

Hypericum perforatum (St. John's Wort)

Integrated Pest Management Plan Crater Lake National Park Spring 2006

Currently, Crater Lake National Park's most prolific and visible exotic plant is *Hypericum perforatum* (HYPE), also known as "klamathweed" or "St. John's Wort". Back in 1993, HYPE had the highest frequency among all the exotic plants in that year's survey, supplying 32% of all weed patches found. In smaller patches, HYPE can be found in many areas (Munson Valley Road, South Pole Quarry, South Yard, Headquarters area, Mazama Campground, Rim Village). HYPE is most abundant along the highway 62 corridor in patches as small as from one or two plants, to three meter deep yellow-flowered swaths extending for a quarter mile or more. Patches tend to be denser and more abundant closest to the Park boundaries on both Highway 62 South and East, then get progressively more sparse as one continues up road towards Munson Valley Road. The concern with this plant is that established patches are difficult to eradicate, and although efforts have been made over the years to hand-pull individuals, total numbers do not seem to be reducing, and gradually patches threaten to spread and grow tenaciously into new territories. A lot of the concern comes from what we know about the plant's biology.

HYPE BIOLOGY

A native of Europe, St. John's Wort was first recorded appearing in California around the turn of the 20th century. Its range grew rapidly becoming a major pasture weed until the intentional introduction of the Australian chrysolina beetle, which greatly reduced HYPE populations west of the Cascade mountains. HYPE continues to spread, especially in areas inhospitable to the chrysolina beetle, displacing native vegetation and sickening livestock. *Hypericum perforatum*, a perennial herb, can grow to be from 2 to 5 feet tall. Their stems are erect and woody with multiple branchings. Leaves are opposite, sessile, and appear to have been perforated by small pin pricks (hence, *perforatum*). Flowers are bright yellow with raised black glands along petal margins. HYPE reproduces both by seed and by short underground rhizomes. It is the combination of the two methods of reproduction that make control difficult. Hand-pulling tends to inevitably leave behind parts of these underground runners which are then often stimulated into greater reproduction. In addition, each plant is capable of producing 15,000+ seeds each year, with seeds cited to remain viable in the soil for 6 to 10 years in some literature, and for more than 20 years, according to other

sources. Hand pulling can be effective for smaller patches, but most literature gives a discouraging report of hand-pulling effectiveness on larger infestations.

OBJECTIVES

In the long-term, we would like HYPE eradicated from the Park, but understand that complete eradication, if possible, will take a diligent annual effort. We wish to initiate an integrated management approach using different control strategies depending on the location of the plants: this will be outlined later in this report.

SITE DESCRIPTION

A vast majority of HYPE plants occur along the road margins along Hwy 62. These plants therefore thrive along side road-runoff ditches in well-drained volcanic soil. A couple hundred plants exist along Munson Valley Road, and smaller populations have been found in a few other locations (see 2003 Exotic Plant Report).

MONITORING AND MAPPING

All HYPE "patches" were located using GPS technology. Before any future treatments, plant locations will be georeferenced using GPS – point topology for smaller patches, and line topology for extended swaths of HYPE. The line topology will help us detect linear expansion of a patch, with corresponding density and width of patch information to flesh out density and depth changes.

PREVENTION

Our best defense against further HYPE infestations would be to identify and hand-pull any new small populations off of the Highway 62 corridor. It would be a good idea to have a representative from the Dept. of Natural Resources make a short presentation to incoming employees at each annual seasonal training, introducing them to a few key weeds (including HYPE), and asking them to report any sightings that might go otherwise unnoticed. Posters with images of the offending weeds should be placed in sight of employees. All new infestations should be visited, georeferenced, hand-pulled, and put on a list of areas to revisit the following year.

CONTROL OPTIONS

The internet provides us with good information about control measures used around the world against HYPE, but our most relevant information

comes from neighboring agencies – what they have tried, which actions have been successful, and which methods have not. Eradication strategies include physical/mechanical (hand-pulling, cutting/mowing), biological, and chemical controls.

Mechanical. Hand-pulling as a HYPE eradication measure tends to be effective for young, newer, small populations, but impractical and ineffective on larger, older infestations (e.g., Highway 62). It has been noted locally and elsewhere, that it is extremely difficult (impossible?) to remove the entire root system from most soils, leaving behind small rhizome fragments from which more young plants develop. Hand-pulling was effective in some dune and prairie settings where, presumably, soils were friable, making complete root extraction possible, but the disturbed/compacted roadside soils that nurture much of our HYPE plants do not allow us to extract the entire root systems effectively. Local land managers all agree that for larger infestations, hand-pulling is ineffective and impractical, but that for smaller populations, with persistence, hand-pulling may be a viable option. Cutting/mowing may also be a viable approach for reducing roadside levels of HYPE: if we are diligent in re-mowing within a few days after plants begin to re-leaf, we may be able to starve the plants down to the roots. Drawbacks to this method may include insufficient numbers of or timings for mowings stimulating increased weed growth, and the mowing of native plants that also grow on the road's shoulder.

Biological. With biological controls, one introduces an exotic insect to control an established exotic plant. In the mid-1940s, two species of *Chrysolina* beetles were collected and shipped from Australia, then released in North America to great success: in the grasslands of northern California, HYPE populations dropped to less than 1% of their former numbers, and in northern Idaho, St. John's Wort abundance hovers around 3% of its former stature. It seems that these beetles require milder winters than those found at Crater Lake, and in general, *Chrysolina spp.* populations haven't been seen locally in the last 10 years above 3,500 feet, making the successful use of biocontrols in Crater Lake unlikely. (Are there other species to research???)

Chemical. Local land managers find that chemical control for larger, well-established HYPE populations works best in the long run for roadside HYPE infestations. Locally, managers use Glyphosate ("Roundup") and Pichloram ("Tordon").

Herbicide	Considerations	Timing
Glyphosate (Roundup)	- Doesn't take out root system, so plant regrows. - Takes out any competing	Late bloom stage

	grasses. - Plant needs to be thoroughly covered or parts of plant may remain green.	
Pichloram (Tordon)	- Doesn't kill grasses. - Hard on pine trees and young firs (can be 3 feet away from pines, and not harm them, according to local source.	
Garlon 3A		

HYPE, once established, tends to out-compete its immediate neighboring plants, so in most cases along Highway 62, if a chemical control were to be used directly on each plant, its effect should be fairly localized. Every effort should be made to ensure, if herbicides were to be used, that a minimum effective dose is applied.