# Global Reintroduction Perspectives: 2018

Case studies from around the globe

Edited by Pritpal S. Soorae

IUCN/SSC Reintroduction Specialist Group (RSG)

RSG

هيئة البيئة - أبوظبي
Environment Agency - ABU DHABI

calgaryzoo

Turner Endangered Species Fund

The designation of geographical entities in this book, and the presentation of the material, do not imply the expression of any opinion whatsoever on the part of IUCN or any of the funding organizations concerning the legal status of any country, territory, or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The views expressed in this publication do not necessarily reflect those of IUCN.

**Published by:** IUCN/SSC Reintroduction Specialist Group & Environment Agency-Abu Dhabi

**Copyright:** © 2018 IUCN, International Union for Conservation of Nature and Natural Resources

Reproduction of this publication for educational or other non-commercial purposes is authorized without prior written permission from the copyright holder provided the source is fully acknowledged.

Reproduction of this publication for resale or other commercial purposes is prohibited without prior written permission of the copyright holder.

**Citation:** Soorae, P. S. (ed.) (2018). *Global Reintroduction Perspectives: 2018. Case studies from around the globe*. IUCN/SSC Reintroduction Specialist Group, Gland, Switzerland and Environment Agency, Abu Dhabi, UAE. xiv + 286pp.

6th Edition

**ISBN:** 978-2-8317-1901-6 (PDF)
978-2-8317-1902-3 (print edition)

DOI: https://doi.org/10.2305/IUCN.CH.2018.08.en

**Cover photo:** Clockwise starting from top-left:
I. Reticulated python, Singapore © ACRES
II. Trout cod, Australia © Gunther Schmida (Murray-Darling Basin Authority)
III. Yellow-spotted mountain newt, Iran © M. Sharifi
IV. Scimitar-horned oryx, Chad © Justin Chuven
V. Oregon silverspot butterfly, USA © U.S. Fish and Wildlife Service
VI. Two-colored cymbidium orchid, Singapore © Tim Wing Yam
VII. Mauritius fody, Mauritius © Jacques de Spéville

**Cover design & layout by:** Pritpal S. Soorae, IUCN/SSC Reintroduction Specialist Group

**Printed by:** Arafah Printing Press LLC, Abu Dhabi, UAE

**Download at:** www.iucnsscrsg.org
www.iucn.org/resources/publications

# Reintroduction of the Oregon silverspot butterfly on the Oregon Coast, Tillamook County, Oregon, USA

**Anne Walker**

**Fish and Wildlife Biologist, US Fish and Wildlife Service, Newport Field Office, 2127 SE Marine Science Drive, Newport, Oregon, 97365, USA anne_walker@fws.gov**

## Introduction

The Oregon silverspot butterfly (OSB) (*Speyeria zerene hippolyta*) was listed as a threatened species under the United States Endangered Species Act (ESA) in 1980. Originally documented from 20 locations along the Pacific coast from northern California to Washington, in 2016 the OSB had just five populations. The greatest threat to the OSB is the lack of suitable habitat. The small number, isolation, and population size are also threats to the species. Following two consecutive drought years in 2014 and 2015, all extant OSB populations experienced significant population declines, indicating the species was at great risk of extirpation. In 2015 - 2017 the US Fish and Wildlife Service (USFWS) restored 12 ha of coastal prairie habitat, planting 56,000 early blue violets (*Viola adunca*), the caterpillar host plant, and thousands of nectar plants on the Nestucca Bay National Wildlife Refuge, in Tillamook County, Oregon, USA. In August of 2017, over 900 OSB caterpillars were released into the newly created habitat. This population was established as a nonessential experimental population (USFWS, 2017). A second reintroduction is planned for 2018 within historical habitat on Oregon Parks and Recreation Department (OPRD), Saddle Mountain State Natural Area, in Clatsop County, Oregon, which currently supports suitable habitat for the butterfly.

Oregon silverspot butterfly

## Goals

- Goal 1: Re-establish an OSB population to minimize the species extinction risk and contribute to the 10 populations needed for recovery.
- Goal 2: Test whether habitat requirements of the species can be met with intensive habitat restoration and maintenance efforts in degraded habitat areas.

- Goal 3: Refine reintroduction techniques to test effectiveness of caterpillar vs. pupae releases.

## Success Indicators

- Indicator 1: Husbandry methods developed to augment OSB populations at risk are successful in providing captive-reared OSB to establish new populations.
- Indicator 2: Weekly butterfly index counts conducted during the butterfly flight period monitor butterfly populations. The ultimate target for success is defined as a population of 200 - 500 OSB sustained for over 10 years.
- Indicator 3: Within habitat restoration areas invasive non-native plant species abundance is significantly reduced, habitat has an abundance of native plants used by the OSB, including the caterpillar host plant, early blue violets, distributed in dense patches, greater than 10 violets/$m^2$, needed for foraging caterpillars and native coastal prairie species used by OSB to nectar.

## Project Summary

**Feasibility:** In 1999 - 2000, the Oregon Zoo in Portland, Oregon, and the Woodland Park Zoo in Seattle, Washington, began a captive-rearing program to provide OSB pupae or caterpillars to augment the declining OSB populations. This effort was undertaken to prevent any further loss of OSB populations while habitat improvement could be implemented. To date, four of the five remaining OSB wild populations have been augmented with captive-reared OSB. The success of the captive-rearing program suggested OSB reintroductions were feasible. Habitat characteristics needed for the OSB include a coastal prairie or low growing native grassland which has an abundance of early blue violets (*Viola adunca*) distributed in dense patches for successful caterpillar forging (Bierzychudek *et al.*, 2009) and an abundance of nectar plants of differing species, blooming throughout the butterfly flight period (USFWS, 2001). Native seed production efforts between 2005 - 2012 provided large amounts of native seed and seedlings for OSB habitat enhancement and restoration projects.

An OSB recovery plan was completed in 2001, with an OSB recovery criteria of 10 populations across the species historical range, with 200 - 500 OSB per population for 10 years (USFWS, 2001). To meet the criteria reintroductions were found to be necessary. An OSB reintroduction plan was prepared in 2010 (VanBuskirk, 2010), which suggested that offspring from 50 mated female OSB could provide the genetic diversity needed to establish a new OSB population.

To facilitate the establishment of additional populations, the USFWS proposed two OSB reintroductions as a nonessential experimental population within the species historical range, as provided for under section 10(j) of the ESA. The designation of the non-essential experimental population allows for a threatened species to be managed as a proposed species, so neighboring landowners will not have concerns that a listed species might impose land use restrictions upon their properties. Because the OSB is not migratory and is a specialist species to coastal prairie habitat, little or no OSB are expected to leave the habitats in which they are released.

With the support of the land managers, the nonessential experimental population areas were defined surrounding the Nestucca Bay National Wildlife Refuge, in Tillamook County, Oregon, and Saddle Mt. State Natural Area, in Clatsop County, Oregon. The OSB reintroduction at Nestucca Bay National Wildlife Refuge began in 2017 and is proposed for Saddle Mountain State Natural Area in 2018 (USFWS, 2017).

Silverspot butterfly caterpillar

**Implementation:** The Nestucca Bay NWR has had 30 acres of coastal prairie habitat in varying stages of restoration since 2011. Since that time invasive weed abundance has been minimized, and thousands of violet and nectar plants have been planted to enhance and restore the coastal prairie ecosystem. On 28th July 2017, approximately 450 OSB caterpillars were released directly on violet plants dispersed throughout densely planted violet patches on Nestucca Bay National Wildlife Refuge. A second release on 3rd August 2017, put the total OSB released at approximately 900. The first OSB butterflies were observed flying on 21st August 2017. Weekly butterfly counts during the butterfly flight period will provide information on caterpillar survival to adulthood, OSB habitat use within habitat areas of differing quality, and overtime, fluctuations in OSB population levels each year.

A second OSB nonessential experimental population reintroduction will occur on OPRD, Saddle Mountain State Natural Area, which was historically occupied by the OSB, last documented at this site in 1973. Based on recent vegetation surveys, the proposed release site contains approximately 60 acres of high-quality butterfly habitat with sufficient densities of the essential species (*Viola adunca* and native nectar plants) to support a population. OSB caterpillars will be released into the highest quality habitat in summer of 2018.

**Post-release monitoring:** On the Nestucca Bay National Wildlife Refuge, the OSB populations will be annually monitored during the butterfly flight period to track year to year population levels. Habitat parameters important to the butterfly, such as violet and nectar plant survival and abundance will also be monitored. The 50 m long x 30 m wide transects will provide information on butterfly use within each area relative to the available plant resources. On Saddle Mountain State Natural Area, population monitoring will begin in summer of 2018, after OSB caterpillars are released. Monitoring at this site will include butterfly counts conducted from stationary points due to the dangerously steep slopes, but will be consistent year to year.

Nestucca Bay National Wildlife Refuge release site

## Major difficulties faced

- The most challenging aspect of this project was associated with the coastal prairie habitat restoration at Nestucca Bay National Wildlife Refuge. At the onset of the project the restoration site was in a degraded condition, having been a livestock pasture for many years. Restoration activities included removing and controlling invasive plant species with herbicides, mowing, burning, and planting native seed and seedlings multiple times.
- The release of the captive-reared OSB was not particularly difficult because the captive rearing methods had been underway since 1999 and methods were well defined (Andersen *et al.*, 2010). However, the release of a large number of caterpillars in which we preferentially wanted to release the largest instar caterpillars, proved difficult to time. While the majority of OSB caterpillars released were 5$^{th}$ or 6$^{th}$ instar some were smaller and potentially more vulnerable to starvation and predation.

## Major lessons learned

- The captive-rearing methods developed to augment OSB populations at risk can also be used to implement reintroductions into suitable habitat at other locations.
- The release of OSB caterpillars vs. the release of pupae is feasible, requires less labor than monitoring OSB pupae enclosed in protective cages. The number of butterflies observed during the transect surveys was approximately 8% of the number of caterpillars released. This is slightly lower than the 12% of OSB counted following pupae releases from cages at other locations. The results are preliminary but may reflect the trade-off of lower survival of released caterpillars verses the labor intensive pupae release method.
- OSB habitat restoration can be very challenging in degraded areas without the resources to aggressively implement site preparation treatments for reoccurring weeds. Native seed must be propagated and available to immediately plant following management activities to suppress nonnative plant invasion.

## Success of project

| Highly Successful | **Successful** | Partially Successful | Failure |
|---|---|---|---|
| | √ | | |

**Reason(s) for success/failure:**

- The release of OSB caterpillars was successful and three weeks after the caterpillar release, adult OSB were flying, observed mating, and females were seen laying eggs. About 8% of the number of caterpillars released were observed as adult butterflies during index counts. This information will be used to calibrate future reintroductions and releases.
- To meet the goal of establishing the new population from 50 mated females, additional releases will be needed. The new population is offspring from just 16 OSB females. Future releases will be conducted incrementally to increase genetic diversity while minimizing impacts to the donor population.

## References

Andersen, M.J., Arnold, M., Barclay, M., Myers, L., Shepherdson, D. & Sullivan, E. (2010) Oregon Silverspot Butterfly Husbandry Manual. Oregon Zoo, Portland, Oregon.

Bierzychudek P., Warner, K., McHugh, A. & Thomas, L. (2009) Testing the host-finding ability of a monophagous caterpillar in the field. *Ecological Entomology* 34: 632-637. https://doi.org/10.1111/j.1365-2311.2009.01112.x

U.S. Fish and Wildlife Service (2001) Oregon silverspot butterfly (*Speyeria zerene hippolyta*) revised recovery plan. U.S. Fish and Wildlife Service, Portland, Oregon.

U.S. Fish and Wildlife Service (2017) Establishment of a Nonessential Experimental Population of the Oregon Silverspot Butterfly in Northwestern Oregon. 82 FR 28567.

VanBuskirk, R. (2010) Controlled Propagation and Reintroduction Plan for the Oregon silverspot butterfly (*Speyeria zerene hippolyta*).

INTERNATIONAL UNION
FOR CONSERVATION OF NATURE

WORLD HEADQUARTERS
Rue Mauverney 28
1196 Gland, Switzerland
Tel +41 22 999 0000
Fax +41 22 999 0002
www.iucn.org