Invasive Species in the St. Lawrence – Eastern Lake Ontario Region

St. Lawrence Eastern Lake Ontario
Partnership for Regional Invasive Species Management
SLELO PRISM

Presented By
Rob Williams
Invasive Species Program Coordinator

"Teaming Up To Stop The Spread of Invasive Species"

St. Lawrence - Eastern Lake Ontario
SLELO PRISM
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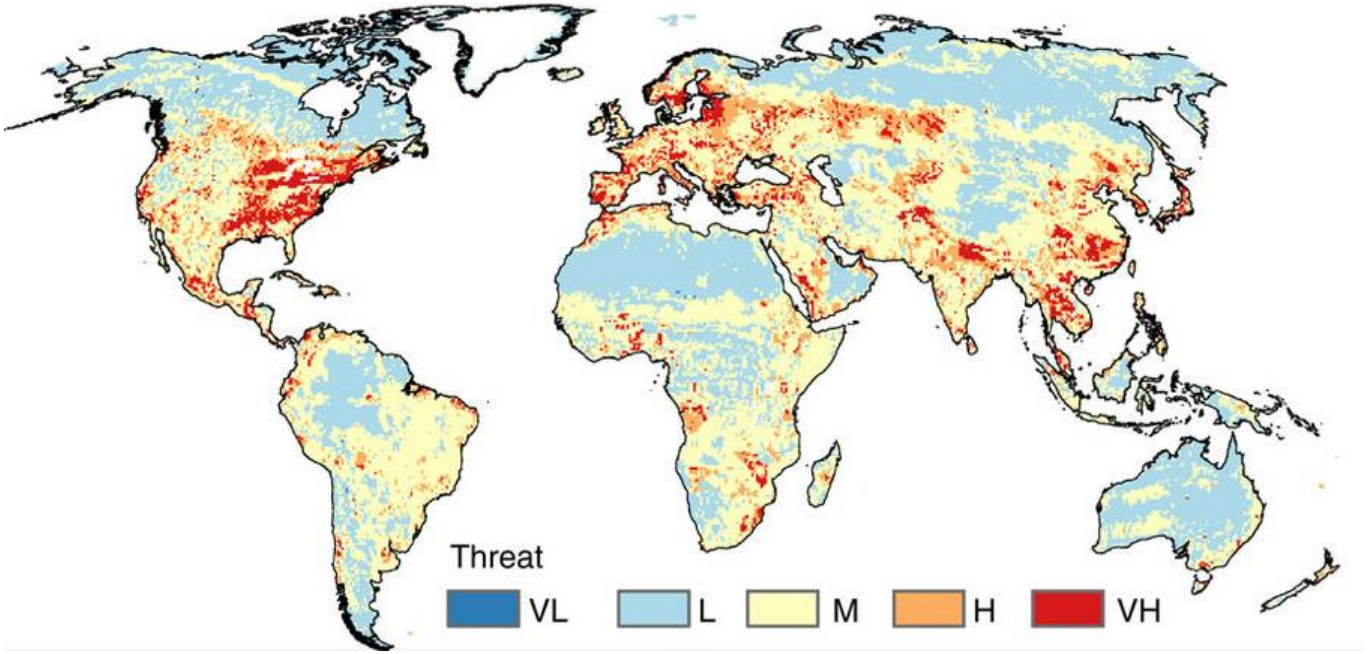
What's all the fuss about invasive species ?

21st Century Global Invasion Risk

17% global land surface is highly threatened by new invasive species

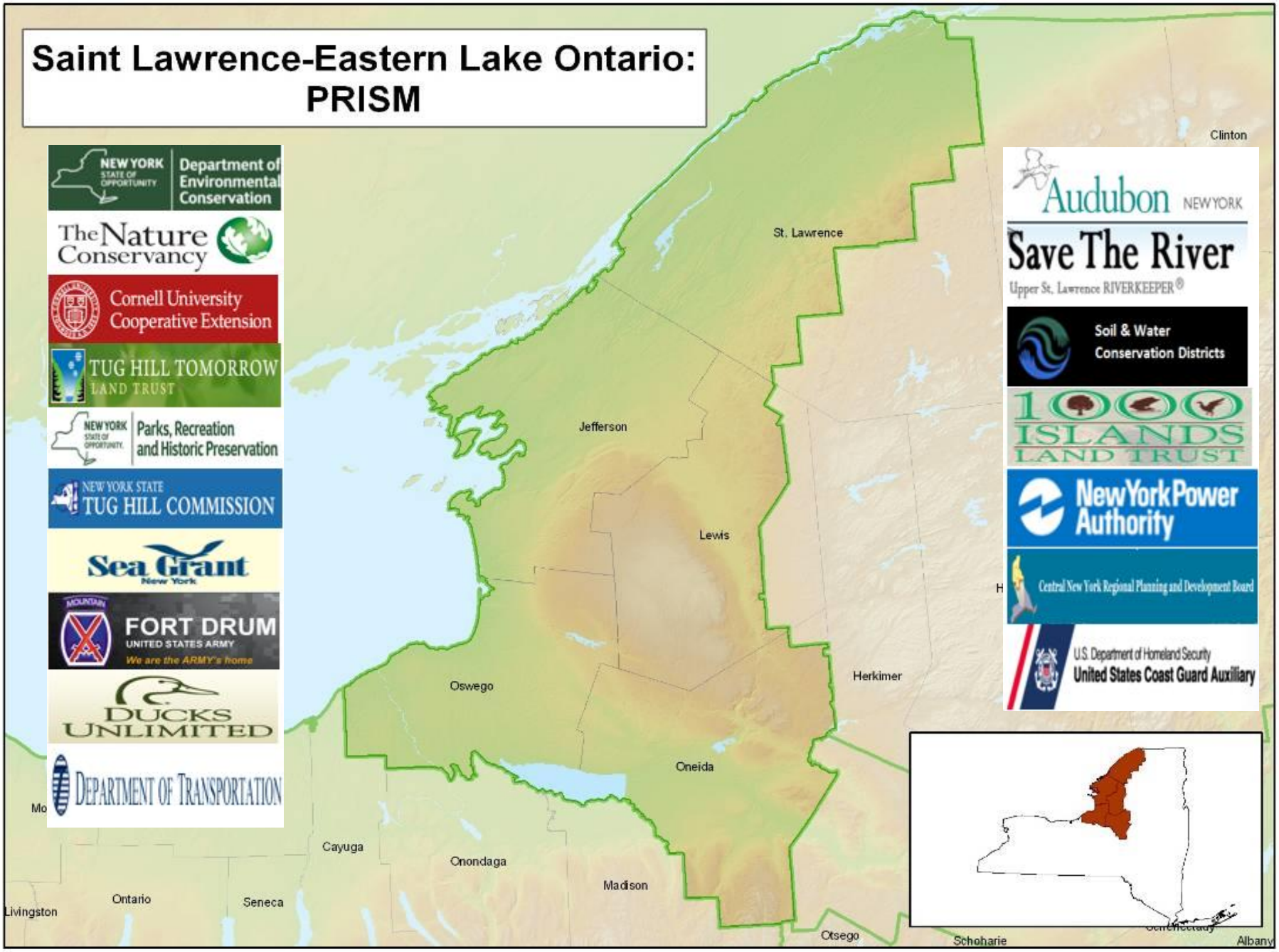


Early et al. 2016


New York State is a continental hub for the import and export of invasive species.
(shown = global transport routes, air and sea)

APIPP
CRISP
LIISMA
SLELO
Western NY
Finger Lakes
Capitol Mohawk
Lower Hudson

Saint Lawrence-Eastern Lake Ontario: PRISM



Invasive Species Quick Facts

- Invasive species almost always out-compete, damage or displace *more valuable* native species.
- Invasive species reduce agricultural crop yields and increase agricultural expenses.
- Invasive species are the second largest threat to biodiversity after habitat loss(1)
- The economic impact of invasive species in the U.S. is estimated at 120 to 138 billion annually.(1)
- Invasive species are a factor in the decline of 49 percent of all threatened or endangered species. (1)

1(Pimentel 2004).

Invasive Species Quick Facts cont…

- Some invasive species cause serious human health impacts including death:
  - Giant Hogweed – toxic sap that burns the skin. Native to southern Russia introduced to US circa 1903.
  - West Nile Virus - West Nile encephalitis is an infection of the brain. First identified in Uganda in 1937, the virus is commonly found in Africa, West Asia, and the Middle East

Invasive Species Quick Facts cont…

- The number of seabirds (Kakapo) being killed each year by the invasive brown rat on the island of Kiska (Circa 2002) are more than were killed by the Exxon Valdez oil spill!

Kakapo
Nocturnal
Ground dwelling

The Exxon Valdez oil spill occurred in Prince William Sound, Alaska, on March 24, 1989, killing over 250,000 sea birds.

(Rattus norvegicus)

Impacts on Specialized Feeders

A Chickadee has evolved over eons to feed their young exclusively on caterpillars and needs to find 6000 to 9000 caterpillars within 50 meters of its nest or its chicks will starve.

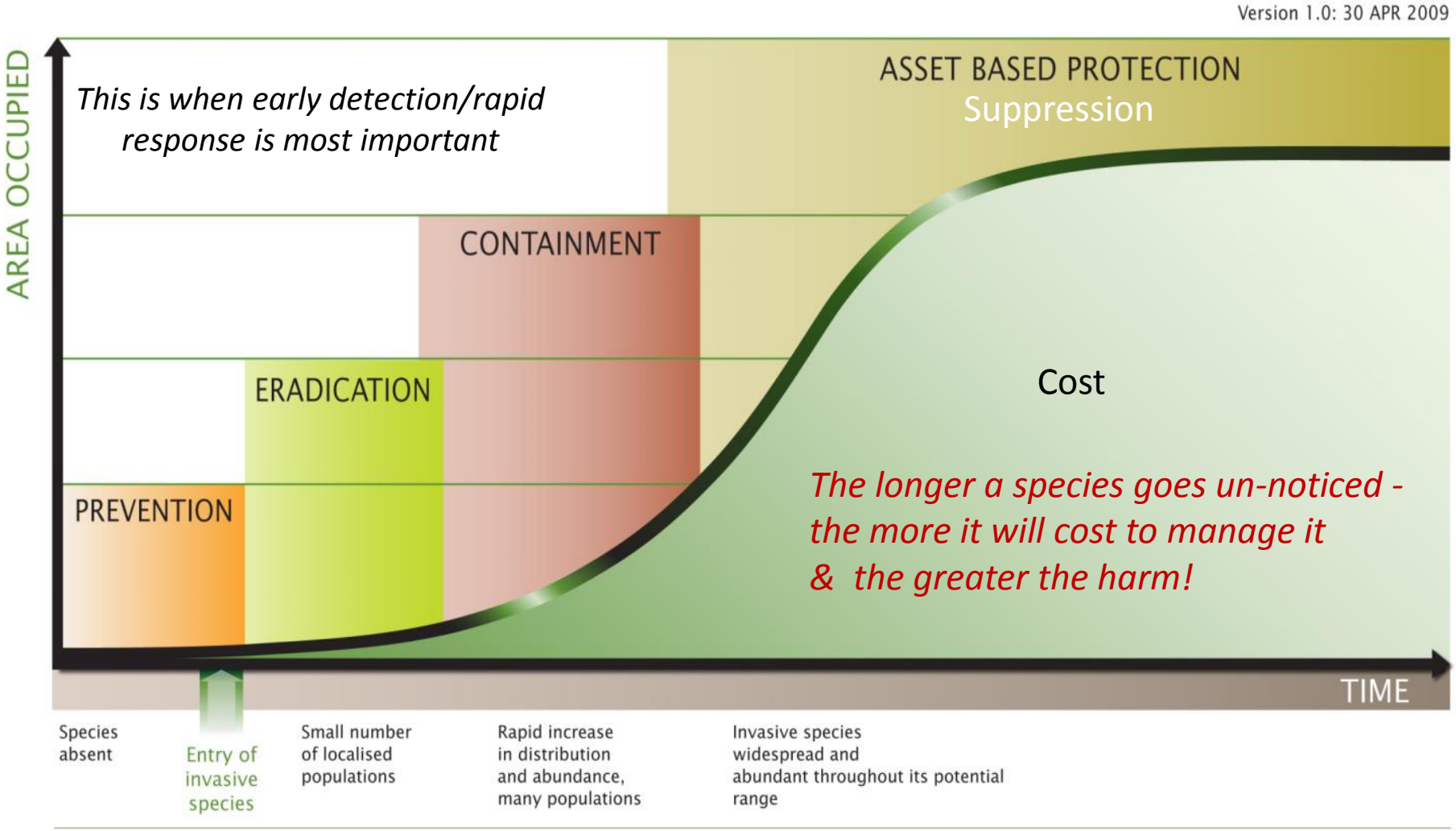
If we replace the plants that support the caterpillars chickadees looses their food source.

Let it hunt in the local parks you say? Wont work because surveys show that 1/3 of plants in parks and in natural areas consist of invasive (non-native) species.

Monarchs are dependent on the indigenous milkweed which are being replaced by swallow-wort. It takes eons to develop a taste for something else!

-Doug Tallamy

GENERALISED INVASION CURVE SHOWING ACTIONS APPROPRIATE TO EACH STAGE



Learn to survey your favorite waterbody or landscape using
Highly Probable Areas, HPA's

- Our PRISM has 24 PRIORITY CONSERVATION AREAS THAT WE FOCUS ON.
- WE ARE ALWAYS LOOKING TO EXPAND OUR VOLUNTEER SURVEY TEAM NETWORK.
- WE ASK THAT YOU REPORT YOUR OBSERVATIONS INTO IMAPINVASIVES.

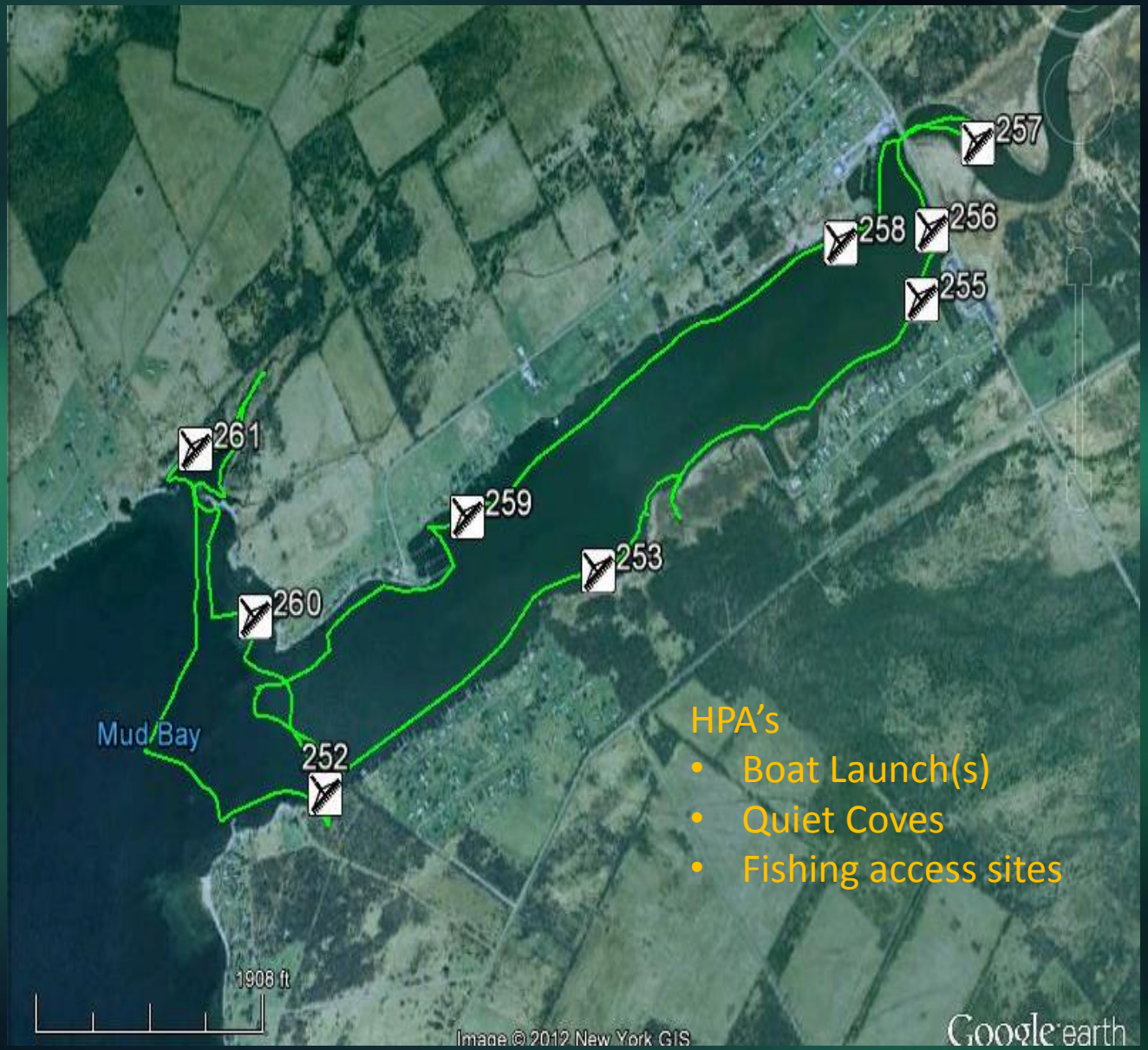
Terrestrial HPA's

Trailheads
Campgrounds
Logging Platforms
Homogenous Tree Stands

Aquatic HPA's

Boat Launch's
Quiet Shallow Coves
Fishing Hot Spots

Example - Aquatic



HPA's
- Boat Launch(s)
- Quiet Coves
- Fishing access sites

Record:
* Waypoints
* Lat/Long
* I.S. Observations

Mud Bay HPA's 2012

Species Categories

- Our PRISM has identified two categories;
  - Target Management Species: (TMS) These are the problematic species that are currently found within the SLELO region and our goal is to eradicate, contain or suppress them.
  - Prevention Species: (PS) These are species that are not found within the SLELO region and our goal is to “prevent” them from entering.

St. Lawrence - Eastern Lake Ontario
SLELO PRISM
Partnership For Regional Invasive Species Management

Target Management Species

Swallow-wort (*Cynanchum spp.*)

TMS

NATIVE RANGE

Europe (Italy, France, Portugal, and Spain)

ECOLOGICAL THREAT

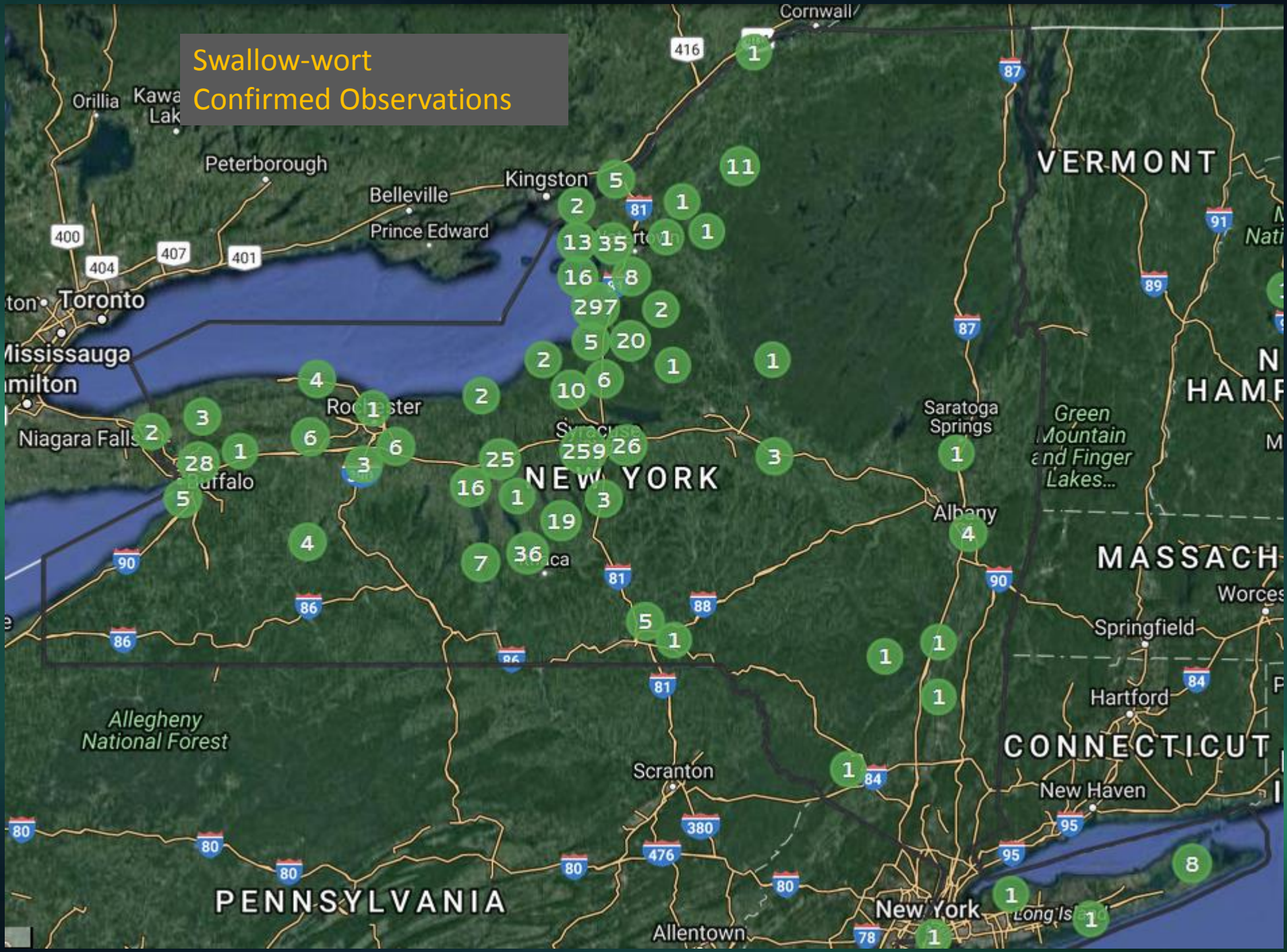
- Aggressively chokes out desirable native species.
- Interferes with forest regeneration.
- Allelopathic (releases chemical into the soil to suppress other species).
- Agricultural problem – can dominate hay fields.

DESCRIPTION

Long, slender leaves with conspicuous pointed seed pod.

Pale – flower pedals are lighter and elongate.
Black – flower pedals are darker and triangular.

Can produce 2,000 seeds per square yard.


Swallow-wort
Confirmed Observations
Cornwall
Orillia
Peterborough
Belleville
Kingston
Prince Edward
Toronto
Mississauga
Niagara Falls
Buffalo
Rochester
Syracuse
NEW YORK
Saratoga Springs
Green Mountain and Finger Lakes...
Albany
VERMONT
MASSACH
Springfield
Hartford
CONNECTICUT
New Haven
Scranton
Allegheny National Forest
PENNSYLVANIA
Allentown
New York
Long Is
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87
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380
476
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297
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10
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259
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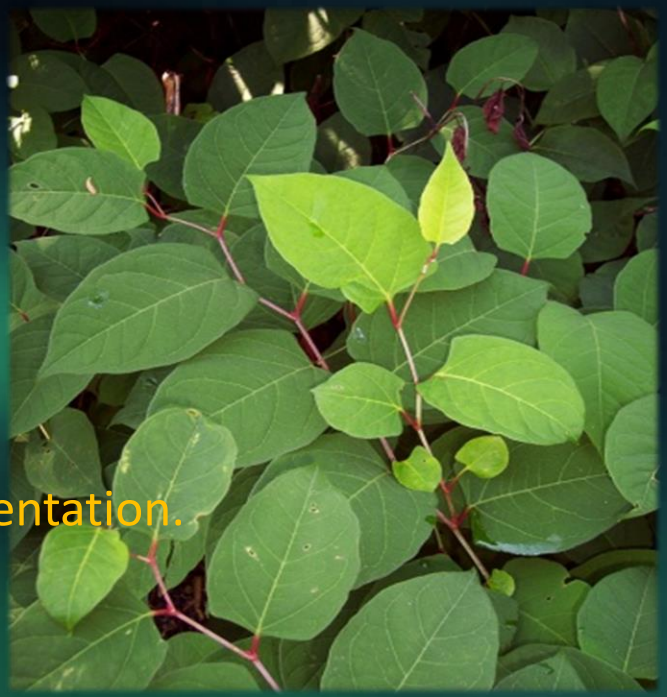
19
36
7

Japanese Knotweed (*Polygonum cuspidatum*)

NATIVE RANGE
Eastern Asia



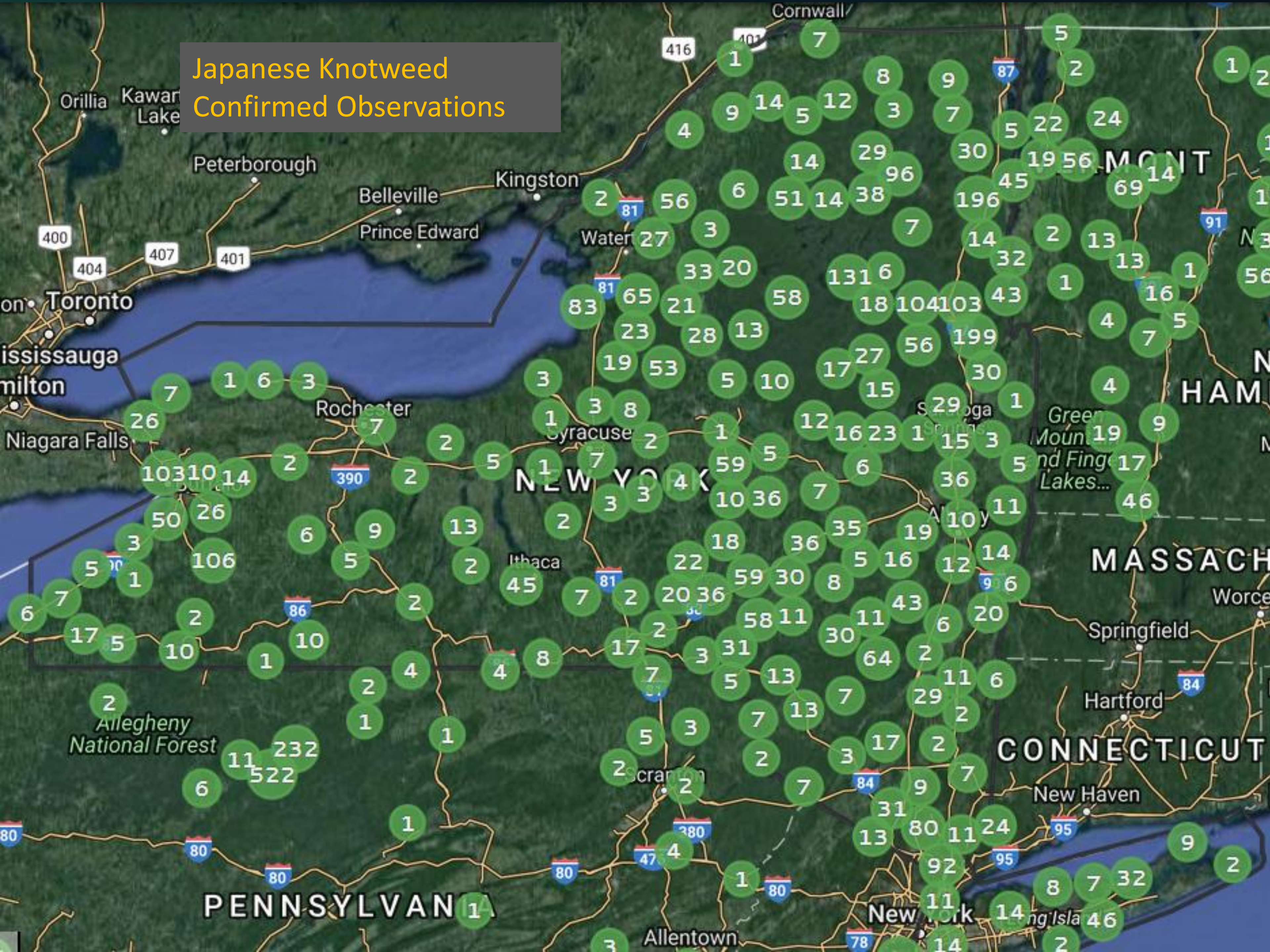
- **ECOLOGICAL THREAT**
- Spreads quickly to form dense thickets that exclude native species.
- Problematic in riparian areas.
- Does not spread well by seed – rather by fragmentation.

DESCRIPTION
Large - 6 inches long by 3 to 4 inches wide leaves, alternating on stem, broadly oval, pointed at the tip.
Arcuate venation.
Flowers: small, greenish-white flowers in branched sprays in summer.

=

Look for: large, monotypic populations.

Japanese Knotweed Confirmed Observations



TMS

Hand-out

Giant Hogweed (*Heracleum mantegazziamum*)

- **ECOLOGICAL & HEALTH THREAT**
- Giant hogweed has two major impacts: ecological and human health.
- It suppresses growth of beneficial native plants.
- Direct skin contact with giant hogweed induces extreme photosensitivity, which can lead to severe burns and scarring and may cause blindness if sap comes into contact with the eye.

History:

-Native to southern Russia.

-In 1901 botanist's discovered the plant and brought seeds back to Europe.

-Seeds distributed to enthusiasts.

-Entered U.S. circa 1905.

June 20 - 3 days post giant hog-weed exposure on right calf

June 22--it's getting bigger and it is very uncomfortable. Feels good bandaged up.

June 23 - and getting bigger

June 24 -- and bigger

June 25 and badder

June 26 - a little lighter

June 27 a.m. things are looking up!

June 28

June 29 it stings!

July 1 - it stings more!

July 5 getting there!

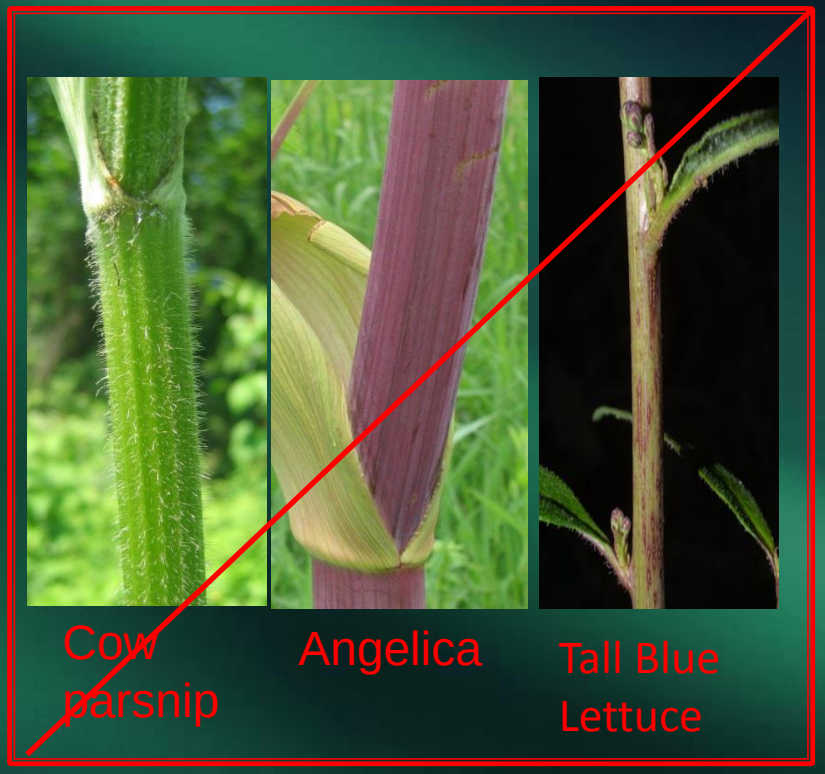
I was exposed to giant hogweed sap on my right calf on Thursday, June 17 We were handling the plants to get them out of an area frequented by children. Next time KEEP OUT tape will be called in to keep the kids away.
The blisters dripped fluid so copiously I had to wear a handkerchief around my ankle to keep the floor dry. July 4 there was still some fluid on the dressing but things are definitely looking up. I can think about wearing those hasmat suits again. Ugh.
Prednisone was very effetive at removing discmfort and abating symptoms. I wonder if the intense systemic itch I am experiencing is my body's allergy response system kicking in after being displaced by the prednizone.

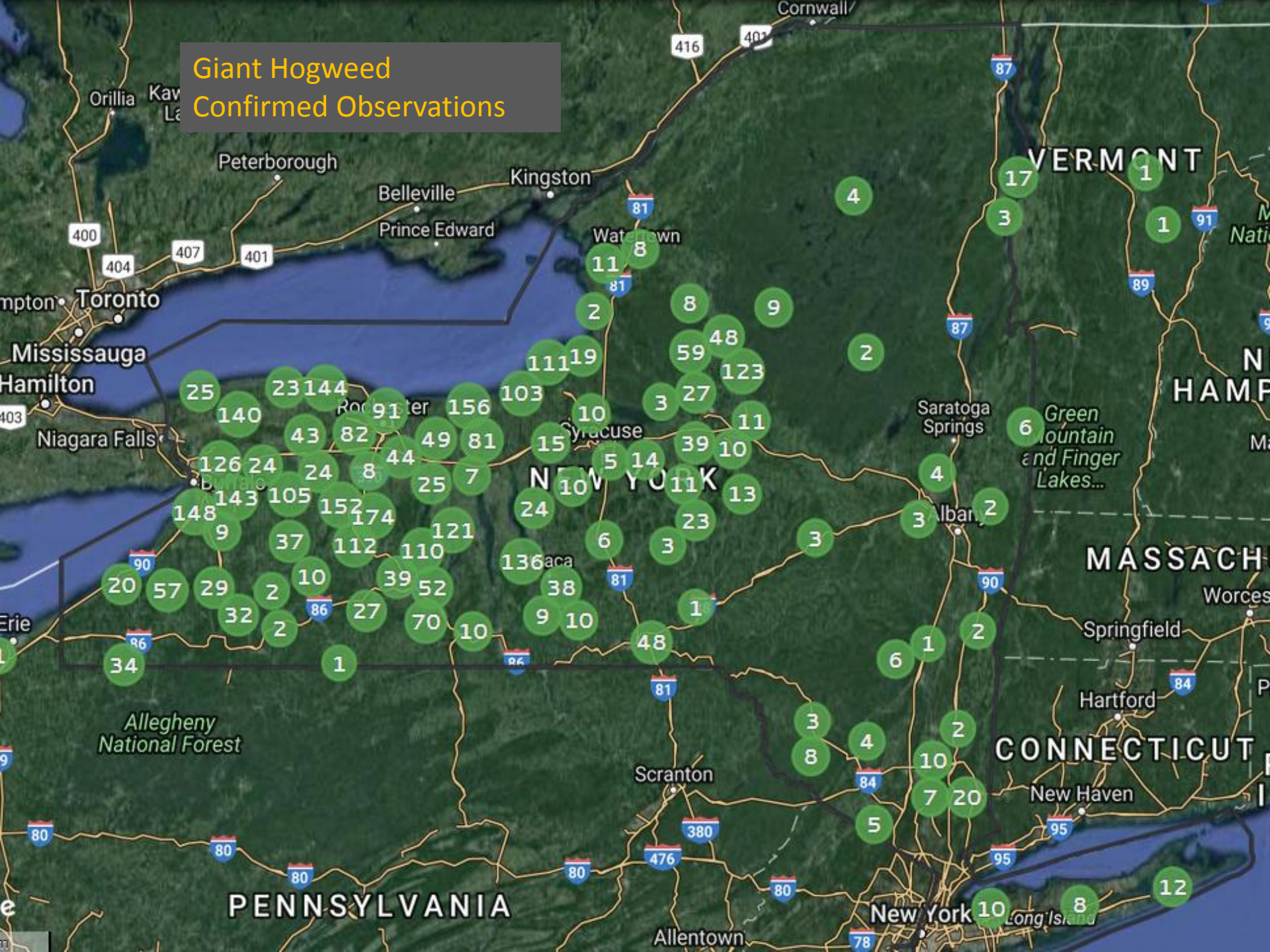
Partners of the SLELO-PRISM continue to treat Hogweed sites in our region
Appx. 33% have been eradicated so far!

Photo credit: Bob Kleinberg

Giant Hogweed has both purple blotches & coarse hairs

Other look-a-likes have one or the other.




Giant Hogweed
Confirmed Observations
Cornwall
Orillia
Peterborough
Kingston
Belleville
Prince Edward
Toronto
Mississauga
Hamilton
Niagara Falls
Syracuse
Saratoga Springs
Green Mountain and Finger Lakes...
VERMONT
NEW YORK
MASSACHUSETTS
Springfield
Hartford
CONNECTICUT
New Haven
Scranton
Allegheny National Forest
PENNSYLVANIA
New York
Long Island
Allentown

Water Chestnut *(Trapa natans)*

NATIVE RANGE

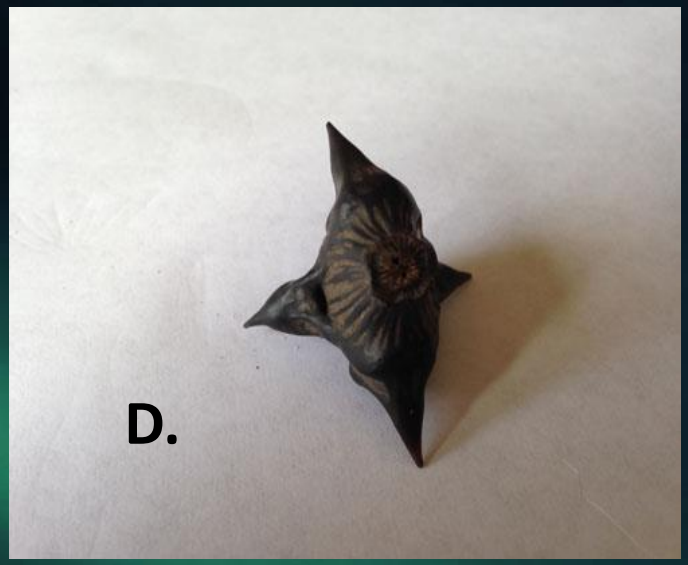
Europe, Asia

Target Management Species

ECOLOGICAL THREAT

- This fast-growing, floating perennial herb forms large mats that completely dominate surface waters.

Water Chestnut continued..



Look for:

A. Rosette – up to 16” diameter.
B. Inflated, spongy petiole
C. Fibrous root stalk.
D. Seed/nut – 4-sharply pointed spines.


Water Chestnut
Confirmed Observations
Peterborough
Kingston
Belleville
Prince Edward
Toronto
Mississauga
Hamilton
Niagara Falls
Buffalo
Rochester
Syracuse
Ithaca
Scranton
Allentown
Allegheny National Forest
VERMONT
Saratoga
Green Mountain and Finger Lakes...
MASSACHU
Springfield
Worcest
Hartford
CONNECTICUT
New Haven
New York
Long Island
PENNSYLVANIA
NEW YORK
Cornwall
709
42
72
44
36
31
20
15
10
32
53
46
257
248
155
130
96
26
5
4
3
2
1

Hand-out x 5

Forest Pest # 1
In the SLELO Region
Emerald Ash Borer

Emerald Ash Borer (EAB)
(Agrilus planipennis)

Pass Around Specimen

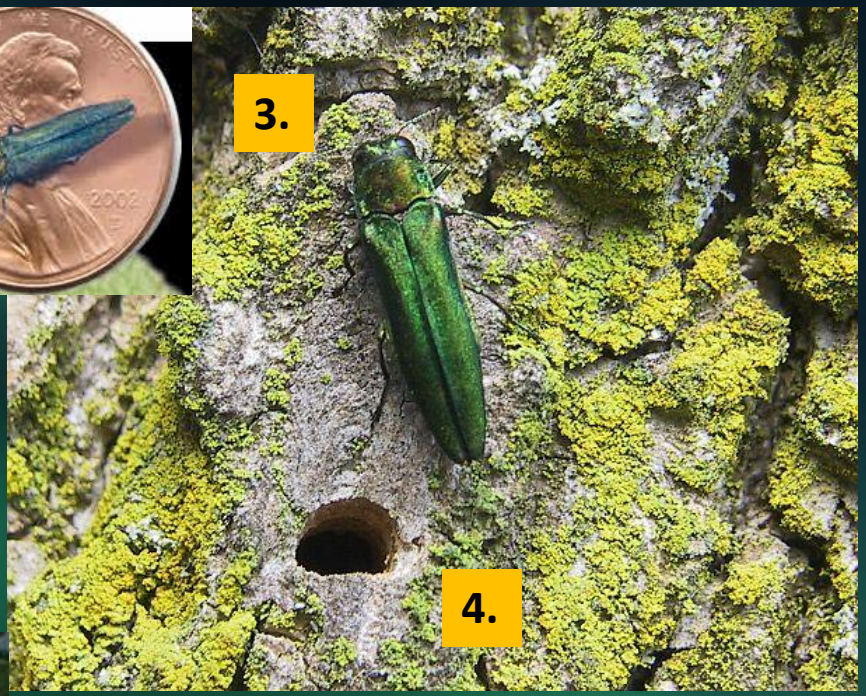
What to look for !
Emerald Ash Borer

* Identify Ash trees.
* Opposite Branching.
* 5-11 Leaflets
* Pronounced Diamond Pattern Bark

1.

2.

3.



4.

1. Ash trees
2. Epicormic growth with dying tree tops.
3. The actual insect
4. D-shape exit holes
5. Purple traps

Look for = Ash tree crown or canopy die back

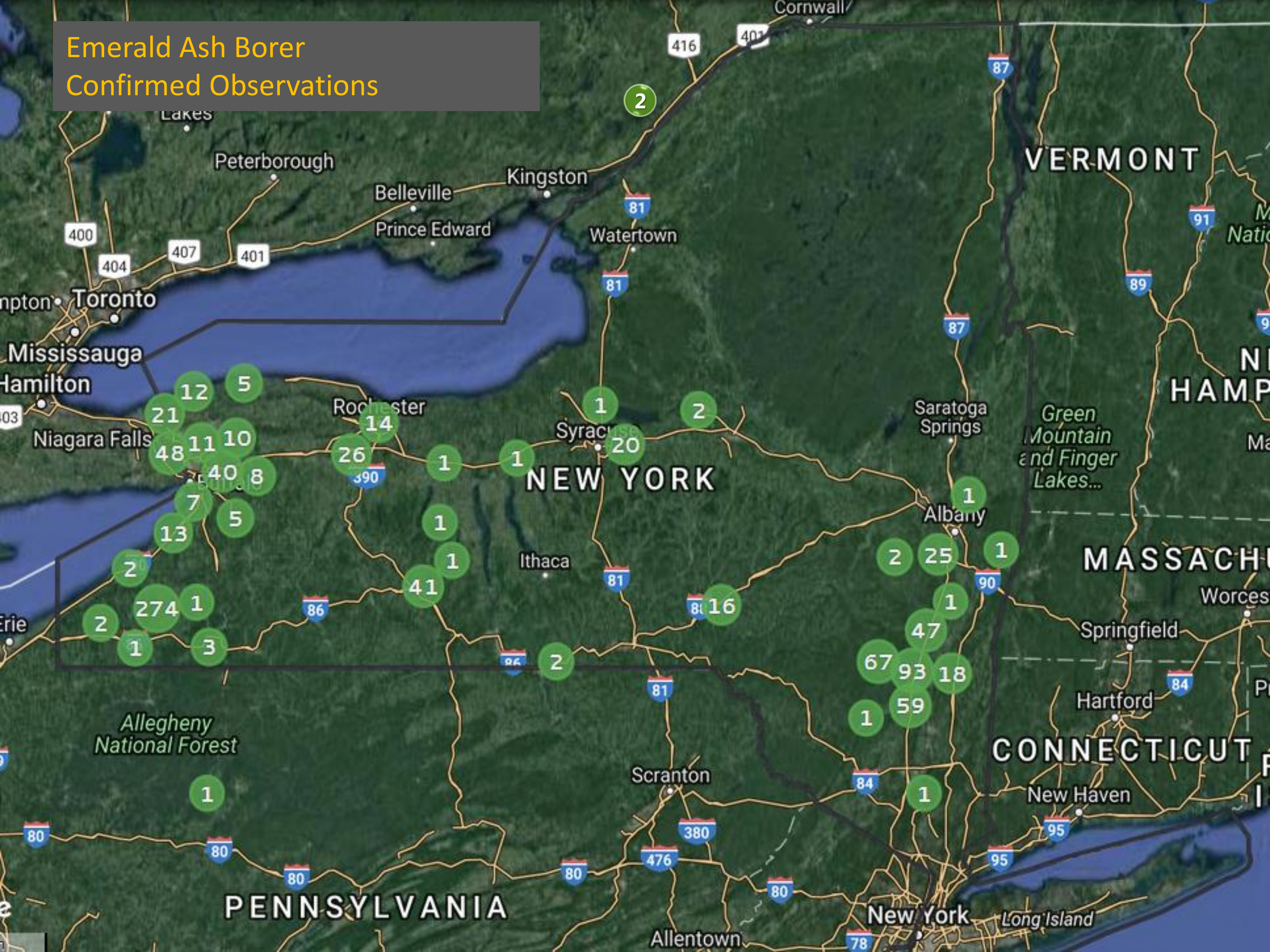
Look for = epicormic growth on ash trees

Look for =

Woodpecker foraging

Look for = D-shape exit holes

Emerald Ash Borer Confirmed Observations



Prevention “Watch-List” Species

- These are species that are not currently found within the SLELO region and our goal is to “prevent” them from entering.

These are species we want you to pay the most attention to.

Mile-A-Minute Vine (*Polygonum perfoliatum*)

NATIVE RANGE

India to Eastern Asia, China

PS

- **ECOLOGICAL THREAT**
- The rapid rate of growth (up to six inches a day) allows this plant to climb over native plants, smothering them.
- Seeds of mile-a-minute are dispersed by birds, ants, small mammals, and by water, remaining buoyant for 7-9 days.

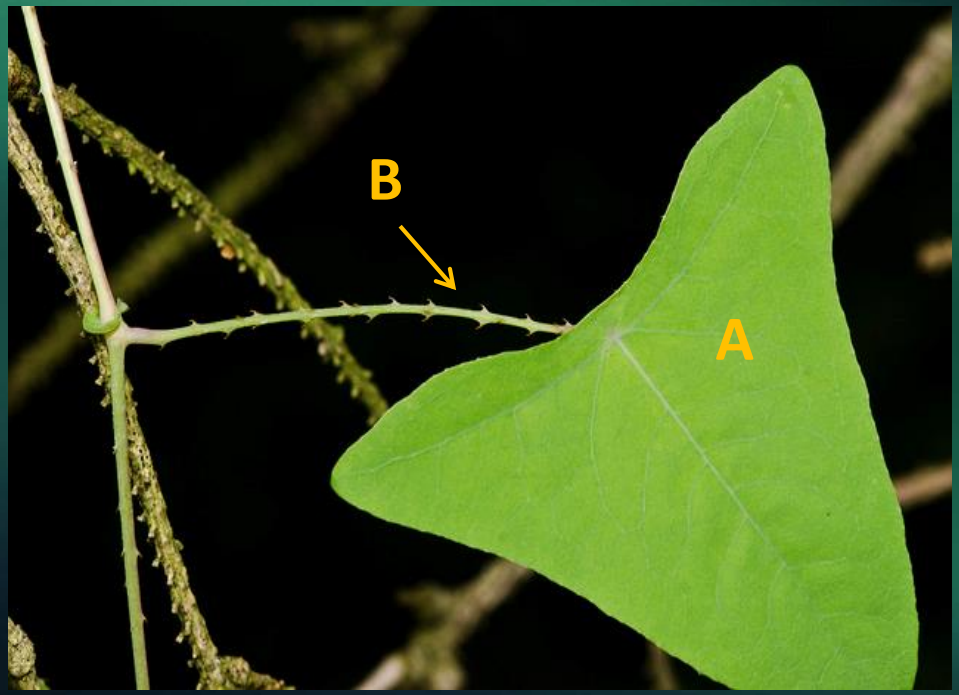
Look for:

A. Triangle shape leaves

B. Recurved barbs on stem

C. Ocreae – distinct cup-shaped structure around the nodes.

D. Deep blue/purple fruits.




Mile-a-minute locations
Confirmed Observations
Cornwall
416
401
87
VERMONT
Peterborough
Kingston
Belleville
Prince Edward
81
Watertown
400
404
407
401
91
89
Toronto
Mississauga
Rochester
Saratoga Springs
Green Mountain and Finger Lakes...
Niagara Falls
Syracuse
NEW YORK
Buffalo
390
1
Albany
Ithaca
90
86
88
2
Springfield
Hartford
84
Allegheny National Forest
16
12
4
6
CONNECTICUT
10
9
Scranton
134
New Haven
139
41
95
380
476
PENNSYLVANIA
34
13
5
Allentown
39
21

Porcelain Berry (*Ampelopsis spp.*)

NATIVE RANGE

PS

Northeast Asia - China, Korea, Japan, and Russian Far East

ECOLOGICAL THREAT

- Vigorously invades of open and wooded habitats.
- Grows and spreads quickly.
- Climbs over shrubs, fences and other vegetation, shading out native plants and consuming habitat.

DESCRIPTION

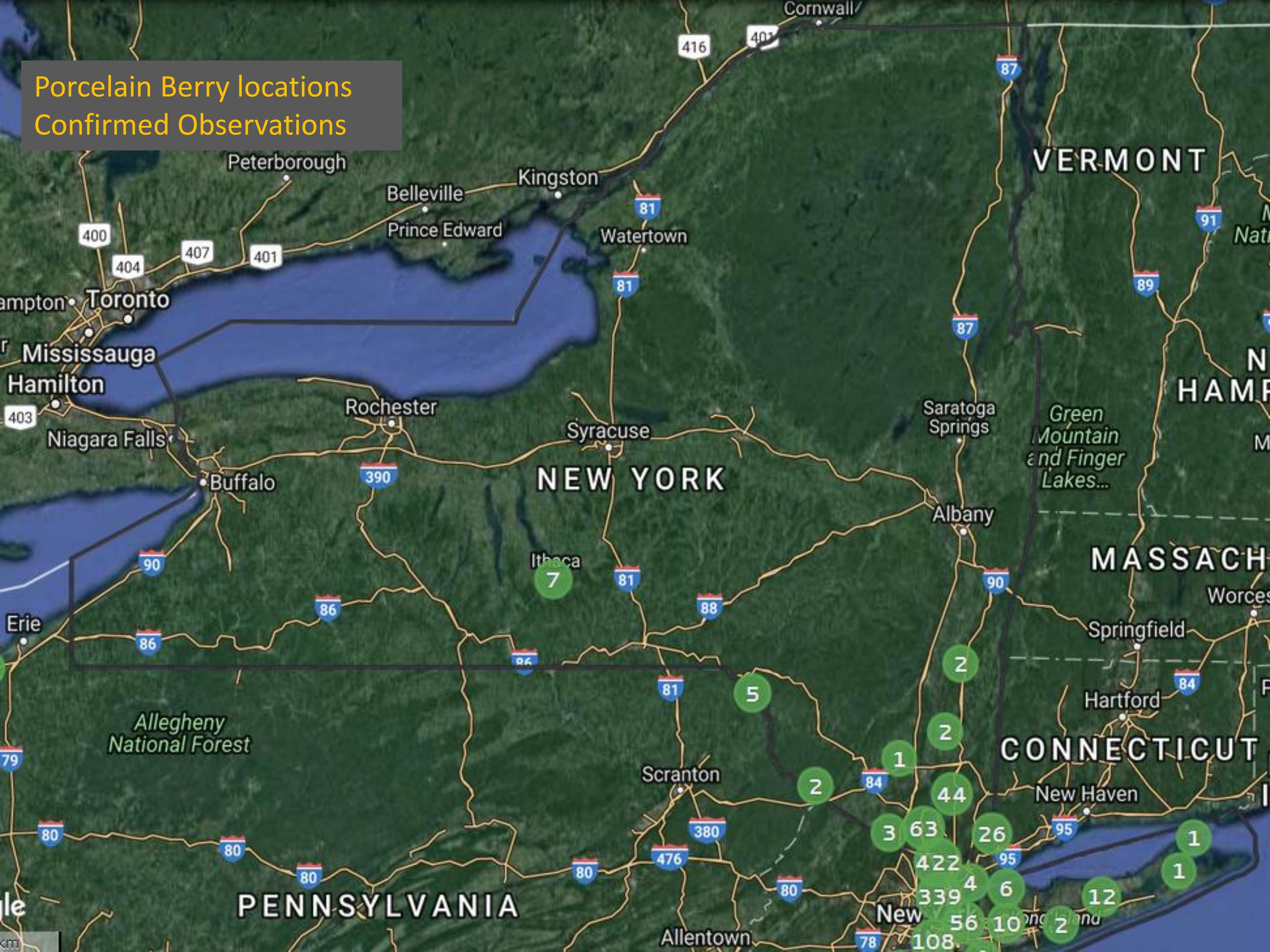
A deciduous, woody, perennial vine. It twines with the help of non-adhesive tendrils that occur opposite the leaves

Jamie Young, National Research Council, Washington, DC
Jil M. Swearingen, National Park Service, Washington, DC

Look for:

A. Deeply lobed leaves
B. Tendrils
C. Porcelain-like fruit

Porcelain Berry locations
Confirmed Observations



Cornwall
416
401
87
VERMONT
Peterborough
Kingston
Belleville
81
Prince Edward
Watertown
91
400
407
404
401
89
Toronto
81
87
Mississauga
Hamilton
403
Rochester
Saratoga Springs
Green Mountain and Finger Lakes...
Syracuse
Niagara Falls
Buffalo
390
NEW YORK
Albany
Ithaca
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MASSACH
90
90
Worces
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Erie
Springfield
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86
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81
84
Hartford
Allegheny National Forest
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79
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CONNECTICUT
Scranton
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84
44
New Haven
80
380
3
63
26
95
1
476
95
80
80
80
422
80
4
6
1
339
12
PENNSYLVANIA
New
56
10
2
78
Allentown
108

Forest Pest # 2
Hemlock Wooly Adelgid (*Adelges tsugae*)

NATIVE RANGE = Asia

ECOLOGICAL THREAT

- May have significant impacts on hemlock trees. Hemlock decline and mortality typically occur within 4 to 10 years after infestation.

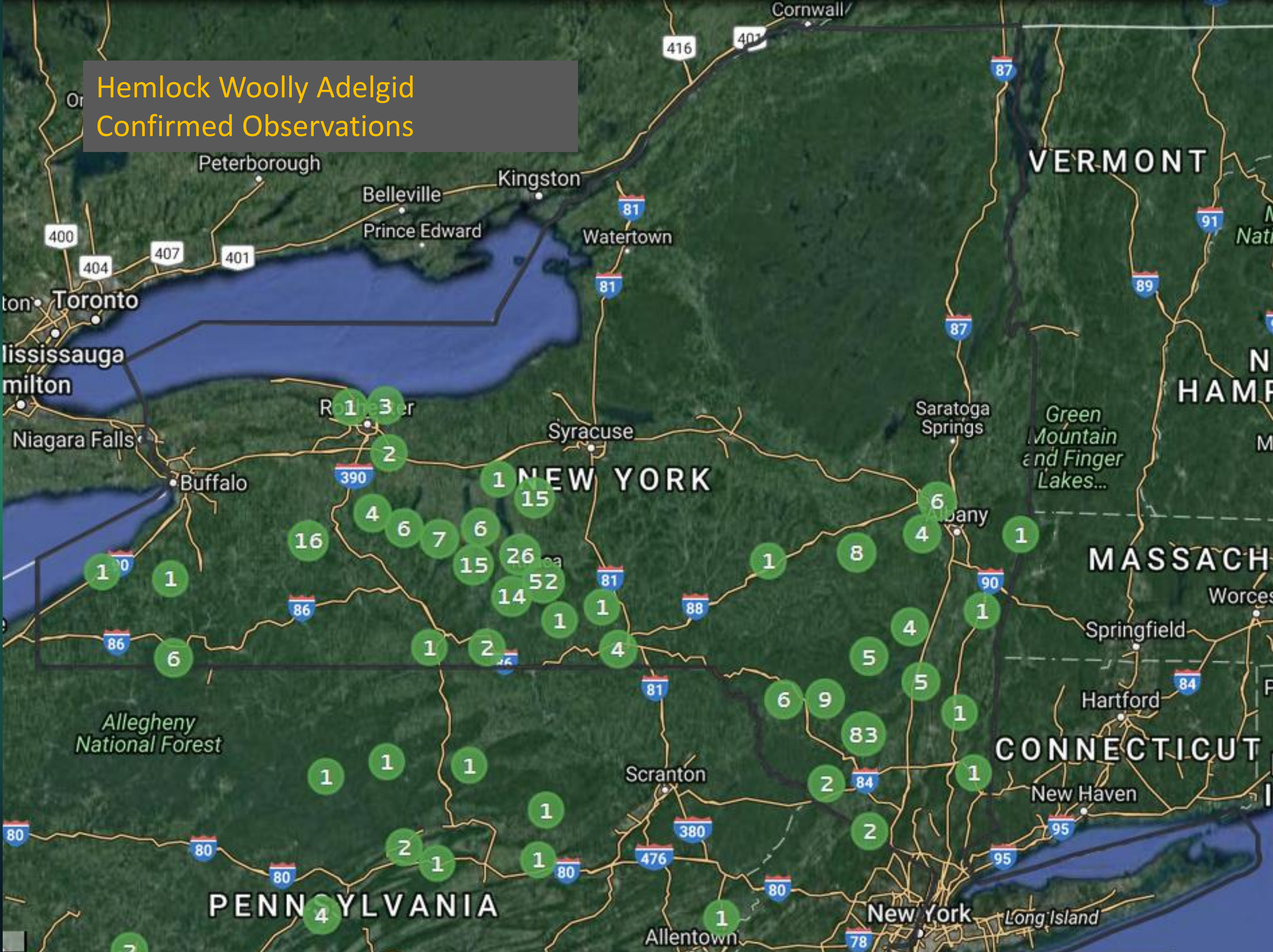
Look for white mass on the under side of Hemlock needles

Heavy infestation

Light infestation

Crawler stage……

Hemlock Woolly Adelgid Confirmed Observations



Cornwall
Peterborough
Kingston
Belleville
Prince Edward
Watertown
Toronto
Mississauga
Hamilton
Niagara Falls
Buffalo
Syracuse
NEW YORK
Saratoga Springs
Albany
Green Mountain and Finger Lakes...
VERMONT
NEW HAMPSHIRE
MASSACHUSETTS
Worcester
Springfield
Hartford
CONNECTICUT
New Haven
Scranton
Allentown
New York
Long Island
Allegheny National Forest
PENNSYLVANIA

Forest Pest # 3
Asian Long-horned Beetle
(*Anoplophora glabripennis*)

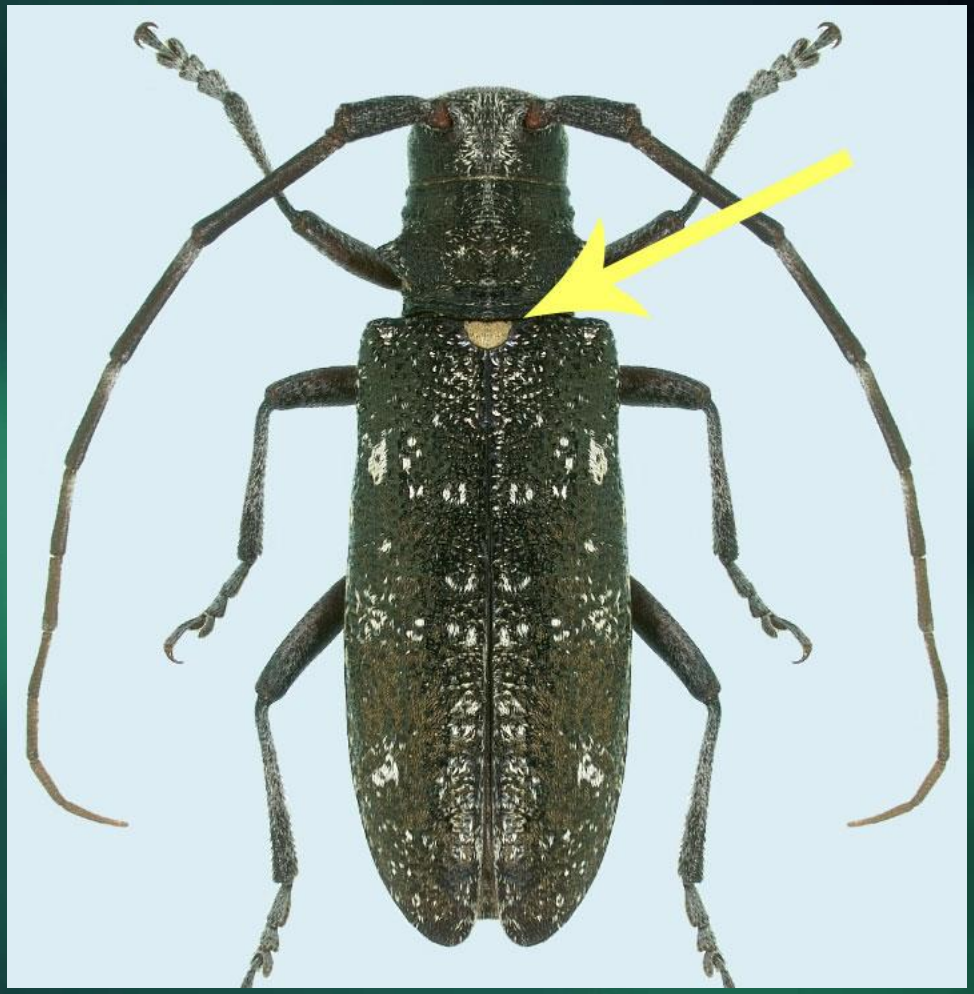
NATIVE RANGE =

ECOLOGICAL THREAT

- May have significant impacts on many species of host trees. ALB is non-selective.

ALB adult male. The body length is 1-1.5 inches long not counting the antennae. Note the lack of a white spot at the area indicated. Photo by Michael Bohne, Bugwood.org.

Source – Minnesota Department of Agriculture



White-spotted sawyer beetle. This is a common native beetle that can be mistaken for ALB. However, note the prominent white spot at the area indicated. Photo by Natasha Wright, Florida Department of Agriculture & Consumer Services, Bugwood.org

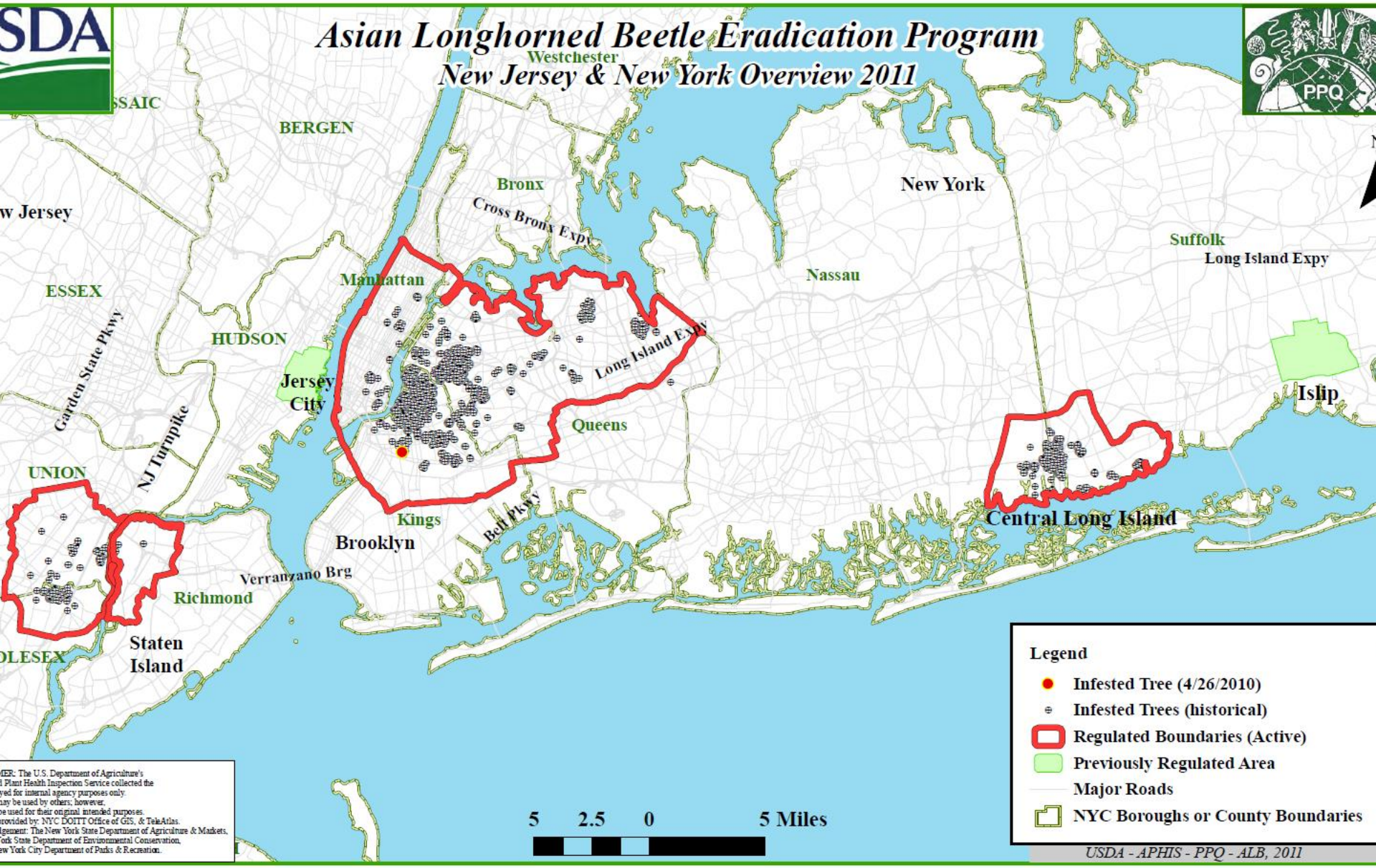
Pass Around Specimen

Source – Minnesota Department of Agriculture

Exit holes (round holes) and egg niches (pits) created by ALB adults. Photo by Dennis Haugen, USDA Forest Service, Bugweb.org.

Tree infested with ALB. Photo by Pennsylvania Department of Conservation and Natural Resources – Forestry Archive, Bugweb.org.

usda.gov/plant_health/plant_pest_info/as | NYIS | USDA - APHIS - APHIS ... | usda.gov | HTTP 404 Not Found



Slender False Brome
(*Brachypodium sylvaticum*)

PS

NATIVE RANGE

Europe, Asia and Africa

NYS Invasiveness Rank: Very high score of 86.6, Part 575 list

ECOLOGICAL THREAT:

- Suppresses forest regeneration, eliminates low growing herbs and pollinators, and degrade wildlife habitat.
- Easily invades a variety of habitats.
- High tolerance for shady and drought stricken areas.
- Prolific seed producer, easily dispersed, spreads quickly.

Grows in clumps

or clusters


Commonly
found along
walking trails

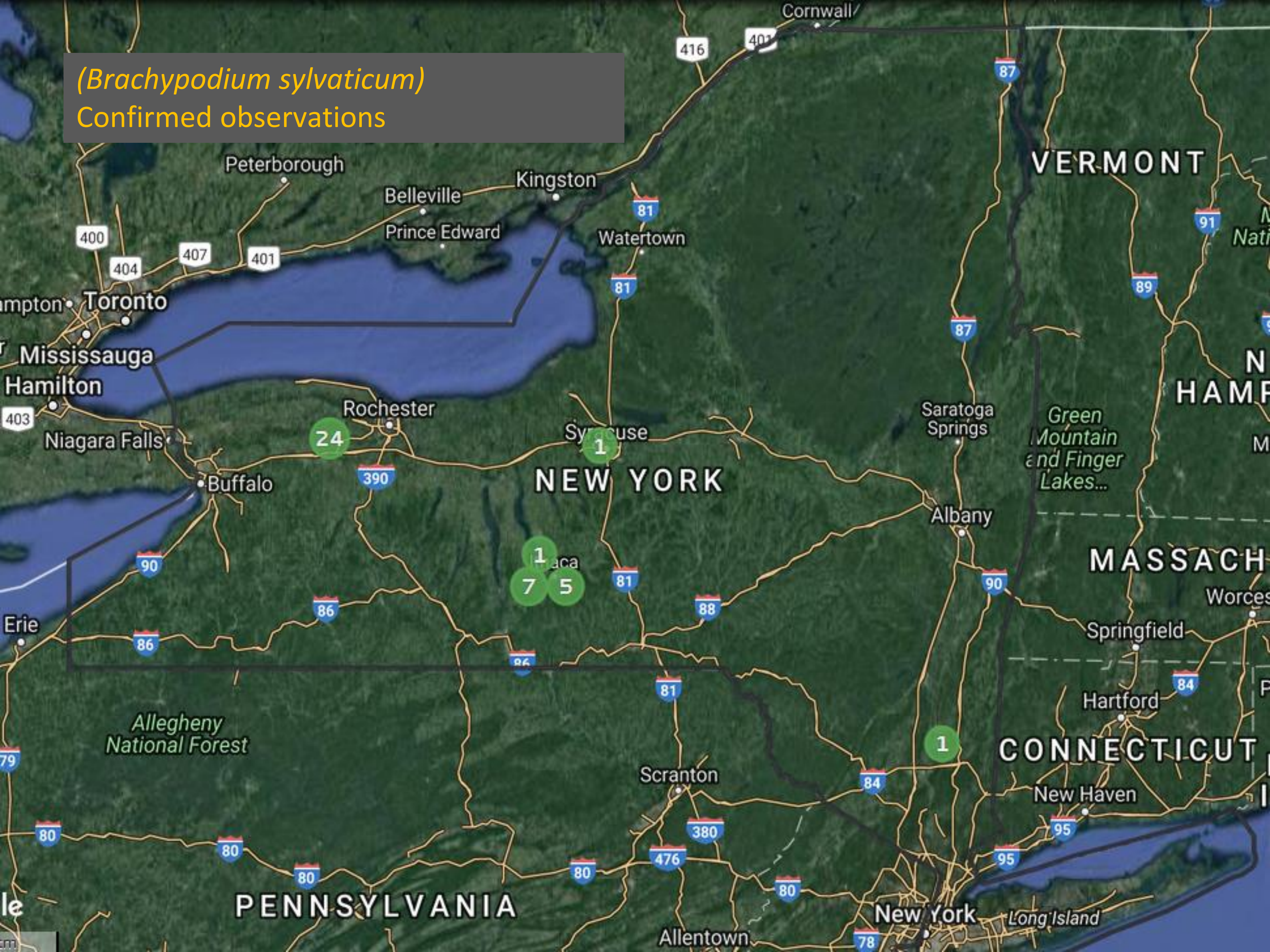
Very long awns

Ribs or ridges on leaf blades

Very long culms

Very hairy stems

(Brachypodium sylvaticum)
Confirmed observations


24
1
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7
5
1
Peterborough
Kingston
Belleville
Prince Edward
Watertown
Toronto
Mississauga
Hamilton
Niagara Falls
Buffalo
Rochester
NEW YORK
VERMONT
Saratoga Springs
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MASSACH
Worces
Springfield
Hartford
CONNECTICUT
New Haven
Erie
Allegheny National Forest
Scranton
PENNSYLVANIA
Allentown
New York
Long Island
Cornwall

Water Soldier *(Stratiotes aloides)*

PS

NATIVE RANGE

Europe and northwest Asia

DESCRIPTION

- Similar in appearance to an aloe plant, spider plant or the top of a pineapple.
- Sharp - serrated and firm leaf edges

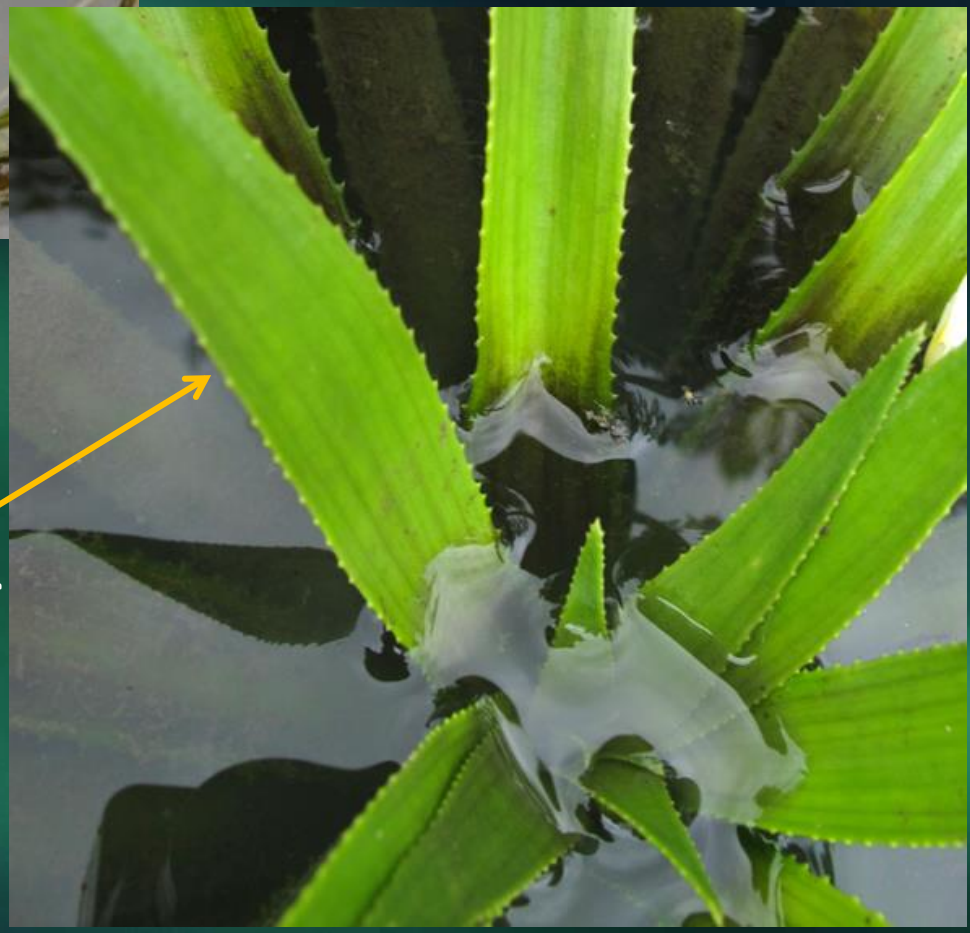
SPREAD: via Turions (small seed like structure)

Look for = large pineapple-like emergent leaves

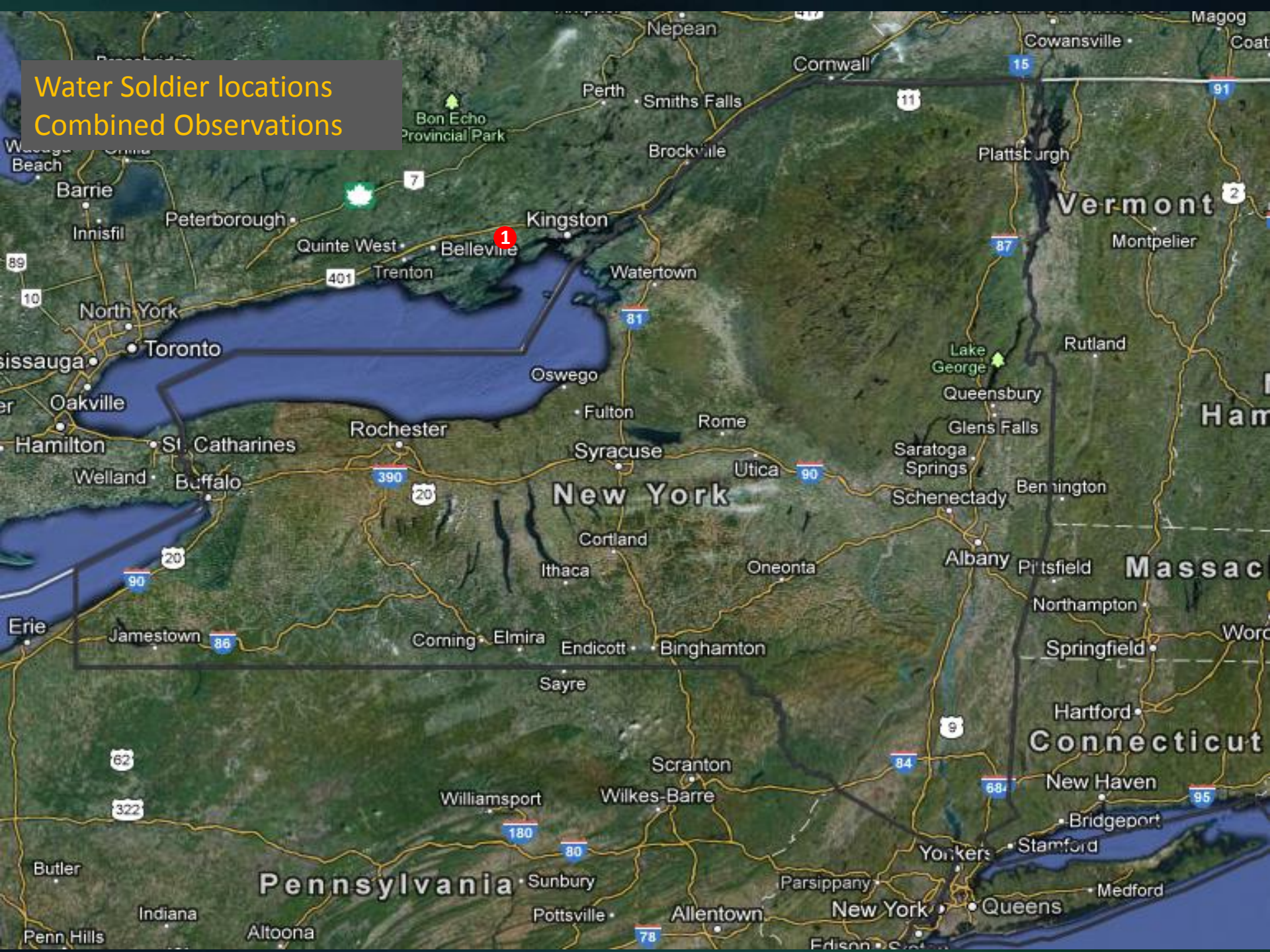
Courtesy – Ontario's Invading Species Program, Ontario Canada

Look for:

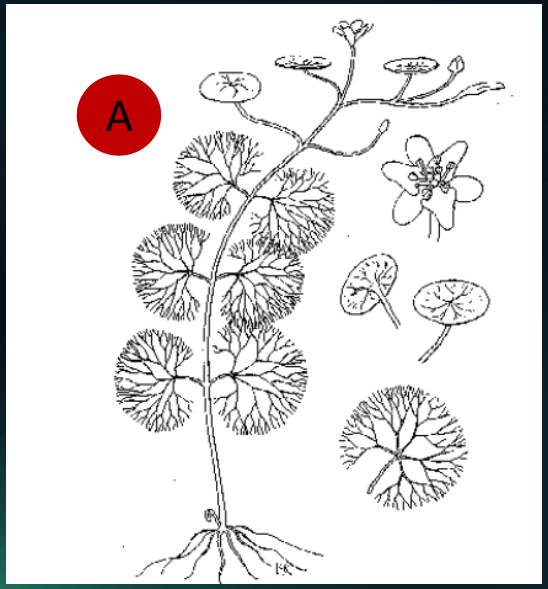
Large white flowers



Serrated leaf edges


Water Soldier locations
Combined Observations
1
Nepean
Cornwall
Cowansville
Magog
Perth
Smiths Falls
Bon Echo Provincial Park
Brockville
Plattsburgh
Barrie
Peterborough
Kingston
Vermont
Innisfil
Quinte West
Belleville
Trenton
Montpelier
Watertown
North York
Toronto
Rutland
Lake George
Oswego
Queensbury
Oakville
Fulton
Rome
Glens Falls
Rochester
Hamilton
St. Catharines
Syracuse
Saratoga Springs
Welland
Buffalo
Utica
New York
Schenectady
Cortland
Albany
Ithaca
Oneonta
Pittsfield
Northampton
Erie
Jamestown
Corning
Elmira
Endicott
Binghamton
Springfield
Sayre
Hartford
Connecticut
Scranton
New Haven
Williamsport
Wilkes-Barre
Bridgeport
Stamford
Butler
Pennsylvania
Sunbury
Parsippany
Medford
Indiana
Pottsville
Allentown
New York
Queens
Penn Hills
Altoona

Fanwort (*Cabomba caroliniana*)
Identification



- ✓ Native to South America.
- ✓ Macrophyte, mostly submersed sometimes floating.
- ✓ Perennial with rhizomes.
- A Leaves are finely divided and arranged in pairs opposite on the stem.
- B The ends of the leaflets are often split or shaped like the letter Y or similar to a snakes tongue. (*NEXT SLIDE*)

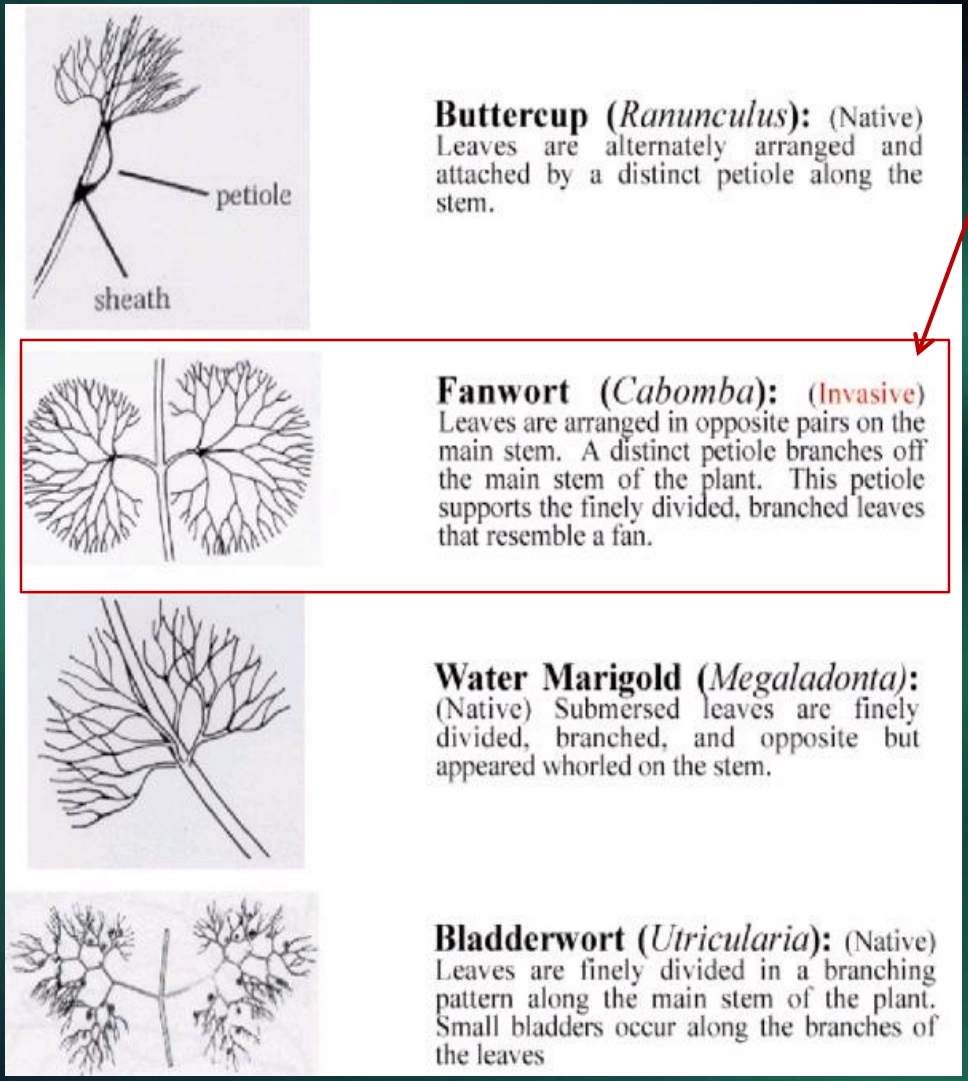
Fanwort *continued……..*

Fanwort *continued.....*

Flowers are white and small (less than 1/2 inch in diameter), and they float on the water surface

Capable of highly dense growth

Fanwort Lookalikes!



- *Key Features (Fanwort)*
  - Fanlike shape leaves that are Y-shaped (snake tongue)
  - Opposite on stem
  - Distinct Petiole
  - Purplish stem
- *How Lookalikes Differ*
  - Buttercup- alternate leaves & extended Petiole
  - Water marigold- no Petiole
  - Bladderwort- no fan and distinct bladders

S. Kishbaugh


Carolina Fanwort
Confirmed Observations
Cornwall
Peterborough
Belleville
Kingston
Prince Edward
Watertown
VERMONT
Toronto
Mississauga
Rochester
Niagara Falls
Buffalo
Syracuse
NEW YORK
Saratoga Springs
Green Mountain and Finger Lakes...
Albany
Ithaca
MASSACHU
Springfield
Hartford
CONNECTICUT
New Haven
Allegheny National Forest
Scranton
PENNSYLVANIA
New York
Long Island
Allentown
1
2
3
5

Water Hyacinth *(Eichhornia crassipes)*

Native to: South America (Zhang et al. 2010)

Spread: Ornamental sales

Impact: Forms dense colonies that block sunlight and crowd out native species.


Water hyacinth
Eichhornia crassipes
Photo by A. Murray
Copyright 2001 Univ. Florida

- Floating plants with large, succulent, round to oval, shiny green leaves.
- Leaves are held upright so they act like sails.
- The leaf stalk (petiole) is thick and spongy and helps to keep the plant buoyant.
- A mass of fine roots hang in the water underneath the plant.
- The flowers are large (2-3 inches) and attractive. They are blue-purple or lilac-colored sometime with a with a yellow spot


Water Hyacinth
Confirmed Observations
Cornwall
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Kingston
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Toronto
Mississauga
Niagara Falls
Buffalo
Rochester
Syracuse
NEW YORK
Ithaca
Albany
Saratoga Springs
Green Mountain and Finger Lakes...
VERMONT
MASSACHU
Springfield
Hartford
CONNECTICUT
New Haven
New York
Long Island
Scranton
Allentown
PENNSYLVANIA
Allegheny National Forest
416
401
400
404
407
401
81
87
91
89
93
90
86
88
84
80
476
380
95
78
7
1

Hydrilla (*Hydrilla verticillata*) PS

NATIVE RANGE

Korea's

ECOLOGICAL THREAT:

- Aggressively spreads and dominates native, beneficial, aquatic plants.
- Renders surface waters unusable for passive recreation and fishing.
- Winter dieback may reduce dissolved oxygen levels.

Hydrilla

Hydrilla has 4-5 or more leaves per whorl.
Most elodea spp. Have 3 leaves per whorl

Elodea

Leaf Margins

Photo credit- NYSFOLA, Jon Reis Photography

Serrated

Look for serrated (toothed) edge that should be apparent with naked eye

If margin smooth (entire), may not be hydrilla

Tubers

Tuber at end of whitish roots (rhizomes)

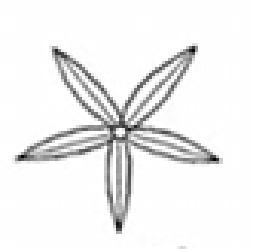
The best distinguishing characteristic of Hydrilla is the tuber

Photo credit- NYSFOLA, Jon Reis Photography

Tubers

Bottom Line….

Leaves in whorls of 4 or more **D** Leaf serrations visible to the naked eye **D** White rhizome & tuber **=** Hydrilla



If you think you have found Hydrilla

1. Note the location preferably with a GPS waypoint.
2. Get a sample, (including tuber), take close up photos on white background
3. Notify your local PRISM representative for positive ID and next steps.


Hydrilla verticillata
Confirmed Observations
Peterborough
Belleville
Kingston
Prince Edward
Watertown
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Mississauga
Rochester
Niagara Falls
Buffalo
Syracuse
NEW YORK
Saratoga Springs
Green Mountain and Finger Lakes...
Albany
VERMONT
MASSACHU
Springfield
Hartford
CONNECTICUT
New Haven
Allegheny National Forest
Scranton
PENNSYLVANIA
Allentown
New York
312
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41
545
1
5
2
2
4
3
19
1
2
16
1
3
400
404
407
401
416
87
81
91
89
90
86
88
84
80
476
380
95
78

Rusty Crayfish *(Orconectes rusticus)*

Native Range:

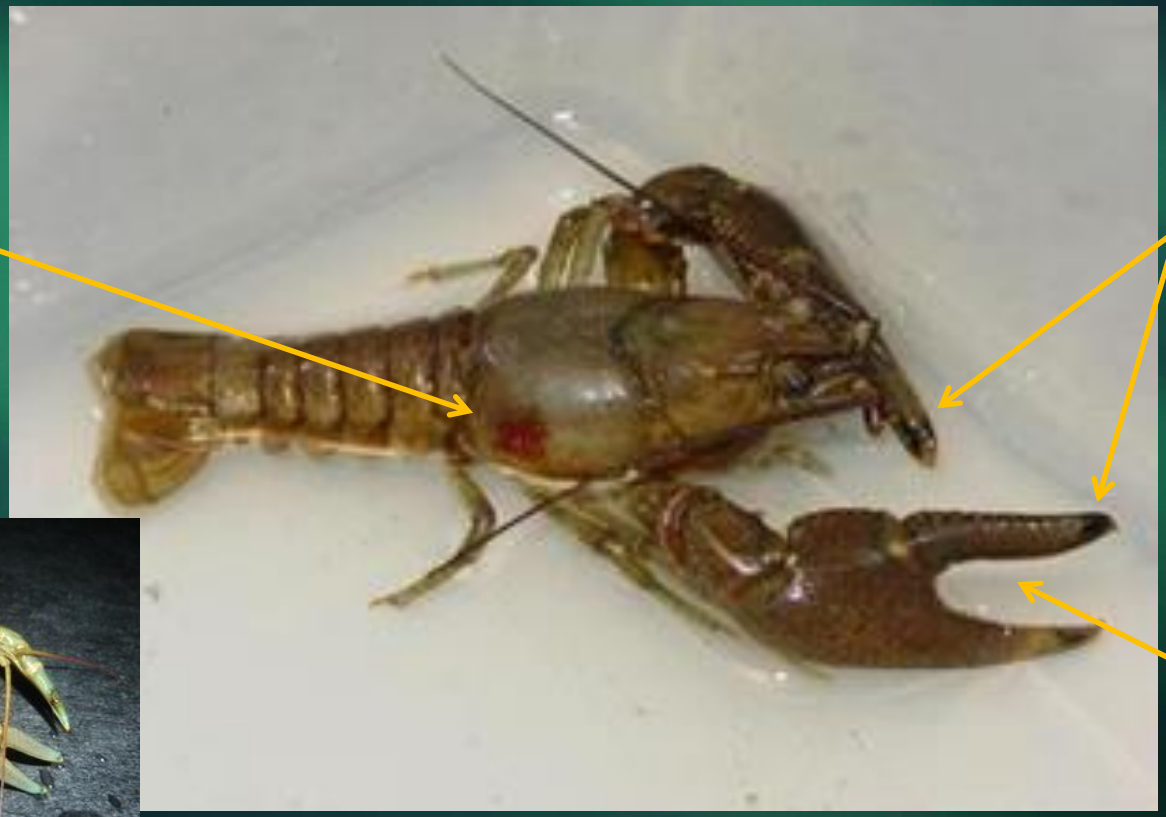
Ohio River basin and the states of Ohio and Kentucky.

Ecological Threat:

* Displace native crayfish.
* Reduce the amount and diversity of aquatic plants.
* Decrease the density and diversity of invertebrates spp.

Carapace:

Pair of "rust" colored spots on both sides.



Claws:

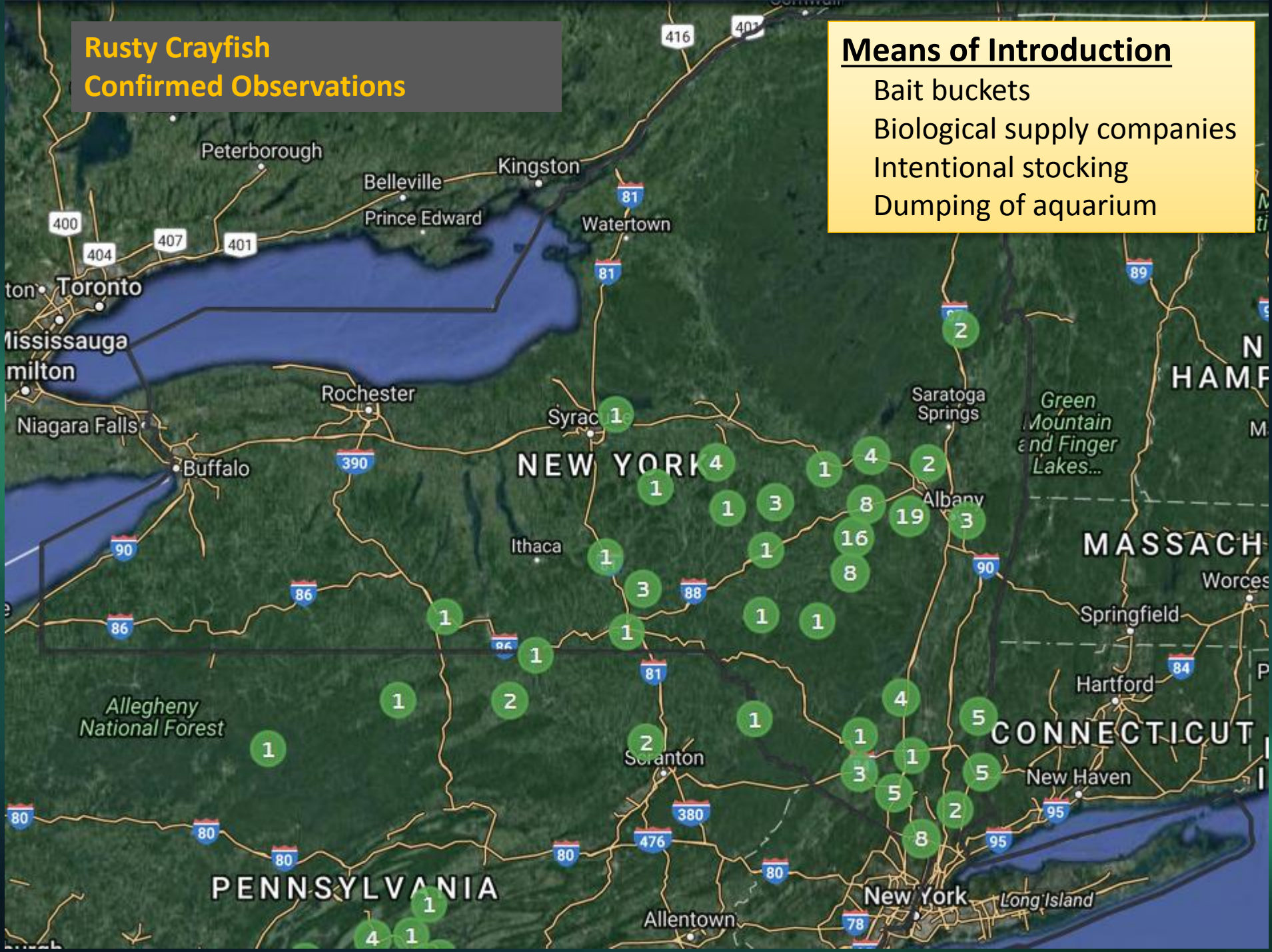
Black bands on tips of claws.

Oval gap when closed.

Comparative claw characteristics

Jeff Gunderson
Minnesota Sea Grant.

5a: Rusty (*O. rusticus*) and native (*O. propinquus*)
Black bands at claw tips. Oval gap when closed.
Smooth, S-shaped moveable claw.


Rusty Crayfish
Confirmed Observations
Means of Introduction
Bait buckets
Biological supply companies
Intentional stocking
Dumping of aquarium
Peterborough
Kingston
Belleville
Prince Edward
Watertown
Toronto
Mississauga
Rochester
Niagara Falls
Buffalo
Syracuse
NEW YORK
Saratoga Springs
Green Mountain and Finger Lakes...
Albany
Ithaca
MASSACHUSETTS
Springfield
Hartford
CONNECTICUT
New Haven
Allegheny National Forest
Scranton
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Long Island
416
401
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404
407
81
89
90
86
88
84
380
476
80
95
78

SAFETY FIRST

- **Be prepared:**
  - **Wear your life jacket**
  - **Know your surroundings**
    - ✓ **Cliffs**
    - ✓ **Quick sand**
    - ✓ **Waterfalls**
    - ✓ **Bees nests**
  - **PPE (personal protective equipment)**
    - ✓ **Gloves, Inhalers, Epi-Pen, etc.**
  - **Dry Bags**
  - **First Aid Kits**
  - **Sunscreen**
  - **Bug Spray**
  - **Don't take risks**
  - **Don't fool around especially in canoes**
  - **Don't panic**
  - **Obtain Emergency phone numbers**

End of species identification