



copeland forest  
friends association

# GARLIC MUSTARD PROJECT

Copeland Friend volunteers surveyed the Forest and  
marked the locations of garlic mustard.

Let's Start Pulling

# Under Threat

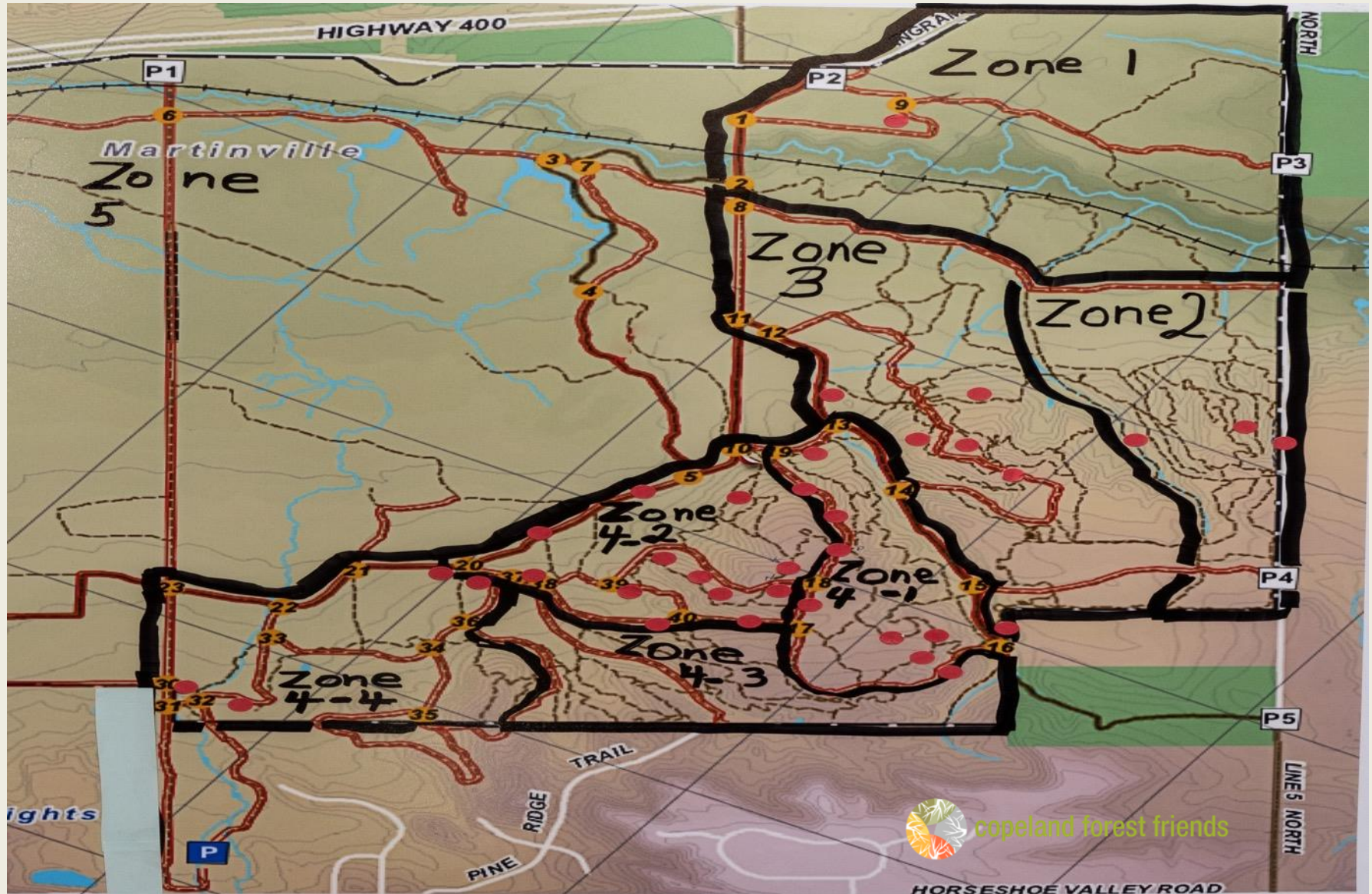


# Why it is urgent to tackle Garlic Mustard Now

- “Garlic mustard is widely recognized as the most Prevalent and Problematic invasive species within our North American deciduous forests.”
- Quote from Nature Conservancy of Canada



# Locations of GM from Survey (Red Dots)



# ANALYSIS of Garlic Mustard Survey

1. 95% of GM is located in upland deciduous forest of the Copeland
2. 95% of GM is located in this Ecologically rich area
3. Locations are of light to medium density
4. Infestations occur on the sides of trails: Woodland plants have already disappeared there
5. Numbers have increased over the last 15 years.



IMPACT: Garlic mustard displaces woodland plants and deciduous saplings. Local woods below right.



# White, S-Shaped Root of Garlic Mustard Releases Toxic Chemicals that Attack Roots of Woodland Plants and Saplings



\*The KILLER part of the garlic mustard plant is the white, S-shaped root

\*It RELEASES TOXIC CHEMICALS that attack the Mycorrhizal fungi found in soil.

\*MYCORRHIZAL fungi surround the roots of plants and saplings. The fungi penetrate the roots of plants, even their cells, and reach out much further than the plants' roots can to absorb nutrients and water

\*But, when the Mycorrhizal fungi are killed by the GM's toxic chemicals, the woodland plants are deprived of food and die.

\*The forest soil retains the poisonous chemicals. It becomes so toxic, that only GM can survive.



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**Botanists recently discovered that sugar maples, native red maples, black cherry, beech and oak trees get up to 75% of their nutrients through mycorrhizal fungus.**

**\*\*That means that we cannot count on our canopy trees being rejuvenated if saplings are killed by garlic mustard.**



Woody plants get >75%  
nutrients from mycorrhizal  
fungi



## **Year One of Garlic Mustard**

**The seeds of garlic mustard plants germinate.**

**Kidney-shaped, scalloped-edged leaves form a rosette. This becomes the basal rosette of next year's plant.**

**The plant overwinters.**



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## Year Two: May & June = Pull Now

Clusters of white 4-petal flowers

Triangular, toothed leaves

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*Still in doubt? Is this Garlic Mustard?*

*Feel: Rub a leaf*

*Should smell like garlic*





# Pull Correctly. It's Critical.

- Must pull all 3 parts: the flowering stem, the basal rosette and the white S-shaped part of the root.
- The first curve of the root has buds. If the S-curve is not removed, the many buds will resprout.
- With TWO hands, reach under the rosette. Your finger may bury into the earth and feel the tap root. Lift the entire plant up vertically.
- The white, S-shaped root must come with the plant.



Pesto, Aioli, Hummus,  
Sautéed Greens  
Yummy!

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# Settlers Ate Garlic Mustard

- In mid 1800's, settlers brought garlic mustard from Europe
- Highly nutritious, prolific and survives our winters
- Natural predators, both diseases and insects, control the invasive in Europe. They do not exist in North America.

## \_\_\_\_\_ Recipes \_\_\_\_\_

- We will post some recipes that we have tried, and hope to have samples at our Spring Pulls.

# July to September Seed Pods Form

Garlic Mustard Population Explodes



- Spreads rapidly by seed alone
- 1000 seeds per plant, 60,000 per sq.metre
- Stands can double in size every 4 years
- Seeds can remain dormant and viable in the ground for 5+ years
- Remove plants in spring before seed production
- Pull for 5+ years to deplete seedbank
- One-off pulling exacerbates the invasion



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## Manual Pulling protects other plants

Spraying herbicides may destroy surrounding vegetation...like this plant seen in its spring and fall transformations. What is it?

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Protect Biodiversity in the Copeland

Keep the color and mystery of nature in the  
Copeland.

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# Protect the Wonder

Go for a walk with Copeland Friends. See False Solomon's Seal in both spring and fall.

# NOW, Good Time to Start

- Priority GM locations already identified
- Light to medium infestations; not rampant
- Easy to access on the side of trails
- Easy to pull the plants
- Manual pulling is best, but needs people
- Copeland Friend volunteer will meet you

# The Plan: One-Hour Pull

- Adopt a section of trail for 5 + years
- Brown stakes with Reference ID mark your location
- Take a Photo before every annual pull; then post it to your page
- Assess progress and effectiveness over 5 years



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# No Hauling Bags out of Forest Compost Bins built by Friends in Copeland



# Join Spring Garlic Mustard Pull

## Only One Hour of Pulling

Option #1	Tuesday	May 14	Morning
Option #2	Tuesday	May 28	Morning
Option #3	Wednesday	May 29	Afternoon
Option #4	Sunday	June 2	Morning
Option #5	Monday	June 3	Evening
Option #6	Tuesday	June 4	Morning Afternoon
Option #7	Tuesday	June 18	Morning Afternoon and Evening

**Please sign up now and join in this important effort to control garlic mustard. Register at:**  
**[garlicmustard@copelandfriends.ca](mailto:garlicmustard@copelandfriends.ca)**

PLEASE respond and indicate what option you want and how many people are coming with you.  
You must preregister so we can stake your section, determine its size and give it a Reference ID tag.  
After you register, we will contact you and confirm the date, time, place + details.

If you cannot make the above dates but would still like to help, please email us your availability.

The garlic mustard pull is open to everyone. Individuals, couples, a family, a group of families, a street, a club, group of friends: bikers, walkers, skiers, card players, Copeland User Group.

THANK YOU

For protecting their habitat

From creatures who live, often hidden from sight, in the Copeland





## References for Garlic Mustard

1. A Landowner's Guide to Managing and Controlling Invasive Plants in Ontario, Partnership of MNRF, OFAH,OIPC,CVC
2. GM, One of Ontario's Most Unwanted Invasive Plants, Nottawasaga Valley Conservation Authority
3. Control Methods for the Invasive Plant Garlic Mustard within Ontario Natural Areas, Nature Conservancy of Canada, pdf
4. [www.invadingspecies.com](http://www.invadingspecies.com) or [www.ontarioinvasiveplants.ca](http://www.ontarioinvasiveplants.ca)
5. 'There's no major city like it': Toronto's unique ravine system under threat, [www.theguardian.com](http://www.theguardian.com)
6. Ready or Not, Garlic Mustard is Moving In: *Alliaria petiolata* as a Member of Eastern North American Forests; [www.biosciencemag.org](http://www.biosciencemag.org)

