

CANDIDATE ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC AND COMMON NAME:

Pleurobema chattanoogaense, painted clubshell
Pleurobema hanleyanum, Georgia pigtoe
Pleurobema troshelianum, Alabama clubshell

LEAD REGION: 4

INFORMATION CURRENT AS OF: January 2003

STATUS/ACTION (Check all that apply):

New candidate

Continuing candidate

Non-petitioned

Petitioned - Date petition received: ____

90-day positive - FR date: ____

12-month warranted but precluded - FR date: ____

Is the petition requesting a reclassification of a listed species?

Listing priority change

Former LP: ____

New LP: ____

Latest date species first became a Candidate: _____

Candidate removal: Former LP: ____ (Check only one reason)

A - Taxon more abundant or widespread than previously believed or not subject to a degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

F - Range is no longer a U.S. territory.

M - Taxon mistakenly included in past notice of review.

N - Taxon may not meet the Act=s definition of Aspecies.@

X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Clams and Mussels - Unionidae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Alabama, Georgia, Tennessee

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Georgia

LEAD REGION CONTACT (Name, phone number): Rick Gooch, 404/679-7124

LEAD FIELD OFFICE CONTACT (Office, name, phone number): Jackson, Mississippi Field Office, Paul Hartfield, 601/321-1125

SUPPORT FIELD OFFICE(S): Athens, Georgia Field Office

BIOLOGICAL INFORMATION (Describe habitat, historic vs. current range, historic vs. current population estimates (# populations, #individuals/population), etc.):

The painted clubshell, Georgia pigtoe, and Alabama clubshell are freshwater mussels that were historically widely distributed in the Coosa River and many of its tributaries in Alabama, Georgia, and Tennessee. These species inhabited moderate to high gradient reefs, shoals, and riffles of small to large rivers throughout the drainage. Host fish and other aspects of the life history of these species are unknown. All three species currently are known from isolated populations surviving in localized portions of a short reach of the Conasauga River above Dalton, Whitfield and Murray Counties, Georgia.

In 1990, the Service initiated a status survey and review of the molluscan fauna of the Mobile River Basin. This included extensive surveys and collections from throughout the Coosa River drainage (M. Pierson, Field Records 1991 to 1994, Calera, Alabama, in litt.; Fish and Wildlife Service (Service) Field Records, Jackson, Mississippi, 1991 to 1994). At all localities in the Coosa River drainage, the freshwater mussel fauna had declined from historical levels, and at all but a few localized areas, the fauna proved to be completely eliminated or severely reduced due to a variety of impacts, including point and non-point source pollution, and channel modifications such as impoundment. Following a review of these efforts and observations, the Service reported 14 species of mussels in the genus Pleurobema, including the painted clubshell, Georgia pigtoe, and Alabama clubshell, as presumed extinct in the Mobile River Basin, based on their absence from collection records, technical reports, or museum collections for a period of 20 years or more (U.S. Fish and Wildlife Service 1994).

The Service and others have continued to conduct surveys in the Coosa River drainage for mollusks (M. Pierson, Field Records, 1995 to 1998; M. Hughes, Field Records, Knoxville, Tennessee, 1997 to 1998; D. Shelton, Field Records 1997 to 1998, Mobile Alabama; Service Field Records 1995 to 1998; Williams and Hughes 1998, Johnson and Evans 2000). Recently, several fresh dead and live individuals of the painted clubshell, Georgia pigtoe, and Alabama clubshell were collected during mussel surveys in the upper Conasauga River, Murray and Whitfield counties, Georgia (D. Shelton, Alabama Malacological Research Center, pers. comm. 1998; M. Hughes, pers. comm. 1998; Johnson and Evans 2000). Knowledgeable Service and U.S. Geological Survey biologists have confirmed these species identifications.

These three mussels historically occurred throughout the Coosa River drainage from the Conasauga River in Tennessee to the lower Coosa River in Alabama (Williams and Hughes 1998, Hurd 1974, van der Schalie 1981). In Tennessee, the painted clubshell was reported from the Conasauga River. In Georgia, the species was found in the Conasauga, Chattooga, Coosa, and Oostanaula Rivers and Armuchee Creek. In Alabama, it was recorded throughout the length of the Coosa River and in the lower portions of some of the larger tributaries. The Georgia pigtoe was historically reported from the Conasauga River in Tennessee and Georgia; the Coosawatee, Oostanaula, Coosa, and Etowah Rivers in Georgia; and the Coosa River and tributaries Big Wills, Terrapin, Big Canoe, Yellowleaf, Waxahatchee, Talledega, and Hatchet Creeks, in Alabama. The Alabama clubshell was historically known from the Conasauga River in Tennessee and Georgia; the Chattooga, Coosawatee and Oostanaula Rivers and Coahutta Creek in Georgia; and the middle Coosa River and Terrapin, Shoal, and Hatchet Creeks in Alabama.

In summary, the painted clubshell, Georgia pigtoe, and Alabama clubshell have been extirpated from throughout most of their historic ranges. The three species are currently known from recent collections of a few live and fresh dead shells of each species from localized portions of the upper Conasauga River in Murray and Whitfield counties, Georgia. The painted clubshell has also been identified from a short reach of the Coosa River in Cherokee County, Alabama (P. Johnson, Southeast Aquatic Research Institute, pers. comm., 2000). Causes of the decline of these species can be attributed to extensive impoundment of the Coosa River and its primary tributaries, and the effects of point and non-point source pollution on the surviving isolated populations.

THREATS (Describe threats in terms of the five factors in section 4 of the ESA providing specific, substantive information. If this is a removal of a species from candidate status or a change in listing priority, explain reasons for change):

Recent genetic studies were unable to distinguish the painted clubshell from the southern clubshell (listed as endangered), or populations of Georgia pigtoe and Alabama clubshell from southern pigtoe (listed as endangered) (P. Johnson, Tennessee Aquarium, pers. comm. 2002). Although there are some morphological differences that suggest separation, additional studies are required.

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

The painted clubshell, Georgia pigtoe, and Alabama clubshell have been extirpated from well over 90 percent of their historic range. All three species currently are known from isolated populations surviving in localized portions of a short reach of the Conasauga River above Dalton, Georgia. The painted clubshell has also been identified from a short reach of the Coosa River in Cherokee County, Alabama.

Isolated populations are vulnerable to land surface runoff that affects water quality or the suitability of aquatic habitats within a watershed. Blocked from avenues of emigration to less affected watersheds, they gradually perish if changes in land use activities cause aquatic habitat conditions to deteriorate. Similarly, if positive land use changes improve previously degraded aquatic habitat conditions, barriers to immigration will, nevertheless, prevent natural recolonization of those areas.

While the detrimental effect of any one source or land use activity may be insignificant by itself, the combined effects of land use runoff within a watershed may result in gradual and cumulative adverse impacts to isolated populations and their habitats. For example, excessive sediments deposited on stream bottoms can smother and kill relatively immobile mussel species, or make their habitat unsuitable for feeding or reproduction (Waters 1995, Hartfield and Hartfield 1996). Suspended sediments can interfere with feeding or affect behavior and reproduction (Waters 1995, Haag *et al.* 1995). Sediment is probably the most abundant pollutant currently affecting these three species. Potential sediment sources within a particular watershed include virtually any activity that disturbs the land surface. Highway construction, improper logging practices, agriculture, housing developments, pipeline crossings, or cattle grazing often result in physical disturbance of stream substrates or the riparian zone, and/or changes in water quality, temperature, or flow.

Excessive nutrient input from multiple sources (e.g, nitrogen and phosphorus from fertilizer, sewage waste, animal manure, etc.) into an aquatic system can also have cumulative effects. Land surface runoff contributes the majority of human-induced nutrients to water bodies throughout the country. Large amounts of nutrients in surface runoff can result in periodic low dissolved oxygen levels that are detrimental to aquatic species (Hynes 1970). They also promote excessive algal growth that can eliminate habitat for mussel conglomerates or juvenile mussels requiring clean rock or gravel substrate (e.g., Hartfield and Hartfield 1996). Excessive nutrients within a stream or river can also indicate the potential presence of pathogenic microorganisms. The human population is expanding within the Conasauga River watershed increasing the sediment and nutrient input to the system, and making the three mussel species vulnerable to progressive degradation from land surface runoff.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

These species are not commercially valuable nor is the Conasauga River subject to commercial mussel harvesting activities. The species have been taken for scientific and private collections in the past. Such activity may increase as the species continued existence becomes known. Although collecting is not considered a factor in the decline of this species, the localized distribution and small size of the known extant populations renders them vulnerable to overzealous recreational or scientific collecting.

C. Disease or predation.

Diseases of freshwater mussels are poorly known. Juvenile and adult mussels are prey items for some invertebrate predators and parasites, and provide prey for a few vertebrate species. Although predation by naturally occurring predators is a normal aspect of the population dynamics of a healthy mussel population, predation may contribute to the further decline of this species due to the localized extent and low numbers of mussels associated with the extant populations.

D. The inadequacy of existing regulatory mechanisms.

Although the negative effects of point source discharges on aquatic communities in the Conasauga River have been reduced over time by compliance with State and Federal regulations pertaining to water quality, there has been less success in dealing with non-point source pollution impacts. Such impacts result from individual private landowner activities (e.g., construction, grazing, agriculture, silviculture, etc.), and public construction works (e.g., bridge and highway construction and maintenance, etc.). Lacking State or Federal recognition, these mussels are not currently given any special consideration under other environmental laws when project impacts are reviewed.

E. Other natural or manmade factors affecting its continued existence.

The threats to the painted clubshell, Georgia pigtoe, and Alabama clubshell are compounded by their restricted range and low numbers. The three species are vulnerable to random catastrophic events (e.g., flood scour, drought, toxic spills, etc.). Limited range and low numbers also make the species vulnerable to land use changes within the Conasauga River watershed that would result in increases in non-point source pollution impacts.

These species may also be adversely affected by the loss or reduction in numbers of the fish host (s) essential to their parasitic glochidial stages. The specific fish host(s) for the glochidia of these species are not known; therefore, impacts on this aspect of the mussels= life cycles cannot be evaluated.

BRIEF SUMMARY OF REASONS FOR REMOVAL OR LISTING PRIORITY CHANGE:

FOR RECYCLED PETITIONS:

- a. Is listing still warranted? ___
- b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? ___
- c. Is a proposal to list the species as threatened or endangered in preparation? ___
- d. If the answer to c. above is no, provide an explanation of why the action is still precluded.

LAND OWNERSHIP (Estimate proportion Federal/state/local government/private, identify non-private owners):

All riparian lands are in corporate or private ownership.

PRELISTING (Describe status of conservation agreements or other conservation activities):

The Service is working to establish a National Wildlife Refuge in the upper Conasauga River. Watershed management outreach has been conducted. The Nature Conservancy has conducted a watershed impact analysis for the Conasauga River watershed. Surveys are ongoing, and genetic studies will be continuing to clarify and confirm taxonomy of these species.

REFERENCES (Identify primary sources of information (e.g., status reports, petitions, journal publications, unpublished data from species experts) using formal citation format):

Haag, W.R., R.S. Butler, and P.D. Hartfield. 1995. An extraordinary reproductive strategy in freshwater bivalves: prey mimicry to facilitate larval dispersal. *Freshwater Biology* 34:471-476.

Hartfield P. and E. Hartfield. 1996. Observations on the conglutinates of Ptychobranchus greeni (Conrad, 1834) (Mollusca: Bivalvia: Unionoidea). *American Midland Naturalist* 135:370-375.

Hurd, J.C. 1974. Systematics and zoogeography of the unionacean mollusks of the Coosa River drainage of Alabama, Georgia, and Tennessee. Ph.D. Dissertation, Auburn University, Auburn, Alabama. 240 pp.

Hynes, H.B.N. 1970. *The Ecology of Running Waters*. University of Toronto Press, Toronto.

- Johnson, P. D. and R.R. Evans. 2000. A contemporary and historical database of freshwater mollusks in the Conasauga River Basin. Report to USGS. SARI, Cohutta, GA.
- U.S. Fish and Wildlife Service. 1994. Status review of select mussel species in the Mobile River Basin. Status Report, U.S. Fish and Wildlife Service, Jackson, Mississippi. 3 pp.
- van der Schalie, H. 1981. Mollusks in the Alabama River drainage, past and present. *Sterkiana* 71:24-40.
- Waters, T.F. 1995. Sediment in streams: sources, biological effects, and control. American Fisheries Society Monograph 7. 251 pp.
- Williams, J.D. and M.H. Hughes. 1998. Freshwater mussels of selected reaches of the main channel rivers in the Coosa drainage of Georgia. U.S. Geological Survey report to U.S. Army Corps of Engineers, Mobile District. 21 pp. and appendices.

LISTING PRIORITY (place * after number)

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|--------|
| THREAT |
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| Magnitude | Immediacy | Taxonomy | Priority |
|--------------------|--------------|-----------------------|----------|
| High | Imminent | Monotypic genus | 1 |
| | | Species | 2 |
| | | Subspecies/population | 3 |
| | Non-imminent | Monotypic genus | 4 |
| | | Species | 5* |
| | | Subspecies/population | 6 |
| Moderate to Low | Imminent | Monotypic genus | 7 |
| | | Species | 8 |
| | | Subspecies/population | 9 |
| | Non-imminent | Monotypic genus | 10 |
| | | Species | 11 |
| | | Subspecies/population | 12 |

Rationale for listing priority number:

Magnitude:

Imminence:

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all additions of species to the candidate list, annual retentions of candidates, removal of candidates, and listing priority changes.

Approve: Linda Kelsey March 14, 2003
Acting Regional Director, Fish and Wildlife Service Date

Concur: _____ Date _____
Director, Fish and Wildlife Service

Do not concur: _____ Date _____
Director, Fish and Wildlife Service

Director's Remarks:

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Date of annual review: January 2003

Conducted by: Paul Hartfield- Jackson, Mississippi FO

Comments:

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