

Endangered and Threatened Mussels in the Apalachicola-Chattahoochee-Flint Basin



Fat threeridge



Purple bankclimber



Chipola slabshell



Shinyrayed pocketbook



Gulf moccasinshell



Oval pigtoe

They make no sound. They cannot see. Some may live for decades, but seldom move from a secure spot. Yet, freshwater mussels are causing a stir; becoming noticed and making us ponder their future as we make plans for our own.

Mussels are in trouble. No other country in the world equals the United States in freshwater mussel variety. While all of Europe supports only 12 species, nearly 300 kinds live here. It's estimated that 70% of our freshwater mussels are extinct, endangered, or in need of special protection. In the Apalachicolan Region, three species have already been declared extinct, seven have been federally protected under the Endangered Species Act, and six more are proposed as candidates for federal protection. Many of their problems stem from how they live and changes that have occurred to their habitat during the past 200 years.

Why are freshwater mussels so imperiled?

Our native freshwater mussels face greater problems today than they did just a few years ago. Some problems aren't new. Although water quality has improved in some areas, pollution, especially non-point source pollution, causes the greatest threat to native mussels. Also sedimentation continues to take a serious toll. Habitat losses through channelization, clearing of riparian and streambank vegetation, dredging, and dam construction still persist. Mussels are impacted by loss of fish hosts from fish kills or dams that prevent fish migration. Poachers can impact mussels by violating harvest regulations set by conservation agencies. However, in some parts of the country, it's a non-native mussel causing the most concern.

Freshwater Mussel Facts

Common and scientific names:

Fat threeridge mussel (*Amblema neislerii*), Shinyrayed pocketbook (*Lampsilis subangulata*), Gulf moccasinshell (*Medionidus penicillatus*), Oval pigtoe (*Pleurobema pyriforme*), Chipola slabshell (*Elliptio chipolaensis*), and Purple bankclimber (*Elliptoideus sloatianus*).

Status: All six mussels were listed on March 16, 1998.

Description: Mussels are bivalve mollusks, which means they have two valves (shells) surrounding a soft fleshy body. Freshwater mussels are related to snails, oysters, clams and squids.

Habitat: Mussels live in the sand and gravel bottoms of streams and rivers. They require good water quality, stable stream channels and flowing water.

Diet: Mussels filter their food out of the water. They eat algae, other small plants and animals and possibly bacteria that grow on pieces of plant debris.

Life history: The larvae of these mussels are parasites on the gills and fins of freshwater fishes, including darters, minnows and bass. The larvae use the host fish for dispersal and cause them little to no harm. Many mussels use lures that mimic minnows, worms, leeches or aquatic insects to attract a suitable fish host.

Natural predators: Some species of fishes and turtles, as well as muskrats, raccoons, and otters feed on mussels.

Threats to survival: Habitat modification through manmade structures like dams and channel alterations has destroyed free-flowing water habitats. These modifications restrict mussels and fish from dispersing which results in small, isolated populations. In addition to habitat modifications, mussel populations are exposed to point source pollution and nonpoint source pollution such as toxic runoff containing fertilizers, herbicides and pesticides from land-use practices.



Life Down Under

Most freshwater mussels live burrowed in sand and gravel at the bottom of rivers and streams. Only a few are adapted to the quiet water and muddy depths of lakes, ponds, and reservoirs.

Unlike most animals, which must travel in search of food, their food drifts to them, mainly tiny plants and animals called plankton suspended in the water. By drawing water inside their shells through a siphon, their gills filter out food and take in oxygen.

Mussels usually don't move much, but a muscular "foot" helps them burrow and allows limited travel if disturbed by floods or drought. The foot also helps anchor them against strong currents and may prevent a hungry muskrat from tugging them out for its dinner! A mussel's shell, however, provides its main protection from predators.

Their hard, calcium-based shells consist of two halves joined by a hinge. Unique names like "fat threeridge," "purple bankclimber," and "Chipola slabshell" refer to the wide range of shell size, color, shape, and texture found among mussel shells.

Although their lives appear boring, their reproductive strategies are quite fascinating. Fertilized eggs develop and are released into the water to begin a parasitic stage. With little time to waste, these youngsters, called glochidia, must attach themselves to a host fish or perish. For some mussels, the host is limited to only a few fish species. This harmless parasitic stage lasts a matter of weeks before the larvae transform into young mussels and are ready to drop off the fish and begin a life in the stream bottom.

Why do we care?

■ **Monitors of aquatic health:** the presence of diverse and reproducing populations of mussels indicate a healthy aquatic system which means good fishing, good water quality for waterfowl and other wildlife species, as well as insurance that our water is safe. Conversely, when mussel populations are at risk, it indicates problems for other fish and wildlife species, and people too.

■ **Ecological value:** mussels are natural filters, feeding on algae, plankton, and silts, they help purify the aquatic system. Mussels are also an important food source for many species of wildlife including otters, raccoon, muskrat, herons, egrets, and some fish.

■ **Economic value:** freshwater mussels have been and continue to be a major economic resource; first in the button industry and now in the cultured pearl industry. Mussels from North American form the nucleus of the cultured pearl industry in Asia.

■ **Education and aesthetic value:** the study of mussels, their natural history, and habitat requirements provides interesting and important lessons on the interconnectedness of the aquatic system and how species adapt to their ecosystem.

■ **Cultural value:** Mussels played an important role in the cultural history of prehistoric and recent native peoples of the Apalachicola River Basin. They were used as food and the shells were used for ornamentation, tools, and as a commodity for trade. Indian shell middens (the piles of shells that native Americans have left behind) extend for miles along sites of old villages and encampments along the Apalachicola River.

■ **Biodiversity:** Mussels have, and hopefully will continue, to play an important role in our aquatic ecosystems. Considering that less than 20 mussel species are found in most other countries of the world, our North American rivers and streams are truly "rich" with close to 300 species!!

Some mussels do not get cancer. Researchers want to know why and mussels may have additional values in the future that we cannot now predict. The loss of any of these species will definitely have consequences on how the aquatic ecosystem functions.

What is being done?

Biologists from the U.S. Fish and Wildlife Service (Service) and the U.S. Geological Survey along with other Federal, State, and private agencies are working together to find solutions to problems facing our mussels.

The Endangered Species Act of 1973 provides an important tool for conservation of endangered and threatened species. Federally endangered species are so rare they are in danger of becoming extinct. Unfortunately, extinction is forever and once gone, a species can never return to our web of life. Threatened species are more abundant at this time but may become endangered in the future.

How can you help?

In order to protect mussels, thereby protecting ourselves, the following things can be done:

- Limit or cease pesticide use to conserve soil and prevent runoff into nearby lakes and streams. Integrated Pest Management (IPM) strategies can replace pesticide use—find out more about it.
- Help control soil erosion by planting trees and plants to avoid runoff of soil into freshwater areas.
- Remove aquatic weeds from boat trailers and motors before using again to prevent the spread of things such as zebra mussels. **Do not** throw weeds back into the water.
- Help support watershed management programs by calling your local resource management agency.
- Support and follow zebra mussel quarantine, inspection, and decontamination programs.
- Conserve water.

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