

2022 Annual Report for *Lathyrus holochlorus*



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PREFACE

IAE is a non-profit organization whose mission is the conservation of native ecosystems through restoration, research, and education. IAE provides services to public and private agencies and individuals through development and communication of information on ecosystems, species, and effective management strategies. Restoration of habitats, with a concentration on rare and invasive species, is a primary focus. IAE conducts its work through partnerships with a diverse group of agencies, organizations, and the private sector. IAE aims to link its community with native habitats through education and outreach.



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Cover photographs: *Lathyrus holochlorus* at Hansen in August 2022. Photo by Sara Alaica.

SUGGESTED CITATION

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EXECUTIVE SUMMARY

The Institute for Applied Ecology (IAE) has been working in partnership with the Bureau for Land Management (BLM) to restore the BLM-sensitive thin-leaved peavine (*Lathyrus holochlorus*) with the aim of preventing its federal and state listing. Since 2012, IAE has monitored populations, wild-collected seed, established a seed amplification field, and reintroduced thin-leaved peavine to six sites in the Willamette Valley. In 2022, IAE prepared two new plots for reintroduction by managing Himalayan blackberry (*Rubus armeniacus*) and helped support an existing population through late season mowing. In addition, IAE maintained the seed amplification bed and collected 1.8 grams of seed from Cutler Lane.

1. INTRODUCTION

Thin-leaved peavine (*Lathyrus holochlorus*) is a rare member of the pea family (*Fabaceae*). Both the Bureau of Land Management (BLM) and U.S. Fish and Wildlife Service (USFWS) consider thin-leaved peavine a species of concern and the Oregon Biodiversity Information Center (ORBIC) categorizes it as a List 1 species. Historically, thin-leaved peavine was found throughout the Willamette Valley and south towards Roseburg in Oregon, and in Lewis County, Washington. Most of the remaining populations exist along roadsides and unmowed fencerows, where they are commonly associated with Oregon white oak (*Quercus garryana*), common snowberry (*Symphoricarpos albus*), various species of rose (*Rosa* spp.), and poison oak (*Toxicodendron diversilobum*). Many populations are threatened by weed-management practices that utilize mowing and herbicides during the growing and reproductive season.

Thin-leaved peavine is a rhizomatous, perennial forb. Small populations are likely composed of a single, self-incompatible genetic clone that typically does not produce viable seed. IAE and volunteers from the Native Plant Society of Oregon (NPSO) conducted a range-wide inventory from 2012-2014 and found that 31% (37) of the 90 known populations appeared to be extirpated. Of the remaining 53 populations, 17 had 10 or less stems, 23 had 100 or less stems, and 13 had greater than 100 stems.

Since 2013, IAE has been collecting seed from remaining thin-leaved peavine wild populations (Table 1). Part of the seed went to establish a raised seed amplification bed at Oregon State University in 2014, which unfortunately failed to produce seed. In 2015, IAE used the remaining collected seed to grow 1,000 plugs at the Corvallis Plant Materials Center for outplanting.

Table 1. Thin-leaved peavine (*Lathyrus holochlorus*) seed collected from wild populations.

Year collected	Cleaned weight (g)
2021	17.87
2020	66.05
2019	32
2016	47
2015	47.9
2014	126.2
2013	174.2

In 2016, IAE planted 1,000 thin-leaved peavine plugs at four sites: Hansen, South Taylor, Dorena Prairie (“East” and “West” plots) and Bake Stewart (“East” and “West” plots) (Appendix A). Bake Stewart Park is public land managed by the U.S. Army Corps of Engineers (ACOE). All other sites are on public lands managed by the BLM. In 2018, 1,464 thin-leaved peavine plugs were planted at two additional sites: Herbert Farm and Natural Area (“Big” and “Small” plots), and Greenbelt Land Trust’s Bald Hill Farm (“Big” and “Small” plots). An additional plot was established near the existing outplanted plot at Hansen (Appendix A).

IAE monitored outplanting survival at all sites except for the Bald Hill Farm Small plot (Table 2). Because of low survival rates, monitoring only continued at the six original planting sites after 2019. The most recent monitoring took place in June 2021, when IAE found the highest survival rates at Dorena Prairie East (22%) and Hansen (20%). Based on these results, the BLM decided to focus restoration efforts on these two sites in 2022.

Since the creation of the original seed amplification bed in 2014, IAE has created a new seed amplification field in 2020 using nursery-grown plugs from wild-collected and donated seed from the NRCS Plant Materials Center. In 2021, IAE interplanted live stakes of snowberry (*Symphoricarpos albus*) to provide dappled light and structure for the thin-leaved peavine to grow on. The thin-leaved peavine did not produce seed in 2020 or 2021.

Table 2. Outplanting sites and survival rates of thin-leaved peavine (*Lathyrus holochlorus*).

Site	Year Planted	Number of Plugs	Most Recent Survey	Most recent survival data. No. (%)
Bake Stewart E	2016	200	2021	20 (10%)
Bake Stewart W	2016	200	2021	23 (12%)
Dorena Prairie E	2016	100	2021	22 (22%)

Dorena Prairie W	2016	100	2021	0
Hansen	2016	200	2021	40 (20%)
South Taylor	2016	200	2021	9 (5%)
Herbert Farm Big	2018	64	2019	1 (1%)
Herbert Farm Small	2018	64	2019	2 (4%)
Hansen RAC	2018	500	2019	45 (9%)
Bald Hill Farm Big	2018	312	2018	102 (33%)
Bald Hill Farm Small	2018	188	No data	No data

2. GOALS AND OBJECTIVES

The goal of this project is to prevent the listing of thin-leaved peavine. The primary objectives are to:

1. maintain thin-leaved peavine seed amplification fields ;
2. continue to collect wild seed from a geographical range of extant populations to maintain genetic diversity;
3. monitor the establishment of outplanted plugs and seeded plots; and
4. improve habitat quality at reintroduction sites to increase plant-establishment success.

3. 2022 RESTORATION ACTIONS

3.1 Wild seed collection

In 2022, IAE collected approximately 1.8 grams of thin-leaved peavine seed from the Cutler Lane site.

3.2 Seed production

The seed amplification field did not produce seed in 2022. In March, IAE fertilized the field with 40 lb/acre of nitrogen, and installed a 24" tall wind fence on the south side of the thin-leaved peavine bed to protect the plants from the brightest sun of the day. There was predation from slugs, ants, and mice, which IAE controlled using traps and bait. The thin-leaved peavine grew steadily and sent out rhizomes, but did not flower in 2022.

3.3 Habitat enhancement

IAE visited three outplanting sites in 2022 and established two new plots at Hansen (Table 3). During ongoing monitoring of thin-leaved peavine, IAE observed that sites with higher levels of shrub cover appeared to have slightly higher rates of survival (Lebo and Esterson 2022). For this reason, IAE and the BLM selected locations for the new plots that are suitable for shrub establishment (Figure 1). To create space for planting and to prevent the existing Himalayan blackberry from outcompeting the thin-leaved peavine, IAE sprayed and mowed the plots to reduce shrub density.

Table 3. Restoration actions completed in 2022.

Date	Staff	Restoration action
8/3/2022	Sara Alaica, Andrew Esterson, Paul Reed, Zade Clark-Henry (IAE); Jessica Celis (BLM)	Visited thin-leaved peavine plots at Dorena Prairie, Hansen, and Bake Stewart. Took photopoints at Hansen.
8/25/ 2022	Sara Alaica, Andrew Esterson, Paul Reed (IAE)	Established two new plots at Hansen by broadcast spraying Himalayan blackberry (<i>Rubus armeniacus</i>).
9/27/2022	Sara Alaica, Paul Reed, Tyler Roberts (IAE)	Mowed Himalayan blackberry (<i>Rubus armeniacus</i>) from two new plots at Hansen
10/26/2022	Zade Clark-Henry (IAE)	Mowed diagonal strips through Dorena Prairie East plot

**Figure 1.** New reintroduction plot at Hansen in September 2022, after spraying (left), and in September 2022, following spraying and mowing (right).

4. 2023 MANAGEMENT RECOMMENDATIONS

- Document number of plants present at five of the original outplanted plots: Bake Stewart East and West, Dorena Prairie East, Hansen, and South Taylor.
- Mow approximately 40-60% of the Himalayan blackberry from plots that have thin-leaved peavine when shrub growth becomes too dense.
- Collect wild seed of thin-leaved peavine to use for plug production or to support seed amplification efforts.

REFERENCES

Lebo, C. and Esterson, A. 2022. *Lathyrus holochlorus*: 2021 Annual report. Unpublished report for the Bureau of Land Management, Northwest Oregon District. Institute for Applied Ecology. Corvallis, OR.

APPENDIX A. THIN-LEAVED PEAVINE INTRODUCTION PLOT MAPS.

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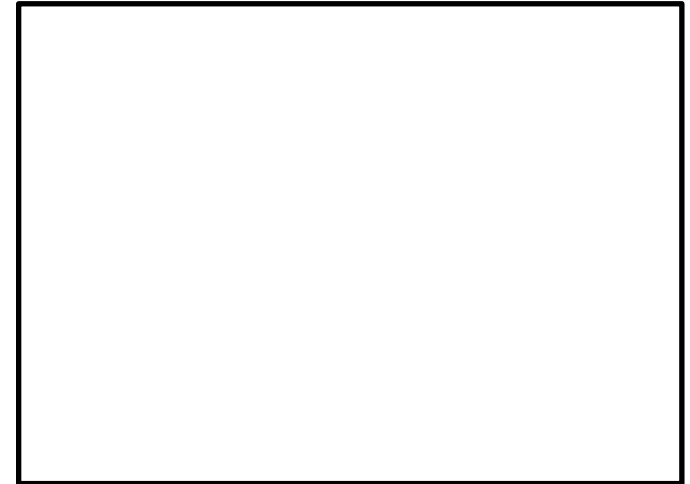


Figure 1. The white outlines show the perimeter of the introduction plots planted in 2016 at Dorena Prairie. The small orange box near the Dorena East introduction plot is the seed plot that was added in 2019.

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Figure 2. The white outlines show the perimeter of the introduction plots planted in 2016 at Bake Stewart Park. The small orange box near the west introduction plot is the seed plot that was added in 2019.

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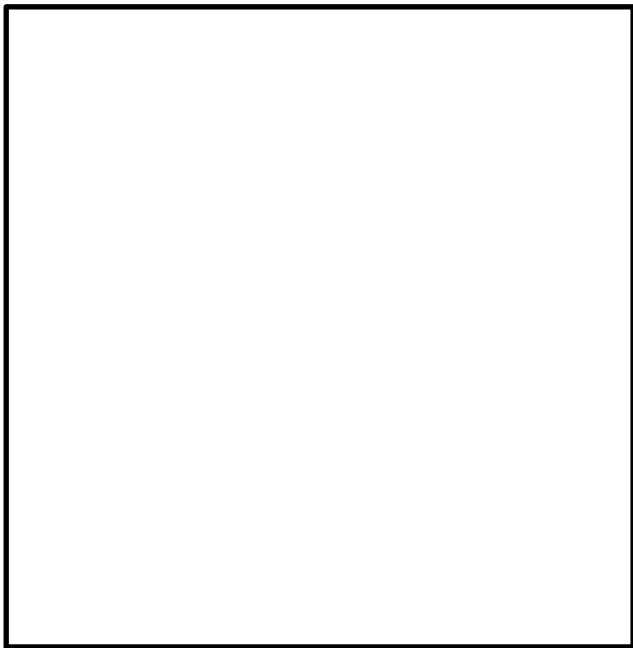


Figure 3. The white outline shows the perimeter of the introduction plot planted in 2016 at Hansen. The small orange box near the plot is the seed plot that was added in 2019. WEW = West Eugene Wetlands.

Figure 4. The white outline shows the perimeter of the introduction plot planted in 2016 at South Taylor. The small orange box near the introduction plot is the seed plot that was added in 2019. WEW = West Eugene Wetlands.

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Figure 5. Big (south) and Small (north) introduction plots at Herbert Farm.

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Figure 6. Big (east) and Small (west) introduction plots at Bald Hill Farm.

APPENDIX B. THIN-LEAVED PEAVINE PHOTOPOINTS.

Hansen



Bake Stewart East



Bake Stewart West



Dorena East



Dorena West



South Taylor



APPENDIX C. PLUG INTRODUCTION PLOT LOCATIONS AND DATES OF ESTABLISHMENT

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APPENDIX D: HISTORY OF COMPLETED RESTORATION ACTIVITIES (2012-2022)

2012

- Obtained historic location records from the Oregon Biodiversity Information Center (ORBIC) and the U.S. Fish and Wildlife Service (USFWS).
- Visited small local populations in Corvallis to increase familiarity of species appearance, habit, and phenology.
- Prioritized sites and made maps to prepare for field surveys in 2013.

2013

- Inspected site and coordinated with partners.
- Removed Scotch broom, Himalayan blackberry, and fruit trees.
- Surveyed known locations of thin-leaved peavine. IAE and Native Plant Society (NPSO) volunteer Julie Gibson visited a total of 62 sites.
- IAE collected a total of 174.2 grams of seed from 12 different populations with the two largest populations yielding 73.5% of the total collected by weight.
- Tested germination and planted germinated seeds in greenhouse to test results of different types of cultivation.

2014

- IAE and NPSO surveyed 90 of the 109 sites visited in 2013 and 2014.
- Collected 126.2 grams of seed from 20 different populations in July and August.
- Conducted germination trials.
- Direct seeded into a raised bed at the Forestry Sciences Laboratory (FSL) at OSU.

2015

- Collected 47.8 grams of seed.
- Grew 1,000 plants at the NRCS Corvallis Plant Materials Center.
- IAE grew 100 second year-old plants.
- Visited four potential introduction sites selected for soils, habitat, and location.
- Mowed introduction sites with hand-held brush cutter to reduce vegetation height and limit competing vegetation and root grubbing by Himalayan blackberry.

2016

- Due to poor germination at FSL, planted two beds totaling 480 ft² with nursery-grown plugs in March. Weeded, fertilized, and irrigated beds. None of the transplants flowered or set seed in 2016.
- Transplanted 1,000 plants to four introduction sites in March: Dorena East and West, Bake Stewart East and West, Hansen, and South Taylor.

- Monitored introduction plots for survival and plant community composition and analyzed and synthesized data.

2017

- Weeded FSL beds and replaced dead plants with live transplants.
- Monitored introduction plots for survival and plant community composition and analyzed and synthesized data.

2018

- Weeded FSL beds.
- Established and planted 1,464 thin-leaved peavine at five new introduction plots: Herbert Big and Small, Bald Hill Big and Small, and Hansen RAC.
- Monitored introduction plots for survival and plant community composition and analyzed and synthesized data.
- Weeded introduction plots.

2019

- Weeded FSL beds.
- Monitored outplanted plots and analyzed data.
- Collected seed from four wild populations: Coyote Spencer Wetland, Cutler Lane, Fish Hatchery Road, and Linn Benton Community College.
- Planted 59 shrubs in 3 locations with highest potential for site enhancement.

2020

- Monitored outplanted plots and analyzed data.
- Collected seed from large, healthy, wild populations.
- Established seed production field.

2021

- Monitored outplanted plots and analyzed data.
- Collected seed from large, healthy, wild populations.
- Took photo points in June.

2022

- Maintained seed amplification beds and installed protective fencing.
- Collected 1.8 grams of seed from Cutler Lane.
- Visited five introduction plots: Dorena East and West, Bake Stewart East and West, and Hansen.
- Prepared two new plots at Hansen by spraying Himalayan blackberry with Garlon 31 (triclopyr) in August and mowing in October.
- Mowed diagonal strips in Dorena East and West introduction plots with brush cutter.