Draft Amendment to the Recovery Plan for the Ka‘u Silversword (*Argyroxiphium kauense*)

Original Approved: November 21, 1995
Original Prepared by: Pacific Region, U.S. Fish and Wildlife Service

Date of Draft Amendment: July 2018
Species addressed in Draft Amendment: *Argyroxiphium kauense* (Mauna Loa [=Ka‘u] Silversword)

We have analyzed all of the best available information and find that there is a need to amend the recovery criteria for *Argyroxiphium kauense* (Mauna Loa [=Ka‘u] Silversword) 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 (USFWS 1996), superseding the Recovery Criteria in the Executive Summary (page iii) and downlisting criteria a-d (on page 27), and includes the addition of delisting criteria. This revision and addition would be added at page 27 with and below the downlisting criteria.

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 A review of the recovery plan and its implementation may show that the plan is out of date or its usefulness is limited, and therefore warrants modification.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 downlisting and delisting criteria for Hawaiian plants based on the revised general recovery objective guidelines developed by the HPPRCC (2011). These criteria are assessed on a species-by-species basis, especially as additional information becomes available.

General distinctions made by the HPPRCC that are relevant to *Argyroxiphium kauense* 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 evaluation 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 *Argyroxiphium kauense* with consideration given to the above general guidelines. While it is a long-lived species, it is monocarpic (USFWS 1996), i.e. flowering only once before dying. Therefore, for these purposes, it will be treated as an annual that grows, flowers, and dies, just over a longer period of time than an annual. It does not behave biologically as a long-lived

perennial species that grows and flowers annually and repeatedly for over ten years prior to dying. *Argyroxiphium kauense* is also self-incompatible and treated as an obligate outcrosser, incapable of self-pollinating to produce viable seeds (Carr et. al., 1986). The State of Hawai'i 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 downlisting criteria on page 27 of the recovery plan (USFWS 1996). No delisting criteria existed in the original recovery plan.

Synthesis

Argyroxiphium kauense totals 626 wild individual plants and currently exists in 3 populations, all of which are in slightly different habitats only on the island of Hawai'i. The Kahuku population is in mesic forest and has 420 individuals. The Kapāpala population is in mesic shrubland – open forest and has six individuals. The Waiākea population has 200 individuals and is located in bog habitat. While the number of wild individuals is declining, the number of outplanted seedlings has increased to over 35,000 outplanted individuals (USFWS 2015). All wild and reintroduced individuals are fenced and fences are maintained so the plants are considered protected from feral ungulates. Other documented threats, such as invasive plants, lava flows, illegal collection, invertebrate herbivory, and drought remain ongoing and unmanaged (USFWS 2015).

No delisting criteria existed in the original recovery plan. The downlisting criteria, however, were included in the plan and are being slightly modified to fit with the standard downlisting objectives as described in the HPPRCC (2011), based on the known biology of the species. The number of populations and plants per population recommended for downlisting remains the same (criterion (a) in the original recovery plan: "there are at least ten populations throughout the historic range, each with a minimum of 2,000 plants"). While the original downlisting criterion (b) specified that "population demographic structures are indicative of increasing numbers", the amended condition is that the populations need to be at least stable, and the time period for that stability is quantified for a minimum of 10 years. The original downlisting criterion (c) specified that "the populations are completely protected from feral ungulates", while the amended version specifies that all threats need to be controlled. The last criterion in the original version, "(d) the populations are genetically diverse and show consistent regeneration", is only slightly revised in the amended downlisting criteria to quantify "genetically diverse" by following Guerrant et. al. (2004).

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 *Argyroxiphium kauense* 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 updated downlisting criteria and (for the first time) delisting criteria for *Argyroxiphium kauense*, which will supersede the downlisting criteria included in the Recovery Plan for the Kaʻu Silversword (USFWS 1996), as follows:

Downlisting Recovery Criteria

Argyroxiphium kauense will be considered for downlisting when:

1) There are 5 to 10 populations in suitable, protected habitat with 2,000 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

Argyroxiphium kauense will be considered for delisting when:

1) There are 10 populations in suitable, protected habitat with 2,000 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 *A. kauense* 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 that 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 know 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 2015).

LITERATURE CITED

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