Current State of Invasive Species in Columbia County

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Presentation Outline

- What are invasive species?
- How invasive species impact our landscape
- What about Climate Change?
- Invasive Species Tiers and The Invasion Curve
- Species Highlights
- Where do I start?
- Questions?

What are Invasive Species?

Invasive species are non-native plant, animals, and pathogens that cause harm to the environment, the economy, or human health

Non-Native Species in New York State

Plant species:

- ~1,500 (Werier 2017)
- 253 considered high impact (NYNHP 2023)

Aquatic Species:

- 243 non-native (USGS NAS 2023)
- 66 considered high impact (NYNHP 2023)



Sooty and white mold grow on honeydew deposited by spotted lanternflies feeding on Ailanthus, Schenley Park, 15 Sep 2023 (photo by Kate St. John)

Cumulative Impacts of Invasive Species

- Ecological
- Economic
- Sociological

Invasive Alien Species

How they impact

Competition Grazing Predation Parasitism Bio-fouling Hybridisation Poisoning Flamability Interactions with other IAS Disease transmission



Outcomes of impact

Environmental

e.g. Modification of hydrology Native species declines Soil erosion Primary production alteration Plant/animal health Habitat degradation

Socio-economic

e.g. Agricultural damage Reduced access to water Infrastructure damage Human health Damage to forestry Reduction in tourism



INVASIVE ALIEN SPECIES AND SUSTAINABLE DEVELOPMENT

- . Impasive alien species (IAB) are species intro used into places outside their natural range that have negative impacts on native biodiversity.
- UAS have major impacts on human health, Evelihoods and food security, and undermine progress towards achieving many of the UN Startainable Development Goals. The core of new introductions is increasing, and the impacts from MS can be compounded by climate change
- USC are not only an environmental problem, and a most-vectoral approach must be bleen to address then Preventative measures, such as brossmarity, are the most cost effective ways to table USC.

What is the issue?

Allen or non-native species are an india, plants or other organisms introduced by humans, either intentionally or accidentally, into areas outside their natural range. Some of the series became installed and and regardedy impact pative blockware by These species are dansified as invasive aller species (IAS).

Taxe to the increase in the movement of people and pening and enhanced transportation, the number of A grish al asers wen ciril becuboth gried sebequ that over one trind of all introductions in the past 200. years occurred after 1970.

According to The FUCN Fled List of Threatened Species. MAR are one of the top causes of Morthweight Louis and the second court common class. of species estinctions. The brown tree snake (Zoge tregulariz; for so emple, is responsible for the eld rollion of 10 bird spot by on the island of Clasm where it was impolated in the 1640s. WS also ponettate the most significant threat to natural World Hertage site effecting 68 out of 241 sites, socording to the IUCV World Hentege Sudook.

AS Inspace on beyond blodlower'ty and also seeks at and impacting a segment acceptantly, and and one one of a effect economic acceptantly, healthcode, food security, and numer health and well-being. Our all UAS risk and emining array was towards and eving 10 of the 17 LBI Statishnab & Development Goals (SDDs).

Why is this important?

hough the scale of the specio-economic costs associated with AS is provide indensioned, it is extensived that the direct impacts of IAS and their management cost the global oconomy billions of USS annually. It a entire and that 'AS cost the EU at least C12.5 Flor/year, and Australia at least AUSS13.6 billion/year twosive alien insents alone; due to their impacts on agriculture and forecry, over at least 195570 till in syed globally. The global cost of control ng investive eshwater instrukter arrivals, such as the priva are pagga masse's which accurricate on wetted surfaces

in a adric power generation and water treatment. act thes, is estimated at more than USEZTT mill



The water Invacinth (Earthornie cransipes), for example which is native to South America, has been intentional introduced around the world for ornamental ourcoses: and as animal food, and has rapidly invaded water says, migation observeds. Takes and rine sacisles, Undo the right conditions it can double in blomass within two weeks forming dense mats, with potentially disastrous consequences. In Africa's Lake Victoria, water hysicish infestations covering 12,000 hestates have blooked. shipping trade and access to ports, and holled fishing activities, impacting 60 ntilico people.

the impacts of IAS, placing food security at risk and jeopardising livelihoods. For example, the fall army worm (Spodophy a Augiperda) was introduced to sub-Saharan Africa most lively from the USA in 2016. some countries. Mascure (Prosopis), a thomy droughttole and shrub multimite. But Americus, was writing introduced to tackle the impacts of desertification but became initialive, forming impenetrable trickets in man

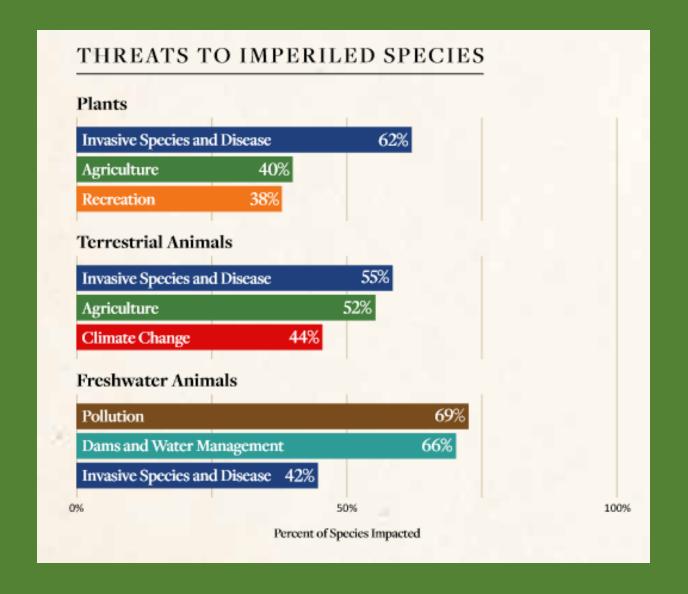
Ecological Impacts of Invasive Species

What are the major threats to biodiversity?

Habitat destruction and degradation, invasive species, dams, and climate change are among the primary threats to our nation's biodiversity.

Biodiversity in Focus: United States Edition 2023. NatureServe.

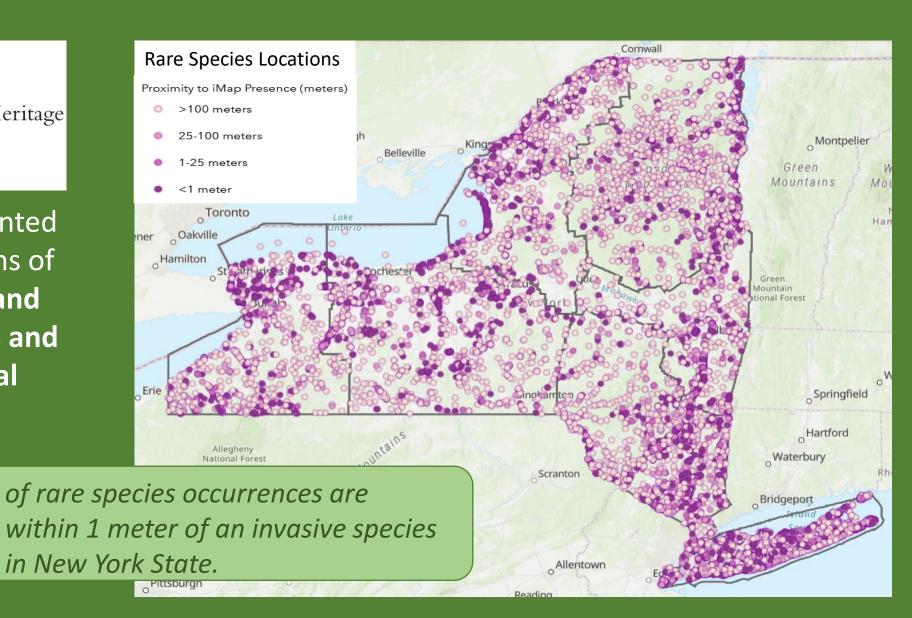




Ecological Impacts of Invasive Species (Cont.)



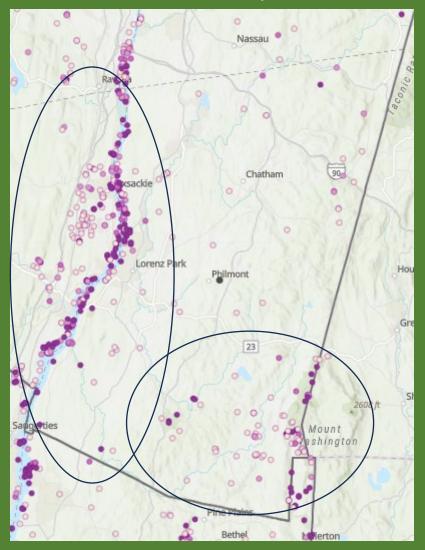
NYNHP has documented over 15,800 locations of rare, threatened, and endangered species and significant natural communities



17%

Ecological Impacts of Invasive Species (Cont.)

Columbia County, NY

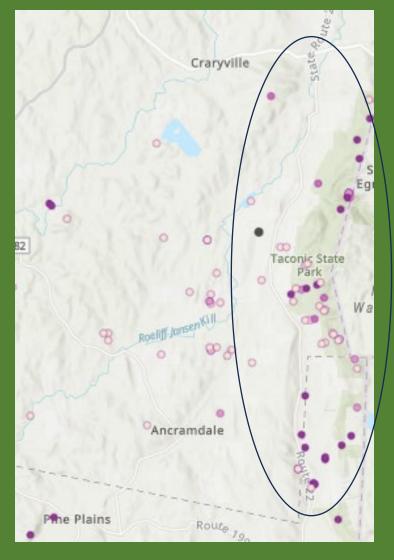


Rare Species Locations

Proximity to iMap Presence (meters)

- >100 meters
- 25-100 meters
- 1-25 meters
- <1 meter</p>

Copake/Ancram, NY



Economic Impacts of Invasive Species

"Thousands of invasive species introduced to new ecosystems around the world are causing more than \$423 billion in estimated losses to the global economy every year by harming nature, damaging food systems and threatening human health...

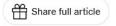
The costs have at least quadrupled every decade since 1970, according to the report, which was based on 2019 data...

Over the last few centuries, humans have intentionally and unintentionally introduced more than 37,000 species to places outside their natural ranges as the world has become more interconnected, the assessment said. More than 3,500 of those are considered invasive because they are harmful to their new ecosystems."

The New Hork Times

Invasive Species Are Costing the Global Economy Billions, Study Finds

A new scientific report offers the most exhaustive look yet at how nonnative plants and animals can drive extinctions, disrupt food systems and harm human health.



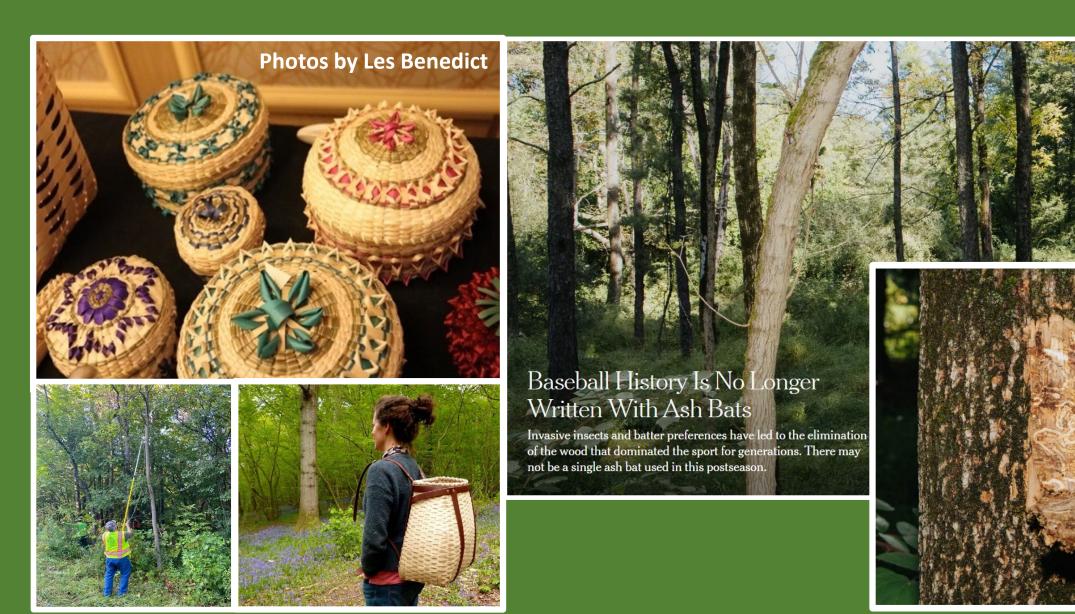




Sept. 4, 2023



Sociological Impacts of Invasive Species



What About Climate Change?

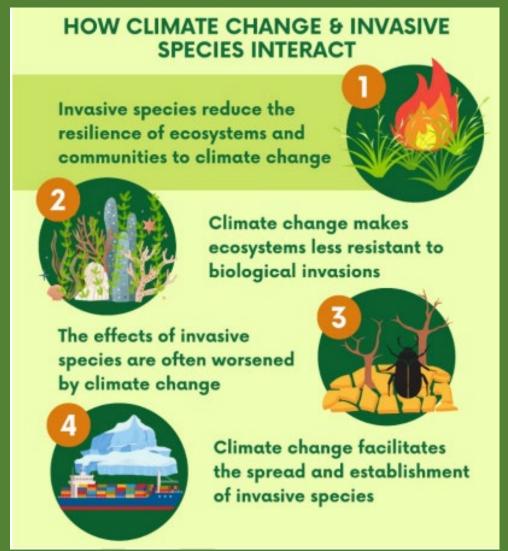
Invasive Species response to climate change

- Increased growth due to increased CO2
- Warmer, earlier spring weather
- Shifts in species ranges

Invasives Species contribution to climate change

- Insect pests are destroying trees
- Creating fire prone areas



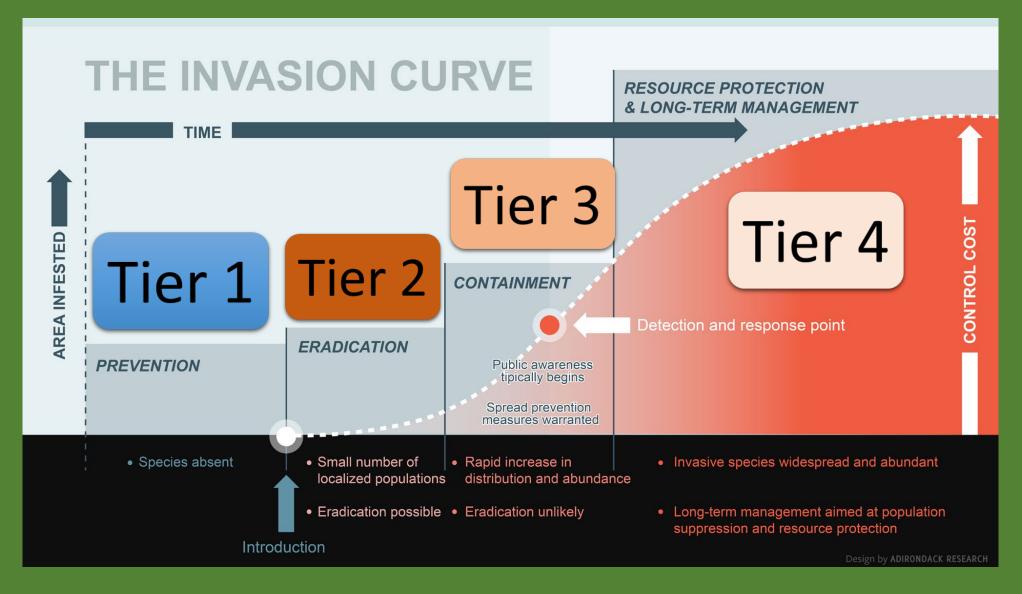


White Paper for Review at Invasive Species Advisory Council in-person meeting to be held 11/13/2023-11/15/2023. This draft completed 11/3/2023

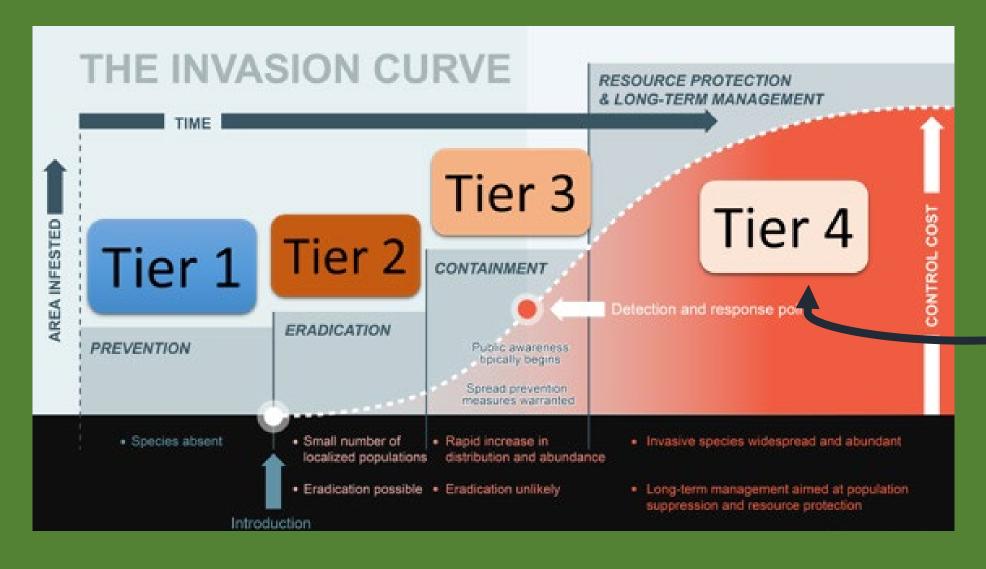
Species Tiers

		Difficulty of Eradication / Cost of Control Abundance (in PRISM plus Buffer)			
L		None in PRISM	Low	Medium	High
Impact (current and future)	Very High or High	TIER 1 Early Detection/Prevention Highest level of early detection survey efforts. Should conduct delineation surveys and assign to appropriate Tier if detected.	TIER 2 Eradication Eradication / Full containment may be feasible	TIER 3 Containment Strategic management to contain infestations and slow spread in PRISMs	TIER 4 Local Control Established / Widespread in PRISM; only strategic, localized management.
pact (cu	Medium	Evaluate Further evaluate impacts and PRISM resources to see if the species should be assigned to one of the other lists.			
lml	Unknown	X	TIER 5 Monitor Species that need more research, mapping, and monitoring to understand their invasiveness.		

Species Tiers and the Invasion Curve



Species Highlights-Terrestrial Plants



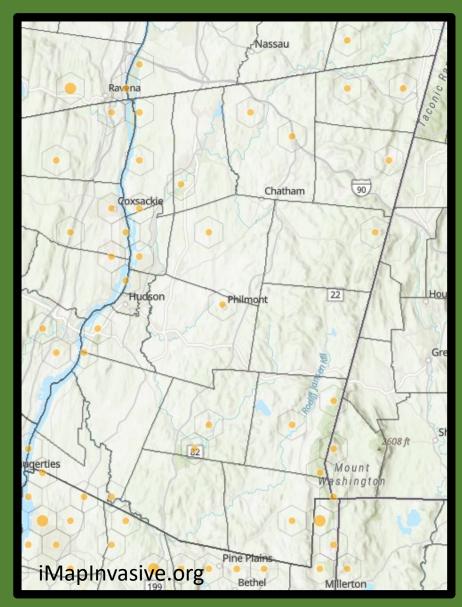
Tier 4

Japanese Barberry
Oriental Bittersweet
Tree-of-Heaven
Autumn Olive
Multiflora Rose

Species Highlights- Japanese barberry, Berberis thunbergii DC.

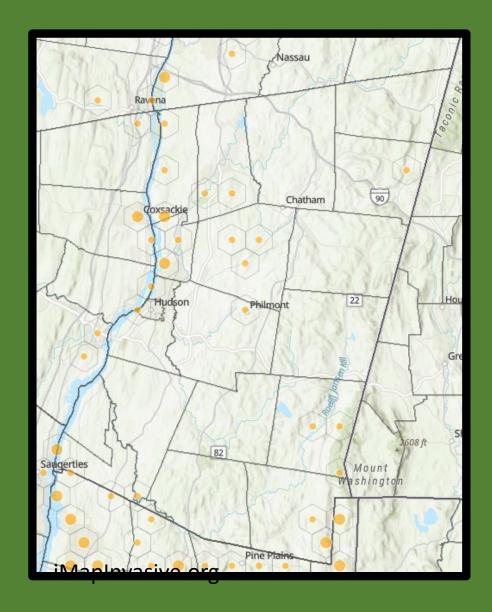






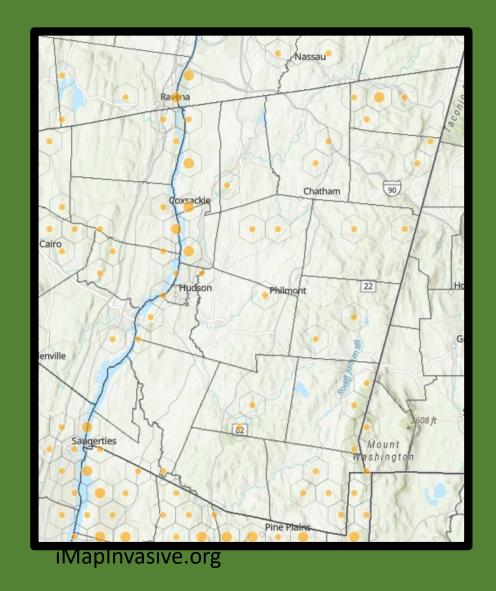
Species Highlights- Oriental Bittersweet, Celastrus, orbiculatus



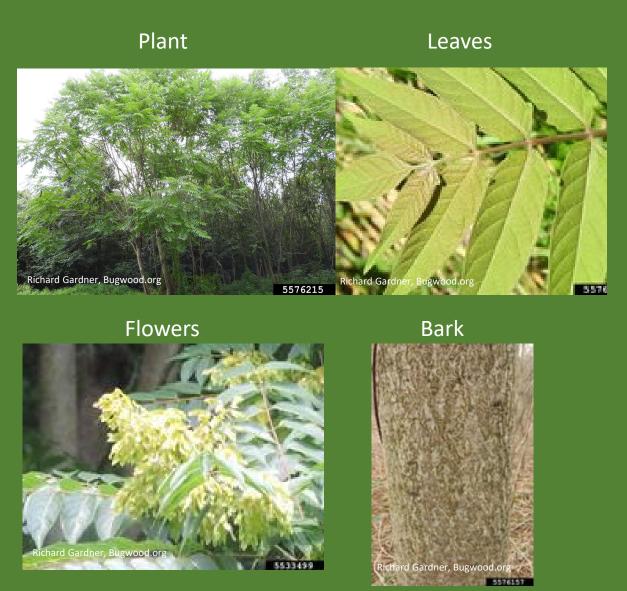


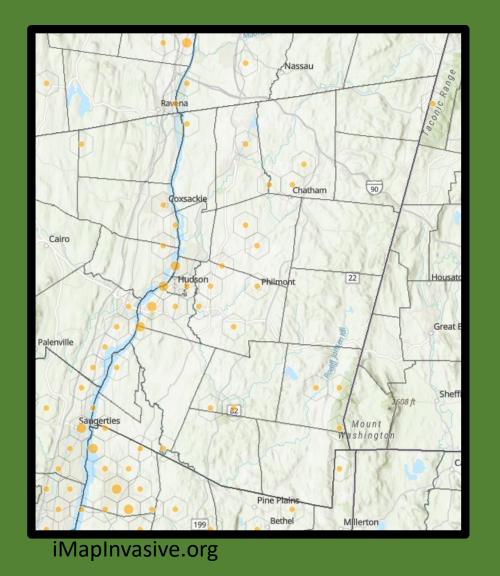
Species Highlights- Multiflora Rose, Rosa multiflora





Species Highlights- Tree-Of-Heaven, Ailanthus, altissima





Species Highlights- Autumn Olive, Elaeagnus umbellata

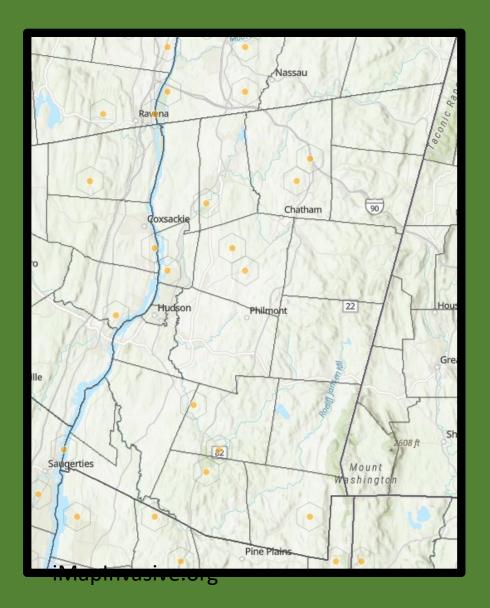


<u>Flowers</u>

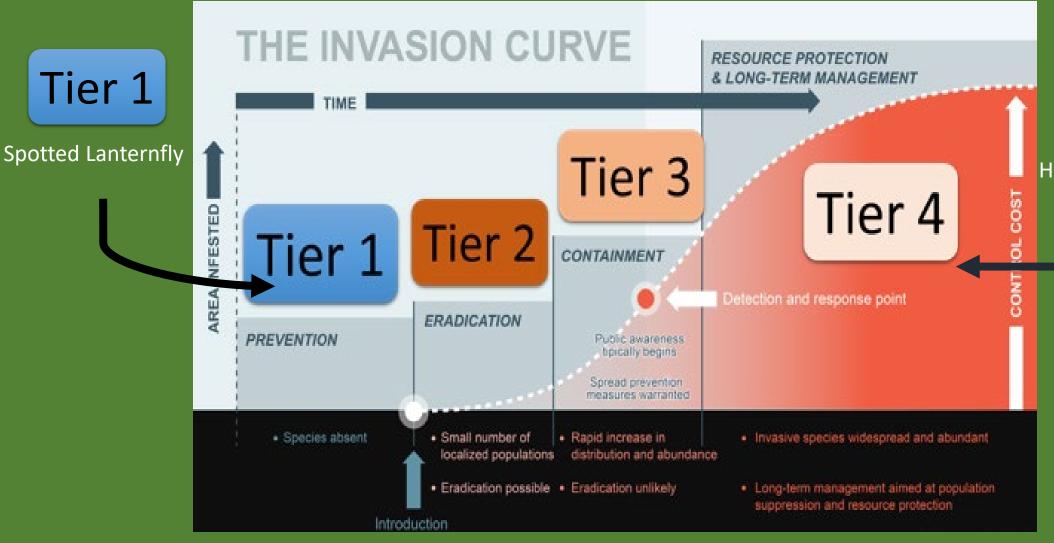


Berries





Species Highlights-Insects



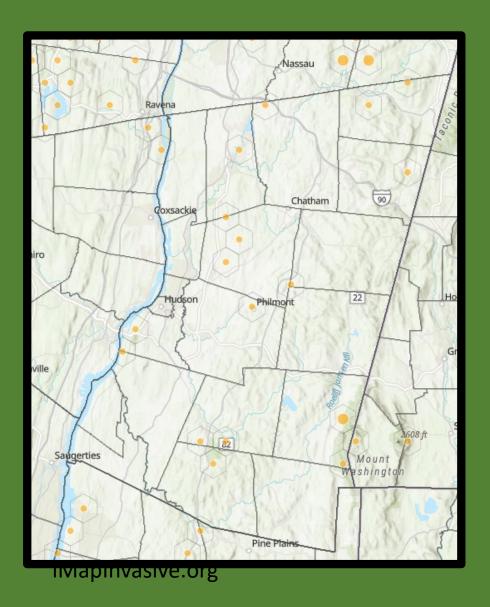
Tier 4

Emerald Ash Borer
Hemlock Woolly Adelgic
Spongy Moth
Jumping Worm

Species Highlights- Hemlock Woolly Adelgid, Adelges tsugae







Species Highlights- Spotted Lanternfly, Lycorma delicatula

Adults

Nymphs



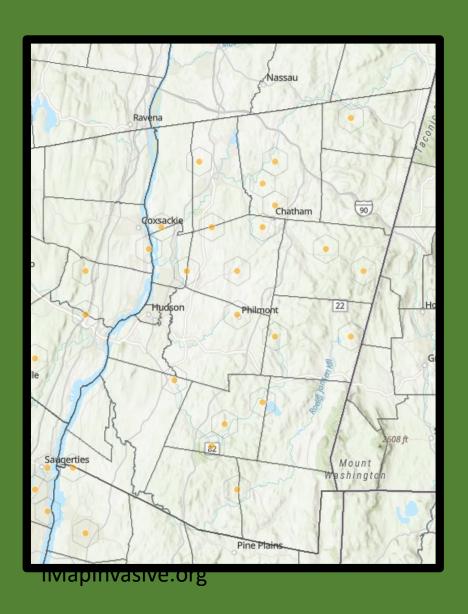
Egg Masses





Species Highlights- Jumping Worm, Amynthas or Metaphire sp.



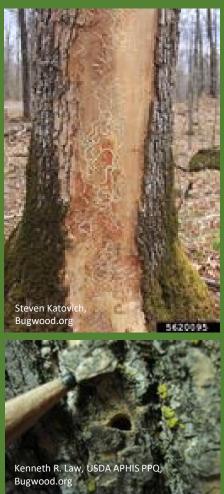


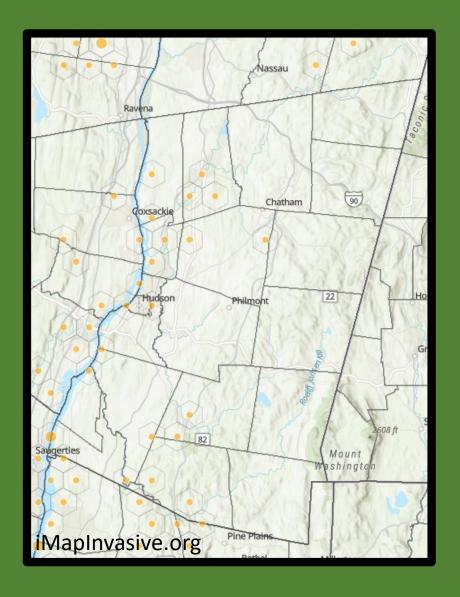
Species Highlights- Emerald Ash Borer, Agrilus planipennis







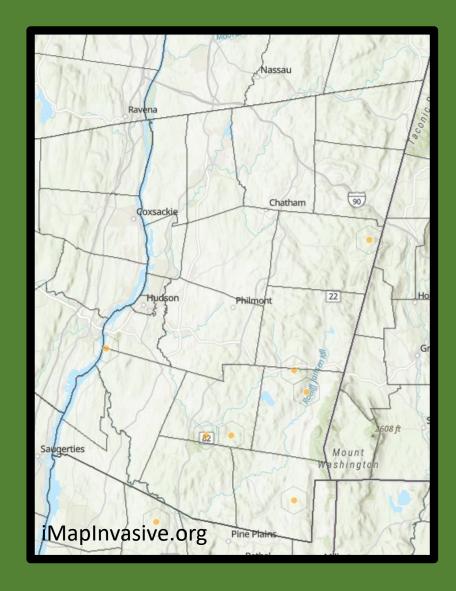




Species Highlights- Spongy Moth, Lymantra dispar

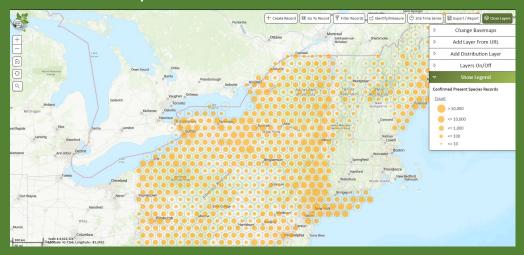






Where do I start?

Join the iMapInvasives network!



Connect with the PRISM!



Questions?

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