

Recovery Plan for Alabama Canebrake Pitcher Plant (*Sarracenia rubra* ssp. *alabamensis*)
Available at: https://ecos.fws.gov/docs/recovery_plan/921008.pdf

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DRAFT AMENDMENT 1

We have identified the best available information that indicates the need to amend recovery criteria for the Alabama canebrake pitcher plant (*Sarracenia rubra* ssp. *alabamensis*). In this recovery plan modification, we identify the current downlisting criteria, describe the proposed delisting criteria and revised downlisting criteria, and include the justification and rationale supporting the proposed recovery plan modification. The proposed modification will be included as an amendment that supplements the Alabama canebrake pitcher plant recovery plan (U.S. Fish and Wildlife Service [USFWS] 1992) by revising downlisting criteria and adding delisting (recovery) criteria that were not developed at the time this recovery plan was completed, superseding only Part II, A (p. 7) of the recovery plan. Recovery plans are non-regulatory documents that provide guidance on how best to help recover the species.

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

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METHODOLOGY USED TO COMPLETE THE RECOVERY PLAN AMENDMENT

The proposed amendments to the recovery criteria are based on the species' recovery plan, recent five-year reviews, and recent studies with the species. The lead biologist for the species gathered the information on the Alabama canebrake pitcher plant and notified the species experts, the relevant State agencies, and nongovernmental partners of the Service's process to complete this amendment. This available information was used to revise the downlisting criteria and develop delisting criteria for the Alabama canebrake pitcher plant.

ADEQUACY OF RECOVERY CRITERIA

Section 4(f)(1)(B)(ii) of the Endangered Species Act (Act) requires that each recovery plan 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 (General Accounting Office 2006) have also affirmed the need to frame recovery criteria in terms of threats assessed under the five threat factors in section 4(a)(1) of the Act.

Recovery Criteria

The current recovery plan (https://ecos.fws.gov/docs/recovery_plan/921008.pdf) (USFWS 1992) provides only downlisting criteria for the species (see page 7).

Synthesis

The Alabama canebrake pitcher plant is a carnivorous plant that is endemic to central Alabama, with all known populations, extant and extirpated, found in the Fall Line Hills ecoregion (see Griffith *et al.* 2001 for ecoregion description). Furthermore, within this ecoregion, most of the species' populations are known from the Upper Alabama subbasin (8-digit hydrologic unit code: 03150201; September 2018 Watershed Boundary Dataset for the United States of America available at <https://datagateway.nrcs.usda.gov/> [accessed November 5, 2018]), while the remaining populations are known from the Lower Coosa subbasin (03150107).

The species was listed as endangered on March 10, 1989 (54 FR 10150) due to threats posed by population and habitat loss (Factor A), overcollection (Factor B), small number of populations (Factor E), small population sizes (Factor E), inadequate habitat management and consequent vegetation succession (Factor E), and adverse land use (Factor E). Furthermore, the species received inadequate state protections (Factor D).

Since finalization of the recovery plan (USFWS 1992), recovery efforts have focused on protection, management, and monitoring of existing populations; surveying for new populations; *ex situ* (off-site) safeguarding of genetic material from each population; and conducting studies into the species' habitat, ecology, management, genetics, and propagation. These recovery efforts are summarized in the most recent five-year reviews (USFWS 2012 and 2018). The threats described in these five-year reviews remain accurate, with population loss (Factor A), habitat destruction (Factor A), occasional poaching (Factor B), limited number of populations (Factor E), small population sizes (Factor E), inadequate or incompatible habitat management (Factor E), alterations of natural hydrologic regimes (Factor E), and encroachment of competing species (Factor E)—including non-native species—continuing to limit recovery of the species. Most populations lack formal, long-term protections.

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. Downlisting is the reclassification of a species from endangered to threatened. Delisting is the removal of a species from the Federal Lists of Endangered and Threatened Wildlife and Plants (hereafter, "Lists"). An "endangered species" is a species (species, sub-species, or distinct population segment [DPS]) that is in danger of extinction throughout all or a significant portion of its range. A "threatened species" is a species that 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 downlisting or delisting 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 due to 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 USFWS, 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 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 Lists, 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*.

Herein, we revise downlisting criteria and provide delisting criteria for the Alabama canebrake pitcher plant, which will supersede those included in the Alabama canebrake pitcher plant recovery plan as follows:

Downlisting Criteria

1. At least 10 geographically distinct populations within the Fall Line Hills ecoregion in Alabama exhibit stable or increasing population trends, as evidenced by natural recruitment and multiple generations. Populations are considered to be geographically distinct when they are separated by at least 1 mile (1.6 kilometer) from their nearest neighbors. (Addresses Factors A, B, E)
2. The 10 stable or increasing populations are protected by a conservation mechanism that addresses the conservation needs of the Alabama canebrake pitcher plant. (Addresses Factors A, D)
3. Protected populations are managed to promote open canopies, integrity of native plant communities, and Alabama canebrake pitcher plant growth. (Addresses Factors A, E)

Delisting Criteria

1. All downlisting criteria have been met. (Addresses Factors A, B, D, E)
2. At least 10 additional geographically distinct populations (as described in Downlisting Criterion 1) within the Fall Line Hills ecoregion in Alabama exhibit stable or increasing population trends, as evidenced by natural recruitment and multiple generations. (Addresses Factors A, B, D, E)
3. The Upper Alabama and Lower Coosa sub-basins within Fall Line Hills ecoregion support at least three (3) populations protected by a conservation mechanism. (Addresses Factors A, E)

Justification of Criteria

The proposed downlisting and delisting recovery criteria reflect the best available and most up-to-date information on the Alabama canebrake pitcher plant. These criteria address the five listing 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).

Downlisting Criterion 1: No change to the 1992 recovery plan's minimum number of populations required for downlisting is proposed, as 10 populations adequately addresses population redundancy for reclassification to threatened. However, this criterion was revised to more clearly define the geographic scope of recovery based on current knowledge of the species' distribution, thereby ensuring adequate representation and redundancy within the species' known ecoregional distribution (i.e., Fall Line Hills). This requirement for reclassification will reduce

threats posed by Factors A (loss of populations), B (overcollection), and E (small number of populations). Ensuring that populations are viable, having long-term trends that are stable or increasing with an average minimum of 100 individuals and that are recruiting new individuals, will increase the resilience of populations. Furthermore, this will provide adequate numbers of individuals within individual populations to buffer against threat Factors B (overcollection) and E (small population sizes).

Downlisting Criterion 2: The requirement that 10 populations be protected remains unchanged from the 1992 recovery plan. Requiring that these populations be protected will ameliorate the lack of enhanced state legal protections. This requirement will primarily reduce threats posed by Factor D (inadequate legal protections) and will further reduce the threat of Factor A (loss of populations).

Downlisting Criterion 3: Habitat management that promotes conditions favorable for Alabama pitcher plant growth, such as open canopies and native plant community integrity, will increase the resiliency of individual populations from environmental and anthropogenic perturbations and catastrophic events. Such management will ensure that adequate habitat is available for the species. This requirement addresses Factors A (loss of habitat) and E (inadequate/incompatible habitat management, encroachment of competing vegetation [including invasive species]).

Delisting Criterion 1: See justification for Downlisting Criteria 1-3.

Delisting Criterion 2: Increasing the total number of viable populations will increase the species' overall resiliency, redundancy, and representation, effectively buffering against potential long-term threats, such as increased drought frequency and expanding development and habitat conversion. While no minimum number of additional protected populations is required, any increase in the number of such populations will further reduce the threats posed by inadequate state protections. By expanding key aspects of the preceding criteria, this criterion will minimize or eliminate threats posed by Factors A (population and habitat loss), B (overcollection), D (inadequate legal protections), and E (small number of populations, small population sizes).

Delisting Criterion 3: This criterion is intended to ensure adequate representation across Alabama canebrake pitcher plant's known geographic distribution within the Fall Line Hills ecoregion. Furthermore, it will ensure a minimum level of population redundancy within each of the sub-basins where the species is known to occur. As such, this criterion will further minimize threats posed by Factors A (population loss) and E (small number of populations). When combined with the preceding criteria, this criterion will ensure Alabama canebrake pitcher plant's overall viability and continued survival throughout its known range into the foreseeable future, thereby making the protections under the Act no longer necessary.

Rationale for Amended Recovery Criteria

Downlisting criteria have been revised to more clearly define the geographic scope of recovery based on current knowledge of the species' distribution and to provide for a means to more readily assess important population and habitat parameters, such as number of populations, number of individuals in each population, integrity of native plant communities, and presence of open canopies. Delisting criteria have been developed to ensure the species' overall viability

into the foreseeable future by increasing its resilience, representation, and redundancy across its known range.

Downlisting Criterion 1: Because Alabama canebrake pitcher plant is endemic to the Fall Line Hills ecoregion, only populations occurring within this ecoregion will be considered for recovery. However, if additional natural populations are discovered in other ecoregions, these ecoregions may also be considered for recovery. The presence of multiple Alabama canebrake pitcher plant populations throughout its known range will ensure the species' representation and redundancy within this area.

Resilient populations require adequate numbers of individuals to reproduce and persist through time and can be demonstrated by long-term monitoring trends that indicate stable or increasing population sizes. Available genetic and population studies provide little data or insight to inform the minimum number of plants necessary for long-term viability of individual populations of Alabama canebrake pitcher plant. As such, the proposed minimum population size of 100 for individual populations should be revised if future genetic studies, population models, or other relevant information indicate that this population size does not adequately ensure individual population resilience for the foreseeable future. The species is capable of clonal spread, which can allow populations to persist and spread locally (via ramets), but can obscure the actual number of genetically distinct individuals (genets). Unlike clonal spread, recruitment of seedlings, via sexual reproduction and subsequent seed production, increases the number of genets (clonal colonies) within populations. Furthermore, documented recruitment of seedlings over multiple years is another indicator of population resilience as it provides evidence that populations contain adequate numbers of individuals and genetic diversity to promote production of successive generations. Resilience to anthropogenic (such as overcollection or habitat destruction) and environmental events (such as droughts or tornadoes) is expected to increase with increasing population size.

Downlisting Criterion 2: No change to the 1992 recovery plan's requirement that 10 populations be protected is proposed. This requirement will ameliorate the inadequacy of existing legal protections, while also contributing to the continued existence of a minimum number of populations into the foreseeable future.

Downlisting Criterion 3: This criterion was revised to denote the desired conditions promoted by habitat and population management (i.e., open canopies, integrity of native plant communities, and growth of Alabama canebrake pitcher plants). Although Alabama canebrake pitcher plant can tolerate some shade, its populations are most vigorous under full sunlight (USFWS 1992). Indeed, populations quickly become depauperate following encroachment of woody species and consequent increased shade (USFWS 2018). As a species that thrives in habitats with open canopies, management activities, such as prescribed fire and other vegetation clearing activities, are necessary to maintain these necessary conditions and enhance growth of Alabama canebrake pitcher plants. Likewise, management activities are necessary to enhance the integrity of native plant communities and limit the encroachment of non-native, invasive plant species at sufficiently low numbers to not inhibit the growth or reproduction of Alabama canebrake pitcher plants. Together, maintenance of these conditions via appropriate habitat management will increase the overall resilience of individual populations by promoting the growth of Alabama canebrake pitcher plants, thereby ensuring existence of these populations into the foreseeable future.

Delisting Criterion 1: See rationale for Downlisting Criteria 1-3.

Delisting Criterion 2: Increased numbers of viable populations across Alabama canebrake pitcher plant's known range will further increase the species' representation among its known watersheds while buffering the species from the loss of individual populations (i.e., increase redundancy). Furthermore, increasing the total number of viable populations is expected to increase the connectivity among individual populations. This will increase the species' overall resilience to anthropogenic and environmental threats, thereby promoting the persistence of the species into the foreseeable future. While this criterion does not specify the number of additional protected needed for recovery, any increase in the number of such populations will further increase the resilience of the species as a whole.

Delisting Criterion 3: Emphasis has been placed on the two sub-basins where the species has been found (i.e., Upper Alabama and Lower Coosa). However, it may be appropriate to consider populations within neighboring sub-basins if 1) natural populations are discovered within these sub-basins or 2) an adequate amount of suitable habitat for potential population establishment is not located within the two primary sub-basins. The requirement that at least three protected populations occur within each of the two sub-basins where the species is known to occur will ensure that the Alabama canebrake pitcher plant will be distributed throughout its known geographic extent within the Fall Line Hills ecoregion, thereby ensuring adequate representation and redundancy within these areas. This will limit risks posed to the species as a whole by future threats that are not uniformly distributed throughout the species' range (e.g., habitat destruction).

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