



HOBART AND WILLIAM SMITH



# Invasive Species and Land Stewardship

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# Finger Lakes Institute



## Mission

*Translating knowledge and research about the Finger Lakes watershed into collaborative action*

## Vision

- ❖ Protect and promote the Finger Lakes' water resources and natural systems
- ❖ Connect science and research with regional and community needs
- ❖ Provide actionable science, education, and outreach on environmental issues



# Finger Lakes PRISM



## Mission

*To reduce the introduction, spread, and impact of invasive species within the Finger Lakes PRISM region through coordinated education, detection, prevention, and control measures*

- ❖ Network of state, federal, and local agencies, NGOs, and other stakeholders that supports a comprehensive approach to invasive species management
- ❖ Allows partners to share and leverage limited resources
- ❖ Funding through the NYS Environmental Protection Fund administered by the NYS DEC



# Partnerships



## **Lake Associations**

Canandaigua Lake Watershed Association  
Cayuga Lake Watershed Network  
Seneca Lake Pure Waters Association  
Keuka Lake Association  
Skaneateles Lake Association  
Oneida Lake Association  
Honeoye Valley Association  
Kettle Lakes Association  
Otisco Lake Preservation Association

## **Municipalities**

City of Rochester  
Town of Greece  
Canandaigua Lake Watershed Council  
Cayuga Lake Watershed Intermunicipal Organization  
Seneca Lake Watershed Intermunicipal Organization  
Cayuga County Water Quality Management Agency  
Ontario County Planning Department  
Onondaga County Planning Department

## **Soil and Water Conservation Districts**

Onondaga County  
Yates County  
Seneca County  
Monroe County  
Tompkins County  
Onondaga County  
Cortland County  
Broome County

## **Agencies**

NYS DEC  
NYS Department of Ag and Markets  
NY Natural Heritage Program  
US Forest Service  
NYS FORCES  
United States Army Corps of Engineers  
Montezuma Wildlife Refuge  
NYS Canal Corp

## **Higher Ed**

Cornell Integrated Pest Management  
SUNY Environmental Science and Forestry

SUNY Brockport  
FLCC Muller Field Station

## **Cornell Cooperative Extension**

CCE Wayne County  
CCE Monroe County  
CCE Onondaga County  
CCE Seneca, Cayuga, Schuyler Counties  
CCE Finger Lakes Grape Program

## **NGOs, Non-Profits, Industry, Others**

Canandaigua Botanical Society  
Baltimore Woods  
Invasive Species Centre  
Buffalo Maritime Center  
Corning Inc  
Oatka Creek Watershed Committee  
Genesee Land Trust  
Genesee Valley Conservancy  
Montezuma Audubon Center  
Central New York Land Trust  
Upper Susquehanna Coalition

# What is an invasive species?

**A non-native species that causes harm to the environment, economy, or human health.**

## Environmental

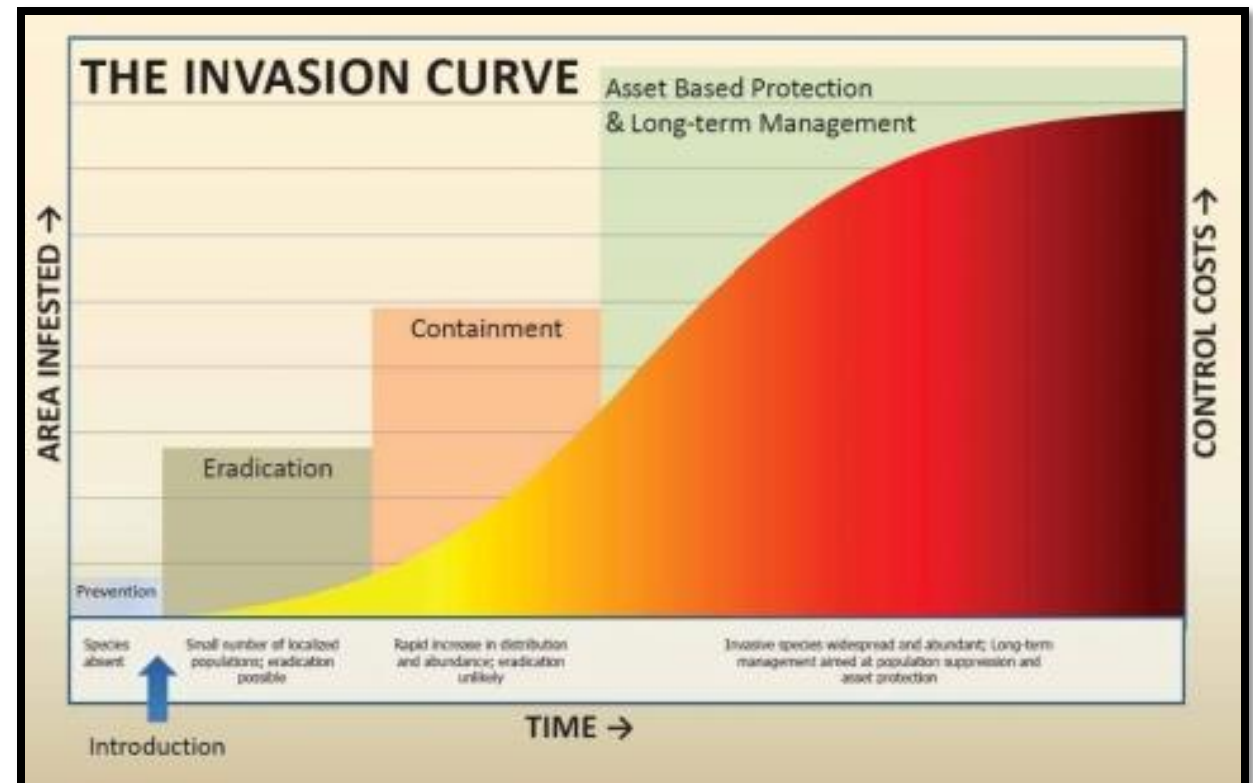
- Reduce biodiversity
- Disrupt ecosystem function

## Economic

- Damages agricultural and forests
- Impact recreation and tourism
- Management costs

## Human Health

- Can cause injury, allergies, or disease
- Impacts soil, water, and air quality



The invasion curve. Adapted from Invasive Plants and Animals Policy Framework/State of Victoria, Department of Primary Industries, 2010

# Invasive Species and Water Quality



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**Increase erosion and sediment runoff**



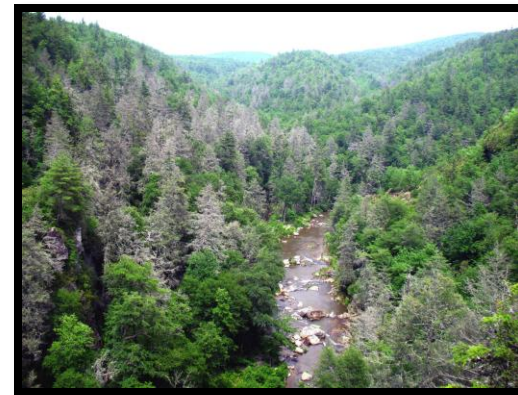
**Reduce wetland and riparian function**



**Alter nutrient cycling**



**Decrease biodiversity and ecosystem resilience**



**Change light conditions and water temperature**

# Eastern Hemlock

*(Tsuga canadensis)*



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- **Foundation species in northeastern forests**
  - Shape forest structure and ecosystem function
- **Regulate stream ecosystems**
  - Provide dense shade
  - Critical for trout and other cold-water species
- **Support biodiversity**
  - Unique habitat for birds, amphibians, and understory plants
  - Maintain moist, stable microclimates
- **Protect water quality**
  - Stabilize soils and streambanks
  - Reduce erosion and sedimentation
- **Long-lived and slow-growing**
  - Can live 300-800+ years



# Hemlock Woolly Adelgid (*Adelges tsugae*)



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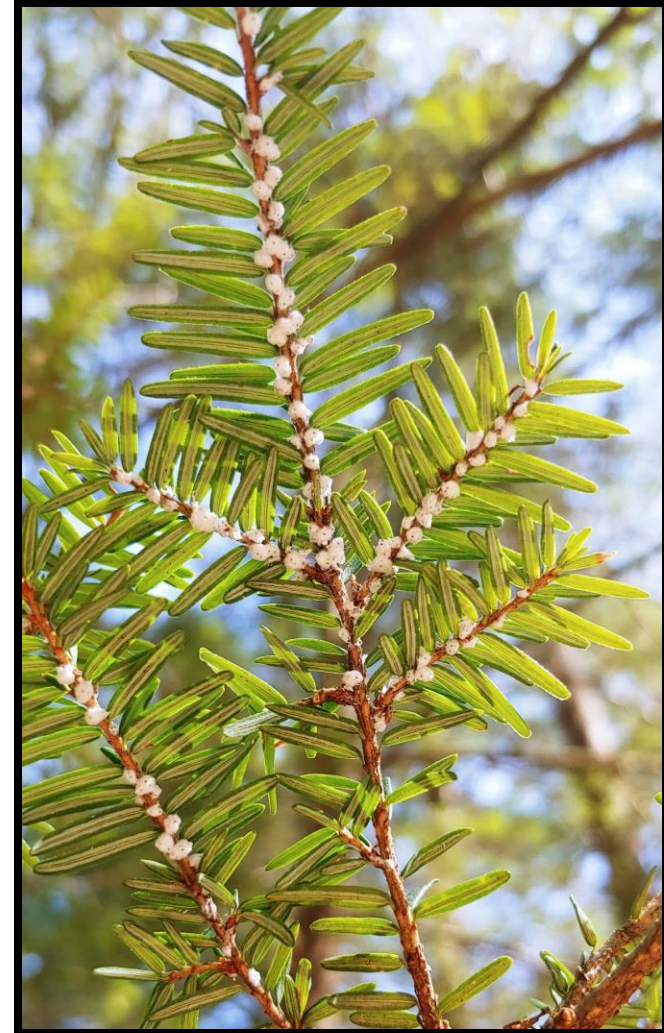


- Invasive aphid-like insect that feeds on Eastern hemlock
- Feeds at the base of needles, disrupting nutrient flow
- Identified by white, woolly egg sacs

**Causes:** Needle loss, crown thinning, and mortality

## **Negatively Impacts:**

- Forest structure
- Stream temperature & habitat
- Erosion and water Quality
- Biodiversity



# HWA in New York

- First detected in NY (Hudson Valley) in 1985
- Observed in the Finger Lakes in the early–2010s
- Increasing spread and concern in recent years

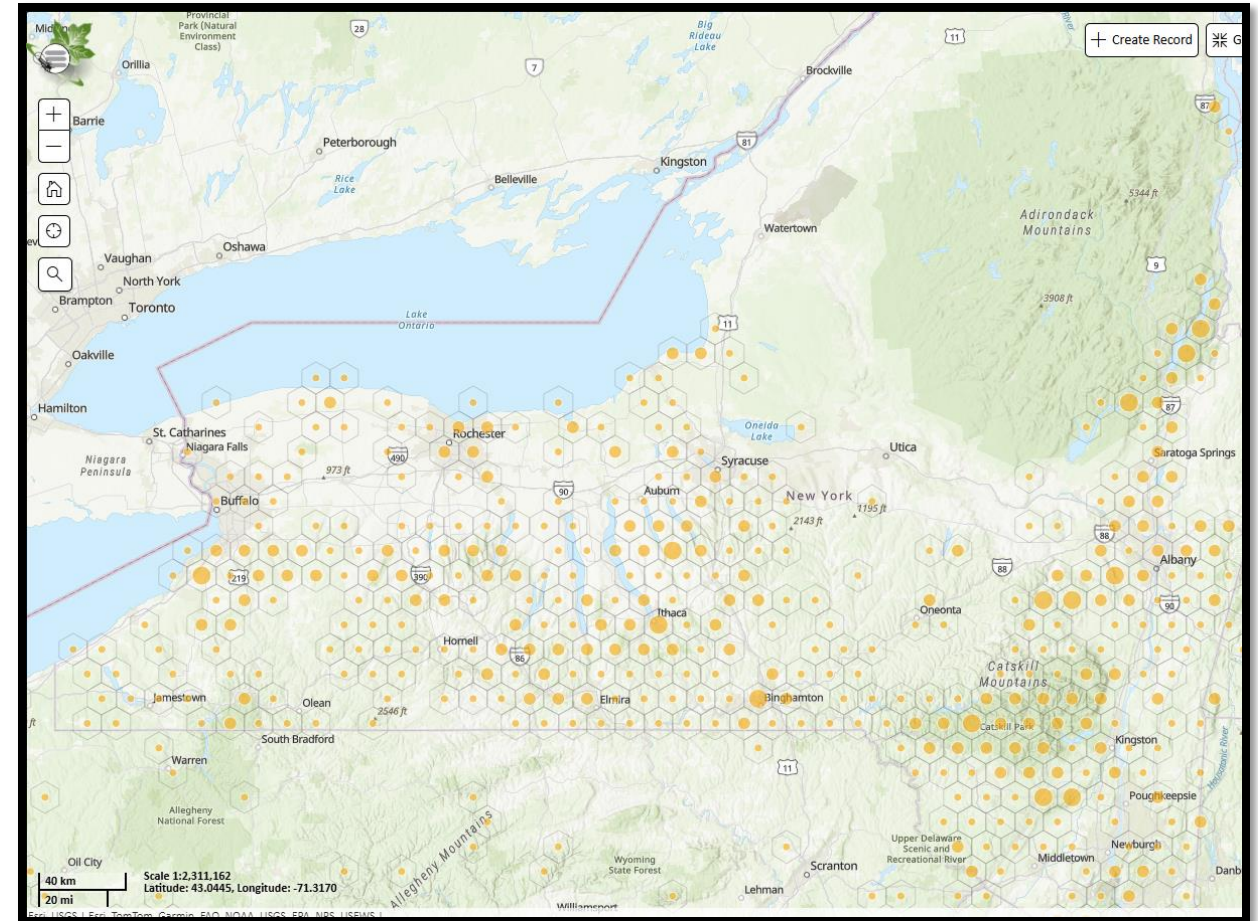
## Management Efforts

### Early focus:

- Monitoring spread
- Protecting high-value trees

### 2010's – Present:

- Shift to active management
- Chemical treatments
- Biocontrol research
- Resilience breeding



# HWA Research

## Lingering Hemlocks



Hemlocks that survive HWA infestation

Possible natural resistance

Key to long-term hemlock conservation

## Biocontrol



Use of predatory insects to suppress HWA

Long-term, landscape-scale management strategy

Complements chemical treatment

**State agencies**

(DEC, OPRHP)

**Federal partners**

(USFS)

**Researchers**

(NYSHI, Cornell)

**PRISMs**

(regional coordination)

## **Key Players in HWA Management**

**Local partners**

(SWCDs, municipalities)

**Private landowners**

**Citizen Scientists**

# Spotted Lanternfly

*(Lycorma delicatula)*

- Planthopper that feeds on sap of 70+ plant species
- Introduced to the U.S. in PA in 2014

## Habitat and Spread:

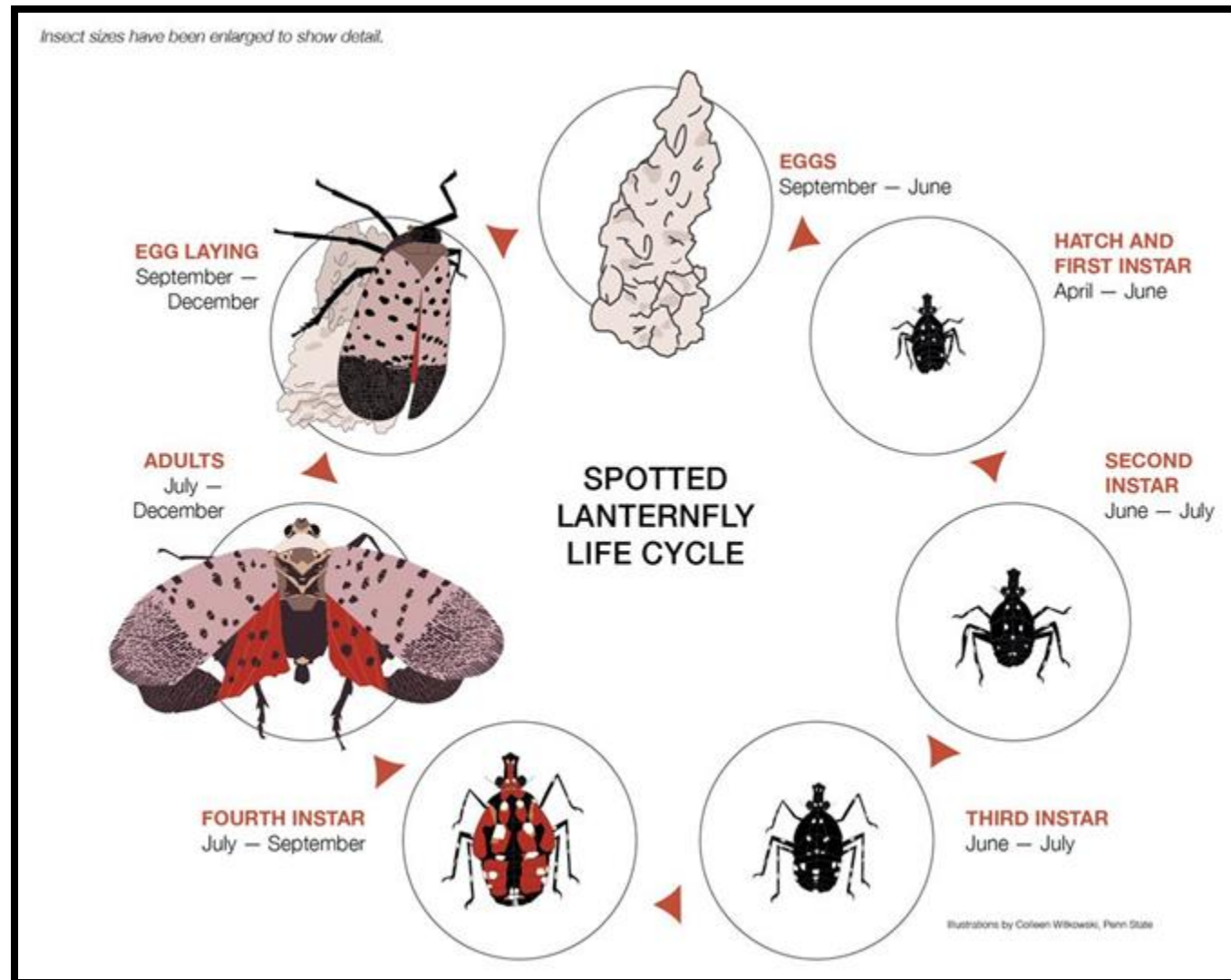
- Disturbed areas, edges, roadsides, rail lines
- Rapid spread through the Northeast
- Egg masses laid on trees, vehicles, outdoor equipment

## Impact:

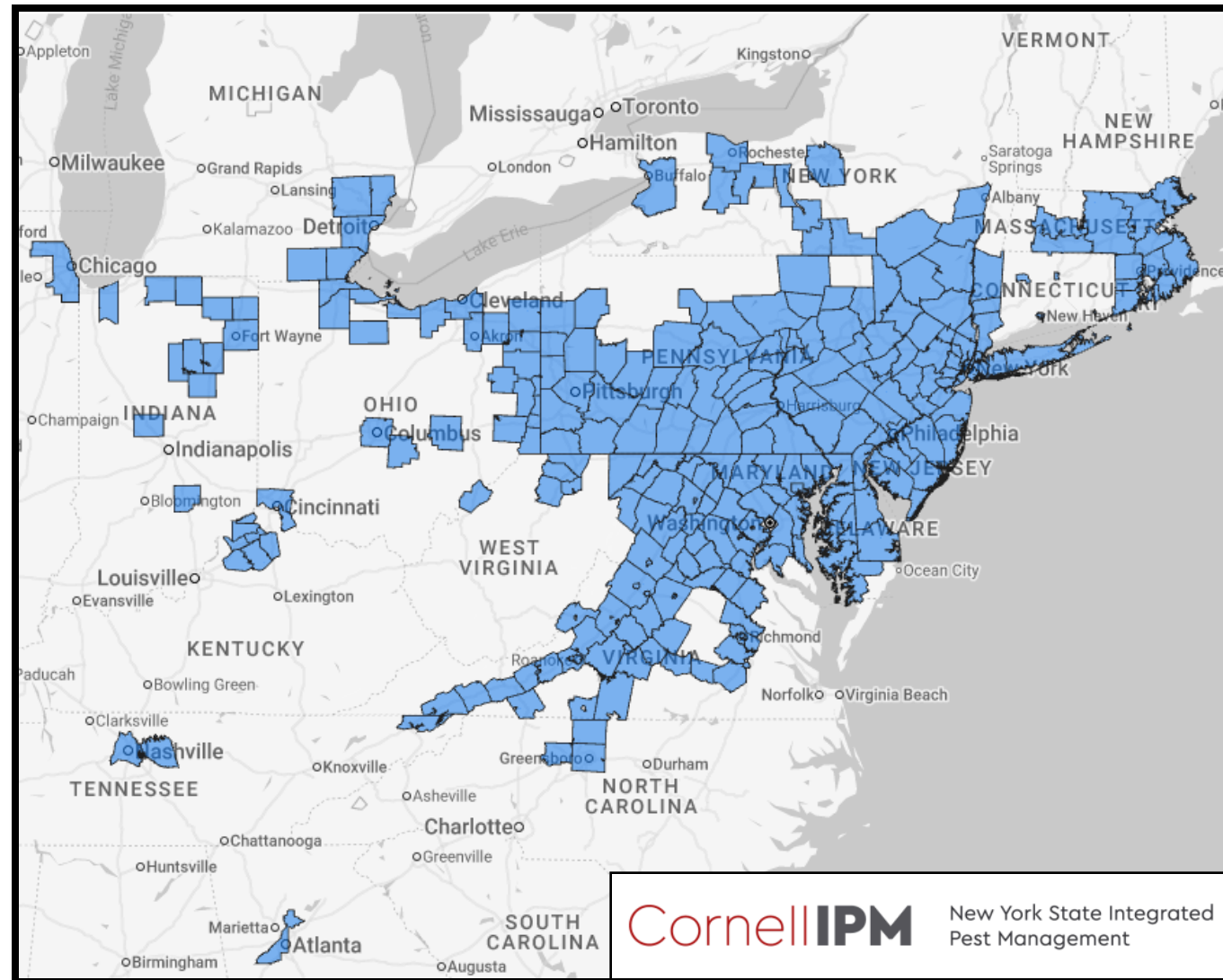
- Weakens host trees by depleting nutrients
- Produces honeydew → leads to sooty mold buildup
- Threatens vineyards, agriculture and recreation
- Nuisance in residential areas



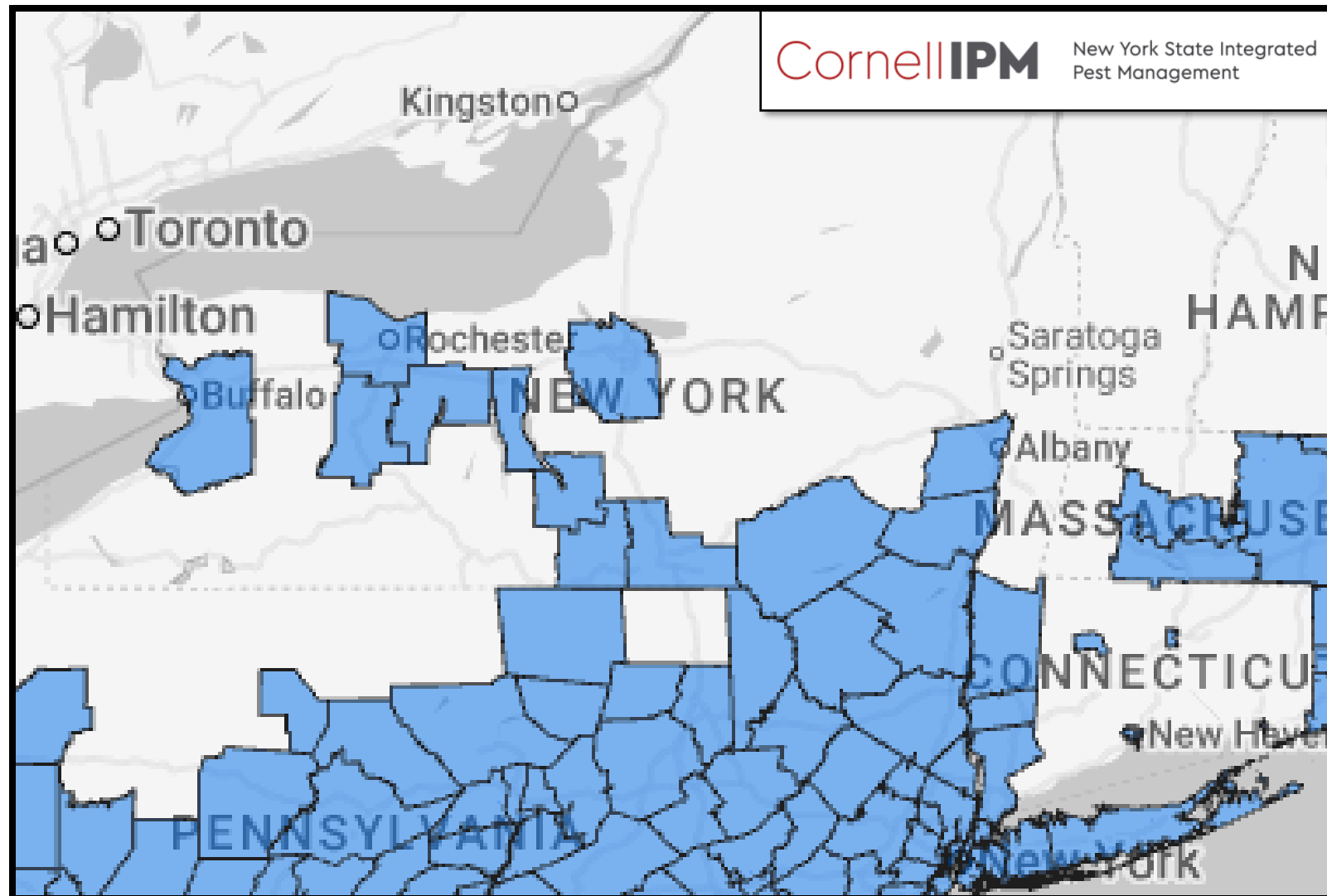
# Spotted Lanternfly: Life Cycle



# Spotted Lanternfly: Distribution by County: U.S.



# Spotted Lanternfly: Distribution by County: NY



# Spotted Lanternfly: Management

## Prevention

Inspect outdoor items

Avoid moving firewood

Spread the word



## Monitoring

Check trees and surfaces regularly

Circle traps

Report sightings



## Manual and Mechanical

Destroy egg masses

Circle traps

Vacuum nymphs and adults



## Chemical

Contact pesticide for SLF

Systemic treatment of TOH



# Tree-of-Heaven

## *(Ailanthus altissima)*



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Introduced to the U.S. in the late 1700s as an ornamental tree.

Widely planted because of its rapid growth and urban tolerance, and is now widespread across the U.S.

### Habitat and spread:

- Common in roadsides, railways, urban areas, forest edges, riparian areas, disturbed sites
- Produces thousands of seeds that are spread by wind, water, and humans
- Spreads aggressively through root suckers

### Impacts:

- Forms dense stands that displace native plants
- Allelopathy – release chemicals that inhibit other species
- Damages infrastructure
- **Preferred host species for the spotted lanternfly**



# Tree-of-Heaven: Identification



## Leaves

Compound leaves with smooth edges and small tooth near the base

Produce strong odor when crushed



## Flowers

Small yellow-green flowers

Emerge late spring



## Seeds

Females produce large clusters of samaras that turn reddish in fall



## Bark

Young bark is smooth and gray that turns light brown with shallow ridges with age

# Tree-of-Heaven: Lookalikes

## IDENTIFYING TREE OF HEAVEN

<b>LOOK ALIKE</b> <b>STAGHORN SUMAC</b> <i>RHUS TYPHINA</i>	<b>TREE OF HEAVEN</b> <i>AILANTHUS ALTISSIMA</i>	<b>LOOK ALIKE</b> <b>BLACK WALNUT</b> <i>JUGLANS NIGRA</i>
<p>← <b>TERMINAL LEAFLET</b></p>  <p><b>FRUIT IS RED, CONICAL, AND FUZZY</b></p>  <p><b>TOOTHED LEAFLET EDGES</b></p> 	<p>← <b>TERMINAL LEAFLET</b></p>  <p><b>FLOWERS RANGE FROM GREEN TO RED AND ARE CLUSTERED</b></p>  <p><b>SMOOTH LEAF EDGES BESIDES 1-2 TEETH AT BOTTOM</b></p> 	<p><b>NO TERMINAL LEAFLET</b></p>  <p><b>FRUIT IS ROUND NUT COVERED BY HUSK</b></p>  <p><b>FINELY SERRATED LEAFLET EDGES</b></p> 

# Tree-of-Heaven: Management

## Prevention

Learn how to identify and remove  
Avoid planting or allowing seeds to establish  
Clean equipment after working in infested areas



## Monitoring & Follow-up

Watch for resprouts and root suckers  
Repeat treatments usually required



## Manual and Mechanical



Hand-pull small seedlings, including entire root  
Cutting alone stimulates root suckering and often makes things worse

## Chemical



Herbicide application is the most effective control method  
Cut-stump or hack-and-squirt

# What Can You Do to Help?

- Learn to identify invasive species
- Clean gear and equipment
- Inspect plant materials
- Avoid moving soil, mulch, or compost
- Don't transport firewood more than 50 miles
- Remove small infestations when possible
- Plant native species
- Report sightings
- Share your knowledge with friends and family



# Finger Lakes PRISM Citizen Science



## Trail Survey Program

### In-person workshops

Walk n' learn format!

Join us and our partners all season long, at a location near you, to learn how to identify invasive species, use our survey collection tool, and build community!

### Virtual Trainings:

- June 9<sup>th</sup> from 5:30pm-6:30pm
- July 29<sup>th</sup> from 5:30pm-6:30pm

You can register today! (Scan QR code)





**Thank you!**

