream, chances are the stream has clean water, good fishing, and plentiful wildlife such as muskrats, otters, herons, and eagles. The mussel at the bottom of the food chain helps keep the stream healthy and livable.

On the other hand, if you find empty shells but no living mussels, you could have cause for alarm.

What caused the mussels to die? Perhaps someone is dumping raw sewage or pesticides upstream. Maybe a new dam built downstream has backed up the water and silt has smothered the mussels. Or maybe a dam has stopped fish from moving upstream, and freshwater mussels cannot reproduce without fish for their hitchhiking glochidia.

Healthy native mussels.

and smother freshwater mussels. Commercial harvest of freshwater mussels has put pressure on some mussel species.

Exotic zebra mussels have invaded some Minnesota waters and attached to freshwater mussels. They compete for food

Because of such troubles, mussel populations have dropped. More than 70 percent of North American species are extinct, endangered, or declining. In Minnesota more than half of native species are listed as endangered, threatened, or of special concern. At least two species have disappeared.

To better protect mussels and their habitat, we first need to find where they live now and where they lived in the past. In 1999 biologists with the Minnesota Department of Natural Resources began the first statewide survey of lakes and rivers to find freshwater mussels. Their survey will take six years to complete.

Laws

No live mussels may be collected in Minnesota. No live or dead mussels may be collected in National Park Service units, including the St. Croix River. If you pick up a live mussel, return it to the water immediately, being careful to place its foot end in the stream bottom so about two-thirds of the shell is buried.

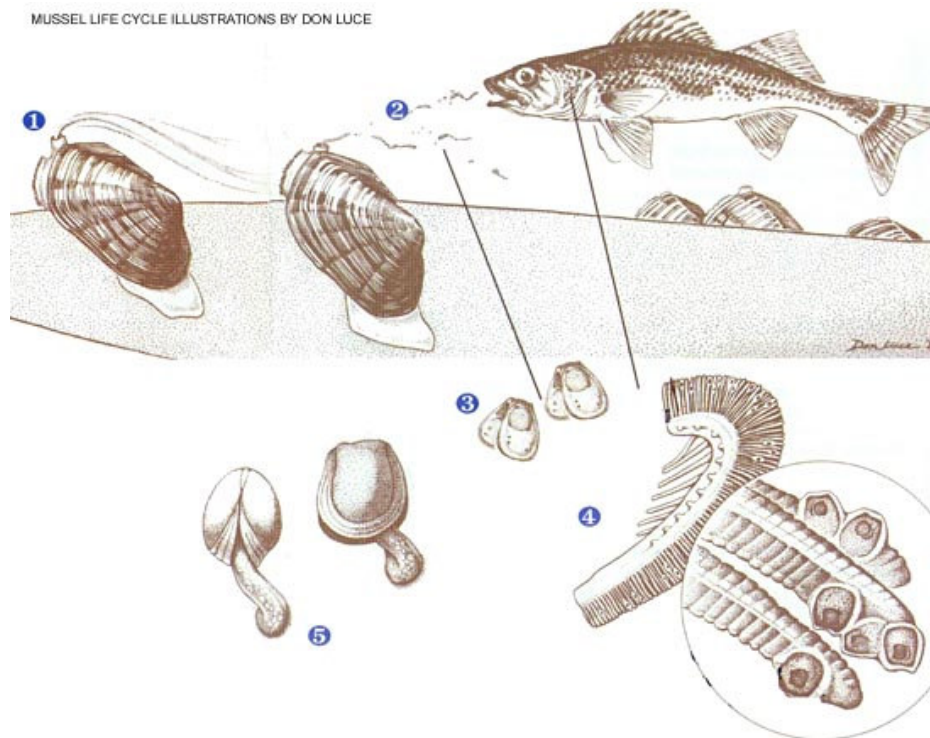
With a fishing license, a person may possess up to 24 whole or 48 half shells of dead mussels. However, it is illegal to collect state listed species. Since many common species look like listed species, and even experts can confuse them, it is best to leave mussels where you find them.

Dan Kelner, malacologist with DNR Ecological Resources, coordinates the statewide mussel survey, funded by the Legislative Commission on Minnesota Resources.

Hitchhiking

Babies

Mussels don't pair up and mate the way many animals do. Much is left to chance. During a breeding season, a female may produce tens of thousands of baby mussels. Yet she'll be lucky if one settles down in the river bottom and matures to adulthood.



1. The male flushes sperm into the water where currents can carry them downstream toward a female. The female draws in sperm to fertilize her eggs. Unless males and females are near each other, the odds for fertilization are slim.
2. The female broods the fertilized eggs inside her, then releases thousands of tiny larvae called glochidia. She must time the release so the tiny baby mussels can hitch a ride on a fish. She senses the presence of a fish, then shoots out glochidia. Many species release their glochidia in clumps shaped like small worms or fish food. Fish feed on them and then expel them through their gills, where the glochidia of many species settle. When a nest-building fish stirs up the river bottom, some glochidia in the river bottom may attach and hitch a ride.
3. When they touch the tissue of a fish, the microscopic glochidia clamp or hook themselves onto the fish's scales, fins, or gills. Some glochidia need a certain species of fish to grow on.
4. A layer of skin grows over the hitchhiker, forming a cyst. Depending on the species, the baby mussel grows on the fish from several days to a few months while it transforms itself into a juvenile. This does not harm or stress the fish.
5. The cyst breaks open, and the juvenile mussel drops off to start its adult life. With luck it will land in good habitat and join other mussels in making a bed in the river bottom.

Some Common Species

1. Plain pocketbook (*Lampsilis cardium*). Common in many streams and rivers, it can grow as big and round as a softball. It resembles the endangered Higgins eye. Males and females of this and a few other mussel species look different from each other.
2. Giant floater (*Pyganodon grandis*). This thin-shelled species is lightweight so it can live in the soft, muddy bottoms of lakes and ponds without sinking. Sometimes a current carries a floater downstream to a new home.
3. White heelsplitter (*Lasmigona complanata*). Sometimes as big as a dinner plate, this common species tolerates polluted waters. Its shell has a large wing, or ala, sticking up. An early settler may have stepped on an ala and cut his foot, hence heelsplitter.
4. Pimpleback (*Quadrula pustulosa*). This bumpy, thick-shelled mussel lives in the Mississippi River and its tributaries. You can tell it apart from other bumpy species because it has a green strip near its hinge.
5. Mapleleaf (*Quadrula quadrula*). This thick-shelled species prefers rivers but can live in reservoirs and lakes with a mud and sand bottom. It is found throughout the Red and Mississippi river watersheds.
6. Wabash pigtoe (*Fusconaia flava*). This species lives in many habitats, from small creeks to large rivers. Usually triangular, it can take on different shapes, depending on colored shell feels like rough cloth. It pigtoe.
7. Threeridge (*Amblema plicata*). As its has ridges along its shell. This can grow nearly as big and round as



PIMPLEBACK AND PISTOLGRIP SPECIMENS COURTESY BELL MUSEUM OF NATURAL HISTORY. PHOTOGRAPHS BY DEBORAH ROSE. OTHER MUSSEL PHOTOGRAPHS COURTESY ILLINOIS NATURAL HISTORY SURVEY.

where it lives. Its chestnut-looks like the threatened round name implies, the threeridge common, thick-shelled mussel a softball.

Uncommon Species

8. Pistolgrip (*Tritogonia verrucosa*). thick-shelled, bumpy species is and a few of its larger tributaries. pistolgrip does not resemble any other species.
9. Elktoe (*Alasmidonta marginata*). in small to medium-sized rivers in Mississippi River watershed. Its about 4 inches long. Threatened in Minnesota. It lives isolated populations in the sharply angled shell can grow
10. Fluted-shell (*Lasmigona costata*). Special concern in Minnesota. Small numbers of this species live in medium-sized rivers statewide. The elongated shell has obvious wavy ridges on one end and can grow 7 inches long.