

Living on the Edge:

Trout are Key to Endangered Mussel's Survival

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Trout are by far the most pursued sport fish in Pennsylvania waters. While most of us appreciate the importance of trout to anglers, the importance of trout to one of Pennsylvania's most endangered native mussel species is less known. Already driven to the edge of extinction by pollution and harvest pressure, the persistence of trout and trout habitat has been the key to the survival of the eastern pearlshell and will be the key to the recovery and eventual return of the species to streams and rivers of the Commonwealth.

The eastern pearlshell is a very rare, moderately thick-shelled mussel. The Pennsylvania population is living at the southernmost edge of the species' North American range in only a few streams within the Delaware River basin. Globally, the eastern pearlshell is unique among North America's mussels in that it is found around the world at similar latitudes. Because the species' populations in northern Europe and Russia appear to be collapsing, the survival of Pennsylvania's eastern pearlshell population is critically important.

Pennsylvania's eastern pearlshells were once fairly common in the smaller tributaries to the Schuylkill and Delaware rivers. The eastern pearlshell was nearly eliminated at the turn of the century by hunters harvesting the mussels in pursuit of extremely rare natural pearls. Around the same time period, eastern pearlshells were also subjected to acid mine drainage from the region's numerous anthracite coal mines, impounded water from hundreds of small dams and increased water temperatures and stream sedimentation associated with widespread deforestation. Despite the many threats to their existence, a few eastern pearlshell populations managed to survive in Pennsylvania.

So, what do trout and a stream bottom dwelling freshwater mussel have in common? The pearlshell is wholly dependent upon trout

for its survival, because trout act as temporary nurseries for larval (baby) mussels. As part of their development process, the larvae (glochidia) of the eastern pearlshell must find a temporary home in which to develop into juveniles. Like the majority of our Pennsylvania



photos-PFBC archives

The eastern pearlshell was listed as an endangered species by the Pennsylvania Fish & Boat Commission on September 10, 2005. Maximum attainable size is approximately 5 inches.



Eastern Pearlshell

mussels, they achieve this by using fish as hosts for the glochidia. Gravid (pregnant) female mussels expel thousands of glochidia into the water column and, as they move downstream, the larvae attach to the unsuspecting trout. The glochidia usually attach to the gills, where there is a lot of surface area. After temporarily parasitizing the fish, the hitchhiking glochidia quickly metamorphose (grow and change) into juvenile mussels, which drop off the fish and settle into the river or stream bed.

Eastern pearlshells have evolved specifically to use trout, including native brook trout, rainbow trout and brown trout, as their host species. Therefore, the survival of the pearlshells is dependent upon the survival and behavior of these trout species. Any changes in trout abundance, diversity or habitat may have devastating consequences for the eastern pearlshell.

Unlike Pennsylvania's other native mussels that prefer slower moving, warmer waters with plenty of calcium for shell development, the eastern pearlshell is unique because it occurs in water cold enough to support trout populations. These streams provide the high quality habitat necessary for the existence of the eastern pearlshell and have relatively high velocity, lower nutrients and calcium-poor sandstone habitats.

If the eastern pearlshell streams were to lose these high quality habitats, trout would either move or be unable to survive, and the eastern pearlshell would be unable to reproduce. This degradation of habitat coupled with the loss of trout would lead to the loss of this important mussel species. Therefore, maintaining the relationship between good quality habitat, trout and the eastern pearlshell is important.

There is hope for the recovery of this species in Pennsylvania. Targeted habitat restoration activities for trout also create habitat for this endangered mussel. The unique relationship between an endangered mussel and native brook trout may mutually help the recovery of both species while also expanding public fishing opportunities.

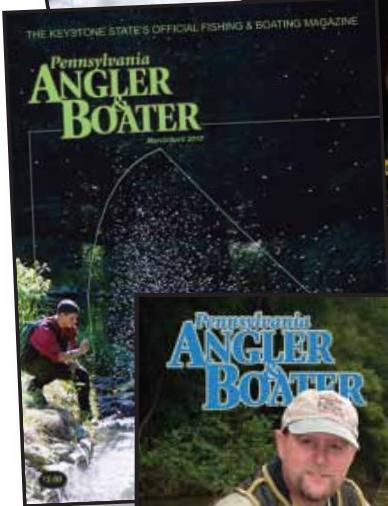
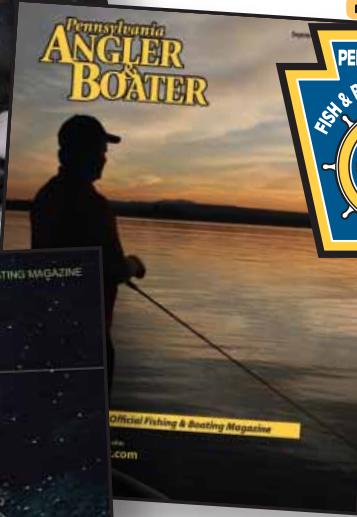
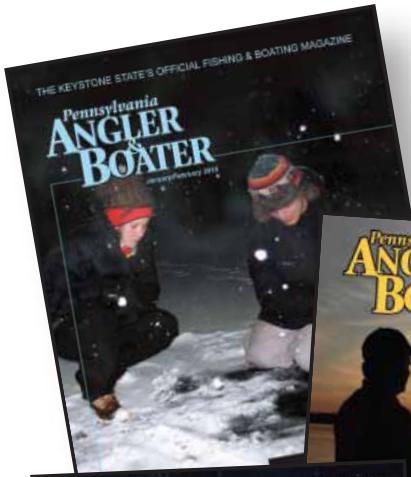


During a stream study, a view bucket is used to search for mussels.

The Pennsylvania Fish & Boat Commission (PFBC) developed a Species Action Plan, or state "recovery" plan, for this species that can be found at www.fishandboat.com/water/amprep/species-plan-margaritifera.pdf. The Species Action Plan provides a realistic step-by-step blueprint for restoring the eastern pearlshell to a point where they can be removed from the list of endangered and threatened species. The next steps for the recovery of the eastern pearlshell include examining trout habitat and population data, so we can identify areas where the habitat and fisheries that support the mussels can be improved. A State Wildlife Grant was recently awarded to the Western Pennsylvania Conservancy to assist PFBC in completing this work.

If you suspect that you encountered an eastern pearlshell during your time on the water, please send high resolution photographs along with a detailed site description (see the example below) to Mike Porta at mporta@pa.gov or Nevin Welte at c-nwelte@pa.gov. After taking the photos, return the specimen to the location where it was collected. Current state regulations prohibit the collection of any freshwater mussels from waters of the Commonwealth and prohibit the unauthorized collection of endangered species without a special endangered species permit. ☐

Example Site Description	
Species (if known):	Eastern Pearlshell (<i>Margaritifera margaritifera</i>)
Date of Observation:	1 January 2013
Location:	Schuylkill River, Berks County, PA. Name of the nearest town or intersection.
GPS coordinates:	Use decimal degrees
Number of individuals observed:	5
Name of observer:	Jane Doe



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