

## **Draft Amendment to the Recovery Plan for *Lipochaeta venosa* and *Isodendrion hosakae***

**Original Approved:** [May 23, 1994](#)

**Original Prepared by:** Pacific Region, U.S. Fish and Wildlife Service

**Date of Draft Amendment:** July 2018

**Species addressed in Draft Amendment:** *Isodendrion hosakae* (Aupaka)

We have analyzed all of the best available information and find that there is a need to amend the recovery criteria for *Isodendrion hosakae* (aupaka) that have been in place since the recovery plan was completed. In this proposed modification, we discuss the adequacy of the existing recovery criteria, identify amended recovery criteria, and present the rationale supporting the proposed recovery plan modification. The proposed modification is to be shown as an appendix that supplements the recovery plan, superseding only the Recovery Criteria (pages iii-iv) in the Executive Summary and the Objective section (page 25) in Part II (Recovery) of the recovery plan (USFWS 1994).

### **BACKGROUND INFORMATION**

Recovery plans should be consulted frequently, used to initiate recovery activities, and updated as needed. A review of the recovery plan and its implementation may show that the plan is out of date or its usefulness is limited, and therefore warrants modification. Keeping recovery plans current ensures that the species benefits through timely, partner-coordinated implementation based on the best available information. The need for, and extent of, plan modifications will vary considerably among plans. Maintaining a useful and current recovery plan depends on the scope and complexity of the initial plan, the structure of the document, and the involvement of stakeholders.

An amendment involves a substantial rewrite of a portion of a recovery plan that changes any of the statutory elements. The need for an amendment may be triggered when, among other possibilities: (1) the current recovery plan is out of compliance with regard to statutory requirements; (2) new information has been identified, such as population-level threats to the species or previously unknown life history traits, that necessitates new or refined recovery actions and/or criteria; or (3) the current recovery plan is not achieving its objectives. The amendment replaces only that specific portion of the recovery plan, supplementing the existing recovery plan, but not completely replacing it. An amendment may be appropriate in cases where significant plan improvements are needed, but resources are too scarce to accomplish a full recovery plan revision in a short time.

Although it would be inappropriate for an amendment to include changes in the recovery program that contradict the approved recovery plan, it could incorporate study findings that enhance the scientific basis of the plan, or that reduce uncertainties as to the life history, threats, or species' response to management. An amendment could serve a critical function while awaiting a more comprehensive revised recovery plan by: (1) refining and/or prioritizing recovery actions that need to be emphasized, (2) refining recovery criteria, or (3) adding a species to a multispecies or ecosystem plan. An amendment can, therefore, efficiently balance

resources spent on modifying a plan against those spent on managing implementation of ongoing recovery actions.

## **METHODOLOGY USED TO COMPLETE THE RECOVERY PLAN AMENDMENT**

The Hawai'i and Pacific Plants Recovery Coordinating Committee (HPPRCC), comprising biologists from federal and state agencies, private conservation organizations, botanical gardens, and universities, was established to advise the Service on the biology and management needs for recovery of listed plants. The HPPRCC has outlined general actions and goals for stages leading towards recovery of listed Hawaiian plants (HPPRCC 2011). Current information is lacking for many Hawaiian plant species with respect to the status of the species and their habitats, breeding systems, genetics, and propagule storage options. The Service has therefore adopted following downlisting and delisting criteria for Hawaiian plants based on the revised general recovery objective guidelines developed by the HPPRCC (2011).

General distinctions made by the HPPRCC that are relevant to *Isodendrion hosakae* include the following:

- *Life span*: Long-lived perennials are those taxa either known or believed to have life spans greater than 10 years; short-lived perennials are those known or believed to have life spans greater than 1 year but less than 10 years; and annuals are those known or believed to have life spans less than or equal to 1 year. When it is unknown whether a species is long- or short-lived, the Service has erred on the side of caution and considered the species short-lived. This will be revised as more is learned about the life histories of these species.
- *Range size*: Narrow extant range and broad contiguous range are recognized as not needing different numbers of individuals or populations, only that the populations be distributed more narrowly or more broadly, respectively, across the landscape.
- *Reproduction strategies*: Obligate outcrossers are species that either have male and female flowers on separate plants or otherwise require cross-pollination to fertilize seeds, and therefore require equal numbers of male and female individuals contributing to reproduction, doubling the number of mature individuals needed for recovery. Species that reproduce vegetatively may reproduce sexually only on occasion, resulting in the majority of the genetic variation being between populations, therefore species dependent on vegetative reproduction require additional populations.
- *Annual population stability*: Species that fluctuate in number of individuals from year to year require a larger number of mature individuals on average to allow for a decline in years of extreme habitat conditions and recuperation in numbers in years of more normal conditions.

The following downlisting and delisting criteria were determined based on known biology of *Isodendrion hosakae* with consideration given to the above general guidelines. This species is considered a short-lived perennial shrub (USFWS 2012). The State of Hawai'i Department of Land and Natural Resources, Division of Forestry and Wildlife's botanist reviewed and confirmed these life-history traits and corresponding criteria as quantified in the peer-reviewed guidelines (HPPRCC 2011). This amendment was written by the Pacific Islands Fish and Wildlife Office's plant recovery coordinator.

## **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 Part II. Recovery Objective section (page 25) of the recovery plan (USFWS 1994). Delisting criteria were not provided in the recovery plan. The downlisting criteria were described as follows: “identified threats must be controlled and [*I. hosakae*] must be present at Sites #1-6 located on the Parker Ranch. Each site must have naturally-reproducing populations that include seedlings, juveniles, and adults, with an age distribution allowing for a stationary or growing population size. They should be maintained for at least 10 years.”

### **Synthesis**

*Isodendron hosakae* had been known exclusively from three cinder cones in South Kohala (USFWS 1994). Plants now currently only occupy 1 cinder cone, Pu‘u Pāpapa, where 35 individuals are known, in the Ke‘āmuku Maneuver Area of Pōhakuloa Training Area. A total of 85 wild plants are represented by seeds in a seed bank at Pōhakuloa Training Area. Future outplanting efforts include assuring genetic representation of at least 50 wild plants at each of 4 outplanting sites within Pōhakuloa Training Area (PTA 2017).

All wild individuals are fenced and fences are maintained and they are considered protected from feral ungulates. All future outplanting sites will occur in fenced, suitable habitat in the Ke‘āmuku Maneuver Area. Other documented threats, such as invasive plants, fire, and military activities are being mitigated by the Natural Resources Program for Pōhakuloa Training Area (PTA 2107, USFWS 2012). Climate change has also been identified as a threat, but has yet to be addressed for this species (USFWS 2012). Fortini *et al.* (2013) conducted a landscape-based assessment of climate change vulnerability for native plants of Hawai‘i using high resolution climate change projections. Climate change vulnerability is defined as the relative inability of a species to display the possible responses necessary for persistence under predicted climate change. This assessment concluded that *I. hosakae* is highly vulnerable to the impacts of climate change, with a score of 0.827 (on a scale of 0 being not vulnerable to 1 being extremely vulnerable to climate change). This species was determined to have no overlap between current and future climate envelopes, and is unlikely to easily tolerate expected changes in climate. This limitation means that *I. hosakae* must either endure in suitable microrefugia within its current climate envelope, or move to newly available climate-compatible areas to avoid extinction. Therefore, additional management actions are needed to conserve this taxon into the future.

The downlisting recovery criteria will be superseded by the new downlisting criteria described below. Some additional new downlisting and all new delisting criteria are also written below. The new criteria are aligned with standards provided based on the species’ life history and reproductive biology as described in the HPPRCC (2011). The downlisting criterion of “identified threats must be controlled” will not change. The downlisting criterion that plants

“must be present at Sites #1-6 located on Parker Ranch” will be replaced by the criterion of 5 to 10 populations of 500 individuals each in protected (ungulate-free), suitable habitat. The current downlisting condition that specifies that populations “must have naturally-reproducing populations that include seedlings, juveniles, and adults, with an age distribution allowing for a stationary or growing population size for at least 10 years”, will only be slightly re-worded but the content will remain the same.

### **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 *Isodendrion hosakae* 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 endangered to threatened. The term “endangered species” means any species (species, subspecies, or distinct population segment) that is in danger of extinction throughout all or a significant portion of its range. The term “threatened species” means any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

We provide both downlisting and delisting criteria for *Isodendrion hosakae*, which will supersede those included in the Recovery Plan for *Lipochaeta venosa* and *I. hosakae* (USFWS 1994), as follows:

#### **Downlisting Recovery Criteria**

*Isodendrion hosakae* will be considered for downlisting when:

- 1) There are 5 to 10 populations in suitable, protected habitat with 500 mature individuals per population;
- 2) All major threats are controlled around the target populations;
- 3) Populations are represented in an *ex situ* collection as defined in the Center for Plant Conservation guidelines (Guerrant *et al.* 2004) that is secure and well managed; and
- 4) All target populations have been stable, secure, and naturally reproducing for a minimum of 10 years. Species-specific management actions may continue to be necessary

#### **Delisting Recovery Criteria**

*Isodendrion hosakae* will be considered for delisting when:

- 1) There are 5 to 10 populations in suitable, protected habitat with 500 mature individuals per population;
- 2) All of the downlisting criteria have been met; and
- 3) All target populations have been stable, secure, naturally reproducing, and within secure and viable habitats for a minimum of 20 years. Species-specific management actions must no longer be necessary, but an ongoing need for ecosystem-wide management actions may remain if long-term agreements are in place to continue management.

These numbers are initial targets, but may be revised as additional information is available. An adequate population viability analysis (PVA) for *I. hosakae* should be conducted to assess needed numbers more accurately based on current management and monitoring data. Information necessary for the PVA includes major limiting factors, breeding system, population structure and

density, and proven management methods for major threats. Genetic analyses should be conducted to ensure adequate genetic representation is present within and among populations

All classification decisions consider an analysis of the following five factors: (1) is there a present or threatened destruction, modification, or curtailment of the species' habitat or range; (2) is the species subject to overutilization for commercial, recreational scientific or educational purposes; (3) is disease or predation a limiting factor; (4) are there inadequate existing regulatory mechanisms in place outside the Act (taking into account the efforts by states and other organizations to protect the species or habitat); and (5) are other natural or manmade factors affecting its continued existence. When delisting or downlisting a species, we first propose the action in the *Federal Register* and seek public comment and peer review of our analysis. Our final decision is announced in the *Federal Register*.

### **Rationale for Recovery Criteria**

The amended recovery criteria are based on the current known biology of the species from the latest 5-year review, and the Hawai'i and Pacific Plants Recovery Coordinating Committee's Revised Recovery Objective Guidelines (HPPRCC 2011, USFWS 2012).

### **LITERATURE CITED**

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