Marys Peak Scenic Botanical Special Interest Area restoration: 2022 annual report

April 2023

Report for U.S. Forest Service, Siuslaw National Forest, Agreements #22-SA-11061200-008 and #22-PA-11061200-009

Report prepared by Rolando Beorchia and Andrew Esterson

Institute for Applied Ecology

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.

Questions regarding this report or IAE should be directed to:

Thomas Kaye (Executive Director)
Institute for Applied Ecology
4950 SW Hout St.
Corvallis, OR 97333

phone: 541-753-3099
fax: 541-753-3098
email: info@appliedeco.org

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We thank ESRI for their support of our GIS program. Maps were created using ArcGIS® software by Esri. ArcGIS® and ArcMap™ are the intellectual property of Esri and are used herein under license. For more information about Esri® software, please visit www.esri.com.

Cover photographs: Common beargrass (*Xerophyllum tenax*) at Marys Peak, Trek Meadow. Photo by Rolando Beorchia July 7, 2022.

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SUGGESTED CITATION

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EXECUTIVE SUMMARY

Over 900 acres of unique meadows and forest compose the Marys Peak Scenic Botanical Special Interest Area (Marys Peak SBSIA). This regionally rare habitat is under protection and ongoing enhancement by the U.S. Forest Service (FS), Bureau of Land Management (BLM) and City of Corvallis who co-own the area. The Institute for Applied Ecology (IAE) is conducting habitat restoration in partnership with the FS, Siuslaw National Forest, who owns the majority of land in the Marys Peak SBSIA. In 2022, IAE performed a variety of restoration activities which incorporated noble fir (*Abies procera*) sapling removal, invasive weed treatment, native seed collection, and the start of a common yarrow (*Achillea millefolium*) seed amplification field. Invasive weed herbicide, mowing and hand pulling treatments targeted oxeye daisy (*Leucanthemum vulgare*), creeping velvet grass (*Holcus mollis*), foxglove (*Digitalis purpurea*), and Scotch broom (Cytisus scoparius). Native seed collection of 16 species totaled 1.413 pounds comprised of common yarrow, Merten's sedge (*Carex mertensii*), California sedge (*Carex californica*), Chamisso sedge (*Carex pachystachya*), harsh paintbrush (*Castilleja hispida*), blue eyed Mary (*Collinsia parviflora*), California oatgrass (*Danthonia californica*), blue wild rye (*Elymus glaucus*), Oregon sunshine (*Eriophyllum lanatum*), Oregon iris (*Iris tenax*), Columbia tiger lily (*Lilium columbianum*), false Solomon's seal (*Maianthemum stellatum*), slender phlox (*Microsteris gracilis*), Cardwell's penstemon (*Penstemon cardwellii*), shade phacelia (*Phacelia nemoralis*), alpine timothy (*Phleum alpinum*). Future restoration activities will include chemical and mechanical weed treatments, mowing and/or burning to reduce creeping velvet grass thatch, conifer sapling removal to preserve open meadow habitat, demolition of a user-created trail, native seed collection, common yarrow seed amplification, and revegetating disturbed areas with appropriate native plant materials.

1. INTRODUCTION

Marys Peak Scenic Botanical Special Interest Area (Marys Peak SBSIA) is a 924 acre parcel of land owned mostly by the U.S. Forest Service (FS), Siuslaw National Forest, but portions are also owned by the Bureau of Land Management (BLM) and the City of Corvallis. Marys Peak is located in the Coast Range on the western edge of the Willamette Valley 15 miles southwest of Corvallis, Oregon. The 130 acres of unique meadow complex on top of Marys Peak composes the highest meadows in the Coast Range and, as such, contains a plant community not seen elsewhere in the range. Marys Peak SBSIA includes a xeric rock garden, a population of noble fir (*Abies procera*), noble polypore (*Bridgeoporus nobilissimus*), and a riparian area that is the headwaters of Parker Creek. The Institute for Applied Ecology (IAE) has supported restoration efforts at Marys Peak SBSIA since 2014.

The Marys Peak SBSIA meadow complex consists of six designated meadows, even though some of these are now contiguous due to tree removal (Figure 1). This report covers restoration actions primarily occurring within Trek, Summit, and West Point Meadows.

Noble fir, Douglas-fir (*Pseudotsuga menziesii*) and western hemlock (*Tsuga heterophylla*) surround the Marys Peak SBSIA meadows and have potential to reduce the acreage of open meadow without active management. H. Zald's 2009 study of five meadows in the Coast Range determined a 34.7% decrease in Marys Peak SBSIA grassland acreage between 1948 and 1994 (Zald, 2009). Zald determined acreage "decline was overwhelmingly due to tree encroachment, which was greater closer to the forest edge" (Zald, 2009). While the population of noble fir on Marys Peak is a unique occurrence and is valued as an integral part of the 924 acres of Marys Peak SBSIA, the expansion of this conifer into the meadow threatens to reduce valuable open-meadow habitat.

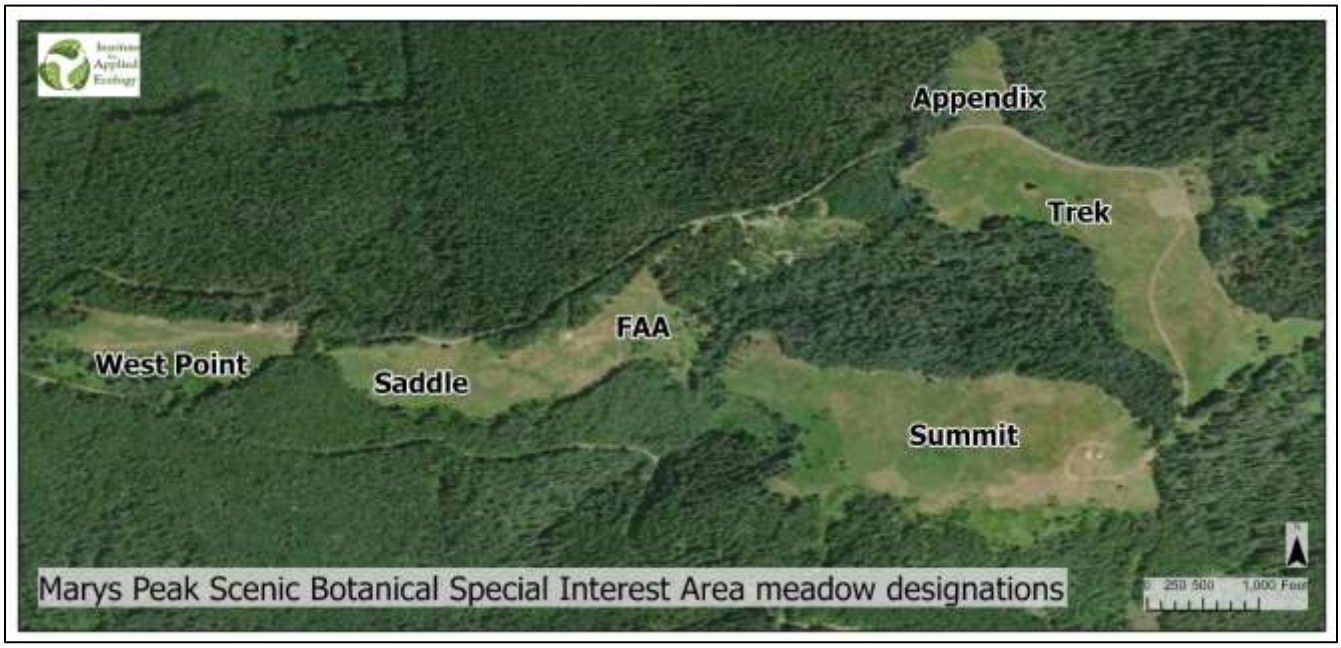


Figure 1. Marys Peak Scenic Botanical Special Interest Area meadow designations.

Summit, Trek, and Appendix Meadows

Active restoration conducted by IAE at Summit, Trek, and Appendix Meadows is funded by the U.S. Forest Service, Siuslaw National Forest, under Stewardship Agreement #22-SA-11061200-008. These three meadows, while nearly contiguous at present, have undergone some distinct changes in the last seven years. In 2016, 2018 and 2020 the FS removed trees to improve meadow connectivity and to reduce conifer encroachment into the open grasslands. In 2016, conifer trees were removed from Appendix Meadow (Figure 2, Appendix A) and provided connectivity to Trek Meadow. In the same operation, trees were removed from the eastern edge and the interior of Trek Meadow, the campground was thinned, and a couple trees were removed from the FAA meadow. In 2020, FS surveys discovered creeping velvet grass (*Holcus mollis*) in Trek Meadow. Subsequent discussions of treatment options lead to the Stewardship Agreement with IAE.

Figure 2. 2016 tree removal in Appendix Meadow and campground (July 2015, August 2016).

FAA and Saddle Meadows

The FAA and Saddle Meadows were made contiguous in 2018 through tree removal performed by the FS. (Figure 3, Appendix A). The natural establishment of native meadow species after the 2018 tree removal seems to be minimal and is being monitored by the FS. This meadow would be a quality candidate for future restoration activity including weed abatement and revegetation. A diverse meadow matrix to connect the overall meadow complex would be an asset to wildlife and the overall quality of the Marys Peak SBSIA.

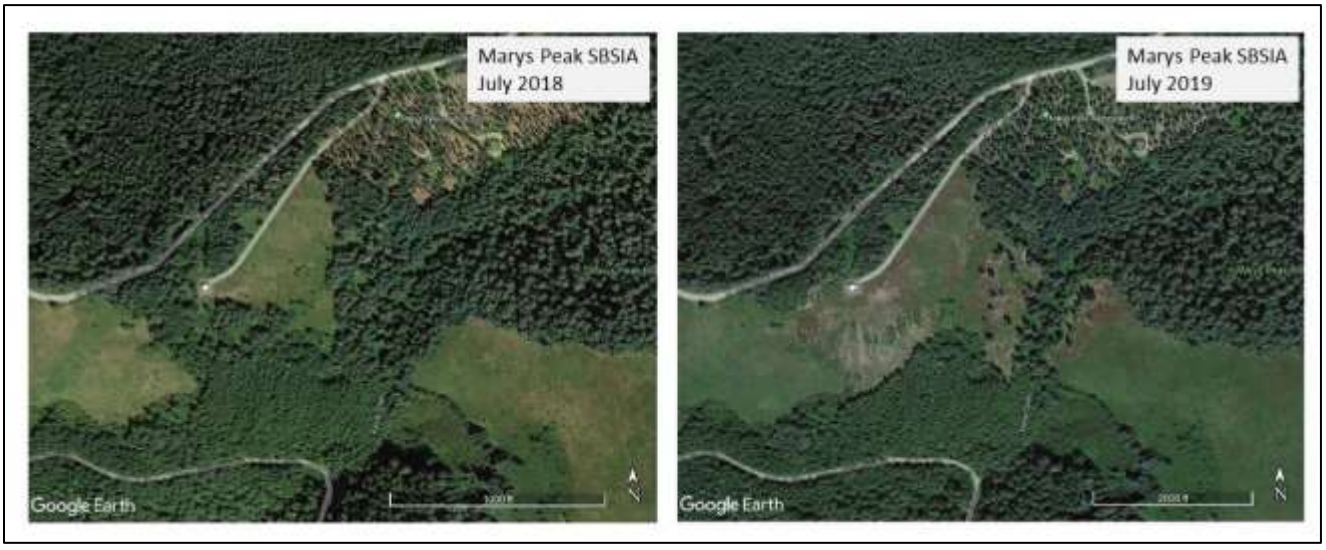


Figure 3. 2018 tree removal between FAA and Saddle Meadows (July 2018 and July 2019).

West Point Meadow

West Point Meadow comprises 12.5-acres west of the Marys Peak summit and is collectively owned by the City of Corvallis and FS. IAE restoration activities at West Point are funded by the U.S. Forest Service, Siuslaw National Forest, under Agreement #22-PA-11061200-009 and an agreement with the Alliance for Recreation and Natural Areas (AFRANA). IAE has been involved in restoration at West Point Meadow

since 2019, when IAE assisted Trout Mountain Forestry, a private land management contractor, in the restoration of areas disturbed by tree removal and improvements to a transmission tower access road in 2019 and 2020 (Figure 4, Appendix A). IAE's primary activities were invasive species treatments, native seed collection, plant propagation, and revegetation through seeding and plug planting. Although IAE was not directly funded by USFS for the work at West Point, USFS staff provided input on weed control and seed collection that was used to perform restoration.

Oxeye daisy (*Leucanthemum vulgare*) occurs along the gravel access road and around the transmission towers in West Point Meadow. Treatments that occurred 2019-2020 were effective at reducing the abundance and spread of oxeye daisy before and after tree removal. Each year less roadside oxeye has been observed and no evidence of the population spreading to newly opened areas has been reported.

Figure 4. 2020 Tree removal in West Point Meadow (July 2019, August 2020).

2. GOALS AND OBJECTIVES

The goal of this project is to rehabilitate unique meadow habitat at Marys Peak SBSIA and reduce effects of disturbance from infrastructure maintenance, visitor traffic, and invasive weeds. There are three primary objectives of this project:

1. Reduce abundance of invasive grasses and forbs in the meadows
2. Reduce meadow encroachment through conifer seedling removal
3. Increase native plant abundance and diversity in disturbed areas

3. 2022 RESTORATION ACTIVITIES

2022 restoration activities at Marys Peak SBSIA focused on invasive weed treatments and reduction of noble fir encroachment. Activities primarily occurred within Trek, Summit, and West Point Meadows. In 2022, no restoration actions were implemented by IAE in the Appendix, FAA, or Saddle Meadows. The FS performed invasive species treatment and conifer sapling removal in 2022, but those activities are not covered in this report.

Revegetating disturbed areas with native plants requires a large quantity of native seed. In 2022, IAE wild collected seed from 16 meadow species (Table 1) from across multiple meadows within Marys Peak SBSIA. A seed amplification field was established for common yarrow (*Achillea millefolium*) using seed previously collected in 2020 from the Marys Peak SBSIA. The common yarrow production field began by seeding plugs on August 2nd, which were then grown outside until they reached a sufficient size to transplant into a production field with 18" spacing on November 1st. Since the bed was first established in 2022, it yielded no seed but harvests are expected in 2023 and 2024. Seed harvested from the amplification field will be used roadside and trailside at Marys Peak SBSIA to revegetate disturbed areas.

Table 1. 2022 Marys Peak seed collection amounts

Scientific Name	Common Name	Total Collected (lb):
Achillea millefolium	common yarrow	0.0810
Carex mertensii	Merten's sedge	0.0345
Carex californica	California sedge	0.0980
Carex pachystachya	Chamisso sedge	0.0050
Castilleja hispida	harsh paintbrush	0.0170
Collinsia parviflora	blue eyed Mary	0.0090
Danthonia californica	California oatgrass	0.0600
Elymus glaucus	Blue wild rye	0.8380
Eriophyllum lanatum	Oregon sunshine	0.0460
Iris tenax	Oregon iris	0.0490
Lilium columbianum	Columbia tiger lily	0.0615
Maianthemum stellatum	false Solomon's seal	0.025
Microsteris gracilis	slender phlox	0.0030
Penstemon cardwellii	Cardwell's penstemon	0.0530
Phacelia nemoralis	shade phacelia	0.0085
Phleum alpinum	alpine timothy	0.0245
	Total (lbs)	**1.413**

Invasive species control of Scotch broom (*Cytisus scoparius*) occurred along Marys Peak Road in 2022 (Table 2, Figure 5) to reduce future spread and potential threat to meadow habitat. IAE and an AmeriCorps National Civilian Community Corps (NCCC) team hand-pulled the shrub along 3.75 miles of road, starting at Highway 20 working upward (Figure 5). As the climate shifts, invasive species may be able to thrive at higher elevations than previously observed, so effort should be made to reduce non-native species invading the meadows via Marys Peak Road.

Table 2. 2022 management actions at Marys Peak Scenic Botanical Special Interest Area

Date	Personnel*	Location	Management Action
7-Mar	IAE	Appendix, Trek	Marys Peak site visit and creeping velvet grass (*Holcus mollis*) surveying.
29-Mar		Trek	Tested capacity to mow creeping velvet grass with string trimmers.
5-Apr		Marys Peak Road	Pulled Scotch broom (*Cytisus scoparius*) along Marys Peak Road and inspected snow level for spring treatments.
2-Jun		Trek	Mapped creeping velvet grass treatment areas, placed pin flags around the perimeters and took photographs.
11-Jun	IAE, Volunteers		Pulled noble fir (*Abies procera*) saplings around meadow edge.
23-Jun	IAE		Treated creeping velvet grass with Poast (sethoxydim). Treated oxeye daisy (*Leucanthemum vulgare*) around parking lot and along with Stinger (clopyralid).
		West Point	Treated roadside oxeye daisy with Stinger (clopyralid).
7-Jul		Trek	Second treatment of creeping velvet grass with Poast (sethoxydim). Treated roadside oxeye daisy with Rodeo (glyphosate).
16-Jul	IAE, Volunteers		Pulled noble fir saplings along meadow edge.
20-Jul	IAE	Trek, West Point	Pulled oxeye daisy and foxglove (*Digitalis purpurea*).
27-Jul		Trek, Summit	Pulled oxeye daisy along the entire gravel summit road, and along the paved road to the western forest edge of Trek Meadow
4-Aug		West Point	Pulled and bagged roadside oxeye daisy.
25-Aug		Trek, West Point	Assessed summer weed treatments were successful and took post treatment photos.
22-Sep	IAE, FS	FAA, Trek	Partner visit with FS to discuss restoration option
1-Dec	IAE, NCCC	Marys Peak Road	Pulled Scotch broom along 3.75 miles of Marys Peak road starting at Highway 20 and working up.
14-Dec			
*Institute for Applied Ecology (IAE), U.S. Forest Service (FS), AmeriCorps National Civilian Community Corps (NCCC), community member volunteers (Volunteers)			

Figure 5. Scotch broom (*Cytisus scoparius*) removal along Marys Peak Road.

Trek and Summit Meadows

The focus of work in Trek and Summit Meadows are invasive weed treatments, meadow edge conifer removal, user-created trail demolition, and post disturbance revegetation. The demolition of user-created trail is expected to occur in 2023 and the post disturbance revegetation will begin in 2024.

The FS discovered creeping velvet grass in Trek Meadow in 2020, and in spring 2022, IAE surveys revealed a population slightly larger than previously expected. This rhizomatous species forms thick mats of dense thatch that is very difficult for native grassland species to outcompete. In 2022, IAE established treatment areas and applied two herbicide treatments on June 23 and July 7, 2022 using the grass-specific herbicide Poast (sethoxydim; Figure 6, Figure **7**, Figure 8, Table 2). IAE sprayed areas slightly larger than the observed population size to capture the rhizomatous growth at the edges and avoid potential escape. The seven treatment areas of creeping velvet grass total 2.6 acres, with the largest 2.16 acre area inhabiting space on both sides of the road near the parking lot (Figure 8).

Figure 6. Creeping velvet grass (*Holcus mollis*) before and after two sethoxydim treatments. Northeast of Trek Meadow parking lot.

Figure 7. Creeping velvet grass (*Holcus mollis*) before and after two sethoxydim treatments. Northwest of Trek Meadow parking lot.

Figure 8. Creeping velvet grass (*Holcus mollis*) treatment areas and acreage.

Oxeye daisy is growing along the gravel road leading to the Marys Peak summit. Vehicular and pedestrian traffic could be factors in the spread of this species upward along the road since it is used as a tower maintenance road and a hiking trail. Controlling it before it spreads throughout the Summit Meadow rock garden is a priority to insure the unique diversity of that habitat. To increase the probability of control, IAE treated this species across multiple phenological stages using multiple treatment methods. In the spring, we treated oxeye daisy once with Stinger (clopyralid; June 23) and once with Rodeo (glyphosate; July 7) (Table 2, Figure 10). In the summer, IAE staff hand-pulled oxeye daisy along the entire gravel road from the summit down to the parking lot, and along the paved road to the western forest edge of Trek Meadow (Figure 9). The plants were pulled before the flowers had dropped their pedals, indicating flower pollination and potential for seed ripening, and were left on trial edge to desiccate (Figure 9, Figure 11).

Figure 9. 2022 manual treatments at Summit and Trek Meadows.

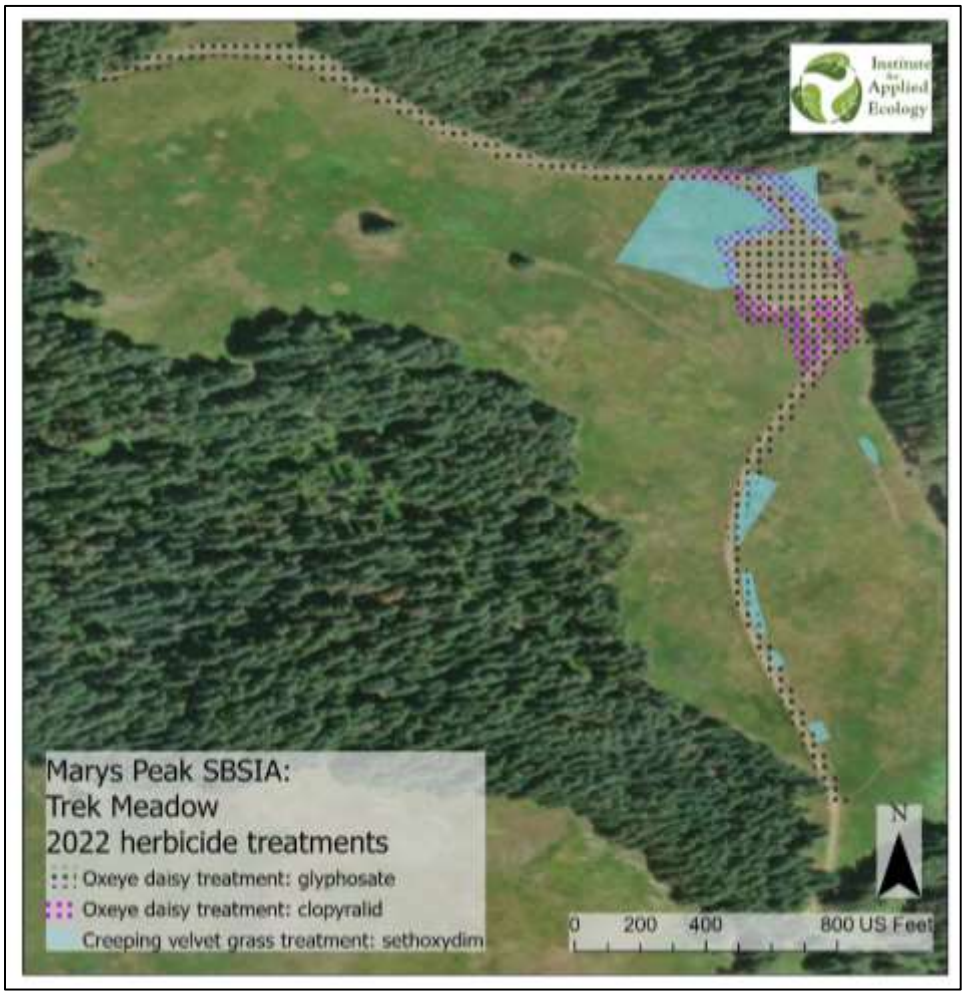


Figure 10. 2022 herbicide treatments at Summit and Trek Meadows.

Figure 11. Oxeye daisy (*Leucanthemum vulgare*) left to desiccate after hand pulling July 27, 2022.

The noble fir population bordering most of the Trek and Summit Meadows has potential to reduce the acreage of meadow within the Marys Peak SBSIA. In 2022, IAE and many community volunteers hand-pulled and cut noble fir saplings to reduce forest encroachment in the meadows (Figure 12, Figure 9). Noble fir saplings were pulled on the southern and western edges of Trek meadow. Continued sapling removal along the forest edge and in the meadow interior will be necessary to maintain open meadow.

Figure 12. Community volunteers pulling noble fir (*Abies procera*) saplings in Trek Meadow June 11, 2022.

West Point Meadow

2022 restoration activities at West Point Meadow primarily focused on reduction of non-native oxeye daisy and foxglove (*Digitalis purpurea*) and collecting native seed for future revegetation effort. IAE hand-pulled foxglove before seed set in both meadow sections north of the road, but the south meadow section was not fully hand treated and many foxglove flowers produced and set seed (Figure 13). Regular herbicide and/or hand pulling treatments will be needed for many years to reduce foxglove abundance and exhaust the seed bank.

Figure 13. 2022 Treatments at West Point Meadow.

Oxeye daisy occurs along the entire gravel road and around the tower buildings in West Point Meadow. In June 2022, IAE treated the roadside oxeye daisy once with Stinger (clopyralid). In July, untreated plants had started to set seed, so they were hand pulled, bagged, and removed from the site. Other lower priority non-native weeds, such as common groundsel (*Senecio vulgaris*), do occur in low abundance and, when identified, were also hand pulled (Table 2).

When revegetating conifer-removal areas and roadsides, especially south-facing road cuts, seeds of disturbance-loving native species are critical. As such, IAE collected edible thistle (*Cirsium edule*) seed to disperse across the recently disturbed areas and fill the ecological niche previously occupied by non-native thistles. More disturbance-loving species present in West Point Meadow should be gathered and redistributed to bare ground.

Figure 14. Edible thistle (*Cirsium edule*) at West Point Meadow July 20, 2022.

4. MANAGEMENT RECOMMENDATIONS

The overarching goal of this project is to restore regionally rare high elevation habitat at Marys Peak SBSIA by controlling priority invasive species and managing coniferous encroachment. The following management actions are recommended for 2023-2025.

- Seed collection in 2023 should include collecting and scouting for California brome (*Bromus carinatus*), harsh paintbrush (*Castilleja hispida*), field chickweed (*Cerastium arvense*), blue eyed Mary (*Collinsia parviflora*), California oatgrass (*Danthonia californica*), Oregon sunshine (*Eriophyllum lanatum*), western wallflower (*Erysimum capitatum*), glacier lily (*Erythronium grandiflorum*), Oregon fawn-lily (*Erythronium oreganum*), Oregon iris (*Iris tenax*), prairie June-grass (*Koeleria macrantha*), Columbia tiger lily (*Lilium columbianum*), false Solomon's seal (*Maianthemum stellatum*), slender phlox (*Microsteris gracilis*), Cardwell's penstemon (*Penstemon cardwellii*), shade phacelia (*Phacelia nemoralis*), alpine timothy (*Phleum alpinum*), western buttercup (*Ranunculus occidentalis*), tall western groundsel (*Senecio integerrimus*), arrow-leaf groundsel (*Senecio triangularis*)
- Continue the seed amplification field for common yarrow.

Trek and Summit Meadows

- Treat oxeye daisy in spring with glyphosate or triclopyr. Hand pull once in full flower and bag to remove seed if pedals have fallen off the inflorescence.
- Treat creeping velvet grass with sethoxydim once in June and again in July.
- Collaborate with the FS to develop a burn plan for the two acres of creeping velvet grass near the parking lot on both sides of the road. Implement the controlled burn in fall 2023 or 2024.
- Revegetate creeping velvet grass treatment areas with broadcast seeding and plug planting in 2024 and 2025.
- Demolish user-created trail using a rototiller to level the existing rut on hilltop. Heavily seed and plant trail by 2024 and 2025 to revegetate. Additional and larger signage at both ends of the trail would be very helpful in deterring foot traffic, reducing overall cost in labor and plant materials, and increasing success rate for revegetating of the area.
- Establish photopoints for ongoing monitoring

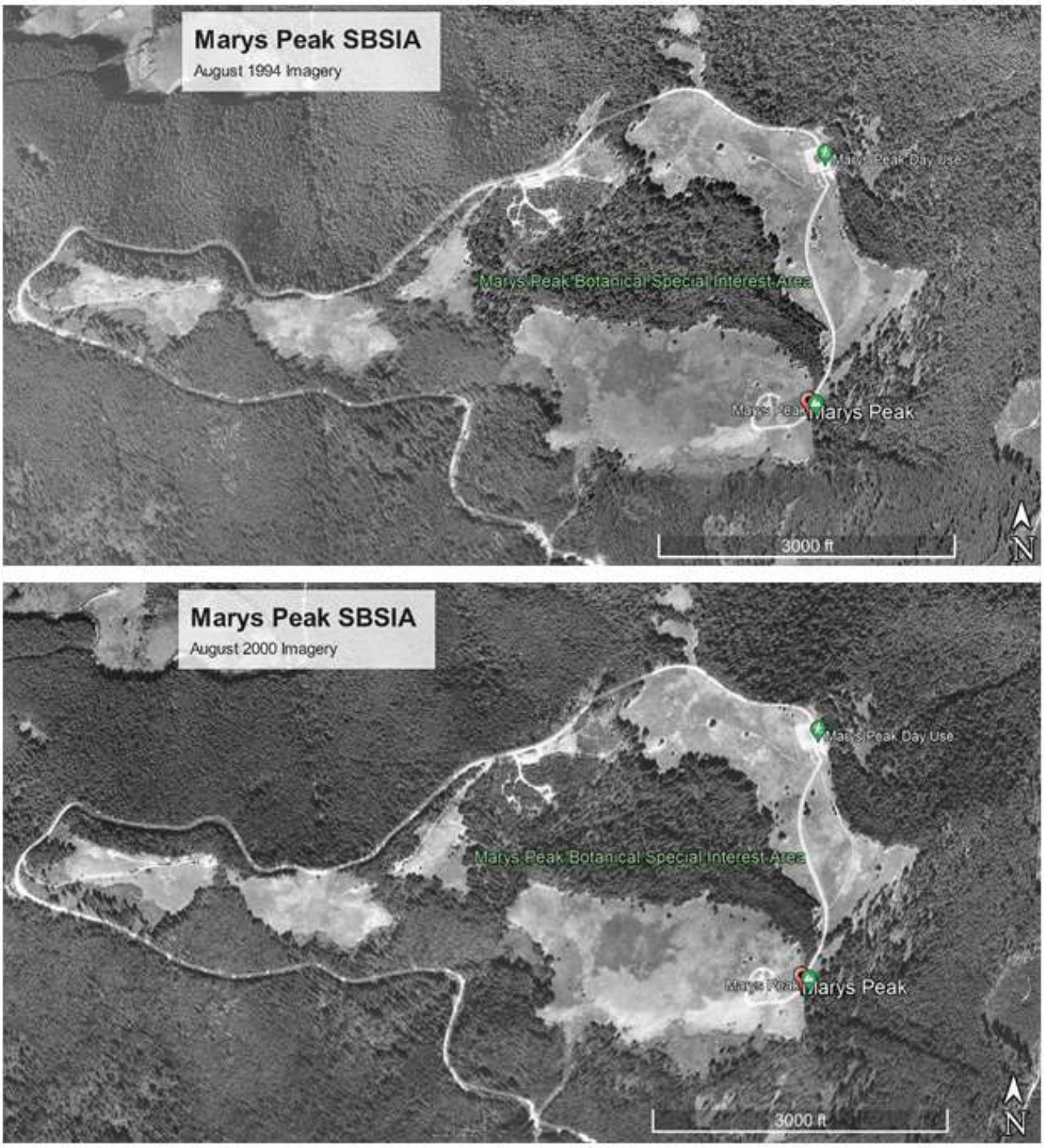
West Point

- Treat oxeye daisy in spring with glyphosate or triclopyr. Hand pull once in full flower and bag to remove seed if pedals have fallen off the inflorescence.
- Treat foxglove by spot spraying with Rodeo (glyphosate) if plants are still rosettes and by hand pulling bolted plants. If seed pods have developed, bag the inflorescence to reduce the seed bank.
- Collect and sow disturbance loving species along south facing road cut to hold bare ground.
    - Consider collecting common beargrass (*Xerophyllum tenax*) seed from Trek Meadow and disperse fall 2023 in small, dense patches to mimic natural growth habits.
    - Gather West Point edible thistle, common yarrow, fireweed (*Chamerion angustifolium*), and pearly everlasting (*Anaphalis margaritacea*) to redistribute on nearby bare ground.
- Establish photopoints for ongoing monitoring

5. REFERENCES

Zald H. 2009. Extent and spatial patterns of grass bald land cover change (1948-2000), Oregon Coast Range, USA. Plant Ecol. 201:517-529.

APPENDIX A. MARYS PEAK SBSIA ARIAL IMAGERY 1994-2022




Marys Peak SBSIA
August 2005 Imagery
Marys Peak Day Use
Marys Peak Botanical Special Interest Area
Marys Peak
5000 ft
N


Marys Peak SBSIA
July 2015 Imagery
Marys Peak Day Use
Marys Peak Botanical Special Interest Area
Marys Peak
5000 ft
N


Marys Peak SBSIA
August 2016 Imagery
Marys Peak Day Use
Marys Peak Botanical Special Interest Area
Marys Peak
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Marys Peak SBSIA
July 2018 Imagery
Marys Peak Day Use
Marys Peak Botanical Special Interest Area
Marys Peak
3000 ft
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Marys Peak SBSIA
July 2019 Imagery
Marys Peak Day Use
Marys Peak Botanical Special Interest Area
Marys Peak
5000 ft
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Marys Peak SBSIA
August 2022 Imagery
Marys Peak Day Use
Marys Peak Botanical Special Interest Area
Marys Peak
3000 ft
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