Recovery Plan for the endangered *Cucurbita okeechobeensis* ssp. *okeechobeensis* (Okeechobee gourd) https://www.fws.gov/verobeach/MSRPPDFs/Okeechobee.PDF

Original Approved: May 18, 1999
Original Prepared by: South Florida Ecological Services Field Office staff

AMENDMENT 1

We have identified best available information that indicates the need to amend recovery criteria for *Cucurbita okeechobeensis* ssp. *okeechobeensis* (Okeechobee gourd) since the recovery plan was completed in 1999. In this modification, we synthesize the adequacy of the existing recovery criteria, show amended recovery criteria, and provide the rationale supporting the recovery plan modification. The modification is shown as addendum that supplements the South Florida Multi-Species Recovery Plan (MSRP; U.S. Fish and Wildlife Service [Service] 1999), superseding only the recovery criteria on page 4-945 of the recovery plan for Okeechobee gourd. Recovery plans are a non-regulatory document that provide guidance on how best to help recover species.

For
U.S. Fish and Wildlife Service
Atlanta, Georgia

Approved: _____
Acting **Regional Director, U.S. Fish and Wildlife Service**

Date: 9/24/19

METHODOLOGY USED TO COMPLETE THE RECOVERY PLAN AMENDMENT

This amendment to the recovery criteria was developed using the most recent and best available information for the species. Primary sources of information included the most recent 5-year review (USFWS 2009) and the current recovery plan (USFWS 1999). This information was analyzed by the U.S. Fish and Wildlife Service (Service) biologists and managers in the North Florida and South Florida Ecological Services Field Offices in order to develop the delisting criteria for Okeechobee gourd.

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

The MSRP only provides downlisting criteria, and they can be found on page 4-945 (https://www.fws.gov/verobeach/MSRPPDFs/Okeechobee.PDF).

Synthesis

The Okeechobee gourd was listed as endangered on July 12, 1993 (58 FR 37432), and again on April 1, 1994 (59 FR 15345), due to a technical correction to the scientific name. The species was listed primarily due to habitat threats concerning conversion of swamps and marshes for agriculture and water level regulation in Lake Okeechobee (Factor A) (Service 1999).

The Okeechobee gourd was once locally common among the extensive pond apple (*Annona glabra*) forests that grew south of Lake Okeechobee and in hammocks along the rim and islands of the lake (Small 1922). By 1930, at least 95 percent of these pond apple forests had been destroyed (Small 1930). At the time of listing, the Okeechobee gourd was only known to survive in a few places in southern Florida. However, in 1993 the Okeechobee gourd was rediscovered along the St. Johns River some 200 years after John and William Bartram encountered it there (Ward and Minno 2002). Currently, two small disjunct populations occur in the wild – one along the St. Johns River which separates Volusia, Seminole, and Lake counties in north Florida, and a second around the shoreline of Lake Okeechobee in Palm Beach and Glades counties in South Florida (Service 1999). Since listing, additional sites have been located and monitored across both populations through combined efforts of various agencies and partners including the Service, Eco-Cognizant Inc., Florida Museum of Natural History (FMNH), Bok Tower Gardens, and the South Florida Water Management District.

Surveys along the St. Johns River in 2002 indicated presence at eight (8) of the 12 sites documented since 1994. It was estimated that the entire St. Johns River population consisted of no more than 100 plants (Ward and Minno 2002). In 2006, surveys indicated that plants were occupying a total of 10 sites, including three (3) new sites that were discovered (Minno and Minno 2006). In 2007, Minno (2007) reported plants at eight (8) of the previous sites, plus four (4) new locations. In 2015, the Florida Natural Areas Inventory (FNAI) reported four (4) element occurrences of the species in five (5) counties.

For several years, the Service funded Eco-Cognizant, Inc. to investigate the biology, habitat requirements, and distribution of the Okeechobee gourd in Florida (Minno and Minno 1995, 1998). Eco Cognizant, Inc. identified wild Okeechobee gourd sites in Volusia, Lake, Seminole, Glades and Palm Beach counties. Through their studies, they found the St. Johns River population is quite different from the Lake Okeechobee population, likely representing different varieties, but it has not yet been formally described (Minno 2017). The St. Johns River population is less affected by development activities, but remains uncommon and very locally distributed there between Lake Monroe and Lake Beresford (Minno 2017). Minno (2017) reported Okeechobee gourd plants across approximately 38 sites along the St. Johns River and 10 sites along North and South Lake Okeechobee including Ritta, Kreamer, and Torry islands.

However, a recent research study of the St. Johns population by the FMNH found occurrences of the Okeechobee gourd to be rare and only found along the main St. Johns River waterway, consisting of 10 sites (Kate 2018). Of these 10 sites, four (4) did not appear to bear any flowers or fruits or have any dried fruits from previous seasons visible on the ground (Kate 2018).

The 2009 5-year review determined that the Okeechobee gourd is currently threatened by Factors A (habitat destruction or modification) and E (other natural or manmade factors) (Service 2009). Most of the known occurrences in the Lake Okeechobee population are on public land (Minno 2009), but extent of management is not reported. The population along the St. Johns River is found primarily on State and County-owned properties. Some sites may be on private land (Service 2009).

Threats to Okeechobee gourd have been partially addressed by conducting more regularly scheduled surveys, using provisions of section 7 of the Endangered Species Act to protect the Okeechobee gourd, investigating the genetic variation present in the two known populations of the subspecies, managing exotic vegetation in wetlands, planting native trees or shrubs to replace exotics, locating potential translocation sites, reintroducing plants, and by monitoring reintroduced plants. Ongoing data collection will help assess the effects of various management practices on Okeechobee gourd survival.

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 Okeechobee gourd 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 species. 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*.

Herein, we provide delisting criteria for the Okeechobee gourd, which will supersede those downlisting criteria included in the MSRP.

Delisting Recovery Criteria

The Okeechobee gourd will be considered for delisting when the following criteria are met:

1. At least 20 populations exhibit a stable or increasing trend, evidenced by natural recruitment and multiple age classes. (addresses Factor A)
2. Populations (as defined in criterion 1) occur in marsh and swamp habitats and are distributed across the historical range of the species. (addresses Factors A and E)
3. Populations (as defined in criterion 1) must be protected via a conservation mechanism or managed such that enough suitable habitat is present for the species to remain viable for the foreseeable future. (addresses Factors A and E)

Justification

These recovery criteria reflect the best available and most up-to date information on the biology of the species and its habitat. In 1994, the species was listed due to habitat destruction (Factor A) and other natural or manmade factors (Factor E). The Okeechobee gourd continues to be threatened by Factors A and E. Therefore, recovery criteria are focused on actions that address the threats associated with Factors A and E, ensuring the species is no longer vulnerable to habitat loss or degradation by protecting and managing enough resilient populations within the historical range of the species.

Achievement of Criteria 1, 2, and 3 will ensure that at least 20 robust populations are adequately protected and sufficiently managed to maintain and/or increase population resiliency, redundancy, and representation throughout the historical range. Narrow ranging endemic species that re-sprout from root-stocks following regular natural disturbances such as fire, rather than relying solely on regeneration from the soil seed bank, and/or are long-lived are less vulnerable to extirpation by stochastic events and demographic fluctuations, such that populations numbering in hundreds of plants are resilient. Twenty (20) resilient populations will provide sufficient redundancy to reduce the vulnerability of the species to range-wide impacts and conserve the existing geographic pattern of genetic diversity in the species.

With the predominant threat being loss and reduction of habitat, conservation of areas occupied by the Okeechobee gourd as well as management of exotic species (e.g., *Ipomoea alba* [moonflower]) are critical in providing for the long-term protection and viability of the species. Recovery efforts will aim to increase Okeechobee gourd distribution through reintroduction and translocation on protected conservation lands. Research on best translocation and reintroduction

practices are ongoing for both the Lake Okeechobee and St. Johns populations as there appear to be unidentified factors that limit the distribution of the Okeechobee gourd.

Rationale for Amended Recovery Criteria

The existing criteria for Okeechobee gourd in the MSRP (Service 1999) (https://ecos.fws.gov/docs/recovery_plan/sfl_msrp/SFL_MSRP_Species.pdf) lacked delisting criteria and included only downlisting criteria for these species. With these amendments, delisting has been clearly defined with measurable, objective criteria in keeping with the recovery strategy and goals outlined in the MSRP. These criteria address what is necessary to ensure resiliency, redundancy, and representation by addressing factors that threaten the species. In achieving these criteria, we expect Okeechobee gourd to have a low probability of extinction for the foreseeable future and have robust, stable populations needed for long-term recovery. We will work together with our partners to strategically and efficiently implement the new criteria.

LITERATURE CITED

Decker-Walters, D.S. 2002a. Report on initial 2002 visits to populations of Okeechobee gourd (*Cucurbita* subsp. *okeechobeensis*). Interim report to the U.S. Fish and Wildlife Service for contract #401812M435. Vero Beach, Florida.

Florida Natural Areas Inventory (FNAI). 2010. Guide to the Natural Communities of Florida: 2010 Edition. Tallahassee, FL

Florida Natural Areas Inventory (FNAI). 2015. Element Tracking Summary. Tallahassee, FL

Kate, H.R. 2018. Personal communication. Postdoctoral Associate with the Florida Museum of Natural History. Electronic mail to Rose and Nguyen. October 5.

Minno, M.C. 2007. Personal communication. Biologist with Eco-Cognizant, Inc. Electronic mail from Minno to Knight. September 4.

Minno, M.C. 2009. Personal communication. Biologist with Eco-Cognizant, Inc. Electronic mail from Minno and Knight. June 30.

Minno, M.C., and M. Minno. 1998. Phenology, pollination, and distribution of the Okeechobee gourd (*Cucurbita okeechobeensis*) along the St. Johns River, Florida, 1997. Final report to the U.S. Fish and Wildlife Service for contract #301815M292. Vero Beach, Florida.

Minno, M.C. and M. Minno. 2006. Survey of the endangered Okeechobee gourd (*Cucurbita okeechobeensis*) in Florida, 2006: Report for the St. Johns River population. Report to the U.S. Fish and Wildlife Service for contract #401816M327. Vero Beach, Florida.

Minno, M.C., and M. Minno. 2017. Investigating Recovery Actions for the Endangered Okeechobee gourd (*Cucurbita okeechobeensis*) at Lake Okeechobee and the St. Johns River.

Moyroud, R. 2009. Personal communication. President of Mesozoic Landscapes, Inc. Electronic mail from Moyroud to Knight. July 22.

Small, J.K. 1922. Wild pumpkins. Journal of the New York Botanical Garden 23: 19-23.

Small, J.K. 1930. The Okeechobee gourd. Journal of the New York Botanical Garden 31: 10-14.

U.S. Fish and Wildlife Service. 1993. Endangered and Threatened Wildlife and Plants; Endangered or Threatened Status for Five Plants. Federal Register 58(131):37432-37443.

U.S. Fish and Wildlife Service. 1999. South Florida Multi-Species Recovery Plan. U.S. Fish and Wildlife Service, Vero Beach, Florida. https://www.fws.gov/verobeach/ListedSpeciesMSRP.html

U.S. Fish and Wildlife Service. 2009. Okeechobee gourd *Curcurbita okeechobeensis* spp. *Okeechobeensis*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Atlanta, Georgia. https://ecos.fws.gov/docs/five_year_review/doc1060.pdf

Ward D.B., and M.C. Minno. 2002. Rediscovery of the endangered Okeechobee gourd (*Cucurbita okeechobeensis*) along the St. Johns River, Florida, where last reported by William Bartram in 1774. Castanea 67: 201-206.

APPENDIX – SUMMARY OF PUBLIC AND PARTNER COMMENTS RECEIVED

Summary of Public Comments

We published a notice of availability in the *Federal Register* on August 6, 2019 (84 FR 38291-38294), to announce that the draft amendment to the Okeechobee gourd Recovery Plan was available for public review, and to solicit comments by the scientific community, State and Federal agencies, Tribal governments, and other interested parties on the general information base, assumptions, and conclusions presented in the draft revision. An electronic version of the draft amendment was posted on our Species Profile website (https://ecos.fws.gov/docs/recovery_plan/Okeechobee%20Gourd%20Recovery%20Plan%20Amendment.pdf). We also developed and implemented an outreach plan that included: (1) publishing a news release on our national webpage (https://www.fws.gov/news/) on August 5, 2019, (2) sending specific notifications to Federal Congressional representatives in Florida, and (3) sending specific notifications to key stakeholders in conservation and recovery efforts.

We received one response in total. The comment was from a non-governmental organization.

This comment questioned the specificity of the recovery criteria. We thank the reviewer and have considered this substantive comment. This comment did not lead to significant changes in the draft plan. Below, we provide a summary of public comment received prior to implementation of the final recovery plan amendments in accordance with section 4(f)(5) of the Endangered Species Act (Act).

Comment: The commenter expressed concern about the "lack of clear definitions and measurable standards" in the recovery criteria.

Response: Recovery criteria should be broad enough to be applicable for the long term and provide flexibility to account for changes in a species' condition through time. We do not currently have a good measure of what a stable or increasing trend for this species would be or how much suitable habitat will be enough to recover the species. Therefore, we described these metrics in the delisting criteria more broadly. If and when, in the future, we are able to better define those metrics, we will either identify those targets in a recovery implementation strategy or revise the criteria to include more specific numbers for those metrics.