Keeping Forest Healthy

Capital Region Partnership for Regional Invasive Species Management

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NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

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INVASIVE SPECIES MANAGEMENT CAPITAL REGION

Program Goal

Identifying forest characteristics and practices to promote resilient and healthy ecosystems.

Our climate is changing in ways that humans have never experienced before, resulting in rising temperatures and shifts in seasonal precipitation patterns.

There are many actions that you can take to ensure that your forest is able to be resilient, healthy, and productive in the face of future changes.

Keeping Forest Healthy

A discussion on the resiliency, health, and productivity of a forest.

Potential risks and management options will be identified that may increase the ability of a forest to respond to changing conditions.

- Forest health characteristics to be explored:
  - ✓ Forest Diversity and Composition
  - ✓ Forest Structure
  - ✓ Regeneration
  - ✓ Climate Risks

Silvicultural practices include a variety of management techniques to benefit wildlife and regeneration.

- Thinning and harvesting create conditions that stimulate the growth of food sources for wildlife.
- Openings created by harvesting provide habitat for deer and a variety of songbirds.
- Thinning accelerates growth and development of older trees that are favored by owls and other species.

Regional Invasive Species & Climate Change Network Supports Native Plantings

Northeast RISCC MANAGEMENT NETWORK

What we know

- As climate warms, hundreds of new invasive plants are projected to expand into the Northeast (Allen & Bradley 2016).
- The majority (61%!) of invasive plants are still available for sale as ornamentals somewhere in the U.S. (Beaury et al. 2021).

NYNHP

Information Management | Plants | Animals | Natural Communities | Invasives | Modeling

Contribute Data | Get Data

New York State Invasive Species Tiers

Filters

Deselect All Filters

nynhp.org/invasives/species-tiers-table/

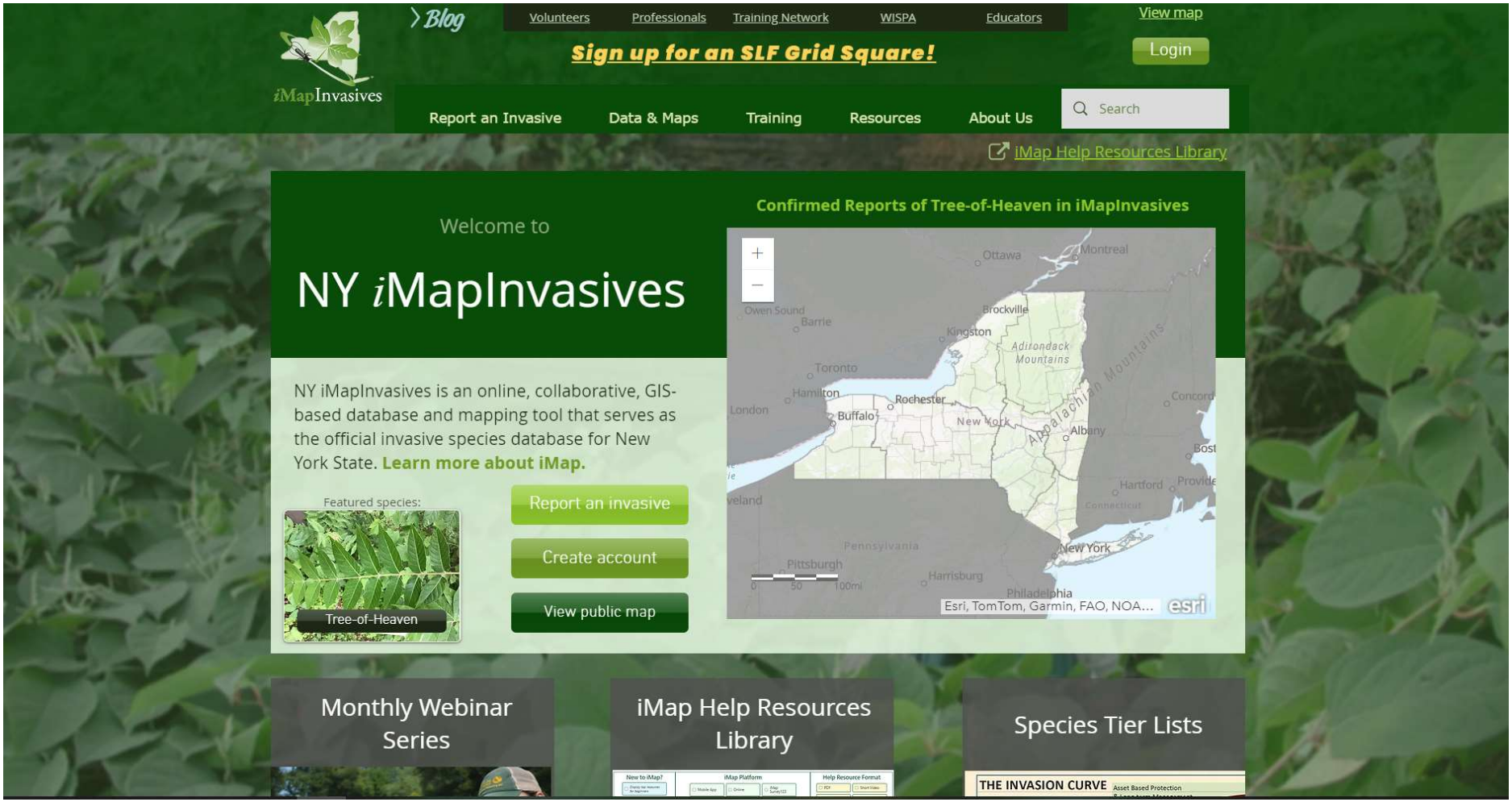
Geography ☑ Statewide ☑ APIPP ☑ CRP ☐ CRISP ☐ Finger Lakes ☐ Lower Hudson ☐ LIISMA ☐ SLELO ☐ WNY ☐ **Select All Geographies**

Taxa Type ☑ TP Terrestrial Plant ☐ TA Terrestrial Animal ☐ AA Aquatic Animal ☐ AP Aquatic Plant ☐ M Microorganism ☐ **Select All Taxa Types**

Tier Value ? ☑ 1 ☑ 2 ☑ 3 ☑ 4 ☑ 5 ☑ Untiered ☑ Buffer ☑ *(Blank)* ☑ **Select All Tier Values**

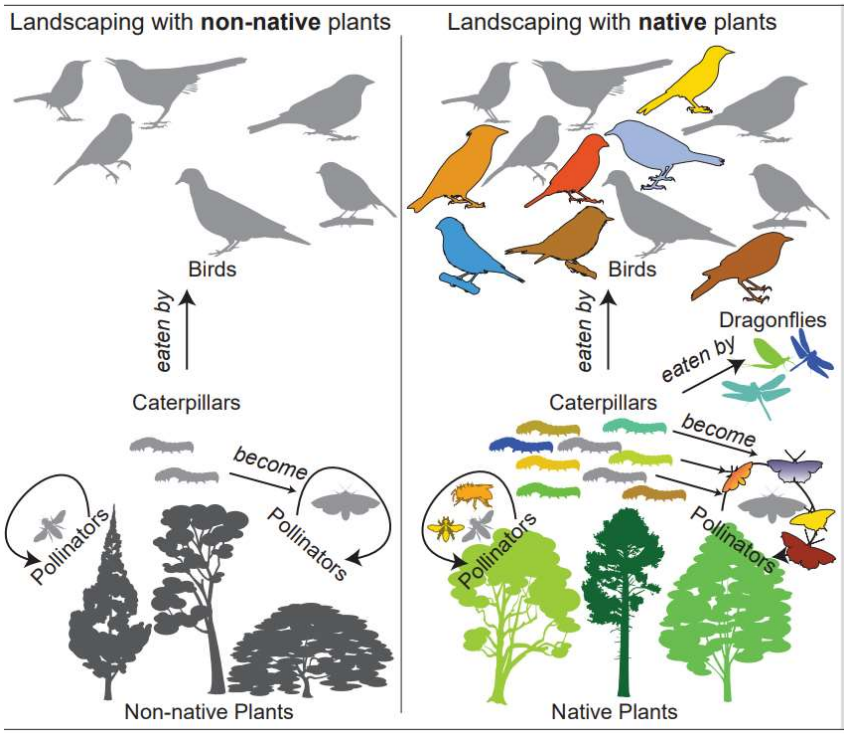
Show 10 entries Search Table:

Species Information			Invasiveness Ranks		State Tier	PRISM Tier	
Common Name	Scientific Name	Type	Ecological	Socio-Economic	NYS	APIPP	Capital Region
Knapweed (species unknown)	*Centaurea spp species unknown*	TP	Not assessed	Not assessed	*Untiered*	4	4
Knotweed (species unknown)	*Reynoutria spp*	TP	Not assessed	Not assessed	*Untiered*	4	4
Kousa dogwood	*Cornus kousa*	TP	Unknown	Insignificant Positive	*Untiered*	*Buffer*	*Untiered*
Kudzu	*Pueraria montana var lobata*	TP	Very High	Insignificant Negative	2	1a	2


iMapInvasives
Blog
Volunteers
Professionals
Training Network
WISPA
Educators
View map
Sign up for an SLF Grid Square!
Login
Report an Invasive
Data & Maps
Training
Resources
About Us
Search
iMap Help Resources Library
Welcome to
NY iMapInvasives
NY iMapInvasives is an online, collaborative, GIS-based database and mapping tool that serves as the official invasive species database for New York State. Learn more about iMap.
Featured species:
Tree-of-Heaven
Report an invasive
Create account
View public map
Confirmed Reports of Tree-of-Heaven in iMapInvasives
Ottawa
Montreal
Owen Sound
Barrie
Brockville
Kingston
Adirondack Mountains
Toronto
Hamilton
Rochester
London
Buffalo
New York
Albany
Hartford
Connecticut
Pennsylvania
Pittsburgh
Harrisburg
Philadelphia
New York
Esri, TomTom, Garmin, FAO, NOA...
esri
Monthly Webinar Series
iMap Help Resources Library
Species Tier Lists
THE INVASION CURVE

What we know

- Native plants support insects, which in turn support birds and other animals.



www.risccnetwork.org/resources

- Non-native trees like gingko, golden rain tree, and amur maackia
  - Support 5 caterpillar species
- Oak trees support pollinators
  - White Oak 495 caterpillars
  - 4000 different animal species
- A single breeding chickadees must catch 7500 caterpillars to rear offspring

Beech Leaf Disease

White Pine Needle Disease

Spotted Lantern Fly

Oak Wilt

Spongy Moth

HWA

Elm Zig Saw Fly

Stilt Grass

Southern Pine Beetle

Thank You New York State DEC Forest Health Diagnostic Lab Jessica Cancelliere

New York Climate Change and Tree Vulnerability

- Climate change is expected to lead to more extreme weather events, higher temperatures, and more frequent summer droughts, and annual flooding.
- Conditions will no longer support certain tree species.
- These changes will impact trees throughout New York
  - -resulting in more tree damage and mortality
  - -changes in local tree species composition
  - -lower survival of planted trees

Incorporating climate change adaptation into forest management goals

Adaptation is the process of a system adjusting to change.

- Promoting a forest's ability to adapt to climate change is the most important objective of climate-related goals.
  - healthy forests sequester and store the most carbon and are more likely to remain as forests.

Swanston et al 2018,

Goals promoting and integrating forest adaptation may fall into three main concepts

Resistance

- Goals and actions are geared towards preventing changes and disturbance.
  - Maintain relatively unchanged conditions.
  - Resistance could be considered when there is a desire to maintain a resource with high economic, cultural, or ecological value

(ex: refugia/relic species).

Resilience

- Goals and actions that allow for some changes within the forest ecosystem with management practices enhancing the ability of the forest to absorb disturbances and tolerate changing conditions.
  - Most effective in forests with species that are better adapted to expected future conditions.
  - Effective in the short term and may be best used to help facilitate a transition to new forest types and species compositions in the long-term.

Transition

- Goals and actions intentionally anticipate and facilitate changes within the forest ecosystem to help it adapt to changing and new conditions.
  - Transition actions may be the most appropriate in ecosystems assessed as highly vulnerable to climate change
  - Transition actions are typically designed for long-term effectiveness.

In summary

- Trees located in southern New York are expected to be more vulnerable to climate change, sooner than trees located further North.
- Trees located in coastal areas and flood zones are expected to be more vulnerable to climate change over the long-term

- Varieties and cultivars adapted to drier, hotter conditions are expected to be less vulnerable to climate change.
- Promote high tree diversity to increase resilience to stressors like high winds, drought, flooding, and invasive pests.
- Always select the right trees for the right place, where trees have the space they need to grow and all the soil, sun, moisture, and hardiness zone requirements they need to survive.

Most Vulnerable		
Shorter term		Over the long term
• American mountain ash • Balsam fir • Balsam poplar • Black ash • Black maple • Black spruce • Chokecherry • Downy Hawthorn • Eastern hemlock • Eastern white pine • European larch • Gray birch	• Jack pine • Japanese larch • Littleleaf linden • Mountain maple • Northern white cedar • Norway spruce • Paper birch • Pin cherry • Quaking aspen • Red spruce • Tamarack • White spruce	• Bigtooth aspen • Butternut • Red pine • Striped maple • Sugar maple • Yellow birch

Swanston et al 2018,

Moderate vulnerability		
Shorter term		Over the long term
• American basswood • American beech • Atlantic white cedar • Blue spruce • Crimean Linden • Cucumbertree • European beech • Horsechestnut • Japanese maple • Japanese pagoda tree • Japanese tree lilac	• London planetree • Pitch pine • Purpleleaf plum • Royal paulownia • Serviceberry • Sweet birch • Sycamore maple • White ash • Yellow poplar	• Austrian pine • Black cherry • Norway maple • Red maple • Silver linden

Swanston et al 2018,

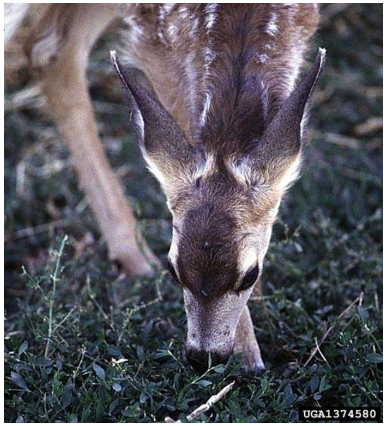
Least vulnerable	
Shorter term	Over the long term
• Cottonwood • Dawn redwood • Northern catalpa • Pignut hickory • Pin oak • Shagbark hickory • Silver maple • Virginia pine • White poplar • Willow oak	• American chestnut • American crabapple • American elm • American holly • American hornbeam • Baldcypress • Bitternut hickory • Black locust • Black walnut • Black willow • Black gum • Boxelder • Bur oak • Callery pear • Chestnut oak • Chinese elm • Kentucky coffeetree • Common fig • Common pear • Eastern hophornbeam • Eastern redbud • Eastern redcedar • Fastigiata oak • Flowering dogwood • Ginkgo • Goldenrain tree • Green ash • Hackberry • Washington hawthorn • Honeylocust • Japanese zelkova • Kwanzan cherry • Mockernut hickory • Northern red oak • Post oak • Red mulberry • River birch • Sassafras • Scarlett oak • Scrub oak • Shingle oak • Siberian elm • Slippery elm • Staghorn sumac • Swamp white oak • Sweetbay • Sweetgum • Sycamore • Tree-of-heaven • White mulberry • White oak

Swanston et al 2018,

Approach to conservation:

- Continue survey & monitoring
- Conserve genetic material
- Support efforts to identify and/or breed resistant trees
- Provide support for research/restoration
- Promoting regeneration
- Invasive species removal
- Protecting mast-producing alternatives

The Deer Problem:



Leopold 1924 Trophic Cascades

Top-down predators determine the health of an ecosystem

- Once removed pray species populations explode
- Resulting in overgrazing
- Kaibab Plateau 100,000 deer exceeded the carrying capacity

"I now suspect that just as a deer herd lives in mortal fear of its wolves," Leopold wrote, "so does a mountain live in mortal fear of its deer."

Whitetail Deer are Keystone Herbivores

- Deer have disproportionately large impacts on biodiversity and forest dynamics
- Retrogressive succession when a forest reverts to scrubland.
  - Tree seedlings and native herbaceous plants are not repopulating the forest in some cases

Deer tend to not Brows Invasive Plants

- Invasive plants are often the symptom and not the cause, of forest health degradation."
- Enclosure studies show that native plants like Spotted Touch Me Not when protected from deer browsing can out compete invasive plants like Garlic Mustard and Japanese Stiltgrass.

White-tailed Deer in Northeastern Forests: Understanding and Assessing Impacts" U.S. Department of Agriculture November 2014.

- Temporal changes in ecological communities lead to simpler states
- Compounded by the introduction of invasive species