

**Recovery Plan for Ochlockonee Moccasinshell (*Medionidus simpsonianus*)**  
[https://ecos.fws.gov/docs/recovery\\_plan/030930.pdf](https://ecos.fws.gov/docs/recovery_plan/030930.pdf)

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**Original Prepared by: US Fish and Wildlife Service, Asheville and Panama City Field Offices**

## **DRAFT AMENDMENT 1**

We have identified best available information that indicates the need to amend recovery criteria for the Ochlockonee Moccasinshell (*Medionidus simpsonianus*) since the recovery plan 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 recovery plan modification. The proposed modification is shown as an addendum that supplements the recovery plan, superseding only pages iv, 77, 79, 81, and 82 of the recovery plan. Recovery plans are a non-regulatory document that provides guidance on how best to help recover the species.

**For  
U.S. Fish and Wildlife Service  
Southeast Region  
Panama City Ecological Services Field Office  
Panama City, Florida**

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## **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 biologist for the species gathered the information and notified species experts of the Service's process to complete this amendment.

We used the following sources of information as a basis for our criteria: conservation strategies developed during an informal meeting of species experts in Gainesville, FL in 2017; follow-up discussions and email exchanges with those experts; and information contained in Holcomb *et al.* 2015 and Pursifull *et al.* in prep., and unpublished survey data collected by the Florida Fish and Wildlife Conservation Commission (FWC) in 2017. All documents and data used for this proposed recovery plan modification are on file at the Panama City Field Office (PCFO).

The document was first internally reviewed by senior biologists at the PCFO. The document was then sent to three outside peer reviewers, who were chosen based on their qualifications and knowledge of the species. Guidance was provided to the reviewers, asking for comments on the information supporting recovery criteria, and identification of any additional new information on the Ochlockonee Moccasinshell that was not considered in this amendment. We noted that we were seeking their opinion that the best available data and analyses were considered in reassessing the recovery criteria. Two reviewers submitted comments and we incorporated them into this proposed modification document, where appropriate.

## 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) have also affirmed the need to frame recovery criteria in terms of threats assessed under the five listing factors (ESA 4(a)(1)).

### Recovery Criteria

The current recovery criteria can be found on pages iv, and 77–82 in the 2003 recovery plan. ([https://ecos.fws.gov/docs/recovery\\_plan/030930.pdf](https://ecos.fws.gov/docs/recovery_plan/030930.pdf))

### Synthesis

*Background*—The Ochlockonee Moccasinshell (*Medionidus simpsonianus*) was listed as endangered on March 16, 1998 (63 FR 12664) due to significant habitat loss, range restriction, and population fragmentation and size reduction. Critical habitat was designated in 2007 (72 FR 64286) and a 5–year review was last completed in 2007 (USFWS 2007).

*Distribution and biology*—The Ochlockonee Moccasinshell is a freshwater mussel endemic to the Ochlockonee River basin in Florida and Georgia, where it presently occupies about 23 river kilometers (rkm) (14 river miles (rm)) of stream channel in the lower Ochlockonee River (generally from rkm 40 to 63) in Liberty and Wakulla counties, FL (Holcomb *et al.* 2015; FWC unpub. data, Pursifull *et al.* in prep.). Since the 1960s, its range has generally been reported as the Ochlockonee River basin upstream of Lake Talquin (USFWS 1998, Williams *et al.* 2014). The mainstem was impounded in 1929 near Tallahassee, FL, forming Lake Talquin. The Ochlockonee Moccasinshell’s known historical range in the upper basin includes 108 river kilometers (67 rm) of the mainstem (generally from rkm 139 to 247). It is also known from one locality on the lower Little River, a large tributary that now flows into Lake Talquin. During 2006 to 2017, status surveys were conducted by three agencies throughout the Ochlockonee River basin. In total 270 surveys were conducted, including all localities where the species was found historically. The Ochlockonee Moccasinshell was not detected in the upper basin (upstream of Lake Talquin) and is presently considered extirpated from this portion of its historical range; however in 2014, a previously unknown population was found in the lower Ochlockonee River. Habitat associations for this population were reported as stable sand near flow refuges associated with areas of increased gradient in river bends and moderately depositional habitats (e.g., backside of a bend, downstream of a flow deflecting barrier); individuals were often found near stabilizing structures such as logs (Holcomb *et al.* 2015). The Ochlockonee Moccasinshell probably has very limited dispersal ability as it likely uses only darters as its fish host (Johnson *et al.* 2016; Williams *et al.* 2014).

*Status*—The Ochlockonee Moccasinshell is an extremely rare freshwater mussel, presently known from one population downstream of the mainstem impoundment. Since this population

was discovered in 2014, a total of 28 individuals have been collected during 19.5 hours of search effort (FWC unpub. data). The species' range has been reduced by at least 89 percent (23 rkm (14 rm) occupied currently compared to 216 rkm (134 rm) historically). The small population and greatly reduced range of the Ochlockonee Moccasinshell makes it more vulnerable to extinction (Holcomb *et al.* 2015).

*Threats*—The upper Ochlockonee River basin, has been impacted considerably by intensive agricultural activities, urban development, industrial and municipal wastewater discharges, groundwater pumping, drought, surface mining, and a mainstem impoundment. Channel instability, reduced flows, and contaminants are thought to be main reasons for the species' decline in the upper basin. The newly discovered population in the lower basin is potentially threatened by saltwater intrusion due to sea level rise and storm surge. Also, the dam may negatively impact flow regimes, water quality, temperature, and can cause channel incision (Hemming *et al.* 2005, Holcomb *et al.* 2015).

*Conservation actions*—In light of new information on the Ochlockonee Moccasinshell's distribution, an expert working group met in December 2017 to informally identify strategies and initial actions necessary to conserve the species. Actions identified include: 1) develop a reintroduction plan; 2) survey remote reaches of the upper mainstem which may include employing environmental DNA techniques; 3) examine whether current water and sediment quality conditions will support the species; and 4) examine genetic diversity within the remaining population to serve as baseline to guide broodstock selection and to resolve any unrealized taxonomic issues. The Service and its partners have recently evaluated potential recovery actions for the species, and the group of experts will be involved in future recovery planning efforts.

## **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 species 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 an endangered species to a threatened species. 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 U.S. Fish and Wildlife Service (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*.

### **Delisting Recovery Criteria**

We are providing recovery criteria for the Ochlockonee Moccasinshell recovery plan (USFWS 2003), which will supersede the existing downlisting 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.

We propose to amend recovery criteria for Ochlockonee Moccasinshell as follows:

- (1) The one (1) Ochlockonee Moccasinshell population in the lower Ochlockonee River basin exhibits a stable or increasing trend, evidenced by natural recruitment, and multiple age classes.
- (2) At least one (1) Ochlockonee Moccasinshell population is established or discovered in the upper Ochlockonee River basin that exhibits a stable or increasing trend, evidenced by natural recruitment, and multiple age classes.
- (3) Spatial distribution and abundance of Ochlockonee Moccasinshell populations are sufficient to protect against extinction from catastrophic events and maintain adaptive potential (occupancy of at least 25 rkm (15.5 rm) of stream channel in the lower basin and 55 rkm (34.2 rm) in the upper basin is needed to maintain each population).
- (4) Threats have been addressed and/or managed to the extent that the species will remain viable into the foreseeable future.

### **Justification of Criteria**

Criterion 1: There is currently only one population of Ochlockonee Moccasinshell, and it must exhibit a stable or increasing trend, natural recruitment, and multiple age classes to be resilient to stochastic events (Factors A and E).

Criterion 2: The Ochlockonee Moccasinshell is presumed extirpated in the upper basin, therefore, expanding its range into historically occupied river reaches upstream of the mainstem impoundment will increase viability (characterized by resilience, representation, and

redundancy), and reduce threats due to curtailment of range (Factor A) and stochastic events (Factor E). Populations upstream and downstream of the mainstem impoundment are necessary to ensure the species will no longer require protection under the Act. For this species it is believed that one additional population exhibiting these traits is necessary to ensure sufficient redundancy such that the species will no longer require protection under the Act.

Criterion 3: The range of the Ochlockonee Moccasinshell is approximately 25 rkm (15.5 rm) in the lower basin, which demonstrates this amount of habitat is adequate to maintain the population's persistence. In the upper basin (upstream of Lake Talquin), 55 rkm (34.2 rm) represents occupation of 50 percent of its historical range in the Ochlockonee River mainstem. The species has limited ability to disperse because darters, its likely host fish, have small home ranges. Therefore, mussel aggregations must be sufficiently dense and distributed over a relatively contiguous length of stream reach such that repopulation by infested fish allows the population to recover from stochastic events. This criterion addresses Factors A and E.

Criterion 4: The main threats to the Ochlockonee Moccasinshell continues to be habitat loss and degradation (Factors A, D, and E). This criterion will protect the population in the lower basin and facilitate the establishment of a population in the upper basin. Criteria outlined on pages 83–86 of the recovery plan will serve as general indicators that threats have been reduced.

### **Rationale for Amended Recovery Criteria**

The recovery criteria were developed for the Ochlockonee Moccasinshell by considering the most recent and best information on its known historical and current distribution and abundance, amount of existing potential habitat, amount of habitat that is irreversibly lost for the foreseeable future, barriers to genetic exchange, and the scientific literature. When listed in 1998, the species was considered absent in the lower basin (downstream of Lake Talquin). The listing factors cited were generally applied to seven mussel species, however habitat destruction and modification (Factor A) appears to be the principal listing criterion for the Ochlockonee Moccasinshell. When the Recovery Plan was written in 2003, it was unknown whether the species was still extant and downlisting criteria were based on the possibility that a population existed in the upper basin (USFWS 2003). Surveys conducted during 2006 to 2017 did not detect the species in the upper Ochlockonee River basin (upstream of Lake Talquin), however, a previously unknown population was discovered in the lower basin. An expert working group identified several actions to establish a stable population in the upper basin (see **Synthesis**). The criteria will ensure that resilient populations are distributed to avoid genetic isolation, potential inbreeding depression, and extirpation from one or two successive catastrophic events such as extreme flooding or drought, storm surge, dam failure, and contaminant spills. With these amended criteria, we expect to increase the species' viability, thus to sustain populations in the wild over time. We will work together with the states of Georgia and Florida to strategically and efficiently implement the new criteria.

### **LITERATURE CITED**

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