**Recovery Plan for the endangered Coosa moccasinshell (*Medionidus parvulus*) and Southern pigtoe (*Pleurobema georgianum*)**
**https://ecos.fws.gov/docs/recovery_plan/001117.pdf**

**Original Approved: November 17, 2000 Original Prepared by: Jackson, Mississippi Field Office, USFWS, and the Mobile River Basin Coalition Planning Committee**

**Amendment 1**

We have identified the best available information that indicates the need to amend recovery criteria for the Coosa moccasinshell and southern pigtoe since the Recovery Plan (RP) was completed. In this proposed modification, we synthesize the adequacy of the existing recovery criteria, show amended recovery criteria, and the rationale supporting the proposed RP modification. The proposed modifications are shown as an addendum that supplements the recovery plan by adding recovery criteria, superseding the recovery objectives and criteria for Coosa moccasinshell and southern pigtoe described in Part IV (pp. 52 and 59, respectively) of the RP for the Mobile River Basin Aquatic Ecosystem (USFWS 2000). Recovery plans are a non-regulatory document that provides guidance on how best to help recover species.

**For**
**U.S. Fish and Wildlife Service**
**Atlanta, Georgia**

**Approved:** Franklin Arnold III
Acting **Regional Director, U.S. Fish and Wildlife Service**

**Date:** 9/26/19

## METHODOLOGY USED TO COMPLETE THE RECOVERY PLAN AMENDMENT

This amendment was developed using the most recent and best available information for the species. The lead biologists for these species gathered information for the Coosa moccasinshell and southern pigtoe that included data from recent surveys and/or publications in Alabama, Georgia, and Tennessee. In addition, we notified species experts of the U.S. Fish and Wildlife

Service (Service) process to complete this amendment, and a meeting among Service biologists was conducted to develop the delisting criteria. Ultimately, biologists and managers in the Georgia Ecological Services Field Office and Alabama Ecological Services Field Office developed the amended recovery criteria utilizing the best available information.

## ADEQUACY OF RECOVERY CRITERIA

Section 4(f)(1)(B)(ii) of the Endangered Species Act (Act) requires that each recovery plan shall incorporate, to the maximum extent practicable, "objective, measurable criteria which, when met, would result in a determination...that the species be removed from the list." Legal challenges to recovery plans (see Fund for Animals v. Babbitt, 903 F. Supp. 96 (D.D.C. 1995)) and a Government Accountability Audit (GAO 2006) also have affirmed the need to frame recovery criteria in terms of threats assessed under the five listing factors.

### Recovery Criteria

The current recovery plan for Coosa moccasinshell and southern pigtoe (USFWS 2000) do not provide adequate guidance for downlisting or delisting (https://ecos.fws.gov/docs/recovery_plan/001117.pdf)

### Synthesis for the Coosa moccasinshell

The Coosa moccasinshell was listed as endangered in 1993 due to a decrease in the historical range, with habitat degradation being a major factor (50 CFR Part 17). Critical habitat (CH) was designated in 2004 (1,155 stream kilometers (km) (717.68 miles)) (69 FR 40084). The most recent status review for the Coosa moccasinshell was in 2019 (USFWS 2019), which recommended no change to the species endangered status.

The Coosa moccasinshell has been historically reported from the Cahaba River, the Sipsey Fork of the Black Warrior River, and the Coosa River, and their tributaries, in Alabama, Georgia, and Tennessee. Since this species was listed, its presence has been confirmed only in the Conasauga River (Murray/Whitfield County, Georgia; Polk County, Tennessee), and its tributary, Holly Creek (Murray County, Georgia) (Johnson and Evans 2000, Johnson *et al.* 2005, MRDMRC 2010, Williams and Hughes 1998).

The Coosa moccasinshell is currently restricted to a 3-km (1.86 miles) reach of Holly Creek in Georgia, a 4-km (2.49 miles) stretch of the Conasauga River in Tennessee (MRBMRC 2010), and at one site in the Little Cahaba River in Alabama where the species was reintroduced (Johnson 2012). The species has been extirpated from the remainder of its historical range in the

Coosa, Cahaba, and the Black Warrior River basins. Recent surveys show that few individuals have been found in the remaining historical range (P. Johnson, pers. comm. 2018). Currently, Alabama Aquatic Biodiversity Center (AABC) is holding Coosa moccasinshell as an ark population for propagation and host fish study purposes. Propagation techniques have been developed for this species by AABC and there has been one reintroduction effort where 59 individuals were released into the Little Cahaba River in Bibb County, Alabama (Johnson 2012). This site was monitored in 2014 and 4 of the 59 individuals were found alive (P. Johnson, pers. comm. 2018).

Critical habitat was evaluated and designated in 2004 along with 10 other species of freshwater mussels (69 FR 40084). It was determined the Coosa moccasinshell required nine separate CH Units across the Coosa River Basin (USFWS 2000). Of those nine CH Units, the Coosa moccasinshell is only found in one unit (Unit 25), and in very low numbers. The reintroduction site is located outside of the nine CH Units, however, it does fall within the historical range of the species and should be considered when meeting the amended recovery criteria.

**Synthesis for the Southern pigtoe**

The southern pigtoe was listed as endangered in 1993 due to a decrease in the historical range, with habitat degradation being a major factor (50 CFR Part 17). CH was designated in 2004 (1,155 stream km (717.68 miles)) (69 FR 40084). The most recent status review for the southern pigtoe was in 2019 with the completion of the species' 5-year status review (USFWS 2019), which recommended no change to the species' endangered status.

The southern pigtoe occurs in riffles, runs, and shoals of medium creeks to large rivers in sand and gravel substrates and is a short-term brooder, gravid during spring and early summer (Williams *et al.* 2008). The Alabama shiner (*Cyprinella callistia*), blacktail shiner (*C. venusta*), and tricolor shiner (*C. trichroistia*) have been reported as hosts for this species (MRBMRC 2010). However, attempts in 2010 and 2015 to culture this species, found the blacktail shiner to be a poor host, producing only 49 juvenile mussels from 31 infested blacktail shiners (Johnson 2018).

The historical range of the southern pigtoe included the Coosa River and its tributaries in Alabama, Georgia, and Tennessee. The species is currently known to survive in the following Coosa River tributaries: Conasauga River (Murray/Whitfield County, Georgia, Bradley/Polk County, Tennessee), Holly Creek (Murray County, Georgia), Armuchee Creek (Floyd County, Georgia), Shoal Creek (Cleburne County, Alabama), Big Canoe Creek (St. Clair County, Alabama), Terrapin Creek (Calhoun County, Alabama), Yellowleaf Creek (Shelby County, Alabama), Hatchet Creek (Coosa County, Alabama), and Cheaha Creek (Talladega County,

Alabama) (Buntin *et al.* 2015; Edelman *et al.* 2015; Evans 2001; Feminella and Gangloff 2000; Gangloff 2005; Gangloff and Feminella 2007; Golder Associates 2008; Johnson 2006, 2018; Johnson and Evans 2000; Johnson *et al.* 2005; Krause *et al.* 2012; Moran 2011, 2017; Pierson 1992, 1993; Williams and Hughes 1998; Wynn *et al.* 2016).

Extant populations of this species are small and localized. Shoal Creek contains the most robust population of southern pigtoe, but is limited to an isolated stream reach (9.6 km) (5.97 miles) in the Talladega National Forest between Sweetwater and Highrock lakes (MRBMRC 2010, Edelman *et al.* 2015). Warren *et al.* (2004) had previously estimated the Shoal Creek population size to be 800 individuals in 2003, but this population seems to have declined in recent years due to recent exceptional drought conditions in 2007-2008 and 2017 (United States Drought Monitor 2019 (https://droughtmonitor.unl.edu), P. Johnson pers. comm. 2019). Biologists were unable to estimate density during a 2011 follow-up survey due to the lack of animals found during quantitative sampling; however, qualitative searches did indicate low relative abundance (collecting only two individuals) (Krause *et al.* 2012).

The status has improved slightly by the discovery of several tributary populations in the Coosa River system in Alabama. However, the range remains highly fragmented and all populations are rare and restricted, and there is no trend data. The southern pigtoe remains vulnerable to extinction due to extreme curtailment of range and habitat, low numbers, and vulnerability to nonpoint source pollution and stochastic events.

Critical habitat was designated in 2004 along with 10 other species of freshwater mussels. It was determined the southern pigtoe required nine separate CH units across the Coosa River Basin (USFWS 2000).

## AMENDED RECOVERY CRITERIA

Recovery criteria serve as objective, measurable guidelines to assist in determining when an endangered species has recovered to the point that it may be downlisted to threatened, or that the protections afforded by the Act are no longer necessary and the Coosa moccasinshell and southern pigtoe may be delisted. Delisting is the removal of a species from the Federal Lists of Endangered and Threatened Wildlife and Plants. Downlisting is the reclassification of a species from endangered to threatened. The term "endangered species" means any species (species, sub-species, or DPS) which is in danger of extinction throughout all or a significant portion of its range. The term "threatened species" means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Revisions to the Lists, including delisting or downlisting a species, must reflect determinations made in accordance with sections 4(a)(1) and 4(b) of the Act. Section 4(a)(1) requires that the Secretary determine whether a species is an endangered species or threatened species (or not) because of threats to the species. Section 4(b) of the Act requires that the determination be made "solely on the basis of the best scientific and commercial data available." Thus, while recovery plans provide important guidance to the Service, States, and other partners on methods of minimizing threats to listed species and measurable objectives against which to measure progress towards recovery, they are guidance and not regulatory documents.

Recovery criteria should help indicate when we would anticipate that an analysis of the species' status under section 4(a)(1) would result in a determination that the species is no longer an endangered species or threatened species. A decision to revise the status of or remove a species from the Federal Lists of Endangered and Threatened Wildlife and Plants, however, is ultimately based on an analysis of the best scientific and commercial data then available, regardless of whether that information differs from the recovery plan, which triggers rulemaking. When changing the status of a species, we first propose the action in the *Federal Register* to seek public comment and peer review, followed by a final decision announced in the *Federal Register*.

**Amended Recovery Criteria**

We are providing recovery criteria for the Coosa moccasinshell and southern pigtoe RP which will supplement the existing criteria. The below recovery criteria describes a recovered species, or a species that should be considered for removal from the List of Endangered and Threatened Wildlife and Plants (50 CFR 17).

Coosa moccasinshell and southern pigtoe

1) At least six (6) populations exhibit a stable or increasing trend, evidenced by natural recruitment, and multiple age classes (Factors A and E ).

2) At least four (4) populations (as defined in Criteria 1) occupy four of the six HUC8 watersheds (Conasauga, Coosawattee, Oostanaula, Upper Coosa, Middle Coosa, and Lower Coosa), and one (1) population occupies the main stem of the Oostanaula or the Coosa River to protect against extinction from catastrophic events and maintain adaptive potential.

a) One (1) additional population (as defined in Criteria 1) of Coosa moccasinshell occupies the Cahaba, Upper Black Warrior, or Lower Black Warrior HUC8.

**3)** Threats have been addressed and/or managed to the extent that the species will remain viable into the foreseeable future (Factors A, C, D, and E).

**Justification for Amended Recovery Criteria**

Criterion 1: Populations that exhibit a stable or increasing trend, natural recruitment, and multiple age classes demonstrate that the population is secure and will be resilient to stochastic events (Factor A). For these mollusks it is believed that six populations exhibiting these traits are necessary to ensure sufficient redundancy such that the species will no longer require protection under the Act.

Criterion 2: To ensure that the species will not become threatened with extinction in the foreseeable future a sufficient number of populations should be distributed throughout its historical range. Therefore, we believe it is necessary for the species to occur in these representative units and in a variety of stream sizes. Using HUC8s as recovery units establish the spatial distribution required to reduce the likelihood of extinction from catastrophic events. The Coosa moccasinshell will require an additional population, due to the larger historical range. Expanding the species' range into historically occupied river reaches will increase its resiliency, representation, and redundancy, and reduce threats due to curtailment of range (Factor A) and stochastic events (Factor E).

Criterion 3: Abatement of the threats to these three species will allow populations to become stable and contribute to the viability of the species (Factor A). They are only known to persist in free-flowing streams. Eliminating significant sources of sedimentation, avoiding channelization and further dam construction, and adhering to good land management practices that minimize non-point source pollution in these sub-basins, will contribute to the conservation of the species into the foreseeable future. Agreements and management plans targeting threats related to these three species are necessary to ensure the species will no longer require protection under the Act.

**Rationale for Recovery Criteria**

The Service adopted analysis of Resiliency, Redundancy, and Representation (3Rs) as a means to determine species viability in regards to listing and other regulatory decisions. The amended criteria follow a similar analysis process. All criteria must address and meet the species needs to accomplish the standards under the 3Rs.

Resiliency (as defined in Smith *et al.* 2018) is met through Criteria 1 listed above. The Service

believes the establishment of data reflecting a stable or increasing trend in population numbers, and determining successful recruitment through multiple age classes, that all three mussel species will withstand any stochastic disturbance that may occur into the future.

Redundancy (as defined in Smith *et al.* 2018) is addressed in Criteria 1 and 3. The requirement of six resilient populations of the southern pigtoe and seven resilient populations of the Coosa moccasinshell across multiple HUC8 watersheds, as well as, in multiple stream orders will provide the distribution necessary to avoid extinction following any catastrophic event. An additional population of the Coosa moccasinshell is required due to the larger historical range of the species. Each of the HUC8s possess unique land characteristics, annual climate variations, and stream morphology. These variances will shield populations across multiple possible catastrophic events.

Representation (as defined in Smith *et al.* 2018) will be accomplished when all three criteria listed above (1, 2, and 3) is accomplished. The species will be distributed across multiple states, physiographic provinces, and stream orders. This should allow for preservation of genetic exchange into the future between two or more populations, distribution across multiple natural variances in habitat types, and allow for future adaptations to the changing environmental conditions.

Specifically, the proposed delisting recovery criteria reflect the best available and most up-to-date information for the Coosa moccasinshell and southern pigtoe. The stability of 6 populations reduces the probability of extinction in the foreseeable future, but aquatic species, and especially freshwater mussels, are subject to habitat degradation from effects throughout their entire catchment. This relationship is reflected in the wide variety of threats mentioned under Factor A and E in the initial listing publication (58 FR 14330). Due to the large number of threats to each population, the only way to ensure that the species will not become threatened with extinction in the future is to create a sufficient number of populations distributed throughout the Coosa Basin, such that the loss of any one population due to unforeseen circumstances does not limit the continued existence of the species. For this reason we believe that a robust and well developed propagation and reintroduction strategy is necessary for the delisting of this species. We suggest the maintenance and improvement of the existing populations along with the establishment of additional populations will have demonstrated that the combination of threats acknowledged in the initial listing are reduced to a degree that is manageable, and that species viability can be sustained despite remaining threats.

Currently, the AABC has successfully propagated and reintroduced the Coosa moccasinshell into the Little Cahaba River in Bibb County, Alabama. This introduced population (and future introduced populations) have the potential to meet the required viable population criteria as

stated above.

Additionally, the development of a successful reintroduction strategy (redundancy across tributaries and large river systems) will demonstrate that future threats are likely to be addressed through active management of the species without resort to future re-listing of the species, ensuring they no longer meet the definition of an endangered species.

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