

## 5-YEAR REVIEW

Short Form Summary

**Species Reviewed:** *Lysimachia scopulensis* (no common name)

**Current Classification:** Endangered

### **Federal Register Notice announcing initiation of this review:**

[USFWS] U.S. Fish and Wildlife Service. 2020. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 129 Species in Oregon, Washington, Idaho, Hawaii, Montana, California, and Nevada. Federal Register 85(48): 14240–14243, March 11, 2020.

### **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 or USFWS) beginning in October 2021. The review was based on a review of current, available information since the last 5-year review for *Lysimachia scopulensis* (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 (<https://ecos.fws.gov/ecp/species/8956>).

### **Review Analysis:**

Please refer to the previous 5-year review for *Lysimachia scopulensis* published in the Federal Register on September 16, 2017 (available at:[://ecos.fws.gov/docs/tess/species\\_nonpublish/2467.pdf](https://ecos.fws.gov/docs/tess/species_nonpublish/2467.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. scopulensis*.

This short-lived perennial shrub in the Primulaceae (primrose) family is listed as endangered and is known from the island of Kaua‘i. The status and trends for the two subspecies of *Lysimachia scopulensis* are provided in the tables below.

New Status Information:

- In 2017, there were approximately 15 individuals of *Lysimachia scopulensis* at Kalalau on Kaua‘i (Watson and Flynn 2015). In 2016, there was a patch that consisted of one to two individuals in the same area (Kishida et al. 2017) and later in 2016, only one individual remained (Perlman and Wood 2017). In 2019, three individuals were observed at Kalalau using drone technology (Nyberg 2019, in litt.). In 2021, two subpopulations were discovered in the Koai‘e-Kawai Iki ridge area, with 21 mature and 6 immature individuals at Koai‘e and 10 mature and 1 immature individuals at Kawai Iki (Plant Extinction Prevention Program [PEPP] 2021).

New Threats:

- None reported.

New Management Actions:

- Surveys and monitoring—In 2019, the population at Kalalau was monitored by drone technology and three individuals were found (Nyberg 2019, in litt.).
- Collection and propagation—
  - In 2017, the Plant Extinction Prevention Program (PEPP) collected seeds and cuttings from the last individual of *Lysimachia scopulensis* at Kalalau (PEPP 2017). The cuttings were successfully propagated and no further collections were made so as not to impact the wild plant (PEPP 2018).
  - In 2022, the Lyon Arboretum Micropropagation Laboratory reported storage of 328 explants representing one founder at Kalalau (Lyon Arboretum 2022). From 2021 to 2022, the Arboretum’s Seed Conservation Laboratory reported storage of 3,066 seeds representing 19 founders from one subpopulation and storage of 202 seeds representing four founders from a second subpopulation (Koai‘e) (Lyon Arboretum 2022).
- Reintroduction and augmentation—In 2016, PEPP and the National Tropical Botanical Garden (NTBG) reintroduced nine individuals of *Lysimachia scopulensis* to an enclosure at Kalalau (Kishida et al. 2016). In 2017, eight more plants were added (Kishida et al. 2017). In 2018, there were two mature and 16 immature plants remaining with an additional individual reintroduced (Kishida 2018).

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

| Date                                | No. wild individuals | No. outplanted | *Preventing Extinction Criteria identified by HPPRCC | *Preventing Extinction Criteria Completed? |
|-------------------------------------|----------------------|----------------|--|--|
| 2010 (listing and critical habitat) | 25–30                | 0              | All threats managed in all 3 populations             | No   |

|                      |                         |   |   |   |
|----------------------|-------------------------|---|---|---|
|                      |                         |   | Complete genetic storage  | No  |
|                      |                         |   | 3 populations with 100 mature individuals each                    | No  |
| 2017 (5-year review) | 16                      | 17  | All threats managed in all 3 populations                          | No  |
|                      |                         |   | Complete genetic storage  | Partially   |
|                      |                         |   | Reproduction (i.e., viable seeds, seedlings) at all 3 populations | Unknown   |
|                      |                         |   | 3 populations with 100 mature individuals each                    | Partially   |
| 2022 (5-year review) | 34 mature<br>7 immature | 1 added;<br>2 mature<br>16 immature remaining | All threats managed in all 3 populations                          | Partially, 1 reintroduced population in exclosure   |
|                      |                         |   | Complete genetic storage  | Partially, 24 founders in 2 populations represented |
|                      |                         |   | Natural reproduction at all 3 populations                         | Partially, seedlings observed at one location       |
|                      |                         |   | 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 scopulensis* and ongoing conservation efforts.**

| <b>Threat</b>  | <b>Listing factor</b> | <b>Current Status</b> | <b>Conservation/ Management Efforts</b>         |
|--|-----------------------|-----------------------|---|
| Degradation and destruction of habitat and herbivory by feral ungulates                      | A, C                  | Ongoing               | Partial, 1 reintroduced population in exclosure |
| Established ecosystem altering invasive plant species degradation of habitat and competition | A, E                  | Ongoing               | Partial, small exclosure is managed             |
| Landslide and flooding destruction or degradation of habitat                                 | A                     | Ongoing               | None  |

|   |   |         |   |
|---|---|---------|---|
| Climate change degradation and destruction of habitat, including hurricanes       | A | Ongoing | None                                    |
| Inadequacy of existing regulatory mechanisms—lack of adequate hunting legislation | D | Ongoing | None                                    |
| Reduced viability due to low numbers  | E | Ongoing | Partial, propagation and reintroduction |

**Synthesis:**

Currently, there are 34 mature and 7 immature wild individuals of *Lysimachia scopulensis* at three locations on Kaua‘i. Twenty-four founders from two populations are represented in collections. Propagules are in storage or are used for reintroduction, and at least 18 individuals were reintroduced to a fenced and managed area.

Stabilizing (interim), downlisting, and delisting objectives are provided in the Kaua‘i Islandwide Recovery Plan (USFWS 2021) 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 scopulensis* 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 Kaua‘i where this species now occurs 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 *Lysimachia scopulensis* have not been met. There are only 34 mature wild individuals (Table 1). Storage of seeds and propagules representing 24 founders from two populations, with some reintroduction, is ongoing (Table 1, Table 2). The reintroduced individuals are fenced and managed. However, the scattered populations, if not within exclosures, are susceptible other threats, including ungulate predation, nonnative plant competition, and landslides. Therefore, *L. scopulensis* meets the definition of Endangered as it remains in danger of extinction throughout its range.

### Recommendations for Future Actions:

No new threats and no significant new information regarding the species' biological status have been reported since the last 5-year review in 2017. Thus, the following recommendations for future actions are reiterated or updated for the 5-year review for 2022.

- Surveys and monitoring—Continue to survey for populations of *Lysimachia scopulensis* in areas of potentially suitable habitat and monitor known populations to determine their current status.
- Ungulate monitoring and control—Continue to construct and maintain exclosures to protect all occurrences from habitat disturbance and herbivory by feral ungulates.
- Nonnative invasive plant monitoring and control—Control established ecosystem-altering nonnative invasive plant species and those that compete with *L. scopulensis* at all populations.
- Climate change adaptation strategy—Research suitability of habitat for viability of species, including where to conduct translocations in the future due to impacts of climate change.
- Captive propagation for genetic storage and reintroduction—Continue propagation efforts for maintenance of genetic stock.
- Reintroduction and augmentation—Continue to reintroduce individuals into protected suitable habitat within historic range that is being managed for known threats to this species.
- Build resiliency and redundancy—Increase numbers of individuals and populations through historic range to reduce impacts of landslides and hurricanes.
- Population biology research—Study *Lysimachia scopulensis* populations to determine viable population size and structure, geographical distribution, 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 species.

### References:

[HPPRCC] Hawai'i and Pacific Plants Recovery Coordinating Committee. 2011. Revised recovery objective guidelines. 8 pp.

Kishida, W., S. Perlman, and K. Wood. 2016. Hawai'i Rare Plant Restoration Group (HRPRG) Field Data Form *in* PEPP 2019: Plant Extinction Prevention Program, FY 2019 Annual Report (Oct 1, 2018-Sep 30, 2019), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F18AC00502, December 26, 2019, UH Mānoa, PCSU, PEPP. 192 pp. + appendices. BioPacifica database record for *Lysimachia scopulensis*, Pacific Islands Fish and Wildlife Office.

- Kishida, W., L. Waiama, and A. Williams. 2017. Hawai'i Rare Plant Restoration Group (HRPRG) Field Data Form *in* PEPP 2019: Plant Extinction Prevention Program, FY 2019 Annual Report (Oct 1, 2018-Sep 30, 2019), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F18AC00502, December 26, 2019, UH Mānoa, PCSU, PEPP. 192 pp. + appendices. BioPacifica database record for *Lysimachia scopulensis*, Pacific Islands Fish and Wildlife Office.
- Kishida, W. 2018. Hawai'i Rare Plant Restoration Group (HRPRG) Field Data Form *in* PEPP 2019: Plant Extinction Prevention Program, FY 2019 Annual Report (Oct 1, 2018-Sep 30, 2019), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F18AC00502, December 26, 2019, UH Mānoa, PCSU, PEPP. 192 pp. + appendices. BioPacifica database record for *Lysimachia scopulensis*, Pacific Islands Fish and Wildlife Office.
- 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.
- Nyberg, B. 2019, in litt., Endangered surveys using unmanned aerial vehicle. National Tropical Botanical Garden, Kalaheo. 10 pp.
- Perlman, S. and K. Wood. 2017. Hawai'i Rare Plant Restoration Group (HRPRG) Field Data Form *in* PEPP 2019: Plant Extinction Prevention Program, FY 2019 Annual Report (Oct 1, 2018-Sep 30, 2019), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F18AC00502, December 26, 2019, UH Mānoa, PCSU, PEPP. 192 pp. + appendices. BioPacifica database record for *Lysimachia scopulensis*, Pacific Islands Fish and Wildlife Office.
- [PEPP] Plant Extinction Prevention Program. 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] 2018. Plant Extinction Prevention Program, fiscal year 2018 interim performance report (October 1, 2017-September 30, 2018) cooperative agreement F14AC00174, US Fish and Wildlife Service CFDA Program #15.657, Endangered species conservation—recovery implementation funds, University of Hawaii at Manoa, Pacific Cooperative Studies Unit, Plant Extinction Prevention Program. 49 pp.

[PEPP] Plant Extinction Prevention Program. 2021. Fiscal year 2021 interim performance report (October 1, 2020-September 30, 2021) cooperative agreements F18AC00502 and F19AC00532, US Fish and Wildlife Service CFDA Program #15.657, Endangered species conservation—recovery implementation funds, University of Hawaii at Manoa, Pacific Cooperative Studies Unit, Plant Extinction Prevention Program.

[USFWS] 2017. *Lysimachia scopulensis* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI.  
[https://ecos.fws.gov/docs/species\\_nonpublish/2467.pdf](https://ecos.fws.gov/docs/species_nonpublish/2467.pdf).

[USFWS] 2020. Endangered and threatened wildlife and plants; initiation of 5-year status reviews for 129 Species in Oregon, Washington, Idaho, Hawaii, Montana, California, and Nevada. Federal Register 85(48): 14240–14243, March 11, 2020.

[USFWS] 2021. Kaua'i Islandwide Recovery Plan. U.S. Fish and Wildlife Service, Portland, OR. 65 pp. + appendices.

Watson, J.C. and T. Flynn. 2015. *Lysimachia scopulensis*. The IUCN Red List of Threatened Species 2015: e.T80233116A80233168.  
<http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T80233116A80233168.en>.

**U.S. FISH AND WILDLIFE SERVICE**  
SIGNATURE PAGE for 5-YEAR REVIEW of *Lysimachia scopulensis*  
(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 \_\_\_\_\_