

**Alabama Canebrake Pitcher-plant
(*Sarracenia rubra* ssp. *alabamensis*)**

**Status Review:
Summary and Evaluation**



Photo by T. Wayne Barger, Alabama Department of Conservation and Natural Resources

**U.S. Fish and Wildlife Service
Southeast Region
Mississippi Ecological Services Field Office
Jackson, Mississippi**

July 2023

STATUS REVIEW

Alabama Canebrake Pitcher-plant (*Sarracenia rubra* ssp. *alabamensis*)

GENERAL INFORMATION

Current classification: Endangered

Lead Field Office: Jackson, Mississippi

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Reviewers:

Lead Regional Office: Atlanta Regional Office, Carrie Straight, (404) 679-7226

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Date of original listing: April 10, 1989 ([54 FR 10150](#))

Methodology used to complete the review:

In accordance with section 4(c)(2) of the Endangered Species Act of 1973, as amended (Act), the purpose of a status review is to assess each threatened species or endangered species to determine whether its status has changed and if it should be classified differently or removed from the Lists of Threatened and Endangered Wildlife and Plants ([50 CFR 424.11](#)). The U.S. Fish and Wildlife Service (Service) evaluated the biology, habitat, and threats of the Alabama canebrake pitcher-plant to inform this status review.

We announced initiation of this review in the Federal Register on May 13, 2022 ([87 FR 29364](#)) with a 60-day comment period and received no comments. The primary sources of information used in this analysis were the 1989 final listing rule ([54 FR 10150](#)), the 1992 and 2019 recovery plan and amendment (respectively), 2012 and 2018 5-year reviews, peer-reviewed scientific literature, unpublished survey data and reports, and personal communication with recognized experts. This review was completed by the U.S. Fish and Wildlife Service, Mississippi Ecological Services Field Office (MFO), Jackson, Mississippi. All literature and documents used for this review are on file at the MFO. All recommendations resulting from this review are the result of thoroughly reviewing the best available information on the Alabama canebrake pitcher-plant.

We have not received significant new information, interpreted previously reviewed information in a new, significant light since the last review of the species, and the level of public interest is low and non-controversial; therefore, no peer review was conducted.

FR Notice citation announcing the species is under active review: May 13, 2022 ([87 FR 29364](#))

Species' Recovery Priority Number at start of 5-year review ([48 FR 43098](#)): 6, indicating that this subspecies has a high degree of threat and low recovery potential.

Review history: Previous 5-year reviews recommending no change in status were published on November 6, 1991 (Service 1991), January 3, 2012 (Service 2012), and July 23, 2018 (Service 2018).

REVIEW ANALYSIS

Listed Entity

Taxonomy and nomenclature

The Alabama canebrake pitcher-plant is part of the so-called “*rubra* complex” within the genus *Sarracenia*, which has been the subject of much taxonomic uncertainty and nomenclatural disagreement. This uncertainty and disagreement were discussed in more detail in the previous 5-year review (Service 2018) and has not been definitively resolved, with *Sarracenia alabamensis*, *S. alabamensis* ssp. *alabamensis*, and *S. rubra* ssp. *alabamensis* variously being used for this taxon. Given continued uncertainty and disagreement, the Service continues to recognize the taxon as it was listed (*Sarracenia rubra* ssp. *alabamensis*). We will review the species’ taxonomy and nomenclature again as more definitive science becomes available.

Distinct Population Segment (DPS) ([61 FR 4722](#))

The Act defines species as including any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate wildlife. This definition limits listing of a DPS to only vertebrate species. Because the species under review is a not a vertebrate, the DPS policy does not apply.

Recovery Criteria

Recovery Plan

Alabama canebrake pitcher plant recovery plan. Date signed: October 8, 1992 (Service 1992).

Recovery plan for Alabama canebrake pitcher plant. Amendment 1. Date signed: September 26, 2019 (Service 2019).

Recovery plans are not regulatory documents and are intended to provide guidance to the Service, States, and other partners on methods of minimizing threats to listed species and on criteria that may be used to determine when recovery is achieved. If the recovery criteria defined in the plan are still valid, meeting recovery criteria can indicate that the species no longer requires protections under the Act. However, when recommending whether a listed species should be delisted, the Service must apply the factors in [section 4\(a\)](#) of the Act ([84 FR 45020](#)).

The 1992 recovery plan only included downlisting (to threatened) criteria and did not include delisting criteria (Service 1992). The recovery plan amendment (Service 2019) revised downlisting criteria and established delisting criteria for the Alabama canebrake pitcher-plant and provided justification and rationale for the amended criteria. Amended recovery criteria are:

“Downlisting Criteria

1. At least 10 geographically distinct populations of sufficient size within the Fall Line Hills ecoregion in Alabama exhibit stable or increasing population trends, as evidenced by natural recruitment and multiple generations over an appropriate time span. 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. These 10 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

In addition to meeting downlisting criteria, the Alabama canebrake pitcher plant will be considered for delisting when the following criteria are met:

4. At least 10 additional geographically distinct populations of sufficient size (as described in Criterion 1) within the Fall Line Hills ecoregion in Alabama exhibit stable or increasing population trends, as evidenced by natural recruitment and multiple generations over an appropriate time span. (Addresses Factors A, B, D, E)
5. The Upper Alabama and Lower Coosa sub-basins within Fall Line Hills ecoregion each support at least three (3) viable populations protected by a conservation mechanism. (Addresses Factors A, E)” (Service 2019, pp. 3–4)

The Service believes these criteria are appropriate and relevant; however, no criteria have currently been met.

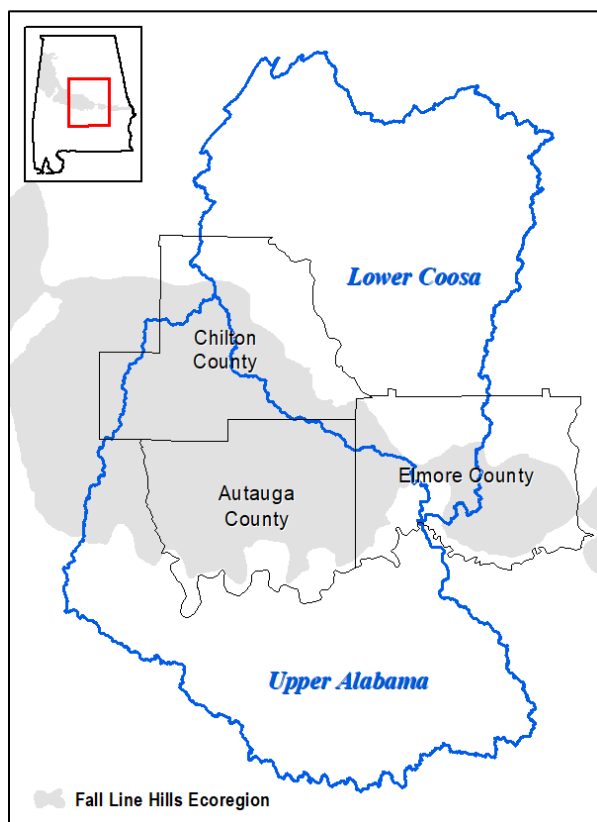


Figure 1. Counties, subbasins, and ecoregion with known Alabama canebrake pitcher-plant populations. Notes: The species is extirpated from Elmore County. Note: Population locations are not presented in this map to reduce poaching threat to the species.

Biology and Habitat Summary

Detailed reviews of Alabama canebrake pitcher-plant's biology and habitat can be found in previous 5-year reviews (Service 2012, 2018). There is limited new habitat information available that impacts the status of the species since the last 5-year review and information presented in that review remains valid.

Alabama canebrake pitcher-plant's population range and distribution are presented in Figure 1 and Table 1, while population status information is presented in Table 1. Of the 12 known populations, 4 are extirpated—including one that was recently extirpated (population C1 in Table 1)—and 8 are extant, which includes a recently discovered population (A5) and a population consisting entirely of transplanted individuals (C6). Due to the recent extirpation of one population on conservation lands, only two of the eight extant populations now receive any protection. Of these protected populations, one occurs mostly on conservation lands owned and managed as a preserve by The Nature Conservancy [TNC] and one occurs on private lands protected under a [Wetlands Reserve Program](#) [WRP] (a conservation program administered by the Natural Resources Conservation Service) easement. These two protected populations are distributed evenly between the Upper Alabama and Lower Coosa subbasins with each subbasin having one protected population.

Table 1. Summary of Alabama canebrake pitcher-plant population statuses.

County	Pop. ¹	Subbasin	Status	Size ²	Survey Year ²	Protected
Autauga	A1	Upper Alabama	Extant (Natural & Transplant)	4106	2019	Partial (Preserve)
Autauga	A2	Upper Alabama	Extant	481	2019	No
Autauga	A3	Upper Alabama	Extant (Natural & Transplant)	859	2019	No
Autauga	A4	Upper Alabama	Extirpated	0	(2016) ³	No
Autauga	A5	Upper Alabama	Extant	6	2021	No
Chilton	C1	Lower Coosa	Extirpated	0	(2018)	Yes (Easement)
Chilton	C2	Lower Coosa	Extant	74	2019	Yes (Easement)
Chilton	C3	Lower Coosa	Extant	7	2019	No
Chilton	C4	Upper Alabama	Extirpated	0		No
Chilton	C5	Upper Alabama	Extant	9	2019	No
Chilton	C6	Lower Coosa	Extant (Transplant) ⁴	19	2019	No
Elmore	E1	Upper Alabama	Extirpated	0	(1995)	No

¹All known populations occur within the Fall Line Hills ecoregion. ²Most recent population size and year of survey (Murphy and Boyd 1999, Byrd 2016, 2018, Yawn 2018, Yawn et al. 2023). ³Years in parentheses indicate last year plants were observed, if known. ⁴Parent plants were transplanted in 1985 prior to destruction of the original population.

In their comprehensive comparison of sites between 1995 (reported in Murphy and Boyd 1999) and 2019, Yawn et al. (2023) visited extant populations to assess population sizes, habitats, and soils. The authors reported the extirpation of one population considered extant in the last 5-year review and one new population discovered in 2020. Overall, population size increased from 3,752 in 1995 to 5,561 plants 2019, despite the loss of some local sites during this time and the apparent reduction of total area occupied by about 60% (Yawn et al. 2023). Reduction of area occupied may be due in part to different area estimations used in the two studies. Discovery of new populations (although small) and efforts to augment existing populations (discussed in more detail in Service 2018 and below in Conservation Activities) likely contributed to this population increase. Furthermore, Yawn et al. (2023) reported juvenile plants (i.e., evidence of recruitment) in three populations, noting that the five survey sites where these juveniles were found had the highest habitat integrity (i.e., highest plant species richness, diversity, and floristic quality).

metrics) and attributed this to active management (prescribed fire and/or hand clearing) of these sites.

Conservation Activities

Populations receive periodic monitoring and management (e.g., prescribed fire, hand clearing); however, because most known populations occur on privately owned lands, these conservation efforts rely on relationships with willing landowners. In recent years, these efforts have been fostered by cooperative efforts with the Alabama Plant Conservation Alliance, The Nature Conservancy, the Service, and others (e.g., Byrd 2019, 2020, 2021, 2022, Thompson 2022). As noted in previous 5-year reviews and Yawn et al. (2023), active management is essential to maintain healthy populations.

Safeguarding efforts summarized in the 2018 5-year review remain relevant, with most known populations represented in off-site (*ex situ*) collections. Alabama canebrake pitcher-plant safeguarding has continued expanding to include additional populations and partner institutions (e.g., Atlanta Botanical Garden, Auburn University's Donald E. Davis Arboretum, Birmingham Botanical Garden; Byrd 2019, Thompson 2019). These off-site collections represent valuable material for genetic conservation, research, and population augmentation and establishment. Indeed, the only remaining plants of one extirpated population (population A4) exist in an *ex situ* safeguarding collection. However, it is unknown how much of the species' genetic variation is represented by current safeguarding collections and additional research and collection may be needed.

Transplantation and augmentation—whether part of formal or informal conservation efforts—have been underway since at least the 1980s, supporting the expansion of known populations and survival of at least one population (population C6) that was otherwise extirpated. Together, these efforts represent successful conservation partnerships and have been supported by private citizens and landowners, the Boy Scouts of America, the Atlanta Botanical Garden, Alabama Plant Conservation Alliance, Alabama Department of Conservation and Natural Resources, The Nature Conservancy, and others (see Service 2018 and references therein for more details; Byrd 2019, Thompson 2022, Yawn et al. 2023).

The Alabama Department of Conservation and Natural Resources (ADCNR) has recently designated the species as a Plant of Conservation Concern in the State Wildlife Action Plan (SWAP; ADCNR 2016). While this designation does not carry any legal protections, this designation does serve to focus attention on the needs of the species and habitats within the state. The State of Alabama also now allows expenditure of funds from the Service pursuant to [section 6](#) of the Act as part of the State's implementation of its SWAP. In addition, Alabama canebrake pitcher-plant was ranked as a species of Very High conservation concern in the recently completed Southeastern Plants RSGCN [Regional Species of Greatest Conservation Need] List (Southeastern Plant Conservation Alliance 2023), a regional cooperative effort funded by the Service to identify and assess plant conservation needs, improve conservation of these species, and inform development of SWAPs within the greater southeastern region.

Threats (Five-Factor Analysis) Summary

The status of a species is determined from an assessment of factors specified in [section 4\(a\)\(1\)](#) of the Act, including: Factor A: the present or threatened destruction, modification, or curtailment of its habitat or range; Factor B: overutilization for commercial, recreational, scientific, or

educational purposes; Factor C: disease or predation; Factor D: the inadequacy of existing regulatory mechanisms; Factor E: other natural or manmade factors affecting its continued existence. A summary of this assessment is detailed below.

Habitat destruction and modification (Factor A) continue to threaten populations of Alabama canebrake pitcher-plant. The species remains vulnerable to inadequate and incompatible habitat management—which can degrade habitat or eliminate populations—and adjacent land uses, such as gravel mining and agriculture, which have degraded habitats by altering hydrology and increasing nutrient inputs (population C1; Byrd 2019, 2020, 2021, Yawn et al. 2023). One population was recently extirpated likely due to a combination of inadequate habitat management, herbicide spraying, and excessive nutrient input from adjacent pasture (Byrd 2020, 2021, Yawn et al. 2023). As noted in previous 5-year reviews (Service 2012, 2018), incompatible road right-of-way maintenance, including herbicide application, contributed to the extirpation of one population (A4). Similar concerns exist for part of another population (C5) occurring within a railroad right-of-way; however, the railroad manager has installed a sign prohibiting herbicide application in the population, which may reduce potential for extirpation at this site because of this activity. The species requires active habitat management, such as prescribed fire or hand thinning to maintain open habitats and limit encroachment of woody, invasive, and competing species. Such management activities require cooperation from willing landowners, and the lack of these cooperative relationships has limited or prevented necessary habitat management of some local sites.

Overcollection (Factor B) was noted in the final listing rule ([54 FR 10150](#)) as threatening this species and poaching has been occasionally noted since then (e.g., Yawn 2018, Yawn et al. 2023). The isolated nature of the species' populations coupled with the attentiveness of their respective landowners is thought to reduce the severity of this threat, which is considered low. The species is available for limited, lawful, permitted commercial trade from commercially grown plants, which may further reduce collection pressure on wild populations.

Disease and predation (Factor C) were not considered significant threats when the species was listed and we have no indication that this has changed.

Alabama canebrake pitcher-plant's legal and regulatory protections remain largely unchanged, with Alabama continuing to have no state laws affording specific protections to Alabama canebrake pitcher-plant or its habitat. However, plants are now eligible to receive conservation funding from the Service pursuant to [section 6](#) of the Act. The species also continues to be included in [Appendix I](#) of the *Convention on International Trade in Endangered Species of Wild Fauna and Flora* (CITES 2023), which limits international trade of species listed pursuant to the treaty. Inadequacy of existing regulatory mechanisms (Factor D) is not considered to pose a significant threat to the species.

Other factors (Factor E) also continue to threaten the species, particularly the small number of populations, small population sizes, and lack of seedling recruitment. Alabama canebrake pitcher-plant continues to be vulnerable due to the small number of populations and small population sizes. Of the species' 8 extant populations, only 3 have populations with 100 or more individuals—which combined account for nearly 98% of plants in the wild (Table 1). Of the remaining 5 populations—representing just over 2% of the entire population—3 have fewer than 10 individuals. As noted in the 2018 5-year review, these smaller populations are vulnerable to destruction from sudden catastrophic events, prolonged droughts and hydrological shifts,

continued habitat degradation, and potential inbreeding depression. However, the species' comparatively high genetic diversity and isolation from other pitcher-plant species may ameliorate some concerns of genetic diversity loss due to small population sizes and hybridization (Furches et al. 2013a, 2013b). Low seedling recruitment has been a persistent problem for this species (e.g., Murphy and Boyd 1999, Brewer and Chesser 2009, Yawn et al. 2023), which can reduce long-term viability of populations and limit the evolutionary potential of the species. Inadequate habitat management has likely contributed to the lack of active seedling recruitment in most populations (Yawn et al. 2023).

Synthesis

Alabama canebrake pitcher-plant is a clump-forming, herbaceous, and carnivorous flowering plant—using pitchers to trap and consume small arthropod prey—endemic to wetland habitats in central Alabama. The species is currently only found in Autauga and Chilton Counties and is considered extirpated in Elmore County, Alabama. Of Alabama canebrake pitcher-plant's 12 known populations, 8 are extant (including one small population consisting entirely of transplanted individuals and their progeny), and 4 are extirpated. While one population was discovered since the 2018 5-year review, another population has since been extirpated. In addition to few extant populations, small population size remains a threat with most (5 of 8) populations having less than 100 plants. Only 3 populations have 100 or more plants and only 1 population has over 1,000 plants. Two populations occur on conservation lands; however, one of these protected populations is also the largest known population (encompassing nearly three-quarters of the species' entire known population in the wild). While overall population size has increased since the mid-1990s by over 48%, active recruitment of the species is generally low, with recent observations noting seedlings at only 3 populations, which represent only a small fraction of individuals within each of these populations. Discovery of additional populations and population augmentation have also contributed to recent population increases.

Active and ongoing habitat management is needed at all populations to maintain the open conditions that the Alabama canebrake pitcher-plant requires, as well as to control competing vegetation and promote seedling recruitment. Together, habitat degradation and incompatible land management have led to the recent extirpations of two populations. Adjacent land uses, such as gravel mining and pasture, have degraded habitats via altered hydrology and nutrient inputs, and led to the recent extirpation of one protected population. Incompatible habitat management, such as herbicide application, has also likely resulted in the recent extirpation of a population and threatens part of another population. Continued habitat degradation due to inadequate management and encroachment of competing species remains a persistent threat, which can reduce seedling recruitment and overall vigor of populations. Because of ongoing threats and the current condition of the species, Alabama canebrake pitcher-plant continues to meet the definition of an endangered species.

RECOMMENDED FUTURE ACTIVITIES

Current recovery criteria are presented in the Recovery Plan Amendment (Service 2019) while the Recovery Plan (Service 1992) provides a detailed discussion of necessary recovery actions. During this status review, new and/or targeted potential recovery activities were identified and are included below.

These actions are recommended to support and promote recovery of the Alabama canebrake pitcher-plant. Use of a numbered list for these recommendations is for convenient reference only and does not necessarily imply prioritization of any activity over others.

Recovery Activities

1. Continue the use of prescribed fire at protected sites and encourage and cooperate with landowners of unprotected sites to conduct prescribed fire as frequently as possible to maintain favorable habitat conditions.
2. Where use of prescribed fire is not feasible, use fire surrogates such as hand clearing and mowing of competing vegetation to maintain favorable habitat conditions.
3. Work with landowners and cooperators to secure adequate protection of privately-owned populations.
4. Work with state, county, and local transportation departments to ensure proper protective measures are implemented for those areas where Alabama canebrake pitcher-plants occur within roadside rights-of-way.
5. Continue to preserve genetic material from all populations through long-term seed storage and live plant collections *ex situ* (off-site).

Monitoring and Research Activities

1. Continue to track population trends and evaluate management needs and efficacy.
2. Expand surveys in the vicinity of known populations and revisit known historical sites regularly to locate and/or relocate populations.
3. Determine the extent that current *ex situ* collections represent the genetic diversity of *in situ* populations and expand *ex situ* collections if necessary.

RESULTS / SIGNATURES**U.S. Fish and Wildlife Service
Status Review of Alabama Canebrake Pitcher-plant****Status Recommendation:**

On the basis of this review, we recommend the following status for this species. A 5-year review presents a recommendation of the species status. Any change to the status requires a separate rulemaking process that includes public review and comment, as defined in the Act.

- ☐ Uplist to Endangered
- ☐ Delist:
 - ☐ *The species is extinct*
 - ☐ *The species does not meet the definition of an endangered or threatened species*
 - ☐ *The listed entity does not meet the statutory definition of a species*
- ☒ No change needed

FIELD OFFICE APPROVAL:

Field Supervisor, Mississippi Ecological Services Field Office, Fish and Wildlife Service

Approve **JAMES AUSTIN**

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Date: 2023.07.21 10:07:17 -05'00'

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