

Freshwater Mussels

By Dennis Skadsen

Freshwater mussels or clams, are bivalve mollusks having two shells or valves that are held together by hinges and muscles which protect and support the body and organs of the animal. Mussels cannot survive outside of their shells, and will die if the valves are pulled apart. Mussels spend their lives buried in the bottom sediment or benthos of the waterbody they inhabit. In the shallow water, the careful observer may be able to see the posterior end of a mussel sticking above the bottom sediment where the siphon tubes are located. Although mussels are mainly sedentary, you may also observe tracks resembling small furrows left in the sediment where mussels have moved along the bottom (see picture below).



White Heelsplitter moving along the bottom of the Little Minnesota River, siphon tubes are visible along the posterior end of the mussel on the left (photo by Dennis Skadsen)

Many of us have collected seashells along ocean beaches, and like seashells, freshwater



A pair of White Heelsplitter shells or valves (photo by D. Skadsen)

mussel shells will wash up on lakeshores or along the banks and sandbars of rivers and streams. Occasionally you'll find where raccoons and other predators have piled shells left from a recent meal. Often these piles indicate a nearby mussel bed that may support several species and dozens of individual mussels.



Fatmucket with exposed mantle (photo by Dennis Skadsen)

Freshwater mussels have very complex life histories. Mussel larvae called glochidia develop in the female and are released when fish are nearby. The glochidia attach themselves to a fish's gills or fins spending the next stage of their life (from a few weeks

to a year) as a parasite. A number of mussel species actually use appendages called mantles that mimic worms, insects, or small fish to attract potential hosts (see photo above). While some freshwater mussels are host specific others can parasitize several species of fish. When the juvenile mussel reaches a certain age and size, they drop from the host fish to the sediment too begin their lives as free-living organisms.

Native Americans used freshwater mussels as a source of food, and their shells for pottery, tools, and jewelry. In the 1800s, the shells of freshwater mussels were utilized for the production of mother-of-pearl clothes buttons. The button industry lasted until the advent of plastics in the late 1940s. There is no evidence freshwater mussels were ever harvested from northeastern South Dakota streams and rivers for the button industry, probably due to the lack of larger thick-shelled species.



Mother-of-pearl buttons (digital scan by Dennis Skadsen)

Mussels were also harvested in the 1800s by speculators in search of pearls. Unfortunately, only about 1 in 1000 mussels

will have a harvestable pearl and thousands of mussels were killed during the pearl-rush. Today, freshwater mussels collected in northeast South Dakota are used mainly for fish bait and occasionally food.

Most species of freshwater mussels can be identified by using a good field guide and observing the shells shape, color of the valves exterior, and the beak sculpture of live mussels. The shape of the pseudocardinal and lateral teeth, and the interior nacre color of dead shells are also useful in identifying to species.



Two pearls forming on the posterior end of a Giant Floater (digital scan by Dennis Skadsen)

Fifteen species of freshwater mussels have been documented in the counties of Day, Grant, Marshall, and Roberts. The majority are lotic species found only in the moving waters of streams and rivers. Two species are found in lentic conditions; the Giant

floaters and Fatmucket are found in larger northeast South Dakota lakes.

This list is compiled from the following sources; Perkins et al. (1995), Burgess and Shearer (2008), and the author's collection. Taxonomic order, common and scientific names follow Sietman (2003).

Freshwater Mussels Observed in Day, Grant, Marshall, and Roberts Counties, South Dakota.



Threeridge (digital scan by Dennis Skadsen)

Amblema plicata **Threeridge**

Rare in northeast South Dakota, only known from one pair of valves collected from the Whetstone River near Big Stone City. Species may prefer larger rivers and streams than those found in this area.



Mapleleaf (digital scan by Dennis Skadsen)

Quadrula quadrula **Mapleleaf**

Rare, only collected at the mouth of the Bois de Sioux River in northeast Roberts County.



Wabash Pigtoe (digital scan by Dennis Skadsen)

Fusconaia flava **Wabash Pigtoe**

Uncommon, collected from the North and South Forks of the Yellowbank River in Grant County, and the North and South Forks of the Whetstone River in Grant County. Apparently absent from the Little Minnesota River and its tributaries in

Roberts County. The above-mentioned rivers are the only known locations where the pigtoe is currently still found alive in the state. Species declining statewide due to sedimentation and pollution.

Anodontooides ferussacianus **Cylindrical Papershell**

Common, collected from Owens Creek, Jim Creek, Jorgenson River, Little Minnesota River, and the North Fork of the Whetstone River in Roberts County; and the North and South Forks of the Yellowbank River, and North and South Forks of the Whetstone River in Grant County. This species is usually found only in the small spring-fed headwaters of these rivers.

Common, collected from the Bois De Sioux, Jorgenson, and Little Minnesota Rivers in Roberts County; and the South Fork of the Whetstone River, and North and South Forks of the Yellowbank River in Grant County.



Creek Heelsplitter (digital scan by Dennis Skadsen)

Lasmigona compressa **Creek Heelsplitter**

Rare, collected from the Little Minnesota River in Roberts County; and from the South Fork of the Whetstone River, and North and South Forks of the Yellowbank River in Grant County. Only long-dead or relic shells found for this species until 2005 when fresh dead shells were recovered from the South Fork of the Yellowbank River by Burgess and Shearer (2008). Species declining statewide due to sedimentation and pollution.

White Heelsplitter (digital scan by Dennis Skadsen)

Lasmigona complanata **White Heelsplitter**

Pyganodon grandis **Giant Floater**

Common, found in all the larger streams, rivers and in several lakes in northeast South Dakota. This species is tolerant of pollution, and unfortunately due to this fact, one of the most abundant species in the state.



Live Creeper with foot visible (photo by Dennis Skadsen)

Strophitus undulates **Creeper**

Uncommon, collected from Jim Creek, Jorgenson River, Little Minnesota River, and North Fork of the Whetstone River in Roberts County; and from the North and South Forks of the Whetstone and Yellowbank Rivers in Grant County.

Lampsilis cardium **Plain Pocketbook**

Rare, only found in the Jorgenson River in Roberts County and the North Fork of the Whetstone River in Grant County. Reported to be rarely abundant when present which may explain the lack of specimen records from northeast South Dakota.



Fatmucket (digital scan by Dennis Skadsen)

Lampsilis siliquoidea **Fatmucket**

The second most common species in northeast South Dakota has been collected from all of the rivers in the area, and from most of the larger lakes.



Plain Pocketbook (digital scan by Dennis Skadsen)



Live Fatmucket in the Little Minnesota River
(photo by Dennis Skadsen)



Black Sandshell (digital scan by Dennis
Skadsen)

Ligumia recta **Black Sandshell**

Rare, only collected at the mouth of the Bois
de Sioux River in northeast Roberts County.



Fragile Papershell (digital scan by Dennis
Skadsen)

Leptodea fragilis **Fragile Papershell**

Uncommon, collected from the Little
Minnesota River and North Fork of the
Whetstone River in Roberts County; Big
Stone Lake; and the North and South Forks
of the Yellowbank River in Grant County.



Pink Heelsplitter (digital scan by Dennis
Skadsen)

Potamilus alatus **Pink Heelsplitter**

Uncommon, collected from Big Stone Lake, the Bois De Sioux and Little Minnesota Rivers in Roberts County; the North Fork of the Whetstone River in Grant County; and Blue Dog Lake in Day County.

Potamilus ohiensis **Pink Papershell**

Rare, only collected from the Bois De Sioux River in Roberts County, and the North Fork of the Whetstone River in Grant County. One of northeast South Dakota's rarest species.

Toxolasma parvum **Lilliput**

Rare, only collected in Grant County from the Whetstone and Yellowbank Rivers. One of the smallest Unionid mussels. Specimens collected by the author rarely longer than 1 inch from anterior to posterior.

(Sphaeriidae) **Fingernail Clams**

These small clams, seldom larger than a penny, can be found in most of the rivers and streams in the area. Apparently hard to identify to species as most guides list only to family.

❖ **Endangered and Threatened Species**

Overharvesting by the button industry in the 1800 and early 1900's and declining water quality has led to almost half of North America's freshwater mussels being listed as federally endangered or threatened species. No state or federally threatened and endangered species are known to occur in

this area. However, species like the Creek Heelsplitter and Wabash Pigtoe have no doubt declined due to degraded water quality (mainly sedimentation) in northeast South Dakota streams and rivers.

The following species are tracked by the South Dakota Natural Heritage Program managed by the SD Dept. of Game, Fish, and Parks. Observations of these species should be reported to Game, Fish, and Parks personnel. The condition of dead shells should be reported as relic or fresh dead (see photo below).

- Amblema plicata* **Threeridge**
- Fusconaia flava* **Wabash Pigtoe**
- Quadrula quadrula* **Mapleleaf**
- Lasmigona compressa* **Creek Heelsplitter**
- Strophitus undulates* **Creepers**
- Lampsilis cardium* **Plain Pocketbook**
- Ligumia recta* **Black Sandshell**
- Potamilus alatus* **Pink Heelsplitter**
- Toxolasma parvum* **Lilliput**

❖ **Suggested References**

Field Guide to the Freshwater Mussels in Minnesota.

By Bernard Sietman
2003. Minnesota Dept. of Natural Resources, St. Paul, MN.

North American Freshwater Mussels, Natural History, Ecology, and Conservation.

By Wendell R. Haag
2012. Cambridge University Press



Top: relic or long dead shell, Bottom: fresh dead shell (digital scan by Dennis Skadsen)

❖ Collecting Freshwater Mussels

It is illegal to harvest live freshwater clams for any purpose in South Dakota. The shells of dead mussels can be collected except for species listed as federally threatened or endangered. These include the Scaleshell (*Leptodea leptodon*), Higgins Eye (*Lampsilis higginsii*), and the Winged Mapleleaf (*Quadrula fragosa*). However, these three species do not occur in northeast South Dakota.

❖ Literature Cited

Burgess, Andy and Jeff Shearer. 2008. A Comprehensive Aquatics Survey of Minnesota River Tributaries. Unpublished Report, S.D. Dept. of Game, Fish, and Parks, Pierre. 41 pp.

Perkins, Keith, Dennis Skadsen, and Doug Backlund. 1995. A Survey for Unionid Mussels in Day, Deuel, Grant, and Roberts Counties, South Dakota. Unpublished Report, S.D. Dept. Game, Fish, and Parks, Pierre. 58 pp.

Sietman, Bernard E. 2003. Field Guide to the Freshwater Mussels in Minnesota. Minnesota Dept. of Natural Resources, St. Paul. 140 pp.