

## **5-YEAR REVIEW**

Short Form Summary

**Species Reviewed:** *Dubautia pauciflorula* (Na`ena`e)

**Current Classification:** Endangered

### **Federal Register Notice announcing initiation of this review:**

[USFWS] U.S. Fish and Wildlife Service. 2007. Endangered and threatened wildlife and plants; initiation of 5-year reviews of 71 species in Oregon, Hawaii, Commonwealth of the Northern Mariana Islands, and territory of Guam. Federal Register 72(45):10547-10550.

### **Lead Region/Field Office:**

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

### **Name of Reviewer(s):**

Annie Marshall, Pacific Islands Fish and Wildlife Office, Fish and Wildlife Biologist  
Marie Bruegmann, Pacific Islands Fish and Wildlife Office, Plant Recovery Coordinator  
Marilet A. Zablan, Pacific Islands Fish and Wildlife Office, Recovery Program Leader  
and acting Assistant Field Supervisor for Endangered Species

### **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 (USFWS) beginning on March 8, 2007. The review was based on the final critical habitat designation for *Dubautia pauciflorula* and other species from the island of Kauai, as well as a review of current, available information (USFWS 2003). The Bernice P. Bishop Museum provided an initial draft of portions of the 5-year review and they also provided recommendations for conservation actions needed prior to the next five-year review. The evaluation of the status of the species was prepared by our lead PIFWO biologist and reviewed by the Plant Recovery Coordinator. The document was then reviewed by the Recovery Program Leader and acting Assistant Field Supervisor for Endangered Species before submission to the Field Supervisor for approval.

### **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](http://ecos.fws.gov/tess_public)).

### **Application of the 1996 Distinct Population Segment (DPS) Policy:**

This Policy does not apply to plants.

## **Review Analysis:**

Please refer to the final critical habitat designation for *Dubautia pauciflorula* published in the Federal Register on June 17, 2003 (USFWS 2003) for a complete review of the species' status (including biology and habitat), threats, and management efforts. No new threats and 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 *Dubautia pauciflorula*.

## **SUMMARY**

Collections of an undescribed species were made in 1909 (C.N. Forbes) and 1911 (J.M. Lydgate), and not again until 1979, when Steve Perlman located a population of 30 individuals in the Wahiawa drainage, Kauai, in the vicinity of the previously collected specimens. The species was not described as *Dubautia pauciflorula* until 1981. At the time this somewhat sprawling shrub or erect small tree was federally listed as endangered (Herbst 1991), three populations with more than 33 individuals were known, all restricted to the same drainage. These included 30 individuals on the Hanapepe fork of Wahiawa Stream; three individuals on Mount Kahili ridge; and a small population on the east fork of Wahiawa Stream. USFWS (1994) reported 47 individuals (25 mature and 22 immature) in four localities in Wahiawa drainage, mostly confined to a small drainage near the type locality. Some degree of regeneration was suggested by the nearly equal numbers of mature and immature individuals. In 2003 (USFWS 2003), four occurrences containing 42 individuals were reported. In the most recent estimate (USFWS 2008), four populations totaling 47 individuals are reported as of February 2004. The following recent collections may increase population numbers and extend the geographic range of *Dubautia pauciflorula*. A collection from Iiiliula Valley, on the northern slope below the dividing ridge and flats of Iole Valley documented a population of approximately 50 individuals (National Tropical Botanical Garden 2008a). Another population of three immature individuals and two seedlings was found in a gulch south of Kapalaoa Peak which appears to be north of the documented populations (Hawaii Biodiversity and Mapping Program 2007).

Herbarium vouchers at Bishop Museum (C. Imada, Bernice P. Bishop Museum, pers. comm. 2008) and National Tropical Botanical Garden (2008a) were flowering in July, August, September, October, and November; fruiting specimens were from October and November.

The major threats to this species remain direct competition with invasive introduced plant species, especially *Melastoma septemnerium* (no common name) and *Psidium cattleianum* (strawberry guava) (Factor E); habitat degradation by feral pigs (*Sus scrofa*) (Factors A and D); landslides and erosion (Factor E); restricted population size, leading to depressed reproductive vigor (Factor E); and hurricanes (Factor E) (USFWS 2003).

National Tropical Botanical Garden (2007) reports 2000 seeds in genetic storage. Several species of *Dubautia*, including *D. pauciflorula*, were successfully rooted from cuttings at the University of Hawaii; however, all plants eventually died when outplanted at Waimea Arboretum and Lyon Arboretum (USFWS 1994). Lilleeng-Rosenberger

(2005) noted that seeds of some of the rare *Dubautia* species had low viability, possibly resulting from degraded habitats and inbreeding depression.

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for the Wahiawa plant cluster, including *Cyanea undulata*, *Dubautia pauciflora*, *Hesperomannia lydgatei*, *Labordia lydgatei*, and *Viola helenae*. To be considered stabilized, which is the first step in recovering the species, existing populations must be free of competition with introduced invasive plant species and protected from feral pigs and seed predators. The individuals must be able to complete their entire life cycle within the area. To meet this objective, the species must be managed to control threats (*e.g.*, fenced and introduced invasive plant species controlled) and as many genotypes as possible from within populations must be collected and backed up in genetic storage as well as growing in safe localities (off-site) (USFWS 1994).

The stabilization and recovery goals for this species have not been met and, therefore, *Dubautia pauciflora* meets the definition of endangered as it remains in danger of extinction throughout its range.

#### **Recommendations for Future Actions:**

- Collect fruit from all wild and any reintroduced individuals that set seed to add to the genetic diversity of the *ex situ* material.
- Control introduced invasive plant species around wild and outplanted plants.
- Construct large-scale fences around all naturally occurring and reintroduced individuals to control feral ungulates.
- Continue reintroducing individuals into protected suitable habitat within historical range.
- Assess genetic variability within extant population.
- Study *Dubautia pauciflora* 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.

#### **References:**

- Hawaii Biodiversity and Mapping Program. 2007. Program Database. University of Hawaii, Center for Conservation, Research and Training. Unpublished.
- Herbst, D.R. 1991. Endangered and threatened wildlife and plants; determination of endangered status for five plants from the Wahiawa drainage basin. Federal Register 56(183): 47695-47700.

Lilleeng-Rosenberger, K.E. 2005. Growing Hawaii's native plants. Mutual Publishing, Honolulu, HI.

National Tropical Botanical Garden. 2008a. Herbarium database. National Tropical Botanical Garden, Kalaheo, Hawaii. Available online at <<http://ntbg.org/herbarium>>. Accessed 10 March 2008.

National Tropical Botanical Garden. 2008b. 2008 Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. Unpublished.

U.S. Fish and Wildlife Service. 1994. Recovery plan for the Wahiawa plant cluster: *Cyanea undulata*, *Dubautia pauciflora*, *Hesperomannia lydgatei*, *Labordia lydgatei*, and *Viola helenae*. U. S. Fish and Wildlife Service, Portland, OR, vi, 52 pp.

U.S. Fish and Wildlife Service. 2003. Endangered and threatened wildlife and plants; final designation or nondesignation of critical habitat for 95 plant species from the islands of Kauai and Niihau, HI; final rule. Federal Register 68(39): 9116–9479.

[USFWS] U.S. Fish and Wildlife Service. 2008. Rare plant tracking database. Pacific Islands Fish and Wildlife Office, Honolulu, HI. Accessed on April 28, 2008. Unpublished.

**Personal communications:**

Imada, Clyde. 2008. Research Specialist, Department of Natural Science/Botany, Bernice P. Bishop Museum, email communication to C. Torres-Santana (USFWS) on June 30, 2008.

**Table 1. Status of *Dubautia pauciflora* from listing through 5-year review.**

<b>Date</b>	<b>No. wild individuals</b>	<b>No. outplanted</b>	<b>Stability Criteria identified in Recovery Plan</b>	<b>Stability Criteria Completed?</b>
1991 (listing)	30	0	Free of introduced invasive plant species	No
			Protected from feral pigs	No
			Protected from seed predators	No
			Complete life cycles within its range	No
			Complete genetic storage	No
1994 (recovery plan)	47	0	Free of introduced invasive plant species	No
			Protected from feral pigs	No
			Protected from seed predators	No
			Complete life cycles within its range	No
			Complete genetic storage	No
2003 (critical habitat)	42	0	Free of introduced invasive plant species	No
			Protected from feral pigs	No
			Protected from seed predators	No
			Complete life cycles within its range	Unknown
			Complete genetic storage	Partially
2008 (5-year review)	47-50	1	Free of introduced invasive plant species	No
			Protected from feral pigs	No
			Protected from seed predators	No
			Complete life cycles within its range	Partially
			Complete genetic storage	Partially

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**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

**Field Supervisor, Pacific Islands Fish and Wildlife Office**

Patrick Leonard  
Patrick Leonard

Date 4/7/09