



## Snuffbox (freshwater mussel)

### *Epioblasma triquetra*

The snuffbox is a freshwater mussel that is listed as an *endangered species*. Endangered species are animals and plants that are in danger of becoming extinct. *Threatened species* are animals and plants that are likely to become endangered in the foreseeable future. Identifying, protecting, and restoring endangered and threatened species are primary objectives of the U.S. Fish and Wildlife Service's endangered species program.

#### What is the Snuffbox?

**Appearance:** The snuffbox is a small- to medium-sized freshwater mussel with a yellow, green or brown shell interrupted with green rays, blotches or chevron-shaped lines. The shell becomes darker and the interruptions less clear with age. Shell shape is typically triangular in females and oblong or ovate in males. Males can grow up to 2.8 inches, with females reaching only up to 1.8 inches.

**Range:** Historically the snuffbox was widespread, occurring in 210 streams and lakes in 18 states and Ontario, Canada. The population has been reduced to 79 streams and lakes in 14 states and Ontario, representing a 62 percent rangewide decline. The snuffbox is currently found in Alabama, Arkansas, Illinois, Indiana, Kentucky, Michigan, Minnesota, Missouri, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, Wisconsin, and Ontario, Canada. Most populations are small and geographically isolated from one another, further increasing their risk of extinction.



Photo by Dr. Chris Barnhart, Missouri State University

*The logperch is a host fish for snuffbox mussels. In this photo, a logperch approached the female mussel, which then snapped shut. Oftentimes, the mussel will snap closed on a fish's head or snout, ensuring that glochidia are released into the fish's gills.*

**Habitat:** The snuffbox is usually found in small- to medium-sized creeks, inhabiting areas with a swift current, although it is also found in Lake Erie and some larger rivers. Adults often burrow deep in sand, gravel or cobble substrates, except when they are spawning or the females are attempting to attract host fish. They are suspension-feeders, typically feeding on algae, bacteria, detritus, microscopic animals, and dissolved organic material.

**Reproduction:** The life cycle of the snuffbox, like most freshwater mussels, is unusual and complex. Males release sperm into the water column that is then siphoned by females to fertilize their eggs. Fertilized eggs develop into

microscopic larvae, called glochidia, within special gill chambers. After brooding for up to 7 months, females expel mature glochidia, which then must attach to the gills or fins of specific host fish species to complete development into juvenile mussels. If successfully attached to a host fish, glochidia mature within a few weeks. Juvenile mussels then drop off and continue to grow, if they fall onto appropriate substrate. Using host fish allows the snuffbox to move upstream and populate habitats it could not otherwise reach.

#### What threatens the snuffbox mussel?

**Dams:** Dams affect both upstream and downstream mussel populations by disrupting natural river flow patterns, scouring river bottoms, changing water temperatures, and

eliminating habitat. Adapted to living in flowing water, the snuffbox cannot survive in the lakes or slow water created by dams.

Snuffbox mussels depend on host fish to move upstream. Because dams block fish passage, they also prevent mussels from moving upstream, isolating downstream mussels from upstream populations. This fragmentation leads to small, unstable populations that easily die out.

**Pollution:** Adult mussels, because they are sedentary (meaning that they tend to stay in one place), are easily harmed by toxins and poor water quality caused by pollution. Pollution may come from specific, identifiable sources such as accidental spills, factory discharges, sewage treatment plants and solid waste disposal sites or from diffuse sources like runoff from cultivated fields, pastures, cattle feedlots, poultry farms, mines, construction sites, private wastewater discharges, and roads. Contaminants may directly kill mussels, but they may also reduce water quality, affect the ability of surviving mussels to have young, or result in lower numbers or disappearance of host fish.

**Sedimentation:** Although sedimentation is a natural process, poor land use practices, dredging, impoundments, intensive timber harvesting, heavy recreational use, and other activities accelerate erosion and increase sedimentation. Sediment that blankets a river bottom can suffocate mussels. Accelerated sedimentation may also reduce feeding and respiratory ability for snuffbox mussels, leading to decreased growth, reproduction, and survival.

**Nonnative Species:** The invasion of the nonnative zebra mussel into the U.S. poses a serious threat. Zebra mussels proliferate in such high numbers that they use up food

resources and attach to native mussel shells in such large numbers that the native mussel cannot eat or breathe. Another invasive species, the round goby, is a nonnative fish species that may displace native host fish species, thus reducing the ability of the snuffbox to reproduce.

### **What is being done to conserve and restore snuffbox mussels?**

**Listing:** In February 2012, the U.S. Fish and Wildlife added the snuffbox to the list of endangered species giving the species full protection under the Endangered Species Act. The ESA provides protection against practices that kill or harm the species and requires planning for recovery and conservation actions.

### **Watershed Protection**

**Partnerships:** The snuffbox cannot survive without help from watershed partnerships to restore habitat and improve surface lands. Causes of habitat degradation are numerous in streams throughout its range. In many cases, the threats are not from actions in or adjacent to rivers, rather, threats are from widespread problems on uplands at the highest elevations of watersheds. Habitat restoration will require improvements across the entire watershed. The voluntary assistance of federal and state agencies, conservation groups, local governments, private landowners, industries, businesses, and farming communities will be necessary to meet recovery goals.

### **What can you do?**

Learn more about how the destruction of habitat leads to loss of endangered and threatened species and our nation's plant and animal diversity. Discuss with others what you have learned.

Help improve water quality in local streams by minimizing use of lawn-care chemicals and properly disposing of or recycling

hazardous materials found in your home, like batteries, paint, car oil, and pesticides.

When boating, please follow any rules established to prevent the spread of exotic pests like the zebra mussel.

Join a conservation group or volunteer at a local nature center, zoo, or wildlife refuge.

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*January 2012*