NERR RESTORATION SERIES

HABITAT IMPROVEMENT FOR THE ENDANGERED WESTERN LILY

Overview

A ten-acre upland forest stand was managed for the recovery of western lily *(Lilium occidentale*) populations in 2018. Following listing as an endangered species in Oregon in 1989 and federally in 1994 the western lily continued to experience decline, primarily due to reduction of habitat.

In 2017 a census within South Slough Reserve showed that this was one of the largest known populations of western lily (1,166 individual plants); however, with only 9% of plants in bloom it was clear that this population was experiencing reduced reproductive output due to stress. Forest regeneration, following logging in the 1990's, had resulted in dense canopy cover and decreased soil moisture, through increased transpiration in aging trees. Western lilies lose reproductive ability in areas of 60-70% canopy closure and are particularly sensitive to changes in hydrology. This restoration project strategically removed trees and shrubs in habitat suitable for lily populations, thus reducing impacts from both increased shade and decreased soil moisture. The goal of these restoration actions was to enhance habitat so that existing populations of western lily would naturally increase.

PROJECT GOAL: INCREASE THE REPRODUCTIVE POPULATION OF THE ENDANGERED WESTERN LILY

Project Location

South Slough National Estuarine Research Reserve

Project Duration

April 2014 to 2020

Project Contact

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Project Size

10 acres (4 hectares)

Primary Cause of Degradation

Suppressed forest disturbance

Project Partners/Funders

US Fish and Wildlife Service

South Coast Land Conservancy

Oregon Department of State Lands

Gustafson Estate

Coos Watershed Association

Friends of South Slough, Inc.

Description of Project Activities

Following a lily habitat viability assessment, vegetation was managed within an area of suitable habitat along with a nearby area used to redirect some deer browsing pressure. Habitat viability was assessed based on the presence of an indicator species (western Labrador tea; *Rhododendron neoglandulosum*), extent of blacklock soils and presence of lilies in a 2016 survey. Vegetation was removed from the restoration area in March and April 2018. Shrubs and brush species were cut down to 3-foot maximum height, 75% of trees under 12" diameter at breast height (DBH) were removed and 25% of larger trees were girdled, topped or removed. Simultaneous clearing of vegetation near the site was used to redirect some deer browsing pressure away from the lily population and in June 2019 reserve staff will incorporate several deer exclusion areas.

Ecological Outcomes Achieved

Managing a population under stress required long term monitoring and may take several years for plants to reestablish adequate resources to complete reproduction. Outcomes from one year following restoration include:

- The lily habitat has shifted from a dense tree/shrub canopy with low light penetration to open early seral habitat.
- The 2018 lily census recorded an increase in total number of plants (by 56 individuals) from the pre-restoration values. With a shift from single leaf dominated population to a vegetative dominated population, suggesting an increase in overall vigor.

Monitoring

Monitoring throughout the project includes:

- Western lily count census
- Vegetation plot surveys
- Tree and shrub surveys
- Water table monitoring
- Deer browse monitoring

Lessons Learned

Manipulation of one ecological stressor can open the potential for another. By removing dense vegetation from lily habitat, an increased stress of deer browsing has been observed. Reserve staff are taking an adaptive management strategy and installing exclusion fences in 2019 to asses browsing impacts.

About the National Estuarine Research Reserve System

The National Estuarine Research Reserve System is a network of 28 protected areas established by partnerships between the National Oceanic and Atmospheric Administration and coastal states. The NERRS protect and conserve 1.3 million acres of coastal and estuarine habitat, while also facilitating improved stewardship of coastal habitats outside of Reserve boundaries. Learn more at https://coast.noaa.gov/nerrs/