Using Aquatic Invasive Species Data to Inform Management Decisions

NYSFOLA – May 2, 2025

Mitchell O’Neill

New York
Natural Heritage
Program

NY Natural Heritage Program

New York Natural Heritage Program

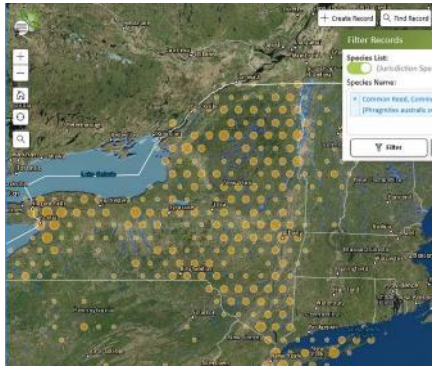
Our mission is to facilitate conservation of New York's biodiversity by providing comprehensive information and scientific expertise on rare species and natural ecosystems to resource managers and other conservation partners.

Partnership between NYS DEC and SUNY ESF

nynhp.org

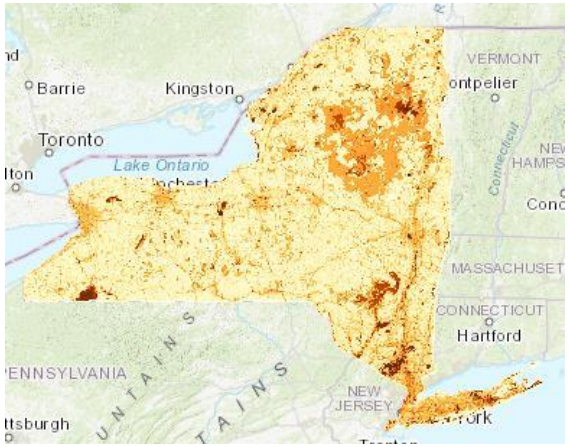
Invasive Species Database Program

iMapInvasives



WISPA

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation | Parks, Recreation and Historic Preservation | Sea Grant New York



Spatial Prioritization Models

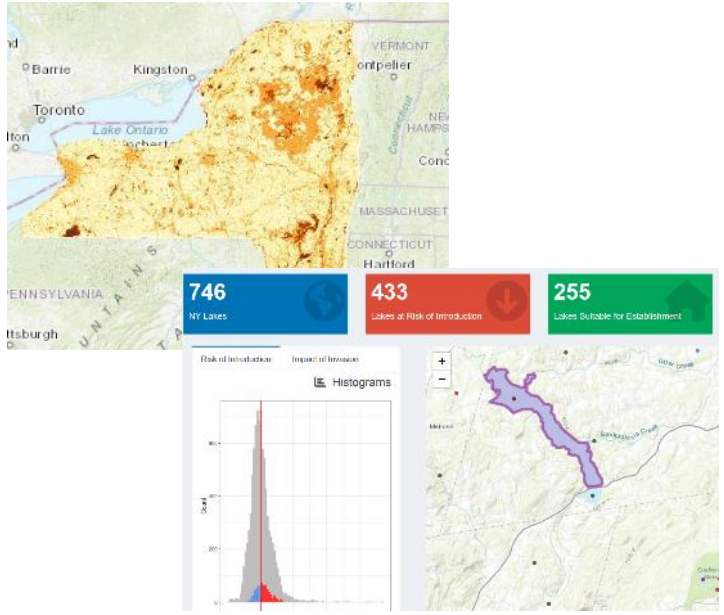
Invasive Species Database Program

- **Provide online and mobile tools** for stakeholders to collect, share, and visualize invasive species data
- **Gather, review, and serve** high-quality datasets for New York
- **Build a community around data tools** to increase early detection capacity
- **Develop analytical tools** and products derived from the invasive species data for *strategic decision-making*

WISPA

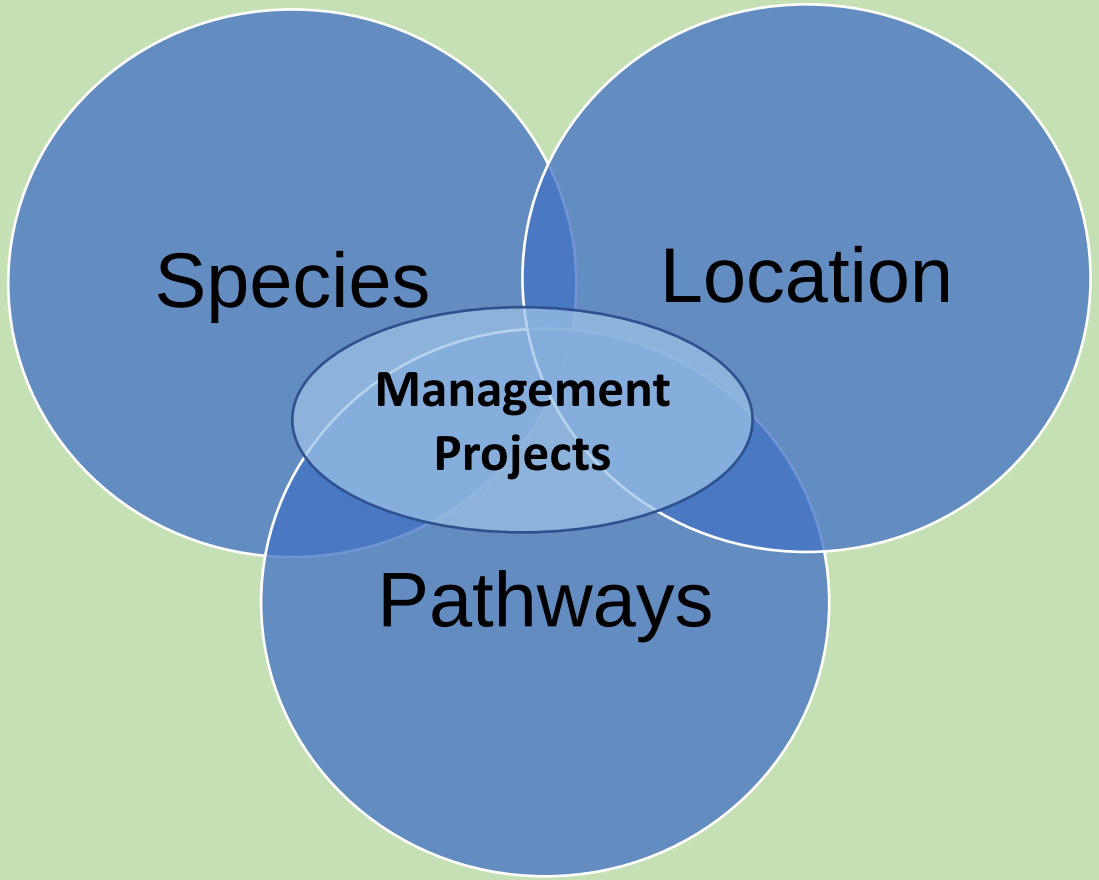
Department of Environmental Conservation | Parks, Recreation and Historic Preservation | Sea Grant

iMapInvasives



Agenda

- Viewing iMap data
- Species Tiers
- AIS Ponds & Lakes Prioritization
- Management Outcomes
- NYNHP Tools – rare species, etc.



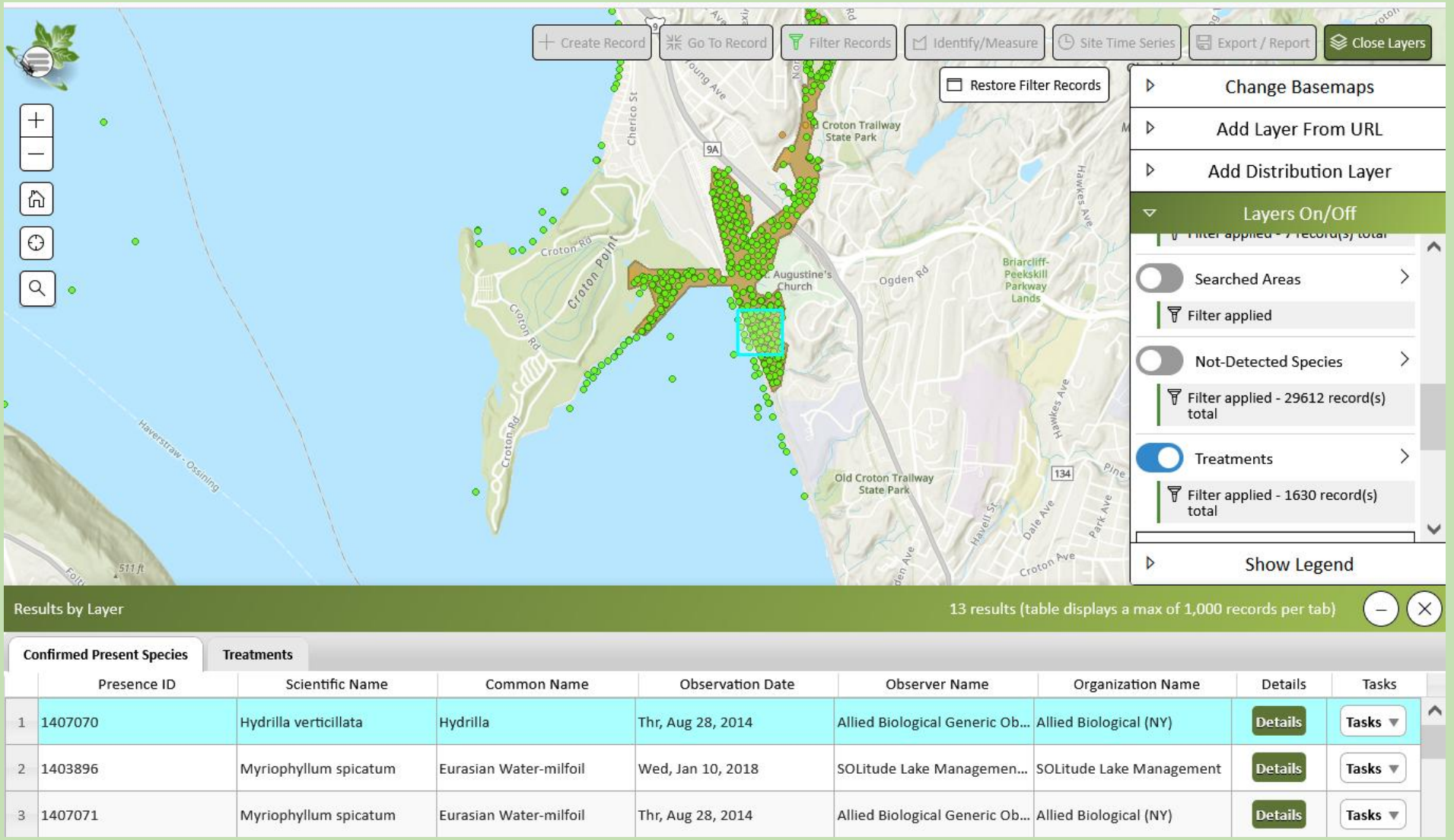
Data types in iMapInvasives

Presence

Not Detected

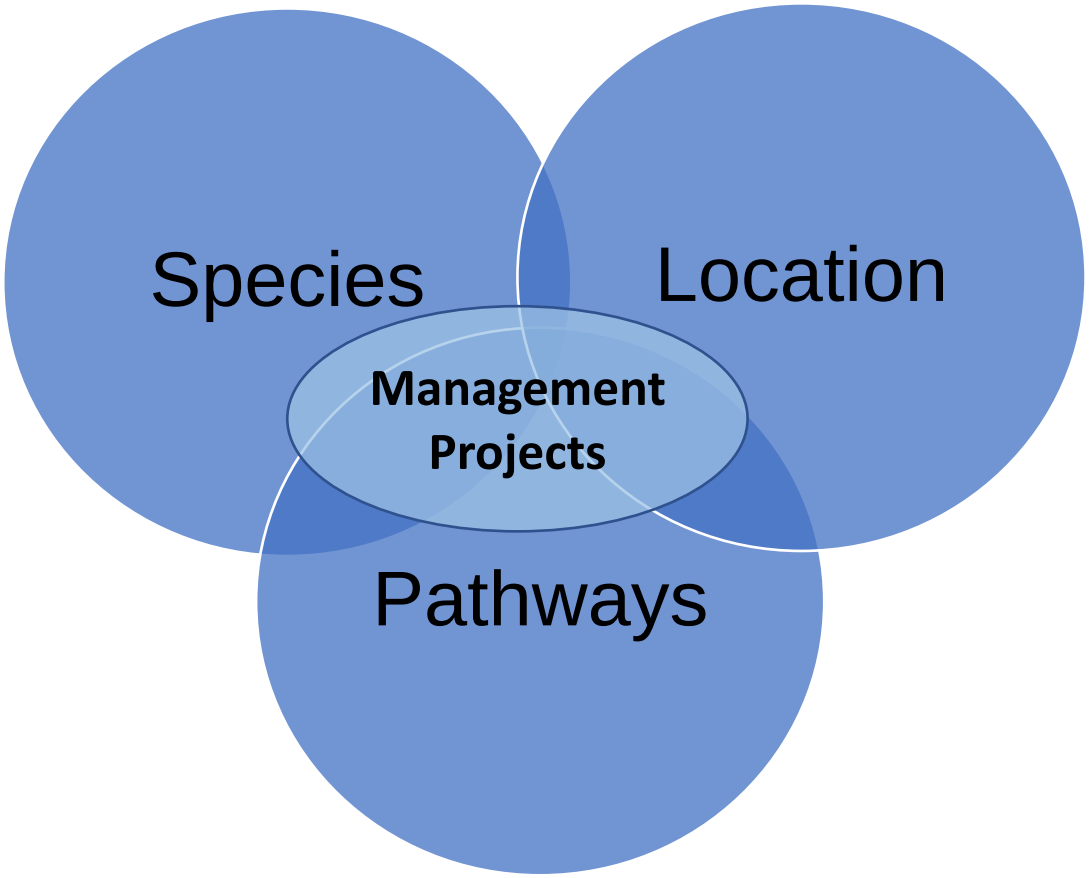
Treatment

Searched Area

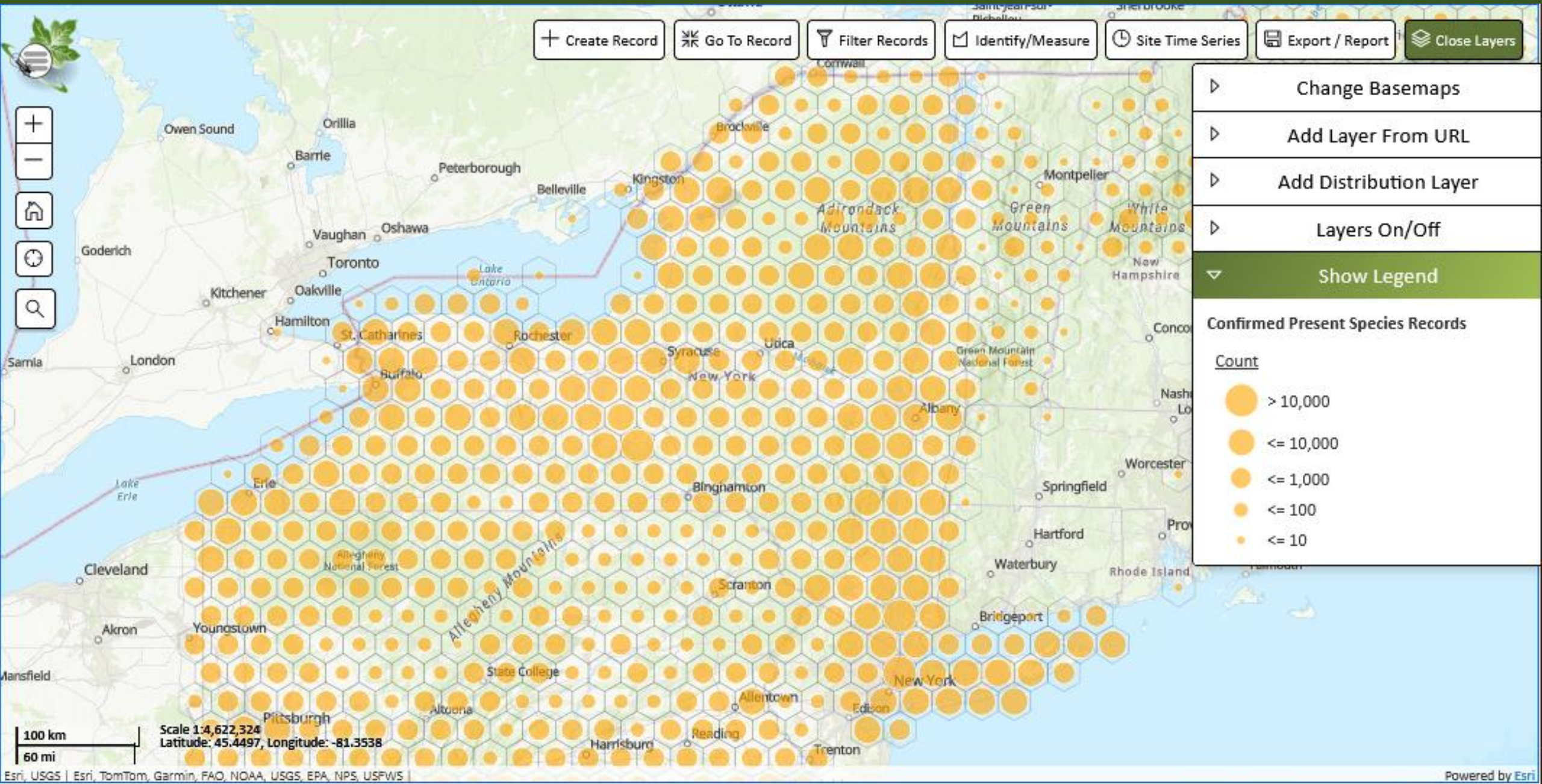


Using the data for strategic decisions

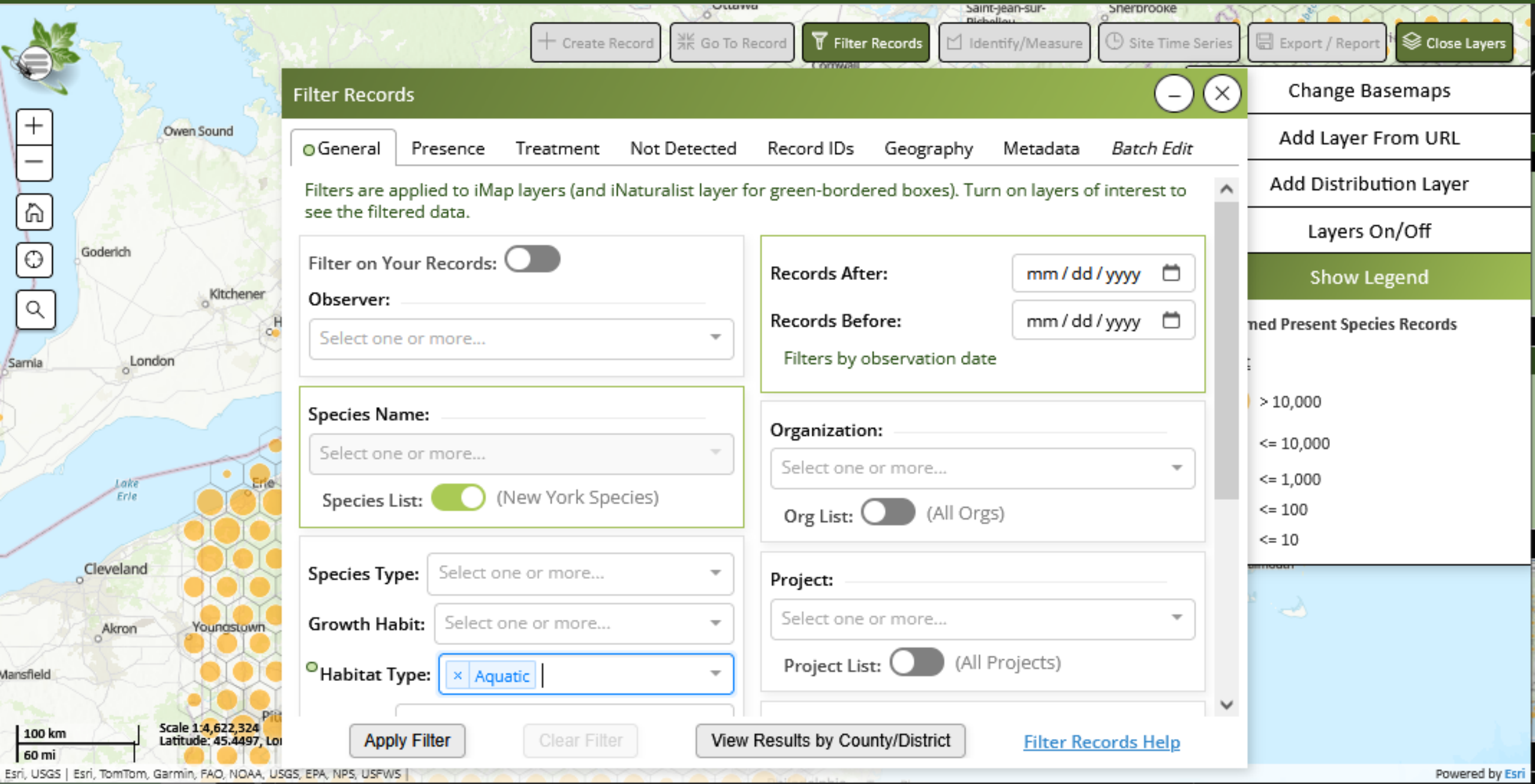
- Can we reduce pathways of invasion?
- Which species should we target first?
- Where will our control efforts have the biggest impact?
- Will our projects be effective?



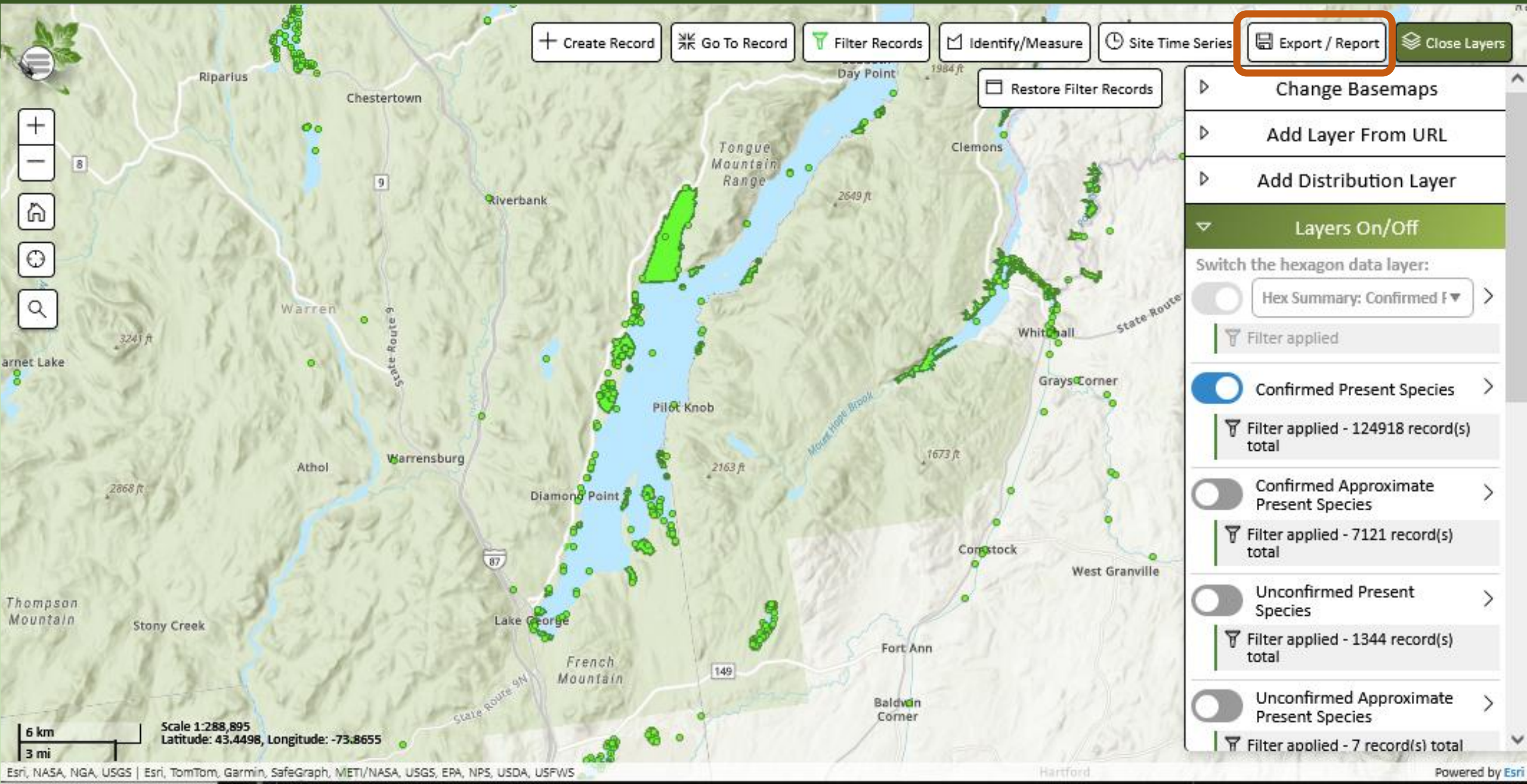
Online Interface – nyimapinvasives.org



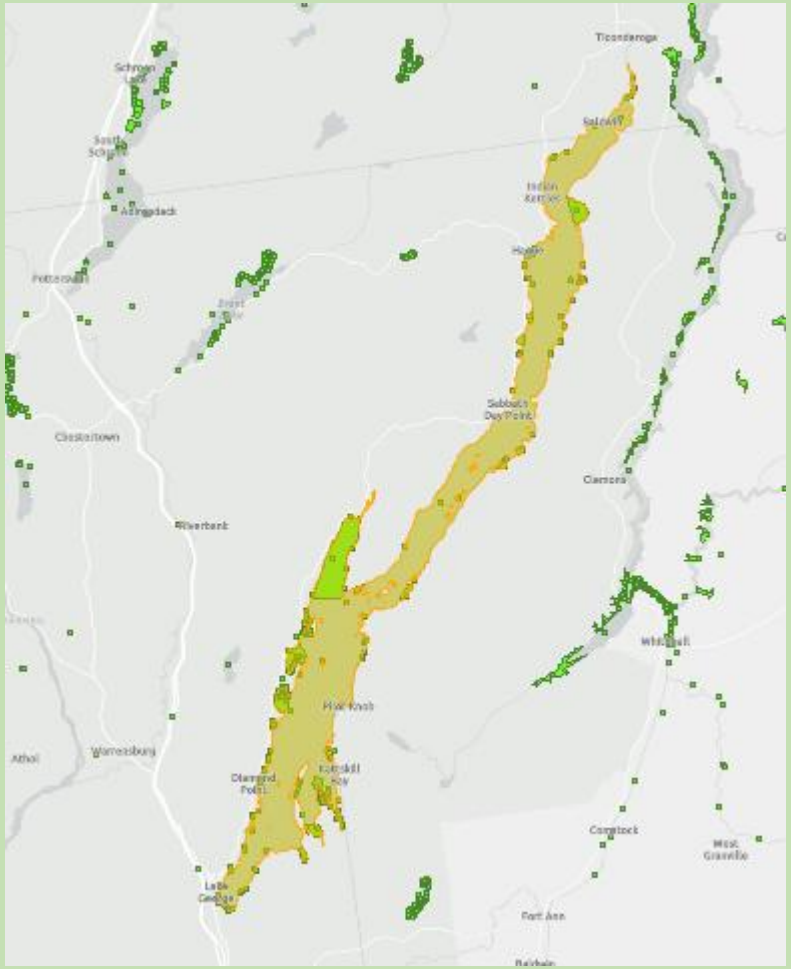
Online Interface – nyimapinvasives.org



Online Interface – nyimapinvasives.org



Online Interface – Reports

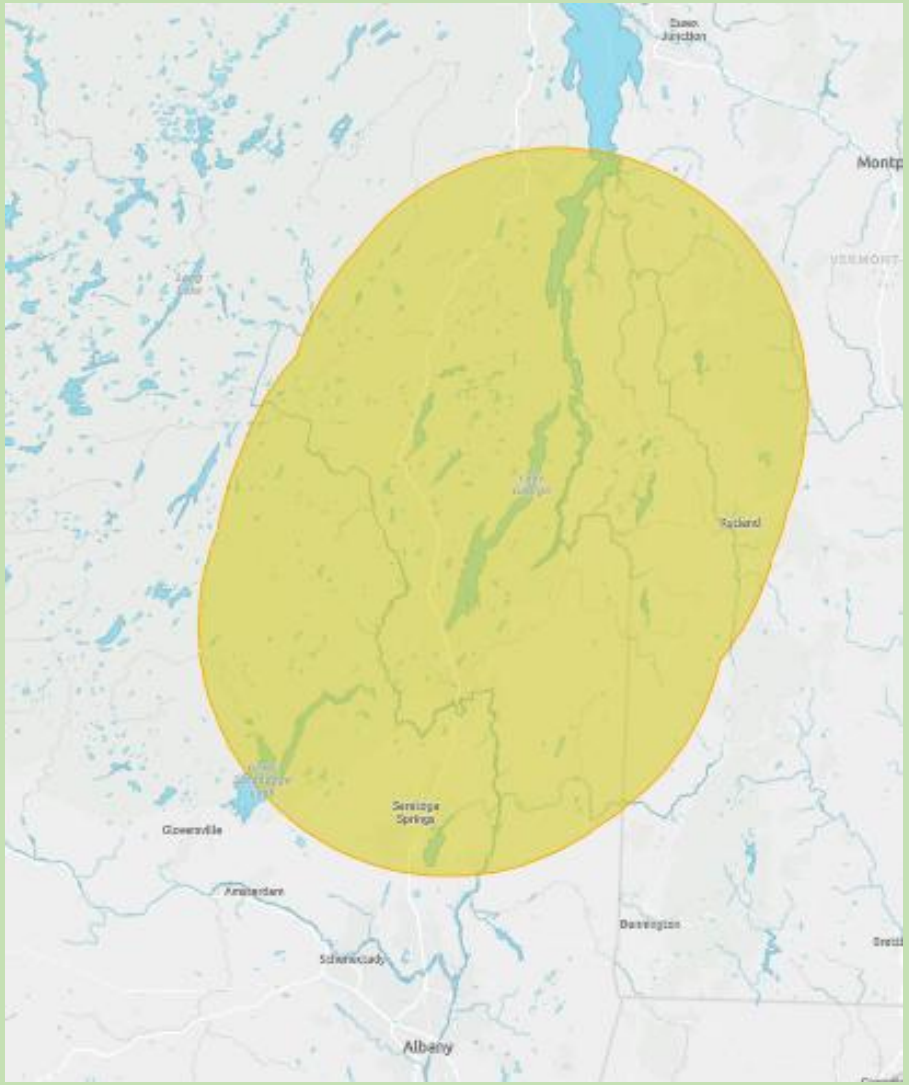


Species List By Geography

iMapinvasives Presence Records:

Scientific Name	Common Name	Confirmed Present Species Count
Bythotrephes longimanus	Spiny Waterflea	3
Cipangopaludina chinensis	Chinese Mysterysnail	2
Corbicula fluminea	Asian Clam, Golden Clam	94
Dreissena polymorpha	Zebra Mussel	9
Myriophyllum spicatum	Eurasian Water-milfoil	683
Najas minor	Brittle Naiad	2
Nasturtium officinale	Watercress	1
Orconectes virilis	Virile Crayfish	4
Potamogeton crispus	Curly Pondweed	5
Sphaerium corneum	European Fingernailclam	2
Viviparus georgianus	Banded Mysterysnail	7
TOTAL		**812**

Online Interface – Reports



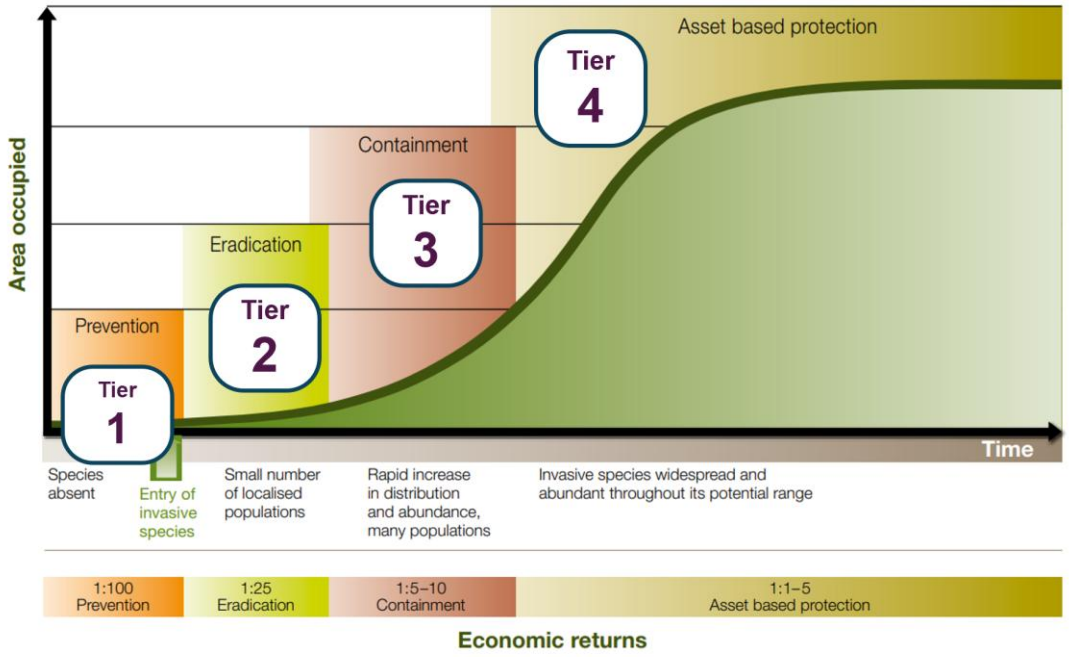
Approaching Region

Scientific Name	Common Name	Confirmed Present Species Count
Butomus umbellatus	Flowering rush	4
Cabomba caroliniana	Fanwort	7
Cipangopaludina spp (species unknown)	Mystery snail (species unknown)	1
Craspedacusta sowerbyi	Freshwater Jellyfish	14
Cyprinus carpio	Common Carp	12
Eubosmina coregoni	Water Flea, a Cladoceran	1
Hydrocharis morsus-ranae	European Frogbit; Common Frogbit	4
Myriophyllum heterophyllum	Variable Watermilfoil; Broadleaf Watermilfoil	6
Nymphoides peltata	Yellow Floating heart	1
Orconectes rusticus	Rusty Crayfish	2
Petromyzon marinus	Sea Lamprey	6
Scardinius erythrophthalmus	Rudd	1
Tinca tinca	Tench	1
Trachemys scripta elegans	Red-eared Slider Turtle	1
TOTAL		**61**

Species Prioritization

Species Tiers

Framework for creating regionally-specific invasive species lists using a shared set of definitions



Invasion Curve with the corresponding NYS Invasive Species Tier values indicated.

Filters

Geography: Statewide, APIPP, CRP, CRISP, Finger Lakes, Lower Hudson, LIISMA, SLELO, WNY, Select All Geographies

Taxa Type: Terrestrial Plant, Terrestrial Animal, Aquatic Animal, Aquatic Plant, Microorganism, Select All Taxa Types

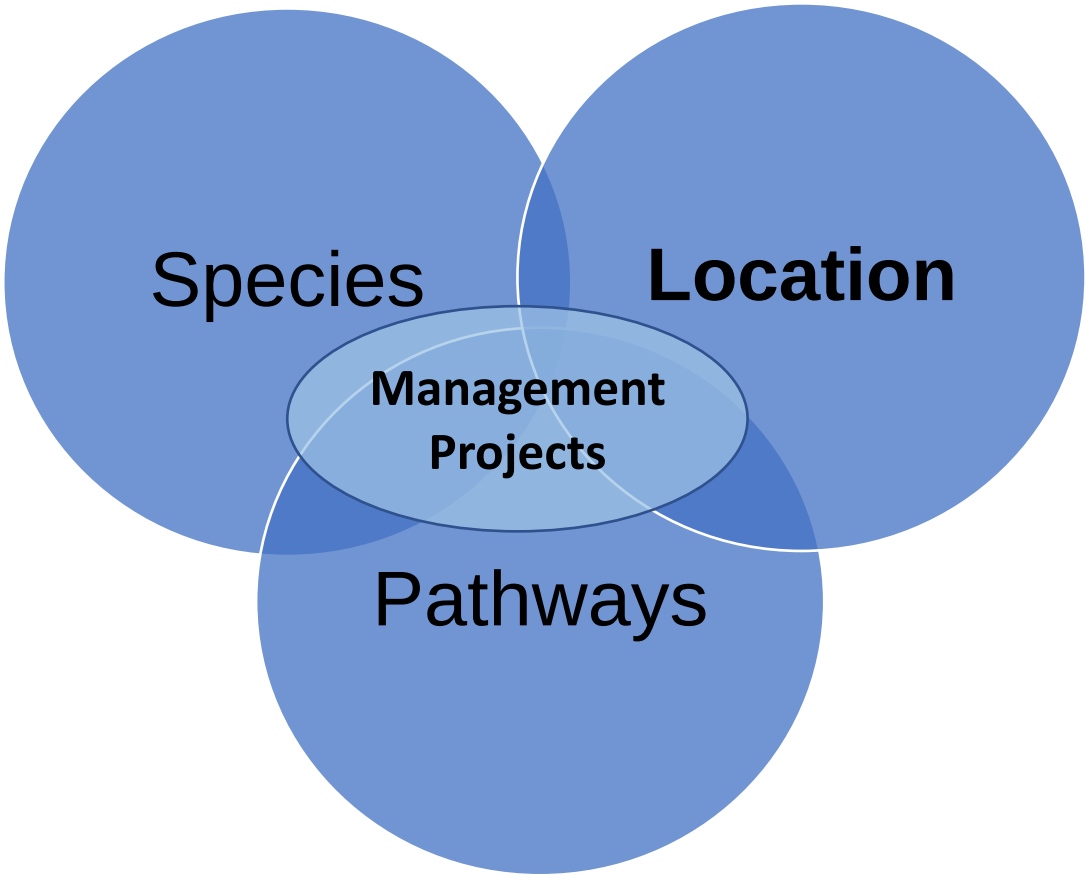
Tier Value: 1, 2, 3, 4, M, (Blank), Select All Tier Values — In any selected geography / In all selected geographies

Show All entries — Search Table:

Species Information			Invasiveness Ranks		Regulatory Status	PRISM Tier
Common Name	Scientific Name	Type	Ecological	Socio-Economic	NYS Part 575	APIPP
European Stream Valvata	*Valvata piscinalis*	AA	High	Significant Negative		2
Fanwort	*Cabomba caroliniana*	AP	High	Not assessed	Prohibited	2
Virile Crayfish	*Orconectes virilis*	AA	Very High	Insignificant Positive		2
Yellow Floating heart	*Nymphoides peltata*	AP	High	Not assessed	Prohibited	2
Asian Clam, Golden Clam	*Corbicula fluminea*	AA	High	Significant Negative	Prohibited	3
Brittle Naiad	*Najas minor*	AP	Moderate	Significant Negative		3
Common Carp	*Cyprinus carpio*	AA	Very High	Insignificant Negative	Regulated	3
European Frogbit; Common Frogbit	*Hydrocharis morsus-ranae*	AP	Very High	Insignificant Negative	Prohibited	3
Fathead minnow	*Pimephales promelas*	AA	Very High	Insignificant Positive		3
Fishhook Waterflea	*Cercopagis pengoi*	AA	Very High	Significant Negative	Prohibited	3
Spiny Waterflea	*Bythotrephes longimanus*	AA	Very High	High Negative	Prohibited	3
Tench	*Tinca tinca*	AA	High	Insignificant Positive	Prohibited	3
Water Chestnut	*Trapa natans*	AP	Very High	Significant Negative	Prohibited	3
Zebra Mussel	*Dreissena polymorpha*	AA	Very High	Insignificant Negative	Prohibited	3
Banded Mysterysnail	*Viviparus georgianus*	AA	High	Insignificant Negative		4

Using the data for strategic decisions

- Can we reduce pathways of invasion?
- Which species should we target first?
- **Where will our control efforts have the biggest impact?**
- Will our projects be effective?



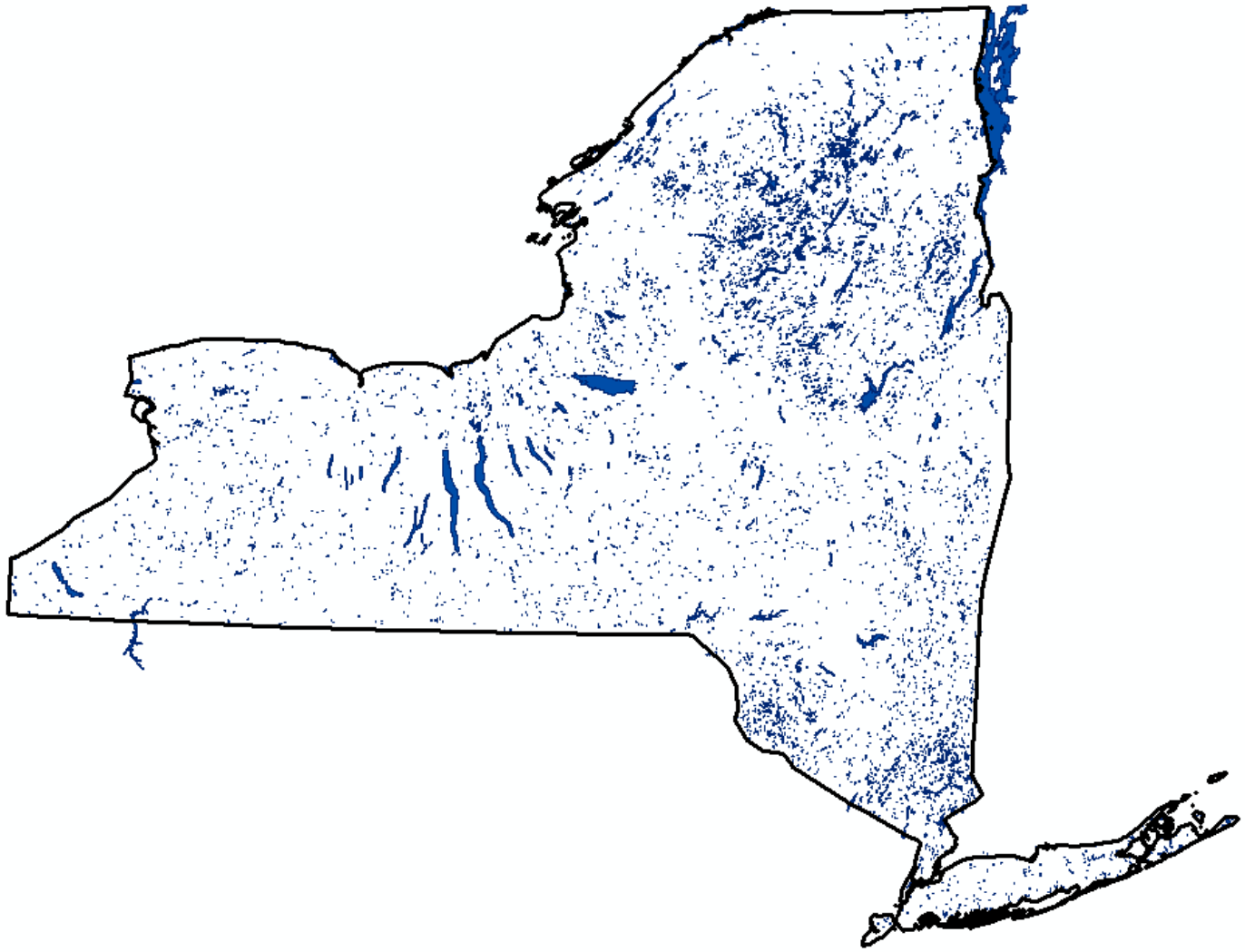
Location Prioritization

Where to Focus Our Efforts

- Over 8,600 ponds, lakes, and reservoirs
- Portions of two Great lakes
- Over 70,000 miles of rivers and streams
- Marine / estuarine ecosystems

High impact aquatic invasive species reported in NYS:

- Plants: 25 species
- Animals: 43 species



Modeling factors that influence aquatic invasive species decisions

Risk of introduction

- Boat traffic
- Motor vehicle traffic
- Distance to known aquatic infestations

Risk of establishment

Habitat Suitability models for a suite of aquatic species

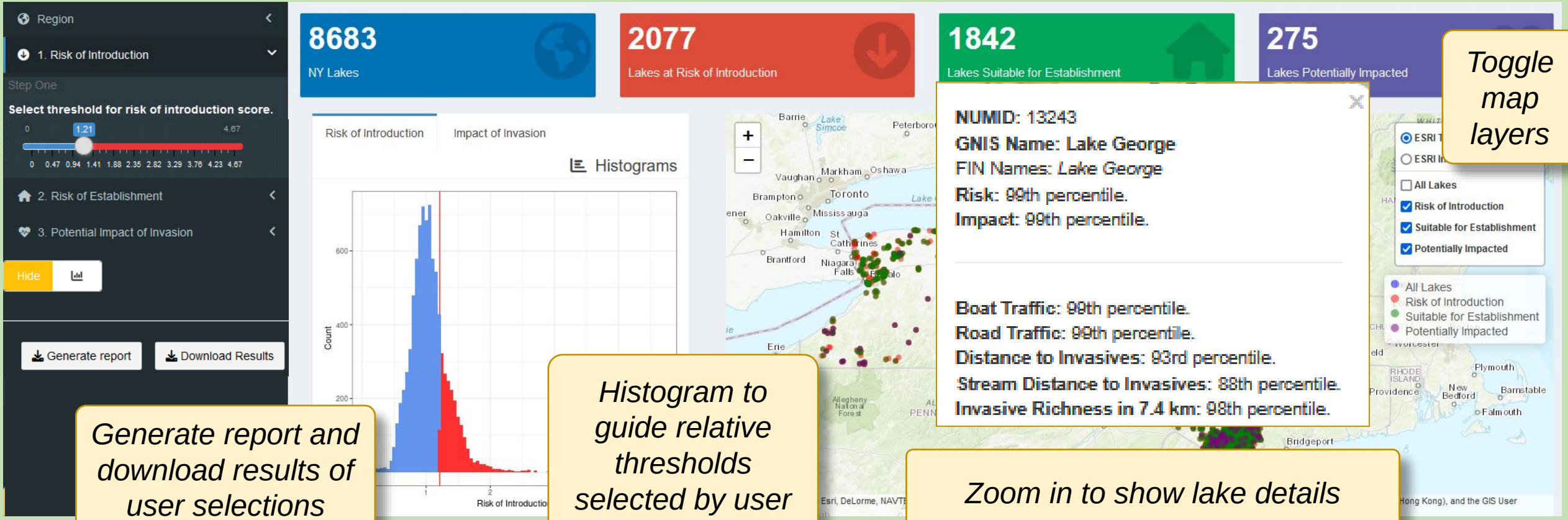
- Water Chestnut
- Hydrilla
- Eurasian Watermilfoil
- Starry Stonewort
- Northern Snakehead
- Rusty Crayfish
- Spiny Waterflea
- Zebra Mussel

Risk of negative impacts if invaded

- Rare species locations
- Fishing
- Landscape Condition Assessment
- Native fish richness
- Likelihood of Harmful Algal Blooms

Aquatic Invasive Species Pond and Lake Vulnerability Prioritization Tool for New York

Driven by user selections of risk thresholds:
Risk of Introduction → Risk of Establishment → Potential Impacts



Toggle map layers

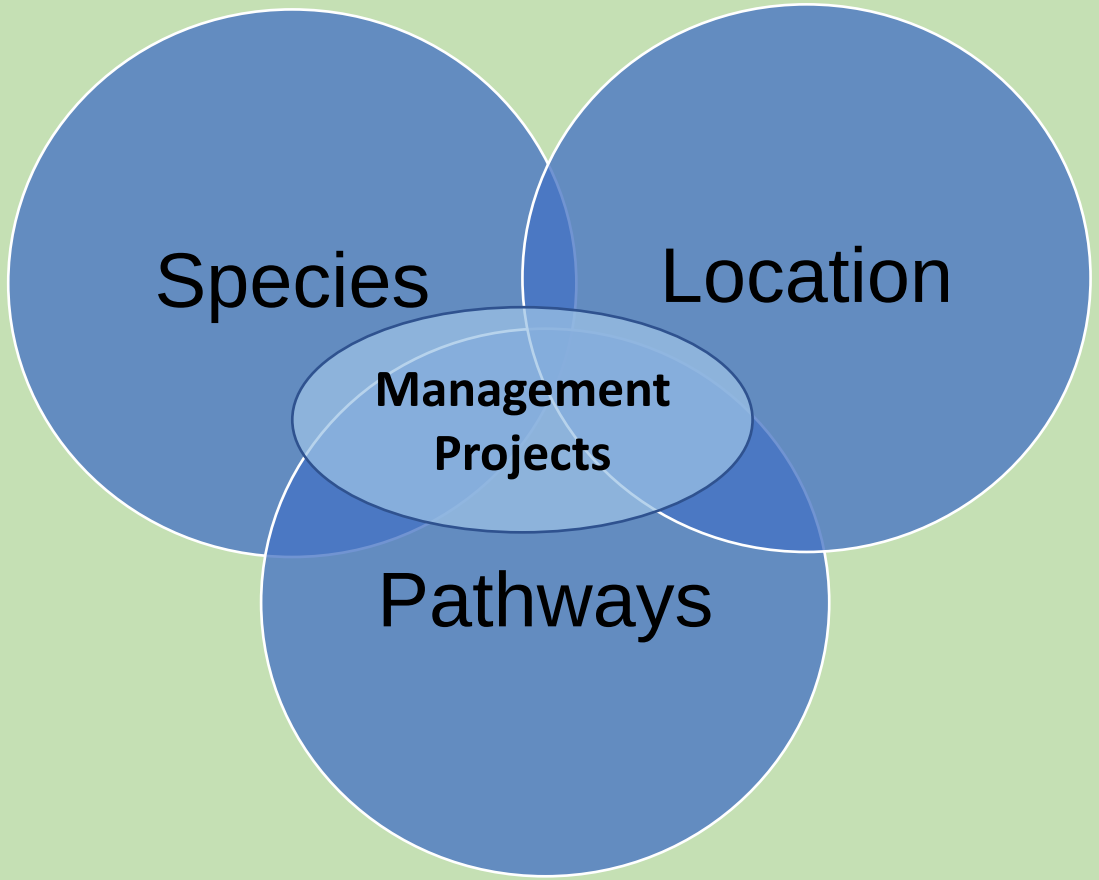
Generate report and download results of user selections

Histogram to guide relative thresholds selected by user

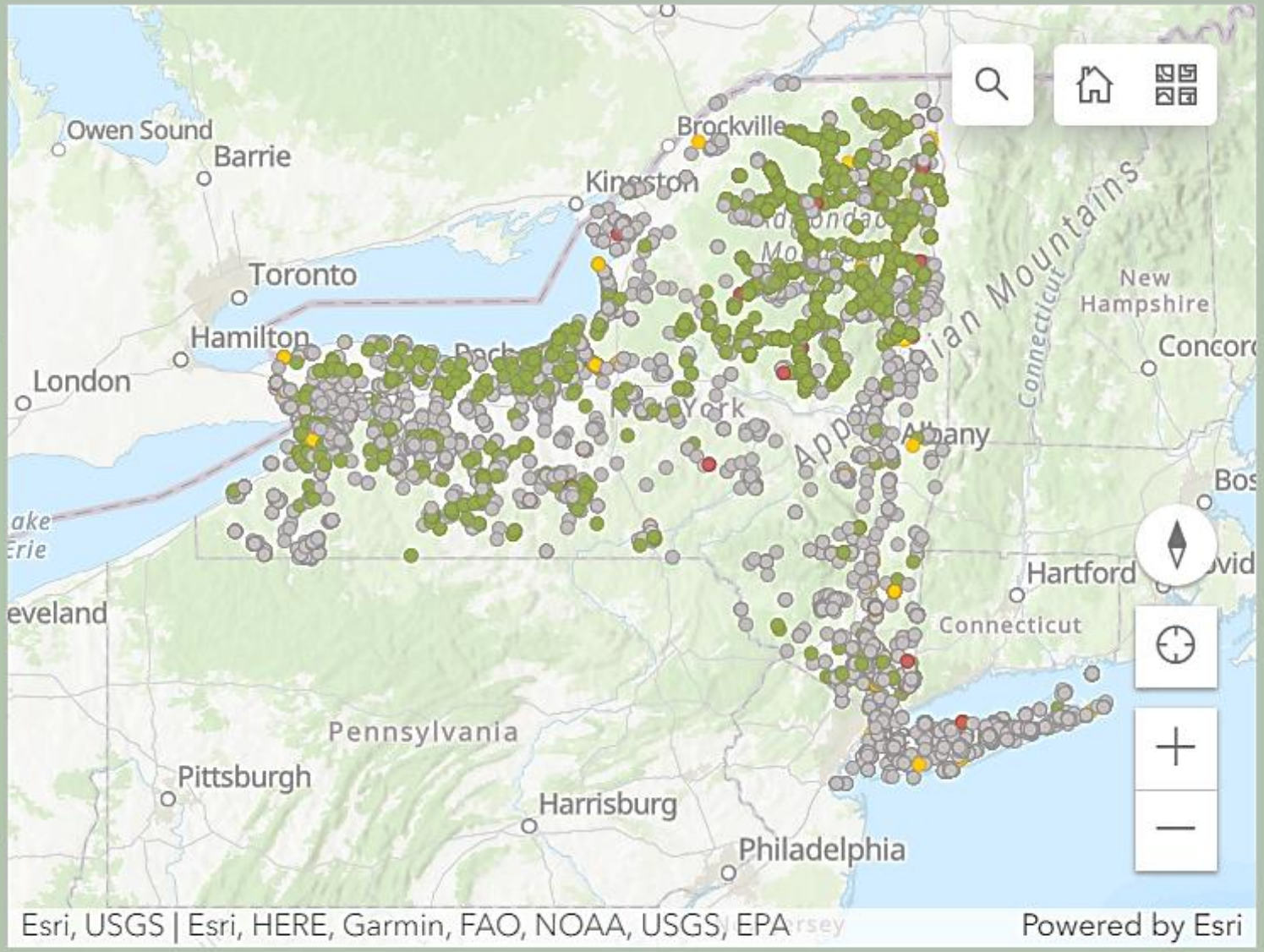
Zoom in to show lake details

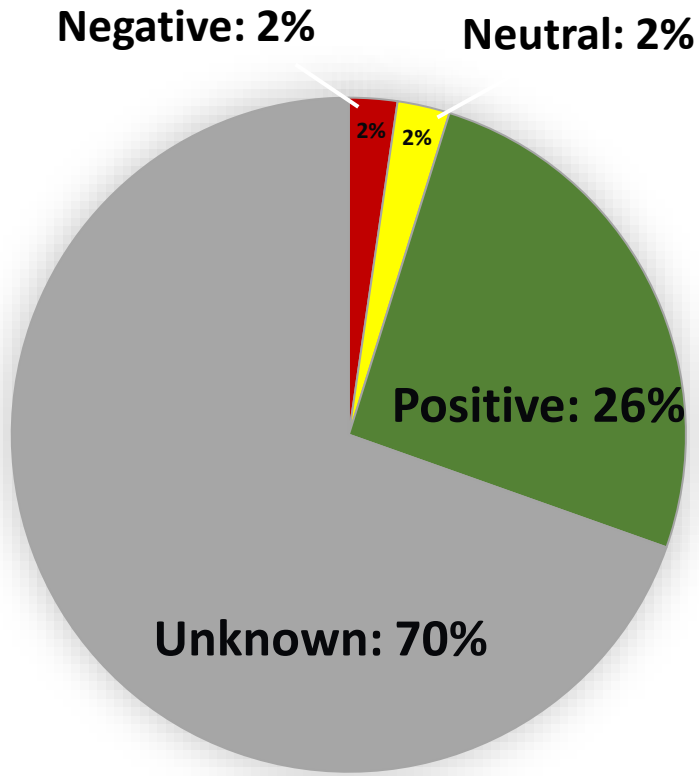
Agenda

- Viewing iMap data
- Species Tiers
- AIS Ponds & Lakes Prioritization
- **Management Outcomes**
- NYNHP Tools – rare species, etc.



NY iMapInvasives Management Outcomes Public Viewer





This map viewer displays an evaluation of treatment outcomes for management sites in NY State, based on changes in size and density of the

Target Invasive Species	Count of Sites
Heracleum mantegazzia…	1,507
Phragmites australis ssp.…	1,303

Tracking your efforts in iMapInvasives

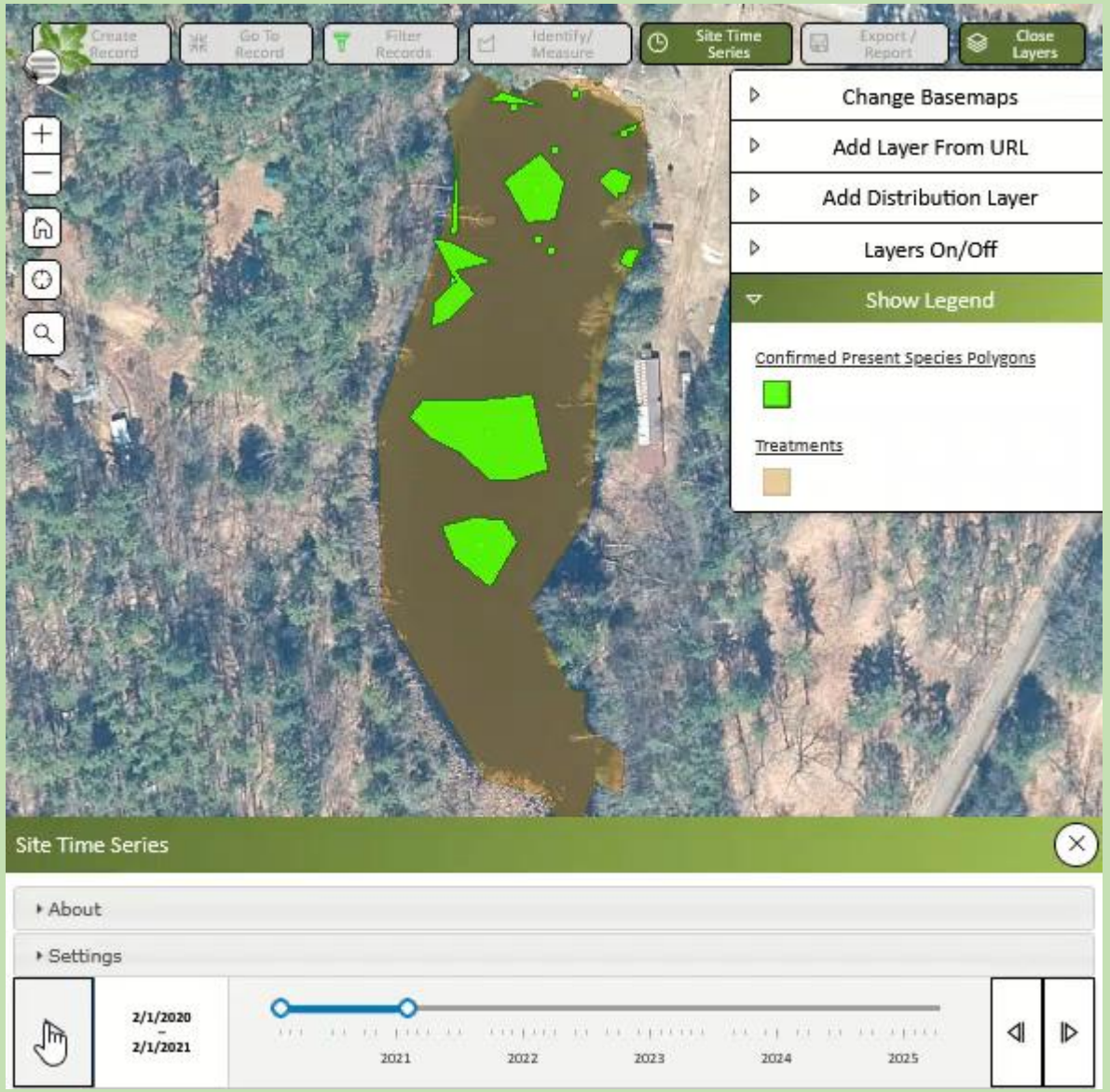
First steps: Submitting presence records.

- Up-to-date list of species known in your lake

Diving Deeper: Polygons and Treatments, year by year.

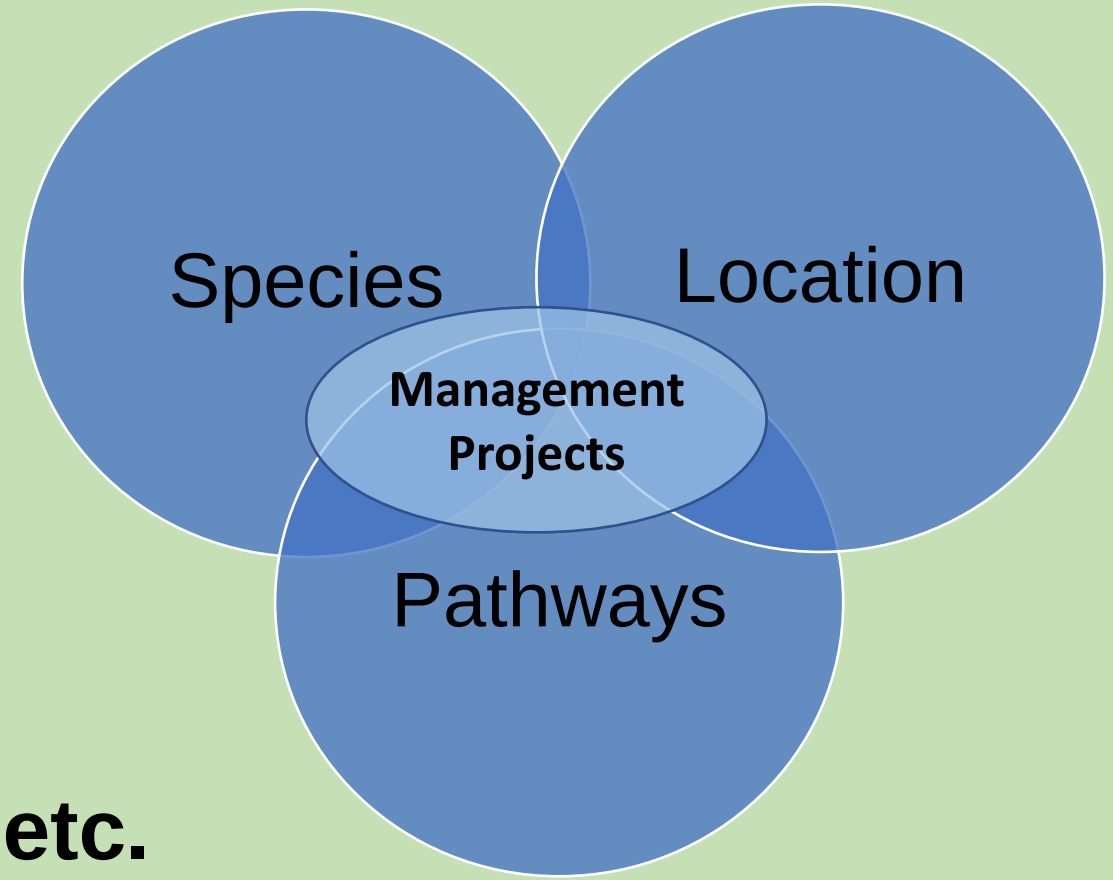
- Mapping abundance (size of patches, percent cover)
- Tracking treatments & presence each year to track change

More info at:
www.nyimapinvasives.org/report



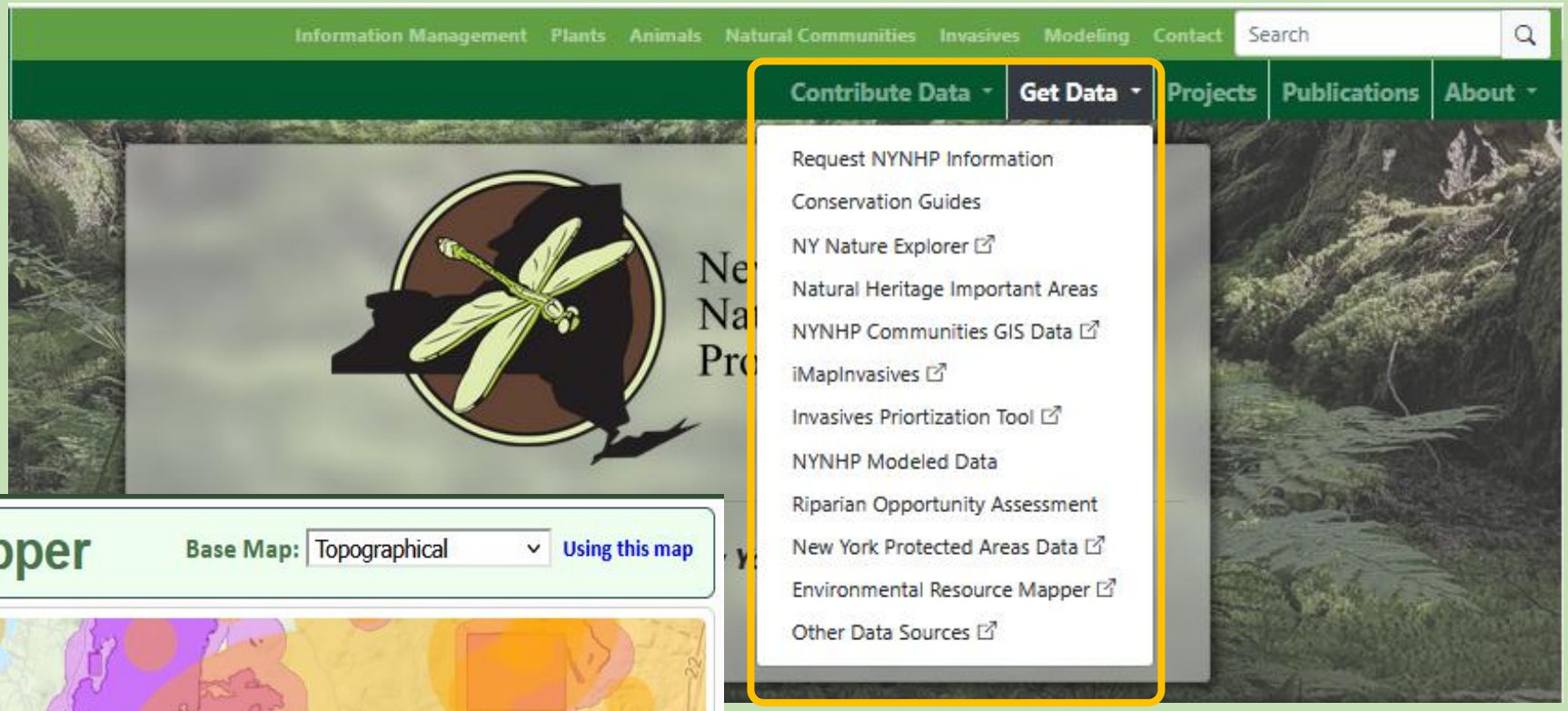
Agenda

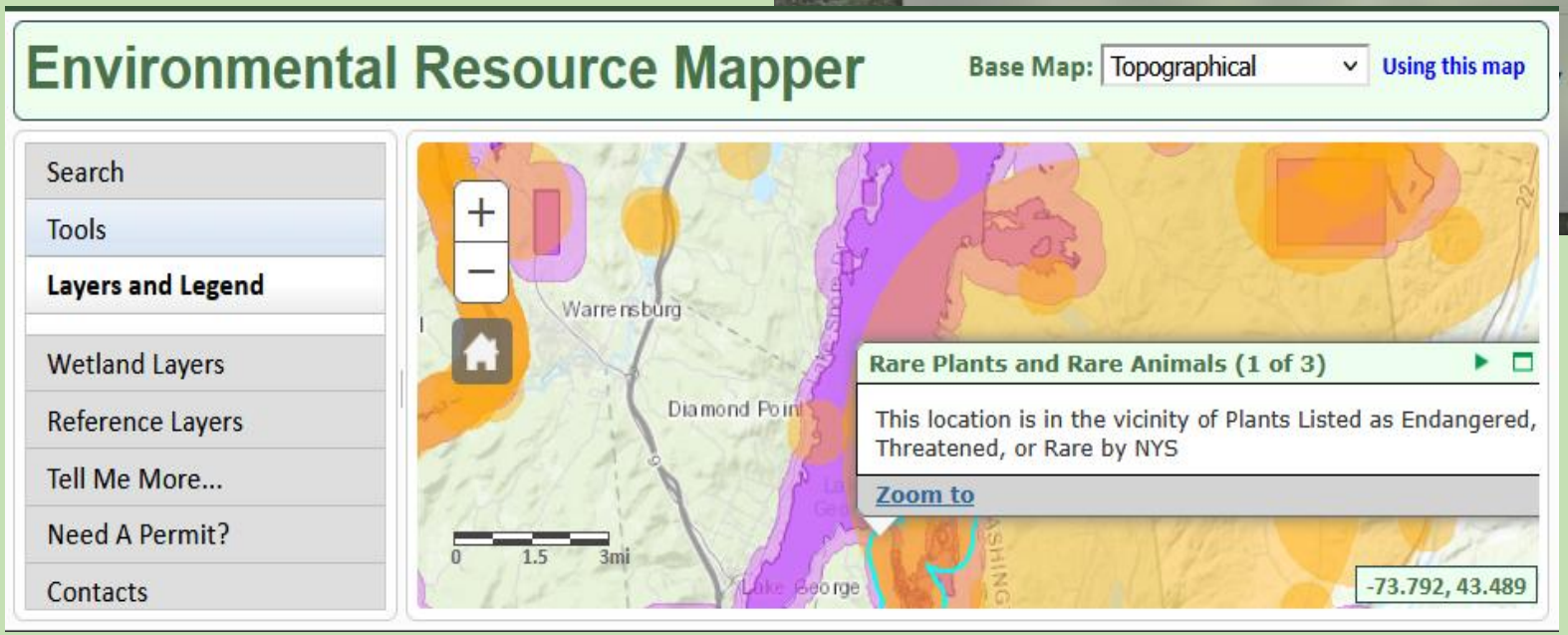
- Viewing iMap data
- Species Tiers
- AIS Ponds & Lakes Prioritization
- Management Outcomes
- **NYNHP Tools – rare species, etc.**



Natural Heritage Data Tools

nynhp.org



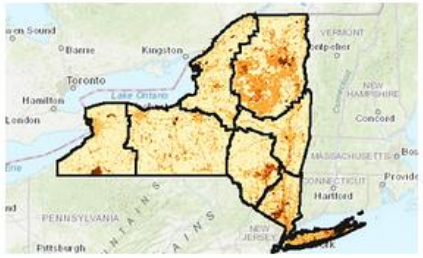


- Conservation guides
- NYNHP Communities GIS Data
- Invasives Prioritization Tool
- NYPAD
- Environmental Resource Mapper

Invasive Species Prioritization tools

Location

Where are invasive species likely to spread and have a high impact?



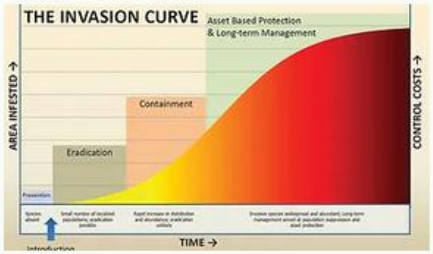
Terrestrial Spatial Prioritization

AIS Vulnerabilty Prioritization

NYNHP developed map models to help prioritize resources for early detection and invasive species control. The resulting map highlights areas with high ecological value and risk of invasive spread.

Species

Which species should management and survey efforts be focused on for each region?



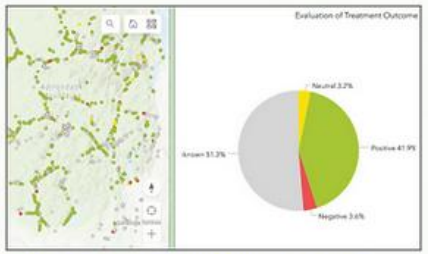
Species Tiers Table

Tiers Overview StoryMap

The invasive species tier lists use a standardized approach based on the invasion curve to categorize species with current data and expert input.

Project

How can we evaluate management outcomes for projects?



The **Management Outcomes Analysis** leverages iMapInvasives data to summarize and visualize outcomes of invasive species management.

INVASIVE PLANT MANAGEMENT
IPMDAT
DECISION ANALYSIS TOOL

iMapInvasives and the Nature Conservancy created **IPMDAT** to help managers determine if an invasive control project is likely to succeed and if it warrants investment of resources.

New York Natural Heritage Program

www.nyimapinvasives.org/data-and-maps

Any Questions?

Links and more info:

- ❖ Learn about / Log into iMap: nyimapinvasives.org
- ❖ Invasive Species Prioritization Tools: nyimapinvasives.org/prioritization
- ❖ iMap data collection tools: nyimapinvasives.org/report
- ❖ Heritage data & tools: www.nynhp.org→ “Get Data” Tab
- ❖ Contact: Mitchell.ONeill@dec.ny.gov

Acknowledgements

- Tim Howard & Amy Conley, NYNHP (spatial modeling and analysis).
- Advisory committees for these tools (PRISMs, DEC, Parks, etc.)
- Funded by the Environmental Protection Fund through NYSDEC

iMapInvasives

New York Natural Heritage Program

Thank you!