Pacific Northwest Garlic Mustard Working Group

Highlights from Recent Collaborations

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Abstract

Invasive plant managers and field staff working on control of garlic mustard (Allaria petiolata) in Oregon, Washington and Alaska recently convened to share observations, identify challenges, discuss treatment strategies and refine methodologies. Through collective sharing of observed treatment successes and deficiencies, potential improvements to control methodologies were revealed. A composite, regional view of the current work being undertaken to combat garlic mustard was also compiled. Developing a platform for future collaboration promotes timely sharing of key information and supports a region-wide effort to contain and decrease garlic mustard presence in the Pacific Northwest.

Background

Garlic mustard has been widely characterized as one of the worst invaders of Northeast and Midwest forests. As an ecosystem modifier, garlic mustard is capable of successfully invading forest understories and becoming the dominant understory species. In the Pacific Northwest, its ecological effects are less studied; however, it has demonstrated the ability to invade nearly all PNW habitat types.

PNW habitats susceptible to garlic mustard:
- Heavily disturbed urban sites to healthy native forests
- Sunny, well-drained sites to shady, moist sites
- Riparian floodplains to upland forest
- Both western and eastern-sides of Cascade and Coast Ranges
- Riparian floodplains to upland forest
- Both western and eastern-sides of Cascades

The comprehensive garlic mustard management programs that have been established in the Northwest have built a thorough network of landowner participation and key infrastructure. All have met challenges, yet many also have suggestions for improving upon methodologies. There is much to be gained through direct collaboration between garlic mustard managers of the Pacific Northwest.

Content presented reflects discussion from a day-long working group gathering, and email and phone correspondence.

Objectives

- Establish a regional view of garlic mustard’s known presence & extent
- Identify and communicate current management & outreach approaches
- Share observations of what appears to be working and not working
- Identify limitations, challenges and opportunities for improvement
- Share tools for better managing data, contacts, mapping
- Build networking abilities to promote timely sharing between agencies and jurisdictions

Discuss and coordinate ongoing and future strategies, at various geographical scales

Challenges

- Variable and adaptable phenology (flowering period, stature, axillary growth)
- Wide ecological aptitude (demonstrated ability to invade nearly all habitats)
- Seed bank longevity (occurrence of new plants after several years of preventing seed production)
- Treatment challenges (flowering may occur incrementally, siliques may continue to produce seed post-treatment, lateral regrowth)
- Coordination and sharing between many entities and mapping/reporting platforms

Discussion

Outreach – Most have generally had successful growth with landowner participation and public reception

Management Strategy – Most entities aim to control all known populations; however, there are some exceptions

Survey – Entities generally rely on a three-pronged approach with 1) proactive mailing campaigns to high risk property owners 2) field surveying and 3) training volunteer weed watchers.

Results – Overall, the consensus was that control programs appear to be curtailing spread from established management zones. Relatively few new invasions have been discovered outside active management areas. While some do not report decline in population density, more have seen declines in density following 2-3 years of treatment.

Recommendations for future efforts:
- Decreasing the size of the impacted area is more difficult than reducing density
- Areas on the leading edge of invasions with less established populations were observed to respond better to control efforts

Control

Integrated Pest Management – Observations and Suggestions

Prevention is key
- Refine methodologies; Evaluate strategies on local and regional scales
- Standardize contractor language on prevention protocol
- Install storm drain stations in public areas and utilize wash stations to remove hard-packed soil
- Fall application of 1% glyphosate to rosettes has been shown to be effective
- Post-spraying fire to open seed pods; it has been observed that this inhibits continued seed production
- Consider clipping off seedheads prior to herbicide application to minimize seed production
- During rainy conditions when foliar application is not possible, it may be prudent to hand-pull or cut seedheads and return later to spray if there is concern about making the most of a limited treatment window
- Most agree that it is desirable to control not just flowering plants, but rosettes, too
- Hemlock mulch may suppress mustard species, including garlic mustard. Successes with this cultural practice have been observed, but requirements include replanting supply after 2yrs and maintaining a match depth of 6".
- Herbicide Selection:
  - Triclopyr: Phenotypic response is usually visible within a few days, which is often desirable. Compared to glyphosate, triclopyr is thought to work faster on seedpods to prevent continued seed production following an application. As a broad-spectrum herbicide, triclopyr does not affect grasses.
  - Glyphosate: Usually provides good systemic control. As a slower-acting herbicide it can take up to 3-5 weeks to completely kill plants. Some agencies elect to use it only during early flowering and switching to using triclopyr during silique formation. Concerns expressed with possible resistance to use of glyphosate alone.
  - Aminopyralid: Observed to show good rosette control, but leads to topkill and root crown resprouting when applied to flowering individuals.

Next Steps

- Collaborate: Develop and facilitate infrastructure for sharing between management staff across region in fist-serv and meeting formats
- Share: Data, mapping, outreach and treatment challenges/successes
- Research: More scientific study is needed on the behavior and adaptability of garlic mustard under varying conditions of the PNW
- Adapt: Refine methodologies; Evaluate strategies on local and regional scales

Contact

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