

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Dubautia herbstobatae* (na'ena'e)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2010. Endangered and threatened wildlife and plants; initiation of 5-year status reviews of 58 species in Washington, Oregon, California, and Hawaii. Federal Register 75(226):71726-71729.

Lead Region/Field Office:

Region 1/Pacific Islands Fish and Wildlife Office (PIFWO), Honolulu, Hawaii

Name of Reviewer(s):

Vickie Caraway, Plant Biologist, PIFWO

Daniel Clark, Oahu, Kauai, Northwest Hawaiian and American Samoa Islands Team Manager, PIFWO

Marie Brueggemann, Plant Recovery Coordinator, PIFWO

Recovery Program Lead, PIFWO

Kristi Young, Programmatic Deputy Field Supervisor, PIFWO

Methodology used to complete this 5-year review:

This review was conducted by staff of the Pacific Islands Fish and Wildlife Office of the U.S. Fish and Wildlife Service (USFWS), beginning on January 31, 2012. The review was based on a review of current, available information since the last 5-year review for *Dubautia herbstobatae* (USFWS 2008). The National Tropical Botanical Garden provided an initial draft of portions of the five-year review and recommendations for conservation actions needed prior to the next five-year review. The document was reviewed by the Plant Biologist, Islands Team Manager, and Plant Recovery Coordinator, followed by the Recovery Program Lead. It was subsequently reviewed and approved by the Programmatic Deputy Field Supervisor.

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/tess_public).

Review Analysis:

Please refer to the previous 5-year review for *Dubautia herbstobatae*, published January 23, 2008 and available online at http://ecos.fws.gov/docs/five_year_review/doc1825.pdf for a complete review of the species' status, threats, and management efforts. No new threats or no significant new information regarding the species' biological status have come to light since listing to warrant a change in the Federal listing status of *D. herbstobatae*.

This short-lived shrub is endangered and occurs on the island of Oahu. The current status and trends for *Dubautia herbstobatae* are provided in the tables below.

New status information:

Survey efforts have greatly increased the number of known individuals, and currently 1,193 mature wild individuals and nine juveniles are known from the four population units currently within military lands. Outside military land, three population units contain 46 mature, four juvenile and two seedling individuals (Oahu Army Natural Resources Program [OANRP] 2012a). The 1,242 mature and immature individuals reported in 2012 represent little change from the 1,237 reported in the last five-year review.

New threats:

Climate change - Climate change may also pose a threat to this species. However, current climate change analyses in the Pacific Islands lack sufficient spatial resolution to make predictions on impacts to this species. The Pacific Islands Climate Change Cooperative (PICCC) funded climate modeling that will help resolve these spatial limitations. High spatial resolution climate outputs are expected to be available sometime in 2013.

New management actions:

- Ungulate exclosures - Only the Makaha population on Oahu remains at risk from feral goats, as other populations have been fenced (U.S. Army Garrison 2010).
- Captive propagation for genetic storage and reintroduction:
 - The U.S. Army has completed genetic storage for 19 individuals of this species (OANRP 2012b).
 - Plants have successfully been propagated from cuttings, rather than from seeds (OANRP 2012b).

Synthesis:

Dubautia herbstobatae is a short-lived perennial, and to be considered stable, must be managed to control threats (*e.g.*, fenced) and be represented in an *ex situ* (off-site) collection. In addition, a minimum of three populations should be documented on Oahu. Each of these populations must be naturally reproducing and increasing in number, with a minimum of 50 mature individuals per population.

For downlisting, a total of five to seven populations of *Dubautia herbstobatae* should be documented on Oahu. Each of these populations must be naturally reproducing, stable or increasing in number, and secure from threats, with a minimum of 300 mature individuals per population. Each population should persist at this level for a minimum of five consecutive years before downlisting is considered.

For delisting, a total of eight to ten populations of *Dubautia herbstobatae* should be documented on Oahu. Each of these populations must be naturally reproducing, stable or increasing in number, and secure from threats, with 300 mature individuals per

population for short-lived perennials. Each population should persist at this level for a minimum of five consecutive years before delisting is considered.

The stabilization goals for this species appear to have been partially met, as three populations have well over 50 mature individuals (Table 1). Downlisting goals have not been met, as only two populations has over 300 mature individuals (Table 1) and not all threats are sufficiently controlled throughout all of the populations (Table 2). Therefore, *Dubautia herbstobatae* meets the definition of endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

- Captive propagation for genetic storage and reintroduction - Continue seed collection for genetic storage.
- Fire protection – Develop and implement fire management plans.
- Predator / herbivore control – Control rats and slugs.
- Ungulate exclosures - Complete fencing of last unfenced population.
- Surveys / inventories - Survey for populations in known historical sites and suitable habitat.
- Population biology research
 - Develop pollination studies.
 - Study populations with regard to population size and structure, geographical distribution, flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, limiting factors and threats.
- Reintroduction / translocation - Reintroduce individuals into suitable habitat within historical range.
- Alliance and partnership development - Initiate planning and contribute to implementation of ecosystem-level management and restoration to benefit this species.

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

Date	No. wild indivs	No. outplanted	Downlisting Criteria identified in Recovery Plan	Downlisting Criteria Completed?
1996 (listing)	<100	0	All threats managed in all 5-7 populations	No
			Complete genetic storage	No
			5-7 populations with 100 mature individuals each	No
1998 (recovery plan)	525	0	All threats managed in all 5-7 populations	No
			Complete genetic storage	Partially
			5-7 populations with 100 mature individuals each	Partially
2003 (critical habitat)	<100	Unknown	All threats managed in all 5-7 populations	No
			Complete genetic storage	Unknown
			5-7 populations with 100 mature individuals each	Unknown
2008 (5-yr review)	1,217	0	All threats managed in all 5-7 populations	Partially
			Complete genetic storage	Partially
			5-7 populations with 100 mature individuals each	Partially
2013 (5-yr review)	1,242	0	All threats managed in all 5-7 populations	Partially (Table 2)
			Complete genetic storage	Partially
			5-7 populations with 100 mature	Partially

Date	No. wild indivs	No. outplanted	Downlisting Criteria identified in Recovery Plan	Downlisting Criteria Completed?
			individuals each	

Table 2. Status of threats to *Dubautia herbstobatae* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulates – (goats) habitat modification and herbivory	A, C, D, E	Ongoing	Partially: Goat eradication has been successful on the Makua side of the range.
Fire – habitat modification and plant destruction	A, E	Ongoing	No
Military training activities, human visitation and trampling	E	Ongoing	Unknown.
Climate change	A, E	Increasing	No

References:

See previous 5-year review for a full list of references (USFWS 2008). Only references for new information are provided below.

[OANRP] Oahu Army Natural Resource Program. 2012a. Makua implementation plan - population unit status: *Dubautia herbstobatae*. 2 pages. Unpublished.

[OANRP] Oahu Army Natural Resources Program. 2012b. Army nursery inventory summary, 2012-03-20.1 page. Unpublished.

U.S. Army Garrison. 2010. 2010 status report for the Makua and Oahu implementation plans. U.S. Army Garrison, Hawaii and Pacific Cooperative Park Studies Unit. Schofield Barracks, Hawaii. 588 pages. Available online at http://manoa.hawaii.edu/hpicesu/DPW/2010_YER/default.htm.

[USFWS] U.S. Fish and Wildlife Service. 1998. Recovery plan for the Oahu plants. U.S. Fish and Wildlife Service, Portland, Oregon. 207 pages, plus appendices.

[USFWS] U.S. Fish and Wildlife Service. 2008. *Dubautia herbstobatae* (na'ena'e) 5-year review summary and evaluation. U.S. Fish and Wildlife Service, Honolulu, Hawaii. Eleven pages. Available online at: http://ecos.fws.gov/docs/five_year_review/doc1825.pdf.

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SIGNATURE PAGE for 5-YEAR REVIEW of *Dubautia herbstobatae* (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
- No Change in listing status

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