

FRESHWATER MUSSELS OF IOWA



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Importance of Mussels

Freshwater mussels may not be the first animal that comes to mind when you think of Iowa's rivers, but they are very important to stream ecology and biodiversity.

They were an important food source for Native Americans, and still are for many animals—fish, turtles, mink, otters, and raccoons. Mussels also filter algae and other microscopic organisms from the water; what they don't digest is spit back out as mucous plugs—a tasty meal for nearby fish.

Freshwater mussels are important to the river's structure. Mussel beds (large groups of mussels) provide a firm, natural structure where the river bottom would otherwise be a shifting mixture of sand, silt, and clay.

This stable microhabitat is home to many different species, all of which contribute to the river ecosystem. Algae growing on mussels are food for small fish and invertebrates, which are eaten by larger fish. Crayfish often convert mussel shells into a suitable home. Mussel beds also provide spawning areas for many game fish.

History of Mussels

Prior to the start of the 20th Century, mussel beds carpeted miles of river bottom from bank to bank in some places.

Freshwater mussels are also an important part of Iowa's history. Searching for pearls imbedded in mussels was a common hobby in the mid to late 1800s. By 1899, 41 factories in Iowa alone used freshwater mussel shells to make buttons, but the introduction of plastic buttons brought the pearl button industry to a halt in the 1940s.

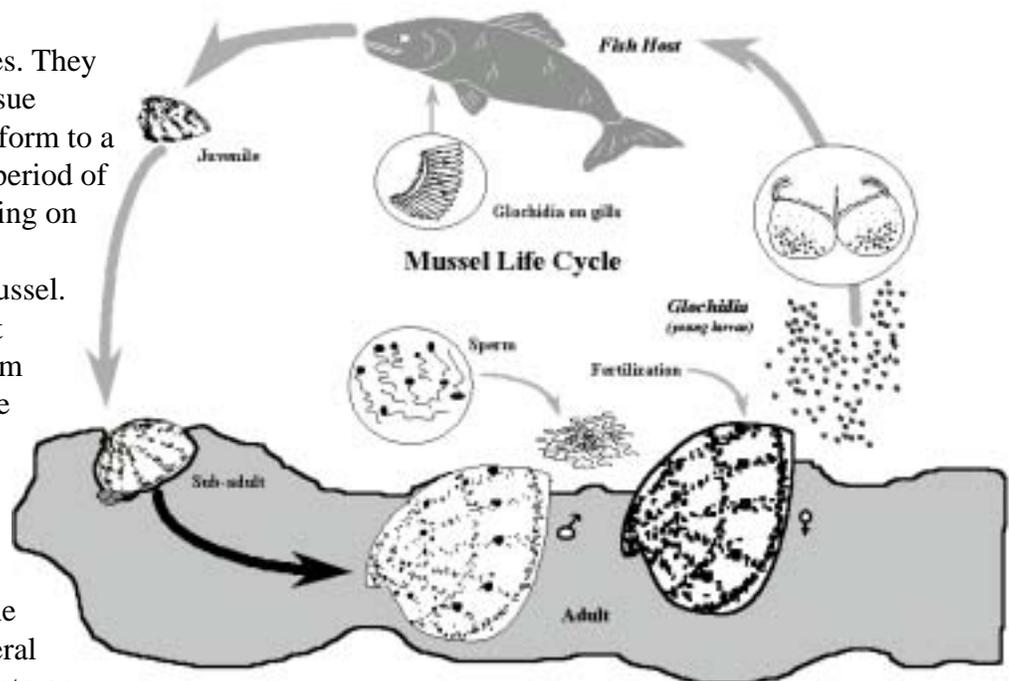
Life Cycle

Freshwater mussels have a quite complex life cycle. Males release sperm into the water. Females downstream take up the sperm with incoming water and their eggs are fertilized.

After a period of days to months, fertilized eggs develop into glochidia (larvae). In most Iowa species, the female displays a "lure" to attract a host fish. When the fish bites the lure, the glochidia are released.

Glochidia are parasites. They clamp down on host tissue (usually gills) and transform to a juvenile mussel over a period of hours to weeks, depending on water temperature and individual species of mussel. Many mussels are "host specific." If a glochidium attaches to an unsuitable host, it dies.

The juvenile mussel resembles a miniature adult. It drops from the fish and burrows into the river bottom. After several years (2-9), it matures into an adult capable of reproduction.



Mussels in Trouble

Siltation, pollution, damming of rivers and streams, over-harvest, and exotic species all have contributed to the decline of freshwater mussels.

Silt smothers mussels. When river bottoms are clogged with silt, mussels disappear.

Freshwater mussels are filter-feeders, so are susceptible to pollutants such as herbicides, pesticides, and other toxic chemicals that can become concentrated in their organs and tissues. Large amounts of a chemical in mussel tissue can indicate other animals and plants in that river or section of river are being exposed to the same chemical pollutants.

Freshwater mussels are sedentary creatures. Most are found in shallow water and require oxygenated, flowing water. Dams alter the river—slowing the water and making vast areas unsuitable for most species of freshwater mussels. They also act as barriers to host fish and their “hitchhiking” mussel larvae.

Years of overharvest for button production brought many species to the brink of extinction. Usually the demand for the shells exceeded the number of mussels that nature produced.

Exotic species compete with native freshwater mussels for food and habitat. Zebra mussels also attach directly to mussel shells. Colonies of zebra mussels cover shells so they can no longer open. The “host” mussel eventually suffocates or starves. Also, mussel reproduction is limited since it can not “lure” host fish through the attached zebra mussels.



spectacle case – endangered in Iowa

How Can You Help Mussels?

There are many things you can do to help freshwater mussels. Work to improve their habitat. This includes improving water quality and reducing sediment build-up on river and lake bottoms. It also means stopping the spread of exotic invaders such as zebra mussels.

Buffer strips of grasses and/or trees between water and land help keep chemicals and other pollutants from reaching the water.



riparian buffer strip

Good soil conservation practices, such as terraces and contours, can greatly reduce the amount of sediment that runs off the land and is deposited on river and lake bottoms, smothering freshwater mussels.

Storm sewer stencils remind people that what goes down the storm sewer, such as lawn chemicals, ends up in the river.

Don't contribute to the spread of zebra mussels. Drain all water from your boat, motor, and trailer and thoroughly wash it after boating and fishing.

A Few Iowa Freshwater Mussels

About 55 species of freshwater mussels were found in Iowa waters at the time of European settlement. Today, we can find only about half of those species.

Common Mussels

giant floater

Pyganodon grandis

Description: The giant floater's shell is extremely variable but usually somewhat elongate and inflated. In young mussels, the light yellow or yellowish green shell is extremely thin, hence another common name, papershell. As it matures, the shell becomes somewhat thicker and turns dark green to brownish in color. The inside of the shell (nacre) is variable in color and may be silvery white, cream, pink, salmon, or copper-colored. It grows up to 10 inches long.

Habitat: ponds, lakes, and sluggish mud-bottomed creek and river pools as well as a variety of other habitats



The giant floater can live in a wide range of habitats. This may be why it is so widespread and common.



common mucket

mapleleaf

Quadrula quadrula

Description: The mapleleaf shell is round to squarish, quite thick, and somewhat inflated. The outside of the shell is variable in color, from yellowish green to light brown with faint rays in small shells to greenish brown or dark brown in larger shells. There are two rows of bumps separated by a shallow depression. The nacre is pearly white. It grows to four inches long.

Habitat: medium to large rivers and reservoirs with gravel, mud, or sandy bottoms



mapleleaf

mucket

Actinonaias ligamentina

Description: The common mucket has an elliptical or oblong shell that is thick, heavy, and fairly compressed. The outside is smooth and yellowish brown with green rays. Shells may become dark brown with faint green rays or no rays at all. The nacre is white, but occasionally is tinted pink or salmon. It may grow to seven inches long.

Habitat: medium to large rivers with bottom of gravel or mixed sand and gravel

plain pocketbook

Lampsilis cardium

Description: The plain pocketbook has a large, round, or somewhat squared shell that is thin to moderately thick and inflated. It is smooth, yellow or tan, and may or may not have green rays. The nacre is white, or bluish white, and sometimes tinged with pink. It grows up to seven inches long.

Habitat: small creeks to large rivers in gravel, mud, or sand



plain pocketbook

threeridge

Amblema plicata

Description: The threeridge has a thick, rounded or elongate shell. It is smooth and has three or more parallel ridges on the posterior end of the shell. Juveniles tend to be green while adults are dark brown or black. The nacre is pearly white. It grows to seven inches long.

Habitat: small to large rivers and reservoirs in gravel, mud, and sand



threeridge

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white heelsplitter

Lasmigona complanata

Description: The white heelsplitter is one of a group of mussels called heelsplitters because of a sharp wing that could literally cut a person's heel if stepped on. It has a rounded shell that is fairly thin, especially in young individuals. Small shells are green or greenish brown and often have faint rays. Larger ones are brown to black. The nacre is white or bluish white. It may grow to eight inches long.

Habitat: pools or sluggish streams with a fine gravel, mud, or sandy bottom



white heelsplitter

Rare, Endangered, or Threatened Mussels

ellipse

Venustaconcha ellipsiformis

Description: The ellipse gets its name from its oval shape. It is small, solid, and compressed. The anterior end is rounded and the posterior end bluntly pointed. The shell usually is smooth in younger mussels. Older mussels may have a few wrinkles or folds on the posterior half. The shell is greenish yellow or green with numerous dark green rays that become wavy as they cross the wrinkles on the posterior end. The nacre is white. It grows to three inches long.

Habitat: small to medium streams in gravel or a sand and gravel mix

Status: Threatened in Iowa

squawfoot

Strophitus undulatus

Description: The squawfoot is an oval shaped mussel that is fairly thin shelled, especially when young. The smooth, shiny shell is green with dark rays in juveniles and becomes chestnut, dark brown, or black in older individuals. The nacre is salmon or cream and bluish white along the outer margin of the shell. The squawfoot grows to four inches in length.

Habitat: mostly small to medium sized streams with gravel, mud, or sandy bottoms

Status: Threatened in Iowa



squawfoot

ellipse



Asian clam

Higgins eye

Lampsilis higginsii

Description: The shell of the Higgins eye mussel is rounded to slightly oblong, solid, and inflated. The smooth shell is yellow, yellowish green, or brown with green rays on most individuals. The nacre is white and often tinged with cream or salmon. It grows four inches long.

Habitat: Mississippi River in gravel or sand

Status: Federally Endangered



Higgins eye

Exotic (non-native) Species

These are introduced to Iowa (not native to the U.S.) and have caused severe problems.

Asian clam

Corbicula fluminea

Description: This is a small clam with a round to slightly triangular inflated shell. The shell is yellowish brown to black with numerous concentric rows of ridges covering the outside. The nacre is white or purplish. It grows to 1.5 inches long.

Habitat: rivers and lakes of all sizes in silt, mud, sand, or gravel



zebra mussel

Dreissena polymorpha

Description: As its name implies, the zebra mussel has alternating stripes of light and dark on its triangular, inflated shell. The nacre is white. It grows to 1.5 inches long; most are smaller.

Habitat: lakes and rivers of all sizes; attaches to almost any hard surface



colony of zebra mussels

Iowa Mussels

(includes species found in the Mississippi and Missouri Rivers along Iowa's borders)

Common Name	Scientific Name	Status	Common Name	Scientific Name	Status
*Asian clam	<i>Corbicula fluminea</i>	C	Ohio River pigtoe	<i>Pleurobema sintoxia</i>	E
*zebra mussel	<i>Dreissena polymorpha</i>	C	pimpleback	<i>Quadrula pustulosa</i>	U
black sandshell	<i>Ligumia recta</i>	U	pink heelsplitter	<i>Potamilus alatus</i>	U
bullhead	<i>Plethobasus cyphus</i>	E	pink papershell	<i>Potamilus ohioensis</i>	U
butterfly	<i>Ellipsaria lineolata</i>	T	pistolgrip (buckhorn)	<i>Tritogonia verrucosa</i>	E
creek heelsplitter	<i>Lasmigona compressa</i>	T	plain pocketbook	<i>Lampsilis cardium</i>	C
cylindrical papershell (cylinder)	<i>Anodontooides ferussacianus</i>	T	pond papershell	<i>Utterbackia imbecillis</i>	U
deertoe	<i>Truncilla truncata</i>	U	pondmussel	<i>Ligumia subrostrata</i>	U
elktoe	<i>Alasmidonta marginata</i>	U	purple pimpleback	<i>Cyclonaias tuberculata</i>	T
ellipse	<i>Venustaconcha ellipsiformis</i>	T	rock-pocketbook	<i>Arcidens confragosus</i>	U
fatmucket	<i>Lampsilis siliquoidea</i>	U	round pigtoe	<i>Pleurobema coccineum</i>	U
fawnsfoot	<i>Truncilla donaciformis</i>	U	slippershell	<i>Alasmidonta viridis</i>	E
fingernailclams & peaclams		C	slough sandshell	<i>Lampsilis teres teres</i>	E
flat floater (heelsplitter)	<i>Anodonta suborbiculata</i>	U	spectacle case	<i>Cumberlandia monodonta</i>	E
fluted shell	<i>Lasmigona costata</i>	U	spike	<i>Elliptio dilatata</i>	U
fragile papershell	<i>Leptodea fragilis</i>	U	squawfoot (strange floater)	<i>Strophitus undulatus</i>	T
giant floater	<i>Pyganodon grandis</i>	U	threehorn wartyback	<i>Obliquaria reflexa</i>	U
hickorynut	<i>Obovaria olivaria</i>	U	three ridge	<i>Amblema plicata</i>	U
Higgins eye	<i>Lampsilis higginsii</i>	E	Wabash pigtoe	<i>Fusconaia flava</i>	U
lilliput	<i>Toxolasma parvus</i>	U	wartyback	<i>Quadrula nodulata</i>	U
mapleleaf	<i>Quadrula quadrula</i>	U	washboard	<i>Megaloniais nervosa</i>	U
monkeyface	<i>Quadrula metanevra</i>	U	white heelsplitter	<i>Lasmigona complanata</i>	U
mucket	<i>Actinonaias ligamentina</i>	C	yellow sandshell	<i>Lampsilis teres anodontooides</i>	E

Status in Iowa:

C = common
 U = uncommon
 T = threatened
 E = endangered

*Exotic species

