Florida Pineland Crabgrass

(*Digitaria pauciflora*)

5-Year Status Review:

Summary and Evaluation

Photo by George D. Gann

U.S. Fish and Wildlife Service
Southeast Region
Florida Ecological Services Field Office
Vero Beach, Florida

August 2023

5-YEAR STATUS REVIEW

Florida Crabgrass *(Digitaria pauciflora)*

GENERAL INFORMATION

Current Classification: Threatened

Lead Field Office: Florida Ecological Services Field Office

Review Authors:

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

Date of original listing: November 6, 2017 (82 FR 46691; October 6, 2017)

Critical habitat/4(d) rule/ Experimental population designation/Similarity of appearance listing: Critical habitat final rule: October 14, 2022 (87 FR 62564)

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) and the University of Georgia evaluated the biology, habitat, and threats of the Florida crabgrass to inform this status review.

We announced initiation of this review in the Federal Register requesting information on this species on May 13, 2022 (87 FR 29364), with a 60-day comment period. We did not receive any public comments. In conducting this 5-year review, the Service relied on the best available information pertaining to historical and current distributions, life history, ecology, and habitat of this species. Sources for this status review include the final listing rule, published and unpublished reports, field observations, and personal communications from recognized experts in the field. This review was completed by students at the University of Georgia and reviewed and finalized by the Service's, Florida Ecological Services Office, Vero Beach, Florida. All recommendations from this review are the result of thoroughly reviewing the best available information on the Florida crabgrass.

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**):** 8. This indicates it is a species with a moderate degree of threats and a high recovery potential.

Review History:
This is the first 5-year status review for this species.

REVIEW ANALYSIS

Listed Entity

Taxonomy and nomenclature:
The Integrated Taxonomic Information System (ITIS) lists the scientific entity, *Digitaria pauciflora*, as a valid, accepted taxonomy for the listed species and list the common name as twospike crabgrass and Florida pineland crabgrass (ITIS 2022). The common name used in the list under the Act is Florida crabgrass (50 CFR 17.12). We will use the common name Florida crabgrass in this review. We are not aware of any changes to the taxonomy of this entity, and it is still considered valid by the Service.

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 is not applicable.

Recovery Criteria

Recovery Plan or Outline:
At the time of this review, recovery criteria for this species have not been finalized.

Biology and Habitat Summary

The Florida crabgrass occurs predominantly within the seasonally flooded ecotones of pine rocklands, marl prairies, and cypress habitat (Bradley and Gann 1999; Fellows et. al 2002, Lang et. al 2022). The historical range of Florida crabgrass includes appropriate habitat in southern Florida, including central and southern Miami-Dade County along the Miami Rock Ridge, from southern Miami to Long Pine Key region of Everglades National Park (ENP) and into Big Cypress National Preserve (BCNP) in Monroe County. Currently, Florida crabgrass is extant only in two locations, ENP and BCNP. The Long Pine Key region of ENP, has a population estimate greater than 200,000 individuals (Maschinski and Lange 2015). In 2007, the BCNP population estimate was greater than 10,000 individual plants (Bradley, pers. comm. 2007). While Florida crabgrass populations remain abundant within ENP and BCNP, these areas represent only half of the species' historical range (Bradley and Gann 1999; Gann 2015).

Florida crabgrass rely on periodic disturbance, such as fire regimes, to maintain their habitat (Bradley and Gann, 1999; ENP 2014). The species is also found in habitats with longer

hydroperiods, particularly marl prairie, that exhibit flooding for several months during the wet season (Gann et al. 2006). Plants can be partially submerged in freshwater for a portion of the year but based on location, they appear not to tolerate salinity.

Florida crabgrass can reproduce sexually, clonally through rhizomes (Webster and Hatch 1990), and via vegetative spread (Fellows et al. 2003; Lange pers. comm 2016). Several subpopulations occur near trails and roads indicating human activities may assist in seed dispersal and recruitment (Lange et al. 2022). Florida crabgrass fruits in the fall and produces flowers from summer to late fall on both new and older growth (Fellows et al. 2002; Wendelberger and Maschinski 2006; Gann 2015).

Everglades National Park Population

The population estimate for Florida crabgrass is greater than 200,000 individuals at Long Pine Key (Maschinski and Lange 2015). In 2007, over 16,000 seeds from this population were collected and sent to the National Center for Genetic Resources Preservation for storage (Gann 2015). In the spring of 2016, wildfires in ENP likely reduced this population. Without a periodic fire regimen to control fuel loads, wildfires can burn hotter and longer causing damage to otherwise fire tolerant species. The populations will likely rebound; however, regeneration could be severely hampered, based on the amount and duration of flooding during the region's late summer storm season. Camp Everglades, the second occurrence in ENP, is listed in Table 1 separately but is considered part of the larger metapopulation and is managed in coordination with ENP management plan.

Big Cypress National Preserve

In 2002, Bradley et al. (2013) discovered Florida crabgrass within the Lostmans Pines region of BCNP in Monroe County, Florida. This represented the first known Florida crabgrass occurrence outside Miami-Dade County (FNAI 2007). This species is widely distributed within Lostmans Pines (Bradley et al. 2013). Bradley et al. (2013) conducted surveys in the Gum Slough region of Lostmans Pines and indicated that the species is widely distributed within the study area documenting over 2,365 individuals. Lange et al. (2022) found over 3,345 individuals. Several sites that were previously documented were revisited in the 2022 study and 100% were confirmed extant. The counts at these locations were 161 in 2012 compared to 695 in 2022 (Lange et al 2022). The study also documented several new subpopulations. This suggests that the overall population at BCNP is stable to increasing. Lange et al. (2022) ran models that identified 4,775 acres of suitable habitat for Florida crabgrass within BCNP boundaries. With known occurrences and the amount of suitable habitat, the population is estimated greater than 10,000 plants with stable to increasing populations (Bradley, pers. comm. 2007; Bradley et al. 2013).

Table 1. Summary and population estimate of the known occurrences of Florida crabgrass.

Population	Ownership	Last Observed	Most Recent Population Estimate
Everglades National Park (ENP)	National Park Service	2015[1]	100,000 – 200,000
Camp Everglades (ENP)	Boy Scouts of America	2016[2]	100-1,000
Big Cypress National Preserve (BCNP)	National Park Service	2022[4]	>10,000
Martinez Pineland	Miami-Dade County	1999[2,3]	Extirpated
Cutler and Longview Camp	Unknown	1903[3]	Extirpated
Jenkins Homestead	Unknown	Unspecified[3]	Extirpated
South Miami	Unknown	1939[3]	Extirpated

[1] Maschinski and Lange 2015
[2] Lange, pers. comm. 2017
[3] Bradley, pers. comm. 2007
[4] Lange et al. 2022

Threats (Five-Factor Analysis) Summary

The status of Florida crabgrass 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 D: the inadequacy of existing regulatory mechanisms; and Factor E: other natural or manmade factors affecting its continued existence. Factor B: overutilization for commercial, recreational, scientific, or educational purposes; and Factor C: disease or predation; are not known threats to this species. All the threats listed in the rulemaking (Service 2017) continue to negatively impact the species and are summarized below.

Extensive land modification for development and agriculture in Miami-Dade and Monroe counties has led to habitat loss, fragmentation, and modification of Florida crabgrass habitat (Factor A). Due to these land modifications, suitable habitat for Florida crabgrass outside of ENP and BCNP is limited and severely fragmented. The degradation of these habitats is expected to continue for areas not protected, which has been exemplified by the extirpation of all the remaining known populations outside of protected areas.

Remaining habitat outside of ENP and BCNP is fragmented which inhibits rates of seed dispersal and increase the encroachment of invasive species (Service 2017). Management for invasive plants is difficult due to bordering urban areas that serve as source populations and allow for the continued invasion of pine rocklands. The introduction of non-native plants has significantly reduced the amount of suitable habitat for Florida crabgrass by out competing native vegetation and altering fire dynamics which allows for habitat succession unsuitable for this species (Factor A and E).

Suppression of natural fire and limitations of prescribed fire in proximity to urban landscapes have created unnatural fire regimes that result in inappropriate conditions for many of the endemic pine rockland species (Service 2017). Pine rockland habitats likely had a historical,

natural fire return interval of 3-7 years from lightning strikes and without that maintenance will convert to hardwood domination and a hammock-like habitat (Wade et al. 1980; Service 2017 and references therein), which will be unfavorable to Florida crabgrass. The proximity of urban environments has limited the ability of using prescribed fire on many pine rockland areas because of air quality and potential spread to nearby urban areas (Wade et al. 1980) and there are also concerns that future burning windows could be reduced because of climate changes (Kupfer et al. 2020). Although ENP and BCNP both use prescribed fires as part of their conservation management, the lack of fire in the past has increased fuel load and may result in fire burning hotter for a longer period, which can negatively impact native species (Factor A, D, E).

The extant populations of Florida crabgrass occur on federal lands (ENP and BCNP), these populations are provided some protections from habitat modification and from unauthorized harm, or collection/destruction of the species. However, state and federal regulatory mechanisms (Factor D) are inadequate to protect the species from habitat degradation, as described above, as well as implications caused by climate change and saltwater intrusion, described below.

Climate change poses a significant threat to the two remaining populations of Florida crabgrass. Sea level rise is expected to greatly reduce the land area within the range of Florida crabgrass in the coming decades (Sweet et al. 2022). Increased frequency and duration of severe hurricanes, increased precipitation rates, and magnitude of storm surges (Intergovernmental Panel on Climate Change 2019) have the potential to modify or destroy the remaining habitat for Florida crabgrass throughout its historical range. While the hydrologic requirements for Florida crabgrass is not well understood, increased inundation for longer periods than normal or increased soil salinity from storm surges has the potential to harm individual organisms as well as negatively impact the integrity of the habitat (Factor A, D, and E).

Synthesis

Florida crabgrass is a species of small perennial clump-grass, found in pine rocklands habitat, marl prairie habitat, and transitional habitats between the two. Currently, Florida crabgrass can only be found within the boundaries of Everglades National Park and Big Cypress National Preserve. The habitat in which Florida crabgrass occurs relies on frequent, low intensity fires to facilitate the removal of understory hardwood growth and creating an open canopy needed by the species. The primary threats limiting the recovery of the Florida crabgrass are habitat destruction from development; poor fire management; the invasion of non-native species; population isolation/fragmentation; and climate change. Populations of Florida crabgrass within the Everglades National Park and Big Cypress National Preserve appear robust with recent surveys characterizing these populations as abundant. However, Florida crabgrass remains vulnerable to extinction due to low population dispersal across its range (low redundancy), and fragmented populations causing decreased genetic diversity (low representation). With the dynamic range of ongoing and future threats and the current condition of the species, Florida crabgrass continues to meet the definition of a threatened species.

RECOMMENDED FUTURE ACTIVITIES

This species does not have a final recovery plan. While completing this status review, we have identified the following potential recovery activities which are included below.

Recovery Activities

- Maintain current populations of the pine rockland habitat with an approved management plan including a prescribed fire regimen.
- Conduct extensive eradication of invasive plants within known populations.
- Develop a translocation/reintroduction plan to identify potential recipient sites for reintroducing or establishment of populations within the historical range. Emphasis should be put on the known extirpated populations in table 1 as well as Nixon Smiley Preserve, Lucille Preserve, Tamiami Complex Addition, and Snapper Creek Pineland.
- Identify and restore patches of historically wetter environmentally endangered lands within Florida crabgrass's historic range.
- Establishing partnerships with private landowners to promote conservation easements and landowner agreements within remaining Florida crabgrass habitats.

Monitoring / Research Activities

- Conduct regular monitoring of populations to better understand species trends.
- Survey extensively in and around the Gum Slough/Stair Steps area of BCNP to better understand the extent of this population.
- Research species demographics such as life history and ecology with an emphasis on understanding the hydrological periods required by the species.
- Evaluate the 16,000 seeds collected for viability in long-term cold storage. Determine storage lifespan and the rate at which banks should be replenished.
- Map the extant populations of Florida crabgrass and identify remaining suitable habitat within the species range.

Outreach Activities:

- Increase public awareness and appreciation for native plants and habitats.
- Attend public events when appropriate to improve the communities understanding of management techniques and policies, such as prescribed fire, in pine rockland habitats.

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RESULTS

U.S. FISH AND WILDLIFE SERVICE
Status Review of Florida Crabgrass

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 ESA.

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist *(Indicate reasons for delisting per 50 CFR 424.11)*:
____ *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.*
_X_ No change needed

Review Conducted By: Heather Hitt, Florida Ecological Services Field Office, Vero Beach

FIELD OFFICE APPROVAL:

Acting for **Division Manager, Florida Classification and Recovery, Florida Ecological Services Field Office, Fish and Wildlife Service**

Approve WILLIAM BROOKS Digitally signed by WILLIAM BROOKS Date: 2023.08.30 12:24:56 -04'00'

LEAD REGIONAL OFFICE APPROVAL:

Acting for **Assistant Regional Director – Ecological Services, Fish and Wildlife Service**

Approve AARON VALENTA Digitally signed by AARON VALENTA Date: 2023.08.29 15:55:04 -04'00'