

Recovery Plan for the Endangered Heavy Pigtoe (*Pleurobema taitianum*)
https://ecos.fws.gov/docs/recovery_plan/891114e.pdf

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We have identified the need to amend recovery criteria for the heavy pigtoe (*Pleurobema taitianum*). This proposed modification will be published as an addendum that supplements the recovery plan by adding delisting criteria which were not developed at the time the initial recovery plan was completed. The addendum will supplement the Recovery Objective and Criteria section of the *Recovery Plan for Five Tombigbee River Mussels* (USFWS 1989). Recovery plans are a non-regulatory document that provide guidance on how best to help recover species.

For
U.S. Fish and Wildlife Service
Region 4
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METHODOLOGY USED TO COMPLETE THE RECOVERY PLAN AMENDMENT

The proposed amendments to the recovery criteria were developed using the most recent and best available information for the species. Primary sources of this information include the species most recent 5-year review (USFWS 2015) and the current recovery plan (USFWS 1989). The lead biologist gathered the information and notified conservation partners of the U.S. Fish and Wildlife Service's (Service) process to complete this amendment.

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.

Existing Recovery Criteria

The current recovery plan (https://ecos.fws.gov/docs/recovery_plan/891114e.pdf) (USFWS 1989) does not provide recovery criteria, but it does outline recovery objectives, see page 9.

Synthesis

The heavy pigtoe was listed as endangered in 1987 due to habitat modification, sedimentation, degradation of water quality, impoundment by dams, stream channelization, dredging, reducing water flow, increasing siltation, and possible disturbance of host fish movements. The factors currently affecting this species includes alteration of habitat from free-flowing to an impounded system, dredging and snagging of the channel, siltation, reducing water flow, and suffocating sediment (Factor A); mortality resulting from commercial shell harvest, collection for scientific purposes, collection as fish bait (Factor B); limited enforcement of Federal or State regulations prohibiting take (Factor D); and fragmentation of populations leading to genetic diversity loss (Factor E) (52 FR 11162).

The heavy pigtoe was historically found throughout the Tombigbee and Alabama rivers, including within the Tombigbee River from the mouth of Tibbee Creek near Columbus, Mississippi, to Demopolis, Alabama; and the Alabama River at Claiborne and Selma, Alabama. It also historically occurred in the lower reaches of some large tributaries including; the East Fork Tombigbee River, Mississippi; the Buttahatchee River, Mississippi; the Sipse River, Pickens and Greene counties, Alabama; the lower Cahaba River, Alabama; and possibly the lower Coosa River, Alabama (52 FR 11162, Williams et al. 2008). It is currently only known to remain from a short reach of the Alabama River, Dallas County, Alabama (MRBMRC 2010, Garner and Buntin 2011). The occupied reach was quantified in 2010 by Garner and Buntin (2011) and was found to hold 6,250 square meters (m²) of suitable habitat. Only two heavy pigtoe were collected from 150 m² sample quadrats, and the following qualitative searches resulted in only four additional heavy pigtoe. These specimens were mature adults, providing no evidence of recruitment. Total number of heavy pigtoe mussels occupying the bed was estimated at 81 animals (Garner and Buntin 2011).

The status of the heavy pigtoe has declined since listing. The most recent five-year review reports that all third order stream populations are thought to be extirpated and the single surviving population in the Alabama River appears to have experienced recruitment failure (USFWS 2015). Its remaining population is vulnerable to natural or human-induced random catastrophic events.

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 delisted and the protections afforded by the Act are no longer necessary. Delisting is the removal of a species from the Federal Lists of Endangered and Threatened Wildlife and Plants. 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. 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*.

Herein, we provide recovery criteria for the recovery plan (USFWS 1989) as the plan did not include measurable criteria at the time of publication.

Amended Recovery Criteria

We are providing recovery criteria for the heavy pigtoe recovery plan (USFWS 1989). The below recovery criteria describes a recovered species, or a species that should be considered for removal from the Federal Lists of Endangered and Threatened Wildlife and Plants (50 CFR 17).

- 1) At least 4 populations exhibit a stable or increasing trend, natural recruitment, and multiple age classes (Factors A, B, and E).
- 2) Spatial distribution of populations (as defined in Criterion 1) includes one (1) population in each of the Alabama and Tombigbee rivers, and two (2) additional populations within the lower reaches of their tributaries (Factors A, B, and E).
- 3) Threats have been addressed and/or managed to the extent that the species will remain viable into the foreseeable future (Factors A, B, 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 habitat destruction, commercial harvest, limited enforcement, and stochastic events (Factors A, B, and E). For the heavy pigtoe, it is believed that 4 populations exhibiting these traits are necessary to ensure 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 the Tombigbee and Alabama rivers and the lower reaches of their tributaries. Expanding the

species' range into historically occupied river reaches will increase its resiliency, representation, and redundancy, and reduce threats due to habitat destruction, commercial harvest, limited enforcement, and stochastic events (Factors A, B, and E).

Criterion 3: Abatement of the threats to the heavy pigtoe will allow populations to become stable and contribute to the viability of the species. The heavy pigtoe is only known to persist in free-flowing large rivers. Commercial mussel harvest is permitted within a majority of the historical range of the heavy pigtoe and could lead to incidental harvest due to difficulty of identifying the species from commercially valuable species. Inadequate state and Federal protections could result from limited law enforcement staff availability. 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 rivers, will contribute to the conservation of the species into the foreseeable future (Factors A, B, D, and E).

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 Criterion 1. The Service believes establishment of a stable or increasing trend in population numbers, and determining successful recruitment through multiple age classes, the heavy pigtoe 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 2. The requirement of four resilient populations distributed between the Alabama and Tombigbee rivers, as well as, in the lower reaches of multiple large tributaries within the Alabama and Tombigbee rivers, will provide the distribution necessary to avoid extinction following any unforeseen catastrophic event. Each of these rivers 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 are accomplished. The species will be distributed across multiple states 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 stability of 4 populations reduces the probability of extinction in the foreseeable future. Due to the large number of threats to each population that cannot be mitigated, 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 its historical range, 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

reintroduction strategy could expedite the recovery of this species. We suggest the maintenance and improvement of the existing population 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 viable populations can be sustained despite remaining threats.

LITERATURE CITED

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