

FIVE-YEAR REVIEW
Western lily (*Lilium occidentale*)
July 2019

GENERAL INFORMATION:

Species: Western lily (*Lilium occidentale*)

Date listed: August 7, 1994

FR citation(s): Western lily final listing rule: 59 FR 42171 42176 - ETWP; Determination of Endangered Status for *Lilium Occidentale* (Western Lily; 08/07/1994)

Classification: Endangered

BACKGROUND:

Most recent status review: Western lily Five-year Review: 75 FR 28636 28642 - Initiation of Five-Year Reviews of 34 Species in California and Nevada; Availability of 96 Completed Five-Year Reviews in California and Nevada (05/21/2010).

Initiation of western lily Five-year Review: 83 FR 28251 28254 - Endangered and Threatened Wildlife and Plants; Initiation of Five-Year Status Reviews of 50 Species in California, Nevada, and the Klamath Basin of Oregon (06/18/2018).

ASSESSMENT:

This Five-year Review was conducted by the U.S. Fish and Wildlife Service's (Service) Arcata Field Office. Data for this review were solicited from interested parties through a Federal Register notice announcing this review on June 18, 2018. To request any data or information we should consider in our review we also contacted David Imper, retired Service botanist and western lily expert; Madeline VanderHeyden, Service species lead for western lily in Region 1; and Wiyot Tribe botanist, Adam Canter. Additionally, we conducted a literature search and a review of information in our files.

We received detailed population accounts for each of the populations in Oregon (Recovery Zones 1, 2, 3, and 4). The results indicate that populations are responding favorably to management activities which promote early successional habitat; however, the extent of these management activities is declining due to competing priorities, as well as a lack of financial and time resources for the land management agencies. Although some sites have experienced more frequent or expansive management and restoration activities, the lack of time and financial resources has reduced the expanse and frequency of management activities overall. Due to a combination of reduced frequency of natural disturbance and decrease in management, many populations of *L. occidentale* have declined.

Novel populations of *L. occidentale* have been documented since the previous review; however, the overall range of the species remains unchanged, thus this information does not alter our understanding of the species' current range (Vander Heyden 2018; Service 2009).

Notable updates*Floras Lake Restoration, Curry County, OR (Recovery Zone 2)*

Restoration activity since the last Five-year review was focused primarily at Floras Lake State Natural Area (FLSNA) where *L. occidentale* habitat northwest of the airport runway was expanded by cutting encroaching native shrubs and gorse (*Ulex europaeus*). This work focused on connecting two known populations of *L. occidentale*, with the belief that additional *L. occidentale* was present but suppressed by heavy tree and shrub canopies. Brush work entailed chainsaw and lopper cutting, followed by hand-hauling of brush to an adjacent dirt skid road for mechanical mulching. Approximately 6 acres were cleared and more work is planned. Although survey data are not available, additional *L. occidentale* were discovered in and adjacent to the cleared area, thus it is likely that the population at that site has the potential to expand with continued restoration work.

Surveys conducted at another site at FLSNA found approximately the same number of flowering plants in 2012 as in 2014 (50 and 47 respectively), but the total number of plants declined from 131 to 56. Anecdotal observations at other historically occupied sites at FLSNA found few, if any, *L. occidentale*. Without additional survey data, it is difficult to determine the overall trend throughout FLSNA.

Population augmentation efforts have been implemented at FLSNA to increase the *L. occidentale* population. In 2017, as part of a population augmentation effort, 448 bulbs were planted at FLSNA, with a survival rate of 19% (Coos Watershed Association 2017).

Crescent City Marsh Outflow Restoration, Del Norte County, CA (Recovery Zone 5)

Since the last Five-year review, the California Department of Transportation (Caltrans) purchased an additional 40 acres of wetlands at Crescent City Marsh. These lands were subsequently deeded to the California Department of Fish and Wildlife (CDFW) along with an endowment to allow for management of the newly acquired lands in perpetuity. This is especially notable since Crescent City Marsh contains the largest number of flowering plants for any population of *L. occidentale*. The addition of these 40 acres will enable more efficient management of the site. For example, Caltrans' purchase of the additional 40 acres has fostered a collaborative project between CDFW, Caltrans, and the Service to restore the outflow capabilities of the Crescent City Marsh by reconnecting the marsh to a culvert under U.S. Highway 101 that has not functioned since the 1980s. Restoration of outflow will allow for more natural hydrological function of the system and provide an appropriate dry-down function during the summer months. Artificially-elevated water levels in the marsh has shown to reduce *L. occidentale* reproduction. This project was completed in September 2018.

In addition, the Elk Valley Rancheria has proposed to construct a casino south of Crescent City Marsh. Construction will include paving areas that are currently vegetation-covered and permeable. The designs for casino construction include measures to slow the flow of runoff from the paved areas as well as developing a monitoring plan to note changes in water table depth at areas of the marsh adjacent to the proposed casino location.

Novel populations since last Five-Year Review

Indian Point, Coos County, OR (Recovery Zone 1)

In June of 2013, a new *L. occidentale* population was discovered on private property located on the South Slough estuary of Coos Bay. Consisting of forested upland, tidelands, and salt marsh, the property known as Indian Point was acquired in 2014 by the Department of State Lands through a National Coastal Wetlands Conservation grant and added to the South Slough National Estuarine Research Reserve. The extent of viable habitat for *L. occidentale* appears to be defined by the extent of Blacklock soil and is characterized by the presence of western Labrador tea (*Rhododendron neoglandulosum*). In 2017, Indian Point was extensively surveyed. A total of 1,166 total *L. occidentale* were detected, of which 112 (9%) were in flower (Beekan and Shrager 2017). In 2018, 1,222 total plants were detected, with 92 in flower (7%; Schmitt, 2018 pers. comm.). The low percentage of reproductive individuals is likely a result of densely vegetated habitat conditions leading to competition for sunlight and water.

Specifically, the *L. occidentale* population at Indian Point is threatened by a dense canopy of shore pine (*Pinus contorta*) and other conifers, in combination with understory shrubs including: evergreen huckleberry (*Vaccinium ovatum*), pacific wax myrtle (*Myrica californica*), cascara (*Rhamnus purshiana*), red huckleberry (*Vaccinium parvifolium*), salal, (*Gaultheria shallon*), salmonberry (*Rubus spectabilis*), red alder (*Alnus rubra*), and western Labrador tea (*Rhododendron neoglandulosum*). To address this threat, habitat restoration to promote population viability and expansion began in 2018. Using hand crews, shrubs in the treatment area were cut back to 3-feet in height, trees less than 12-inches diameter at breast height were removed, and larger trees were girdled or topped. In addition, all cut woody debris was transported out of the area. Approximately 10 acres were treated. Biomonitoring surveys, including vegetation plot surveys and water table monitoring will track vegetation and groundwater changes and measure *L. occidentale* response. The South Slough National Estuarine Research Reserve has identified the improvement of *L. occidentale* habitat as the highest restoration priority on Indian Point (Beekan and Shrager 2017).

Sixes Headland, Floras-Blacklock State Park/Private, Curry County, OR (Recovery Zone 2)

In 2017, the Oregon Parks and Recreation Department (OPRD) purchased additional property adjacent to the Floras Lake State Natural Area. The property consists of ocean beach backed by forested uplands. During an assessment of the property, a new population of *L. occidentale* was discovered along the margin of the forest, adjacent to and also within a privately owned pasture used for livestock grazing. Thirty-five flowering plants were counted on the OPRD property (Laier, 2018 pers. com), and an extensive survey, including the private land, documented 641 plants, with 300 in flower (Bird, 2018 pers. com). The pasture is densely vegetated with forage grasses, thus it is probable that additional nonflowering plants were present but not observed. Discussions with OPRD and the private landowner are in the early stages. To date, the landowner has expressed support for actions that would, at a minimum, continue to maintain the plants while retaining grazing operations, and OPRD is interested in actions on OPRD property to expand the population. The Service will work closely with OPRD and the private landowner to develop a restoration plan.

Conclusion

After reviewing the best available scientific information, we conclude that western lily (*Lilium occidentale*) remains an endangered species. The evaluation of threats affecting the species under the factors in 4(a)(1) of the Endangered Species Act and analysis of the status of the species in our “*Lilium occidentale* (western lily) Five-Year Review: Summary and Evaluation” remain an accurate reflection of the species current status.

RECOMMENDATIONS FOR FUTURE ACTIONS:

All occupied *L. occidentale* sites need improvement to fully restore the extent of suitable *L. occidentale* habitat to reach recovery goals and prevent further extirpation. The apparent decline of populations at two Oregon state parks is of concern, and populations at the other parks, while stable, are relatively low given the amount of potentially suitable habitat. While augmentation and small scale, ongoing efforts to remove invasive vegetation have been successful at maintaining and possibly expanding a few populations, it is unlikely that recovery goals will be significantly advanced without more extensive work targeting larger areas. Therefore, the Service should continue to support habitat restoration on state lands while encouraging, where feasible, a greater effort to expand occupied *L. occidentale* sites.

The current grazing lease at Cape Blanco State Park should be managed to promote and maintain *L. occidentale* habitat. At Floras Lake State Natural Area, a broader, landscape level view should be taken in light of the widely distributed yet fragmented populations present and high availability of potentially suitable habitat.

Monitoring efforts have suffered due to lack of staff time and budgetary constraints. To support management decisions and recovery actions, repeatable, rigorous survey efforts should be conducted for each *L. occidentale* population. Survey schedules should be developed for each occupied site. Furthermore, data collection should follow established protocols, and data should be entered into a database housed by the Service.

L. occidentale habitat should be conserved through conservation easements, and property acquisition should be pursued for populations on private lands that remain threatened by agriculture or development. Section 6 Non-traditional Recovery Grants may be used to secure conservation easements or acquire property, provided there is support from the Oregon Department of Agriculture and local land trust support. Obtaining endowment funds to cover land trust long-term expenses remains challenging, as does the challenge of negotiating a price for property acquisition.

The Service needs to continue to work with the Bonneville Power Administration (BPA) to consult on actions occurring within BPA's right-of-ways that adversely affect *L. occidentale*. BPA's vegetation maintenance activities are credited with maintaining suitable habitat, yet much could be done to improve right-of-way management for *L. occidentale*. Examples include signage to inform powerline workers of sensitive habitats, training of workers in best management practices for those habitats, and better security to prevent trespass and damage by unauthorized vehicles.

REFERENCES

Beekan, N. and H. Schrager. 2017. Indian Point restoration plan. South Slough National Estuarine Research Reserve. Charleston, OR. 80pp.

Bird, T. 2018. Pers.com. Port Orford, OR.

Coos Watershed Association. 2017. Western lily restoration and monitoring: final report for U.S. Fish and Wildlife Service Cooperative Agreement F14AC00695. Coos Bay, OR. 13pp.

Laier, S. 2018. Pers. Com. Natural Resources Specialist, Oregon Parks and Recreation Department, Charleston, OR.

Schmitt, J. 2018. Pers. Com. Watershed Monitoring Coordinator, South Slough National Estuarine Research Reserve, Charleston, OR.

(Service) U.S. Fish and Wildlife Service. 2009. *Lilium occidentale* (Western lily) 5 Year Review: Summary and Evaluation. Sacramento, California. 49 pp.

Vander Heyden, M. 2018. General Overview of *Lilium occidentale* Actions and Status in Oregon since 2008. Unpublished Report. Bandon, OR. 9pp.

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Approve Jennifer R. Noves Date 7/29/2019

