

Abutilon menziesii
(ko'oloa'ula)

**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: *Abutilon menziesii* (ko‘oloa‘ula)

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5-YEAR REVIEW
***Abutilon menziesii* / (ko‘oloa‘ula)**

1.0 GENERAL INFORMATION

1.1 Reviewers

Lead Regional Office:

Region 1, Endangered Species Program, Division of Recovery, Jesse D’Elia,
(503) 231-2071

Lead Field Office:

Pacific Islands Fish and Wildlife Office, Loyal Mehrhoff, Field Supervisor, (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 of the U.S. Fish and Wildlife Service (USFWS), beginning on June 1, 2010. The review was based on the final rule to list *Abutilon menziesii* and the Lanai plant cluster recovery plan (USFWS 1986, 1995), as well as a review of current, available information. The National Tropical Botanical Garden provided an initial draft of portions of the review and recommendations for conservation actions needed prior to the next five-year review. The evaluation of Tamara Sherrill, biological consultant, was reviewed by the Plant Recovery Coordinator. The document was then reviewed by the Recovery Program Lead and the Assistant Field Supervisor for Endangered Species before submission to the Field Supervisor for approval.

1.3 Background:

1.3.1 Federal Register (FR) Notice citation announcing initiation of this review:

USFWS. 2009. Endangered and threatened wildlife and plants; initiation of 5-year reviews of 103 species in Hawaii. Federal Register 74(49):11130-11133.

1.3.2 Listing history

Original Listing

FR notice: USFWS. 1986. Endangered and threatened wildlife and plants; determination of endangered status for *Abutilon menziesii* (kooloaula). Federal Register 51(187):34412-34415.

Date listed: September 26, 1986

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. 2003a. Endangered and threatened wildlife and plants; final designation of critical habitat for three plant species from the island of Lanai, Hawaii; final rule. Federal Register 68(6):1220-1274.

USFWS. 2003b. Endangered and threatened wildlife and plants; designation of critical habitat for 60 plant species from the Islands of Maui and Kahoolawe, Hawaii; final rule. Federal Register 68(93):25934-26165.

USFWS. 2003c. Endangered and threatened wildlife and plants; final designation or nondesignation of critical habitat for 101 plant species from the island of Oahu, Hawaii; final rule. Federal Register 68(116):35949-35998.

USFWS. 2003d. Endangered and threatened wildlife and plants; final designation and nondesignation of critical habitat for 46 plant species from the island of Hawaii, Hawaii; final rule. Federal Register 68(127):39624-39761.

Critical habitat was not designated for *Abutilon menziesii* in 1986 when listed because it was determined not prudent to publish the locations of the plants (USFWS 1986). On March 9, 1998, the United States District Court for the District of Hawaii directed USFWS to review the prudency findings for 245 listed plant species in Hawaii. On August 10, 1998, the court ordered USFWS to publish proposed critical habitat designations or nondesignations for at least 100 species by November 30, 2000, and to publish proposed designations or nondesignations for the remaining 145 species by April 30, 2002 (*Conservation Council for Hawaii v. Babbitt*, 24 F. Supp. 2d 1074). Critical habitat was not designated for *A. menziesii* in 2003 because this species was not part of the

lawsuit and subsequent stipulations, and therefore was not included in that rulemaking.

1.3.4 Review History:

Species status review [FY 2010 Recovery Data Call (August 2010)]:
Declining

Recovery achieved:

1 (0-25%) (FY 2007 Recovery Data Call – most recent year reported)

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

2

1.3.6 Current Recovery Plan or Outline

Name of plan or outline: Lanai plant cluster recovery plan. U.S. Fish and Wildlife Service, Portland, Oregon. 138 pages.

Date issued: September 29, 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 criteria?

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 (Listing Factors A, C, D, and E) affecting this species is presented in section 2.3.2 and Table 2. Listing Factor B (overutilization for commercial, recreational, scientific, or educational purposes) is not known to be a threat to this species.

Stabilizing, downlisting, and delisting objectives are provided in the Lanai Plant Cluster Recovery Plan (USFWS 1995), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Abutilon menziesii* is a long-lived perennial. To be considered stabilized, which is the first step in recovering the species, the taxon must be managed to control threats (*e.g.*, fenced, weeding, etc.), be represented in an *ex situ* (off-site) collection, have a minimum of three field populations on Lanai, and if possible, on at least one other island where they now occur or occurred historically. Each of these populations must be naturally reproducing and increasing in number, with a minimum of 25 mature individuals per population.

This recovery objective has not been met.

For downlisting, a total of five to seven populations of *Abutilon menziesii* should be documented on islands where they now occur or occurred historically. 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. Each population should persist at this level for a minimum of five consecutive years before downlisting is considered.

This recovery objective has not been met.

For delisting, a total of eight to ten populations of *Abutilon menziesii* should be documented on islands where they now occur or occurred historically. Each of these populations must be naturally reproducing, stable or increasing in number, and secure from threats, with 100 mature individuals per population for long-lived perennials. Each population should persist at this level for a minimum of five consecutive years before delisting is considered.

This recovery objective has not been met.

2.3 Updated Information and Current Species Status

2.3.1 Biology and Habitat

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

Variation in flower color from pink through red, purple, and even yellow is reported among different populations of *Abutilon menziesii* (National Tropical Botanical Garden 2009a, 2010).

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:

On Oahu in 1996, a population of *Abutilon menziesii* was discovered in Kapolei in the Ewa area of Oahu on old sugarcane land. Botanical surveys by Kenneth Nagata and Winona Char found 93 individuals in 1996 and 1997. By 2001, this number was estimated to have declined to only 30 to 50 individuals (Ohashi and PBR Hawaii 2004). Because this population was located in the path of a new road, the Hawaii State Department of Transportation developed a Habitat Conservation Plan to mitigate impacts to this species resulting from highway construction and several other developments projected for the area by the State Department of Hawaiian Homelands and the University of Hawaii. Some of these wild individuals were relocated temporarily to a holding area in Kapolei, while new plants were propagated to establish populations elsewhere on Oahu.

The only other natural occurrences of *Abutilon menziesii* on Oahu were three populations on land in Lualualei and Kalealoa managed by the U.S. Navy. A single individual at Kalealoa was last observed in 1991 (Hawaii Biodiversity and Mapping Program 2010). At Lualualei, there were nine mature and one immature individuals in one population, and one individual in another as of June 2006 (Hawaii Biodiversity and Mapping Program 2010; USFWS 2008).

On the island of Hawaii, the current status of a population of 38 individuals which was reported in 1985 and 1992 from Puako in South Kohala is currently not known (Hawaii Biodiversity and Mapping Program 2010; USFWS 1995). A population at Waikoloa adjacent to Auwaiakeakua Gulch is apparently gone (M. Donoho, Department of Forestry and Wildlife, pers. comm. 2009). It may have been extirpated by a combination of feral goats and drought. It is believed that a seed bank may still exist in the soil there, and that *Abutilon menziesii* could sprout if rain fall were sufficient (M. Donoho, pers. comm. 2009).

The one population of *Abutilon menziesii* on Maui was located southwest of Puu o Kali, above Kihei between Kekuawahaulaula and Keokea, on Department of Hawaiian Homelands land, at Sakagawa Ranch, at 183 to 366 meters (600 to 1,200 feet) elevation (in the area also called Red Hill). In 1987, two patches of plants were seen between 320 to 366 meters (1,050 to 1,200 feet) elevation, and in 1996 ten patches, each three by three meters (10 by 10 feet), were seen at 274 to 335 meters (900 to 1,100 feet) elevation (National Tropical Botanical Garden 2010; Perlman 2009; Wood 2009). This population was reported to have 20 individuals in 2009 (H. Oppenheimer, Plant Extinction Prevention Program, pers. comm. 2009). As many as 200 individuals are reported to exist within the Puu o Kali enclosure, with recruitment taking place since goats were removed (A. Medeiros, U.S. Geological Survey, pers. comm. 2009). Another population is known to Plant Extinction Prevention staff on private land in West Maui (H. Oppenheimer, pers. comm. 2009).

On Lanai, the Puu Mahanalua (Twin Peaks) population burned in 2009; and no recruitment has been observed yet (H. Oppenheimer, pers. comm. 2009). In 1987 and 1990 approximately 30 individual plants were observed below the road between 320 and 381 meters (1,050 and 1,250 feet) elevation. By 1999, only six patches were seen, and in 2001 ten were seen (Perlman 2009; Wood 2009). In 2008, six plants were observed in flower and fruit, from which seeds were collected, at 366 meters (1,200 feet) elevation (Perlman 2009).

On Lanai, another population with two groups of plants was located at Kalama, Kalamaiki Gulch, above Keone Bay, below old pineapple fields. This is north of the airport and Kamalapa Road, in what is known as the

Keone Habitat Study Area, a fenced enclosure of the Department of Land and Natural Resources at 344 meters (1,130 feet) elevation. In 1989, there were over 300 individuals, and from 1999 to 2007 it was possibly the largest *Abutilon menziesii* population left, with several hundred individuals (S. Perlman, pers. comm. 2009). A third area on Lanai was at Anapuka with about 50 individuals observed along the edge of pineapple fields in 1990, but without flower or fruit (Perlman 2009).

Currently, there are three populations totaling 40 to 60 individuals occurring on Oahu. There are no individuals known currently on the island of Hawaii. There are three populations totaling at least 220 individuals occurring on Maui and two populations totaling several hundred individuals on Lanai.

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

No new information.

2.3.1.4 Taxonomic classification or changes in nomenclature:

No new information.

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.):

See section 2.3.1.2 above.

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

On Oahu, *Abutilon menziesii* is located near Kapolei in the Barbers Point area. The habitat at Kapolei is old sugarcane fields, which have only two other native species among the many other plants that typically invade former agricultural land. At Kalaeloa, near the northwest corner of the former naval air station, at 15 meters (50 feet) elevation, the associated species, which are mostly introduced invasive species, are *Desmanthus virgatus* (bundleflower), *Leucaena leucocephala* (koa haole), *Merremia tuberosa* (wood rose), *Passiflora suberosa* (corky passionflower), and the native *Sida fallax* (ilima) (Hawaii Biodiversity and Mapping Program 2010).

On the island of Hawaii, where *Abutilon menziesii* is located in South Kohala District, the vegetation is mixed alien shrubland and grassland,

dominated by invasive introduced species including *Cenchrus ciliaris* (buffelgrass) and *Pennisetum setaceum* (fountain grass) with scattered *Leucaena leucocephala* (koa haole) and *Prosopis pallida* (kiawe). Native species present include *Sida fallax*, *Chenopodium oahuensis* (aheahea), and *Waltheria indica* (uhaloa) (Geometrician Associates 2006).

On Maui, Puu o Kali is a remnant *Erythrina sandwicensis* (wiliwili) dry forest located above Kihei on aa lava flows, on the slopes of East Maui. Alien vegetation is mixed with associated native species including *Acacia koaia* (koiae), *Achyranthes splendens* var. *splendens* (no common name), *Argemone glauca* (pua kala), *Bonamia menziesii* (NCN), *Canavalia pubescens* (awikiwiki), *Capparis sandwichiana* (maiapilo), *Chamaesyce* sp. (akoko), *Chenopodium oahuense*, *Diospyros sandwicensis* (lama), *Dodonaea viscosa* (aalii), *Hibiscus brackenridgei* (mao hau hele), *Lipochaeta rockii* (nehe), *Myoporum sandwicensis* (naio), *Nesoluma polynesianum* (keahi), *Nototrichium sandwicense* (kului), *Rauwolfia sandwicensis* (hao), *Reynoldsia sandwicensis* (ohe), *Senna gaudichaudii* (kolomona), *Sicyos hispidus* (anunu), *Sida fallax*, and *Waltheria indica* (uhaloa) (National Tropical Botanical Garden 2010; Perlman 2009; Wood 2009).

On Lanai, Puu Mahanalua (Twin peaks) has dry forest habitat with *Erythrina sandwicensis*, *Sida fallax*, and *Dodonaea viscosa* (National Tropical Botanical Garden 2010; Perlman 2009; Wood 2009). At Kalama iki Gulch, or Keone, the habitat is mostly invasive introduced plant species in degraded native dry shrubland with the native species *Sida fallax* and *Dodonaea viscosa*, and at Anapuka the habitat is also mostly invasive introduced plant species including *Leucaena leucocephala* and *Urochloa maxima* (Guinea grass) (National Tropical Botanical Garden 2009a; Perlman 2009).

2.3.1.7 Other:

No new information.

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:

Invasive introduced plants that modify the habitat on Maui include *Abutilon grandiflora* (hairy abutilon), *Bidens pilosa* (beggartick), *Cenchrus ciliaris*, *Chloris virgata* (fingergrass), *Lantana camara* (lantana), *Leucaena leucocephala*, *Melinis repens* (Natal redtop grass), *Prosopis pallida* (mesquite), *Urochloa maxima*, and *Setaria verticillata*

(bristly foxtail) (Perlman 2009; Wood 2009). Other threats to the habitat there include fire, Axis deer (*Axis axis*), cattle (*Bos taurus*), and goats (*Capra hircus*) (H. Oppenheimer, pers. comm. 2009; Perlman 2009; Wood 2009).

The Puu Mahanalua (Twin peaks) area of Lanai suffered a serious fire in 2009. The habitat is degraded by *Urochloa maxima*, *Leucaena leucocephala*, *Casuarina equisetifolia* (ironwood), *Lantana camara*, and various grasses (Perlman 2009; Wood 2009).

Threats to habitat on Oahu and the island of Hawaii include development and fire (National Tropical Botanical Garden 2009b; Perlman 2009; USFWS 1986; Wood 2009).

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

Not a threat.

2.3.2.3 Disease or predation:

Deer are reported to chew, trample, and knock down plants of *Abutilon menziesii*. Rats (*Rattus rattus*), mouflon sheep (*Ovis aries*), and insect predators including Hibiscus scale (*Pinnaspis strachani*) and Chinese rose beetle (*Adoretus sinicus*) are also reported to eat or damage these plants (National Tropical Botanical Garden 2010b; Perlman 2009; USFWS 1986; Wood 2009).

2.3.2.4 Inadequacy of existing regulatory mechanisms:

No new information.

2.3.2.5 Other natural or manmade factors affecting its continued existence:

The introduced invasive plant species discussed in section 2.3.2.1 above are also a threat to *Abutilon menziesii* because they compete with the species for water, light, and nutrients. Fire is also a direct threat to individuals of *A. menziesii*.

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) has currently funded climate modeling that will help resolve these spatial limitations. We anticipate high spatial resolution climate outputs by 2013.

The Lualualei population of *Abutilon menziesii* on Oahu is being managed by the U.S. Navy (Hawaii Biodiversity and Mapping Program 2004). A habitat conservation plan (HCP) was approved in 2004 for *Abutilon menziesii* at Kapolei. It was developed by the State Department of Transportation and the State Department of Land and Natural Resources to describe the impacts and measures that will be taken to mitigate impacts to *A. menziesii* as the result of the proposed construction of a North-South Road, and Kapolei Parkway. Although the Department of Transportation is the sole applicant, the implementation of the HCP to mitigate impacts of development actions may be conducted by other agencies or organizations, some of which are not yet identified. Certificates of inclusion, which authorize incidental take to third parties, have been issued to the Department of Hawaiian Home Lands, the University of Hawaii, and the City and County of Honolulu who anticipate undertaking developments of housing and educational facilities (Ohashi and PBR Hawaii 2004).

The HCP outlines a strategy to take cuttings and collect seeds from the existing plants prior to their removal from the Kapolei locations, and using these materials to maintain genetic representation of the original population by growing cuttings in nurseries. Seeds placed in storage are to be used to establish three new populations in protected areas elsewhere on Oahu. In addition, the HCP provides funding to protect and maintain these populations for a minimum period of 20 years to ensure that they will survive. Cuttings from plants will continue to be propagated (Ohashi and PBR Hawaii 2004).

As a result of the HCP, *Abutilon menziesii* has been outplanted at nine different sites: Diamond Head, Honouliuli Unit of the Pearl Harbor National Wildlife Refuge, Kealia Trail, Kaena Point, Ka Iwi State Park, Ewa Villages Golf Course, Koko Crater Botanical Garden, Pouhala Marsh, and the Pahole Nike Site. In August 2007, the entire planting at Kaena was destroyed by fire. Four of these sites are being utilized to create self-reproducing “wild” populations with full genetic representation of the 62 original wild plants: Ewa Villages Golf Course, Diamond Head, Honouliuli Unit of the Pearl Harbor National Wildlife Refuge, and Koko Crater Botanical Garden. Of these sites, Diamond Head has 119 individuals with 74 percent representation of the genetic diversity of the original Kapolei population, managed under a Memorandum of Understanding between State Parks and the U.S. Army. At Koko Crater there are now 75 plants representing 59 founders, or 95 percent of the original genetic diversity. At Honouliuli, the land is owned by the U.S. Navy, but designated as part of the Pearl Harbor National Wildlife Refuge and the population is managed by the State Department of Land and Natural Resources, Division of Forestry and Wildlife. It currently has 88 individuals representing 55 founders, or 89 percent of the original genetic

diversity. The Ewa Village site is within 90 meters (100 yards) of the original Kapolei population location and currently has 69 individuals representing 66 percent of the original plants. Additional test sites at Kealia Trail, Kaena Point, Ka Iwi State Park, and Pouhala will be used to test the biological requirements of the species. The final known individual plants of the existing Kapolei population were transplanted into the fenced Contingency Reserve Area at the Kapolei site. Twenty-five plants were translocated and none died to date. A greenhouse was established at Mokuleia at the end of the Dillingham Air Field to grow *A. menziesii* and other associated species for reintroductions at all sites on Oahu (Mansker 2008).

On the island of Hawaii in 2006 an environmental assessment was published for a proposed emergency road in Waikoloa that could impact the historical location of *Abutilon menziesii* in South Kohala (Geometrician Associates 2006). The road would provide an additional evacuation route during natural disasters, including fires, lava flows and earthquakes. A recent report, however, indicated that the population near Waikoloa, adjacent to Auwaiakeakua Gulch, was not impacted by the bypass road (M. Donoho, pers. comm. 2009). Hundreds of individuals grown from seed at Amy Greenwell Ethnobotanical Garden, collected from the Puako population, were outplanted at Kaupulehu Preserve and are doing well (Y. Carter, Kaupulehu Preserve, pers. comm. 2009).

Abutilon menziesii is widely grown in botanical gardens throughout the Hawaiian Islands. Seeds collected from populations on all four islands are stored at the Lyon Arboretum (Center for Conservation Research and Training Seed Storage Facility 2009). The National Tropical Botanical Garden has 2,760 seeds in storage, and three plants in the nursery (National Tropical Botanical Garden 2009b). Hawaii Division of Forestry and Wildlife's Maui nursery has material from Puu o Kali (Maui Division of Forestry and Wildlife 2010). Maui Nui Botanical Gardens has 31 plants and 300 first generation seeds from Puu o Kali, representing five wild individuals (Maui Nui Botanical Gardens 2009). Oahu Department of Forestry and Wildlife nursery at Dillingham has 155 plants representing 62 original individuals from Kapolei, and the Oahu Department of Forestry and Wildlife Pahole Nursery has 10 plants (Oahu Division of Forestry and Wildlife, Dillingham 2009; Oahu Division of Forestry and Wildlife, Pahole 2010). The Waimea Valley Arboretum has 45 plants from Lanai, Oahu, and Maui, representing 16 individuals (Waimea Valley Arboretum 2009). The Kauai Division of Forestry and Wildlife nursery has three plants and 40 seeds of this species (Kauai Division of Forestry and Wildlife 2009).

2.4 Synthesis

The interim stabilization goals for this species have not been met as there are only one or possibly two populations with more than 25 mature individuals on the island of Lanai (Table 1) and not all threats are being managed (Table 2). Therefore, *Abutilon menziesii* meets the definition of endangered as it remains in danger of extinction throughout its range.

Table 1. Status of *Abutilon menziesii* from listing through 5-year review.

| Date | No. wild individuals | No. outplanted | Stabilization Criteria identified in Recovery Plan | Stabilization Criteria Completed? |
|----------------------|-----------------------------|-----------------------|---|--|
| 1986 (listing) | ca. 65 | 0 | All threats managed in all 3 populations | No |
| | | | Complete genetic storage | No |
| | | | 3 populations with 25 mature individuals each on Lanai | No |
| 1999 (recovery plan) | at least 645 | 0 | All threats managed in all 3 populations | No |
| | | | Complete genetic storage | Partially |
| | | | 3 populations with 25 mature individuals each on Lanai | Unknown |
| 2010 (5-year review) | several 100 | 100s | All threats managed in all 3 populations | Partially (Table 2) |
| | | | Complete genetic storage | Partially |
| | | | 3 populations with 25 mature individuals each on Lanai | Partially: Kalama several 100 individuals on Lanai, Anapuka 50 individuals on Lanai, Kapolei 30-50 individuals on Oahu, Puu o Kali 200 on Maui |

Table 2. Threats to *Abutilon menziesii*.

| Threat | Listing factor | Current Status | Conservation/ Management Efforts |
|--|-----------------------|-----------------------|---|
| Ungulates – habitat modification and herbivory | A, C, D | Ongoing | Puu o Kali fenced |
| Development | A | Ongoing | Kapolei material reintroduced to 3 sites |
| Rats – herbivory | C | Ongoing | No |
| Invertebrates – herbivory | C | Ongoing | No |
| Fire | E | Ongoing | No |
| Invasive introduced plants | A, E | Ongoing | Lualualei and Kapolei, outplanted populations |
| Climate change | E | Increasing | No |

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

- Continue maintenance of all populations through weed control and fencing.

- Develop and implement fire management plans for each population.
- Outplant to augment genetic representation in each Oahu site.
- Monitor existing populations to track status and historical sites for new recruitment.
- Collect seeds from those populations not currently well represented.
- Continue reintroducing individuals into protected suitable habitat within historical range.
- Assess the modeled effects of climate change on this species, and use to determine future landscape needed for the recovery of the species.
- Work with Hawaii Division of Forestry and Wildlife and other land managers to initiate planning and contribute to implementation of ecosystem-level restoration and management to benefit this species on Lanai and Maui.

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Signature Page
U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of *Abutilon menziesii* (ko'oloa'ula)

Current Classification: E

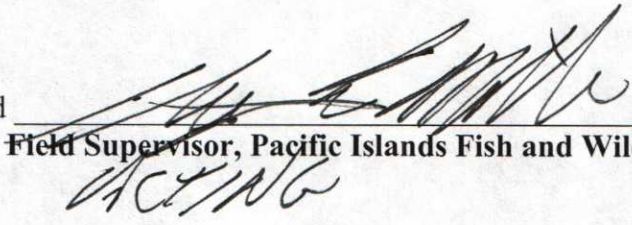

Recommendation resulting from the 5-Year Review:

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

Appropriate Listing/Reclassification Priority Number, if applicable:

Review Conducted By:

Chelsie Javar, Fish and Wildlife Biologist
Marie Bruegmann, Plant Recovery Coordinator
Jess Newton, Recovery Program Lead
Assistant Field Supervisor for Endangered Species

Approved  Date 
Field Supervisor, Pacific Islands Fish and Wildlife Office