INVASIVE SPECIES CONTROL FACT SHEET

Garlic Mustard (*Alliaria petiolata*)
Identification and Mechanical Control Recommendations for Long Island

**BACKGROUND**

**History:**
Garlic Mustard was brought to Long Island in 1868. It is native to Europe and was brought to the United States for medicinal and culinary purposes.

**Biology/Ecology:**
Garlic mustard infestations are initially latent and inconspicuous; invading habitats by actively growing and reproducing when native plants are dormant. Seed germination occurs in early spring before the native plants are active. Continuous plant growth occurs through late fall and winter (in warmer regions) after native plants have gone dormant. In early spring of the second year this biennial, flowers and goes to seed. *Alliaria petiolata*
is known to exude allopathic chemicals. These biological mechanisms allow populations to rapidly increase and expand.

Garlic mustard persists in shade and sun, invades disturbed and undisturbed areas equally and is commonly found in understories, edges, roadsides, landscaping, riparian areas, and open fields. Its spread is facilitated by the transport of contaminated soil by animals and humans.

**Identification:**
Garlic mustard as a biennial plant, encompasses two growth stages, the first year is vegetative growth and the second year it reproduces ending its lifecycle. Due to Garlic mustard’s reproductive habits, both forms of the plant are found growing together.

In the first year, the plant form occurs in a basal rosette (crown of leaves at ground level) consisting of bright to dark green kidney shaped leaves with scalloped edges. It does not flower in the first year. A distinct garlic/onion scent, for which the plant is named, is revealed with crushing of the leaves. This odor weakens with plant maturity.

In March of the second year of growth, the plant reaches maturity. The leaves become triangularly serrated with a purple green tinge and a shoot(s) emerges from the crown of the basal rosette, terminating at heights up to three feet. In late April through May, it bears white, clustered, four petaled flowers (in the shape of a cross) indicative of the mustard family. The flowers occur on the leaf axils (where leaf attaches to stem) and distal (distant) end of the stem. Seed pods are long and slender with small oblong flatish black seeds and form in late May through June. The plant browns at senescence (death) but remains erect with seed pods intact.
Garlic Mustard (*Alliaria petiolata*)

Not to Scale

CONTROL METHODS

Goal: To prevent the spread by seed and to exhaust the seed bed.

Mechanism of Spread:
Seed is spread by wildlife (fur and hooves) and through contaminated soils. Intentional human transport as Garlic mustard is recognized as a wild edible.

Target:
The most effective method in eradicating Garlic mustard is to target the flowering plant rather than basal rosette. The basal rosette will resprout if the entire root is not removed, whereas the pulling of a flowering plant ensures any remaining plant material (root, crown) will not regenerate. Timing thus is important to ensure that flowering plants are pulled prior to seed set.

The basal rosettes will flower the following year and seed remains viable for up to five years, therefore repetitive (yearly) eradication efforts and monitoring must occur until the seed bank is exhausted and/or seed loses viability.

Phenology:
Germination: Fall (potentially) and Spring - March 15 (cotyledons)
First true leaves: April 12
Flowering stalk: April 17
Seed set: May 15
Senescence: June 10 (beginning)

Eradication Timing:
Eradication efforts should start in March prior to flowering and continue through June.

Permits:
None necessary unless plant exists in a designated wetland.

Concerns:
Must dispose of entire plant in garbage bags as seed set will occur on pulled plants.

Tools:
Gloves, 3 mil garbage bags, mower with bagging device, weed whacker, scythe, weed fork.

Control Procedures:

1. Mature Plants -Small Infestations:
Mature flowering plants should be pulled by hand starting in early spring (March – June) during flowering and prior to seed set. The entire plant should be pulled or cut as close to the soil as possible which will prevent resprouting. Soil disturbance should be minimal to prevent germination of seed bank.
2. **Mature Plants-Larger Infestations:**
Large infestations of flowering plants can be cut via mowing, weed whacking, or use of scythe prior to seed set. This should be completed as close to ground level as possible without disturbing soil. Cutting at this level will prevent the re-flowering from leaf axils. Timing as it related so seed set should be carefully evaluated due to the potential of mechanical methods to spread seed. Plants in flower should be bagged to prevent seed set.

3. **Plants With Seed Set (June – July):**
After seed set, careful hand removal of the plants should occur. These plants should be immediately bagged to minimize seed spread. If the plant is in the browning stage, the plant is dead and majority of the seedpods have already shattered or will shatter with contact. Removal efforts may be futile at this stage and efforts should be focused on eradication during the next season. Care should be taken to clean treads of shoes, tools and clothing if in an area where garlic mustard pods area shattering.

4. **Basal Rosette Removal:**
If basal rosettes are targeted, the entire root must be removed. The use of a weed fork may facilitate such removal. Ground disturbance should be minimized as much as possible to prevent further seed germination. Pulling while soils are moist will facilitate ease of root removal and help prevent breakage of root.

**Disposal:**
All Garlic mustard plants in flower must be contained as the flowers will form viable seeds even after pulling. Plants should be disposed of in 3 mil thick black garbage bags and tightly closed. To kill the plants and seed, the bags should be placed in the sun to “cook” or liquefy. The hotter the temperature the more likely the heat will kill the seeds. The ideal location would be on asphalt or a concrete surface. Monitor bags for tears and break down. Dispose of these bags at a transfer station.

**Prevention:**
Equipment, clothing and shoes should be cleaned prior to leaving the site to ensure seeds are not transported. Equipment, clothing and shoes should be cleaned prior to leaving the site to ensure seeds are not transported. Stiff brushes are effective in removing soil and seed from shoe treads and clothing.

**Restoration:**
Planting recommendations for restoring sites with native plants should be made on a site by site basis in order to ensure the correct plants are matched with the correct environmental conditions.
REFERENCES


http://www.ipm.msu.edu/garlicAbout.htm

www.forestconnect.info Controlling Invasive Species in Woodlots, Cornell Cooperative Extension and New York Department of Conservation.


PHOTO CREDITS

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