

# Carolina heelsplitter

## *Lasmigona decorata*



*Carolina heelsplitter*; Gary Peeples

**Status:** Endangered

**Description:** The Carolina heelsplitter was first described in 1852. It has an ovate, trapezoid-shaped shell. The outer surface of the shell varies from greenish brown to dark brown in color, and shells from younger specimens have faint greenish brown or black rays. The nacre (inside surface) is often pearly white to bluish white, grading to orange in the deepest part of the shell. However, in older specimens the entire nacre may be a mottled pale orange. The shell of the largest known specimen of the species measures 4.6 inches in length. Like other freshwater mussels, the Carolina heelsplitter feeds by siphoning and filtering food particles from the water column.

The reproductive cycle of the species is similar to other native mussels. Males release sperm into the water, and the eggs are fertilized when the sperm are taken in by the females through their siphons during feeding and respiration. Females retain the fertilized eggs in their gills until the larvae (glochidia) fully develop. The glochidia are released into the water and must attach to the gills or fins of the appropriate fish species. They remain attached to their “fish host” for several weeks, drawing nourishment from the fish while they develop into juvenile mussels. They do not hurt their “fish host.” The juvenile mussels then detach from the fish host and drop to the bottom of the stream where they continue to develop, provided

they land in a suitable place with good water conditions. This dependence on a certain species of fish increases the mussels’ vulnerability to habitat disturbances. If the fish host is driven off or eliminated because of habitat or water quality problems, the mussels can’t reproduce and will eventually die out.

**Habitat:** The Carolina heelsplitter requires cool, clean, well-oxygenated water. Stable, silt-free stream bottoms appear to be critical to the species. Typically stable areas occur where the stream banks are well-vegetated with trees and shrubs.

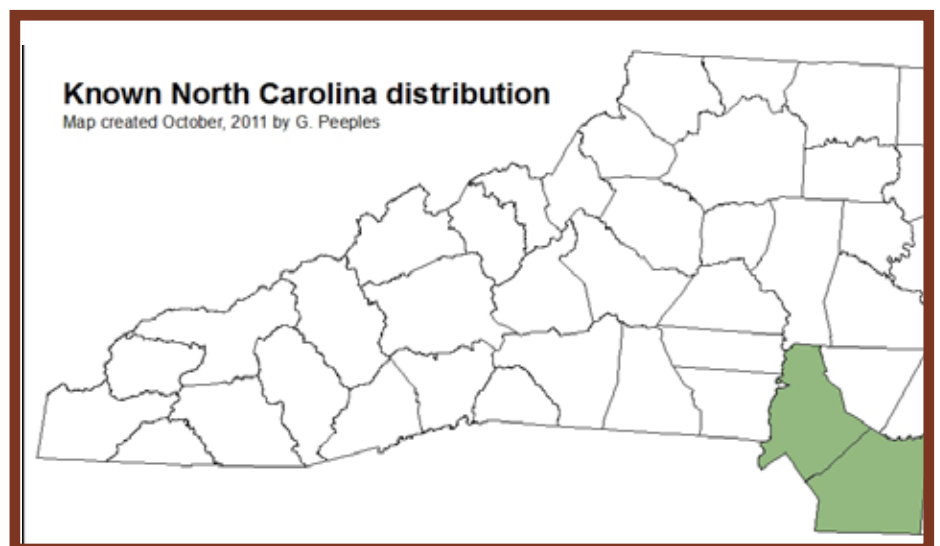
**Range:** Historically the Carolina heelsplitter occurred in several locations within the Catawba and Pee Dee River systems in North Carolina and the Catawba, Pee Dee, Saluda, and Savannah River systems in South Carolina. Today, only ten populations are known to survive. The species still occurs in two small streams in North Carolina – one in the Catawba River system and one in the Pee Dee River systems. In South Carolina there are six remaining populations, one in the Pee Dee; four in the Catawba; and two in small tributary streams in the Savannah River system. Finally, one

population sits on the North Carolina/South Carolina state line, in the Catawba River system.

**Listing:** Endangered, June 30, 1993. 58 FR 34926 34932

**Critical habitat:** Designated September 2, 2002. 67 FR 44501 44522

**Threats:** Poor water quality and habitat conditions have led to the decline and loss of populations of the Carolina heelsplitter and threaten the remaining populations. Studies have shown that freshwater mussels, especially in their early life stages, are extremely sensitive to many of the pollutants (chlorine, ammonia, heavy metals, etc.) commonly found in municipal and industrial wastewater releases. Impoundments (dams), channelization projects, and in-stream dredging operations directly eliminate habitat. These activities also alter the quality and stability of remaining stream reaches by affecting the water flow, temperature, and chemistry. Agriculture (both crop and livestock) and forestry operations, roads, residential areas, golf courses, and other construction activities that do not adequately control soil erosion and water run-off contribute excessive



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amounts of silt, pesticides, fertilizers, heavy metals, and other pollutants that suffocate and poison freshwater mussels. The alteration of floodplains or the removal of forested stream buffers can be especially detrimental. Flood plains and forested stream buffers help maintain water quality and stream stability by absorbing, filtering, and slowly releasing rainwater. This also helps recharge groundwater levels and maintain flows during dry months.

**Why should we be concerned about the loss of species?** Extinction is a natural process that has been occurring since long before the appearance of humans. Normally, new species develop, through a process known as speciation, at about the same rate other species become extinct. However, because of air and water pollutions, forest clearing, loss of wetlands, and other man-induced environmental changes, extinctions are now occurring at a rate that far exceeds the speciation rate.

All living things are part of a complex and interconnected network. The removal of a single species can set off a chain reaction that could affect many other species. For example, the loss of a single plant species can result in the disappearance of up to 30 other species of animals and plants. Each extinction diminishes the diversity and complexity of life on earth.

Endangered species are indicators of the health of our environment. The loss of these plants and animals is a sign that the quality of our environment – air, land, and water – is declining. Gradual freshwater mussel die-offs, such as the declining Carolina heelsplitter, and sudden mussel kills are reliable indicators of water pollution problems. Stable, diverse mussel populations generally indicate clean water and a healthy aquatic environment. While poor environmental quality may first manifest itself in the health of our plant and animal populations, if untreated, it eventually affects humans directly, as we breathe polluted air, lose valuable topsoil to erosion, or get sick from swimming in contaminated water.

We depend on the diversity of plant and animal life for our recreation, nourishment, and many of our

lifelines. Medicines and the ecological functions they provide. One-quarter of all the prescriptions written in the United States today contain chemicals that were originally discovered in plants and animals. Industry and agriculture are increasingly making use of wild plants, seeking out the remaining wild strain of many common crops, such as wheat and corn, to produce new hybrids that are more resistant to disease, pests, and marginal climatic conditions. Our food crops depend on insects and other animals for pollination. Healthy forests clean the air and provide oxygen for us to breathe. Wetlands clean water and help minimize the impacts of floods. These services are the foundation of life and depend on a diversity of plants and animals working in concert. Each time a species disappears, we lose not only those benefits we know it provided but other benefits that we have yet to realize.

### What you can do to help

Establish and maintain forested stream-side buffers. Several federal, state, and private programs are available to assist landowners, both technically and financially, with restoring and protecting stream-side buffers and eroding streams.

Implement and maintain measures for controlling erosion and storm water during and after land-clearing and disturbance activities. Excess soil in our streams from erosion is one of the greatest water pollution problems we have today.

Be careful with the use and disposal of fertilizers, pesticides, and other chemicals. Remember, what you put on your land or dump down the drain may eventually wind up in nearby water.

Support local, state and national clean water legislation.

Report illegal dumping activities, erosion, and sedimentation problems. These activities affect the quality of our water, for drinking, fishing, and swimming.

Participate in the protection of our remaining wild lands and the restoration of damaged ecosystems.

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