

Restoration Highlights

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Revealing the Forest: English Ivy Removal in the Willamette Valley

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It is not difficult to find examples of English ivy infested woodlands near human habitation. What is more difficult to find are examples of successful reclamation of these forests. For this small landowner, the question was whether a practical removal method could be found.

Three acres of Willamette Valley mixed forest were treated to remove *Prunus avium* (bird cherry) and *Hedera helix* (English ivy) between 1999 and 2013. Various approaches were tested, and an herbicide mix was chosen in 2002 for yearly application in dormant season. Cherry saplings were removed manually. By September 2013 nearly 100% of the large mature ivy plants

were removed, though small young ivy plants were still present.

This forest is an isolated remnant of the pre-settlement forest which in 1850 bordered a large wetland complex known as Lake Labish, running northwest from Salem, Oregon.ⁱ Though the subject parcel was logged sometime in the 1920s, its tree species composition remains the same as the 1850 forest: "Closed Upland Forest: Douglas fir forest, often with bigleaf maple, grand fir, dogwood, hazel, yew. No other conifers present. No oak."ⁱⁱ Fifty species of birds, nine species of mammals, and three species of amphibians were observed using these woodlands between 2005 and 2011.ⁱⁱⁱ



Figure 1: In 2002 the forest was covered in a near continuous layer of ivy, which scaled many trees to a height of up to 50 feet.

Objectives:

- Remove all ivy from trees and forest floor.
- Leave existing native species intact.
- Use methods which would not compromise area water quality and minimally affect wildlife.

Methods:

1999-2002: Small-scale experiments with various techniques of physical ivy removal:

- Mowing small sections with Billygoat mower and string mower: not effective.
- Hand removal: cutting a line 10 feet long with flat shovel, and then raking

backwards from line, essentially rolling the ivy into a carpet. Results: native false Solomon's seal, (*Smilacina racemosa*) and waterleaf, (*Hydrophyllum fendleri*) popped back up seemingly undamaged after the ivy was rolled away. After a period of several months the natives strengthened and filled in, giving a first glimpse of the potential reward for clearing the ivy out of the woods. Though the method worked, it was far too labor-intensive for the size of the woodland.

2002-2013: Herbicide treatments

Herbicide treatments in this project were modeled after a formula referred to as the "Nature Conservancy Mix^{iv}", (NCM), which has varied slightly over the past decade as new information became available. This mix is applied during the period of greatest dormancy for deciduous plants, December through early February, to avoid contact with native deciduous plant leaves. It works very slowly on ivy when applied this season, but the effects do start to show up during April through June. A window of three days without rain is required, since the "least toxicity" objective prohibits the use of newer rain-fast glyphosate formulations. It is preferable to spray when temperatures are over 50° F in the day and there is afternoon sun. However, given the reality of the northwest climate, treatments were applied whenever there were three days predicted without precipitation, regardless of temperature.

- 2000-2002: Treatment of both small photo plots and large sections with NCM. The NCM at that time called for:
 - 2% glyphosate (aquatic formula, without additives)
 - 2% Scythe, a burn-down herbicide
 - 0.5% LI700, a farmland surfactant, rated for application in vicinity of salmon bearing streams.

- Result: Judged to be 60% effective each year. By 2002 some treated areas judged 80-90% clear of ivy.
- 2002, 2003: Alternative treatments applied in test plots:
 - 4% Finale, 1% LI700
 - NCM applied with Mantra sprayer which applies microfine droplets of glyphosate at such a low rate that it approximates application with water-based spray.
 - Result: Neither of these methods produced a noticeable effect on the ivy.
- 2006-2009: Entire mixed woodland area treated with stronger version of NCM, increasing glyphosate content to 4%.
- 2010-2012. Spot treatments as needed, 4% NCM mix.
- 2011: Hand pulling around sword ferns, which appear to be very sensitive to glyphosate. About 10 person-hours work removed the ivy from about 1 acre of ferns.
- October 2013: Spot treatments with an



Figure 2 : The treated forest (red dots) is located about 2 miles east of Brooks, Oregon, at elevation 150' in farmland. It is part of the closed upland which once lined both sides of historic Lake Labish. This woodland was bordered to the east the lake, visible as onion fields in the lower right corner of the photo, and by French Prairie to the west, now visible as agricultural fields.

updated formula now used in the Portland area by the Nature Conservancy: 4% Rodeo Aquamaster, 2% Triclopyr, 2% Competitor surfactant.

Results:

Ten test plots were selected at random by use of random number generation along north/south and east/west axes. A mean of 1.2 ivy plants per square meter were found per plot. Almost all of these plants were small independently rooted plantlets, with one or two leaf sets and no runners or a single runner to one other set of leaves. These are new plantlets, not remnants of the formerly extensive cover of plants which was composed of long runners rooted at various points along their length.

The overall appearance of the woodland indicates a positive effect. The vista through the woods is completely changed, as one sees a native understory of oso berry, hazelnut, and the occasional Oregon grape, unobscured by thickets of exotic cherry saplings. The forest floor, especially, has been completely transformed, showing extensive regrowth of the native plant cover in some areas, especially the star-flowered Solomon's seal, which appears to have become both denser and more extensive in the last few years.



Figure 3: View from same vantage point as Figure 1, taken in January, 2014.

Discussion:

It would be useful in future studies to inventory plant and animal species present prior to and following the ivy removal, to assess the effect of ivy removal on habitat quality.

The technical question left unanswered by this study is what to do about the ivy seedlings which have sprouted up in so many spots. Should they be removed manually en masse to prevent further spreading, or will spot herbicide treatments eventually prove effective?

On a broader scale, this problem can probably only be reduced by more effective public education about the effects of English ivy encroachments on native forests. Neighbors within a half mile radius the subject parcel have ivy patches which have scaled trees and fences and are producing ivy berries and seeds in large quantities. This in itself shows the complex nature of this problem: ivy appears to provide a tempting food source for some native avian species, and may affect those species in a positive way, yet its effects on the plant composition of forest floors may have a negative impact on other species.

ⁱ Christy, J.A., E.R. Alverson, M.P. Dougherty, S.C. Kolar, C.W. Alton, S.M. Hawes, L. Ashkenas & P. Minear. 2011. GLO historical vegetation of the Willamette Valley, Oregon, 1851-1910. ArcMap shapefile, Version 2011_04. Oregon Biodiversity Information Center, Portland State University. As quoted within: Willamette Valley Pre Settlement Vegetation 1850, online dataset/map found at Data Basin. View map with Basemap set at "Topography", and look east of Brooks in area called Skunkville. <http://databasin.org/maps/new#datasets=ec12d24283554cb68c2de68c4c10dd2b>

ⁱⁱ Ibid., see descriptive text using *Information* feature button on map's control bar.

ⁱⁱⁱ **Summary of Findings**
Vertebrate Species Habitat Preferences in a Remnant Willamette Valley Woodland, p 1 Jonathan Pope, unpublished paper, 10-30-2011

^{iv} [Camassia Natural Area Restoration Project and Phase 3 Ivy Control Experiment Final Report US F&WS Cooperative Agreement #13420-01-J152](#)
The Nature Conservancy, Oregon Field Office
Jonathan Soll - Project Manager, January 2006