



North Junction Overlook Revegetation Project

2019 Annual Report



**ON THIS PAGE**

Park visitors ignore fencing to access the caldera rim at the North Junction Overlook.

Photo by Carrie Wyler

ON THE COVER

“Restoration Area, Please stay off” sign in the middle of the trampled North Junction Overlook area.

Photo by Scott Heisler

North Junction Overlook Revegetation Project

2019 Annual Report

Carolyn S. Wyler, Scott E. Heisler, and Jennifer S. Hooke

National Park Service
Crater Lake National Park
P.O. Box 7
Crater Lake, Oregon 97604

April 2020

U.S. Department of the Interior
National Park Service
Crater Lake National Park
Crater Lake, Oregon

This annual report series is intended for the timely release of basic data sets and data summaries. Care has been taken to assure accuracy of raw data values, but a thorough analysis and interpretation of the data has not been completed. Consequently, the initial analyses of data in this report are provisional and subject to change.

All manuscripts in the series receive the appropriate level of peer review to ensure that the information is scientifically credible, technically accurate, appropriately written for the intended audience, and designed and published in a professional manner.

This report received informal peer review by a subject matter expert who was not directly involved in the collection, analysis, or reporting of the data.

Views, statements, findings, conclusions, recommendations, and data in this report do not necessarily reflect views and policies of the National Park Service, U.S. Department of the Interior. Mention of trade names or commercial products does not constitute endorsement or recommendation for use by the U.S. Government.

This report is available in digital format from the Crater Lake National Park website:

<https://irma.nps.gov/DataStore/Reference/Profile/2272603>

Please cite this publication as:

Wyler, C.S., S.E. Heisler, and J.S. Hooke. 2020. North Junction Overlook Revegetation Project: 2019 Annual Report. Crater Lake National Park, Crater Lake, Oregon.

Contents

	Page
Figures.....	iv
Tables.....	iv
Abstract.....	v
Acknowledgments.....	vi
Introduction.....	7
Background.....	9
Present Rehabilitation Plans.....	10
Methods.....	13
Revegetation.....	13
Native Seed Collection and Processing.....	13
Plant Propagation.....	14
Invasive Vegetation Management.....	16
Results.....	16
Revegetation.....	16
Native Seed Collection and Processing.....	18
Plant Propagation.....	19
Invasive Vegetation Management.....	19
Discussion.....	19
Literature Cited.....	21

Figures

	Page
Figure 1. The North Junction Overlook as viewed from the parking lot looking up towards the caldera rim.....	7
Figure 2. The North Junction Overlook area with major social trails and trampled areas indicated in red.....	8
Figure 3. A 1935 site plan showing a trail (narrow dashed lines) from the old entrance and ranger stations (which have since been demolished) up to the Merriam Point observation station.	9
Figure 4. Whitebark pine (<i>Pinus albicaulis</i>) in the North Junction area with exposed roots from soil erosion..	10
Figure 5. Location of components (C01-C04) of the North Junction Overlook Rehabilitation project.....	11
Figure 6. The North Junction Overlook in 1935	12
Figure 7. Two different plant communities of several present at North Junction.....	13
Figure 8. Seeding containers with blue wildrye (<i>Elymus glaucus</i> ssp. <i>glaucus</i>). Covering seeded pots with soil..	15
Figure 9. Winterizing pots with mulch. Germinated pots with rodent-exclusion screens overwintered for cold stratification.....	15
Figure 10. Crowds of people view Crater Lake from North Junction in late spring.....	16
Figure 11. Seed drying facility in the Stall 9 garage. Cleaning seed..	18

Tables

	Page
Table 1. 2019 plant phenology for the North Junction area.....	14
Table 2. Revegetation prescription for the North Junction Overlook area.....	17
Table 3. Amount of seed collected by plant species in 2019.	18
Table 4. Number of pots seeded for plant propagation in 2018 and 2019.	19

Abstract

Efforts are underway to rehabilitate the North Junction Overlook area, which is a popular site from which to view Crater Lake. This is a collaborative project in which the Botany program is responsible for revegetation of trampled areas back to native plant communities after new trail and overlook construction is completed. Revegetation progress made during the 2019 field season included collecting seed from 12 different plant species and seeding just under 2,500 pots for propagation. The entire project area was surveyed for invasive plants; none were encountered. Revegetation work is planned to continue into the 2020 season, expanding and increasing seed collection and plant propagation efforts to build a solid foundation of plant materials available for restoration.

Acknowledgments

This project would not be possible without collaboration with the Crater Lake National Park Maintenance division. The assistance of Kirsten Hardin and Jennifer Gifford is greatly appreciated. Funding for this project is provided by the National Park Service Recreation Fee program. Sarah Raube of the National Park Service Pacific West Regional Office provided landscape architect expertise and assistance with designing and developing site plans. Steve Mark, Park Historian, graciously provided information that helped piece together the historical vegetation and previous planning information for this site. Members of the Botany staff assisted with seed collection and plant propagation efforts, namely Melody Frederic, Carson Ralls, Benjamin Wright, Delacey Randall, Elena Olsen, Hamilton Hasty, Vance McNees, Sarah Hogan, and Matthew Jelinske.

Introduction

Crater Lake National Park's (CRLA) North Junction Overlook is one of the most heavily visited locales in the Park. It serves as the first viewing opportunity of Crater Lake for visitors arriving from the North via the Park's North Entrance Road. The area is named "North Junction" due to its location at the three-way intersection of the North Entrance Road, West Rim Drive, and East Rim Drive (Figure 2). Despite its importance and prominence as a visitor destination, the condition of facilities and the natural landscape at the North Junction Overlook area is poor. The area has suffered from a Park planning and management void that has resulted in no clear route for pedestrian circulation, with destructive consequences.

The North Junction Overlook site is presently characterized by excessively wide trail and overlook areas resulting from extreme degrees of trampling by Park visitors (Figure 1). The area is plagued by a network of social trails, including ones leading into the Crater Lake caldera, contributing to visitor confusion on the intended destinations and travel routes in the North Junction Overlook area and jeopardizing visitor safety. What should be one of the premier areas for viewing Crater Lake instead is dusty, denuded, and appears neglected. There is a strong need to rehabilitate the North Junction Overlook area by improving and defining the trail and overlook areas and restoring the subalpine plant communities that frame this magnificent viewpoint.

The North Junction Overlook area includes trails, social trails, and overlooks from the North Junction



Figure 1. The North Junction Overlook as viewed from the parking lot looking up towards the caldera rim. The subalpine meadow has been transformed to an expanse of erosive, dusty volcanic sand by heavy visitor use. Photo by Jen Hooke.

parking lot east to the caldera rim and north to include the Merriam Point Overlook (Figure 2). The North Junction Overlook Rehabilitation project is intended to redesign the trail and overlook areas to allow Park visitors to safely view Crater Lake while also protecting the natural landscape and restoring the scenic beauty of the site. This project is funded by the National Park Service's (NPS) Recreation Fee program, which directly inserts Park entrance fees back into

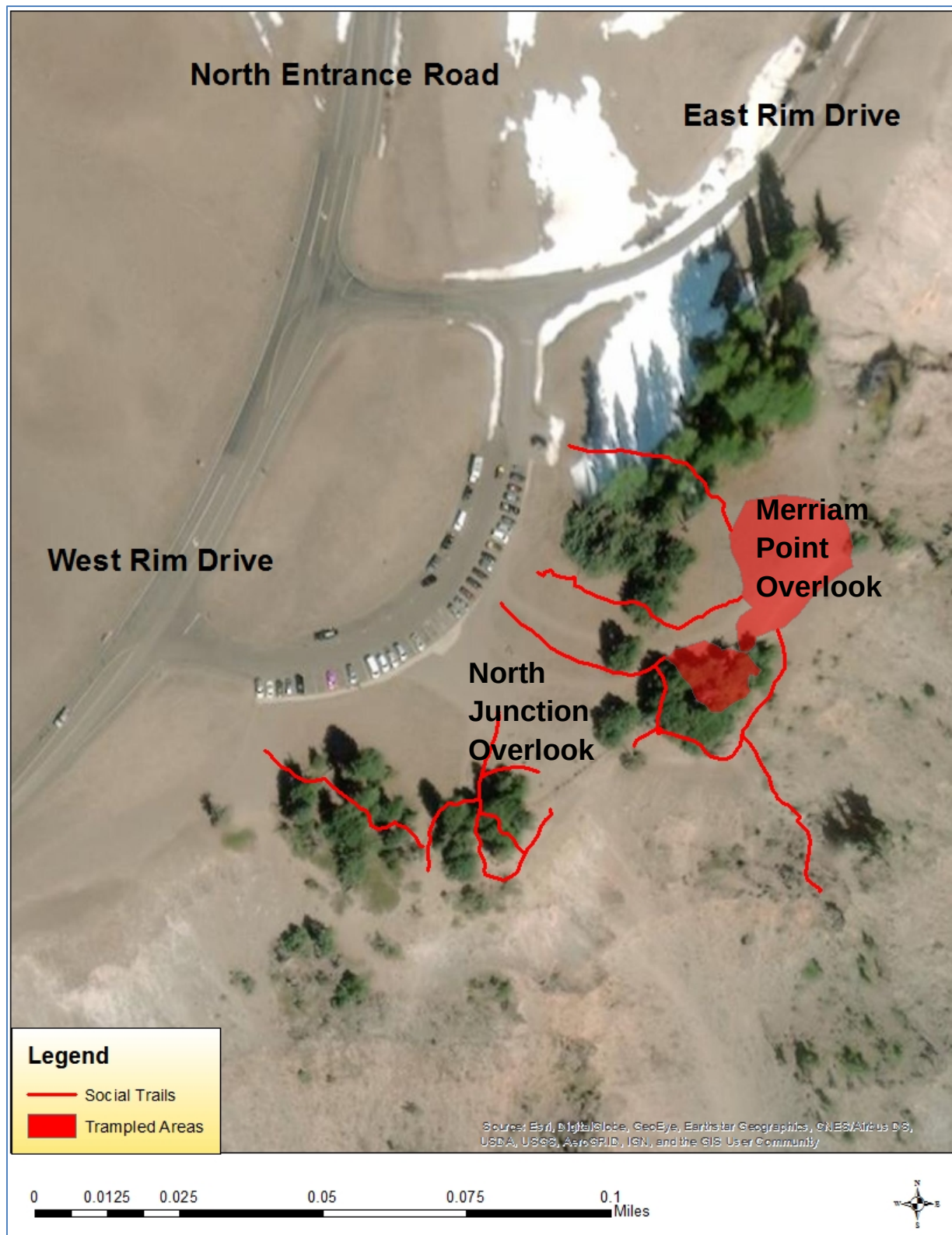


Figure 2. The North Junction Overlook area with major social trails and trampled areas indicated in red. Note the social trail (bottom right) extending into the Crater Lake caldera. Map by Jen Hooke.

improving the visitor experience. This report focuses on the revegetation and restoration aspect of the rehabilitation project.

Background

The North Junction (referred to as the ‘Diamond Lake Junction’ in the Park’s early years) area was originally planned as the site of the Merriam Point Observation Station, one of seven observation stations along Rim Drive intended to showcase the diversity and beauty of the Crater Lake caldera (Mark and Watson 2009). A site plan for this area developed in 1935 designed a trail leading from an old ranger station up to the caldera rim (Figure 3).

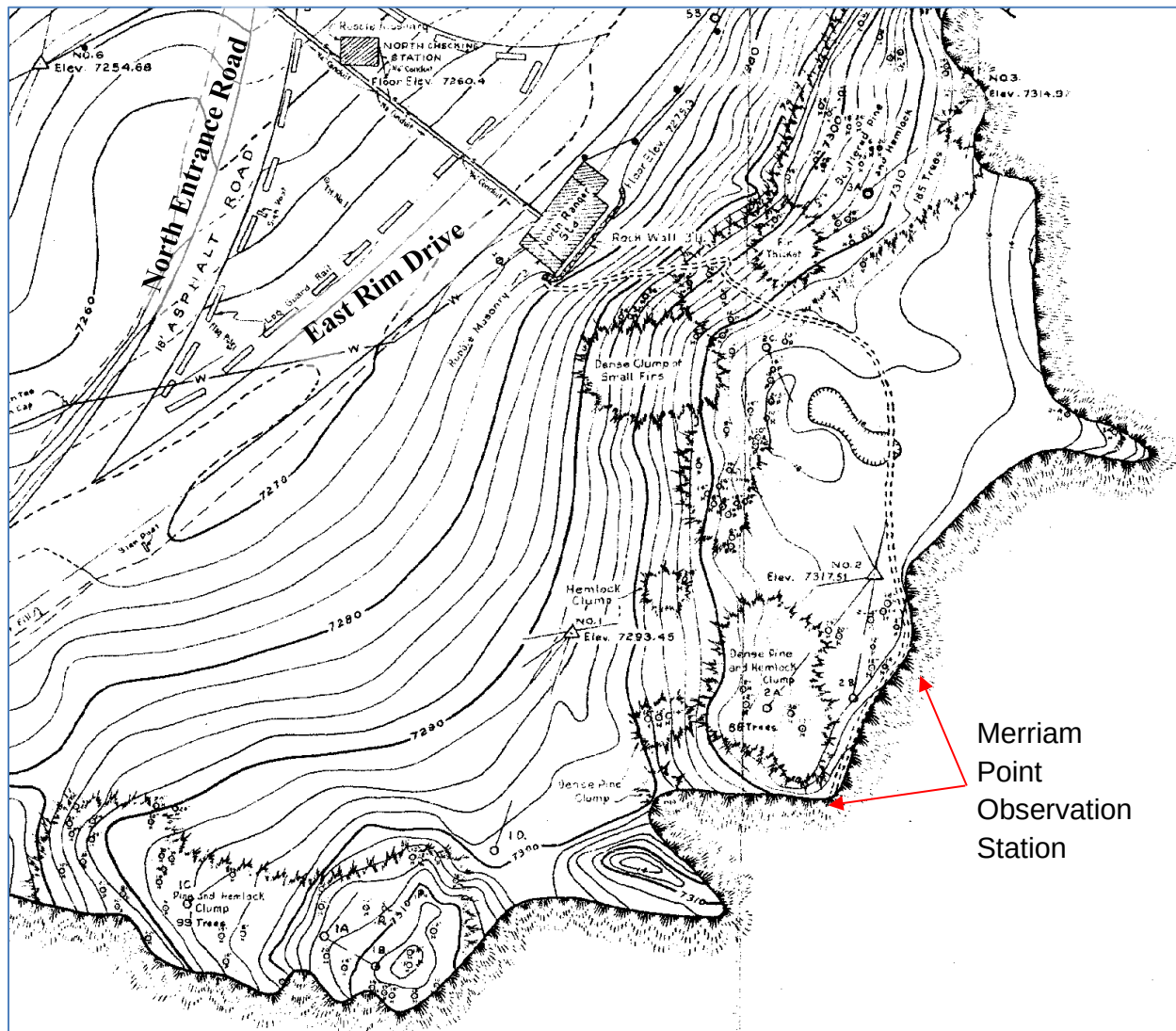


Figure 3. A 1935 site plan showing a trail (narrow dashed lines) from the old entrance and ranger stations (which have since been demolished) up to the Merriam Point observation station.

However, no action was taken to plan or prepare this site to accommodate visitor use after the completion of Rim Drive in 1941. As Mark and Watson (2009, page 98) describe the site:

“What planners hailed as possessing the potential to become the most popular stop along Rim Drive soon showed unsightly wear because the NPS failed to construct the walkways and view points. Safety concerns on the part of some employees led to erection of a wood rail fence at the most conspicuous overlook in 1995, but snow loading dictated an almost annual replacement of the horizontal members. With little else in place to restrict visitor impact to this site, overuse had meanwhile destroyed much of the vegetation between the parking lot and the rim.”

The Park took notice of the need for restoration and revegetation at this site as early as 1978 (Barnes 1978):

“The area in the vicinity of the north junction [sic] is heavily used by visitors desiring a lake view. Trampling and subsequent erosion of the rim area is the result of this heavy use. The most extensive damage is at the base of very old white bark pines where the area has been trampled, denuded, and subsequently erosion has washed the soil from the roots (Figure 4).”

The need for restoring the North Junction area was mentioned in several assessments made by NPS staff, including recommendations made by NPS Regional Director Charles H. Odegard (1987), and NPS Regional Landscape Architect Joe Dunstan (1991). The need for a comprehensive plan for the North Junction Overlook was also described by Landscape Architect Robyn Gyorgyfalvy (2001). A detailed revegetation plan (Klepadlo 1999) was developed by CRLA Botany staff in 1999 but was never implemented.

Present Rehabilitation Plans

The present effort to rehabilitate the North Junction Overlook is split into four components (C01-04; Figure 5), and includes:

- C01: Creation of an accessible viewing area of Crater Lake for all Park visitors at the end of an already established trail to the caldera rim. The existing trail will be hardened and delineated, and a rock support wall will be installed. Heavily trampled areas and social trails will be revegetated.



Figure 4. Whitebark pine (*Pinus albicaulis*) in the North Junction area with exposed roots from soil erosion. Photo by Jen Hooke.

- C02: Restoration of the main route between the North Junction parking lot and the North Junction Overlook. The existing trail will be narrowed, hardened, and delineated and an overlook area with sturdy fencing installed. Heavily trampled areas and social trails will be revegetated.
- C03: A trampled, eroded slope next to the parking lot will experience erosion control measures and the slope will be revegetated.
- C04: The Merriam Point Overlook area will be redesigned with a narrower trail, defined overlook area, and fencing. Heavily trampled areas and social trails will be revegetated.

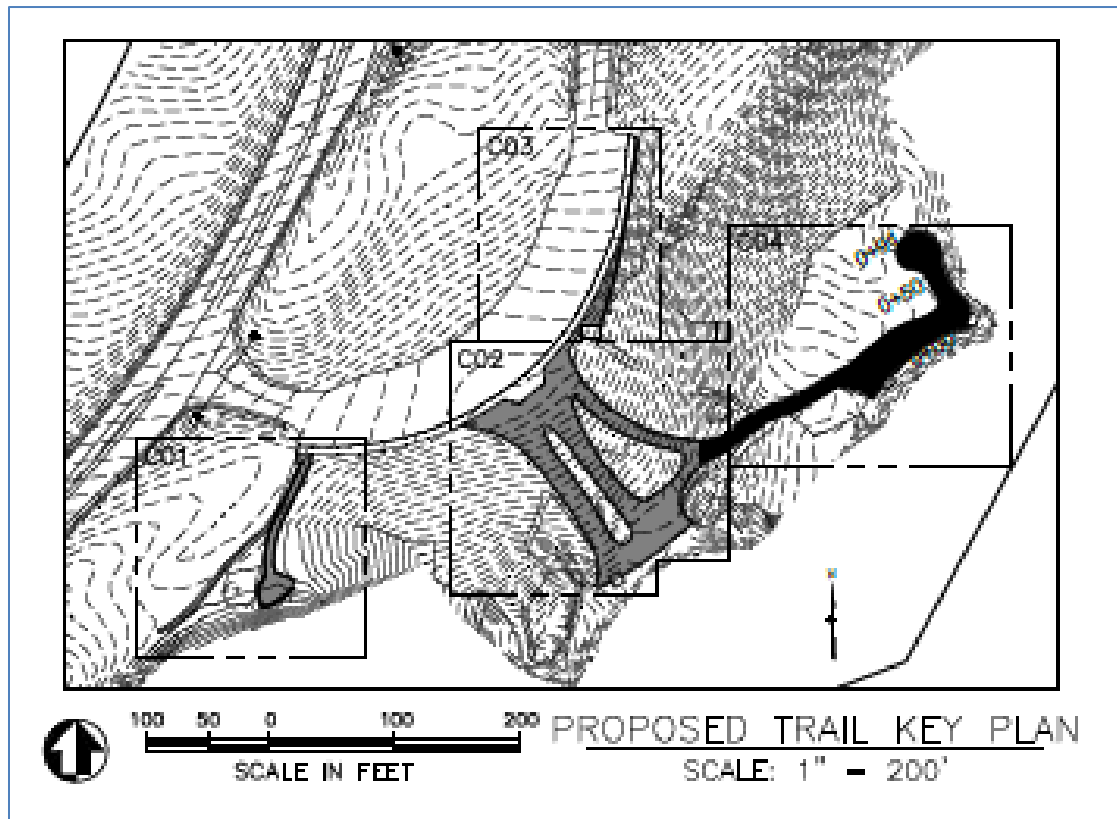


Figure 5. Location of components (C01-C04) of the North Junction Overlook Rehabilitation project.

Construction of the new trail and overlook areas will commence in 2020. To prepare for this effort, the Botany program planned for revegetation of this site through investigating historic information (Figure 6), developing revegetation prescriptions, collecting native plant materials, and propagating plants. These efforts are detailed in the Methods and Results sections.



Figure 6. The North Junction Overlook in 1935 (top – NPS photo by George Grant) and 2018 (bottom— photo by Jen Hooke). Where possible, vegetation communities will be reestablished as part of this project.

Methods

Revegetation

The first step in revegetation planning was gathering information about the native plant species present in the North Junction Overlook area. This area is characterized by subalpine fellfield vegetation communities (DiPaolo et al. 2018) with scattered tree islands comprised of mountain hemlock (*Tsuga mertensiana*) and whitebark pine. Subalpine fellfield vegetation is common around the caldera rim, and at the North Junction area consists of meadows with soft sandy/ashy pumice soils of the Cleetwood-Sunnotch-Castlecrest complex (NPS 2013). The site was visited during the 2018 field season and a species list created to guide revegetation efforts. Historic photos also guided which plant species to use for revegetation. From the initial species list, a revegetation prescription for the North Junction Overlook area was developed based on the abundance of plant species present in adjacent, relatively intact plant communities in nearby locations (Figure 7). Relative cover values were determined by ocular estimates. Additional information collected included microsite factors (e.g. downed wood, available organic materials) that could aid establishing plants, wind exposure of the site, and aspect.



Figure 7. Two different plant communities of several present at North Junction. Photos by Carrie Wyler.

Native Seed Collection and Processing

Using the revegetation prescription as a reference, seed was collected from grasses, forbs, and subshrubs within half a mile of the project area. Seeds were not collected from all plant species listed in the revegetation prescription during the 2019 season, and seeds from additional species may be collected in subsequent years. Seed collection in 2019 targeted the most abundant plant species in

the project area, and ones that the Botany program has experienced the most success with propagating and planting in prior restoration projects. The seed collection process commenced in 2019 by observing and documenting the phenology of each targeted species in the project area (Table 1). Seeds were collected according to the Botany program's established Seed Collection Protocols (Beck et al. 2017). Seed was dried and cleaned according to the Botany program's Seed Cleaning and Short Term Storage Protocol (on file on the Botany server). Limited collections of individual species were maintained during processing for use in plant propagation. Remaining seed was prepared for overwintering and stored in the Botany seed freezer for use in broadcast seed mixes.

Table 1. 2019 plant phenology for the North Junction area.

Common Name	Scientific Name	Leaf	Bud	Flower	Fruit	Seed
Needlegrass	<i>Achnatherum occidentale</i>	6/24	7/08	8/05	8/19	8/23
Newberry's fleecflower	<i>Aconogonon davisiae</i> var. <i>davisiae</i>	**	6/24	7/08	8/05	8/19
California brome	<i>Bromus carinatus</i> var. <i>carinatus</i>	6/24	7/22	7/29	8/05	8/12
Pussypaws	<i>Calyptidium umbellatum</i>	**	**	**	**	7/22
Brewer's sedge	<i>Carex breweri</i>	**	7/08	7/22	8/05	8/23
Common squirreltail	<i>Elymus elymoides</i> ssp. <i>elymoides</i>	6/24	7/08	7/29	8/12	8/23
Blue wildrye	<i>Elymus glaucus</i> ssp. <i>glaucus</i>	**	**	**	**	9/12
Greene's goldenweed	<i>Ericameria greenei</i>	6/24	8/05	8/19	**	9/26
Anderson's lupine	<i>Lupinus andersonii</i>	6/24	7/08	7/22	8/05	8/19
Prostrate lupine	<i>Lupinus lepidus</i> var. <i>lobbii</i>	6/24	7/08	7/22	8/05	8/19
Spreading phlox	<i>Phlox diffusa</i>	6/24	7/08	7/22	7/29	8/08
Crater Lake currant	<i>Ribes erythrocarpum</i>	**	**	**	**	9/10

** Information not available

Plant Propagation

Propagation of native plants from seed poses difficulties for the Botany program due to the lack of equipment for cold stratification of seeds and the year-round staffing required for early season plant care. To address these difficulties, plant propagation techniques utilize CRLA's abundant snowpack to cold stratify seeded pots, and the plant propagation schedule aligns with the present Botany field season.

In October of 2019, Ray Leach "SC7 Cone-tainer" pots were placed in racks and then filled and settled to 0.5" below the container rim with Premier "PRO-MIX HP Mycorrhizae" soil. These pots

were then seeded with a small pinch of native seeds collected from the restoration area during the 2019 field season. A thin (~1/8") layer of soil was then placed over the seeds, and the pots were watered (Figure 8).



Figure 8. Seeding containers with blue wildrye (*Elymus glaucus* ssp. *glaucus*) (left). Covering seeded pots with soil (right). Photos by Carrie Wyler.

The seeded pots were placed under rodent-excluding screens in the Botany program's space at the Ball Diamond at Park headquarters and left to overwinter under the snowpack to replicate natural germination conditions (Figure 9). Prior to overwintering, pots were placed in a tight group, and mulch was packed around the perimeter to protect roots from exposure to severe cold and desiccation.



Figure 9. Winterizing pots with mulch (left). Germinated pots with rodent-exclusion screens overwintered for cold stratification (right). Photos by Carrie Wyler.

Invasive Vegetation Management

Given the project area location, invasive vegetation management (IVM) stands as a critical component of a successful revegetation effort. As one of the Park's most heavily visited sites (Figure 10), potential exists for the introduction of invasive plant species especially to recently restored areas. Invasive Vegetation Management efforts include conducting area surveys and controlling invasive plant species, both before and during rehabilitation efforts. See the 2019 IVM Annual Report (Randall et al. 2020) for detailed methodology on invasive plant survey and control. Historic invasive plant populations were investigated using the IVM program's geodatabase, which maintains invasive plant records from 2003—present. Any invasive plant species encountered are treated as per the Park's Invasive Vegetation Management Plan (DOI NPS 2017).



Figure 10. Crowds of people view Crater Lake from the North Junction Overlook in late spring. Photo by Carrie Wyler.

Results

Revegetation efforts are categorized into two main emphasis areas: (1) those focused directly on revegetation such as collecting and processing native seed, propagating plants for outplanting, and preparing soils and sites for planting and seeding; and (2) invasive vegetation management.

Revegetation

The 2019 field season was primarily one of obtaining plant materials needed to support revegetation efforts. No construction of new trails or overlook areas occurred this season. Revegetation efforts were focused solely on preparing for the upcoming rehabilitation work and contributing to the foundation of plant materials (e.g., plants available for outplanting; seed available for broadcast seeding) needed to support the North Junction Overlook Rehabilitation project. Botany staff developed a revegetation prescription (Table 2) for the North Junction Overlook area that serves to guide which plant species are used to restore the vegetation communities that have been destroyed by heavy visitor use at this site.

Table 2. Revegetation prescription for the North Junction Overlook area.

Seed Zone: North Junction		ID: NJO
Location: North Junction Overlook Area		
Site Description: Trail and overlook areas will be paved and permanent fencing installed, as well as a new ADA-ABA accessible lookout area established. The current disturbed area will be reduced, and social trails closed. Trampled areas outside of trail and overlook corridors will need to be restored and revegetated.		
Pre-Disturbance Site Information		
Plant Species	Common Name	Relative % Cover
<i>Achnatherum occidentale</i>	Needlegrass	5%
<i>Aconogonon davisiae</i> var. <i>davisiae</i>	Newberry’s fleeceflower	50%
<i>Arctostaphylos nevadensis</i>	Pinemat manzanita	2%
<i>Bromus carinatus</i> var. <i>carinatus</i>	California brome	5%
<i>Phlox diffusa</i>	Spreading phlox	7%
<i>Elymus elymoides</i> ssp. <i>elymoides</i>	Common squirreltail	5%
<i>Ericameria greenei</i>	Greene’s goldenweed	8%
<i>Erigogonum marifolium</i> var. <i>marifolium</i> & <i>E. pyrolifolium</i>	Buckwheats	6%
<i>Lupinus andersonii</i> & <i>L. lepidus</i> var. <i>lobbii</i>	Lupines	4%
<i>Tsuga mertensiana</i> & <i>Pinus albicaulis</i>	Mountain hemlock & Whitebark pine	7%
<i>Luzula hitchcockii</i>	Hitchcock's smooth woodrush	1%
	Total Cover:	100%
Associated species: <i>Anaphalis margaritacea</i> , <i>Anemone occidentalis</i> , <i>Calyptidium umbellatum</i> , <i>Carex</i> species, <i>Castilleja</i> species, <i>Luetkea pectinata</i> , <i>Phacelia hastata</i> ssp. <i>compacta</i> , <i>Ribes erythrocarpum</i>		
UTM (Zone 10, NAD 83):	Beginning: 0569211 End: 4757234	Beginning: 0569329 End: 4757351
Total Vegetative Cover: 50%		Elevation: 7,265 ft. – 7,295 ft.
Slope: 0% in some areas, and 25% in others	Aspect: West/NW	Snowmelt out: mid-June
Soil “hardness,” presence of rocks: Area is compacted and very sandy, 0-2% small pebbles present		
General Soil description: Sandy pumice		
Ameliorating microsite features: Conifer needles and cones, some small branches and twigs around tree areas; other areas barren		
Wind exposure: High	Canopy cover (overall): 5-10%, trees are in clumps	
Area: Approximately 1.5 acres (precise area needs to be taken in 2019)		
Comments: Area prescription was done before rehabilitation, but after multiple decades of visitor soil compaction and vegetation destruction.		
Recorders: CW, SH, TC Date: 7/23/18		

Native Seed Collection and Processing

Seed was collected from 12 individual plant species during the 2019 season, and a seed mix was created from plant species of lesser abundance (Table 3). Seed was dried at the seed drying facilities in the Stall Nine garage at Park headquarters and cleaned in the Rat Hall garage bay (Figure 11). Seed is currently being stored in the Park's unheated warehouse at Park headquarters in sealed action packers.

Table 3. Amount of seed collected by plant species in 2019.

Common Name	Scientific Name	Quantity (g)
Needlegrass	<i>Achnatherum occidentale</i>	151
Newberry's fleecflower	<i>Aconogonon davisiae</i> var. <i>davisiae</i>	10
California brome	<i>Bromus carinatus</i> var. <i>carinatus</i>	**
Pussypaws	<i>Calyptidium umbellatum</i>	6
Brewer's sedge	<i>Carex breweri</i>	100
Common squirreltail	<i>Elymus elymoides</i> ssp. <i>elymoides</i>	430
Blue wildrye	<i>Elymus glaucus</i> ssp. <i>glaucus</i>	31
Greene's goldenweed	<i>Ericameria greenei</i>	**
Anderson's lupine	<i>Lupinus andersonii</i>	154
Prostrate lupine	<i>Lupinus lepidus</i> var. <i>lobbii</i>	124
Spreading phlox	<i>Phlox diffusa</i>	7
Crater Lake currant	<i>Ribes erythrocarpum</i>	**
Species mix	n/a	1,719
TOTAL		2,732

**Cleaned seed weights unavailable



Figure 11. Seed drying facility in the Stall 9 garage (left). Cleaning seed (right). Photos by Carrie Wyler.

Plant Propagation

Five plants species were targeted for plant propagation efforts in 2018 and seven species in 2019 (Table 4). Plants propagated in the fall of 2018 successfully germinated and are growing well at the Ball Diamond nursery. A total of 2,497 pots were seeded in October of 2019 and are presently in cold stratification under the snowpack at the Ball Diamond. Two species will be propagated from cuttings during the spring of 2020: pinemat manzanita (*Arctostaphylos nevadensis*) and Crater Lake currant (*Ribes erythrocarpum*). Germination and establishment success will be evaluated during the 2020 field season.

Table 4. Number of pots seeded for plant propagation in 2018 and 2019.

Scientific Name	Number of Pots Seeded 2018	Number of Pots Seeded 2019
<i>Achnatherum occidentale</i>	588	291
<i>Aconogonon davisiae</i> var. <i>davisiae</i>	1,078	800
<i>Elymus elymoides</i> ssp. <i>elymoides</i>	490	384
<i>Elymus glaucus</i> ssp. <i>glaucus</i>	n/a	198
<i>Ericameria greenei</i>	98	500
<i>Lupinus andersonii</i>	n/a	300
<i>Phlox diffusa</i>	294	294
Total	2,548	2,497

Invasive Vegetation Management

Only one population of invasive plants were detected in the project area during 2019: approximately 25 white clover (*Trifolium repens*) plants. These were treated upon discovery.

Discussion

The 2018 and 2019 field seasons laid the foundation for revegetation efforts at the North Junction Overlook area. Revegetation plans were developed, seeds were collected, and plant propagation initiated to provide the first pulse of plant materials needed to restore damaged landscape back to scenic native plant communities of the caldera rim environment. Lessons learned from recent revegetation projects such as the Rim Drive Rehabilitation Revegetation project and the Pacific Crest Well Pipeline Revegetation project guided efforts made on the North Junction Overlook Revegetation project. Seed collection in 2019 targeted species that are easy to collect from and provide abundant seed (Wyler et al. 2019). Plant propagation techniques used were ones with which the Botany program has had prior success (Heisler et al. 2019).

The 2020 field season will require continued seed collection and plant propagation efforts, especially for Newberry's fleecflower. This species is the most dominant in the area and its seeds are extremely difficult and time consuming to collect. Plant propagation success needs to be evaluated in summer of 2020 and adjustments made to ensure adequate plant establishment and growth. The project area will need continued survey for and treatment of invasive plant species.

Continued collaboration with the Maintenance Division will be necessary to ensure that social trail obliteration and soil decompaction occur concurrently with construction of new trail and overlook areas. In areas with extreme soil compaction, utilizing mechanical equipment for decompaction may be necessary. A combination of temporary and permanent fencing will be a vital part of revegetation success and fencing will need to be on hand early; procuring this during the 2020 field season is recommended so that restored areas can be protected from further trampling damage. Similar fencing to what was used on a recent revegetation project at Rim Village (Hooke et al. 2019b) may be an appropriate option for revegetation areas at the North Junction Overlook site.

Social trail obliteration will be challenging as some trails are well established and many years of trampling damage have resulted in extreme degrees of soil erosion. Discouraging further use of social trails will need fencing, signage, and enforcement to keep visitors in designated areas for safety and resource protection. In heavily eroded areas such as component C-03, slope stabilization efforts may be required prior to revegetation. It is recommended to work with NPS Landscape Architects to develop solutions to this issue.

The sandy/ashy pumice soils that are abundant at the North Junction Overlook area may pose additional challenges to revegetation efforts due to their softness/erodibility and well-drained natures. Soils may need more amendments (e.g., compost, organic material) than have been used on other revegetation projects in the Park. The most abundant plant species at the North Junction Overlook area is Newberry's fleecflower; this species has an uncommon trait in that its above-ground portions turn red in mid-summer, senesce, and tumble across the landscape, leaving the soils its leaves and stems protected relatively barren. It may be necessary to blend plantings of fleecflower with grasses and other forbs that anchor the soil throughout the entire growing season. Larger plants, including shrubs and sub-shrubs such as pinemat manzanita, the Crater Lake currant, and Greene's goldenweed may be especially effective at anchoring soils in erosive areas around the caldera rim and on slopes. Plant cuttings of these species, especially pinemat manzanita and the Crater Lake currant, should be attempted in the spring of 2020.

Literature Cited

- Barnes, P. 1978. Notes on Revegetation, Crater Lake National Park. Unpublished report on file at Crater Lake National Park headquarters.
- Beck, J.S., A.H. Fraser, C.S. Wyler, M.C. Frederic, and K.M. Williams. 2017. Rim Drive Rehabilitation Revegetation Project 2016 Annual Report. Crater Lake National Park, Crater Lake, Oregon.
- Department of the Interior National Park Service. 2017. Crater Lake National Park Invasive Vegetation Management Plan Environmental Assessment. Crater Lake, Oregon.
- DiPaolo, D.A., D.C. Odion, K.M. Rolih, P. Adamus, and D.A. Sarr. 2018. Vegetation classification and mapping: Crater Lake National Park. Natural Resource Report NPS/CRLA/NRR—2018/1663. National Park Service, Fort Collins, Colorado.
- Dunstan, J. 1991. Field Report (August 5-7, 1991). Memorandum on file at Crater Lake National Park headquarters.
- Gyorgyfalvy, R. 2001. Volcanic Legacy Scenic Byway, Corridor Management Plan, Supplement III. Produced in cooperation with the Winema National Forest, Oregon.
- Heisler, S.E., C.S. Wyler, J.S. Hooke, T.L. Chizinski, M.C. Frederic, and K.M. Scott. 2019. Pacific Crest Well Pipeline Revegetation Project 2018 Annual Report. National Park Service, Crater Lake National Park, Crater Lake, Oregon.
- Randall, D.R.A, E.L. Olsen, J.S. Hooke, H.L. Hasty, S.E. Hogan, V.J. McNees, and M.W. Jelinske. 2020. Invasive Vegetation Management: 2019 Annual Report. National Park Service, Crater Lake National Park, Crater Lake, Oregon.
- Hooke, J.S., Heisler, S.E., Wyler, C.S., and T.L. Chizinski. 2019b. Rim Village Barriers Revegetation Project 2018 Annual Report. National Park Service, Crater Lake National Park, Crater Lake, Oregon.
- Klepadlo, S. 1999. Intent for the Restoration of North Junction Overlook. Unpublished report on file at Crater Lake National Park headquarters.
- Odegaard, C.H. 1987. North Junction Overlook. Memorandum on file at Crater Lake National Park headquarters.
- Mark, S.R. and J. Watson. 2009. Rim Drive Cultural Landscape Report: Crater Lake National Park, Oregon. Department of the Interior, National Park Service, Pacific West Region: Social Science Series Publication Number 2009-01.
- National Park Service. 2013. National Park Service – SRI – Soil Survey Geographic (SSURGO) for Crater Lake National Park, Oregon.

Wylar, C.S., T.L. Chizinski, S.E. Heisler, J.S. Hooke, M.C. Frederic, and K.M. Scott. 2019. Rim Drive Rehabilitation Revegetation Project 2018 Annual Report. National Park Service, Crater Lake National Park, Crater Lake, Oregon.

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

April 2020

National Park Service
U.S. Department of the Interior



[Crater Lake National Park](#)

P.O. Box 7
Crater Lake, OR 97604