Changes in the plant community of River View Natural Area following removal of invasive plants

> Paulette Bierzychudek Dept. of Biology Lewis & Clark College



# River View Natural Area (146 acres) in sw Portland purchased by city of Portland in 2011



## May-June censuses in 2012, 2013, 2014

- 100 plots in RVNA upland forest
- 100 plots in adjacent forested areas where no invasive removal occurred (Lewis & Clark campus, Riverview Cemetery)



- presence/absence of herbaceous species recorded in 3 nested frequency plots of 0.25, 1, and 4 m<sup>2</sup> area
- numbers of shrubs/trees/ferns recorded in circular plots of 78.5 m<sup>2</sup> area

## The Good: 11 native herb species occur only in ivy-removal areas (all are ± infrequent)



Viola glabella

ella Epilobium ciliatum(?) Trientalis latifolia Asarum caudatum Tellima grandiflora



Vicia americana



Osmorhiza chilensis

Plus: Stachys cooleyae, Anemone deltoidea, Monotropa uniflora, Fragaria vesca

#### No native herb species occur only in control areas.

Photo credits: <u>http://commons.wikimedia.org/wiki/File:Viola\_glabella\_9032.JPG</u>, <u>http://sbwildflowers.wordpress.com/wildflowers/onagraceae/epilobium/epilobium-ciliatum/</u>, <u>http://en.wikipedia.org/wiki/Trientalis\_latifolia</u>, <u>http://www.wnps.org/plants/tellima\_grandiflora.html</u>, <u>http://commons.wikimedia.org/wiki/File:Vicia\_americana\_%283646448599%29.jpg</u>, <u>http://www.pnwflowers.com/flower/asarum-caudatum</u>, <u>http://depts.washington.edu/propplnt/Plants/osmorhiza%20chilensis.htm</u>

### Nine additional native herb species occur in both ivy-removal & control areas



Achlys triphylla



Claytonia sibirica



Hydrophyllum tenuipes



Nemophila parviflora



Trillium ovatum



Vancouveria hexandra

#### Plus: Galium aparine(?), Geum macrophyllum(?), Urtica dioica

Photo credits: <u>http://science.halleyhosting.com/nature/gorge/3petal/bar/achlys/achlys.htm</u>, <u>http://www.bobnisbet.com/ocf/flowers.htm</u>, <u>http://www.pcc.edu/resources/rcesc/plants.html</u>, <u>http://species.wikimedia.org/wiki/Nemophila\_parviflora</u>, <u>http://www.publicdomainpictures.net/view-image.php?image=6609</u>, https://www.nargs.org/forum/inside-out-flower-vancouveria-my-american-dream

#### All nine species are more frequent in ivy-removal areas than in control areas



Achlys triphylla, Geum macrophyllum, Urtica dioica too infrequent to analyze

The Bad: Non-native herb species are more frequent in ivy-removal plots than in control plots. These are mostly small seedlings.



non-native species are increasing in frequency over time in both removal and control plots The Ugly: Shrubs are more diverse (left) and abundant (right) in control areas (where invasive plants are still present) than in ivy-removal areas...



- Did the shrub communities of control and removal areas differ even before invasives were treated?
- Did herbicide cause mortality of non-target species?

### Future plans

- Invasive plant treatment at Lewis & Clark College and Riverview Cemetery began in 2014 (thanks to MCSWCD)
- This work converts former control areas to removal areas
- With 3 years of pre-removal data for former control areas, we can better identify causes of any future changes
- Monitoring of all areas will continue in summer 2015 (and beyond)

Questions/ideas? <bierzych@lclark.edu>

Many Lewis & Clark students and the financial support of Lewis & Clark College have made this work possible.