

# **GARLIC MUSTARD**

***(Alliaria petiolata)***



**EMERGING  
PEST PLANT  
IN NC**

# AGENDA

- Background on Garlic Mustard
- Ecological threats
- Control strategies
- Early Detection, Rapid Response: Fighting an invasion along Ellerbe Creek in Durham, NC

# What people are saying about garlic mustard:

## USDA website:

- Prohibited in four northeastern states
- Class A noxious weed in Alabama and Washington

## Tennessee EPPC:

- Rank 1 invasive

## A representative testimonial:

*"I have seen, in Maryland, Pennsylvania, New York and in the mountains of West Virginia, vast expanses of garlic mustard that have almost completely eliminated the native herbaceous layer of the habitats it occupies."*

-- Chris Baranski, Wildlife Forest Manager,  
NC Wildlife Resources Commission

# CURRENT DISTRIBUTION IN NC

- Radford mentioned only the **Dan River area** (1970s)
- Wheatley's listing: **Ashe, Buncombe, Madison, Orange (Mason Farm), Rockingham counties**
- Communication from Gary Kauffman: GM in mountains "spotty but starting to get a foot-hold": **Macon County, Haywood County, two outbreaks in Buncombe County**
- Jamey Donaldson: **Roan Mountain** infestation
- Ellerbe Creek Watershed Association: **Durham County** since at least 2002
- Communication from Perry Sugg of NC EEP: One site in **Greensboro**

# Modes of Spread Through State

- **Ellerbe Creek in Durham**

**Initial infestation:** probably hitchhiked on landscape plants

**Subsequent spread:** stream flow, floods, deer?

- **Roan Mountain**--probably came in with road fill



Biennial, up to 4 feet high, smells like garlic

## Leaf shape and texture



Garlic Mustard



Violet leaf



First year's basal rosette



First year rosettes form dense groundcover



**2nd year flowering stalk  
April/May**



**Seed capsules (siliques) of  
2nd year plants - May**



**Remains of 2nd year seedstalks  
(Milwaukee, WI)**



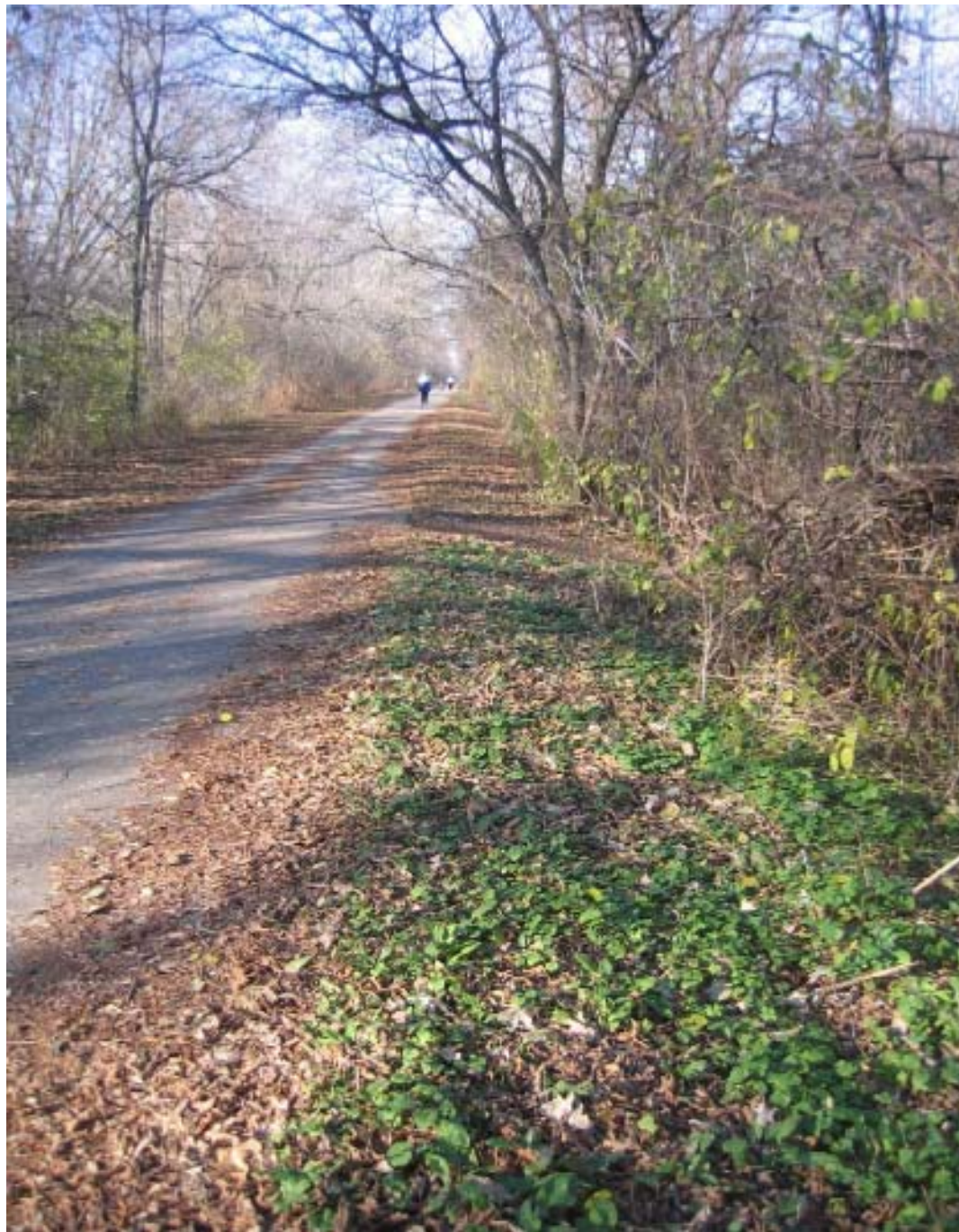
Garlic Mustard in parks  
(Princeton, NJ)



**Garlic Mustard in backyard gardens  
(Princeton, NJ)**



**Garlic mustard on a hillside  
(Milwaukee, WI)**



**Garlic Mustard along a bike trail**

# ECOLOGICAL THREATS

- Displacement of native species
- G.M. allelopathic--releases chemicals through roots that suppress other plant growth
- Disruption of mycorrhizal relationships in soil important for water and nutrient uptake
- Impacts reproduction of the woodland butterfly *Pieris napi oleraceae*, which utilizes native toothworts, e.g. *Cardamine concatenata* (*Dentaria laciniata*)
- Changes to forest litter affect habitat for salamanders, molluscs and other wildlife



**Toothwort**  
***Cardamine concatenata* (*Dentaria laciniata*)**

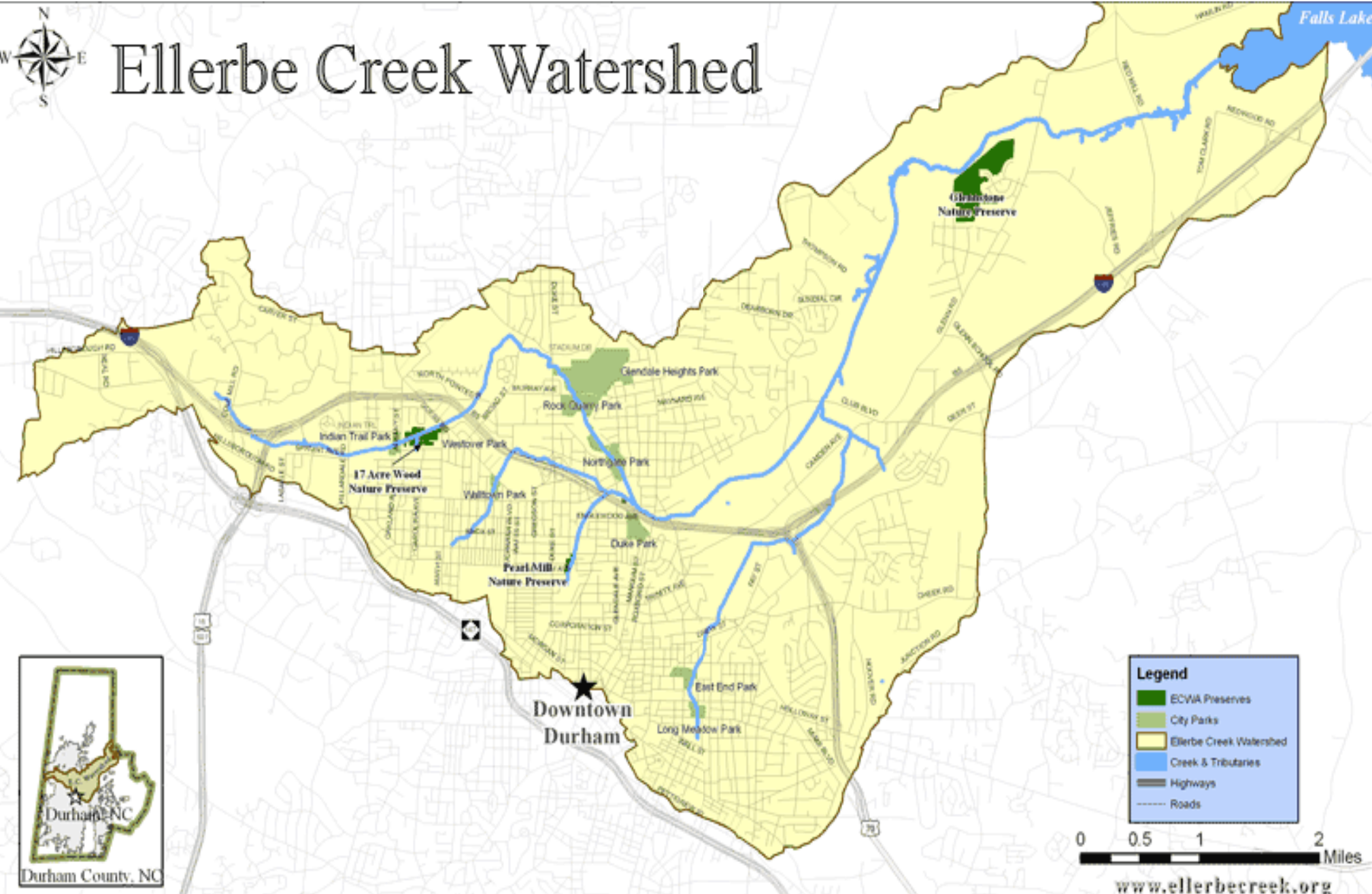
# Garlic Mustard in Durham, NC



**Ellerbe Creek**



# Ellerbe Creek Watershed



Garlic mustard first found just north of downtown Durham along South Ellerbe Creek

I lived 7 years in North Carolina  
without encountering garlic mustard.



**Garlic mustard first discovered along  
a tributary of Ellerbe Creek in  
downtown Durham in 2002**

# Garlic Mustard in Durham County, NC



## Legend

✦ Garlic Mustard Patch Pulled Spring 2008

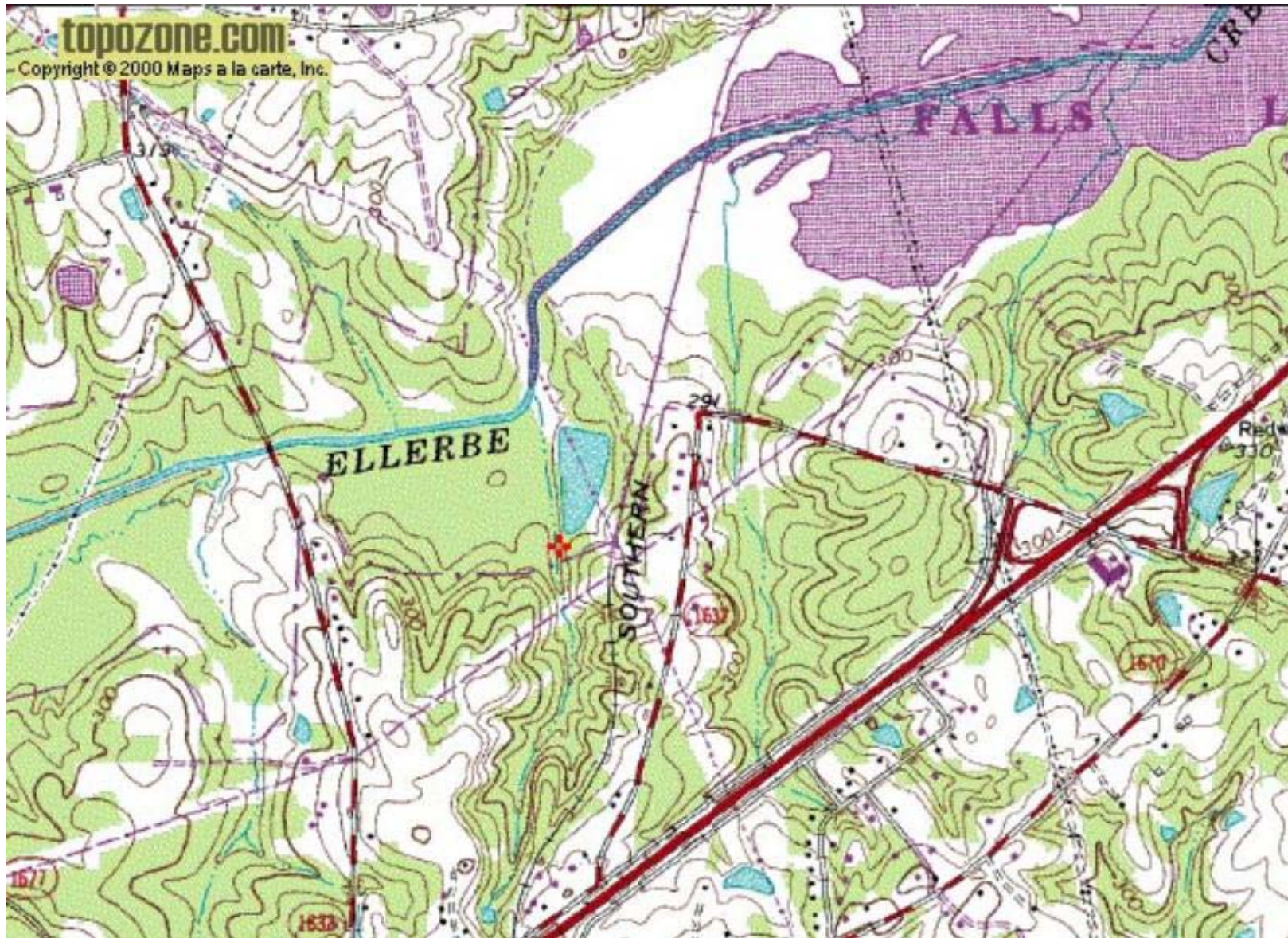
map prepared by Carl Stearns of the  
Ellerbe Creek Watershed Association May 2008  
[www.ellerbecreek.org](http://www.ellerbecreek.org)

This extent of Ellerbe Creek was not surveyed in 2008, but we can only assume that there is Garlic Mustard growing in this area. Future eradication efforts will have to involve more laborers to work through this area.

Garlic Mustard was first detected here at the Duke Diet & Fitness Center by Stephen Hiltner and has continued to spread downstream.

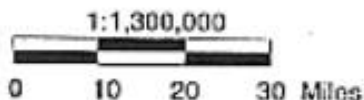
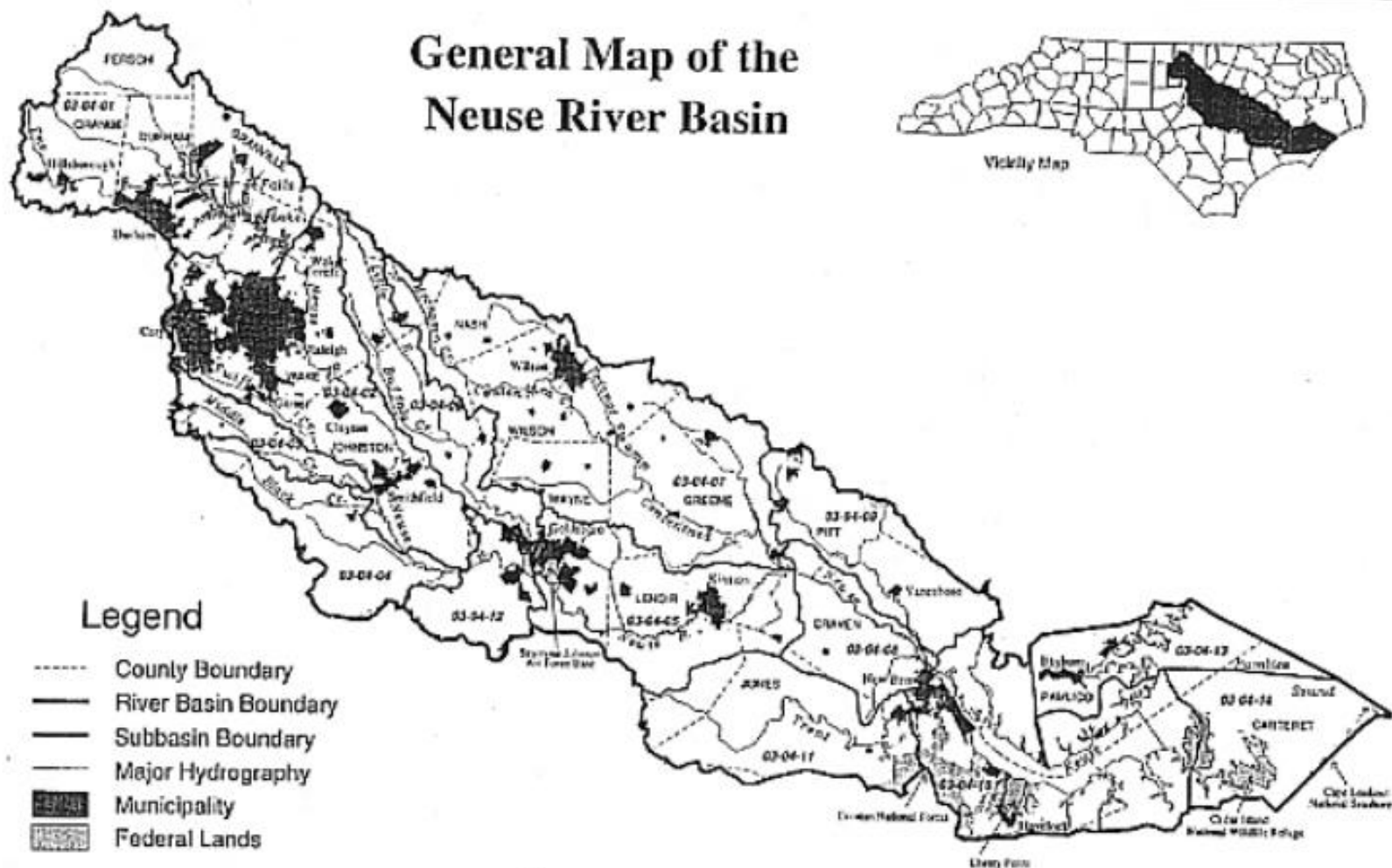
0 0.25 0.5 1 Miles

## Tracking populations (shown in lime green) along Ellerbe Creek



**Why care about a small outbreak in a small watershed in Durham?**

# General Map of the Neuse River Basin



## Garlic mustard escapes into the Neuse River watershed?



**Since 2002, annual garlic mustard pulling by volunteers--6,750 plants pulled in 2009**

# Noxious weed creeps into city, kills native plants

BY JIM WISE  
STAFF WRITER

It's pestiferous, poisonous, it stinks — and it's here.

Garlic mustard, that is, *Alliaria petiolaris*. The noxious weed has invaded the banks of Ellerbe Creek, and eco-conscientious citizens are doing their best to get it out.

"It is feared by nature lovers," said Fred Broadwell, one of about 10 volunteers who have been seeking out and rooting out garlic mustard this spring. Another eradication expedition is headed for the woods this weekend.

**WHY?** "It is a very successful plant, in that it poisons other plants," Broadwell said. "It shades out wildflowers, it grows very fast and it takes over an area."

Or, as put by the Plant Conservation Alliance (a federal outfit with outside "cooperator" agencies):

"Once introduced to an area, garlic mustard outcompetes native plants by aggressively monopolizing light, moisture, nutrients, soil and space."

**HOW:** "Each plant produces thousands of seeds," Broadwell said, and they can scatter several yards from the parent plant. According



The Ellerbe Creek Watershed Association is trying to rid the area of garlic mustard, an invasive weed that poisons native species.

COURTESY OF CARL STEARNS

to Broadwell, water appears to be the main factor abetting the spread in Durham: When the creek rises, like after a heavy rain, the seeds are picked up and carried downstream to invade new territory.

**WHERE:** "The first ones we found were around Trinity Avenue,"

said weed-puller Joanne Abel. That was six years ago. Despite repeated efforts by the Ellerbe Creek Watershed Association, the plant has spread downstream as far as Red Mill Road.

**SO?** "If the garlic mustard reaches the Falls' Lake," said Abel, "it will become a problem for folks all the way to the coast!"

**WHENCE?** Garlic mustard is a European native first identified in the U.S. in the late 1860s, on Long Island. Presumably imported for food and medicinal purposes, it thrives in moist and shady places like creek banks and now ranges as far west as Nebraska and as far south as Virginia.

In North Carolina, it has so far appeared only on Roan Mountain in the far west and Ellerbe Creek.

Rick Iverson, a state agriculture department weed expert, said North Carolina doesn't have garlic mustard on its list of noxious weeds — yet — but it is considered a pest wherever it occurs.

"I'm not surprised" it has broken out in Durham, he said.

"There are probably a number of different ways seeds can travel," Iverson said. "It could possibly

hitchhike on animals, or people bring it in on their boots."

**WHAT IS TO BE DONE:** "You pull it up by the roots," Abel said. "Have to get it all or it grows back."

**NOW:** "We are alarmed that we are seeing more of the plant this year than in previous years," Broadwell said. "So we are ... increasing the effort to eradicate the plant."

**HELPING HANDS:** "We would love to have more volunteers," Broadwell said.

This weekend's work is weather-dependent, but as of Thursday the plan was to pull plants at the Glennstone Nature Preserve off Glenn Road starting at 10 a.m. today and continuing until about 2 p.m.

To get there, take Exit 180 off I-85 North and turn left onto Glenn School Road, then right onto Glenn Road. After 1.3 miles, turn left onto Glennstone Drive, go a quarter-mile and park near the nature preserve entrance.

To find out more or check for changes of plan, call Broadwell at 220-8213.

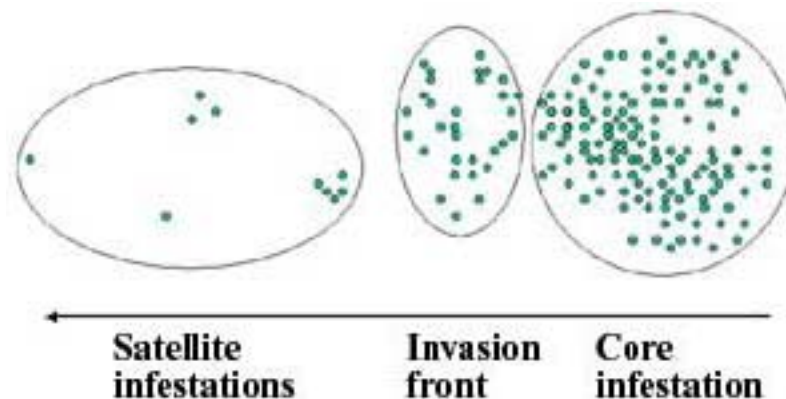
jim.wise@newsobserver.com or (919) 956-2408

# CONTROL STRATEGIES

**Aim is to prevent new seedset and deplete existing seed bank--a five year process**

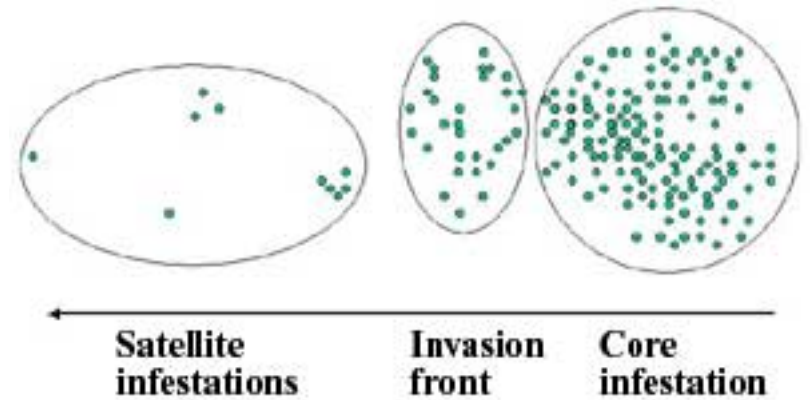
- Focus first on finding and eradicating small satellite infestations
- Pull and bag ALL second year plants
- 1-2% glyphosate on 1st year rosette--if native flora present, then treat when natives dormant
- Late-spring prescribed burn

<http://www.ipm.msu.edu/garlicMge.htm> (Michigan State)



# Early Detection Rapid Response

"Remove satellite infestations first"



"Satellite infestation" concept works at all scales of action:

A woods, a watershed, a county, **a state,**

**a nation, a planet**

Can regulation reflect that?

# Cooperative Weed Management Area in Durham, NC

- Ellerbe Creek Watershed Association  
([www.ellerbecreek.org](http://www.ellerbecreek.org))
- NC Wildlife Resources Commission (May, 2009  
letter from Chris Baranski)
- Role for NC-EPPC?
- Role for other state agencies?

Contact info: **[stevehiltner@gmail.com](mailto:stevehiltner@gmail.com)**

Info about Ellerbe Creek: **[www.ellerbecreek.org](http://www.ellerbecreek.org)**