

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Pteris lidgatei* (no common name)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2019. Endangered and threatened wildlife and plants; initiation of 5-year status reviews for 91 species in Oregon, Washington, Hawaii, and American Samoa. Federal Register 84(112): 27152–27154, June 11, 2019.

Lead Region/Field Office:

Interior Region 12/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, Conservation & Restoration Team 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 2020. The review was based on a review of current, available information since the last 5-year review for *Pteris lidgatei* (USFWS 2014). The evaluation by Cheryl Phillipson, Biologist, was reviewed by Lauren Weisenberger, Plant Recovery Coordinator, and Megan Laut, Conservation and Restoration Team 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/tess_public).

Review Analysis:

Please refer to the previous 5-year reviews for *Pteris lidgatei* in the Federal Register on June 2, 2009 and June 5, 2014 (available at https://ecos.fws.gov/docs/tess/species_nonpublish/1374.pdf and https://ecos.fws.gov/docs/tess/species_nonpublish/2204.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 *P. lidgatei*.

This short-lived perennial terrestrial fern in the Pteridaceae family is endangered and is known from the islands of O‘ahu, Moloka‘i, and Maui. The status and trends for *P. lidgatei* are provided in the tables below.

New Status Information:

- In 2016, critical habitat was designated on Moloka‘i for *Pteris lidgatei* in the montane wet and wet cliff ecosystems (3,783 hectares [ha], 9,347 acres [ac]) and in 10 units on Maui in the lowland wet and wet cliff ecosystems (2,621 ha, 6,457 ac) (81 FR 17790, March 30, 2016).
- At the time of the last 5-year review in 2014 for *P. lidgatei*, there were three populations on O‘ahu totaling 13 individuals and three populations on Maui totaling 15 individuals, no plants had been observed on Moloka‘i since 2007. Currently, on O‘ahu the last observations of *P. lidgatei* were in 2012 at Kaluanui (one individual) and in 2011 at Waimano; however, in 2014 that remaining individual was found to have died (Ching-Harbin et al. 2014). On west Maui, there were two mature individuals observed in 2018, and none remained at Kaua‘ula in 2021 (Oppenheimer 2018; PEPP 2021).

New Threats:

- Drought—Drought conditions associated with climate change has been reported as a threat to occurrences of *P. lidgatei* at Kahakuloa and Kaua‘ula on Maui (PEPP 2014, 2015, 2021). Over the last 100 years, the Hawaiian Islands have experienced an annual decline in precipitation of over 9 percent, increasing to as much as 15 percent within the last 20 years (US-NSTC 2008, p. 61; Chu and Chen 2005, pp. 4812–4813; Diaz et al. 2005, 4 pp.). Drought affects plants directly by desiccation. The increase in drought frequency and intensity leads to a self-perpetuating cycle of increase in cover of nonnative plants, increase in the number of fires, and an increase in erosion (US-GCRP 2009, pp. 18, 24; Warren 2011).

New Management Actions:

- Collection and propagation for genetic storage and reintroduction—
 - The Lyon Seed Conservation Laboratory reported one raft of explants representing one founder of *P. lidgatei* at Kahakuloa, Maui (Lyon Arboretum 2020).
 - The Plant Extinction Prevention Program (PEPP) reports collection of fertile fronds from plants at Kahakuloa and Kaua‘ula, Maui, that were sent to Lyon Arboretum (PEPP 2014, 2016).

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

Date	No. wild individuals	No. outplanted	Downlisting Criteria identified in Recovery Plan	Downlisting Criteria Completed?
1994 (listing)	14 (O‘ahu) 12 (Maui)	0	All threats managed in all 3 populations	No
			Complete genetic storage	No

			3 populations with 50 mature individuals each	No
1998 (recovery plan)	13 (O'ahu) 20 (Maui)	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2003 (critical habitat)	13 (O'ahu) 20 (Maui) 0 (Moloka'i)	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2009 (5-year review)	16 (O'ahu) 27 (Maui) 8 (Moloka'i)	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2012 (critical habitat, O'ahu)	17–24 (O'ahu)		All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2014 (5-year review)	2 (O'ahu) 15 (Maui) Unknown (Moloka'i)	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially

			3 populations with 50 mature individuals each	No
2016 (critical habitat, Maui Nui)	1+ (Maui) 6 (Molokai)	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
Date	No. wild individuals	No. outplanted	*Preventing Extinction Criteria identified by HPPRCC	*Preventing Extinction Criteria Completed?
2021 (5-year review)	ca 1 (O‘ahu) ca 2 (Maui) 0 (Moloka‘i)	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			Natural reproduction at all 3 populations	No
			3 populations with 50 mature individuals each	No

* 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 *Pteris lidgatei* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Degradation and destruction of habitat by feral ungulates	A	Ongoing	Partially, Kaluanui (O‘ahu) and Kahakuloa (Maui) are fenced
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	None
Degradation and destruction by landslides, drought, and erosion	A	Ongoing	None

Fire	A	Ongoing	Partial, fire management plan for military training areas
Predation and herbivory by ungulates	C	Ongoing	Partially, Kaluanui (O‘ahu) and Kahakuloa (Maui) are fenced
Predation and herbivory by invertebrates—slugs	C	Ongoing	None
Reduced viability due to low numbers	E	Ongoing	Partial, spore collection and propagation
Climate change, including hurricanes and drought	E	Ongoing	None

Synthesis:

Currently, there are two individuals of *Pteris lidgatei* on Maui and possibly one individual remaining on O‘ahu. The occurrence on Moloka‘i has not been observed in more than 10 years. Drought conditions are reported as a threat to occurrences on Maui. One area each on Maui and O‘ahu are fenced. A few explants are in a collection and spore collections from wild plants are ongoing.

Stabilizing (interim), downlisting, and delisting objectives were provided in the Final Recovery Plan for Four Species of Hawaiian Ferns (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 a (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.

Pteris lidgatei is a short-lived perennial terrestrial fern. 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, Maui, and/or Moloka‘i where they now occur or occurred historically and each of these populations must be naturally reproducing (i.e., viable spores, sporelings) with a minimum of 50 mature, reproducing individuals per population.

The preventing extinction goals for this species have not been met. There are only two individuals on Maui and possibly one individual on O‘ahu, and *Pteris lidgatei* is potentially extirpated from Moloka‘i. No reintroductions have been conducted. Genetic

representation is incomplete (Table 1). One area on O‘ahu and one area on Maui are protected by ungulate exclosures (Table 2). Therefore, *Pteris lidgatei* meets the definition of Endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

Drought is reported as a threat to occurrences on Maui; however, no significant new information regarding the species’ biological status has been reported since the last 5-year review in 2014. Thus, the following recommendations for future actions are added or reiterated for the 5-year review for 2021.

- Surveys and inventories—Continue to survey historical and current range to determine status of *Pteris lidgatei*.
- Ungulate monitoring and control—Continue to fence recently occupied areas to protect possible occurrences from the impacts of feral ungulates.
- Invasive nonnative plant monitoring and control—Eradicate invasive nonnative plants within the vicinity of all known occurrences.
- Predator and herbivore monitoring and control—Implement effective control measures for slugs at all *P. lidgatei* populations.
- Captive propagation for genetic storage and reintroduction—
 - Continue collection of genetic resources for storage, propagation, and reintroduction.
 - Develop propagation protocols for use in propagation of plants for reintroductions and augmentations.
- Reintroduction and translocation—Begin reintroduction efforts.
- Climate change adaptation strategy—Research suitability of habitat for reintroduction of this species in the future due to impacts of climate change, including hurricanes and drought.
- Alliance and partnership development—Continue to work with partners and other land managers in planning and implementation of remote monitoring methods and ecosystem-level restoration and management to benefit this taxon.

References:

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[US-NSTC] US National Science and Technology Council. 2008. Scientific assessment of the effects of global change on the United States. Committee on Environment and Natural Resources. 261 pp.

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

For Field Supervisor, Pacific Islands Fish and Wildlife Office

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