

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Bidens hillebrandiana* subsp. *hillebrandiana* (ko‘oko‘olau)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2023a. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 133 Species in Oregon, Washington, Idaho, Montana, California, Nevada, Hawaii, Guam, and the Commonwealth of the Northern Mariana Islands. Federal Register 88(56):17611–17614, March 23, 2023.

Lead Region/Field Office:

Region 1/Pacific Islands Fish and Wildlife Office (PIFWO), Honolulu, Hawai‘i

Name of Reviewer:

Cheryl Phillipson, Biologist, PIFWO

Lauren Weisenberger, Plant Recovery Coordinator, PIFWO

Megan Laut, Recovery Program Manager, PIFWO

Methodology used to complete this 5-year review:

This review was conducted by staff of the Pacific Islands Fish and Wildlife Office (PIFWO) of the U.S. Fish and Wildlife Service (Service) beginning in October 2023. The review was based on a review of current, available information since the last 5-year review for *Bidens hillebrandiana* subsp. *hillebrandiana* (USFWS 2020). The evaluation by Cheryl Phillipson, Biologist, was reviewed by Lauren Weisenberger, Plant Recovery Coordinator, and Megan Laut, Recovery Program Manager.

Background:

For information regarding the species’ listing history and other facts, please refer to the Fish and Wildlife Service’s Environmental Conservation On-line System (ECOS) database for threatened and endangered species (<http://ecos.fws.gov/ecp/species/9491>).

Review Analysis:

Please refer to the previous 5-year reviews for *Bidens hillebrandiana* subsp. *hillebrandiana* published in the Federal Register on August 26, 2020 (available at https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/3050.pdf) for a complete review of the species’ status, threats, management efforts, and references cited. We are not aware of any significant new information regarding the species’ biological status since listing to warrant a change in the Federal listing status of *B. hillebrandiana* subsp. *hillebrandiana*.

This short-lived perennial herb in the Asteraceae (sunflower) family is endangered and occurs along the Kohala coast of the island of Hawai‘i. The status and trends for *Bidens hillebrandiana* subsp. *hillebrandiana* are provided in the tables below.

New Status Information:

- The most recent estimates for wild individuals were provided in the State’s Plant Extinction Prevention Program’s grant report to the U.S. Fish & Wildlife Service regarding surveys conducted along the Kohala coast from 2017 through 2019 (USFWS 2019). Currently, there are an estimated 40 individuals in two subpopulations from Pololū to ‘Āwini (USFWS 2023b, p. 22; Keir 2023).
- There are no current *ex situ* collections of this species.

New Threats:

- None reported.

New Management Actions:

- Surveys and monitoring—The Plant Extinction Prevention Program (PEPP) surveys occurrence areas opportunistically. In 2021, the area along the Muliwai coastal pali (cliff) was surveyed between ‘Āinahou and Waimanu using UAV, but no individuals were observed (PEPP 2019–2024). In 2024, a second area at Honopue-Honoke‘ā was surveyed for *Hylaeus* (native bees), and no individuals of *Bidens* were observed in the area (PEPP 2019–2024).
- Captive propagation for genetic storage and reintroduction—In 2019, collections were made by PEPP; however, no other collection efforts have been reported since that time (Hawai‘i Department of Land and Natural Resources [HDLNR] 2020, p. 4).
- Reintroduction and translocation—In 2019, PEPP reintroduced 94 individuals to a site near Honopue (HDLNR 2020, pp. 4, 11; PEPP 2019–2024). In 2021, it was reported that the outplanting site was checked during a survey and no plants were found (PEPP 2019–2024).

Table 1. Status and trends of *Bidens hillebrandiana* subsp. *hillebrandiana* from listing through current 5-year review.

Date	No. wild individuals	No. Outplanted	Preventing Extinction Criteria Identified by HPPRCC*	Preventing Extinction Criteria* Completed?
2013 (listing)	<40	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2020 (5-year review)	40	94	All threats managed in all 3 populations	No

			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2025 (5-year review)	ca 40	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			Reproduction (i.e., viable seeds, seedlings) at all 3 populations	No
			3 populations with 50 mature individuals each	No

Table 2. Threats to *Bidens hillebrandiana* subsp. *hillebrandiana* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Degradation and destruction of habitat and herbivory by feral ungulates	A, C	Ongoing	None
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	None
Degradation and destruction by rockfalls, landslides, high surf, and erosion	A	Ongoing	None
Climate change degradation or loss of habitat, including hurricanes and drought	A	Ongoing	None
Predation and herbivory by rodents	C	Ongoing	None
Inadequacy of existing regulatory mechanisms	D	Ongoing	None
Reduced viability due to low numbers	E	Ongoing	Partial, reintroduction was not successful

Synthesis:

Currently there are approximately 40 wild individuals of *Bidens hillebrandiana* subsp. *hillebrandiana* in two subpopulations along the Kohala coast of the island of Hawai‘i.

These subpopulations are not protected from feral ungulates by exclosures or strategic fencing and no other management is performed. Surveys are opportunistically conducted on State land. Currently, no founders are represented in collections or propagation. In 2019, 94 individuals were outplanted; however, none of the reintroduced individuals were observed on the last survey in 2021.

Preventing extinction, interim stabilization, downlisting, and delisting objectives are provided in the Recovery Plan for 15 Species from the Island of Hawai‘i (USFWS 2023c). Furthermore, life history traits such as breeding system, population size fluctuation or decline, and reproduction type (sexual or vegetative), have been included in the calculation of goals for the number of populations and reproducing individuals for each stage. The goals for each stage remain grouped by life span defined as annual, short-lived perennial (fewer than 10 years), or long-lived perennial.

Bidens hillebrandiana subsp. *hillebrandiana* is a short-lived perennial herb. To prevent extinction, which is the first milestone in recovering the species, the taxon must be managed to control threats (e.g., fenced) and have 50 individuals (or the total number of individuals if fewer than 50 exist) from each of three populations represented in *ex situ* (secured off-site, such as a nursery or seed bank) collections that are well managed. In addition, a minimum of a total of three populations should be documented on Maui where the species occurs or occurred historically and each of these populations must be naturally reproducing (i.e., viable seeds, seedlings) with a minimum of 50 mature, reproducing individuals per population.

The preventing extinction goals for *Bidens hillebrandiana* subsp. *hillebrandiana* have not been met. The current status of the remaining subpopulations is uncertain. There is no reported ungulate or nonnative invasive plant control. Although collections were made and plants were reintroduced, none survived, and no remaining collections are reported. The effects of climate change including hurricanes, landslides and erosion, seed predation and herbivory by rats, and reduced viability due to low numbers are not addressed (Tables 1a, 1b, Table 2). Therefore, *B. hillebrandiana* subsp. *hillebrandiana* meets the definition of Endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

No significant new information regarding the species’ biological status has been reported since the last 5-year review in 2020. Thus, the following recommendations for future actions are updated or reiterated for the 5-year review for 2025.

- Surveys and monitoring—Continue to assess the status of known populations of *Bidens hillebrandiana* subsp. *hillebrandiana* in historical locations and search for the subspecies in areas of potentially suitable habitat.
- Ungulate monitoring and control—Construct and maintain strategic fencing to protect individuals from the negative impacts of feral ungulates.
- Invasive nonnative plant monitoring and control—Control established ecosystem-altering nonnative invasive plant species and those that compete with *B. hillebrandiana* subsp. *hillebrandiana* at all populations.

- Control of predation by rats—Implement effective control measures for rats at all populations.
- Captive propagation for genetic storage and reintroduction—Continue to collect genetic material (seeds) for storage and propagation efforts and for maintenance of genetic stock.
- Reintroduction and translocation—Continue to propagate and reintroduce individuals into suitable habitat within historic range that is being managed for known threats to reduce the impacts of climate change, and landslides and erosion.
- Climate change adaptation strategy—Research suitability of habitat in the future due to the impacts of climate change, including drought.
- Build resiliency, redundancy, and representation—Increase species’ viability through habitat restoration, threat control, and reintroductions into suitable habitat that is being managed for known threats.
- Alliance and partnership development—Continue to work with partners in planning and implementation of ecosystem-level restoration and management to benefit this subspecies.

References:

- [HDLNR] Hawai‘i Department of Land and Natural Resources. 2020. Hawai‘i Department of Land & Natural Resources Division of Forestry & Wildlife Rare Plant Program Interim Performance Report, grant number: F18AF01199, Plant Restoration and enhancement: threatened and endangered, candidate, and species of concern outplanting. 17 pp.
- [HPPRCC] Hawai‘i and Pacific Plants Recovery Coordinating Committee. 2011. Revised recovery objective guidelines. 8 pp.
- Keir, M. 2023. *Bidens hillebrandiana* subsp. *hillebrandiana*. The IUCN Red List of Threatened Species 2023: e.T200769976A200769990.
<https://dx.doi.org/10.2305/IUCN.UK.2023-1.RLTS.T200769976A200769990.en>.
- [PEPP] Plant Extinction Prevention Program. 2019–2024. Plant Extinction Prevention Program fiscal years 2019 to 2023 interim performance report (October 1, 2018–September 30, 2023). U.S. Fish and Wildlife Service CFDA Program \$15.657 Endangered Species Conservation—Recovery Implementation Funds, Cooperative Agreement: F18AC00502 (Final performance report), University of Hawai‘i at Mānoa, Pacific Cooperative Studies Unit. 105 pp. + database.
- [USFWS] U.S. Fish and Wildlife Service. 2019. Coast Program, Plant Extinction Prevention Program final report (reporting period: October 1, 2018—September 30, 2019). USFWS Coast Program Catalog of Federal Domestic Assistance (CFDA) Number 15.630, Award #F17AC00452, Pacific Cooperative Studies Unit, University of Hawai‘i, Honolulu. 26 pp.

- [USFWS] 2020. *Bidens hillebrandiana* subsp. *hillebrandiana* (ko‘oko‘olau) 5-year review summary and evaluation. Pacific Islands Fish and Wildlife Office, Honolulu. 24 pp. https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/3050.pdf.
- [USFWS] 2023a. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 133 Species in Oregon, Washington, Idaho, Montana, California, Nevada, Hawaii, Guam, and the Commonwealth of the Northern Mariana Islands. Federal Register 88(56):17611–17614, March 23, 2023.
- [USFWS] 2023b. Species report for *Bidens hillebrandiana* subsp. *hillebrandiana* (ko‘oko‘olau). Final version 1.0, Pacific Islands Fish and Wildlife Office, Honolulu, HI. 31 pp.
- [USFWS] 2023c. Recovery plan for 15 species from the island of Hawai‘i. July 18, U.S. Fish and Wildlife Service, Portland, OR. 87 pp.

U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW of *Bidens hillebrandiana* subsp.
hillebrandiana (ko'oko'olau)

Pre-1996 DPS listing still considered a listable entity? N/A

Recommendation resulting from the 5-year review:

- Delisting
- Reclassify from Endangered to Threatened status
- Reclassify from Threatened to Endangered status
- X No Change in listing status

For Field Supervisor, Pacific Islands Fish and Wildlife Office

Date _____