

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. 2012. Endangered and threatened wildlife and plants; 5-year status reviews of 46 species in Idaho, Oregon, Washington, Nevada, Montana, Hawaii, Guam, and the Northern Mariana Islands. Federal Register 77(44):13248-13251.

Lead Region/Field Office:

Region 1/Pacific Islands Fish and Wildlife Office (PIFWO), Honolulu, Hawaii

Name of Reviewer(s):

Chelsie Javar-Salas, Plant Biologist, PIFWO
Maui Nui and Hawaii Island Team Manager, PIFWO
Marie Bruegmann, 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 March 6, 2012. The review was based on a review of current, available information since the last 5-year review for *Pteris lidgatei* (USFWS 2009). The evaluation of Chelsie Javar-Salas, Plant Biologist, was reviewed by the Island 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).

Review Analysis:

Please refer to the previous 5-year review for *Pteris lidgatei* published on June 2, 2009 (available at http://ecos.fws.gov/docs/five_year_review/doc2437.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 *P. lidgatei*.

This short-lived terrestrial fern is endangered and is found on the islands of Oahu, Molokai, and Maui. The current status and trends for *Pteris lidgatei* are provided in the tables below.

New status information:

In addition to those populations cited in the previous 5-year review, new observations include the following:

- In 2010, there were 3 populations containing a total of 13 individuals of *P. lidgatei* on Oahu; 6 mature individuals at South Kaukonahua, 2 immature individuals and 2 sporophytes at Helemano, and 3 mature individuals at Kawaiiki (U.S. Army Garrison 2010).
- The exact numbers as reported in 2010 was reported in the 2011 report by the U.S. Army Garrison (2011).
- In 2012, there were 2 populations containing a total of 5 individuals of *P. lidgatei* on Oahu; a single mature individual at Kaluanui and 2 immature individuals and 2 sporophytes at Helemano (U.S. Army Garrison 2012).
- In 2013, only a single mature individual of *P. lidgatei* at Kaluanui was reported by the U.S. Army Garrison (2013).
- The Plant Extinction Prevention Program [PEPP] (2009) reported 3 populations containing a total of 17 individuals of *P. lidgatei* on Maui. In 2012, the number of individuals decreased from 17 to 15 individuals on Maui (PEPP 2012).
- On Oahu, there were 5 populations containing a total of 16 individuals (9 mature, 5 immature, and 2 sporophytes) (PEPP 2012).
- The final listing and critical habitat rule for Oahu reported there were 5 locations totaling between 17 and 24 individuals in the Koolau Mountains (USFWS 2012a).
- The proposed listing and critical habitat rule for Maui Nui reported there were 4 locations containing a total of 9 individuals of *P. lidgatei* on Molokai and Maui (USFWS 2012b).

Overall, the numbers of individuals have decreased from approximately 51 individuals reported in the previous 5-year review to approximately 18 wild mature individuals in 2014 (PEPP 2012; USFWS 2012b).

New threats:

- Landslides and flooding destruction or degradation of habitat – Landslides and erosion has been identified as a threat to this species on Maui and Oahu (PEPP 2009).
- Slug herbivory – Herbivory by slugs (unidentified species) has been reported as a new threat to this species (PEPP 2009).
- Climate change degradation of habitat – Climate change may pose a threat to this species. Fortini *et al.* (2013) conducted a landscape-based assessment of climate change vulnerability for native plants of Hawaii using high resolution climate change projections. Climate change vulnerability is defined as the relative inability of a species to display the possible responses necessary for persistence under climate change. The assessment by Fortini *et al.* (2013) concluded that *P. lidgatei* is moderately vulnerable to the impacts of climate change. Therefore, additional management actions are needed to conserve this taxon into the future.

New management actions:

- Captive propagation for genetic storage and reintroduction

- The Harold L. Lyon Arboretum Micropropagation Lab (2012, 2013) has an unspecified number of sporophytes of *P. lidgatei* in captive propagation.
- The National Tropical Botanical Garden (2013) has an unspecified amount of spores of *P. lidgatei* from Maui in genetic storage.
- Surveys / inventories – A survey of current locations containing *P. lidgatei* was conducted on Maui by PEPP (2010).
- Population viability monitoring and analysis
 - The Plant Extinction Prevention Program (2009, 2012) monitored the wild population at Schofield on the island of Oahu. A new individual was discovered during the 2009 monitoring effort.
 - The wild population of *P. lidgatei* on Maui was monitored by PEPP (2010, 2012).
- Listing and critical habitat designation
 - Eleven units of unoccupied and occupied areas of critical habitat for *P. lidgatei* were designated in the lowland wet ecosystem units on Oahu (USFWS 2012a).
 - Six units of unoccupied and occupied areas of critical habitat for *P. lidgatei* were proposed in the montane wet and wet cliff ecosystem units on Molokai (USFWS 2012b). On Maui, 11 units of unoccupied and occupied areas of critical habitat for *P. lidgatei* were proposed in the lowland wet and wet cliff ecosystem units. The final rule for critical habitat designations has not been published at the time of this review.

Synthesis:

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for four species of Hawaiian ferns (USFWS 1998), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Pteris lidgatei* is a short-lived perennial, and to be considered stable, this species must be managed to control threats (e.g. fenced) and be represented in an *ex situ* (at other than the plant's natural location, such as a nursery or arboretum) collection. In addition, a minimum total of three populations should be documented on islands where it now occur or occurred historically. Each of these populations must be naturally reproducing and increasing in number, with a minimum of 50 mature individuals per population.

The interim stabilization goals for this species have not been met, as no population of 50 or more mature individuals exists (Table 1) and all threats are not being sufficiently managed throughout all of the populations (Table 2). Therefore, *Pteris lidgatei* meets the definition of endangered, as it remains in danger of extinction throughout its range.

Recommendations for future actions:

- Surveys/inventories – Continue surveying geographical and historical range for a current assessment of the species' status.
- Captive propagation genetic storage and reintroduction
 - Continue collection of genetic resources for storage, propagation, and reintroduction into protected suitable habitat within historical range.
 - Evaluate genetic resources currently in storage to determine the need to place additional genetic resources in long-term storage due to this species' vulnerability to climate change.

- Ungulate monitoring and control – Fence remaining populations to protect them from the impacts of feral ungulates.
- Invasive plant monitoring and control – Eradicate invasive introduced plant species within the vicinity of all known individuals.
- Predator / herbivore monitoring and control – Control slugs within the vicinity of all known *P. lidgatei* populations.
- Population viability monitoring and analysis – Continue monitoring wild and outplanted individuals.
- Climate change adaptation strategy – Research the suitability of habitat for reintroducing this species in the future due to the impacts of climate change.
- 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 *Pteris lidgatei* from listing through current 5-year review.

Date	No. wild individuals	No. outplanted	Stabilization Criteria identified in Recovery Plan	Stabilization Criteria Completed?
1994 (listing)	26	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1998 (recovery plan)	33	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2003 (critical habitat)	37	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2009 (5-yr review)	51	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2012 (critical habitat)	13 (Oahu only)	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2012 (critical habitat – proposed)	9 (Molokai & Maui only)	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2014 (5-yr review)	18	0	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No

Table 2. Threats to *Pteris lidgatei* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulates – degradation of habitat and herbivory	A, C, D, E	Ongoing	Partially, Helemano is fenced
Invasive introduced plants	A, E	Ongoing	None
Landslides	A	Ongoing	None
Slug herbivory	C	Ongoing	None
Fire	E	Ongoing	None
Low numbers	E	Ongoing	Partially, captive propagation for genetic storage and reintroduction
Climate change	A, E	Increasing	None

References:

See previous 5-year review for a full list of references (USFWS 2009). Only references for new information are provided below.

Fortini, L., J. Price, J. Jacobi, A. Vorsino, J. Burgett, K. Brinck, F. Amidon, S. Miller, S. Gon II, G. Koob, and E. Paxton. 2013. A landscape-based assessment of climate change vulnerability for all native Hawaiian plants. Technical report HCSU-044. Hawaii Cooperative Studies Unit, University of Hawaii at Hilo, Hawaii. 141 pages.

Harold L. Lyon Arboretum Micropropagation Laboratory. 2012. Micropropagation database. University of Hawaii at Manoa, Honolulu, Hawaii. Unpublished.

Harold L. Lyon Arboretum Micropropagation Laboratory. 2013. Micropropagation database. University of Hawaii at Manoa, Honolulu, Hawaii. Unpublished.

National Tropical Botanical Garden. 2013. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. 30 pages. Unpublished.

[PEPP] Plant Extinction Prevention Program. 2009. Annual report for Plant Extinction Prevention Program, fiscal year 2009 (July 1, 2008-June 30, 2009). 115 pages. Unpublished.

[PEPP] Plant Extinction Prevention Program. 2010. Plant Extinction Prevention Program annual report, fiscal year 2010 (July 1, 2009-June 30, 2010). 122 pages. Unpublished.

[PEPP] Plant Extinction Prevention Program. 2012. Plant Extinction Prevention Program annual report, fiscal year 2012 (July 1, 2011-June 30, 2012). 169 pages. Unpublished.

U.S. Army Garrison. 2010. Status report for the Makua and Oahu implementation plans. U.S. Army Garrison, Hawaii and Pacific Cooperative Park Studies Unit. Schofield Barracks, Hawaii. 561 pages. Available online at <http://manoa.hawaii.edu/hpicesu/dpw_mit.htm>.

U.S. Army Garrison. 2011. Status report for the Makua and Oahu implementation plans. U.S. Army Garrison, Hawaii and Pacific Cooperative Park Studies Unit. Schofield Barracks, Hawaii. 265 pages. Available online at <http://manoa.hawaii.edu/hpicesu/dpw_mit.htm>.

U.S. Army Garrison. 2012. Status report for the Makua and Oahu implementation plans. U.S. Army Garrison, Hawaii and Pacific Cooperative Park Studies Unit. Schofield Barracks, Hawaii. 232 pages. Available online at <http://manoa.hawaii.edu/hpicesu/dpw_mit.htm>.

U.S. Army Garrison. 2013. Status report for the Makua and Oahu implementation plans. U.S. Army Garrison, Hawaii and Pacific Cooperative Park Studies Unit. Schofield Barracks, Hawaii. 177 pages. Available online at <http://manoa.hawaii.edu/hpicesu/dpw_mit.htm>.

[USFWS] U.S. Fish and Wildlife Service. 1998. Recovery plan for four species of Hawaiian ferns. U.S. Fish and Wildlife Service, Portland, Oregon. 78 pages.

[USFWS] U.S. Fish and Wildlife Service. 2009. *Pteris lidgatei* 5-year review short form summary. U.S. Fish and Wildlife Service, Honolulu, Hawaii. 7 pages.

[USFWS] U.S. Fish and Wildlife Service. 2012a. Endangered and threatened wildlife and plants; endangered status for 23 species on Oahu and designation of critical habitat for 125 species; final rule. Federal Register 77(181):57648-57862.

[USFWS] U.S. Fish and Wildlife Service. 2012b. Endangered and threatened wildlife and plants; listing 38 species on Molokai, Lanai, and Maui as endangered and designating critical habitat on Molokai, Lanai, Maui, and Kahoolawe for 135 species; proposed rule. Federal Register 77(112):34464-34775.

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

Pre-1992 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

for **Programmatic Deputy Field Supervisor, Pacific Islands Fish and Wildlife Office**

Maia M. Buegeman

Date *2014-06-05*