

## 5-YEAR REVIEW

### Short Form Summary

**Species Reviewed:** *Hedyotis parvula* (no common name)

**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 five-year review for *Hedyotis parvula* (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](http://ecos.fws.gov/tess_public)).

#### **Review Analysis:**

Please refer to the previous 5-year review for *Hedyotis parvula* published on January 18, 2008 (available at [http://ecos.fws.gov/docs/five\\_year\\_review/doc1817.pdf](http://ecos.fws.gov/docs/five_year_review/doc1817.pdf)) for a complete review of the species' status, threats, and management efforts. No significant new information regarding the species' biological status has come to light since listing to warrant a change in the Federal listing status of *H. parvula*.

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

New taxonomic information:

No new taxonomic information has been received since the last five-year review (USFWS 2008), which reviewed the move from the genus *Hedyotis* to *Kadua*. In 2012, USFWS revised the taxonomic status for this species when it revised critical habitat on Oahu, with no change in range or distribution (USFWS 2012). This species is now listed as *Kadua parvula*, and is addressed as such for the remainder of this review

New status information:

- Two naturally occurring populations of *Kadua parvula* currently exist on Oahu. The population on military land at Ohikilolo contains 100 mature and 157 immature individuals and 5 seedling individuals (U.S. Army Garrison 2011).
- The population at Halona contains 97 mature and 35 immature individuals and 19 seedlings (U.S. Army Garrison).

The current total is 413 (U.S. Army Garrison 2011), an increase from the 263 reported in the last five-year review (USFWS 2008).

New management actions:

- Captive propagation for genetic storage and reintroduction - The Oahu Army Natural Resource Program (OANRP) has completed genetic storage for this species (U.S. Army Garrison 2010).
- Ungulate exclosures - Ungulate exclusion fencing for the known wild populations has been completed (U.S. Army Garrison 2010).
- Reintroduction / translocation - East Makaleha Valley has been identified as a suitable reintroduction site for a new population to meet the OANRP species stability goals (OANRP 2012).

**Synthesis:**

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for Oahu plants (USFWS 1998), based on whether the species is an annual, a short-lived perennial, or a long-lived perennial. *Kadua parvula* is a short-lived perennial, and to be considered stable, the species 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.

The stabilization goals for this species have not been met, since only two populations of 50 or more mature individuals exist (Table 1) and threats are not being sufficiently managed throughout all of the populations (Table 2). Therefore, *Kadua parvula* meets the definition of endangered as it remains in danger of extinction throughout its range.

**Recommendations for Future Actions:**

- Population biology research - Study *Kadua parvula* 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.

- Ungulate exclosures – Maintain existing exclosures and monitor for potential incursions.
- Existing population management and restoration – Continued management of known populations of *Kadua parvula*.
- Reintroduction / translocation – Continue reintroducing into suitable habitat.
- Alliance and partnership development - Initiate planning and contribute to implementation of ecosystem level restoration and management to benefit this taxon.

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

<b>Date</b>	<b>No. wild individuals</b>	<b>No. outplanted</b>	<b>Stabilization Criteria identified in Recovery Plan</b>	<b>Stabilization Criteria Completed?</b>
1996 (listing)	0	0	All threats managed in 3 populations	No
			Complete genetic storage	No
			3populations with 50 mature individuals each	No
1998 (recovery plan)	220-235	0	All threats managed in 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	Partially
2003 (critical habitat)	247	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	Partially
2008 (5-yr review)	263	0	All threats managed in 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	Two populations exceed 50 individuals
2013 (5-yr review)	197 mature, 216 immature, 5 seedlings – total 413	0	All threats managed in 3 populations	Partially (Table 2)
			Complete genetic storage	Yes
			3 populations with 50 mature individuals each	Partially - Two populations

**Table 2. Status of threats to *Kadua parvula* and ongoing conservation efforts.**

<b>Threat</b>	<b>Listing factor</b>	<b>Current Status</b>	<b>Conservation/ Management Efforts</b>
Ungulates –habitat degradation and predation by pigs and goats	A, C, D	Ongoing	Partially: 2 populations are now fenced
Fire – habitat modification and plant destruction	E	Ongoing	Partially
Invasive introduced plants – habitat degradation and competition	A, E	Ongoing	Partially: weed control ongoing
Military activities	A		Partially
Stochastic events	A, E	Ongoing	No
Climate change	A, E	Increasing	No

**References:**

See previous 5-year review for a full list of references (USFWS 2007). Only references for new information are provided below.

[OANRP] Oahu Army Natural Resource Program. 2012. Makua implementation plan - population unit status: *Hedyotis parvula*. 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/2010\\_YER\\_Edited.pdf](http://manoa.hawaii.edu/hpicesu/DPW/2010_YER/2010_YER_Edited.pdf)>.

U.S. Army Garrison. 2011. 2011 Status report for the Makua and Oahu implementation plans. U.S. Army Garrison, Hawaii and Pacific Cooperative Park Studies Unit. Schofield Barracks, Hawaii. 269 pages. Available online at <[http://manoa.hawaii.edu/hpicesu/DPW/2011\\_YER/2011\\_YER\\_Edited.pdf](http://manoa.hawaii.edu/hpicesu/DPW/2011_YER/2011_YER_Edited.pdf)>.

[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. *Hedyotis parvula* (no common name) 5-year review summary and evaluation. U.S. Fish and Wildlife Service, Honolulu, Hawaii. 12 pages. Available online at [http://ecos.fws.gov/docs/five\\_year\\_review/doc1817.pdf](http://ecos.fws.gov/docs/five_year_review/doc1817.pdf)>.

[USFWS] U.S. Fish and Wildlife Service. 2012. Endangered and threatened wildlife and plants; endangered status for 23 species on Oahu and designation of critical habitat for 124 species; final rule. Federal Register 77:57648-57862.

**U.S. FISH AND WILDLIFE SERVICE**  
SIGNATURE PAGE for 5-YEAR REVIEW of *Kadua parvula* (no common name)

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

*acting deputy*  
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Date *2013-08-12*