Exotic Plant Program
Crater Lake National Park
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Introduction

Exotic plant control by means of hand-pulling unwanted invasive species was the focus of the exotic plant program at Crater Lake National Park in 2005. In general, areas that were treated with hand-pulling in 2004, were revisited with further manual control actions being subsequently performed again in 2005. **Overall, little change was seen between 2004 and 2005 in the known exotic plant populations in relation to abundance or size of area infested. In most cases, exotic plant occurrences were located in the same places where they have been documented indicating that there is either viable seed remaining in the seed bed of these removed populations or in some instances, asexual propagation has prolonged the presence of these populations. For the purpose of cohesion in definition, we should consider these populations contained but not yet controlled.** Some new occurrences were discovered in 2005 which had been overlooked in previous years because we had focused on developed areas during surveys. For example, approximately ½ acre of *Cirsium vulgare* (Bull thistle) was found in PH2; in the southern extension of Crater Lake National Park known as the panhandle.

In addition to revisiting known populations, the approach for removing unwanted non-native plants was to prioritize the most noxious species first such as *Centaurea maculosa* (spotted knapweed), control populations that were still small and which could then be positively effected by hand-pulling, and to keep the exotics from encroaching into Munson Valley from Highway 62 S. where the bulk of our exotic plant problem exists. In all, Munson Valley Rd. as well as Highway 62 S. to the Annie Springs picnic area was contained in order to create a buffer in which to halt the spread of noxious seeds up the road corridor.

Wendy Coleman, Biological Sciences Technician, CRLA initiated these control measures and was assisted by Molly Allen, Biological Sciences Technician, CRLA and many

volunteers from the Youth Conservation Corps, The Friends of Crater Lake, and dedicated N.P.S. employees.

Areas Contained

Munson Valley Rd.
Spruce Lake
Headquarters
Employee Housing (Steele Circle and Sleepy Hollow)
Diamond Lake overlook
North Entrance Fee Station
South Entrance Fee Station
Highway 62 S. (Munson Valley Rd to Annie Springs picnic area)
Highway 62 S. (known Centaurea maculosa population)
Highway 138
Wizard Island
Rim Village

Approximately 11.4 acres of land containing exotic plants was treated by hand-pulling at Crater Lake National Park in 2005. An additional 1.5 acres was documented as having exotic plant species present but was not contained. Areas which were not treated were either avoided because time ran out to do so before seed set or the population was too numerous to be effectively contained by hand-pulling. The true number of total acres infested with exotic plants at Crater Lake National Park was not quantified in 2005, however this figure can be attained in 2006 in conjunction with a GIS layout of the distribution of the exotic plant locations. The most current, collective data for all species controlled in 2004 and 2005 are located in an Excel file in K:\APPS\RM\TER.BIO.STUFF\flora\Exotic Plants\Exotic Plant Database Updated 2005. The following list represents the relationship of species contained in 2005 to the total area treated for that species.

Invasive Plant Species	**Area treated in 2005 (acres)**
Hypericum perforatum	4.0
Cirsium arvense	1.4
Cirsium vulgare	1.5
Verbascum thapsus	1.3
Leucanthemum vulgare	.3
Rumex acetosella	.7
Tragopogon dubius	.2
Centaurea maculosa	1.3
Rumex crispus	.2
Taraxacum vulgare	.4
Grindelia sp.	.1

Control Method Experiments

During 2005, I researched various control methods for our top priority invasive plants and have summarized them and included them in this report. I will briefly present some possible experiments in locations I believe would be appropriate.

First, I will present options for *Hypericum perforatum* (St. John's Wort) on Highway 62 S. This population begins at the boundary and extends past Lodgepole picnic area. Although this population of *Hypericum perforatum* generally becomes more sporadic and less abundant as it moves up Highway 62 S., it continues to expand at an alarming rate and is becoming a serious problem. Literature suggests that there is little hope for successful eradication of this species due to propagation at the root level making hand-pulling virtually a waste of time. I have provided more details for control of St. John's

Wort later in this document however, I am personally very interested in some information that stated that the roots of *Hypericum* can be "starved out" if treated by mowing when the stems are 6 to 8 inches tall. This method would require 3 to 5 years to test and would be dependant on consistent and meticulous treatment for accuracy. I recommend that we engage in a study which compares the effects of mowing (probably done by N.P.S. at least three times per season with a weed-eater) to the effects of hand defoliation, hand-pulling, or herbicides if it is acceptable. Biological control for St. John's Wort has also been suggested but has not been studied at this elevation and could be problematic from introducing one non-native species in order to control another.

I also suggest we establish plots in the PH2 to control bull thistle using hand pulling versus cutting the stem at the surface. Literature suggests that the best approach for controlling bull thistle is to prevent the seeds from being reintroduced into the seed bed- *Cirsium vulgare* seeds have relatively short viability. As bull thistle is considered a true biennial, second year plants could be treated, thus reducing future generations. It is important to remove all pulled and cut plant material from the area as immature *Cirsium* flower heads can produce mature seeds even after being cut. The same experiment could be carried out at Spruce Lake where bull thistle is rampant; the main difference between the two areas would be that the plots at Spruce Lake would contain *Verbascum thapsus* in addition to the thistle.

Almost every source in which invasive plant control methods were presented, stated that competition by native grass and herb species is essential in long term, effective control. Areas which are identified for experimental treatment should be surveyed for native species availability and seeds should be collected for cultivation.

Recommendations for 2006

Continue to control the areas which have been worked on in 2004 & 2005. This is the only opportunity we have to monitor the progress of the control methods at this time and it is essential to be consistent if we hope to eradicate any invasive plants with low tech approaches such as hand-pulling.

Set up experimental plots and test control methods for effectiveness.

Address the burgeoning *Hypericum perforatum* (St. John's Wort) problem on Highway 62 S.

Survey Highway 62 W. for new exotic plant occurrences which may be introduced as a result of major road construction done in 2005. Also, there were exotic plant populations on Highway 62 W. which were not accessible during the 2005 construction-these populations should be revisited and controlled.

Coordinate with the Cultural Resources division and establish a plan for exotic plant removal in the historic landscape islands along the promenade. Two species were observed at the end of the season but were not documented. These species include *Spergularia rubra* and *Rumex crispus* and were found in the plot across from the Community House.

Consider training for the exotic plant program technician at a northwest park with an established exotic plant control program.

Coordinate with the Friends of Crater Lake whom have stated an interest in long term stewardship of Spruce Lake.

Coordinate with the Friends of Crater Lake in removing non-native plants from the S. Boundary (just outside of the park). The Friends have adopted a 1 mile stretch of Highway 62 S. and have pulled the weeds in previous years, however, the removal has not been consistent from year to year.

Follow up on *Centaurea maculosa* infestation on the Winema side of Highway 138. There are many spotted knapweed individuals in this road corridor which could become established in the Cornerstone prescribed fire area in the northeast corner of the park. Contact Bob Barrett at the Oregon Department of Agriculture as they have the right-of-way on Highway 138. Sarah Malaby at the Winema Forest Service may also be contacted.

Investigate control methods for *Rumex acetosella*. A file containing control options has been put together (along with files on our top invasive plant species), however because of time constraints, possible control methods for this species remains unknown. Two additional species which need research are *Bromus tectorum* and *Linaria dalmatica* which are known in the park but are not yet as abundant as the exotics investigated in this report.

Access a copy of the report discussing exotic plant occurrences in quarries in which fill dirt was brought into the park for Highway 62 construction and Rim Village construction in 2005. This information is should be available through Sarah Wynn, Denver Service Center. This report may be helpful in developing a monitoring strategy for exotic plant emergence following the mentioned construction projects.

Find a way to support an exotic plant crew at Crater Lake. We will not be able to make progressive advances in exotic plant control without one.