

# Invasive Plants in Pennsylvania

## Garlic Mustard

*Alliaria petiolata*



Chris Evans, River to River CWMA  
[www.forestryimages.org](http://www.forestryimages.org)

### Background:

Garlic mustard was likely introduced into the United States by early European settlers for culinary or medicinal purposes. It was first recorded in Long Island, New York in 1868.



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### Range:

Native to Europe, garlic mustard now ranges from eastern Canada, south to Georgia and as far west as Oregon.

### Description:

Garlic mustard is a cool season biennial herb with triangular to heart-shaped leaves. Leaves give off an odor of garlic when crushed. First-year plants appear as a rosette of leaves that remain green through winter, maturing the following spring. Button-like clusters of white flowers give way to erect, slender pods by May. Dead stalks of dry, brown seedpods hold viable seed throughout the summer.



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### Habitat:

This invasive is frequently found in moist, shaded soil of river floodplains, forests, edges and openings, especially in disturbed areas. Garlic mustard is associated with calcareous soils and does not tolerate high acidity.

### Biology and Spread:

Garlic mustard plants develop rapidly, each individual producing thousands of seeds that scatter nearby. Because white-tailed deer find garlic mustard distasteful, they further its expansion by eliminating native competition, as well as by exposing the soil and seedbed through trampling.

### Ecological Threat:

Highly shade-tolerant, garlic mustard is capable of invading high-quality, mature forests. To the detriment of spring ephemeral wildflowers, garlic mustard quickly forms monocultures by monopolizing resources. Its allelopathic compounds inhibit seed germination of other species.

Toothwort (*Dentaria* sp.), the host plant of the rare West Virginia white butterfly (*Pieris virginianensis*), is one of the spring ephemerals outcompeted by garlic mustard. The butterfly is drawn to lay its eggs on garlic mustard, a fatal mistake for its offspring. Garlic mustard may also disrupt the mutualistic relationship between native trees and mycorrhizal fungi.

## How to Control this Species:

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### Physical

Because garlic mustard seeds can remain viable in the soil for five years or more, effective management is a long-term commitment. The goal of management is to prevent further seed production and to nip pioneering colonies in the bud.

For small infestations, hand-pulling is extremely effective. Larger infestations may be controlled by cutting. This should be done when the plant is in flower. All plant material should be removed from the site following treatment, since seeds can still develop on cut stems.

### Chemical

For heavy infestations, where the risk to non-target species is minimal, the systemic herbicide glyphosate may be useful.

Herbicide can be applied at any time of the year, including winter (to kill overwintering rosettes) as long as the temperature remains above 50° Fahrenheit, and rain is not expected for at least 8 hours.

Chemical control is best done in late fall when most native plants are dormant.

### Prevention

Infestations may be prevented by monitoring and removing pioneering plants. Disturbances, such as foot traffic, overgrazing and erosion, should be minimized.

A regular burning regime in fire-adapted oak woodlands can also prevent infestations.



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## Look-A-Likes:

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Many native white-flowered plants occur alongside garlic mustard, and may be mistaken for it. These include toothworts, sweet cicely (*Osmorhiza claytonia*) and early saxifrage (*Saxifraga virginica*).



Toothwort

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## References:

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*Center for Invasive Species and Ecosystem Health:*  
<http://www.invasive.org/browse/subinfo.cfm?sub=3005>

*Plant Conservation Alliance's Alien Plant Working Group:*  
<http://www.nps.gov/plants/alien/fact/alpe1.htm>

## For More Information:

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*DCNR Invasive Species Site:* <http://www.dcnr.state.pa.us/conservationscience/invasivespecies/index.htm>

*DCNR Invasive Exotic Plant Tutorial for Natural Lands Managers:*  
[http://www.dcnr.state.pa.us/forestry/invasivetutorial/garlic\\_mustard.htm](http://www.dcnr.state.pa.us/forestry/invasivetutorial/garlic_mustard.htm)