

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Lysimachia filifolia* (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 *Lysimachia filifolia* (USFWS 2017). 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 *Lysimachia filifolia* in the Federal Register on July 21, 2009, August 5, 2013, and September 16, 2017 (available at https://ecos.fws.gov/docs/tess/species_nonpublish/1386.pdf, https://ecos.fws.gov/docs/tess/species_nonpublish/2085.pdf, and https://ecos.fws.gov/docs/tess/species_nonpublish/2464.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 *L. filifolia*.

This short-lived perennial herb in the Primulaceae (primrose) family is endangered and occurs on the islands of Kaua‘i and O‘ahu. The status and trends for *Lysimachia filifolia* are provided in the tables below.

New Status Information:

- In 2012, critical habitat was designated on O‘ahu for *Lysimachia filifolia* in three units in the wet cliff ecosystem (2,000 hectares [ha], 4,944 acres [ac]) (77 FR 57648, September 18, 2012). Critical habitat as designated on Kaua‘i in 2003 remains the same (68 FR 9116, February 27, 2003).
- Currently, there are 10 to as many as 30 individuals of *L. filifolia* at Uwao and possibly five small subpopulations at Waiāhole (last estimated to total 100 individuals in 2015) on O‘ahu (PEPP 2015). The two remaining populations at Wainiha and Waikoko stream on Kaua‘i could not be relocated and were likely destroyed by rock falls (Plant Extinction Prevention Program [PEPP] 2015, 2017).

New Threats:

- None reported.

New Management Actions:

- Collection and propagation for genetic storage and reintroduction—
 - The Lyon Arboretum Micropropagation Laboratory reported propagation of 188 explants representing two founders from Waiāhole, O‘ahu (Lyon Arboretum 2020). In 2018, the Lyon Arboretum Seed Conservation Laboratory reported collection and storage of 780 seeds representing three founders from Uwao, O‘ahu (Lyon Arboretum 2020).
 - The State’s Native Ecosystems Protection and Management Program (NEPM) reported 10 plants in storage at the Pahole Rare Plant Facility representing four founders from Uwao, O‘ahu (NEPM 2020).
- Reintroduction and translocation—PEPP reintroduced 12 individuals near the Poamoho stream crossing (O‘ahu) in 2019 (PEPP 2019). The upper Poamoho area is fenced (USFWS 2018, unpublished).
- Population biology research—Cuttings were taken from plants at Waiāhole and Uwao for DNA analysis (PEPP 2014, 2015).

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

Date	No. wild individuals	No. outplanted	Stabilization Criteria identified in Recovery Plan	Stabilization Criteria Completed?
1994 (listing)	76 (Kaua‘i) 150–200 (O‘ahu)	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	Unknown

1995 (recovery plan)	25–75 (Kaua‘i) 150–200 (O‘ahu)	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2003 (critical habitat)	20–75 (Kaua‘i) 50 (O‘ahu)	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2009 (5-year review)	30 (Kaua‘i) >125 (O‘ahu)	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals	No
2012 (critical habitat-O‘ahu)	50–160 (O‘ahu)	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals	No
2013 (5-year review)	30 (Kaua‘i) 60 (O‘ahu)		All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals	No
Date	No. wild individuals	No. outplanted	*Preventing Extinction Criteria identified by HPPRCC	*Preventing Extinction Criteria Completed?

2017 (5-year review)	0 (Kaua'i) ca 100 (O'ahu)	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			Natural reproduction at all 3 populations	No
			3 populations with 50 mature individuals each	No
2021 (5-year review)	0 (Kaua'i) 10–30, possibly >100 (O'ahu)	12 (O'ahu)	All threats managed in all 3 populations	Partial, nonnative plant control at 1 reintroduction site on O'ahu
			Complete genetic storage	Partial, 6 founders from 2 O'ahu populations represented
			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 *Lysimachia filifolia* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Degradation and destruction of habitat by feral ungulates	A	Ongoing	Partial, reintroduction area is fenced
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	Partial, nonnative plant control at reintroduction site
Degradation and destruction by landslides	A	Ongoing	None
Predation and herbivory by rats	C	Ongoing	None

Predation and herbivory by invertebrates	C	Ongoing	None
Reduced viability due to low numbers	E	Ongoing	Partial, seed collection, propagation, and reintroduction
Climate change, including hurricanes	E	Ongoing	None

Synthesis:

Currently, on O‘ahu, *Lysimachia filifolia* totals 10 to 30 individuals at one location with possibly 100 individuals total at five separate waterfalls. The last known populations on Kaua‘i were not relocated and may have been destroyed by rock falls. Seed collections and propagation are ongoing and currently six founders from two populations O‘ahu are represented. Twelve plants were reintroduced on O‘ahu.

Stabilizing (interim), downlisting, and delisting objectives were provided in the Recovery Plan for the Kaua‘i Plant Cluster (USFWS 1995) 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.

Lysimachia filifolia is a short-lived perennial herb. 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 Kaua‘i and/or 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. There are an estimated total of 10 to 30 wild individuals on O‘ahu (possibly more than 100 if some locations are resurveyed) and no known individuals on Kaua‘i, and numbers continue to decline. Twelve individuals were reintroduced at one location on O‘ahu. No regeneration has been observed. There is partial genetic representation for populations on O‘ahu (Table 1). Not all threats are being addressed (Table 2). Therefore, *Lysimachia filifolia* meets the definition of Endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

We are not aware of any new threats or significant new information regarding the species' biological status since the last 5-year review in 2017. Thus, the following recommendations for future actions are reiterated for the 5-year review for 2021.

- Surveys and inventories—Continue surveys of current and potentially suitable habitat for a complete assessment of the species' status.
- Invasive plant monitoring and control—Control established ecosystem-altering nonnative invasive plant species, and those that compete with *Lysimachia filifolia* at all populations.
- Predator and herbivore monitoring and control—Implement effective measures to control rodents and determine and implement effective control methods for slugs.
- Captive propagation for genetic storage and reintroduction—Continue collection of genetic resources for storage, propagation, and reintroduction into managed suitable habitat.
- Reintroduction and translocation—
 - Continue reintroductions and augmentations into suitable habitat in areas that are managed for known threats.
 - Increase numbers of populations and individuals within suitable habitat to reduce impacts from rock falls and landslides.
- Climate change adaptation strategy—Research suitability of habitat for reintroduction of this species in the future due to impacts of climate change, including hurricanes.
- Population biology research—Study *L. filifolia* to determine viable population size and structure, geographical distribution, flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, limiting factors, and threats.
- 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 taxon.

References:

- [HPPRCC] Hawaii and Pacific Plants Recovery Coordinating Committee. 2011. Revised recovery objective guidelines. 8 pp.
- Lyon Arboretum. 2020. 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.
- [NEPM] Native Ecosystems Protection and Management. 2020. 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.

- [PEPP] Plant Extinction Prevention Program. 2014. PEPP annual report fiscal year 2014 (July 1, 2013-June 30, 2014). 185 pp.
- [PEPP] 2015. PEPP annual report fiscal year 2015 (July 1, 2014-June 30, 2015). 179 pp.
- [PEPP] 2017. Plant Extinction Prevention Program FY 2017 Annual Report (Oct 1, 2016-Sep 30, 2017), Coop Agreement: F14A00174, U.S. Fish and Wildlife Service CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, 235 pp.
- [PEPP] 2019. Plant Extinction Prevention Program, annual recovery subpermit FWSPIFWO-26 report (January 1st, 2018–December 31st 2018), as designated under the U.S. Endangered Species Act. Unpublished report submitted to U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawaii. 192 pp.
- [USFWS] U.S. Fish and Wildlife Service. 1995. Recovery plan for the Kaua‘i Plant Cluster. USFWS Region 1, Portland, OR. 270 pp.
- [USFWS] 2009. *Lysimachia filifolia* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI.
https://ecos.fws.gov/docs/tess/species_nonpublish/1386.pdf.
- [USFWS] 2012. Endangered and threatened wildlife and plants; endangered status for 23 species on Oahu and designation of critical habitat for 124 species. 77 FR 57648, September 18, 2012.
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https://ecos.fws.gov/docs/tess/species_nonpublish/2085.pdf.
- [USFWS] 2017. *Lysimachia filifolia* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI.
https://ecos.fws.gov/docs/tess/species_nonpublish/2464.pdf.
- [USFWS] 2018. GIS data for ungulate units, unpublished.
- [USFWS] 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.

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SIGNATURE PAGE for 5-YEAR REVIEW of *Lysimachia filifolia*
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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

_____ Date _____