

Species: Eastern Pearlshell (*Margaritifera margaritifera*)  
Global Rank: G4  
State Rank: S1  
State Wildlife Action Plan Priority: High-level Concern Species  
CCVI Rank: Extremely Vulnerable  
Confidence: Very High

Habitat (adapted from NatureServe 2010):

Eastern pearlshells are generally found in cold, nutrient-poor, unpolluted trout streams and smaller rivers with moderate flow rates. Benthic substrate is usually sand, fine gravel, or a sand-gravel mix where mussels can bury themselves (Spoo 2008). This species has a circumboreal distribution in northern Europe, eastern North America, and Eurasia. Its range includes the arctic and temperate regions of western Russia, westwards through Europe to the north-eastern seaboard of North America and southwards to the Iberian peninsula and "central" Europe. In North America, it is distributed from Newfoundland and Labrador down to Pennsylvania (Burch 1975) and Delaware and west to the Appalachian mountains (Ziuganov et al. 1994).

Current Threats:

Impacts to water quality from coal mining have eradicated the eastern pearlshell from all but a very few locations in Pennsylvania. Other threats include degradation of water quality, alteration of pH, eutrophication, and temperature increases in streams (PA Bulletin, Doc # 05-1675).

Main Factors Contributing to Vulnerability Rank:

*Distribution relative to anthropogenic barriers:* Several dams are located upstream of the few known locations of this species in Pennsylvania and will likely hinder possible establishment of metapopulations upstream of known occurrences (PA Bulletin, Doc # 05-1675).

*Predicted impact of land use changes designed to mitigate against climate change:* Natural gas extraction in the upper Delaware region of Pennsylvania may negatively impact river water quality.

*Dispersal and movement:* As adults, eastern pearlshells are mostly non-migratory with only limited vertical movement and possibly passive movement due to flood events (NYNHP 2010).

*Predicted micro sensitivity to changes in temperature:* Since eastern pearlshells inhabit cold water trout streams, temperature increases due to climate change will likely alter habitat quality.

*Predicted macro sensitivity to changes in precipitation, hydrology, or moisture regime:* Considering the range of the mean annual precipitation across the species' range in Pennsylvania, the species has experienced a very small precipitation variation in the past 50 years.

*Dependence on specific disturbance regime likely to be impacted by climate change:* More intense flooding events, likely associated with climate change in Pennsylvania, may affect eastern pearlshell populations by altering water/habitat quality (e.g., increased siltation).

*Dependence on other species for propagule dispersal:* Eastern pearlshells depend on a few salmonid fish to serve as glochidial hosts (Spoo 2008).

References:

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Spoo, A. 2008. The pearly mussels of Pennsylvania. Coachwhip Publications. Landisville, Pennsylvania. 210pp.

Ziuganov, V., A. Zotin, L. Nezhlin, and V. Tretiakov. 1994. The Freshwater Pearl Mussels and Their Relationships with Salmonid Fish. VNIRO Publishing House: Moscow, Russia. 104 pp.