



# WILDLIFE NOTES

## Texas Hornshell Mussel

All photos by Brian Lang

At one time New Mexico had at least eight species of native mussels; now we have a remnant population of one species, the Texas Hornshell (*Popenaias popeii*).

### RANGE

The Texas Hornshell historically occurred in New Mexico, Texas and Mexico, but has declined notably throughout its range. It is now confirmed only in the Black River of Eddy County, New Mexico and possibly the Big Bend reach of the Rio Grande in Texas. Hornshells used to be fairly common in the lower Pecos River near Carlsbad and Roswell but now are confined to a few relict populations in a nine mile stretch of the lower Black River which still has permanent flows and good water quality. This represents only 12% of the historic range in the state.

### HABITAT

Hornshells typically occur in narrow areas of rivers and streams with travertine bedrock and fine-grained sand, clay or gravel on the bottom. They prefer undercut banks, crevices and bases of big boulders where the current is slowed, allowing the mussels to get a safe foothold and not be washed away in times of high water.

### DESCRIPTION

The Texas Hornshell is a bivalve mollusk, meaning it looks like a clam with two hard shells.



The outer shell surface appears olive-green to dark brown. They may grow as long as 7 inches. Inside there is a muscular foot for movement, siphons for water exchange, gills and the viscera.

### BEHAVIOR

Hornshell mussels live partially imbedded in mud, sand and gravel on the bottoms of rivers and streams. Adult mussels move by thrusts and pulls of the foot. The slow movements of mussels stir sediments and help exchange oxygen between the sediment and water.



TOP: Hornshell habitat in Black River.  
BOTTOM: Adult Hornshell.

### DIET/FEEDING

Mussels are filter feeders; by siphoning action, they take bacteria, diatoms, algae, tiny animals and organic detritus from the water. They may also obtain food by using the foot to sweep up organic and inorganic particles from the substrate.



Pinhead-sized juvenile mussel has dropped off fish host to begin bottom-feeding. Photo courtesy of USFWS.

## REPRODUCTION

Hornshells and other freshwater mussels have evolved a fascinating and complex reproductive strategy. The life cycle begins with males releasing a ball of sperm into the river current. Females living downstream inhale these during their filter “feeding” and eggs are fertilized internally. Gravid females are found April through August.

The embryos develop in specialized portions of the females’ gills, growing into tiny creatures called glochidia, about the size of sand grains. Females release these babies into the current. The glochidia must then find certain fish species that are suitable hosts. Most kids are completely dependent upon others at some point in their growing up and these mussel babies are no exception. If they encounter the right fish, they clamp onto gill tissues where they are nourished by fish blood. However, since the meeting of Hornshell glochidia and appropriate fish is mostly by luck, rarely does the number of glochidia attached to the gills damage a fish.

After a few weeks of using the fish as nursery and taxi, the tiny glochidia begin to look like miniature mussels. They develop a foot, kick free of the host and fall to the bottom of the stream/

pond where they settle in as juvenile mussels for a life of filter feeding.

Preliminary research has confirmed glochidia on seven fish species in the Black River: Gizzard Shad, Red Shiner, River Carpsucker, Blue Sucker, Grey Redhorse, Channel Catfish, and Longear

## Sunfish

The odds of glochidia finding a host, attaching, landing in a suitable environment and reaching adulthood are incredibly slim even in the best environmental conditions. They also have predators such as raccoons, muskrats, some birds, turtles, and fish. But if they do survive, they may live well over 20 years. In favorable environments, mussel beds can be extremely long-lived, from a few decades to a maximum of about 200 years.

## CONSERVATION

The Texas Hornshell represents the last remaining native mussel in New Mexico, as all other native mussels (7 species) have been extirpated. There remain only a few thousand Hornshell individuals. The decline in freshwater mussel populations in New Mexico can be directly attributed to human actions that modify physical conditions in streams.

In general, filter-feeding mussels require clean, flowing water. They are very sensitive to

environmental degradation and serve as indicators of aquatic ecosystem health. Habitat modification in the form of impoundments, diversions for agriculture and flood control, contamination of water from the oil and gas industry, increased sedimentation from prolonged overgrazing and loss of native vegetation have been linked with the drastic decline of many North American mussels. Much of the river habitat within the historic range of Texas Hornshell has experienced tremendous increases in salinity as a result of agricultural returns to the rivers. Groundwater depletion and exotic species are further threats to mussel communities. Mussels may also be threatened by the loss of the specific host fish for their glochidia. Over the last century, the decline of many native fishes, and even the extinction and extirpation of some species, could have affected Hornshell numbers. Dams may have prevented host fish migrations.

New Mexico has listed the Texas Hornshell as a state-endangered species since 1983. The U.S. Fish and Wildlife Service classifies the Texas Hornshell as a candidate for federal endangered status. A recovery plan for the species developed by New Mexico Game and Fish can be found at [http://www.wildlife.state.nm.us/conservation/threatened\\_endangered\\_species/documents/TXHornshellRecoveryPlanFinal.pdf](http://www.wildlife.state.nm.us/conservation/threatened_endangered_species/documents/TXHornshellRecoveryPlanFinal.pdf)

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