

**Recovery Plan for Royal Snail (*Pyrgulopsis ocmorhaphae*)**

[https://ecos.fws.gov/docs/recovery\\_plan/950811.pdf](https://ecos.fws.gov/docs/recovery_plan/950811.pdf)

**Original Approved:** August 11, 1995

**Original Prepared by:** J. Allen Ratzlaff, Asheville Ecological Services Field Office

**AMENDMENT 1**

We have identified best available information that indicates the need to amend recovery criteria for the Royal Snail (*Pyrgulopsis ocmorhaphae*) 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 provided as an addendum that supplements the recovery plan, superseding only Part II A (page 3) of the recovery plan (USFWS 1995).

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

Approved:   
Acting Regional Director, U.S. Fish and Wildlife Service

Date: September 26, 2019

**METHODOLOGY USED TO COMPLETE THE RECOVERY PLAN AMENDMENT**

The proposed amendment to the recovery criteria for Royal Snail was developed by the lead biologist using the most recent and best available information for the species. We requested peer review of the science supporting the draft amendment from Dr. Paul Johnson (Alabama Department of Conservation and Natural Resources (ADCNR), Jeff Garner (ADCNR), and David Withers (Tennessee Department of Environment and Conservation) in accordance with the OMB Peer Review Bulletin. Guidance was provided to the reviewers to focus their review on specific aspects of the recovery criteria and this amendment. Specifically, we asked the peer reviewers to provide their comments on (a) the adequacy of the information used to develop the recovery criteria identified below, (b) the adequacy of our analyses to reassess the recovery criteria, and (c) the availability of any additional species information not considered in 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.

## **Recovery Criteria**

The Royal Snail recovery plan does not provide downlisting or delisting criteria (USFWS 1995, p. 3; [https://ecos.fws.gov/docs/recovery\\_plan/950811.pdf](https://ecos.fws.gov/docs/recovery_plan/950811.pdf)).

## **Synthesis**

The Royal Snail was listed as endangered in 1994 due to degradation of habitat and water quality (Factor A) and due to isolation of the two populations (Factor E) (59 FR 17994). The most-recent status review for the Royal Snail was in 2011 with the completion of the species’ 5-year review (USFWS 2011), which recommended no change to the species’ endangered status. The Royal Snail has a narrow distribution; known from only two spring-run populations (Owen Spring Branch and Town Creek) in the Sequatchie River system.

Abundance estimates at both springs were completed from 2011 to 2012, and due to high overall abundances it was determined that captive propagation was not necessary (Withers 2016; Johnson 2018, pers. comm.). Additionally, due to the conservation efforts of partners (Tennessee Department of Environment and Conservation (TDEC), most notably) it was determined that a detailed threat assessment was not necessary.

Habitat and water quality degradation remain the greatest threats to the species. Habitat has been impacted by several types of human activities including direct habitat destruction at the Town of Jasper’s water treatment plant and habitat destruction from off-road vehicle (ORV) use in the Owen Spring Branch. Additionally, beaver dams have inundated free-flowing cold water spring-runs in both Town Creek and Owen Spring Branch, increasing water temperature and limiting habitats available to the royal snail. However, both sites offer some protections as the headwaters of Town Creek are owned by the Town of Jasper’s water treatment plant and Owen Spring Branch occurs in Sequatchie Cave State Natural Area (SNA), which is owned by TDEC. However, the recharge area for the spring at Sequatchie Cave SNA was estimated to be approximately 5 square miles in size (Martin 2015). Thus, the limited and disjunct distribution of the Royal Snail populations, combined with large, mostly unprotected recharge areas that influence hydrology and water quality of streams occupied by the species, make the species vulnerable to extinction from stochastic events, even when of short duration.

The Service and its partners continue to evaluate potential recovery actions for the Royal Snail. In 2016, TDEC developed a conservation strategy outlining specific recovery actions that they would undertake at Sequatchie Cave SNA to stabilize habitat and protect the Royal Snail (Withers 2016). For example, recent site improvements have stabilized the right descending bank, added stormwater infiltration, and added native plants and permeable parking to the SNA, reducing water quality threats related to surface runoff, erosion, and sedimentation resulting

from past land uses at Sequatchie Cave SNA and nearby lands (Chance 2018, pers. obs.). Additionally, Johnson (2019, pers. comm.) confirmed that populations of the Royal Snail exhibit continuous recruitment through the year, which is not uncommon among spring-affiliated invertebrate species. The Royal Snail recovery plan reported that the species was believed to have an annual life cycle and that short-term perturbations preventing a single year's reproduction could cause its sudden extinction (USFWS 1995).

## **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 distinct population segment (DPS) of vertebrate) 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*.

We provide delisting criteria for the Royal Snail, which amend the recovery plan for the species, as follows:

### **Delisting Recovery Criteria:**

The Royal Snail will be considered for delisting when the following criteria are met:

- 1) The two (2) existing populations occupying Town Creek and Owen Spring Branch exhibit stable or increasing trends, as evidenced by snail densities, size-class distribution, and spatial extent of occupied habitat.
- 2) Threats have been addressed and/or managed to the extent that the species will remain viable for the foreseeable future.

### **Justification for Criteria**

Criterion 1) The Royal Snail has a naturally restricted distribution and is known (historically and currently) from only two spring-run populations (Owen Spring Branch and Town Creek) in the Sequatchie River system. The species' distribution, rangewide and within each spring-run, provides representation of all known populations. Maintaining stable densities and size-class distribution through year-round recruitment bolsters viability (characterized by resilience, representation, and redundancy (Smith et al. 2018)) of the species and reduces the possibility for stochastic events to impact these isolated populations (Factor E).

Criterion 2) This criterion further address the recovery objective to “protect its habitat from present and foreseeable threats (Factor A).” In order to achieve Criterion 1, recovery actions are needed to remove threats that reduce habitat quality and constrain population growth.

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

The proposed delisting recovery criteria reflect the best available information for the Royal Snail. The Royal Snail has a narrow range; however, the species' distribution, including the full extent of all currently occupied stream reaches, provides representation of all known populations. Year-round reproduction further increases viability (characterized by resilience, representation, and redundancy (Smith et al. 2018)) of the species and reduce the possibility for stochastic events to impact these isolated populations, as considered in Factor E.

The delisting criteria in this amendment further address the recovery objective to “protect its habitat from present and foreseeable threats.” The Service and other partners, especially TDEC, have made progress in removing threats (Factor A) to the Royal Snail by removing beaver dams and adding barriers to prevent ORV use in Owen Spring Branch. Other threats mentioned in the recovery plan have not happened. For example, zebra mussels have not invaded the spring habitats within the range of the Royal Snail. Further, the proposed chip mills mentioned in the listing rule were not completed. An agreement with the Town of Jasper's water treatment plant is needed and would protect water quality in Town Creek and provide additional habitat protections for the species. Another priority action is to protect riparian vegetation adjacent to Town Creek to ensure the resilience of this population. Together, these measures will reduce threats that could physically disrupt the quality and availability of habitats occupied by Royal Snail. To fully understand potential water quality related threats to Royal Snail, work is needed to determine potential physicochemical factors that could pose a threat to the species, including temperature, dissolved oxygen, conductivity, and pH. Data also are needed to characterize exposure and response of Royal Snail to potential toxicological threats (e.g., common salts, metals, surfactants, herbicides, pesticides, and ammonia).

## LITERATURE CITED

- Johnson, P. 2019. Comments for *Marstonia ogmorhappe* Recovery Criteria. Unpublished comments and data provided to U.S. Fish and Wildlife Service, Cookeville, Tennessee. August 30, 2019.
- Martin, R. 2015. An investigation to determine the recharge area of Sequatchie Spring, Marion County, Tennessee. Unpublished report to Tennessee Wildlife Resources Agency, Nashville, Tennessee. 57 pp.
- Smith, D.R., N.L. Allan, C.P. McGowan, J.A. Szymanski, S.R. Oetker, and H.M. Bell. 2018. Development of a species status assessment process for decisions under the U.S. Endangered Species Act. *Journal of Fish and Wildlife Management* 9(1): 302-320.
- U.S. Fish and Wildlife Service (USFWS). 1995. Royal Snail recovery plan. Atlanta, Georgia. 20 pp.
- USFWS. 2011. Royal Marstonia (Snail) (*Pyrgulopsis ogmorhappe*) 5-Year Review: Summary and Evaluation. USFWS Southeast Region, Tennessee Ecological Services Field Office, Cookeville, Tennessee. 18 pp.
- Withers, D.I. 2016. A conservation strategy for the royal snail (*Marstonia ogmorhappe* Thompson) and Sequatchie caddisfly (*Glyphopsyche sequatchie* Etnier and Hix) at Sequatchie Cave State Natural Area, Marion County, Tennessee. Tennessee Department of Environment and Conservation, Nashville, Tennessee. 105 pp.