

Bivalves of Montana

NATIVE

GIANT FLOATER

Pyganodon grandis

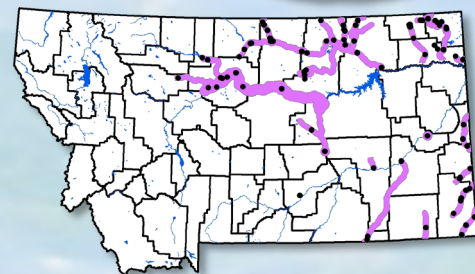
DESCRIPTION: Shell is up to 6 inches long. Generally thin, elliptical & light weight. Hinge has no teeth. Shell color is brownish to tan-green, inside pearly-blue sheen.

STATUS: Native species, globally common, statewide common and secure populations

PRIMARY HABITAT: Prefer pool and side channel areas of small to large warm prairie rivers with a mud, sand or gravel substrate. This mussel is tolerant of silt and warm water temperatures.

HOST FISH: Native Species: Iowa Darter, Brook Stickleback and Channel Catfish. Introduced Species: Common Carp, Yellow & Black Bullhead, Centrarchids and Yellow Perch.

KEY WATERSHEDS: Within the Missouri, Milk, and Little Missouri river drainages, more evenly distributed in the northern glaciated basins (Battle, Big Muddy, Frenchman, Poplar River, Rock Creek).



NATIVE

FINGERNAIL CLAMS AND PEACLAMS

Species in the family *Sphaeriidae*

DESCRIPTION: Across Montana 28 native species of peaclams and fingernail clams have been observed. These minute clams can be common but are often overlooked.

IDENTIFICATION: These species resemble typical clams found in fresh and saltwater environments. Although identifying clams to species can be difficult due to similar appearances, these animals are easily distinguished from freshwater mussels and Asiatic Clam by their small size (most species are approximately the size of a thumbnail or smaller) and delicate shells.

KEY WATERSHEDS Found state-wide in ponds, lakes, reservoirs, streams and rivers.



NON-NATIVE

BLACK SANDSHELL

Ligumia recta

DESCRIPTION: Elongate, pointed shell normally 4 to 6 inches long with a convex ventral edge. Shell interior has a purple to pink hue. Outside of shell can be dark brown to black.

STATUS: Introduced species, globally common, statewide common, rare within its native range in many midwestern states

PRIMARY HABITAT: Medium to large warm prairie rivers in riffles or runs with pebble, gravel, or firm sand substrates. This mussel is fairly intolerant of silt and warm water temperatures.

HOST FISH: Native species: Sauger. Introduced species: Centrarchids, Walleye, and Yellow Perch.

KEY WATERSHEDS: In the Missouri, Musselshell, and Milk rivers, spreading upstream from a Fort Peck Reservoir introduction. Highest densities in the Upper Missouri National Wild and Scenic River reach.



FATMUCKET

Lampsilis siliquoidea

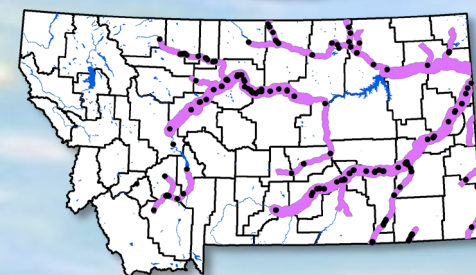
DESCRIPTION: Shell is 4 to 6 inches across. Generally heavy shell with large hinge teeth. Outside of shell can be light brown, yellowish to tan, often with greenish rays, inside white.

Status: Native species, globally common, statewide common and widespread populations

PRIMARY HABITAT: Prefer side-current areas, runs, and pools of medium to large cool to warm rivers with pebble, gravel, sand, or silt substrates. Fatmuckets are fairly tolerant of silt.

HOST FISH: Native species: Freshwater Drum, Channel Catfish, Stonecat and Sturgeons. Introduced species: Common Carp, Black Bullheads, Centrarchids and Yellow Perch.

KEY WATERSHEDS: Within the Missouri, Marias, Milk, Yellowstone and Little Missouri river drainages. Largest populations are found in the Upper Missouri National Wild and Scenic River reach.



INVASIVE

ZEBRA AND QUAGGA MUSSELS

Dreissena species

DESCRIPTION: a small, triangular bivalve (<50mm or ~2 inches). Color patterns can vary with some populations having only dark or light-colored shells and no stripes. They are typically found in dense aggregations attached to objects, surfaces, or other mussels by byssal threads extending from underneath the shells. Both species are similar, but Zebra Mussels have shells with flat backs.

STATUS: Aquatic Invasive Species, population failed

HABITAT: Fresh water lakes, reservoirs and rivers are potential habitat for these species. Adult mussels attach to submerged objects with byssal threads. Both species can survive overland transport and be introduced to new waterbodies through contaminated watercraft.

IMPACTS OF INTRODUCTION: Estimated potential economic damages of Dreissenid mussel infestations in Montana are up to \$234 million per year, including \$122 million to recreation, \$61 million to agriculture, \$47 million to infrastructure, and \$4 million to government revenue. Additionally, the estimated loss to lake shore property values is estimated to be \$497.4 million.



Zebra Mussel



Quagga Mussel

WHITE (CREEK) HEELSPLITTER

Lasmigona complanata

DESCRIPTION: Ovate shell rounded and laterally compressed, normally 4 to 6 inches long. Dorsal margin straight with a large wing. Outside of shell dark brown. Interior a bluish-pearl to white.

STATUS: Introduced species, globally common, statewide uncommon

PRIMARY HABITAT: Pools in medium to large sluggish prairie rivers with a mud, sand, or fine gravel bottom. Tolerant of silt and warm temperatures.

HOST FISH: Native species: Sauger. Introduced species: Carp, Green Sunfish, Largemouth Bass, and Walleye.

KEY WATERSHEDS: In the Missouri River basin, known from the Lower Milk River, and Beaver Creek, a tributary of the Little Missouri River.



WESTERN PEARLSHELL

Margaritifera falcata

DESCRIPTION: Elongate shell is normally 2.5 to 4 inches in length with a concave ventral edge. Interior shell has a purple to pink hue. Outside of shell can be dark brown to black.

STATUS: Native, globally uncommon, statewide uncommon, declining and at-risk. **Species of Concern** across western U.S

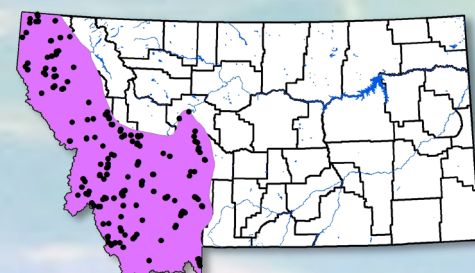
PRIMARY HABITAT: Prefer stable gravel substrates in low-gradient trout streams and intermountain rivers. Found in runs and riffles in main-current channel areas.

HOST FISH: Native species: Westslope Cutthroat Trout, Bull Trout, Steelhead and Chinook Salmon (Idaho). Introduced species: Rainbow Trout and Brook Trout.

KEY WATERSHEDS: In the upper Missouri: Beaverhead and Big Hole rivers (Deep & Clam Creeks) and the Madison River. Upper Clark Fork River (Upper Rock Creek in Willow & Sand Basin Creeks). Blackfoot-Clearwater, Thompson, and Kootenai-Yaak River (East Fisher River & Fivemile Creek).



Species of Concern



ASIATIC CLAM

Corbicula fluminea

DESCRIPTION: This freshwater clam is a small (<60 mm or 2.4 in) yellow or tan bivalve with shell ornamented by distinct, concentric ridges, anterior and posterior lateral teeth with many fine serrations. The shells are very hard and will not break under finger-strength pressure like native peaclams.

STATUS: Aquatic Invasive Species, detected in Montana

PRIMARY HABITAT: Rivers, lakes and reservoirs. Species has been detected in a single waterbody in southcentral Montana.

IMPACTS OF INTRODUCTION: The most prominent effect of the introduction of the Asiatic Clam into the United States has been biofouling of power and industrial water systems. It has also disrupted irrigation canals, pipes, and drinking water supplies. It alters benthic substrates and competes with native species for limited resources. More recent studies have implicated the Asiatic clam with the decline of native mussels.



MAPLELEAF

Quadrula quadrula

DESCRIPTION: Ovate shell thick and heavy, normally 3 to 5 inches in length and width. Outside of shell tan to dark brown. Generally two rows of bumps or pustules on raised ridges of outer shell.

STATUS: Introduced species, globally common, only a handful of records in Montana.

PRIMARY HABITAT: Pools or runs in large prairie rivers or reservoirs with a mud, sand, or gravel bottom. Usually not found in stream reaches with swift current.

HOST FISH: Native species: Channel Catfish. Introduced species: Yellow and Black Bullhead

KEY WATERSHEDS: Known only from the lower Tongue River and adjacent areas of the Yellowstone River.



Freshwater Mussel Ecology

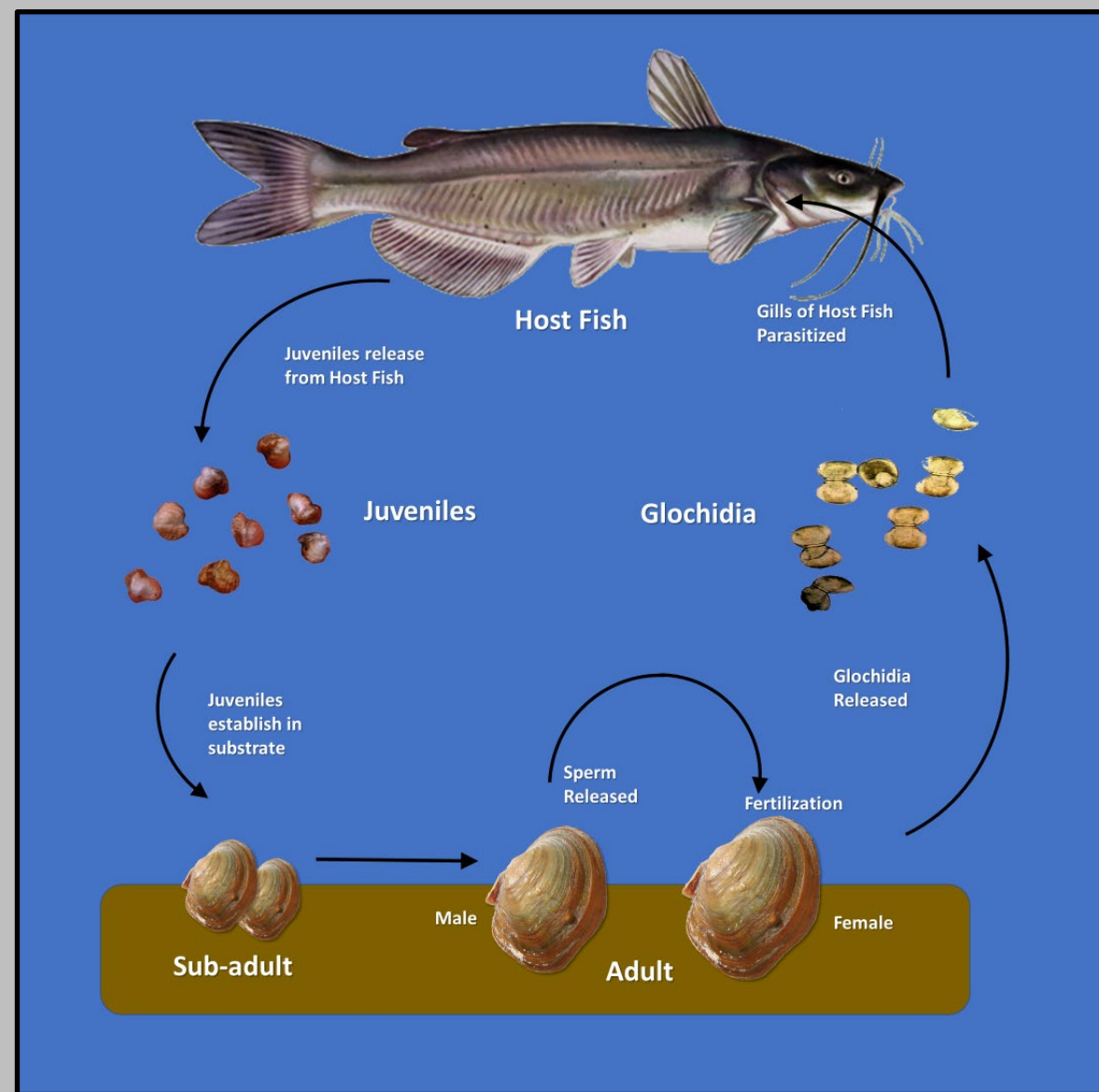
Montana's Hidden Biological Treasure

Mussels are a seldom seen and under-appreciated biological component of many Montana trout streams and prairie rivers. Few people know Montana has native freshwater mussels; even fish biologists and fishing guides who spend thousands of hours on rivers may not realize that they are floating over or stepping on these cryptic organisms; most resemble rocks on the river bottom.



Life Cycle of Freshwater Mussels

Freshwater mussels, sometimes called “clams”, are a group of mollusks within the class Bivalvia (meaning 2 valves or shells joined by a hinged ligament). Montana's native and introduced freshwater mussels have larvae that parasitize a host-fish. True clams such as native peaclams and invasive mussels have free-living larvae. Some species of freshwater mussels have developed elaborate lures to trick the host fish to bite them and become infected with mussel larvae.



Because larvae can be attached to the host fish for up to 3 months, mussels may be carried to new areas within the watershed. These otherwise sedentary species can move many miles upstream from their parents or even to different states. Our non-native freshwater mussels were likely introduced by hitching a ride on fish stocked into the state's waterbodies.

Native, Non-native and Invasive Bivalves

Although our native and non-native mussels share a name with several aquatic invasive species, Zebra and Quagga mussels are more closely related to peaclams and fingernail clams than true mussels. Members of the order *Unionoida* (freshwater mussels) are large bivalves that rely on fish to disperse their larvae.



Invasive mussels attached to a freshwater mussel. Note the difference in size.

Mussels that are present or may become present in Montana can be classified in the following ways:

- **Native Species:** Freshwater mussel species that were historically present in Montana and colonized Montana waters without aid of humans.
- **Non-native:** Freshwater mussel species present in Montana through introduction of host fish species by humans. These species are not considered problematic in the ecosystems they inhabit.
- **Invasive:** Non-native species that aggressively colonize the areas that they are introduced into often disrupting ecosystems and causing economic harm. Care should be taken to eliminate introductions and establishment of these species.

Native Mussel Conservation

North America contains the most diverse mussel fauna (~300 species) of any continent. Unfortunately, 38 of these species are presumed to be extinct and another 77 are considered critically endangered or threatened in their range. Mussels are filter feeders and require good water quality to thrive. Degradation of aquatic environments through altered hydrology, warming water temperatures, pollution, and sedimentation are ongoing threats to many species. In Montana the Western Pearlshell is a state Species of Concern due to declining abundance. Just 14 of 120 previously occupied sites were found to have viable populations in 2010 and declines are ongoing.



Learn more about Montana's wildlife and Invasive species on the Montana Field Guide <https://fieldguide.mt.gov/>

Community Science

How the public can aid wildlife science and management

Native and introduced mussel species are of interest to biologist and shells are often visible within the waterbodies they inhabit. Aquatic Invasive Species are a threat to the ecosystems they are introduced into. Observations of both groups of mussels are important for understanding species distribution and implementing management actions. If you find live or dead mussels, please report your sightings. Pictures of shells are best. Be sure to include GPS coordinates or a detailed description of the collection location.

If you spot **Invasive Mussels or Clams** please report to Montana Fish, Wildlife and Parks: by phone (406) 444-2440 or online using the Report A Suspected AIS Tool



Native and introduced Mussels can be reported to the Montana Natural Heritage Program:



Unsure of your identification? Photos can be uploaded to iNaturalist: <https://www.inaturalist.org/>



Impacts of Invasive Mussels in Montana

Although Zebra or Quagga Mussels are not established within the state, these invasive species pose a substantial threat to the ecosystems they might be introduced into and the infrastructure that relies on these waterbodies. In 2019 potential invasive mussel introductions were projected to negatively impact irrigation for agriculture and livestock, water treatment facilities, hydroelectric generation, fishing, boating, tourism, and property values. The total cost of establishment of these species is estimated at \$234 million per year. *Dreissena* species (Zebra or Quagga) were first reported as detections of veliger larvae in Montana in 2016. These species do not appear to have become established, but regular interceptions of watercraft contaminated with these species at check stations highlights the need to remain vigilant and avoid introduction.