

***Solanum drymophilum* (erubia) Recovery Plan**

U.S. Fish and Wildlife Service (USFWS). 1992. *Solanum drymophilum* Recovery Plan. Prepared by Susan Silander for U.S Fish and Wildlife Service Atlanta, Georgia. 17 pp.

Original Approved: July 9, 1992 Original

Prepared by: Susan R. Silander

AMENDMENT 1

We have identified best available information that indicates the need to amend recovery criteria for *Solanum drymophilum* (erubia) since the recovery plan was completed. In this modification, we synthesize the current information available, show amended recovery criteria, and the rationale supporting the recovery plan modification. In addition, we recommend new tasks to help direct the actions to achieve the objective of the recovery plan to delist the species. The modification is shown as an addendum that supplements the recovery plan, superseding only Part II A (page 6) 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
Atlanta, Georgia**

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

Date: 9/24/19

METHODOLOGY USED TO COMPLETE THE RECOVERY PLAN AMENDMENT

The amendments to the recovery criteria are based on the Erubia 5-year Status Review (USFWS 2015), which collected the most recent information of the species. The information was synthesized by U.S. Fish and Wildlife Service (Service) biologists and managers in the Caribbean Ecological Services Field Office (CESFO) in order to develop the delisting criteria for erubia.

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

See previous version of criteria in [Solanum drymophilum Recovery Plan](#) on page 6.

Synthesis

Erubia was listed as an endangered plant on August 26, 1988 (53 FR 32827). Currently, erubia is known from three (3) populations: *Las Piedras del Collado* (previously known as *Las Tetas de Cayey*) in the municipality of Salinas (this was the only known population at the time of listing); Río Abajo Commonwealth Forest in the municipality of Arecibo; and two localities near road PR-140 in the municipality of Florida.

No recent surveys have been conducted on these populations. The only information available indicate that the population size of the species is approximately 150-200 individuals in *Las Piedras del Collado* (disclosed at the time of listing; USFWS 1992); and 3 individuals in one of the two sites known at the municipality of Florida (PRDNER, unpublished report, 2013). Staff from the Puerto Rico Department of Natural and Environmental Resources (PRDNER) did not report any erubia individuals for the second population in Florida, when visited in 2013 (PRDNER 2013). Also, there is no current estimate for the Río Abajo Commonwealth Forest population. This population has not been monitored since its discovery, and the 50 individuals originally documented were relocated during the construction of highway PR-10 (PRHTA 1995). No information is available regarding the survival of those 50 transplanted individuals. The Río Abajo Commonwealth Forest is the only protected land of the four sites indicated above.

The 2015 5-year status review (USFWS 2015) determined that erubia continues to be threatened by Factor A (present or threatened destruction, modification, or curtailment of its habitat or range), and Factor E (other natural or manmade factors affecting its continued existence). Habitat modification and degradation has been identified due to urban expansion within the northern karst region of Puerto Rico. In addition, suitable habitat for the species has been degraded by current and previous agriculture practices (e.g., abandonment of coffee plantations, intentional cutting of vegetation for cattle and horse grazing), and quarry activities which have modified the vegetation structure of the sites. Natural growth of vegetation (e.g., vines, shrubs) at these sites seems to affect the recruitment of new individuals of erubia (PRDNER 2013). Hurricanes and tropical storms, human-induced fires, invasive species, and anthropogenic factors (e.g., direct cutting of erubia individuals) are also identified as threats to the species. Although these threats are considered non-imminent, the limited number of populations and the low number of individuals make them moderate to high in scope (USFWS 2015).

Comprehensive field surveys of erubia are recommended within suitable habitat for the species. Also, the establishment of effective propagation protocols for erubia utilizing experience from other Solanaceae species is needed.

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 erubia 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. 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*.

We provide new delisting criteria for erubia, which will supersede those included in its Recovery Plan. The recovery criteria presented below represent our best assessment of the conditions that would most likely result in a determination that delisting of erubia is warranted as the outcome of a formal five-factor analysis in a subsequent regulatory rulemaking. Achieving the prescribed recovery criteria is an indication that the species is no longer threatened or endangered, but this must be confirmed by a thorough analysis of the five factors.

Amended Delisting Recovery Criteria:

The amended delisting criteria for erubia are as follows:

1. The two (2) existing populations on privately owned lands (i.e., Salinas and Florida) are protected through conservation mechanisms (addresses Factors A and E).
2. Existing three (3) populations on *Las Piedras del Collado*, Río Abajo Commonwealth

Forest, and the municipality of Florida show a stable or increasing trend, evidenced by natural recruitment and multiple age classes (addresses Factors A and E).

3. Establish three (3) new populations on lands protected by conservation mechanisms within the known geographical range of the species that demonstrate a stable or increasing trend, evidenced by natural recruitment and multiple age classes (addresses Factors A and E).
4. Threat reduction and management activities have been implemented to a degree that the species will remain viable into the foreseeable future (addresses Factor E).

Rationale for Amended Recovery Criteria

The recovery criteria reflect the best available and most up-to date information on the biology of the species and its habitat.

Currently, there are only three (3) known populations of erubia with low counts of individuals. In order to maintain the genetic integrity of the species and to provide adequate representation throughout the species range, the recovery criteria have been designed to protect and manage the known populations and establish new self-sustaining populations to ensure long-term viability of the species.

These recovery criteria address the need of maintaining the viability of the currently known populations. Formal long-term conservations mechanisms such as land acquisition, conservation agreements or easements, and habitat restoration practices to protect the species and its habitat are necessary to ensure its continued existence in the wild. Erubia is known to occur adjacent to the PRDNER Las Piedras del Collado Natural Reserve. This reserve encompasses only approximately 19.4 acres (DRNA 2004), and further expansion is recommended to include the areas where erubia is found. Since the purpose of the Commonwealth Law No. 283-2000, known as *Ley para designar el área de los montículos de Las Piedras del Collado como Reserva Natural* (Law to designate Las Piedras del Collado as a Natural Reserve) was to control urban and tourism development in the area, and to protect and conserve the geological formation of *Las Tetas de Cayey* and the surrounding forested areas, we believe the inclusion of the area where erubia is located into the reserve would protect this population and ameliorate current threats to the species at this site. Also, development and implementation of conservation agreements or easements to protect privately-owned sites on the municipality of Florida would result in protection and management of this population.

The development of propagation and reintroduction programs to augment existing populations and for the establishment of additional populations of erubia on protected lands would increase the redundancy and resiliency of the species, necessary to withstand catastrophic events such as human-induced fires and hurricanes. Also, the establishment of new populations in protected sites managed for conservation would avoid anthropogenic threats such as habitat destruction and modification, and intentional cutting or removal of the species to provide grazing grounds for cattle and horses.

Long-term management and monitoring of natural and established populations are needed to reduce site-specific threats and to establish population trends for erubia.

ADDITIONAL SITE SPECIFIC RECOVERY ACTIONS

Develop and implement a monitoring protocol to adaptively manage the species and its habitat. Additional monitoring should occur after major disturbances (e.g., fires, hurricanes, and landslides) as recommended in the 2015 5-year review status. This recovery action should be coordinated with PRDNER and be included within Task 112: *Monitor all known individuals of the approved recovery plan.*

LITERATURE CITED

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