

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Abutilon sandwicense* (no common name)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2022. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 167 Species in Oregon, Washington, Idaho, Montana, California, Hawaii, Guam, and the Northern Mariana Islands. Federal Register 87(90): 28031–28034, May 10, 2022.

Lead Region/Field Office:

Region 1/Pacific Islands Fish and Wildlife Office (PIFWO), Honolulu, Hawai‘i

Name of Reviewer:

Cheryl Phillipson, Biologist, PIFWO

Lauren Weisenberger, Plant Recovery Coordinator, PIFWO

Megan Laut, Recovery Program Manager, PIFWO

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 (Service) beginning in October 2023. The review was based on a review of current, available information since the last 5-year review for *Abutilon sandwicense* (USFWS 2019). The evaluation by Cheryl Phillipson, Biologist, was reviewed by Lauren Weisenberger, Plant Recovery Coordinator, and Megan Laut, Recovery Program Manager.

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/ecp/species/7482>).

Review Analysis:

Please refer to the previous 5-year reviews for *Abutilon sandwicense* published in the Federal Register on August 2, 2011 and September 20, 2019 (available at https://ecos.fws.gov/docs/tess/species_nonpublish/1744.pdf and https://ecos.fws.gov/docs/tess/species_nonpublish/2819.pdf) for a complete review of the species' status, threats, management efforts, and references cited. We are not aware of any significant new information regarding the species' biological status since listing to warrant a change in the Federal listing status of *A. sandwicense*.

This short-lived perennial shrub in the Malvaceae (mallow) family is endangered and is known from the island of O‘ahu. The status and trends for *Abutilon sandwicense* are provided in the tables below.

New Status Information:

- Currently, in the Wai‘anae mountains of O‘ahu, there are six population units (PUs) with wild individuals at Ka‘awa–Pu‘ulu, ‘Ēkahanui-Huliwai, Hālonā, Mākaha Makai (the largest population of 81 mature wild individuals), Mākaha Mauka, and North Mikilua that totaled 149 mature and 254 immature individuals in 2023. In addition, there are six mature individuals within an enclosure at Lualualei (Army Natural Resources Program on O‘ahu [ANRPO] 2023 appendices, p. 326, Wai‘anae Mountains Watershed Partnership [WMWP] 2023, p. 1). Three reintroduced/augmented populations at ‘Ēkahanui–Huliwai; Mākaha Makai (Kamā‘ili), and Kahanahāiki total 142 mature and 137 immature individuals (ANRPO 2023 appendices, p. 326).
- Currently, there are approximately 156 founders from 7 populations represented in seed collections, propagation, and reintroductions/augmentations (ANRPO 2022a).

New Threats:

- Hybridization—Hybridization of *Abutilon sandwicense* with *A. grandifolium* is a potential threat to individuals at ‘Ēkahanui (ANRPO 2022b appendices, p. 179).

New Management Actions:

- Monitoring and surveys—
 - ANRPO monitors individuals within PUs in the Wai‘anae mountains (ANRPO 2022b, p. 53; ANRPO 2022b appendices, p. 168). Habitat monitoring and erosion control at ‘Ēkahanui MU with outplanting of common native plant species to help protect habitat (ANRPO 2022b, p. 76; ANRPO 2022b appendices, p. 190).
- Ungulate monitoring and control—
 - Populations at Manuwai, ‘Ēkahanui-Huliwai, Hālonā, and Mākaha are within enclosures (ANRPO 2022b appendices, pp. 165, 520). Feral ungulates are controlled at Ka‘awa-Pu‘ulu, Huliwai, Mākaha Makai and Mākaha Mauka, North Mikilua, and ‘Ēkahanui-Huliwai (ANRPO 2021 appendices, p. 406; ANRPO 2022b, pp. 53, 520; ANRPO 2023 appendices, p. 368) and at the reintroduced populations at Kahanahāiki and Kaluakauila (not currently occupied) (ANRPO 2021 appendices, p. 406; ANRPO 2022 appendices, p. 520; ANRPO 2023 appendices, p. 368).
 - The population at Hālonā in Lualualei valley, managed by the WMWP for the U.S. Navy, is within an enclosure that is monitored quarterly (WMWP 2022a; WMWP 2022b; WMWP 2023). In addition, an aerial survey for feral goats was conducted and seven were detected (WMWP 2023).
- Invasive nonnative plant management—
 - Nonnative invasive plants are controlled at Ka‘awa-Pu‘ulu, ‘Ēkahanui-Huliwai, Mākaha Makai and Mākaha Mauka, and Manuwai (ANRPO 2020, p. 46; ANRPO 2021, p. 406; ANRPO 2022b appendices, pp. 183, 400, 520; ANRPO 2023 p. 63; ANRPO 2023 appendices, pp. 169–170, 368) and at the

- reintroduced populations at Kahanahāiki and Kaluakauila (not currently occupied) (ANRPO 2021, p. 406; ANRPO 2023 appendices, p. 368).
- Fire prevention/management—
 - Fire management (fuel load control) is conducted at Ka‘awa-Pu‘ulu and Wai‘anae Kai PUs and along the exclosure at Manuwai (ANRPO 2021 appendices, p. 406; ANRPO 2022b appendices, p. 520; ANRPO 2023 appendices, pp. 170, 368).
 - Implementation of the Lualualei Fire Management Plan is ongoing for the Hālonā exclosure (Naval Facilities Engineering Systems Command [NAVFAC] 2022a).
 - Rodent management—
 - Rodents are controlled by ANRPO with trap grids set at ‘Ēkahanui-Huliwai, Mākaha Makai, and Ka‘awa-Pu‘ulu (ANRPO 2021, p. 406; ANRPO 2022b, p. 192; ANRPO 2022b appendices, p. 520; ANRPO 2023, p. 208; ANRPO 2023 appendices, p. 368), and at the reintroduced population at Kahanahāiki (ANRPO 2021 appendices, p. 406).
 - Rodents are controlled by the WMWP at the Hālonā exclosure in Lualualei (WMWP 2022b; WMWP 2023).
 - Invertebrate management—
 - Predation/herbivory by slugs and nonnative snails is a threat to *A. sandwicense* at Mākaha and may be controlled by application of a molluscicide if no native snails are present (ANRPO 2021 appendices, p. 104).
 - Funding for research on methodology for control of the black twig borer (*Xylosandrus compactus*) was allocated in 2022 for Lualualei. Pesticides were applied but there was no significant positive trend for any one treatment (NAVFAC 2022a, 20 pp.; NAVFAC 2022b, 7 pp.).
 - Collection and propagation for genetic storage and reintroduction—
 - In 2023, the Army’s rare plant nursery reported storage of one individual representing the only founder at Kahanahāiki, five individuals representing founders at Mākaha Makai, and one individual representing one founder at Mākaha Mauka (ANRPO 2023 appendices, p. 408). The PU at Kahanahāiki has met 100 percent of storage goals with a single founder represented; ‘Ēkahanui-Huliwai PU has met 86 percent of storage goals with 12 founders represented; the Mākaha Makai PU has met 76 percent of storage goals with 38 founders represented; the Mākaha Mauka PU has met 14 percent of storage goals with three founders represented, and the Ka‘awa-Pu‘ulu PU has met 9 percent of storage goals with four founders represented. The remaining populations are not completely represented (ANRPO 2023 appendices, p. 408). In 2022, the ANRPO seedbank inventory reported a total of 9,559 seeds stored representing 157 founders at 10 populations (ANRPO 2022a). In 2022, the ANRPO nursery inventory reported storage of seven propagated individuals representing one population at Mākaha and one individual propagated representing one founder at Kahanahāiki (ANRPO 2022a).

- In 2018, the Waimea Arboretum reported 36 seeds/plants in refugia representing five founders from unspecified populations (Waimea Arboretum 2018).
- In 2006, the National Tropical Botanical Garden (NTBG) stored approximately 300 seeds representing one second generation plant at the garden (NTBG 2022).
- In 2022, the Lyon Arboretum Seed Conservation Laboratory reported storage of 389 seeds collected between 2001 and 2009 representing one cultivated plant each at Waimea Arboretum and the Amy Greenwell Arboretum, and two wild populations (four founders at Halona and one founder at Pu‘u Hapapa-Mikilua) at Lualualei (Lyon Arboretum 2022).
- Reintroduction/Augmentation—In 2022, ANRPO reported reintroduction of a total of 339 individuals at four populations (‘Ēkahanui-Huliwai, Mākaha Makai, Kahanahāiki, and Kaluakauila) with three populations (142 mature and 137 immature individuals) currently surviving (ANRPO 2022b).
- Hybridization—The ANRPO will monitor individuals at ‘Ēkahanui and remove any nonnative *A. grandifolium* that pose a threat of possible hybridization (ANRPO 2022b appendices, p. 179).

Table 1. Status and trends of *Abutilon sandwicense* from listing through current 5-year review. Table 1a shows progress according to Interim Stabilization Goals; Table 1b shows progress according to Preventing Extinction Goals.

Table 1a.

Date	No. wild individuals	No. outplanted	Stability Goals identified in Recovery Plan	Stability Goals Completed?
1991 (listing)	300–400	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2011 (5-year review)	137	28	All threats managed in all 3 populations	Partial
			Complete genetic storage	Partial
			3 populations with 50 mature individuals each	Partial, only Mākaha Makai population >50

			3 populations with 100 mature individuals each	No
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Table 1b.

Date	No. wild individuals	No. outplanted	*Preventing Extinction Targets identified by HPPRCC	*Preventing Extinction Targets Completed?
2019 (5-year review)	527	>200	All threats managed in all 3 populations	Partial
			Complete genetic storage	Nearly complete
			Reproduction (i.e., viable seeds, seedlings) at all 3 populations	Partial, seedlings observed at 'Ēkahanui
			3 populations with 50 mature individuals each	Partial, only Mākaha Makai population >50
2024 (5-year review)	155 mature 254 immature	142 mature 137 immature	All threats managed in all 3 populations	Partial, 4 wild and 1 reintroduced populations within exclosures; nonnative plant control at 6 populations
			Complete genetic storage	Complete, 156 founders from 7 populations
			Natural reproduction at all 3 populations	Partial, seedlings observed at 'Ēkahanui
			3 populations with 50 mature individuals each	Partial, 1 population >50 mature individuals

* The Preventing Extinction Stage was established in 2011. Prior to 2011, the Interim Stabilization Stage was the first stage towards recovery (now it is the second stage after Preventing Extinction).

Table 2. Threats to *Abutilon sandwicense* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulate degradation of habitat	A	Ongoing	Partial, 4 wild and 1 reintroduced populations within exclosures
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	Partial, nonnative plant management at 6 populations
Fire destruction and degradation of habitat	A	Ongoing	Partial, fire management plans in place for Army training areas and Navy lands at Lualualei
Climate change degradation or loss of habitat	A	Ongoing	None
Predation and herbivory by feral ungulates	C	Ongoing	Partial, 4 wild and 1 reintroduced populations within exclosures
Predation and herbivory by rodents	C	Ongoing	Partial, rodent control at 4 wild and 1 reintroduced populations
Predation and herbivory by invertebrates	C	Ongoing	Partial, molluscicide may be used at 1 population and insecticide trials ongoing at 1 population
Hybridization	E	Potential	Partial, removal of nonnative species of <i>Abutilon</i> at 1 population
Reduced viability due to low numbers	E	Ongoing	Partial, seed collection, propagation, and reintroduction efforts ongoing

Synthesis:

Currently there are 155 mature and 254 immature wild individuals of *Abutilon sandwicense* on O‘ahu; however, the number of wild individuals continues to decline. Five populations are provided protection by fencing and nonnative plant control. Seed collections, propagation, and outplanting are ongoing. Three PUs have complete genetic representation at interim stabilization goals. Approximately 156 founders from 7 populations are represented in seed collections and propagation/nursery storage. A total of 279 mature and immature individuals were reintroduced. Recruitment is observed at one population.

Stabilizing (interim) and preventing extinction targets, and downlisting and delisting criteria are provided in the Recovery Plan for the O‘ahu Plants (USFWS 1998) and have

been updated according to the draft revised recovery objective guidelines developed by the Hawai‘i and Pacific Plants Recovery Coordinating Committee (HPPRCC 2011). The HPPRCC identifies an additional initial objective, the Preventing Extinction Stage, in addition to the Interim Stabilization, Delisting, and Downlisting objectives. Furthermore, life history traits such as breeding system, population size fluctuation or decline, and reproduction type (sexual or vegetative), have been included in the calculation of goals for the number of populations and reproducing individuals for each stage. The goals for each stage remain grouped by life span defined as annual, short-lived perennial (fewer than 10 years), or long-lived perennial.

Abutilon sandwicense is a short-lived perennial shrub. To prevent extinction, which is the first milestone in recovering the species, the taxon must be managed to control threats (e.g., fenced) and have 50 individuals (or the total number of individuals if fewer than 50 exist) from each of three populations represented in *ex situ* (secured off-site, such as a nursery or seed bank) collections that are well managed. In addition, a minimum of a total of three populations should be documented on O‘ahu where they now occur or occurred historically and each of these populations must be naturally reproducing (i.e., viable seeds, seedlings) with a minimum of 50 mature, reproducing individuals per population.

The preventing extinction goals for this species have not been met. The number of wild individuals continues to decline. Although genetic storage is complete for three population units (Table 1), there is only one population totaling at least 50 mature individuals, and all threats are not being managed (Table 1, Table 2). Recruitment is reported at only reintroduced population. Therefore, *Abutilon sandwicense* meets the definition of Endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

Hybridization with the nonnative *Abutilon grandifolium* is a potential threat, but no other significant new information regarding the species’ biological status has been reported since the last 5-year review in 2019. Thus, the following recommendations for future actions are updated or reiterated for the 5-year review for 2024.

- Surveys and inventories—
 - Continue surveys for populations of *Abutilon sandwicense* in areas of potentially suitable habitat.
 - Continue to determine suitable locations for translocation/reintroductions.
- Ungulate monitoring and control—Continue to construct and maintain exclosures to protect *A. sandwicense* from the negative impacts to habitat by feral ungulates.
- Invasive nonnative plant monitoring and control—Continue control of established ecosystem-altering nonnative invasive plant species, and those that compete with *A. sandwicense*.
- Fire monitoring and control—Continue to develop and implement fire prevention management plans.

- Climate change adaptation strategy—Assess the modeled effects of climate change on this species and use to determine future landscape needed for the recovery of the species.
- Predator and herbivore monitoring and control—
 - Continue to construct ungulate exclosures or strategic fencing at all populations of *A. sandwicense* to protect this species from trampling and herbivory.
 - Continue to implement effective methods to control rodents.
 - Continue to research best control methods for predation and herbivory by insects and slugs/snails.
- Captive propagation for genetic storage and reintroduction—Continue collection and propagation efforts for maintenance of genetic stock and for reintroduction.
- Translocation/reintroduction—Continue augment current populations and to translocate/reintroduce individuals into suitable habitat within historic range that is being managed for known threats to this species.
- Build resiliency, redundancy, and representation—Increase species’ viability through habitat restoration and threat control, to reduce impacts of climate change and potential hybridization.
- Alliance and partnership development—Continue to work with partners and other land managers in planning and implementation of ecosystem-level restoration and management to benefit this species.

References:

[ANRPO] Army Natural Resources Program O‘ahu. 2020. 2020 Status report for the Mākua and O‘ahu Implementation Plans. Office of the Vice President for Innovation and Research, University of Hawai‘i. 214 pp + appendices.

[ANRPO] 2021 Status report for the Mākua and O‘ahu Implementation Plans. Office of the Vice President for Innovation and Research, University of Hawai‘i. 207 pp. + appendices.

[ANRPO] 2022a. Report on controlled propagation of listed species, as designated under the U.S. Endangered Species Act. Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai‘i.

[ANRPO] 2022b. 2022 Status report for the Mākua and O‘ahu Implementation Plans. Office of the Vice President for Innovation and Research, University of Hawai‘i. 228 pp.

[ANRPO] 2023. 2023 Status report for the Mākua and O‘ahu Implementation Plans. Prepared by Army Natural Resources Program O‘ahu, Office of the Vice President for Innovation and Research, University of Hawai‘i. 255 pp. + appendices.

- [HPPRCC] Hawai‘i and Pacific Plants Recovery Coordinating Committee. 2011. Revised recovery objective guidelines. 8 pp.
- Lyon Arboretum. 2022. Report on controlled propagation of listed species, as designated under the U.S. Endangered Species Act. Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai‘i.
- [NTBG] National Tropical Botanical Garden. 2022. Report on controlled propagation of listed species, as designated under the U.S. Endangered Species Act. Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai‘i.
- [NAVFAC] Naval Facilities Engineering Systems Command Hawai‘i. 2022a. Progress Report: Lualualei management goals, reporting period April 2022–June 2022. 20 pp.
- [NAVFAC] 2022b. Progress Report: Lualualei management goals, reporting period July 2022–September 2022. 7 pp.
- [USFWS] U.S. Fish and Wildlife Service. 1998. Recovery Plan for the O‘ahu Plants. Portland, OR. 207 pp. + appendices.
- [USFWS] 2011. *Abutilon sandwicense* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI.
https://ecos.fws.gov/docs/tess/species_nonpublish/1744.pdf.
- [USFWS] 2019. *Abutilon sandwicense* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI.
https://ecos.fws.gov/docs/tess/species_nonpublish/2819.pdf.
- [USFWS] 2022. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 167 Species in Oregon, Washington, Idaho, Montana, California, Hawaii, Guam, and the Northern Mariana Islands . Federal Register 87(90): 28031–28034, May 10, 2022.
- [WMWP] Wai‘anae Mountains Watershed Partnership. 2022a. Performance progress quarterly report SF-PPR, January 31, 2022, Grant W9126G-21-0024. 19 pp.
- [WMWP] 2022b. Performance progress quarterly report SF-PPR, March 31, 2022, Grant W9126G-21-0024. 13 pp.
- [WMWP] 2023. Performance progress report SF-PPR, W9126G-21-2-0024, University of Hawai‘i Office of Research Services, Pacific Cooperative Studies Unit. 24 pp.

Waimea Arboretum. 2018. Report on controlled propagation of listed species, as designated under the U.S. Endangered Species Act. Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai'i.

U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW of *Abutilon sandwicense* (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
- X No Change in listing status

For Field Supervisor, Pacific Islands Fish and Wildlife Office

_____ Date _____