



## Snuffbox (freshwater mussel)

### *Epioblasma triquetra*

The snuffbox is a freshwater mussel that the U.S. Fish and Wildlife Service has proposed to list 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 that is 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, while females only grow up to 1.8 inches.

**Range:** Historically the snuffbox was widespread, occurring in 208 streams and lakes in 18 States and Ontario, Canada. The population has been reduced to 74 streams and lakes in 14 States and Ontario, which is a 65 percent rangewide decline. Most remaining populations are small and geographically isolated from one another, further increasing their risk of extinction.

**Habitat:** The snuffbox is usually found in small to medium-sized creeks in areas with a swift current, although it is also found in Lake



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.*

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.

Snuffbox 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. The male releases sperm in the water column that is then siphoned by the female to fertilize her eggs. Fertilized eggs develop into microscopic larvae, called glochidia, within special gill chambers. After brooding for up to seven months, the female expels mature glochidia, which then must attach to the gills or fins of a 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 fish as a host species allows the snuffbox to move upstream and populate habitats it could not reach otherwise.

#### 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. The snuffbox, a mussel adapted to living in flowing water habitat, cannot survive in the still water impounded behind dams.

Snuffbox mussels also depend on host fish as a means to move

upstream. Because dams block fish passage, mussels are also prevented from moving upstream, which isolates upstream mussel populations from downstream populations leading to small unstable populations more likely to die out.

**Pollution:** Adult mussels are easily harmed by toxins and degraded water quality from pollution because they are sedentary (they tend to stay in one place). 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, feedlots, 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:** Sedimentation can be accelerated by poor land use practices, dredging, impoundments, intensive timber harvesting, and heavy recreational use. Excessive sedimentation suffocates freshwater mussels because it is difficult for them to move away from the threat. Impacts from increased or heavy sedimentation also reduces feeding and respiratory ability for the snuffbox mussel, which can lead to decreased growth, reproduction, and survival.

**Nonnative Species:** Nonnative zebra mussels have invaded U.S. waters, and pose 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 breath.

Another invasive species, the round goby, is a nonnative fish that may displace native host fish species, thus reducing reproductive ability of the snuffbox reproduce.

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

**Listing:** In 2007, the U.S. Fish and Wildlife Service completed a status assessment for the snuffbox mussel. The Service is now proposing to list it as endangered. If listed, the snuffbox will receive the Endangered Species Act's (ESA) full protection. The ESA would provide protection against certain practices and would require planning for recovery and recovery actions.

**Watershed Protection through 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 the rivers where the species is found. Instead, threats are due to 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 locally in 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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