



## Winged mapleleaf

### *Quadrula fragosa*

#### What is the Winged Mapleleaf?

The winged mapleleaf is 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 is the primary objective of the U.S. Fish and Wildlife Service's endangered species program.

**Appearance** - Winged mapleleaf grow up to four inches long. They have thick shells that are greenish brown, chestnut, or dark brown in color. Their shell, like that of a few other native freshwater mussel species, has several rows of bumps running from the hinge (umbo) to the edge of the shell. The patterns of these rows of bumps, or tubercles, help biologists differentiate this from other, similar mussel species. Faint rays are visible in small shells.

**Range** - When the recovery plan was approved in 1997 only one population of winged mapleleaf was known to be extant – in the St. Croix River on the border between Minnesota and Wisconsin. Since then four additional populations have been found: in the Saline River and Ouachita River in Arkansas, in the Little River in Oklahoma, and in the Bourbeuse River in Missouri. Additional surveying is needed to assess and monitor the status and distribution of each population.

**Habitat** - Winged mapleleaf are found in riffles with clean gravel, sand, or rubble bottoms and in clear, high



*The endangered winged mapleleaf is a freshwater mussel found in only five populations in Minnesota, Missouri, Arkansas, and Oklahoma.*

quality water. In the past, it may also have been found in large rivers and streams on mud, mud-covered gravel, and gravel bottoms.

**Feeding Habits** - To feed, the winged mapleleaf siphons in water and filters out food particles. It is thought that most of the particles that are actually used as food are phyto- and zooplankton – tiny organisms that drift with river currents.

**Reproduction** - Winged mapleleaf reproduction is similar to many other freshwater mussels. The males shed sperm into the water. Eggs, on the gills of females, are fertilized when sperm is collected as the female siphons in water. After fertilization, the females store the developing larvae (glochidia) in their gills until they're expelled into the river current. These glochidia must attach to the gills or fins of a fish to complete development. Glochidia can only develop on certain species of

fish which are called host fish. Known host fish for the winged mapleleaf are channel and blue catfish. Glochidia continue growing on the fish and transform into juveniles, then they drop off and land on the river bottom where they mature into adults.

The lifespan of the winged mapleleaf is not known, but the oldest known individual in the St. Croix is 22 years old.

#### Why is the winged mapleleaf endangered?

**Habitat Fragmentation and Small Population Size** - The five remaining populations are largely or entirely isolated from one another and appear to be highly differentiated genetically (Hemmingsen 2008). Each may possess important local adaptations. Propagation of winged mapleleaf and its reintroduction into historically occupied river reaches could reduce the impact to the species' genetic

diversity that might result from the loss of any of the remaining populations. In addition, it may be an important tool to increase the viability of one or more populations. The Service and its partners have not yet demonstrated the ability to produce winged mapleleaf in the numbers that would be necessary to effectively reintroduce the species. Significant progress toward this end has been made recently, however, and several agencies and scientists are now cooperating to establish successful protocols.

**Zebra Mussels** - Zebra mussels are an exotic species of mussel that threaten freshwater mussels in the Mississippi River watershed. Zebra mussels were inadvertently introduced into North America during the late 1980's and became established in the lower St. Croix River in 2000. They attach to any hard surface and breed so prolifically that they smother or otherwise harm native freshwater mussels. It is essential to the conservation of winged mapleleaf that zebra mussels are not allowed to invade this species' sole reproducing population.

**Land Use Changes** - The remaining reproducing population of winged mapleleaf is near the major metropolitan area of Minneapolis and St. Paul, Minnesota. As sprawl from this urban area continues, more and more of the St. Croix River watershed will be developed, which could result in increasing levels of contaminants and sediments in runoff that drains into the river. In Missouri and Arkansas, agriculture and industry are abundant in the watersheds where winged mapleleaf are present. These activities can

destabilize river corridors and increase runoff of harmful pesticides, chemicals, and sediment.

### **What is being done to prevent extinction of the winged mapleleaf?**

**Listing** - The winged mapleleaf was added to the U.S. List of Endangered and Threatened Wildlife and Plants on July 22, 1991. It is illegal to harm, harass, collect, or kill the mussel. Permits can be obtained from the U.S. Fish and Wildlife Service for scientific studies or take that is incidental to an otherwise legal activity.

**Recovery Plan** - A recovery plan has been prepared that identifies and prioritizes actions that are necessary to recover this species.

**Habitat Protection** - Xcel Energy, which operates a dam just upstream of the only known reproducing population of winged mapleleaf, is coordinating with the Minnesota and Wisconsin DNR's and the U.S. Fish & Wildlife Service to insure instream flow levels that protect this mussel. In addition, the National Park Service, the states of Minnesota and Wisconsin, the U.S. Army Corps of Engineers, and others are cooperating with the U.S. Fish and Wildlife Service to keep zebra mussels out of habitat occupied by winged mapleleaf in the St. Croix River.

### **What can I do to help prevent the extinction of species?**

**Learn** - Learn more about the winged mapleleaf and other endangered and threatened species. Understand how the destruction of habitat leads to

loss of endangered and threatened species and our nation's plant and animal diversity. Tell others about what you have learned.

**Join** - Join a conservation group or volunteer at a local Refuge, nature center, or zoo.

**Protect** - Protect water quality by minimizing use of lawn chemicals (i.e., fertilizers, herbicides, and insecticides), recycling used car oil, and properly disposing of paint and other toxic household products. If you boat, do whatever you can to prevent spreading zebra mussels within or between water bodies.

*U.S. Fish & Wildlife Service  
1 Federal Drive  
Fort Snelling, Minnesota 55111  
612/713-5350  
<http://www.fws.gov/midwest/endangered>  
Revised November 2009*

### **Literature Cited**

Hemmingsen, A. H. 2008. Phylogenetic placement and population genetic analysis of the endangered winged mapleleaf, *Quadrula fragosa*. M.S. Thesis. Iowa State University. Ames, IA. 110 p.

Hornbach, D. J., and M. C. Hove. 2008. Habitat requirements of the winged mapleleaf mussel: potential habitat degradation and decline in the St. Croix River. Macalester College, St. Paul, MN. 65 p.