

Amendment to the Recovery Plan for *Caesalpinia kavaiensis* and *Kokia drynarioides*

Original Recovery Plan Approved: [May 6, 1994](#)

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

Recovery Plan Amendment Approved:



Acting **Regional Director, Pacific Region**
U.S. Fish and Wildlife Service

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Species addressed in Amendment: *Kokia drynarioides* (Koki‘o)

We have analyzed all of the best available information and find that there is a need to amend the recovery criteria for *Kokia drynarioides* (koki‘o) that have been in place since the recovery plan was completed in 1994. In this amendment, we discuss the adequacy of the existing recovery criteria, identify amended recovery criteria, and present the rationale supporting the proposed recovery plan modification. The modification is to be shown as an appendix that supplements the recovery plan, superseding only the Recovery Criteria in the Executive Summary (page iii) and the downlisting criteria (pages 40-41) in section II.1 (Recovery Objectives) 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 A review of the recovery plan and its implementation may show that the plan is out of date or its usefulness is limited, and therefore warrants modification.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 U.S. Fish and Wildlife Service (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 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 *Kokia drynarioides* 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 *Kokia drynarioides* with consideration given to the above general guidelines. It is a long-lived tree with a narrow extant range, occupying dry forests of North Kona, Hawai‘i. The species is capable of self-pollination (USFWS 1994). 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 HPPRCC guidelines (M. Keir, pers. comm. 2018). This recovery plan amendment was written by the Pacific Islands Fish and Wildlife Office’s plant recovery coordinator.

A draft of this recovery plan amendment was published for public review on January 31, 2019 (84 FR 790). In addition, we sought peer review. Please see the Appendix for a summary of the comments received and our responses.

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 the Executive Summary (page iii) and Part II. Recovery, Objectives Section (page 40-41) of the recovery plan (USFWS 1994).

The original downlisting criteria in the recovery plan are as follows:

“[*Kokia drynarioides*] should be considered for downlisting when:

- 1) It is observed and documented that the major threats listed in Part I are greatly reduced.
- 2) It is observed and documented that following the removal of threats, new trees are being recruited by natural regeneration at a rate adequate to replace individuals lost from the population and preserve long term genetic diversity.
- 3) Recovery proceeds for the time, approximately 13 years, needed to provide demographic data to be used in population viability analysis (PVA) to estimate minimum population numbers and densities for effective reproduction.
- 4) A thorough review of the environmental dynamics and human activities within the dry forest habitat is conducted to determine the minimum habitat area needed to give a high probability of survival of the species over the next 200 years.
- 5) Current habitat has been secured in perpetuity.
- 6) Any management practices necessary to maintain the protected habitats have been implemented.
- 7) The habitat is populated with the numbers and densities indicated by the results of research and the PVA (minimum of 100 naturally reproducing individuals in each of 3 populations in North Kona).”

Synthesis

There is 1 location with 1 individual and another location with 15 wild individuals. Additionally, there have been 6 reintroductions totaling over 1,000 individuals. Populations are fenced and fences are maintained. Therefore, the populations are considered protected from ungulates (PEPP 2017).

Grazing by introduced ungulates and competition with invasive plants, mainly fountain grass (*Cenchrus setaceus*), were the two main threats identified in the recovery plan (USFWS 1994). Fire, development, rodent and invertebrate seed predation, and damage by introduced aphids have been identified as additional threats (USFWS 2009). Impacts of climate change have been identified as another threat (USFWS 2015). To quantify potential impacts from climate change, 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 *K. drynarioides* is vulnerable to the impacts of climate change, with a score of 0.73 (on a scale of 0 being not vulnerable to 1 being extremely vulnerable to climate change). Therefore, additional management actions are needed to conserve this taxon into the future. Collections and controlled propagation are ongoing management activities, along with threat control at several populations, including fencing and weed management (USFWS 2015).

We have modified the downlisting criteria in the current recovery plan as follows: Downlisting Criterion 1 is modified to include all currently known threats. Criterion 2 is modified to just focus on the need for regeneration and population stability and not directly link it to threat control. Criterion 3 is modified from 13 years to 10 years (for downlisting), which is the standard HPPRCC recommendation, and no data exists to support the need for 3 additional years. Criterion 4 is being removed, as there is little biological data available to provide an accurate estimate, there are many variable, exogenous factors that would be difficult to control or model, there are efforts to conduct similar models for all listed Hawaiian plants without needing to require it for this particular species, and the goal for a specific amount of stable populations at a large enough size is regardless of an estimate for how much space is needed. Due to the broad distribution of the species, Criterion 5 is modified to “suitable habitat is available”, and Criterion 6 is simply re-worded. Lastly, Criterion 7 is slightly modified to better fit the new HPPRCC framework (see HPPRCC 2011), and allow for flexibility in the requirements for each island to further encourage reintroductions in the best available habitats. The total number of individuals recommended for recovery remains the same, except that a range is provided between downlisting and delisting.

Delisting criteria are now included in this amendment, as described below.

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 *Kokia drynarioides* 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 *Kokia drynarioides*, which supersede those included in the Recovery Plan for *Caesalpinia kawaiensis*, and *Kokia drynarioides* (USFWS 1994), as follows:

Downlisting Recovery Criteria

Kokia drynarioides may be considered for downlisting when:

- 1) There are 5 to 10 populations in suitable, protected habitat with 200 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

Kokia drynarioides may be considered for delisting when:

- 1) All of the downlisting criteria have been met; and
- 2) 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 upward as additional information is available. An adequate population viability analysis (PVA) for *K. drynarioides* 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 compared to the initial variation assessed in the interim stage.

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, species expert data, and the Hawai‘i and Pacific Plants Recovery Coordinating Committee’s Revised Recovery Objective Guidelines (HPPRCC 2011, PEPP 2017, USFWS 2015). We deleted Delisting Recovery Criterion 1 (“There are 10 populations in suitable, protected habitat with 200 mature individuals per population”) that was presented in the draft amendment to remain consistent with current management recommendations in the HPPRCC’s Recovery Objective Guidelines (HPPRCC 2011). Because the numerical targets in Downlisting Recovery Criterion 1 are also consistent with the HPPRCC recommendations for delisting, and all downlisting criteria must be met in order to meet delisting criteria, the former Delisting Recovery Criterion 1 is unnecessary. The HPPRCC recommendations reflect the limited amount of habitat available within the species’ historic range for establishment of new populations.

LITERATURE CITED

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- [GAO] Government Accountability Office. 2006. Endangered species recovery. GAO-06-463R. April 6, 2006. 27 pp.
- Guerrant, E.O., P.L. Fielder, K. Havens, M. Maunder. 2004. Revised genetic sampling guidelines for conservation collections of rare and endangered plants, Appendix 1. *In* E.O. Guerrant, K. Havens, and M. Maunder (Eds.), *Ex Situ Plant Conservation: Supporting Species Survival in the Wild* (pp. 419-441). Island Press.
- [HPPRCC] Hawai‘i and Pacific Plants Recovery Coordinating Committee. 2011. Revised Recovery Objective Guidelines. 12 pp.
- [PEPP] Plant Extinction Prevention Program. 2017. Species status update report. February 2017. 39 pp.
- [USFWS] U.S. Fish and Wildlife Service. 1994. Recovery Plan for *Caesalpinia kavaiensis* and *Kokia drynarioides*. U.S. Fish and Wildlife Service, Pacific Region. Portland, Oregon. June 1994. 82 pp.
- [USFWS] U.S. Fish and Wildlife Service. 2009. *Kokia drynarioides* 5-year review summary and evaluation. https://ecos.fws.gov/docs/five_year_review/doc2476.pdf.
- [USFWS] U.S. Fish and Wildlife Service. 2015. *Kokia drynarioides* 5-year review summary and evaluation. https://ecos.fws.gov/docs/five_year_review/doc4591.pdf.

PERSONAL COMMUNICATIONS

Keir, M. 2018. Phone conversation to approve HPPRCC recovery criteria and life history for *Kokia drynarioides*. 30 May 2018.

APPENDIX. SUMMARY OF PUBLIC, PARTNER, AND PEER REVIEW COMMENTS RECEIVED

Summary of Public Comments

We published a notice of availability in the *Federal Register* on January 31, 2019 (84 FR 790-795) to announce that the draft amendment to the Recovery Plan for *Caesalpinia kavaiensis* and *Kokia drynarioides* 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 the Service's Species Profile website for *Kokia drynarioides*

(https://ecos.fws.gov/docs/recovery_plan/KOKDRY_Draft%20Recovery%20Plan%20Amendment_20180801.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 January 30, 2019, (2) sending specific notifications to Congressional contacts in Hawai'i's first and second Congressional Districts, consult the corresponding Outreach Plan or contact your Regional Public Affairs Officer for more information), and (3) sending specific notifications to key stakeholders in conservation and recovery efforts. These outreach efforts were conducted in advance of the *Federal Register* publication to ensure that we provided adequate notification to all potentially interested audiences of the opportunity to review and comment on the draft amendment.

We received three responses in total. These included comments from interested citizens, non-governmental organizations, and interest groups.

Public comments ranged from providing minor editorial suggestions to specific recommendations on plan content. We have considered all substantive comments; we thank the reviewers for these comments and to the extent appropriate, we have incorporated the applicable information or suggested changes into the final recovery plan amendment. In general, these comments did not lead to significant changes from the draft recovery plan amendment. Below, we provide a summary of public comments received; however, some of the comments that we incorporated as changes into the final recovery plan amendment did not warrant an explicit response and, thus, are not presented here. We also provided copies of all comments received during the formal public comment period to all relevant Federal agencies for their consideration prior to implementation of the final amended recovery plan, in accordance with section 4(f)(5) of the Act.

Comment (1): Concern that, "criteria are being added in the absence of any scientific peer review and that this will lead to a failure on the Service's part to follow the best-available science."

Response: Peer review was conducted following the publication of the Notice of Availability, and in accordance with the requirements of the Endangered Species Act (Act). Below we provide a detailed summary of peer review comments and our responses, where appropriate.

Comment (2): Concern that, “the decision to update recovery criteria for these 42 species as a group is indicative of the Service moving away from utilizing recovery teams and outside scientific expertise.”

Response: Section 4 of the Act provides the Service with the authority and discretion to appoint recovery teams for the purpose of developing and implementing recovery plans. The current effort to update recovery plans with quantitative recovery criteria for what constitutes a recovered species is not indicative of the future need for, and does not preclude the future utilization of, recovery teams to complete recovery planning needs for listed species.

Comment (3): New and significant information has been developed in the years since the existing recovery plan was adopted. Updating this plan can serve to better inform the Service, the regulated community, and Federal, State, and local resource agencies.

Response: A recovery plan should be a living document, reflecting meaningful change when new substantive information becomes available. Keeping a recovery plan current increases its usefulness in recovering a species by ensuring that the species benefits through timely, partner-coordinated implementation based on the best available information.

Comment (4): The Service should consider whether the updated recovery criteria would be less burdensome on Federal agencies and the regulated community than the existing criteria.

Response: Recovery plans are guidance documents that outline how best to help listed species achieve recovery, but they are not regulatory documents. Recovery plans are intended to establish goals for long-term conservation of listed species and define criteria that are designed to indicate when the threats facing a species have been removed or reduced to such an extent that the species may no longer need the protections of the Act.

Recovery criteria are achieved through the funding and implementation of recovery actions by both the Service and our partners. In addition to the existing recovery actions included in each of these recovery plans, the amendments address the need for any new, site-specific recovery actions triggered by the modification of recovery criteria, along with the costs, timing, and priority of any such additional actions. Because recovery plans are not regulatory documents, identification of an action to be implemented by any public or private party does not create a legal obligation beyond existing legal requirements. Nothing in a recovery plan should be construed as a commitment or requirement that any Federal agency obligate or provide funds.

Comment (5): The Service should consider whether the recovery criteria are achievable, because including unattainable recovery criteria could render such plans meaningless, or impede other processes under the Act.

Response: The National Marine Fisheries Service and U.S. Fish and Wildlife Service Interim Endangered and Threatened Species Recovery Plan Guidance (2010) emphasizes the development of recovery criteria that are specific, measurable, achievable, realistic, and time-referenced (SMART). The achievable component of SMART criteria implies that the authority, funding, and staffing needed to meet recovery criteria are feasible, even if not always likely.

In developing recovery criteria specifically, we attempt to establish criteria that are both scientifically defensible and achievable to the greatest extent possible. At times, however, the feasibility of achieving certain criteria can be, or appear to be, constrained by the particular, difficult circumstances that face a species. Even in such cases, criteria serve to guide recovery actions and priorities for the species. Furthermore, as recovery progresses, periodic reevaluation of the species status through the 5-year review process may reveal that the barriers to achieving certain criteria have been removed or that circumstances or our understanding of the species have evolved. In that event, the Service can revise recovery criteria to ensure that they reflect the strategy most likely to succeed in the goal of recovery.

Comment (6): The Service should consider conservation efforts that have been put into place for the listed species since the previous iteration of the recovery plan, especially where the Service has supported conservation efforts, in formulating recovery criteria that will be established or amended by the revised draft plan.

Response: While section 4 of the Act directs the Service to specifically develop and implement recovery plans, several other sections of the Act and associated programs and activities also provide important opportunities to promote recovery. Information from these programs and activities about the biological needs of the species can inform recovery planning (including the formulation or revision of recovery criteria) and implementation. These conservation efforts have been considered during the development of this and other recovery plans.

Comment (7): The Service should determine whether ongoing species conservation efforts beneficially address one or more of the listing factors set forth in the Act implementing regulations addressing species listings and designation of critical habitat.

Response: All Service decisions that affect the listed status or critical habitat designation of a particular species, including our 5-year review of each listed species, are made by analyzing the five factors described in section 4 of the Act. Such an analysis necessarily includes an assessment of any conservation efforts or other actions that may mitigate or reduce impacts on the species. While our objective with this particular effort was to establish objective, measurable criteria for delisting, conservation actions play a crucial role in determining if and when those criteria have been satisfied.

Comment (8): The Service should be mindful of the impacts that recovery plan criteria can have on the section 7 process of the Act for the regulated community, because the Service and other Federal resource agencies sometimes request that recovery criteria be addressed in biological assessments and other planning processes under the Act addressing listed species.

Response: Recovery plans can both inform, and be informed by section 7 processes of the Act. When revising a recovery plan, existing section 7 consultations may provide helpful information on: recent threats and mechanisms to avoid, minimize, or compensate for impacts associated with those threats; a summarized status of the species; and indication of who important partners may be. Section 7 consultations can inform the need for revised recovery actions, recovery

implementation schedule activities, recovery criteria, or species status assessments to provide more comprehensive recovery planning while the species remains listed.

Comment (9): The Service should include the full panoply of current information available for the species in all revised draft recovery plans.

Response: Our recovery planning guidance recommends that recovery planning be supported by compilation of available information that supports the best possible scientific understanding of the species. Although it is not necessary to exhaustively include all current information within the text of the recovery plan, to the extent that this information is specifically relevant and useful to recovery, the recovery plan may summarize such material or incorporate it by reference. Supporting biological information may also be included within a species status assessment or biological report separate from the recovery plan document itself.

Comment (10): The Service should consider whether the existing recovery plan should be revised or replaced in its entirety rather than amended in part.

Response: Under guidance established in 2010, partial revisions allow the Service to efficiently and effectively update recovery plans with the latest science and information when a recovery plan may not warrant the time or resources required to undertake a full revision of the plan. To further gauge whether we had assembled, considered, and incorporated the best available scientific and commercial information into this recovery plan revision, we solicited submission of any information, during the public comment period, that would enhance the necessary understanding of the species' biology and threats, and recovery needs and related implementation issues or concerns. We believe the recovery plan amendment, which targets updating recovery criteria, is appropriate for the species. However, we will also continue to evaluate the accuracy and usefulness of the existing recovery plan with respect to current information and status of conservation actions, and may pursue a full revision of the plan in the future, if appropriate.

Summary of Peer Review Comments

We solicited independent peer review between the draft and final amendment in accordance with the requirements of the Act from the State of Hawai'i Division of Forestry and Wildlife and Department of Hawaiian Home Lands, Hawai'i Volcanoes National Park, University of Hawai'i Pacific Cooperative Studies Unit and Center for Conservation Research and Training, University of Arizona, Kamehameha Schools, U.S. Army Pōhakuoloa Training Area, National Tropical Botanical Garden, Hawai'i Island Seed Bank, and Waikoloa Dry Forest Initiative. Criteria used for selecting peer reviewers included their demonstrated expertise and specialized knowledge related to *Kokia drynarioides* and the management of rare plants, including habitat and threat management as well as propagation and reintroduction methods. The qualifications of the peer reviewers are in the decision file and the administrative record for this recovery plan amendment.

In total, we solicited review and comment from 17 peer reviewers from 11 partner agencies. We did not receive comments from any peer or partner reviewers.