



Pennsylvania Imperiled Mussel Species Listing Criteria

Role of Different Criteria:

For listing as Endangered, Threatened, or Candidate there is a range of quantitative criteria; *meeting any one* of these criteria qualifies a taxon for listing at that level of immediate concern. Each taxon should be evaluated against all the criteria. Even though some criteria will be inappropriate for certain taxa (some taxa will never qualify under these however close to extinction they come), there should be criteria appropriate for assessing immediate concern levels for any taxon. The relevant factor is whether *any one* criterion is met, not whether all are appropriate or all are met. Because it will never be clear in advance which criteria are appropriate for a particular taxon, each taxon should be evaluated against all the criteria, and *all* criteria met at the highest immediate concern category must be listed.

Derivation of Criteria:

The criteria matrix has been modeled after the IUCN Red List. Criteria values have been derived from the IUCN Red List Version 3.1, the Nature Conservancy's definitions of threatened and endangered mussel species, and a PFBC analysis of statewide mussel distribution data from multiple sources.

GENERAL CRITERIA	PABS IMMEDIATE CONCERN CATEGORIES		
	ENDANGERED	THREATENED	CANDIDATE
	SPECIFIC CRITERIA	SPECIFIC CRITERIA	SPECIFIC CRITERIA
<p>A. Population reduction in the form of either of the following:</p> <p>1) An observed, estimated, inferred or suspected population reduction of ___% over the previous 20 years or four generations, whichever is longer, based on and specifying any of the following:</p> <ul style="list-style-type: none"> a) direct observation b) an index of abundance appropriate to the taxon c) a decline in area of occupancy, extent of occurrence and/or quality of habitat d) actual or potential levels of exploitation e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites. 	<p>≥ 80% in last 20Y or 4 G</p>	<p>≥ 50% in last 20Y or 4 G</p>	<p>≥ 20% in last 20Y or 4 G</p>
<p>2) A population reduction of at least ___% projected or suspected to be met within the next 10 years or 3 generations, whichever is longer, where the time period must include both the past and the future, based on and specifying any of b), c), d) or e) above.</p>	<p>≥ 80% in next 10Y or 3 G</p>	<p>≥ 50% in next 10Y or 3 G</p>	<p>≥ 20% in next 10Y or 3 G</p>

Continued GENERAL CRITERIA	ENDANGERED	THREATENED	CANDIDATE
	SPECIFIC CRITERIA	SPECIFIC CRITERIA	SPECIFIC CRITERIA
B. <u>Distribution & Trends:</u> 1) Extent of occurrence estimated to be less than ___ square miles or	<40 sq. mi.	<2,000 sq. mi.	<7,700 sq. mi.
2) Area of occupancy estimated to be less than ___ square miles, or	<4 sq. mi.	<200 sq. mi.	<770 sq. mi.
3) Extent of occupancy in stream or river less than ___ miles	<10 mi.	<50 mi.	<150 mi.
4) Estimates indicating any two of the following:			
a) Severely fragmented or known to exist at ___ location(s)	<6 locations	≤11 locations	≤20 locations
b) Continuing decline, observed, inferred or projected in any of the following: (1) extent of occurrence (2) area of occupancy (3) area, extent and/or quality of habitat (4) number of locations or subpopulations (5) number of mature individuals (6) reproduction and recruitment of mature individuals into population	Qualified decline, any rate	Qualified decline, any rate	Qualified decline, any rate
c) Extreme fluctuations in any of the following: (1) extent of occurrence (2) area of occupancy (3) number of locations or subpopulations (4) number of mature individuals	Qualified extreme fluctuations	Qualified extreme fluctuations	Qualified extreme fluctuations
C. Population estimated to number fewer than ___ Individuals.	<1,000	<3,000	<10,000
D. Quantitative analysis showing the probability of extinction in the wild is at least ___% within ___ years or ___ generations, whichever is longer	50% in 10Y or 3G	20% in 20Y or 5G	10% in 100Y