

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Dubautia plantaginea* ssp. *humilis* (na‘ena‘e)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2021. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 77 Species in Oregon, Washington, Idaho, and Hawaii. Federal Register 86(120):33726–33728, June 25, 2021.

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 Team 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 2022. The review was based on a review of current, available information since the last 5-year review for *Dubautia plantaginea* ssp. *humilis* (USFWS 2018). The evaluation by Cheryl Phillipson, Biologist, was reviewed by Lauren Weisenberger, Plant Recovery Coordinator, and Megan Laut, Recovery Team 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/5833>).

Review Analysis:

Please refer to the previous 5-year reviews for *Dubautia plantaginea* ssp. *humilis* published in the Federal Register on July 21, 2009, June 2, 2014, and October 23, 2018 (available at https://ecos.fws.gov/docs/tess/species_nonpublish/1403.pdf, https://ecos.fws.gov/docs/tess/species_nonpublish/2187.pdf, and https://ecos.fws.gov/docs/tess/species_nonpublish/2630.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 *D. plantaginea* ssp. *humilis*.

This short-lived perennial shrub and obligate outcrosser in the Asteraceae (sunflower) family is endangered and is endemic to Mauna Kahālāwai (west Maui). The status and trends for *Dubautia plantaginea* ssp. *humilis* are provided in the tables below.

New Status Information:

- Currently, there are approximately 30 wild individuals of *Dubautia plantaginea* ssp. *humilis* along the cliffs of ‘Īao valley on Mauna Kahālāwai (west Maui) (Maui Plant Extinction Prevention Program [Maui PEPP] 2021). Most of the individuals are inaccessible.
- Twelve founders (wild plants) from one subpopulation and two founders from a second subpopulation on Mauna Kahālāwai are represented in *ex situ* storage and propagation (Lyon Arboretum 2022; Maui Nui Botanical Garden 2021; Olinda Rare Plant Facility 2023).

New Threats:

- None reported.

New Management Actions:

- Monitoring and surveys—Maui PEPP surveys for individuals and monitors the population of *Dubautia plantaginea* ssp. *humilis* along the cliffs of ‘Īao valley (Maui PEPP 2017-2021).
- Control of nonnative invasive plants—Maui PEPP controls nonnative invasive plants near accessible individuals of *D. plantaginea* ssp. *humilis* (Maui PEPP 2017-2021).
- Collection and captive propagation for genetic storage and translocation—
 - In 2019, the Olinda Rare Plant Facility (ORPF) reported propagation and storage of 26 individuals representing three founders from ‘Īao (ORPF 2023).
 - In 2021, the Lyon Arboretum Micropropagation Laboratory reported propagation of 108 explants representing one founder at ‘Īao (Lyon Arboretum 2022). The Lyon Arboretum Seed Conservation Laboratory reported storage of 5,263 seeds representing 12 founders in one subpopulation, and 1,054 seeds representing two founders at a second subpopulation at ‘Īao (Lyon Arboretum 2022).
 - In 2019, the Maui Nui Botanical Garden (MNBG) reported storage of 75 seeds representing an unknown number of founders at ‘Īao (MNBG 2019). In 2021, MNBG collected 100 seeds from individuals at the garden (sourced from ‘Īao) for refugia (MNBG 2021).
 - Maui PEPP reported collection of seeds from accessible plants at ‘Īao for storage at Lyon Arboretum (Maui PEPP 2017-2021).

Table 1. Status and trends of *Dubautia plantaginea* ssp. *humilis* from listing through current 5-year review.

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1999 (listing)	<300	0	All threats managed in all 3 populations	No
			Complete genetic storage	No

			3 populations with 50 mature individuals each	Partially
2009 (5-year review)	ca 50	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	Partially
2014 (5-year review)	30	15	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
Date	No. wild individuals	No. outplanted	*Preventing Extinction Criteria identified by HPPRCC	*Preventing Extinction Criteria Completed?
2018 (5-year review)	22	0	All threats managed in all 3 populations	Partially, ungulate and nonnative plant management
			Reproduction (i.e., viable seeds, seedlings) at all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2023 (5-year review)	ca 30	0, all previous translocations died	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			Natural reproduction at all 3 populations	Unknown
			3 populations with 50 mature individuals each	No

* The Preventing Extinction Stage was established in 2011. Prior to 2011, the Interim Stabilization Stage was the first stage towards recovery (now it is the second stage after Preventing Extinction).

Table 2. Threats to *Dubautia plantaginea* ssp. *humilis* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Degradation and destruction of habitat by feral ungulates	A	Ongoing	None
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	Partial, nonnative plant control where accessible
Landslides and flooding destruction and degradation of habitat	A	Ongoing	None
Drought and erosion destruction and degradation of habitat	A	Ongoing	None
Climate change degradation or loss of habitat	A	Ongoing	None
Collection impacts	B	Potential	Partial, many individuals inaccessible
Predation and herbivory by feral ungulates	C	Ongoing	None
Predation and herbivory by rodents	C	Ongoing	None
Predation and herbivory by invertebrates	C	Ongoing	None
Reduced viability due to small populations	E	Ongoing	Partial, seed collection and propagation ongoing

Synthesis:

Currently there are approximately 30 wild individuals of *Dubautia plantaginea* ssp. *humilis* along the steep cliffs of ‘Īao Valley on Mauna Kahālāwai (west Maui). Nonnative plants are controlled opportunistically. Seeds are collected from accessible plants with storage and some propagation at three facilities. There are no current translocation efforts and previous reintroductions are did not survive.

Stabilizing (interim), downlisting, and delisting objectives are provided in the Addendum to the Recovery Plan for the Multi-Island Plants (USFWS 2002) and have been updated according to the draft revised recovery objective guidelines developed by the Hawai‘i and Pacific Plants Recovery Coordinating Committee (HPPRCC 2011). The HPPRCC identifies an additional initial objective, the Preventing Extinction Stage, in addition to the Interim Stabilization, Delisting, and Downlisting objectives. 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.

Dubautia plantaginea ssp. *humilis* is a short-lived perennial shrub and an obligate outcrosser. 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 they now occur or occurred historically and each of these populations must be naturally reproducing (i.e., viable seeds, seedlings) with a minimum of 100 mature, reproducing individuals per population.

The preventing extinction goals for this species have not been met. Approximately 30 wild individuals in one population on Mauna Kahālāwai (Table 1). There are no populations totaling at least 100 reproducing individuals and, although seeds are collected, stored, and propagated, no translocations persist. In addition, all threats are not being sufficiently managed throughout the range of the species (Table 2). Therefore, *Dubautia plantaginea* ssp. *humilis* meets the definition of Endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

Drought and erosion are added as new threats to *Dubautia plantaginea* ssp. *humilis*. No other new information regarding the species' biological status has been reported since the last 5-year review in 2018. Thus, the following recommendations for future actions are added or reiterated for the 5-year review for 2023.

- Surveys and population monitoring—Continue to monitor the wild population and survey for additional populations of *Dubautia plantaginea* ssp. *humilis* 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—Continue control of established ecosystem-altering nonnative invasive plant species within and around accessible individuals of *D. plantaginea* ssp. *humilis*.
- Collection impacts—Continue to strategically collect propagative materials from accessible individuals.
- Climate change adaptation strategy—Research suitability of habitat for translocation of this species in the future due to the impacts of climate change.
- Predator and herbivore monitoring and control—
 - Implement effective control methods for rodents within the vicinity of all individuals of *D. plantaginea* ssp. *humilis*.
 - Develop and implement effective control methods for slugs at accessible individuals of *D. plantaginea* ssp. *humilis*.

- Captive propagation for genetic storage and translocation—Continue collection of genetic resources for storage, propagation, and translocation to protected suitable habitat within historical range.
- Translocation and augmentation—Continue to augment the population and translocate individuals into suitable habitat that can be managed for known threats.
- Build resiliency, redundancy, and representation—Translocate individuals into suitable habitat that is being managed for known threats to this species to reduce impacts of landslides, flooding, drought, and erosion.
- Alliance and partnership development—Continue to work with partners and other land managers in planning and implementation of ecosystem-level restoration and management to benefit this taxon.

References:

[HPPRCC] Hawai‘i and Pacific Plants Recovery Coordinating Committee. 2011. Revised recovery objective guidelines. 8 pp.

Lyon Arboretum. 2022. Report on controlled propagation of listed species, as designated under the U.S. Endangered Species Act. Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai‘i.

[MNBG] Maui Nui Botanical Garden. 2019. Report on controlled propagation of listed species, as designated under the U.S. Endangered Species Act. Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai‘i.

[MNBG] 2021. Report on controlled propagation of listed species, as designated under the U.S. Endangered Species Act. Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai‘i.

[Maui PEPP] Maui Plant Extinction Prevention Program. 2017-2021. Monthly Maui Nui plant species monitoring reports. Excel data tables.

[ORPF] Olinda Rare Plant Facility. 2023. Report on controlled propagation of listed species, as designated under the U.S. Endangered Species Act. Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai‘i.

[USFWS] U.S. Fish and Wildlife Service 2002. Addendum to the Recovery Plan for the Multi-Island Plants. Portland. 93 pp. + appendices.

[USFWS] 2009. *Dubautia plantaginea* ssp. *humilis* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. https://ecos.fws.gov/docs/tess/species_nonpublish/1403.pdf.

[USFWS] 2014. *Dubautia plantaginea* ssp. *humilis* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. https://ecos.fws.gov/docs/tess/species_nonpublish/2187.pdf.

[USFWS] 2018. *Dubautia plantaginea* ssp. *humilis* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI. https://ecos.fws.gov/docs/tess/species_nonpublish/2630.pdf.

[USFWS] 2021. Endangered and Threatened wildlife and plants; initiation of 5-year status reviews for 77 Species in Oregon, Washington, Idaho, and Hawaii. Federal Register 86(120): 33726–33728, June 25, 2021.

U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW of *Dubautia plantaginea* ssp. *humilis*
(na'ena'e)

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

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