

Hibiscus clayi
(Clay's hibiscus, Aloalo, Akiohala)

**5-Year Review
Summary and Evaluation**

**U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
Honolulu, Hawaii**

5-YEAR REVIEW

Species reviewed: *Hibiscus clayi* (Clay's hibiscus, Aloalo, Akiohala)

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5-YEAR REVIEW
***Hibiscus clayi* (Clay's hibiscus, Aloalo, Akiohala)**

1.0 GENERAL INFORMATION

1.1 Reviewers

Lead Regional Office:

Region 1, Jesse D'Elia, Chief, Division of Recovery, (503) 231-2071.

Lead Field Office:

Pacific Islands Fish and Wildlife Office, Gina Shultz, Assistant Field Supervisor for Endangered Species, (808) 792-9400.

Cooperating Field Office(s):

N/A

Cooperating Regional Office(s):

N/A

1.2 Methodology used to complete the 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) between June 2006 and June 2007. The National Tropical Botanical Garden provided most of the updated information on the current status of *Hibiscus clayi*. They also provided recommendations for conservation actions that may be needed prior to the next five-year review. The evaluation of the lead PIFWO biologist was reviewed by the Plant Recovery Coordinator. These comments were incorporated into the draft five-year review. The document was then reviewed by the Recovery Program Leader and the Assistant Field Supervisor for Endangered Species before final approval.

1.3 Background:

1.3.1 FR Notice citation announcing initiation of this review:

USFWS. 2006. Endangered and threatened wildlife and plants; initiation of 5-year reviews of 70 species in Idaho, Oregon, Washington, Hawaii, and Guam. Federal Register 71(69):18345-18348.

1.3.2 Listing history

Original Listing

FR notice: USFWS. 1994. Final listing, endangered and threatened wildlife and plants; determination of endangered or threatened status for 24 plants from the island of Kauai, HI. Federal Register 59(38):9304-9329.

Date listed: February 25, 1994.

Entity listed: Species

Classification: Endangered

Revised Listing, if applicable

FR notice: N/A

Date listed: N/A

Entity listed: N/A

Classification: N/A

1.3.3 Associated rulemakings:

USFWS. 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):9215-9264.

Critical habitat was designated for *Hibiscus clayi* in seven units totaling 504 hectares (1,887 acres) on Kauai.

1.3.4 Review History:

Species status review [FY 2006 Recovery Data Call (September 2006)]:
Stable

Recovery achieved:

1 (0-25%) (FY 2006 Recovery Data Call)

1.3.5 Species' Recovery Priority Number at start of this 5-year review:

5

1.3.6 Current Recovery Plan or Outline

Name of plan or outline: Recovery plan for the Kauai plant cluster. 1995. U.S. Fish and Wildlife Service, Portland Oregon. 227 pages.

Date issued: 1995

Dates of previous revisions, if applicable: N/A

2.0 REVIEW ANALYSIS

2.1 Application of the 1996 Distinct Population Segment (DPS) policy

2.1.1 Is the species under review a vertebrate?

Yes
 No

2.1.2 Is the species under review listed as a DPS?

Yes
 No

2.1.3 Was the DPS listed prior to 1996?

Yes
 No

2.1.3.1 Prior to this 5-year review, was the DPS classification reviewed to ensure it meets the 1996 policy standards?

Yes
 No

2.1.3.2 Does the DPS listing meet the discreteness and significance elements of the 1996 DPS policy?

Yes
 No

2.1.4 Is there relevant new information for this species regarding the application of the DPS policy?

Yes
 No

2.2 Recovery Criteria

2.2.1 Does the species have a final, approved recovery plan containing objective, measurable criteria?

Yes
 No

2.2.2 Adequacy of recovery criteria.

2.2.2.1 Do the recovery criteria reflect the best available and most up-to date information on the biology of the species and its habitat?

Yes
 No

2.2.2.2 Are all of the 5 listing factors that are relevant to the species addressed in the recovery?

 X Yes
 No

2.2.3 List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information:

A synthesis of the threats (Factors A, B, C, D, and E) affecting this species is presented in section 2.4.

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for the Kauai plant cluster (USFWS 1995), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. In order for *Hibiscus clayi*, a long-lived perennial, to be considered stable, the existing population must be managed to control threats (e.g., fenced) and be represented in an *ex situ* (off-site) collection. Additionally, a minimum total of three populations should be documented on Kauai, each population must be naturally reproducing and increasing in number with a minimum of 25 mature individuals per population (USFWS 1995).

This recovery objective has not been met.

For downlisting, a total of five to seven populations of *Hibiscus clayi* should be documented on Kauai. Each of these populations must be naturally reproducing, stable, or increasing in number, and secure from threats, with a minimum of 100 mature individuals per population. In addition, each population should persist at this level for a minimum of five consecutive years before downlisting is considered (USFWS 1995).

This recovery objective has not been met.

For delisting, a total of eight to ten populations should be documented on Kauai. Each of the populations must be naturally reproducing, stable or increasing in number, and secure from threats, with a minimum of 100 mature individuals per population. Each population should persist at this level for a minimum of five consecutive years (USFWS 1995).

This recovery objective has not been met.

2.3 Updated Information and Current Species Status

In addition to the status summary table below, information on the species' status and threats was included in the final critical habitat rule referenced above in section I.C.5 ("Associated Rulemakings") and in section II.D ("Synthesis") below, which also includes any new information about the status and threats of the species.

Status of *Hibiscus clayi* from listing through 5-year review.

Date	No. wild inds	No. outplanted	Stability Criteria	Stability Criteria Completed?
1994 – listing	4	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 25 mature individuals each	No
1995 – recovery plan	4	11	All threats managed in all 3 populations	No
			Complete genetic storage	Yes
			3 populations with 25 mature individuals each	No
2003 – critical habitat	4	11	All threats managed in all 3 populations	No
			Complete genetic storage	Yes
			3 populations with 25 mature individuals each	No
2007 – 5-yr review	5	15	All threats managed	No
			Complete genetic storage	Yes
			3 pops with 25 mature individuals each	No

2.3.1 Biology and Habitat

2.3.1.1 New information on the species' biology and life history:

2.3.1.2 Abundance, population trends (e.g. increasing, decreasing, stable), demographic features (e.g., age structure, sex ratio, family size, birth rate, age at mortality, mortality rate, etc.), or demographic trends:

2.3.1.3 Genetics, genetic variation, or trends in genetic variation (e.g., loss of genetic variation, genetic drift, inbreeding, etc.):

2.3.1.4 Taxonomic classification or changes in nomenclature:

2.3.1.5 Spatial distribution, trends in spatial distribution (e.g. increasingly fragmented, increased numbers of corridors, etc.), or historic range (e.g. corrections to the historical range, change in distribution of the species' within its historic range, etc.):

2.3.1.6 Habitat or ecosystem conditions (e.g., amount, distribution, and suitability of the habitat or ecosystem):

2.3.1.7 Other:

2.3.2 Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms)

2.3.2.1 Present or threatened destruction, modification or curtailment of its habitat or range:

2.3.2.2 Overutilization for commercial, recreational, scientific, or educational purposes:

2.3.2.3 Disease or predation:

2.3.2.4 Inadequacy of existing regulatory mechanisms:

2.3.2.5 Other natural or manmade factors affecting its continued existence:

2.4 Synthesis

Hibiscus clayi was known historically from scattered locations on the island of Kauai, including the Kokee region on the western side of the island, Moaloaa Valley to the north, Nounou Mountain in Wailua to the east, and as far south as Haiku (USFWS 1994). At the time of listing, only four trees were known to exist in the Nounou Mountains population. Before the cattle were removed from the area, they greatly degraded the habitat (USFWS 1994). There are currently five remaining wild trees there as well as approximately 15 outplanted nursery trees (National Tropical Botanical Garden 2006). Thirty-five plants were grown at the

Hawaii Division of and Wildlife's Kokee Rare Plant Facility (Hawaii Division of Forestry and Wildlife 2005). Plants grown by the National Tropical Botanical Garden have been outplanted for genetic storage at its gardens in Lawai and Limahuli on Kauai and Kahanu at Hana, Maui. Seven individuals are planted at the National Tropical Botanical Garden at Lawai, Kauai, in the Lawai Forest Restoration for *ex situ* genetic storage. Eight individuals are planted in the Makawahi Cave Reserve at Mahaulepu, Kauai (R. Nishek, National Tropical Botanical Garden, pers. comm. 2006). This species is widely available in commercial cultivation because of its charismatic red flower. Another plant in the native section of the National Tropical Botanical Garden was grown from a collection from a now extirpated population on Haupu, Kauai (National Tropical Botanical Garden 2006). The species of this collection was reconfirmed by Dr. David H. Lorence, Director of Science at the National Tropical Botanical Garden (D. Lorence, National Tropical Botanical Garden, pers. comm. 2006).

The vegetation of Nounou Mountain is a relictual *Acacia koa* mesic forest dominated by the invasive introduced tree *Psidium cattleianum* (strawberry guava). The remaining individuals grow on a steep north-east facing slope, under a dry semi-open canopy (Wood 2002; Tangalin 2006; Perlman 2006).

The main threats, invasive introduced plant species (Factor E), habitat degradation by feral pigs (Factors A and D), and predation by numerous invertebrates (Factor C) continue to occur and the low number of individuals left in the wild makes the species vulnerable to stochastic events, such as hurricanes and landslides (Factor E) (National Tropical Botanical Garden 2006; Wood 2002; Lilleen-Rosenberger 2005). Plants are also located near the trail, which may expose the plants to vandalism or illegal collection activity (Factor B). There is some evidence of vandalism, in that machete and saw marks were observed on the trunks of plants in January 2000 (Wood 2002). Rats eat the seeds, and hibiscus mites have been observed on the plants (Factor C) (Wood 2002).

The stabilization and recovery goals for this species have not been met, as no populations exist with stable numbers and the threats are not being managed. Therefore, *Hibiscus clayi* meets the definition of endangered as it remains in danger of extinction throughout its range.

3.0 RESULTS

3.1 Recommended Classification:

Downlist to Threatened

Uplist to Endangered

Delist

Extinction

Recovery

Original data for classification in error

No change is needed

3.2 New Recovery Priority Number: N/A

Brief Rationale:

3.3 Listing and Reclassification Priority Number: N/A

Reclassification (from Threatened to Endangered) Priority Number: _____

Reclassification (from Endangered to Threatened) Priority Number: _____

Delisting (regardless of current classification) Priority Number: _____

Brief Rationale:

4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

- Collect seed from the sole representative of a now extinct population from Haupu, Kauai, and the remaining individuals in the Nounou population, continue propagation, and cross the resultant offspring with individuals from the Nounou lineage to expand the genetic base of the species.
- Fence individual plants for short-term protection from ungulates.
- Control introduced invasive plant species around remaining plants.
- Survey for populations in known historical sites and suitable habitat.
- Augment the wild population as plants become available in nurseries.
- Reintroduce individuals into suitable habitat within historical range that is being managed for the known threats to this species.

5.0 REFERENCES

Hawaii State Division of Forestry and Wildlife. 2005. Interim Report, EPRE2, Plant Restoration and Enhancement – Kokee Rare Plant Facility, September 30, 2005.

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

National Tropical Botanical Garden. 2006. Database query for *Hibiscus clayi* localities. September 29, 2006. Unpublished.

Perlman, S. 2006. Botanist, National Tropical Botanical Garden. Field log summaries. Unpublished.

Tangalin, N. 2006. Botanist, National Tropical Botanical Garden. Field log summaries. Unpublished.

[USFWS] U.S. Fish and Wildlife Service (USFWS). 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 Volume 68(39): 9215-9264.

[USFWS] U.S. Fish and Wildlife Service. 1995. Recovery Plan for the Kauai plant cluster, Portland Oregon. 227 pp.

[USFWS] U.S. Fish and Wildlife Service. 1994. Final listing endangered and threatened wildlife and plants; determination of endangered or threatened status for 24 plants from the island of Kauai, HI. Federal Register 59(38): 9304-9329.

Wood, K.R., M.H. Chapin, S. Perlman and M. Maunder. 2002. Critically endangered Hawaiian plant taxa and conservation collections within the genetic safety net (GSN), Final report prepared for the U.S. Fish and Wildlife Service. Unpublished.

Personal Communications:

Robert Nishek, Nursery Manager, National Tropical Botanical Garden, 3530 Papalina Road, Kalaheo, HI 96741, August 2006.

Dr. David H. Lorence, Director of Science, Tropical Botanical Garden, September 12, 2006.

Signature Page
U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of *Hibiscus clayi* (Clay's hibiscus, Aloalo, Akiohala)

Current Classification: E

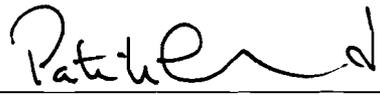
Recommendation resulting from the 5-Year Review:

- Downlist to Threatened
- Uplist to Endangered
- Delist
- No change needed

Appropriate Listing/Reclassification Priority Number, if applicable: _____

Review Conducted By:

Marilet A. Zablan, Recovery Program Leader and Acting Assistant Field Supervisor for Endangered Species, June 24, 2007
Marie Brueggmann, Plant Recovery Coordinator, February 21, March 23, May 24, and June 29, 2007
Annie P. Marshall, Fish and Wildlife Biologist, February 6, 2007

Approve  Date 1/18/08
Lead Field Supervisor, Fish and Wildlife Service