In These Woods

Issue Seven: 2023

Cornell Cooperative Extension
Columbia and Greene Counties

Invasive **Species**

Cornell Cooperative Extension offices across the Catskills region offer free information and invasive species identification services. If you find a species that you suspect could be invasive, please send a clear photo with your contact information to columbiagreene@cornell.edu or your local extension office.

Staff also provide evidence-based resources and knowledge to help you with your management effort. We encourage everyone to report what they see, no matter how common it might be, on the iMapInvasives online mapping tool. More information on this below.

2023 Issues:

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Issue 3 - Woodland Enhancements

Issue 4 - Wildlife & Recreation

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About Us

The mission of Cooperative Extension is to enable people to improve their lives and communities through partnerships that put experience and research knowledge to work. Extension staff and trained volunteers deliver education programs, conduct applied research, and encourage community collaborations. Our educators connect people with the information they need on topics such as commercial and consumer agriculture; nutrition and health; youth and families; finances; energy efficiency; economic and community development; and sustainable natural resources. Our ability to match university resources with community needs helps us play a vital role in the lives of individuals, families, businesses, and communities in our region.

You can learn more about the programs and services we provide on our website. You can also contact us directly to help overcome a challange, share stories and gather tools to help you achieve your goals. Below is the contact information for our two offices. We look forward to hearing from you.

Acra (Greene County)

Agroforestry Resource Center
6055 Route 23
Acra, New York 12405
(518) 622-9820

Hudson (Columbia County)

Extension Education Center
479 Route 66
Hudson, New York 12534
(518) 828-3346

In These Woods Woodland Stewardship Series is a collaboration among Cornell Cooperative Extension of Columbia & Greene Counties, New York City DEP, USDA Forest Service, and the Watershed Agricultural Council's Forestry Program

Cover photo by Hans Isaacson. National Association of State Foresters. Hemlock Woolly Adelgid. 2021

CCE Columbia & Greene's

Agroforestry Resource Center

Cornell Cooperative Extension's Agroforestry Resource Center (ARC) was established in 2003 to help sustain the vast, privately-held forest resources in the Hudson Valley, Catskill Mountains and surrounding region. It is home to the Agriculture and Natural Resources team who focus on regional education and outreach in all woodland and working landscape subject areas.

Agroforestry is defined as the combination of agriculture and forestry practices that create integrated, productive and sustainable land-use systems. These practices can include ginseng, mushrooms, maple and other high-value products.

Through a variety of programs and partnerships, CCE offers land stewards economically viable and ecologically sustainable practices to help preserve and manage woodlands. The ARC includes a diverse and talented group of natural resource educators, an interactive indoor space and a 142-acre model forest that supports an outdoor "laboratory" for demonstration, research and hands-on workshops.

To learn more about the Agroforestry Resource Center, visit:
Agroforestry Resource Center

Siuslaw Model Forest

Siuslaw (Sy-use-luh) Model Forest is our 142-acre living classrom. It's one of our greatest educational resources and sits right across the street from the Agroforestry Resource Center in Acra. Our Natural Resources team and its partners manage this diverse property for all to experience. It's home to innovative demonstration sites, habitat, trails, and real-world examples of woodland stewardship principles and best management practices.

Siuslaw as a Model

In 2007, Siuslaw was designated a NYC Department of Environmental Protection Model Forest. Siuslaw is one of four model forests in the region that all demonstrate the importance of sustainable land stewardship, forest health and water quality protection through education.

Today, Cornell Cooperative Extension hosts many public education programs in the forest and partners with researchers, ecological monitors, and other institutions and organizations like SUNY ESF and the Watershed Agricultural Council's Forestry Program to bring these resources to the community.

The Siuslaw Model Forest is open to the public during our regular business hours (8:30-4:00 Mon-Fri). There are miles of trails for non-motorized recreation and many interpretive signs that educate around best management practices and activities you can bring home to your woods.

Agroforestry

Check out our tree and understory crop demonstrations, along with the shiitake and oyster mushroom laying yard - great inspiration for your backyard or small commerical operation.

Timber Stand Improvement (TSI)

See the different stages of growth and practices employed to restore habitat or thin dense stands of trees to encourage healthy forest conditions.

Best Management Practices (BMP)

Walk the woods roads and learn about open topped culverts, broad based dips, water bars and other techniques for preventing erosion and protecting water.

Enhancements

There are bird nesting boxes, pollinator houses, American chestnut restoration planting, habitat thinnings and plenty of tree identification markers to keep you learning!

Introduction to Invasive Species

Organisms have adapted with the conditions and characterists of their habitat. Both simple and highly complex life evolved alongside each other creating a natural balance. All species native to a habitat play an important role in keeping that ecosystem healthy, often through predator/prey dynamics or symbiotic relationships.

Under natural conditions, habitats are usually slow to change. Species migration, extinction of old and emergence of new take time. Human evolution had a way of speeding up that process through utilization of their surrounding natural resoruces and travlling with those species. A classic example is European settlers in North America came with familiar seeds to ensure a food source in the 'new world'. The dandelion is infamous for its arrival in this way. The species took off and as many homeowners with lawns are aware, it still thrives.

Spotted Lanterfly. Pennsylvania Dept. of Agriculture.

Native referes to species characteristic of the ecosystem. They're naturally occuring and have continually shaped and adapted to that place. Species like a Sugar Maple or a Trillium wild flower are native to the Catskills.

Non-native species did not evolve in the place they are located but generally do not cause harm to that ecosystem. Dandelions fit this description- some may not enjoy them or want them in our landscape, but they are here and do not impact us in a hugely negative way.

An invasive species can be a plant, animal or other organism that cause ecological or economic harm. Humans are the primary mode of introduction, whether intentional like the dandelion or by accident like a bug on a shipping crate (i.e. Emerald Ash Borer).

The ecological harm can occur in different ways, some of which happens over time and some are immediately apparent.

Invasives can outcompete surrounding organisms, resulting in a reduction of the natives that play important roles in the ecosystem. This type of interaction occurs slowly and might not be noticeable at first. Multiflora rose fits this bill- its leaves emerge earlier in the spring and remain later in the fall when compared to the natives surrounding it. This allow the plant to outcompete others such as our native roses or forest understory plants.

Other ecological impacts may be more extreme, resulting in death of the impacted natives- such as the way Emerald Ash Borer quick kills our native Ash trees. Both of these examples have economic impacts as well. The multiflora rose can reduce the amount of native tree regeneration in the forest understory allowing less timber to grow there for future harvests and emerald ash borer kills the ash trees that we have used for baseball bats or basket making.

With global trade and travel, the movement of species has been expedited. We all have the potential to play a role in this movement therefore we all have a responsibility to try to minimize it. Becoming familiar with these terms and the species that fall under each category is a great first step. As woodland owners, we can then take responsibility for our own corner of the world with simple observation as a start. Read on to learn the ins and outs of invasives, discover which species to focus on and find resources that can help in your journey of stewardship.

Managing Invasive Species: The Invasion Process

U.S. Fish & Wildlife Service

Some scientists view the invasion process in three phrases (1, 2). This process is presented conceptually below and may not apply to all invasive plant species in all environments. Not all nonnative plants become invasive. Many that are accidentally or intentionally introduced do not survive in the new environment, and of the ones that do survive, few become invasive.

Introduction Phase

The number of invading plants in an area is small during the introduction phase and may not be detected by managers. Plant numbers may not increase for a long time. This period is referred to as the "lag time."

Environmental factors play an important role in whether or not the invading plants survive and become established. A plant community with more resources such as nutrients, water, and sunlight will provide a more suitable habitat for new plants than an area where resources are limited.

Colinization Phase

After the introduction phase and a lag time, an explosive period of expansion may occur. During the colonization phase, the invading plants are more easily detected by managers.

Expansion during this phase is thought to be more the result of plant species' biological traits (such as the ability to propagate vegetatively or grow rapidly) than environmental factors.

Naturalization Phase

When an invading plant species establishes a new self-perpetuating population and is integrated into the plant community, it is considered "naturalized." During this phase, expansion has slowed and the population is relatively stable.

Environmental factors, such as a decrease in resources, may contribute to slowing down the expansion. If resources are made available by changes in the environment, such as land-use activities that alter an adjacent native plant community, the population may continue to expand.

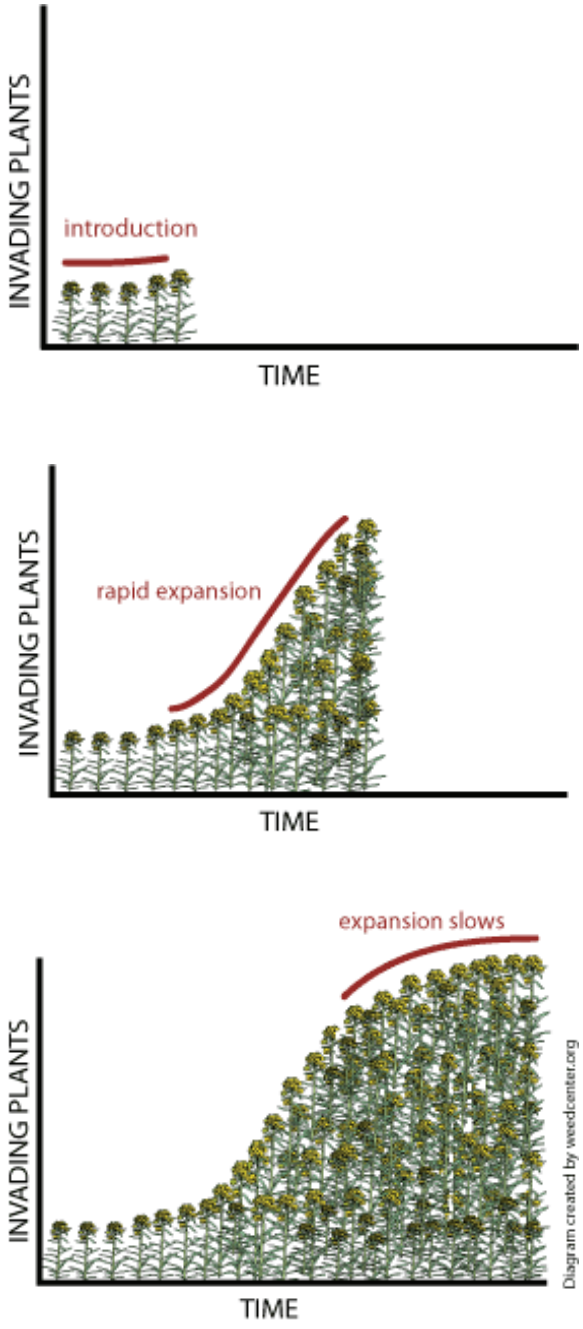


Diagram of the three phases of the invasion process showing the change in the number of invading plants over time (Adapted from 1).

Applying Management To The Invasion Process

US Fish & Wildlife Continued

Understanding which phase in the invasion process a plant population is in provides information that is helpful for developing management strategies.

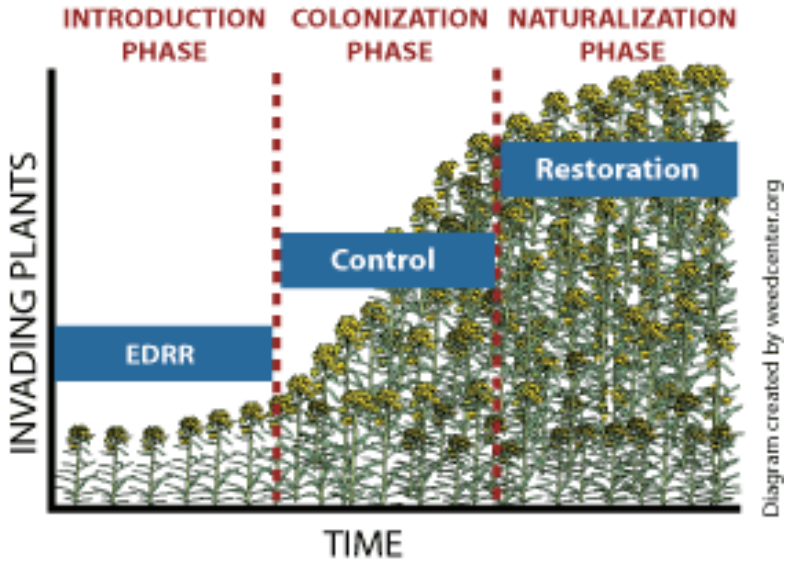


Diagram showing management strategies most useful for the phases of the invasion process (Adapted from 2, 3).

Prevention	Early Detection Rapid Response	Control	Restoration
Preventing an invading plant species from moving into a new area is the most effective form of management.	Many invading plant species have a long lag time following their introduction. Early detection and rapid response (EDRR) is key to eradicating the plants before their population expands.	Once a population has reached the colonization phase, it is very difficult to eradicate. Management efforts should focus on controlling and containing the expanding population before it becomes naturalized.	Naturalized populations are often too widespread and difficult to manage. Restoration may be considered for high value areas that are relatively small.

References

1. Cousens R, Mortimer M. 1995. Dynamics of Weed Populations. New York (NY): Cambridge University Press. 332 p.
2. Radosevich S. Online textbook chapter 2: Plant population biology and the invasion process. Center for Invasive Plant Management. <http://www.weedcenter.org/textbook/>. Accessed 2007 May 30.
3. Hobbs RJ, Humphries SE. 1995. An integrated approach to the ecology and management of plant invasions. Conservation Biology 9(4): 761-770.

Management in Your Woods

The Early Detection & Rapid Response (EDRR) approach used by professionals can be a great system for your own management. By using this framework, you can prioritize time and resources to address concerns that ultimately support larger-scale forest health goals.

Prevention:

Limit the introduction of invasive species into your landscape. This includes making informed decisions when transporting, planting, transplanting or disposing material. Woodland owners can also create their own "safety measures" for equipment and visitors. A longer-term goal can include working with a forester to improve forest health and resilience to limit the impact of invasive species.

Asian Long-horned Beetle. Photo by Michael Bohne, bugwood.org.

Early Detection & Rapid Response:

Limit spread and impact. Monitor your forest and keeping up to date on the status of existing and potential invasive species in your region will help minimize the impact if they are introduced.. Timing is everything when it comes to a new species showing up or existing species starting to spread into your woods. Swift action in reporting and arranging treatment will help limit that near and long-term pressure.

Oak Wilt on symptomatic Red Oak leaf. Division of Lands and Forests' Forest Health Imaging Lab

Eradication or Containment:

Eradication or limiting an invasive impact is the primary objective after establishment. Treating invasives safely and effectively on your own or with the help of professionals is the best way to limit long-term impact. Management can also include improving forest health through species selection and building resilience. Contact your forester or organization dedicated to sustainable stewardship (see all previous issues to learn more about state programs, organizations, forest associations and how to find a forester)

Asian jumping Worm. Image by Wisconsin Department of Natural Resources

Local Control

When an invasice species is fully established across a region, little can be done on a large or coordinated scale. Focusing on your woods, or contiguous acreage with cooperating neighbors, is sometimes the only

Hemlock Woolly Adelgid. Image by CT Ag. Experiment Station Archive, Bugwood.org

Early Detection and Rapid Response

Preventing invasive species introduction is the best way to solve a problem before it starts. Unfortauntely, that's not always effective or possible. Some larger-scale prevention strategies include import-export regulations, state control efforts and regulatory actions such as limiting firewood movement and sale of certain species. In your woods, it can include cleaning boots and equipment before entering or exiting, limiting organic matter movement, and keeping a close eye on your woods for new species.

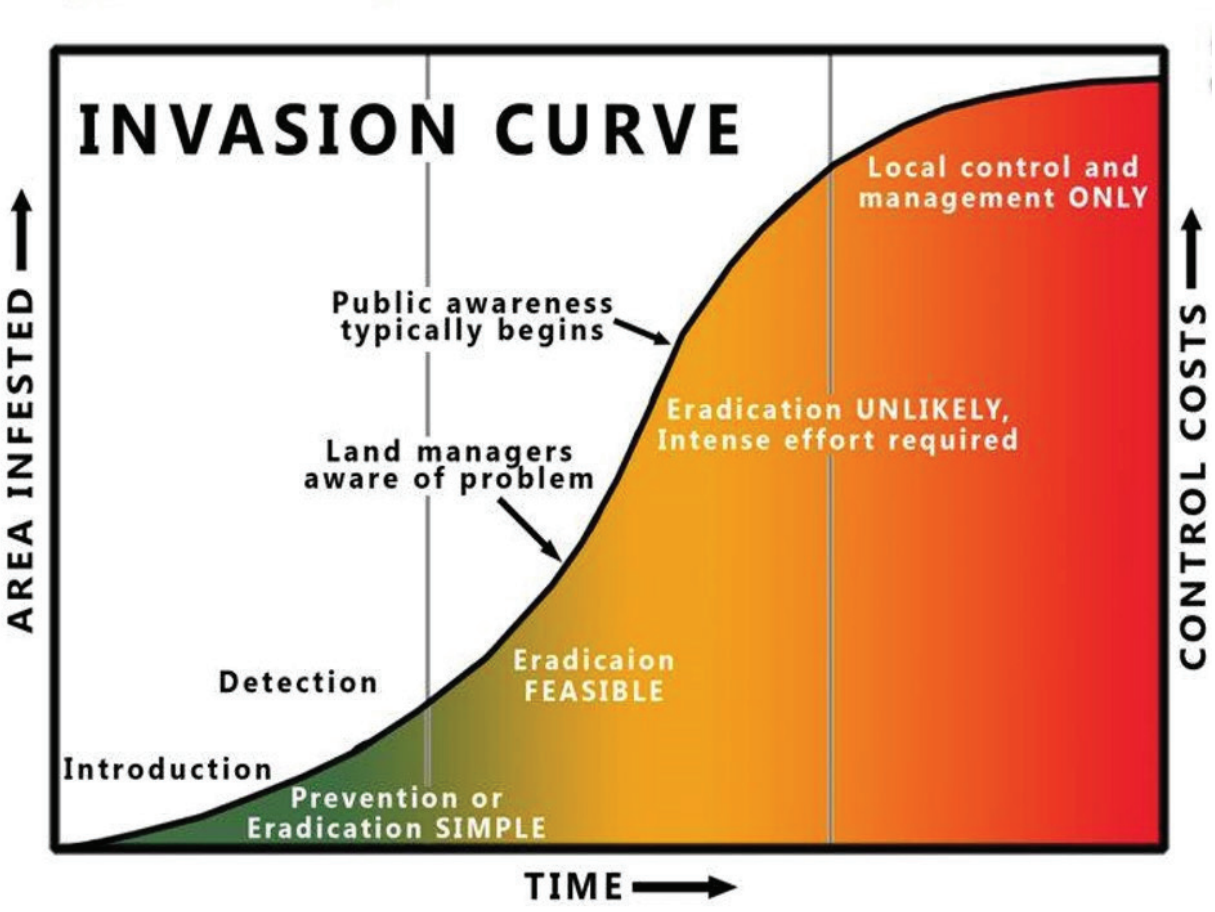
When species prevention fails, the next best option is to identify and eradicate new invasives before they establish. Research shows that an early detection and rapid response system (EDRR) is our best tool and most cost effective stategy against invasive species impacts.

Early detection and rapid response increase the likelihood that invasive populations will be found, contained, and eradicated. When administered effectively, EDRR can:

- Slow the establishment and expansion of newly introduced species
- Prevent, decrease or delay the economic impact felt locally and regionally
- Decrease cost and dedicated resources required long-term control and restoration
- Limit ecological harm to native and non-native/non-invasive landscapes.

The Invasion Curve:

How the population growth patterns of invasive species impacts and shapes management outcomes over time. EDRR systems primarily focuse on introduction through early containment.



Reporting Invasive Species

To effectively detect and respond to invasive populations, natural resource professionals need to know two main things: The first is "what" to look for and the second is "where" to look. This requires a deep understanding of existing populations and possible new threats. It also requires a dedicated effort from the general public.

Woodland owners and stewards play a particularly important role in EDRR. New York State woodlands are 63% privately owned. That's over 14 million acres. That doesn't include the nearly 5 million acres of publically owned woods, agricultrual lands, coasts, or urban and suburban landscapes. Governments, organizations and institutions cannot possibly monitor that much land and so must rely on sightings from those on the ground.

iMapInvasives

In 2007, the New York Natural Heritage Program (partnership between NYS DEC and SUNY ESF) started working with their Florida counterpart to find an efficient and effective way to gather and share invasive species data. Through strong partnerships with organizations like The Nature Conservancy, they created a tool called iMapInvasives.

The iMapInvasives app and online tool is a free GIS-based data management system that allows anyone to identify, report and pinpoint the location of any invasive species. These sightings help PRISM staff and professionals locate and prioritize resources toward the detection and subsequent management of new invasive species. This tool also helps us understand the extent to which an existing species has spread. Email alerts and regular reporting allows for a real-time snap-shot of invasive species status. However, this resource is only as valuable as our collective commitment to using it. Without stewards monitoring and reporting their findings, the presence of an invasive species may not be known.

Follow the link to learn more about the program and how you can report. You'll find trainings and instructions to create your own account and start sharing what you see in your woods! https://www.nyimapinvasives.org/

Controlling Invasive Species in Woodlots

Cornell University Cooperative Extension & New York State Department of Environmental Conservation

It is often difficult for landowners to cultivate desirable plant species on their property. An even more frustrating task is keeping unwanted plants at bay. In recent years, exasperated landowners have struggled with invasive plants on their property, with varying results. This fact sheet describes how plants can become invasive and provides control tips for landowners.

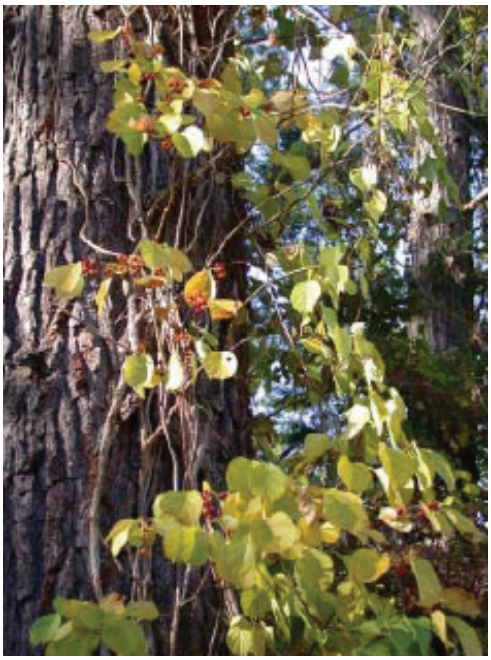
'Exotic', 'alien', introduced', and 'non-native' are terms used to describe plants that have established themselves in locations outside their known historical ranges. Most plant introductions are done so intentionally - either as ornamentals, crops, or because they are thought to improve wildlife habitat or assist with erosion control. Many non-natives such as ox-eye daisy (Chrysanthemum leucanthemum) and bachelor's button (Centaurea cyanus) are so widely naturalized (self-sown) in certain areas of the country that many people assume they are native. Most non-native species are not harmful, and many are considered beneficial. As a matter of fact, the large majority of our agricultural plants are not native!

Some introduced species are extremely aggressive in their growth habits and can overtake desirable species, causing significant damage to the ecosystem. These are what we call 'invasive' plants. Invasive, non-native plants typically have several characteristics that help them thrive in their new areas. They may:

- Grow Fast
- Mature Quickly
- Produce Seeds, a high percentage of which will germinate
- Spread vegetatively through roots, etc, as well as through seeds
- Cost a lot (time & money) to control
- Are unaffected by native pests and diseases

As invasives occupy an area they form dense single-species stands of growth, limiting the availability of light, water, nutrients, and space to desirable native plants. In doing so, they can alter hydrology and soil composition. Some even hybridize with native species resulting in unnatural changes to the gene pool. Others may harbor pathogens that affect the native species.

Tree of Heaven is a prolific seed producer, grows rapidly, and can overrun native vegetation



Oriental bittersweet is an aggressive plant that grows over other vegetation at all levels in the forest

Top: Multi-flora Rose
Bottom: Buckthorn

What can landowners do to combat invasive plants?

Learn what plants are already known to be a problem in your area, and avoid planting them. Some, such as purple loosestrife (Lythrum salicaria), are still available as landscape plants and are sold or promoted in nurseries. It is best to err on the side of caution - if you have any doubts about a certain type of vegetation, don't plant it!!

Consider planting native trees and shrubs. Native plants occur naturally in the region in which they evolved. In the United States, native plants are usually defined as those plants that have been present since the time of European contact. Because native plants have evolved and adapted to local conditions, they are vigorous and hardy and able to survive winter cold and summer heat. Once established, they require little or no irrigation or fertilization, thereby saving you energy and water.

Trees, Shrubs and Vines:

• The simplest method to remove woody plants is to cut them down. Once may be enough, but most will sucker from the stump or roots, even those that generally do not reproduce vegetatively. Check for suckering every year, if not more often.

• Dig up stumps/roots.

• Do not plant invasive plants near woodland areas, and resist the urge to buy the many invasives that are still available in the nursery trade.

• Herbicides or a combination of cutting and herbicides is an option. Some of the most effective herbicides for controlling invasive species must be applied by a licensed pesticide applicator. Call your local Cornell Cooperative Extension office for recommendations.

Photo: Autumn Olive

Native plants also provide food and shelter for birds, butterflies, and other desirable wildlife. However, even some native plants can be quite aggressive so be sure you understand the growth habits of any native plants you decide to use on your property.

Vigor and hardiness are characteristics native plants share with invasive plants, so be sure you understand the growth habits of any native plants you decide to use in your woodland – some are quite aggressive!

If you currently have invasive plant species growing on your land, recommendations for control are listed below. Whichever method you decide to use, realize that controlling invasives is an uphill challenge and requires patience and persistence.

Forbs:

Annuals:

• Pull by hand or apply herbicide before they seed.
• Repeat every year until the seed bank in the soil has been exhausted.

Perennials:

• Pull by hand repeatedly throughout the growing season; many will resprout from the roots.
• Dig out roots if you can get to them. Repeated pulling will diminish the carbohydrate supply in the roots over time.
• Smother with non-permeable plastic. Cover area in early spring and leave for two or more seasons.
• Some herbicides can be used, contact CCE for a list.
• Continue control methods until seed bank in the soil has been exhausted.

Photo: Garlic Mustard

Common Woodland Invasive Plants in New York:

Name	Habitat	Spread	Control
Trees			
Norway Maple *Acer platanoides*	Forest Edge. Fencerows Full Sun to Full Shade	By Seed (wind)	Avoid planting near woodlands
Tree of Heaven *Ailanthus altissima*	Forest Edge and Gaps, Disturbed areas, Zone 5 and warmer	By Seed and Root suckers.	Avoid planting near woodlands; hand-pull or dig up
White Poplar *Populus alba*	Full sun, Forest Edges, Wetland Edges	Root Suckers	Avoid planting near woodlands;
Black Locust *Robina pseduoacacia*	Forest Edge and Interior, Full Sun to Full Shade, Disturbed Sites	Root Suckers (primarily) and Seed	Avoid planting. Dig up seedlings or apply herbicide
Shrubs			
Barberry *Berberis thunbergii, vulgaris*	Forest Interior and Edge, Full Sun to Full Shade	By Seed (birds)	Cut Down/ Dig up or apply herbicide
Autumn Olive *Elaeagnus umbellata*	Open areas, Forest Edge	By Seed (birds)	Avoid planting in woodlands; Cut Down/ Dig Up
Burning Bush *Euonymus alatus*	Full Sun to Full Shade	By Seed (birds) and Root Suckers (form thickets)	Avoid planting in woodlands. Cut Down/ Dig up; herbicide
Privet *Ligustrum obtusifolium*	Full Sun to Full Shade, Forest Edge and Interior	By Seed (birds)	Avoid planting; Cut Down/ Dig up; herbicide
Honeysuckle *Lonicera tatarica, maackii, morrowii*	Full Sun to Full Shade, Forest Edge and Interior	By Seed (birds) Stump Sprouts	Cut Down/ Dig up; herbicide
Buckthorn *Rhamnus cathartica, frangula*	Full Sun to Full Shade, Upland and Wetland	By Seed (birds)	Same as above
Multiflora Rose *Rosa multiflora*	Full Sun to Full Shade	By Seed (birds)	Same as above
Vines			
Porcelain Berry *Ampelopsis Brevipedunculata*	Full to Partial Sun, Forest Edge and Gaps	By Seed (birds, mammals), Stems and Roots.	Hand-pull; herbicide
Oriental Bittersweet *Celastrus orbiculatus*	Full Sun to Partial Shade Forest Edge and Gaps	By Seed (birds, humans)	Hand-pull; herbicide
Japanese Honeysuckle *Lonicera japonica*	Full Sun to Full Shade Forest Edge	By Seed (birds)	Hand-pull; herbicide
Forbs			
Garlic Mustard *Alliaria petiolata*	Full Sun to Full Shade Disturbed Soils, Biennial	By Seed	Hand-pull
Purple Loosestrife *Lythrum salicaria*	Full Sun to Partial Shade, Wetland and Upland Sites, Perennial	By Seed, Underground Stems	Hand-pull; *Galerucella pusilla and calmariensis* leaf-eating beetles
Japanese Knotweed *Polygonum cuspidatum*	Full Sun to Full Shade, almost any site, Perennial	By Seed, and Roots	Hand-Pull, Dig Up Roots, Smother, Herbicide

Hope for the future: Biological Control

A primary reason exotic invasive species are so pervasive is that they have few, if any, diseases or pests in their new environment. Researchers have had some success in finding and propagating native or non-native fungi, viruses, mites and/or insects that help control the target invasive species, without posing a threat to desirable plants. Purple loosestrife has been successfully controlled in this manner in many sites. Research is underway to find biological control agents for garlic mustard, multi-flora rose, kudzu, and other major non-native invasives of old fields and forests in the northeast.

Prepared by Rebecca Hargrave, Emily Selleck, and Kelly Fallone with support of Cornell Cooperative Extension of Chenango, Essex, and Cayuga Counties. Edited and compiled by Kristi L. Sullivan, Peter J. Smallidge and Gary R. Goff, Cornell University. 2006

Introduction to Biological Control

News from Cornell's New York Invasive Species Research Institute

The New York Invasive Species Research Institute, established in 2008 and housed in the Dept. of Natural Resources at Cornell University with support from the NYS Dept. of Environmental Conservation, spans the research-implementation divide by promoting communication and collaboration between scientists, land managers and policy makers to improve the scientific basis of invasive species decisions.

What is Biological Control?

Biological control, or biocontrol as it's often termed, is a method of utilizing one species to control another. Most often applied in the worlds of agriculture and natural resource management, this strategy offers a more targeted approach to reducing pest populations and mitigating negative impacts than traditional methods. There are a number of different approaches under the umbrella of biological control:

Classical Biological Control: Bringing natural enemies from an invasive species' home range and releasing them into the invaded range. This is the most common approach, and requires the most extensive research and permitting process detailed below.

Augmentation: Identifying natural enemies of a pest that already exist in a system, rearing them, and making augmentative releases to boost agent populations in the wild.

Conservation: Conserving and promoting the native natural enemies already present in a system to maintain a desirable balance.

More About Biological Control:

How It Works:

The aim of biological control is to introduce or augment co-evolved predators or pathogens of a pest species to a system in order to reduce the negative impact of the target pest species. A biocontrol program is not considered successful unless it is able to do so. Typically, this mitigation of negative impact is mediated by a biocontrol agent decreasing abundance, reproductive output, or vigor of the pest species on the landscape. Agents act to maintain pest populations at a lower level, however they will never eradicate a pest species completely. Once a biocontrol agent has been released, follow-up experiments by researchers are essential to track survival and impact on the target species, and promote establishment of agents.

Risks & Benefits:

As with all management actions, there are risks that go along with biological control programs. Examples of early "biological control" efforts, including the famous Cane Toad of Australia, showcase the devastation that can occur when organisms are not properly screened before introduction. Regulations and rigorous tests required today are designed to minimize the risk of non-target impacts, and organisms that are approved for release are typically highly specialized and share a deep evolutionary history with the target pest. Notably, biocontrol programs typically target pests that are widespread and have few effective management options. For this reason, in New York State, invasive species managers have continually voiced support for these initiatives. Where successful, biological control programs can save managers and growers an immense amount of time, effort, and resources, and serve as a sustainable long-term solution to pest issues.

Biocontrol Updates From 2020
Active Projects in New York State

Knotweed Complex
Reynoutria japonica, R. sachalinensis, R. x bohemica

The psyllid Aphalara itadori, a sap-sucking insect native to Japan, is currently the only biocontrol agent for knotweeds. A. itadori has been released in the U.K. and Canada, but establishment success has been variable with no obvious impact on Japanese knotweed in the field. A. itadori was officially approved for release in the US on March 20th, 2020. Field releases in New York (and other states in the US) have occurred in June 2020 to assess performance of A. itadori. Due to the difficulties in establishing this species and the limited impact observed, re-distribution efforts will only occur if the species shows promise in field tests.

Outlook: If A. itadori shows promise, re-distribution efforts will occur in a few years. In the meantime, additional herbivores from the native range will be evaluated for their safety and promise as additional biocontrol agents for knotweeds.

Water Chestnut: Trapa natans

Galerucella birmanica, an Asian leaf feeding beetle, is currently the focal agent of the water chestnut biocontrol program and studies are being conducted at Cornell's quarantine facility using insects originally imported from China. Host-specificity testing is complete, but researchers will continue to explore interactions between leaf-feeding beetle, G. birmanica, and native species. This work will last through the 2020 field season.

Mating pairs of G. birmanica feeding on water chestnut. Credit: W. Simmons

Outlook: A petition for field release of G. birmanica is expected to be submitted to the USDA Technical Advisory Group in fall of 2020. G. birmanica has a large impact on water chestnut in its native range in Asia and similar impacts on North America populations are anticipated after field release.

Hemlock Woolly Adelgid: Adelges tsugae

The predaceous beetle Laricobius nigrinus is the most broadly established agent for hemlock woolly adelgid (HWA) and the only agent independently spreading and reproducing in abundance in the Eastern US. Two silver fly species, Leucopis argenticollis & L. piniperda, whose larvae feed on HWA eggs have been released at a number of sites since 2015. Researchers in New York are currently developing and optimizing lab-rearing protocols for these three agents, as well as conducting studies on their biology, behavior and establishment in the field. Scymnus camptodromus, a ladybird beetle native to China, is not yet approved for release, however shows promise as an agent and may be the target of future investigations.

Releasing Leucopis flies onto Hemlock Woolly Adelgid infested branches. Credit: Mark Whitmore

Outlook: The New York State Hemlock Initiative is engaged in actively researching, rearing, and releasing predators (Laricobius nigrinus and Leucopis spp.) at field sites across NY State, with the goal of implementing and assessing the efficacy of biocontrol as a long-term strategy for managing HWA in NY.

Swallow-wort Vincetoxicum rossicum, V. nigrum

While several biocontrol agents are currently in development for swallow-wort biocontrol, the leaf-feeding moth, Hypena opulenta, is only agent approved for release in the US. H. opulenta was first released in 2013 in Canada, and in New York in 2018. In Canada, individuals have successfully overwintered and established, though agent density and subsequent feeding damage to plants has not yet reached levels that are likely to impact plant fitness. Lab-based experiments have documented negative impacts of larval feeding on plant reproduction and plant biomass. In the US, difficulties with mass-rearing have led to fewer individuals being released into research sites than anticipated.

In Europe, testing has resumed on the root-feeding beetle Chrysochus asclepiadeus. In a lab setting, this agent consumed native milkweeds, however an open field test conducted this summer in Europe revealed adult beetles are much more specific to swallow-wort than previously supposed. Follow up field tests to investigate further are planned for 2019.

The biological control agent Hypena opulenta. Credit: L. Milbrath

Outlook: H. opulenta populations and their impact will continued to be monitored and further experimental releases are planned for 2020 in New York. Researchers are conducting pre-and post-release swallow-wort and vegetation monitoring at select sites in the state to determine impact of this agent. Populations of H. opulenta may take several years to establish and reach densities that can negatively impact swallow-wort populations. Once mass-rearing issues are overcome, this agent will potentially become more widely available for those wishing to participate in releases.

Common Reed: Phragmites australis

Currently two European stem-feeding moths, Archanara geminipuncta and A. neurica, are the most promising agents in the Phragmites biocontrol program. Common garden experiments in Europe have documented reduced flowering, stem height, and biomass on Phragmites attacked by these agents. Due to the high degree of relatedness between invasive and native Phragmites, non-target impacts on native Phragmites was a concern that was addressed in detail in this program. Experiments assessing agent preference between native and introduced Phragmites have shown Archanara exhibits a high preference for introduced Phragmites. A more complete risk assessment indicated that field release of these to moths represents little risk to native Phragmites populations. In Spring 2019, regulatory agencies in Canada approved field release of these moths and the Technical Advisory Group in the US recommended field release as well.

Outlook: Canadian authorities will proceed with field releases of agents in 2020, most likely in Ontario. Researchers are now working with USDA/APHIS and USFWS to produce the documents needed for a notification in the Federal Register, which would be the next step in allowing for agents to be released in the US. This may take up to a year or longer, depending on speed of review at federal agencies

Interfering Vegetation Management

By Peter Smallidge

In all forest vegetation management situations, you should start with a plan that details the interfering species, the desired plant species, the costs, how the interfering vegetation will be treated, and how the site will be re-vegetated. Webinar archives detailing the vegetation management planning process are available at www.youtube.com/ForestConnect

The word "treatment" is used here to describe the manner in which the vegetation is manipulated, often with the goal of killing the stems causing the interference. The treatment has two attributes – the method and the mode. Method is typically mechanical or chemical and mode is either broadcast or selective. Biocontrol methods are not described here. Each treatment can be described by a method and a mode. First we will review some principles, then consider some examples.

Which Method and Which Mode?

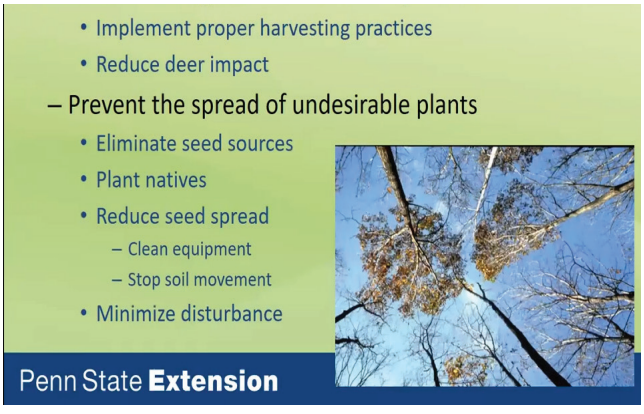
Both mechanical and chemical methods have useful applications. Often the choice depends on the attitude of the owner, the time of year, the terrain, or the equipment. For some circumstances, a mechanical method is followed by a chemical method. Mechanical methods might include hand-pulling, brush saws and chain saws, timber ax and Fecon mowers, or livestock. Chemical treatments are herbicides, a type of pesticide that targets plants.

The decision about whether to use chemical methods may be decided by the owner's attitudes and comfort with the use of herbicides. Some owners, such as maple produces who are certified organic, are restricted from using most conventional herbicides. Herbicides are regulated by the EPA through authority given to the NYS DEC. The regulatory process helps inform users about the known ways that the active ingredients will behave in the environment. If an owner uses an herbicide, they should carefully follow the label. Home recipes of chemical concoctions should never be used.

Mode is selected depending on the desired specificity of the treatment to individual or groups of stems. A selective treatment affects individual stems and a broadcast treatment affects all stems in an area. If an interfering species is mixed with a high percentage of a desired species, a selective treatment may be used to reduce injury to the desired species. Selectivity is possible through physically isolating one stem from others, by using a treatment that only affects a certain species, or by applying a treatment at a time of year when desirable species are not susceptible. If the interfering species predominates, or financial or logistical constraints preclude a selective treatment then a broadcast treatment would be applied.

Foliar spray treatment of large plants has the potential for overspray onto nearby plants. Be alert to the proximity of desired plants.

The abundance of undesired stems is often a good place to start when considering whether to use a selective or broadcast mode. The principle to consider here is the fixed cost to visit each stem in a selective treatment. If there are too many stems per acre that means (1) the cost per acre will become prohibitive and (2) because there are a fixed number of stems per acre the interfering stems have likely displaced the desirable stems and a broadcast treatment would have limited relative collateral damage. Although not widely studied, the threshold between selective and broadcast is about 400 stems per acre. Each owner's situation is a bit different, so this threshold should only be used as a guide.

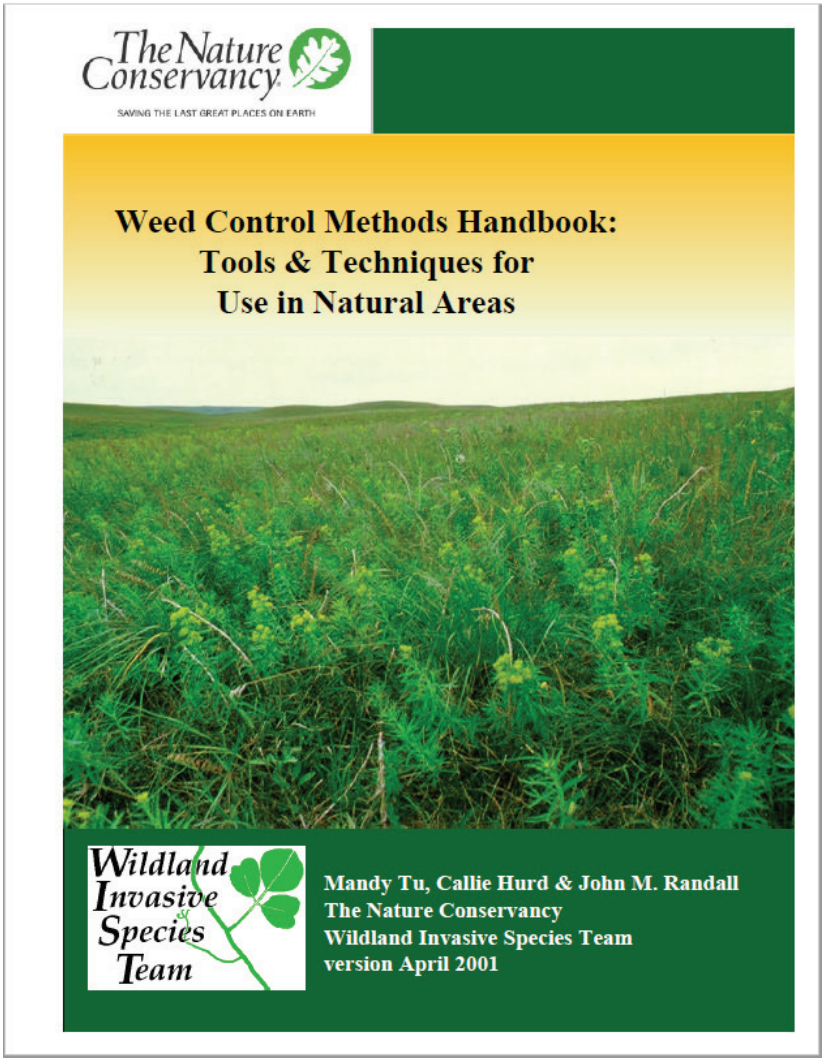


"Using herbicides to manage vegetation in hardwood forestry"

Additional Management Resources:

Control methods can vary based on many factors such as resources available, species present, scale and individual goals. There are a host of resources available to help you develop an approach for your situation. Please contact your local CCE if you're looking for fact sheets, best management practices or shared experience with invasive species treatment.

- The information presented above is expanded on specifically for each method and mode on the Strategies To Control on smallfarms.cornell.edu/.
- Highly detailed insight on specific weed control methods for each species is a document produced by The Nature Conservancy: invasive.org/gist/products/handbook/methods-handbook.pdf
- Cornell CALS New York State Integrated Pest Management for Invasive Species: nysipm.cornell.edu/environment/invasive-species-exotic-pests/



Have you seen a Spotted Lanternfly? *Let's check!*

EGG MASSES: September – May

Spotted Lanternfly Egg Mass Description

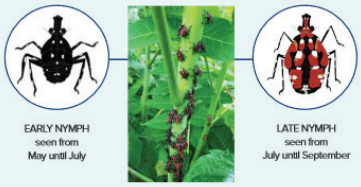



Found on the tree bark, rusty metal, rocks, outdoor furniture, vehicles and other smooth surfaces. About 1 inch long and a half to three-quarters of an inch wide. Mud-like covering, color can vary from white to tan to gray or brown. Freshly laid eggs are often shiny and appear to have a waxy coating that becomes dry and cracked over time. Old egg masses can shed their covering and look like four to seven rows of seed-like eggs, 30–50 eggs total.

NYMPHS: April – October

Spotted Lanternfly
Early Nymphs – Late Nymph Description

Black with white spots without wings, becomes red with white spots and black patches as it matures. Fourth instar nymphs are over ½ inch long. Hop suddenly when approached or touched.



ADULTS: July – November

Spotted Lanternfly
Early Nymphs – Wings Closed / Wings Open

At rest – greyish-faint pink wings with many round black spots. The wing tips are black and gray with a webbed appearance. Flying or startled - insect will show bright red hind wings, 1.5" – 2.5" wide with wings spread. Adults are about 1 inch long and a half inch wide while wings are folded. Adults can hop several feet if startled.




To report a spotted lvanternfly sighting, scan the QR code, or visit:
https://agriculture.ny.gov/slf

NEW YORK STATE OF OPPORTUNITY | Department of Agriculture and Markets

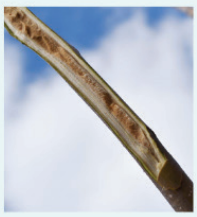
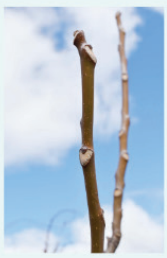
Have you seen a Tree-of-heaven? *Let's check!*

LEAVES: Spring – Fall

Alternate leaf arrangement. Pinnately compound leaves (one leaf made up of many leaflets). 1 – 4ft long. Leaflets have smooth edges with 1 or 2 small lobes at the base of each leaflet. Odorous glands on lobes smell foul. Leaflets have smooth shiny surface on top, underside is lighter in color and has a duller surface. Turn bright yellow in fall before dropping.

TWIGS: All year

Twig has large leaf scar with single row of vascular bundle scars. Bud is directly above leaf scar. Soft, light brown, corky pith inside twigs smalls similar to burnt peanut butter. Twig bark is dark brown – grey.

SEEDS: Summer – winter

Seeds are numerous and only found on female trees. Winged samaras turn from green to pink – yellow to brown and can persist on the tree through the winter.


Annemarie Smith
ODNR Division of Forestry, Bugwood.org


Bugwood.org

BARK: All year

Smooth bark with "cantaloupe like" pattern. Grey – very light tan.


To report a spotted lanternfly sighting, scan the QR code, or visit:
https://agriculture.ny.gov/slf

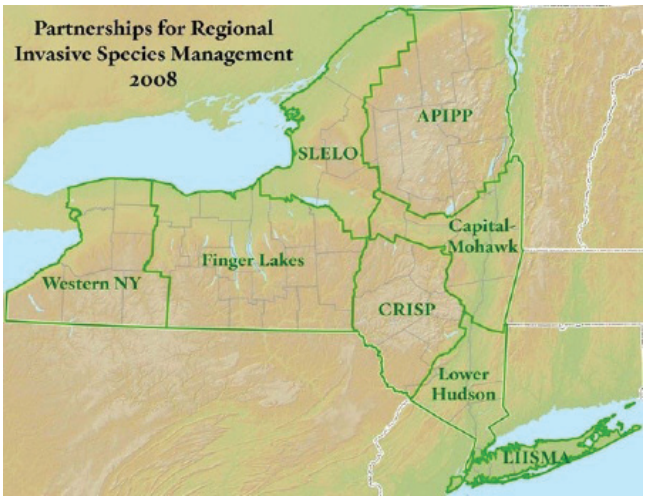
NEW YORK STATE OF OPPORTUNITY | Department of Agriculture and Markets

New York State PRISM

There are many organizations, institutions, and government agencies that work to prevent, control or eradicate invasive species in New York State. However, there is a particularly helpful program that every woodland owner should know about: the NYS DEC Partnerships for Regional Invasive Species Management or PRISM.

The PRISM model was developed by the state to help prevent and minimize the harm caused by invasive species on New York's environment, economy and the health and well-being of the State's citizens. Today, PRISM are coordinated by non-profit organizations across the state by region. The regional structure is effective, in part, because the same pressures don't always apply across the board. For example the Lower Hudson PRISM is experiencing a much higher rate of Spotted Lanternfly sightings than the Adirondacks. Each region can focus on their top priority while helping other regions prepare.

The PRISM Coordinators provide a host of services and make resources available for all residnets in the respective region. Some of their work includes: (1) prioritizing species threats and coordinating partner efforts; (2) recruiting and training citizen volunteers; (3) prodividng public education; (4) establishing early detection monitoring networks and; (5) implementing eradication and control efforts.



NYS PRISM Regions.

In These Woods readers likely own or steward woodlands in the Catskill Regional Invasive Species Partnership (CRISP) or Capital Region. Below is a list of counties served and the link to learn more about the pressures and efforts in your area.

To see the full PRISM listing, visit:
nyis.info/prisms.

CRISP
Catskill Regional Invasive Species Partnership

PRISM Coordinator:
Catskill Center for Conservation and Development.

Serves: Schoharie, Otsego, Delaware, Sullivan, Ulster, higher elevation half of Greene County and a small corner of Orange.

www.catskillinvasives.com

CAPITAL-MOHAWK
PRISM
Partnership for Regional Invasive Species Management

PRISM Coordinator:
CCE of Saratoga County

Serves: Albany, Columbia, Montgomery, Rensselaer, Schenectady, and parts of Fulton, Herkimer, Saratoga, Warren, and Washington.

www.capitalregionprism.org

Resources

Finding an Arborist

As the old saying goes, Foresters care for the whole forest and Arborists care for the individual tree. For tree treatment or tree health assessments, you can find a certified arborist from the New York State Arborists Chapter of the International Society of Arboriculture:
https://nysarborists.com/

NYS Pesticide Applicator Regulations:

Some invasive species treatment calls for chemical application. It's important to know the applicable rules and regulations as well as safe handling practices.
https://www.dec.ny.gov/permits/209.html

New York State Policies and Programs:

Invasive Species Regulations:
https://www.dec.ny.gov/animals/99141.html

NYS Firewood Transport Rules:
https://www.dec.ny.gov/animals/28722.html

NYS Invasive Species Comprehensive Management Plan: November 2018
https://www.dec.ny.gov/docs/lands_forests_pdf/iscmpfinal.pdf

New York City Department of Environment Conservation
Invasive Species in the NYC Watershed:
https://www1.nyc.gov/site/dep/environment/invasive-species.page

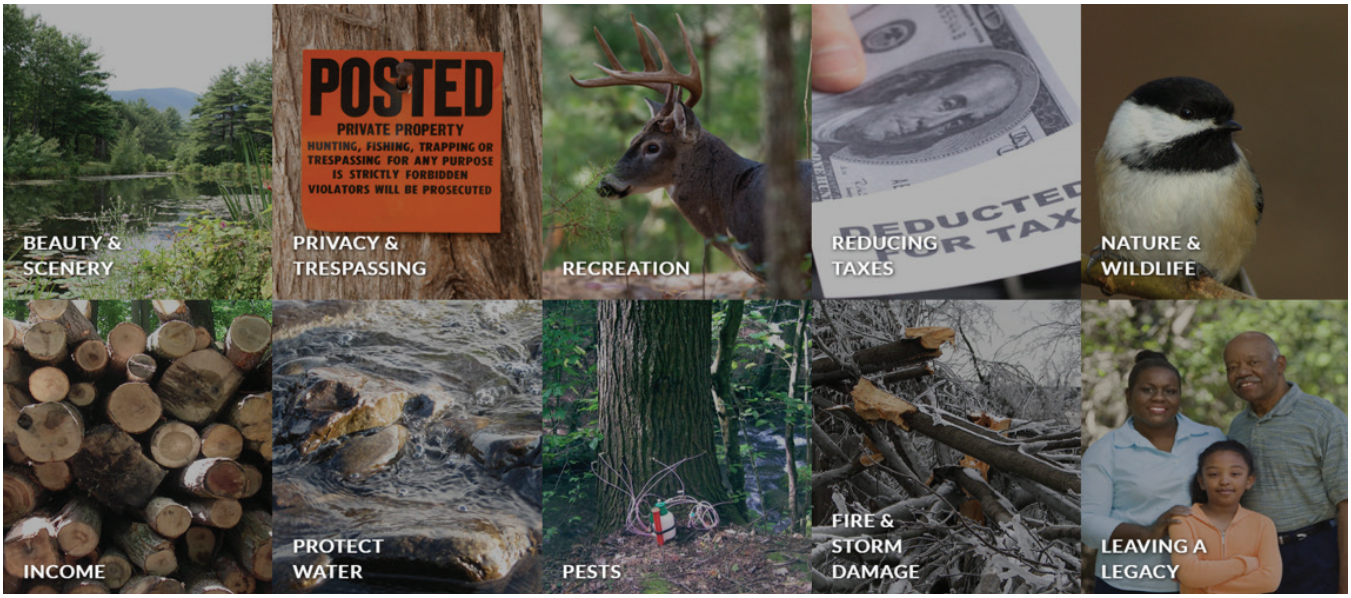
New York Invasive Species (IS) Information

New York State's gateway to science-based invasive species information:
http://nyis.info/

Cornell University Invasive Species Research Institute:
http://www.nyisri.org/

The New York State Hemlock Initiative:
https://blogs.cornell.edu/nyshemlockinitiative/

Resource Collections



MyWoodlot

As highlighted above, MyWoodlot offers a wide selection of resources on woodlands. There are activities and blogs from professionals and other landowners that highlight projects and ideas that you can actually implement. The activities broadly include beauty and scenery, privacy and trespassing, recreation, reducing taxes, nature and wildlife, income, protecting water, pest, fire and storm damage, and leaving a legacy.

Create your MyWoodlot profile for free to save and organize activities and resources that match your goals. Follow the link below to begin exploring all these resources and keep up to date with new activities that are added weekly!

Visit MyWoodlot

ForestConnect

A Cornell University resource to connect woodland users to the knowledge and resource needed to ensure sustainable production and ecological function on private woodlands. The site houses information for woodland stewards, educational resources and offers countless webinars on a wide variety of woodland topics.

Visit ForestConnect

CCE Columbia & Greene

Visit our site to find resources and more information on upcoming events. Our Natural Resoures Team is also ready to support you in all your woodland stewardship goals. Please reach out if you're looking for specific information, have questions about your woods, or need assistance in determing next steps.

Woodland Owner Networks

Women Owning Woods

We are a group of women landowners and natural resource professionals from the Catskills and the Hudson Valley region of New York. We've organized this group of professionals and landowners as a way to foster learning experiences and discussions about forest property. Details about gatherings will be sent out via email in our eNewsletter. To subscribe to that list you can email wow@nycwatershed.org to join.
Follow us on Facebook to stay connected, share your stories, and learn from your peers.

Find WOW on Facebook

Master Forest Owner Volunteers

The Master Forest Owner (MFO) program provides private woodland owners of New York State with the information and encouragement necessary to manage their forest holdings wisely. Since its inception in 1991, MFOs of Cornell Cooperative Extension have helped over 1,000 landowners. The term "Master" Forest Owner implies education as in "School-Master". Experienced and highly motivated volunteer MFOs are available statewide, ready to assist neighbor woodland owners with the information needed to start managing their woodlands, through free site visits to landowners properties. The training volunteers receive complements their experience as forest owners.

Learn more about the MFO Program

Catskill Forest Association

The Association was formed for the purpose of promoting knowledge and understanding of forest ecology and economics; to promote long-term forest management; to educate the public and enhance the economy of the Catskill region; to demonstrate economically feasible and environmentally sound forest practices: to serve as a source of information about forest management; to serve private landowner rights; and to identify and manage private forest lands dedicated to the demonstration and practices of high standards of forestry.

Learn more about the CFA

New York Forest Owners Association (NYFOA)

The mission of the New York Forest Owners Association (NYFOA) is to promote sustainable forestry practices and stewardship on privately owned woodlands in New York State.

Learn more or join NYFOA

Cornell Cooperative Extension
Columbia and Greene Counties

Agroforestry Resource Center
6055 Route 23
Acra, New York 12405

Postage

Connect

Website: ccecolumbiagreene.org
Email: columbiagreene@cornell.edu
Phone: 518-622-9820

@CCEColumbiaGreene

@ccecgc

Mission

Cornell Cooperative Extension Columbia and Greene Counties puts knowledge to work in pursuit of economic vitality, ecological sustainability, and social well-being. We bring local experience and research-based solutions together, helping Columbia and Greene County families and communities thrive in our rapidly changing world.

CCE Columbia and Greene Counties is a registered 501(c)(3) nonprofit.