

**U. S. Fish and Wildlife Service  
Draft Revised Recovery Plan for the  
Alabama Red-bellied Turtle (*Pseudemys alabamensis*)**



Prepared by:  
James Godwin  
Alabama Natural Heritage Program  
Environmental Institute  
Auburn University, Alabama

and

Linda LaClaire  
U.S. Fish and Wildlife Service  
Ecological Services  
Jackson, Mississippi

For:  
Southeast Region  
U.S. Fish and Wildlife Service  
Atlanta, Georgia

February 2019

## DISCLAIMER

Recovery plans delineate reasonable actions that are believed necessary to recover and/or protect the species. Plans are prepared by the U.S. Fish and Wildlife Service, sometimes with the assistance of recovery teams, contractors, State agencies, and others. Plans are reviewed by the public and subject to additional peer review before they are adopted by the U.S. Fish and Wildlife Service. Objectives will only be attained and funds expended contingent upon appropriations, priorities, and other budgetary constraints. Recovery plans do not obligate other parties to undertake specific tasks and do not necessarily represent the views nor the official positions or approval of any individuals or agencies involved in the plan formulation, other than the U.S. Fish and Wildlife Service. They represent the official position of the U.S. Fish and Wildlife Service only after they have been signed by the Assistant Regional Director, Regional Director, or Director as approved. Approved recovery plans are subject to modification as dictated by new findings, changes in species status, and the completion of recovery tasks. By approving this document, the Regional Director certifies that the information used in its development represents the best scientific and commercial data available at the time it was written. Copies of all documents reviewed in development of the plan are available in the administrative record, located at the U.S. Fish and Wildlife Service's Southeast Regional Office, Atlanta, Georgia.

Suggested literature citation:

U.S. Fish and Wildlife Service. 2019. Draft Revised Recovery Plan for Alabama Red-bellied Turtle (*Pseudemys alabamensis*). Atlanta, Georgia. 7 pp.

## **Draft Revised Recovery Plan for the Alabama Red-bellied Turtle (*Pseudemys alabamensis*)**

This Draft Recovery Plan describes criteria for determining when the Alabama Red-bellied Turtle has been recovered and should be considered for delisting from the Federal List of Endangered and Threatened Wildlife. It also lists site-specific actions that will be necessary to meet those criteria, and estimates the time and cost for implementing recovery actions. Brief descriptions of the species' status, habitat requirements, and limiting factors are included. A detailed discussion of these and other topics pertinent to the recovery of the Alabama Red-bellied Turtle can be found in the Species Status Assessment (SSA) and the Draft Recovery Implementation Strategy. These supplemental documents are available at <http://www.fws.gov/mississippi>. The Recovery Implementation Strategy and SSA are finalized separately from the Recovery Plan and will be updated on a routine basis.

***Current Species Status:*** The Alabama Red-bellied Turtle (*Pseudemys alabamensis*) was federally listed as endangered on June 16, 1987 (52 FR 22939), and is also listed as state endangered by the two states where the species is known to occur: Alabama and Mississippi. A recovery plan for the species was finalized in 1990 (U.S. Fish and Wildlife Service 1990). When the Alabama Red-bellied Turtle was listed in 1987, it was not known to occur in Mississippi. Although a red-bellied turtle had been observed in Mississippi, the assumption was that it was a different species and it was not studied in depth until the early 1990's. Currently, the Alabama Red-bellied Turtle is known from the lower Mobile River delta and drainages surrounding Mobile Bay in Baldwin and Mobile Counties, Alabama; and from the lower watersheds of the Pascagoula, Tchoutacabouffa and Biloxi rivers and the Back Bay of Biloxi in Harrison and Jackson counties, Mississippi. As there are no apparent connections between the Mobile River system (Alabama) and the Pascagoula River system (Mississippi), the distribution of the species across the two states is assumed to be disjunct. Presence/absence surveys conducted in both states indicate the species status may be stable, however an analysis of threats indicates that several new threats have been identified while the threats present at the time of listing are still present (U.S. Fish and Wildlife Service 2015). During the development of the SSA, ten Alabama Red-bellied Turtle populations were delineated based on the species' occupancy of specific watersheds, six in Alabama and four in Mississippi (U.S. Fish and Wildlife Service 2018). The Alabama Red-bellied Turtle is assigned a recovery priority number of 5, indicating a species with high degree of threat and low recovery potential.

***Habitat Requirements and Limiting Factors:*** Alabama Red-bellied Turtles typically occur in broad, vegetated expanses of shallow water (1-2 meters or 3.3-6.6 feet in depth) in the backwater areas of bays, in and along river channels, and less frequently in oxbow lakes. Snags and dense beds of submersed and emergent aquatic vegetation provide turtles with a substrate for cover, predator avoidance, food, and structure for basking and thermoregulation. Although regarded as a freshwater species, the occasional presence of barnacles on shells of *P. alabamensis* indicates that the turtle is tolerant, to some extent, of saline waters.

The Alabama Red-bellied Turtle exhibits different habitat preferences within the two states where it occurs, probably based on habitat availability. In Mississippi, *P. alabamensis* inhabits

fresh to brackish marshes with shallow, slow-flowing waters and extensive beds of aquatic vegetation. Freshwater marshes upstream of brackish marshes are also utilized but to a lesser extent. In Alabama, the turtle occupies the freshwater of shallow side-channel coves along the main river channels draining into Mobile Bay, as well as smaller tributary streams, and broad, shallow brackish bays surrounding Mobile Bay. The extant Alabama Red-bellied Turtle populations are in many cases small, isolated, and have limited potential for recolonization should they be extirpated. Abundant submerged aquatic vegetation (SAV) is an important element of habitats in both states. The greatest threats to this species are loss or degradation of habitat, especially the loss and degradation of the SAV on which the turtle depends. Results from the SSA indicated that the main driver of future habitat degradation or loss was sea level rise (U.S. Fish and Wildlife Service 2018).

**Recovery Strategy:** The recovery strategy for Alabama Red-bellied Turtle is to ensure the long-term viability of the species through habitat conservation, restoration, and management in order to promote population stability and growth. The ten Alabama Red-bellied Turtle populations, named based on watershed occupancy, include four populations (Pascagoula River, Bellefontaine, Old Fort Bayou, and Tchoutacabouffa River) in Mississippi and six populations (Bon Secour River, Weeks Bay, Lower Mobile–Tensas River Delta, Dog River, Fowl River, and Bayou La Batre) in Alabama (U.S. Fish and Wildlife Service 2018).

Recovery of the Alabama Red-bellied Turtle is based upon the ecological principles of resiliency, redundancy, and representation (Wolf *et al.* 2015). **Resiliency** is positively related to population size and growth and describes the ability of populations to withstand stochastic events (events arising from random factors). **Redundancy** spreads the risk among multiple populations and describes the ability of a species to withstand or bounce back from catastrophic events. Redundancy requires conservation of multiple populations within each state where the species occurs as the populations in Alabama occur in watersheds that are likely isolated from those in Mississippi. **Representation** describes the ability of a species, based on its diversity, to adapt to changing environmental conditions. In the absence of species-specific genetic and ecological diversity information for the Alabama Red-bellied Turtle, representation within the species is based on the extent and variability of habitat characteristics across its geographical range in Alabama and Mississippi (U.S. Fish and Wildlife Service 2018).

**Recovery Objectives:** The recovery objectives are to protect, restore, and manage habitat to provide conditions necessary to recover and ultimately remove the Alabama Red-bellied Turtle from the list of protected species under the Endangered Species Act. We are defining reasonable recovery criteria for what constitutes a recovered species based on the best available information on this species. As new information becomes available, criteria will be reevaluated.

### **Criteria for Delisting**

- (1) At least five (5) Alabama Red-bellied Turtle populations exhibit a stable or increasing trend, evidenced by natural recruitment, and multiple age classes. Populations (as defined in criterion 1) must be distributed as described below to ensure adequate regional representation and intra-regional redundancy of resilient populations (addresses Factors A and E).

- (a) Three (3) of the five (5) populations must occur in Alabama. One (1) in the Lower Mobile-Tensaw Delta, one(1) in drainages on the west side of Mobile Bay, and one (1) in drainages on the east side of Mobile Bay.
  - (b) Two (2) of the five (5) populations must occur in Mississippi. One must be in the Pascagoula River.
- (2) Conservation measures (e.g., habitat protection and management) and commitments are in place to manage threats of habitat loss, degradation and fragmentation such that sufficient habitat quantity and quality exists for the the Alabama Red-Bellied Turtle to remain viable into the foreseeable future (addresses Factor A and E).
  - (3) Additional threats have been reduced or eliminated to the degree that the species will remain viable into the foreseeable future (addresses Factor A, B, C, D, and E).

### **Justification of Criteria**

The proposed delisting recovery criteria reflect the best available and most up-to-date information on the Alabama Red-bellied Turtle. These criteria address the five factors described in section 4(a)(1) of the Act and incorporate the conservation biology principles of representation, resiliency, and redundancy (Wolf *et al.* 2015).

Criterion 1: The number of Alabama Red-bellied Turtle populations required for delisting adequately address population representation, resiliency, and redundancy such that if the other two criteria are met, the species will no longer be in danger of becoming endangered in the foreseeable future. Ensuring that populations are viable, by documenting long-term population trends that are stable or increasing will demonstrate the resilience of populations. Actions taken to meet criterion 1 will reduce threats posed by Factor A (loss of habitat and restricted range) and Factor E (adult survivorship and population growth). For the this species it is believed that five populations exhibiting these traits are necessary to ensure sufficient redundancy such that the species will no longer require protection under the Act.

Criterion 2: Long-term habitat protection will ensure that conditions favorable for Alabama Red-bellied Turtle, and adequate habitat to support the species, are maintained into the future by supporting resilience of individual populations. This criterion addresses Factor A (loss of habitat), Factor D (inadequate legal protection), and Factor E (inadequate habitat management; population survival).

Criterion 3: The reduction or elimination of additional threats to the Alabama Red-bellied Turtle, addressing representation, resiliency, and redundancy, will ensure viability of the species into the foreseeable future. This criterion addresses Factors A, B, C, D, and E.

**Actions Needed:** The recovery actions identified in the table below are those that, based on the best available science, we believe are necessary to accomplish the recovery of the Alabama Red-bellied Turtle.

Table 1. Recovery Actions with Estimated Cost and Priority Number<sup>1</sup>

<b>Recovery Action</b>	<b>Estimated Cost</b>	<b>Priority</b>
1. Develop standardized protocols for Alabama Red-bellied Turtle surveys	Costs covered under existing State and Federal programs	2
2. Locate crucial habitats within the distribution of recovery populations that are used for basking, feeding, nesting, overwintering; and by small juveniles.	\$200,000	1
3. Implement a schedule of regular population and habitat surveys, at 5-year intervals, as part of a range-wide monitoring plan.	\$300,000	1
4. Identify threats to recovery populations and habitat.	Costs covered under existing State and Federal programs	1
5. Work with governmental and nongovernmental partners to determine the best methods to restore SAV beds for recovery populations.	\$150,000	1
6. Implement protections for basking, feeding, nesting, and overwintering habitats to remove threats to recovery populations.	\$300,000	1
7. Establish standardized methods for monitoring of populations and habitat conditions.	Costs covered under existing State and Federal programs	2
8. Determine population and habitat trends, at five-year intervals for Alabama Red-bellied Turtle recovery populations in Alabama and Mississippi.	Costs will be absorbed under existing State and Federal programs	2
9. Complete a genetic analysis to determine the discreteness between and among Alabama and Mississippi populations and to estimate effective population sizes.	\$90,000	2
10. Conduct research to develop a more complete understanding of biological and ecological factors that are limiting recovery.	\$300,000	2

11. Coordinate all recovery activities, evaluate success, and revise recovery plan as needed.	Costs covered under existing State and Federal programs	3
<b>Total Estimated Cost: \$1,340,000</b>		

Recovery actions are assigned numerical priorities to highlight the relative contribution they may make toward species recovery (48 FR 43098):

**Priority 1** - An action that must be taken to prevent extinction or to prevent the species from declining irreversibly.

**Priority 2** – An action that must be taken to prevent a significant decline in species population/habitat quality or some other significant negative impact short of extinction.

**Priority 3** – All other actions necessary to provide for full recovery of the species.

**Estimated Cost to Delist:** The cost to recover and ultimately delist Alabama Red-bellied Turtle is estimated to be \$1,340,000. Some costs are not determinable at this time, and therefore the total cost of recovery may be higher than this estimate.

**Date of Delisting:** If all actions are fully funded and implemented as outlined, including full cooperation of all partners needed to achieve recovery, we anticipate that recovery criteria for delisting could be met by 2050.

### Literature Cited

U.S. Fish and Wildlife Service. 1990. Alabama Red-bellied Turtle Recovery Plan. Atlanta, Georgia. 17 pp.

U.S. Fish and Wildlife Service. 2015. Alabama Red-bellied Turtle (*Pseudemys alabamensis*) Five-year Review: Summary and Evaluation. Mississippi Ecological Services Field Office, Jackson, Mississippi. 24 pp.

U.S. Fish and Wildlife Service. 2018. Draft Species Status Assessment Report for Alabama Red-bellied Turtle (*Pseudemys alabamensis*), Atlanta, Georgia. 88 pp.

Wolf, S., B. Hartl, C. Carroll, M. C. Neel, and D. N. Greenwald. 2015. Beyond PVA: why recovery under the Endangered Species Act is more than population viability. *BioScience* 65:200-207.