



LOWER HUDSON PRISM

2023 ANNUAL REPORT

LOWER HUDSON
PARTNERSHIP FOR REGIONAL
INVASIVE SPECIES MANAGEMENT



LOWER
HUDSON
PRISM



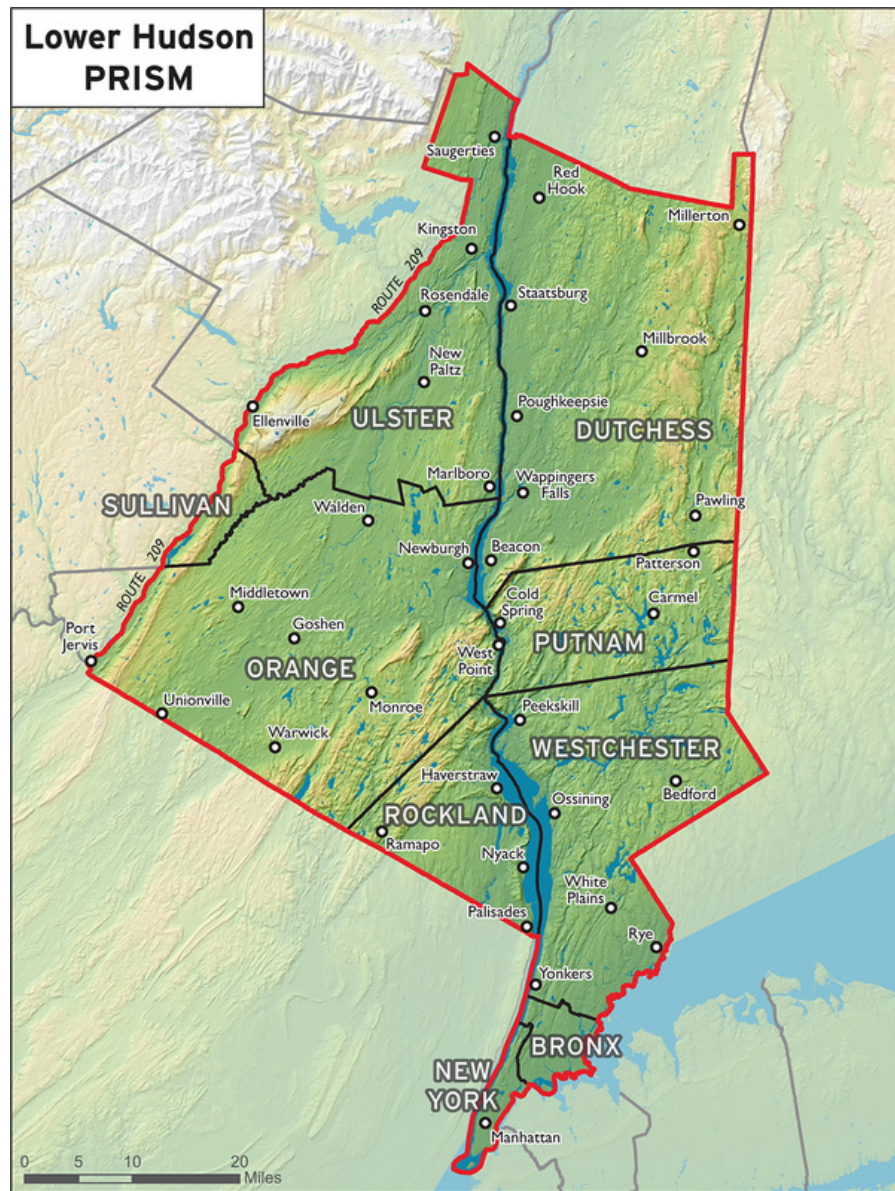
NEW YORK STATE
INVASIVE SPECIES
MANAGEMENT

Lower Hudson Partnership for Regional Invasive Species Management 2023 Annual Report

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The above map represents the area served by the Lower Hudson Partnership for Regional Invasive Species Management (LH PRISM). The LH PRISM is hosted by the New York–New Jersey Trail Conference using funds from the Environmental Protection Fund as administered by the New York State Department of Environmental Conservation.

Mission

The mission of the Lower Hudson Partnership for Regional Invasive Species Management is to protect the rich biodiversity and ecosystems of the Lower Hudson region through collaborations that focus on controlling the introduction, spread, and harmful impact of invasive species.

The overarching goals guiding LH PRISM's strategic approach and mission:

Capacity Building: *The LH PRISM has a robust public identity, strong internal structure and a sustainable resource base to continue its mission.*

Conservation Targets: *The LH PRISM protects the rich, native biodiversity of the Lower Hudson Valley by focusing on priority targets for conservation.*

Strategic Invasive Species Management: *The LH PRISM supports and optimizes ecosystem health through strategic invasive species management.*

Education and Outreach: *The LH PRISM reaches out to new audiences and delivers education that communicates the identification, impacts and ecology of invasive species as well as the positive effects of invasive species management on ecosystems. The LH PRISM offers clear steps for action on personal and community levels.*

Mitigating Pathways of Invasion: *LH PRISM has a coordinated program to prevent invasive species introductions by focusing on pathways*

Information Exchange: *The establishment of an information exchange allows Lower Hudson PRISM partners and other professionals to strategically manage and integrate information relevant to the management of invasive species and offer that information to any person, group, agency (partner and non-partner alike).*

2023 Steering Committee

Matt Aiello-Lammens, Pace University
Michael Fargione, Cary Institute for Ecosystem Studies
Taro Ietaka, Westchester County Parks
Meredith Taylor, NYC Environmental Protection
Budd Veverka, Mianus River Gorge
Brent Boscarino, New York - New Jersey Trail Conference
Keri VanCamp, Vassar College

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Summary of Accomplishments



The Lower Hudson Partnership for Regional Invasive Species (LH PRISM) helps preserve native biodiversity in the Lower Hudson Valley through the development and implementation of invasive species education and outreach programs, as well as the strategic surveying, monitoring and management of invasive species.

Summary of Accomplishments

2023
at a glance

We reached

212,316

individuals across our
social media platforms



666

management
projects over

5,874

acres

590

workshops,
presentations, and
outreach events
educating over

9,077

people about invasive
species



10,267

volunteers dedicated

33,009

hours of service

177,270

overall video
content views



One of the hallmarks of the LH PRISM is the extensive network of volunteers that dedicate time and effort to collaborative invasive species work. 2023 saw a record-breaking number of 10,267 volunteers dedicate 33,009 hours to invasive species-related projects that helped restore our region's ecosystems to a more balanced state. These efforts included the work of LH PRISM's Invasives Strike Force Survey and Monitoring Program volunteers who devoted over 1,000 hours to searching for and reporting on five high priority invasive species in our region: beech leaf disease (BLD), spotted lanternfly (SLF), tree of heaven, hemlock woolly adelgid (HWA) and black swallow-wort. This year's survey work also placed additional emphasis on reporting lingering and pest-resilient trees impacted by invasive forest pests and pathogens including emerald ash borer, BLD and HWA.

LH PRISM's Invasives Strike Force (ISF) Crew aims to protect high value native habitats in our region from the threat of invasive species with a focus on the strategic management of Tier 2 (emerging) and newly arrived invasive species. In 2023, the ISF Crew took on 36 projects that targeted 10 Tier 2 species. This work included several long-term monitoring and management projects on sticky sage, giant hogweed, Scotch broom, SLF and kudzu in collaboration with PRISM partner organizations and state agencies. Altogether, the ISF Crew and PRISM partner organizations engaged in 666 management and monitoring projects that protected 5,874 acres of native habitat in the Lower Hudson Valley.

LH PRISM aims to reach new audiences through providing impactful educational programming that communicates the positive impacts of invasive species management on ecosystem health and provides clear steps for action on both personal and community levels. We welcomed a remarkable 10 new partners to the LH PRISM network this past year, which is a testament to our dedication and continued growth and diversity as a partnership. Altogether, LH PRISM staff and partners engaged in 590 in-person and live-streamed educational workshops and events that reached 9,077 members of our extended community in the Lower Hudson region. Furthermore, our digital education and outreach efforts continued to grow and thrive. An increased emphasis on Facebook and Instagram reels and YouTube video content, which achieved a historic 177,270 views in 2023, significantly extended our reach as a network to further establish ourselves as environmental education leaders in an increasingly hybrid learning environment.

Invasives Strike Force (ISF) Program Reports



SECTION 1

**INVASIVES
STRIKE FORCE
CREW**

SECTION 2

**CITIZEN SCIENCE,
EDUCATION AND
OUTREACH**

SECTION 3

**CHALLENGES
AND NEEDS**



SECTION 1: INVASIVES STRIKE FORCE CREW

Strategic Management of Terrestrial Invasive Species on a Regional Scale

The Invasives Strike Force (ISF) is an AmeriCorps crew hosted by the New York-New Jersey Trail Conference's Conservation Corps (TCCC) Program. The ISF Crew services the Lower Hudson PRISM region with the goal of protecting precious terrestrial natural resources through strategic invasive species management. This work aims to prevent, eradicate, contain, and/or suppress the spread and impact of invasive species depending on a variety of environmental factors.





ISF Crew Leader, Zack, marking target species in a meadow in Westchester County .



ISF Crew Member, Niko, and Crew Leader, Layla, at work.

For example, projects the ISF Crew takes on have different goals based on local ecological needs, known regional distribution, known impacts in other areas, potential rate of spread, as well as reproductive capacity of the species of management interest. In general, the ISF Crew prioritizes early detection and rapid response management projects to eradicate low abundance, high impact, emerging invasive species on a regional scale. The crew also prioritizes protecting highly valuable ecological, historic, economic and cultural resources. Given these principles and with the help of LH PRISM's engaged volunteers, this small crew has a tremendous role in shaping the health of our region's ecosystems for generations to come.

In 2023, the ISF crew completed 36 projects to help protect our region's natural areas. They worked with 40 different invasive species, 10 of which were Tier 2 (emerging), 13 of which were Tier 3 (established), 15 of which were Tier 4 (widespread), and 2 of which were Tier M (monitor). Across all projects this year, the ISF crew surveyed 572.87 acres, found 184 acres infested, managed 158 acres, and removed 61,234 individual invasive plants. This work equated to 275 searched area records being processed by the ISF Crew leaders and Terrestrial Invasive Species Coordinator and sent to iMapInvasives for loading into the official invasive species database.

A Stitch in Time Saves Nine

In the Lower Hudson Valley, many natural areas are inundated with widespread invasive shrubs like Japanese barberry, multiflora rose, and burning bush. These example species have had significant and lasting ecological and economic impacts on our region over the past century. By targeting emerging invasive species that have low regional abundance, the ISF Crew endeavors to prevent the next big widespread invader from taking hold. This is especially critical in the Lower Hudson Valley as the region's population density, ports, and travel hubs significantly increase the overall likelihood and number of new species being introduced. The crew worked on the following Tier 2 emerging invasives in 2023: castor aralia, hardy kiwi, Japanese tree lilac, Scotch broom, silver vine, small carpetgrass, sticky sage, giant hogweed, incised fumewort, and paper mulberry.

One emerging invasive plant that has a long-term management goal of regional eradication in the Lower Hudson Valley is giant hogweed. This plant, like many other known invasive species, was brought over as an ornamental landscaping curiosity, specifically prized for its large size and unique appearance. However, the sap of giant hogweed is phototoxic, meaning it can cause severe burns and even blindness if one is exposed to the sap and sunlight. Giant hogweed can also create monocultures that push out native species, particularly in its preferred riparian habitat. Statewide efforts to manage this dangerous invasive species are coordinated in partnership with the NYS DEC.



ISF Crew members working to manage giant hogweed.

With over 4,000 giant hogweed sites statewide, giant hogweed cannot be classified as an emerging invasive species in northern and western New York, where these populations are denser. However, in the Lower Hudson PRISM, there are only 44 known infestations and only 11 of those are known to still have giant hogweed plants. Field management of this species commences prior to the plant going to seed in early July. This year, the ISF managed a total of 718 giant hogweed plants at 13 sites, finding less than 25 plants at most of the sites.

At the largest of the giant hogweed sites in the LH PRISM region, there were too many plants for field crews to accurately count just three or four years ago. Since ISF Crew management commenced in 2021 and more accurate counts were feasible, the site has seen a 90% decline in numbers of plants targeted for management (from 7,000 in 2021 to 1,100 in 2022 to 700 in 2023), a clear sign of progress and hope that eradication of giant hogweed is within reach in the region!



ISF Crew member, Niko, holding up a giant hogweed specimen he removed.



ISF Crew member, Emily, holding up Scotch broom.



ISF Crew surveying for Scotch broom in Harriman SP.

Persistence is Key

A single visit to manage an invasive species population is not enough to consider the job done. This is because seeds dropped by mature invasive plants may persist in the soil for years waiting for the right environmental conditions to germinate. Additionally, if the entire root system isn't removed or killed during management, many plants stimulate a stress response that triggers vigorous re-growth. Thus, management plans need to account for multiple years of follow-up work that includes both treatment and post-treatment monitoring.

Although seedbank longevity varies by species, as a general rule, the LH PRISM considers a population locally eradicated when there have been no target species found at a site for at least three consecutive visits over three years. With a large jurisdiction and many priorities, the ISF Crew typically does not have capacity for a follow-up visit within the same year. If the ISF Crew visits a site multiple years in a row, data is taken on the population prior to management to evaluate the effectiveness of the prior years' treatments. In 2023, the ISF visited 171 sites for follow-up management and monitoring purposes and there were no plants found at 44 sites previously treated by the ISF (25.7%).

One project in which post-management monitoring has demonstrated notable positive progress is regional kudzu management. Kudzu was brought over to the United States in the late 1800's as an ornamental plant and was promoted as a tool for soil erosion control from the 1930's through the 1950's. This vine quickly escaped from where it was planted and began to grow voraciously, especially along roadsides and forest edges. It became known as the "plant that ate the south" and it is now nibbling at the north. Critically, kudzu is known to be a "sleepier species"; one that is likely to become even more invasive in Northeastern forests as a result of climate change. Furthermore, kudzu is currently known to have established populations only in the Long Island and Lower Hudson PRISM regions. Post management monitoring of these infestations is imperative to evaluate the efficacy of management of kudzu before it has the chance to spread to other parts of the state.

There are 61 known kudzu sites in the Lower Hudson Valley. The ISF Crew partners with the DEC to tackle this aggressive invader each year. Of the 61 known sites, the ISF Crew was able to visit 50 of them in 2023 (82%). Of those 50 sites, there was no kudzu found at 22 of them (44% of sites visited; 36% of sites overall). These efforts were supported by the Trail Conference's Conservation Dogs Program, who was tasked with surveying sites where there was thought to be no more kudzu following previous management efforts. These searches help alleviate human survey biases and allow our teams to confidently and efficiently confirm eradication statuses (see upcoming Conservation Dogs Program subsection for more information on this program's achievements).



Kudzu at one of the sites managed by the ISF Crew.



ISF Crew helped rehabilitate New England cottontail (above) habitat through invasives management at a partner site in 2023.



Invasives Strike Force Crew and volunteers at the Great Swamp.

Preserving the Vulnerable, Unique, and Valuable

When most land managers deal with invasive species, the goal is to allow native plants and wildlife to thrive, improving overall biodiversity, ecosystem health and resilience. Significant natural areas that are biodiversity hotspots, that host rare, threatened, endangered or protected species or contain sensitive and/or critical habitats are especially important to prioritize for invasive species prevention, protection and management.

One example of the ISF Crew stepping in to protect a special native species of concern was the management work done on New England cottontail habitat at the Great Swamp in eastern Dutchess and Putnam County. New England cottontail is the only native rabbit in New York and has suffered widespread population loss and habitat declines in its native range over the past 50 years. In partnership with Friends of the Great Swamp, the ISF Crew helped clear certain types of invasive shrubs and trees, creating brush piles within a specified plot to promote conditions that support New England cottontail survival and reproduction. Selective invasive plant removals in sectional plots rather than all at once, coupled with native shrub plantings and strategic canopy thinning are all important adaptive management techniques that promote New England cottontail habitat and provide New England cottontail with competitive advantages over nonnative Eastern cottontails. The ISF hopes their work can contribute to New England cottontail population rehabilitation and increase habitat connectivity in the region.

Volunteer Engagement

Prevention is hailed as the most cost effective and efficient way to mitigate invasive species impacts. The ISF Crew hosts volunteer workdays to educate the public on invasive species ecology, demonstrate best management practices in action, and provide tangible examples of our collective and individual reliance on healthy habitats. In hosting these workdays, the ISF hopes to inspire personal, cultural, and legislative changes to stop the introduction and spread of invasive species. In 2023, the ISF hosted 31 volunteer workdays in which 92 volunteers contributed 577 hours to invasive species management projects. These removal days also show that invasive species management, though daunting, is attainable with a plan, community participation, and a positive attitude.

In addition to leading volunteer workdays, LH PRISM staff also focused efforts on leveraging the Trail Conference's trail maintenance volunteer community to help with regional efforts to control the spread of invasive species through well-traveled trail corridors. LH PRISM staff helped advise Trail Conference staff and Regional Trail Council volunteer leaders on the production and presentation of invasive species best management practices that were tailored toward trail maintenance techniques and initiatives. This outreach significantly expanded our management reach and capacity in the region. Altogether, the Trail Conference's 749 trail maintainers and leaders dedicated 3,719 volunteer hours to invasive species control efforts in 2023 that were independent of organized ISF crew workdays.





ISF Crew members Avani (left) and Nick (right) identifying and displaying invasive species.

Inspiring Environmental Leaders

Professional and career development is also a key component of what the Invasives Strike Force Program strives to achieve by providing valuable hands-on experience in environmental planning, field work and networking opportunities for ISF Crew members. The ISF Crew is comprised of members from AmeriCorps, a national service program that focuses on personal and professional development. Many ISF members are recent undergraduates looking to gain experience in the environmental field and/or individuals looking to switch career fields. They are trained from the ground up on plant identification, invasive species ecology and management, data management, reporting, mapping, and volunteer engagement. Project partners, who are often environmental professionals, are encouraged to meet with ISF members to discuss their role, organization, and career path. ISF members further increase their network connections by attending LH PRISM meetings and professional development seminars hosted by the Trail Conference.

Through collaborative projects with other Conservation Corps crews at the Trail Conference, the ISF also participates in sustainable trail building and responsible use education and outreach. Though the primary focus of the Invasives Strike Force program is on terrestrial invasive species management initiatives, our team worked with members of the Trail Conference's Trail Steward Conservation Corps Program to remove roughly 3,177 pounds (dry biomass) of water chestnut from the Hudson River at Margaret Norrie State Park over the course of three weeks in August.

They created an area where native fish and plants could thrive outside of the monoculture of water chestnut that had existed before. It was a rewarding and collaborative effort, with various stewards and other Corps members playing a significant part in making the removal efforts more streamlined and effective.

The ISF Crew also teamed up with Trail Steward Corps members across ten other days throughout the 2023 season. These collaborative efforts focused on invasive species surveying and removal projects and provided the public with invasive species outreach and education. This included taking on an ongoing restoration project, in collaboration with Wild Woods Restoration Project, to remove over 5,000 invasive plants and planting 658 native plants in three target areas near one of the Trail Steward Program's stewarding sites. Looking forward, integrating the work of the Trail Conference's Trail Stewards Program into LH PRISM activities and the work of the ISF Crew will significantly advance the goals of LH PRISM's education and outreach objectives. See Section 2: Citizen Science, Education and Outreach, Trail Steward Program of this annual report for more information.



Trail Stewards managing various invasive species within the Lower Hudson region.



Conservation Dogs Program Coordinator, Arden Blumenthal, and Conservation Dog, Peat, searching for Scotch broom.

Working with Conservation Dogs: Detection and Management

The Trail Conference's Conservation Dogs Program (CDP) deploys highly trained dog and handler teams that help support LH PRISM's Invasives Strike Force Program in protecting the ecological integrity of Hudson Valley native habitats through invasive species detection and monitoring. The CDP has been an integral asset in the effective management of invasive species by a) locating remaining individuals not detected by humans following removals, b) detecting species where they have not previously been found but where there is high risk of invasion, c) extending the boundaries of known infestations, and d) surveying difficult terrain or areas of dense vegetation that humans have difficulty traversing. Below are project summaries for the species that the CDP targeted in 2023 as part of our broader Invasives Strike Force Program agenda.

Scotch broom: CDP Program Coordinator, Arden Blumenthal, and American Field Labrador, Peat, worked on Scotch broom in 2023, visiting 34 sites in Harriman and Bear Mountain State Parks, which represented an increase of 10 sites since 2022. These sites were selected as sites worth managing by the CDP since each site was classified as having minimal seedling or sapling plants following management efforts by the ISF Crew. The team surveyed 17.8 acres over 18.3 hours and removed 714 Scotch broom plants in 2023.

Kudzu: 2023 was the fourth year the dogs have helped NYS DEC and the ISF Crew to survey for kudzu. The dogs were strategically assigned sites that were expected to have few, if any, plants based on the results of surveys in previous years. Trainer and handler Josh Beese, Dia (American Field Labrador) and Fagen (Belgian Malinois) surveyed 12 sites, covering 8.8 acres. Only 2 of the 12 sites had remnant populations following treatment- a great sign that regional eradication efforts are continuing to positively progress.

Spotted lanternfly (SLF): The Trail Conference's Conservation Dogs Program performed SLF egg mass surveys and removals in coordination with NYS Department of Agriculture and Markets and with support from a USDA Plant Protection Act (PPA) grant. In total, the team surveyed for 123 hours and removed 1,048 egg masses from the environment in 2023.

Sticky sage: The CDP dedicated the month of August to sticky sage surveying and management in Dover, NY. 2023 was the fourth year the dogs joined the ISF crew in the fight against sticky sage by scouting new areas to help establish the boundaries of the infestation and double-check sites that the ISF crew had already surveyed and treated in years prior.

In 2023, the team surveyed 138.7 acres over 29 hours and helped remove 365 plants.

Conservation Dog, Dia, searching for sticky sage.





SECTION 2:

CITIZEN SCIENCE, EDUCATION AND OUTREACH

Inspiring Stewardship through Citizen Science, Education and Outreach

The Trail Conference organizes close to 7,000 volunteers that contribute over 8,000 hours to protecting our region's natural areas annually. We provide trail maintenance and land stewardship education and outreach to approximately 250 public and private entities. This work includes coordinating the development of priorities and implementing programs for invasive species prevention, education, outreach and management in the region with the help of our LH PRISM partners. The following subsections highlight the diversity of citizen science, education and outreach-oriented initiatives led by LH PRISM staff in 2023.



Invasives Strike Force Survey and Monitoring Program

Program Overview

The Invasives Strike Force (ISF) Survey and Monitoring Program is designed to engage community members and volunteers in the surveying and monitoring of high-priority and/or emerging invasive species in the Lower Hudson PRISM region. This year's survey focused on the identification and reporting of 5 invasive species (beech leaf disease (BLD), spotted lanternfly (SLF), hemlock woolly adelgid (HWA), black swallowwort, and tree of heaven). This species list was developed in consultation with the New York Natural Heritage Program and NYS DEC's priority species lists. Data collected by volunteers are not only useful in better understanding the distribution and rate of spread of these species but also in identifying candidate sites for biological control releases, in the case of HWA and swallow-wort specifically.

This year's ISF Survey and Monitoring Program also placed additional emphasis on collecting data on lingering and pest-resilient trees impacted by forest pests. For example, select survey volunteers worked with the Ecological Research Institute's Monitoring and Managing Ash (MaMA) and Rapid Ash Mortality Assessment (RAMA) Programs to assess ash health and with LH PRISM staff to launch a pilot lingering beech and hemlock survey initiative. These latter two programs were developed in collaboration with the Beech Leaf Disease Coalition and the Nature Conservancy/NYS Hemlock Initiative's Lingering Hemlock Working Group, respectively. These forest pest and pathogen-resilient programs aim to help enable ash, hemlock and beech restoration by assessing canopy health and degree of resistance to the impacts of emerald ash borer (EAB), HWA and BLD, respectively. The goal is to identify trees that likely have some heritable resistance from which material can be used to breed highly resistant, locally adapted native trees.





ISF surveyor plant identification training workshop.



ISF volunteer surveyor, Cathy Elko, on her trail assignment.

Training Workshops and Resources

In 2023, LH PRISM staff coordinated 5 ISF Survey and Monitoring Program workshops focused on the identification of all invasive species on this year's list (see previous section) as well as on how to identify lingering and pest-resilient ash, beech and hemlock trees. All volunteers were trained in reporting protocols using the iMapInvasives mobile app. In total, 149 volunteers dedicated 281 hours to participating in these survey, monitoring and reporting trainings alone.

We posted all training workshops to the LH PRISM YouTube channel which received an additional 564 views. Hard copies of survey resources including quick ID guides and lingering ash, hemlock and beech guides were provided to all participating volunteers. These resources provided helpful on-demand support for our surveyors while in season, building ID confidence and ensuring more accurate reporting.



ISF volunteer surveyor, Stephanie Brown, looking up into a hemlock grove to assess canopy health.

Volunteer Survey Reporting Metrics

Of the 75 unique volunteers who took on a survey assignment in 2023, 17 were new to the ISF Survey and Monitoring Program. This collection of volunteers completed 155 survey assignments for a total of 1,028 hours dedicated to surveying and monitoring for the year. This work included completing 19 lingering ash surveys, 8 rapid ash mortality assessments and 10 EAB presence surveys in addition to collecting annual data on 4 LH PRISM BLD monitoring plots.

All volunteer data points were reported directly to iMapInvasives. Altogether, ISF volunteers contributed 4,458 presence records to iMapInvasives in 2023 (Appendix II). An additional 25,000 volunteer-contributed points were submitted towards the end of 2023 that will be incorporated into the database in early 2024. This inspiring volunteer reporting effort led to LH PRISM winning two NYS awards in different terrestrial species categories (beech leaf disease and tree of heaven) as part of the 8th Annual Invasive Species Mapping Challenge.

New York Invasive Species Expo

At the end of September 2023, LH PRISM staff were thrilled to participate in the New York State Invasive Species Expo in Saratoga Springs, NY. Leading up to the Expo, LH PRISM Education and Outreach Coordinator, Krysti Sabins, served on the planning committee for the Sunday (public) portion of the event, assisting with advertising and media, as well as other collaborative tasks along the way. Krysti also assisted with marketing for the overall expo, including the creation of graphics, posters, and logos used throughout the event.

During Sunday's Community Conservation Day, the public engaged with all of NY's PRISMs as well as other statewide agencies. Our team enticed passersby with our spotted lanternfly "Bug-Busters" game and carnival cutout, educating them along the way. Throughout the day, we engaged with hundreds of members of the public as they filtered through.

During the professional days of the Expo, our team enjoyed a myriad of workshops, classes, and demos - and hosted a few sessions of our own. Krysti presented on Storytelling and the Language of Invasive Species alongside fellow PRISM E&O folks, while LH PRISM Coordinator, Brent Boscarino, highlighted our regional response to spotted lanternfly and lessons learned over the years. LH PRISM's Terrestrial Invasive Species Program Coordinator, Ryan McClean, ran a management strategies workshop, and Conservation Dogs Program Coordinator, Arden Blumenthal, and Conservation Dog Peat demonstrated how the team detects Scotch broom (an emerging invasive plant found in Harriman and Bear Mountain State Parks primarily). All in all, the Expo was a wonderful way to connect with the public as well as our colleagues to celebrate the work we do.





Trail Stewards Declan Urffer and Ryan McClean assisting with invasive species removal.



Trail Stewards Sydney Veitinger and Declan Urffer show off their display table that included an invasive species hunt

ISF Trail Steward Program Initiatives

The Trail Conference's Trail Steward Program, which is overseen by the LH PRISM Coordinator, engages visitors at popular high-use trailheads and summits in the greater New York metropolitan area to educate them on Leave No Trace principles, responsible outdoor recreation, hiker safety and preparedness, and ecological stewardship. By utilizing the "Authority of the Resource" technique in interactions with visitors, Trail Stewards emphasize the protection of natural resources and the benefits of a healthy ecosystem to encourage positive shifts in behavior. In conversations with visitors, Trail Stewards have the perfect opportunity to inspire action and raise awareness of invasive species and the importance of cleaning boots, gear, and pets – before and after their visit. Trail Stewards receive training and education throughout the season on plant identification, common and emerging invasive species in our region, and the best methods for communicating effectively with a diverse range of visitors.

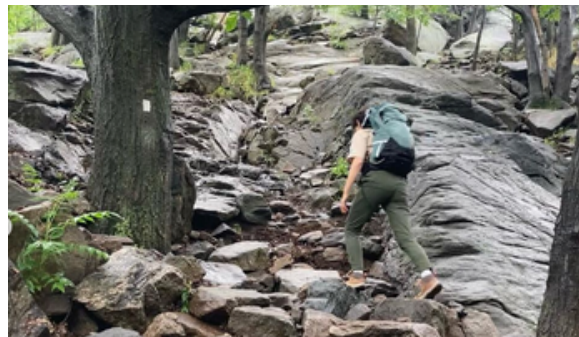
In 2023, the Trail Conference's Trail Steward Program dedicated 1,104 hours to invasive species-related messaging, management, and restoration activities. The Trail Stewards encountered over 26,000 visitors between May and October at trailheads, out on trails, and at popular viewpoints and summits.

Increased signage, such as informational posters at the steward stations and boot brushes at trailheads and kiosks, served as talking points for visitors who may have been first-time trail users, unaware of the threats that invasive species pose to the parks in and surrounding our region. Trail Stewards also engaged the public in volunteer opportunities and encouraged visitors to participate in ways that were meaningful to them (e.g., invasive species-related trail maintenance, outreach and education, or citizen science).

A new initiative for 2023, the Trail Stewards offered multiple guided hikes for the public at key stewarding locations across the region. During these interpretive walks, stewards taught participants essential skills such as basic plant identification, Leave No Trace principles for responsible outdoor enjoyment, the history and ecological significance of the area, and invasive species education. Their mission goes beyond imparting technical know-how; trail stewards inspire a sense of responsibility by educating hikers on how to give back to the lands they cherish, fostering a sustainable and respectful relationship between people and the environment.



Trail Stewards removing water chestnut.



Trail Steward roving Breakneck Ridge.



LH PRISM Coordinator, Brent Boscarino, leading the Trail Stewards on an invasives ID guided walk.

Other PRISM Staff-Led Education and Outreach Program Initiatives

LH PRISM staff also led 36 other education and outreach events, workshops, and presentations in 2023 that reached an additional 1,366 live participants. This included several invited presentations (e.g., spotted lanternfly ecology and management with Westchester Recreation and Parks Society, invasive plant ID and ecology with Adirondack Mountain Club, and conservation dog detection techniques in invasive species work with the Northeast Regional Invasive Species and Climate Change Management Network, among others). Tabling events at Teatown's Eaglefest focused on HWA identification and mitigation. SLF was the featured species for the LH PRISM table at Rye Nature Center's Old Fashioned Winter's Afternoon, Dover Middle School's Earth Day Celebration and Ridgewood High School's Super Science events – all events that were tailored toward youth and family engagement.

LH PRISM staff also led several other trainings in addition to our regular ISF Survey and Monitoring workshops. For example, we ran a series of workshops tying the tenets of Leave No Trace and invasive species ecology to responsible photography including a joint workshop with Hudson Highlands Land Trust highlighting the natural features of the Hudson Highlands and the impacts of invasive species along trail corridors. Similarly, we held a workshop in the summer at Minnewaska State Park Preserve and in the fall at Sterling Forest that educated attendees on responsible recreation including Play. Clean. Go. principles. This workshop also focused on photography skills to document the natural beauty of these unique parks.

The diversity of educational events led by LH PRISM staff reflects our dedication to reaching multiple stakeholder audiences and constituents in the Lower Hudson Valley. Please see the LH PRISM Partner Metrics section for other educational materials and online learning resources produced by LH PRISM partners in addition to these PRISM staff-led events.



Photography + ecology workshop in Hudson Highlands State Park.



SECTION 3:

CHALLENGES AND NEEDS

The Invasives Strike Force Crew made tremendous progress on several long-term management and monitoring projects in 2023. One of the highest priority projects that the ISF Crew tackles (the eradication of sticky sage in Dover, NY) spans multiple private properties. This 80+ acre infestation is especially concerning as the Appalachian Trail cuts through it and the seeds of sticky sage can readily catch a ride on hikers and animals using the trail. Knowledge of the extent of the infestation is imperative to constructing an effective strategic management plan. New permissions to scout and manage sticky sage on the outer boundary of known populations are obtained each year. This is to help ensure we've fully located all extant patches.





A specimen of sticky sage in Dover, NY.



The ISF Crew surveying for sticky sage.

However, securing permission to manage infestations at each private property where sticky sage is known to be present remains a challenge. Outreach attempts to landowners will continue in 2024; the LH PRISM Terrestrial Invasive Species Coordinator will leverage strong relationships built over the past five years with participants in this project to try and obtain the final permissions necessary to access and manage these remaining populations.

Two other long-term projects that the ISF Crew has taken on include kudzu and Scotch broom. There are a handful of Scotch broom and kudzu sites that are growing on cliffsides. With the ISF's current training and equipment, it is too dangerous for the crew to access these segments of the population. Ideally, these infestations would be managed by a crew that has climbing capabilities or the work would be done aerially via drone treatment. The Terrestrial Invasive Species Coordinator is in conversation with these project partners to develop a solution to accessing these populations.

There will be a few revisions to the Invasives Strike Force management operations in 2024. The ISF endeavors to dive deeper into management of invasive species with the goal of conservation target protection. New York Natural Heritage Program data on rare/endangered species and significant natural communities will be reviewed and mined for potential projects that meet PRISM goals and objectives.

Additionally, the ISF will explore the utilization of native restoration techniques as tools to combat invasive species. Partnerships are being formed to allow for ISF sites to be planted with native species following treatment. The competition from these native plants should help suppress invasive species regrowth and seed germination. There is a great need for local, genetically diverse, affordable, climate smart native seeds and plugs to make this vision a reality.

Forest pests and pathogens, including BLD, EAB and HWA, continue to be major stressors to forest ecosystems in the Lower Hudson Valley. The Invasives Strike Force Survey and Monitoring Program volunteers continue to put forth incredible efforts to map not only emerging invasive plants in our region, but also identify the degree to which our native trees are impacted by (or resisting the impacts of, in the case of lingering trees) forest pests. We have begun exploring the option of partnering with academic and/or other research institutions to leverage our ISF volunteer data to build robust artificial intelligence models to help identify beech and hemlock stands. When used together with existing statewide prioritization models, these efforts will help us regionally prioritize areas for forest pest and pathogen management (through biocontrol and other treatment means).

LH PRISM's digital education and outreach infrastructure has grown tremendously since the beginning of the COVID pandemic and further blossomed with the creation of LH PRISM's popular YouTube Channel and Instagram accounts. LH PRISM's webpage is in need of substantial updating to keep pace in an increasingly digital world and we plan to begin the process of transitioning our website to a modernized platform to better meet user demand. Our plan is to subcontract with a website design company in 2024 so that our website can become more easily navigable and act as a more efficient and helpful central hub for information sharing between partners, the public and staff.



An owl oversees our work at a hemlock woolly adelgid biocontrol release site

Lower Hudson PRISM Partner Reports



SECTION 1

**LH PRISM
PARTNER
METRICS**

SECTION 2

**LH PRISM
PARTNER
SUCCESS STORIES**

SECTION 3

**LH PRISM
SUBCONTRACTED
PROJECTS**



SECTION 1:

LH PRISM PARTNER METRICS

Partnership Capacity Building

To maintain and grow our organizational structure, LH PRISM strives to provide incentives for our partners to remain active, engaged, and connected in terms of communication and opportunities for collaboration. 2023 was a remarkable year in regards to partner recruitment with 10 new partners joining the partnership. These new partners include: Dutchess Land Conservancy, Botanical Solutions, LLC, Fat and Sassy Goats, Don Gabel, Simon Gruber, Gunks Climber's Coalition, Hammond Museum and Japanese Stroll Garden, Little Bear Environmental Consulting, Louis Calder Center- Fordham University, and Cornell Cooperative Extension- Westchester County.



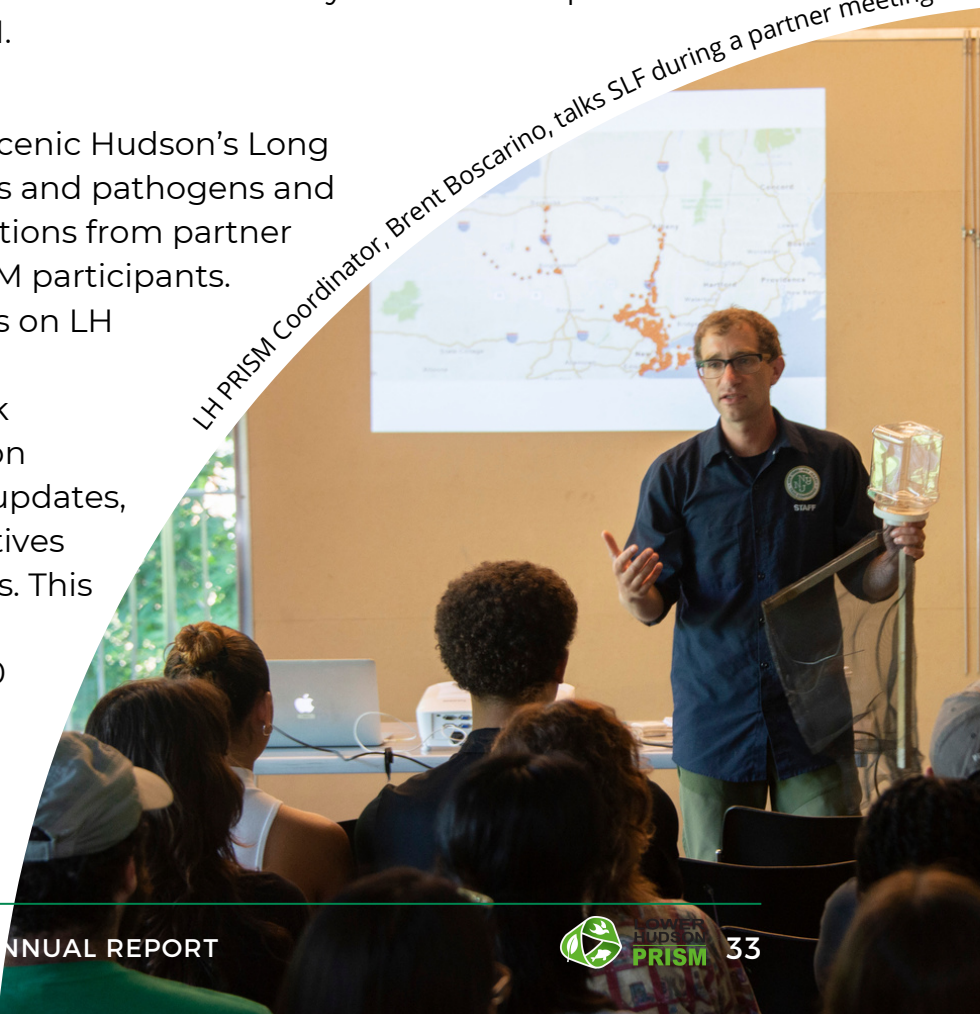
In addition to welcoming so many new partners, LH PRISM Coordinator, Brent Boscarino, engaged in 14 site visits to partner organization's properties to see first hand the exciting work they were leading in 2023. These site visits help PRISM staff to witness and learn the lessons and challenges that our partners face on a day-to-day basis, enabling us to make more well-informed decisions on how best to support our partners in their work. The diversity of partner projects and partnership growth highlight our expanding visibility and capacity as the go-to source for invasive species identification, education, monitoring and management in the Lower Hudson Valley.

Partner Meetings

In 2023, we held 4 PRISM partner meetings. January's online meeting focused on the development of 2023's Action Plan, with partners workshopping priorities, goals and objectives for the year. We also discussed the release, detail and timing of two requests for funding opportunities: one to solicit the help of the Invasives Strike Force Crew in 2023 and the other for subcontract work to carry out invasive species projects through LH PRISM.

July's partner meeting at Scenic Hudson's Long Dock Park focused on pests and pathogens and featured multiple presentations from partner organizations and LH PRISM participants. This included presentations on LH PRISM's SLF management response, regional hemlock prioritization and restoration advances, BLD status and updates, post-BLD restoration initiatives and lingering ash programs. This meeting was a resounding success, drawing in over 80 participants.

LH PRISM Coordinator, Brent Boscarino, talks SLF during a partner meeting





Fall partner meeting held at Vassar College.



Partner meeting/BLD Coalition at Scenic Hudson's Long Dock Park.

October's partner meeting was held at Vassar College and featured a hands-on walking tour of Vassar that focused on Tier 2 species identification and the challenges of managing invasive species in historic estates and institutions. Vassar College staff also highlighted their ambitious riparian buffer restoration project emphasizing their invasive species removal efforts, native species plantings and decision-making processes along the way. This meeting was a great way for partners to see colleagues' work in action and gain valuable on-site experience in identifying Tier 2 species that are typically dispersed throughout the PRISM region in one location.

December's partner meeting at Black Rock Forest was a productive meeting that included strategic plan workshopping as well as a hands-on demonstration of Black Rock Forest's rapid invasive species survey protocol that was supported by LH PRISM subcontract funding. Please see the next section for more updates and information on LH PRISM's strategic planning process.

Strategic Planning Process

In 2023, LH PRISM commenced a 5-year strategic planning process with advice and guidance from consultant Strong Outcomes, LLC, the LH PRISM Strategic Planning Committee as well as input and feedback from a diversity of partners and invasive species stakeholders from our region.

In October 2023, the Strategic Planning Committee developed a comprehensive outreach survey that was sent to a variety of invasive species stakeholders in the Lower Hudson Valley including volunteers, partners and PRISM participants. The survey elicited 101 individual responses: 34% of which were volunteers and/or engaged community members, 30% land managers, 8% educators, and 4% were researchers. Respondents consistently valued being part of the network because it kept them apprised of emerging threats and how to apply best management practices in response. The partnership provided strength in knowing they weren't alone in the fight and that their efforts could be seen as effective force multipliers. They also highlighted the strength of LH PRISM staff in helping to coordinate surveys for partners and volunteers, creating engaging educational content for the public and in organizing the priorities and goals of the Invasives Strike Force Crew. Below are a few representative quotes from the survey that touch on different aspects of LH PRISM's work in the eye of regional stakeholders:

“ —

“It is great to be up to date on the latest information, to make sure we are working effectively, and to collaborate with other organizations doing the same type of work.”

-PRISM Volunteer

“ —

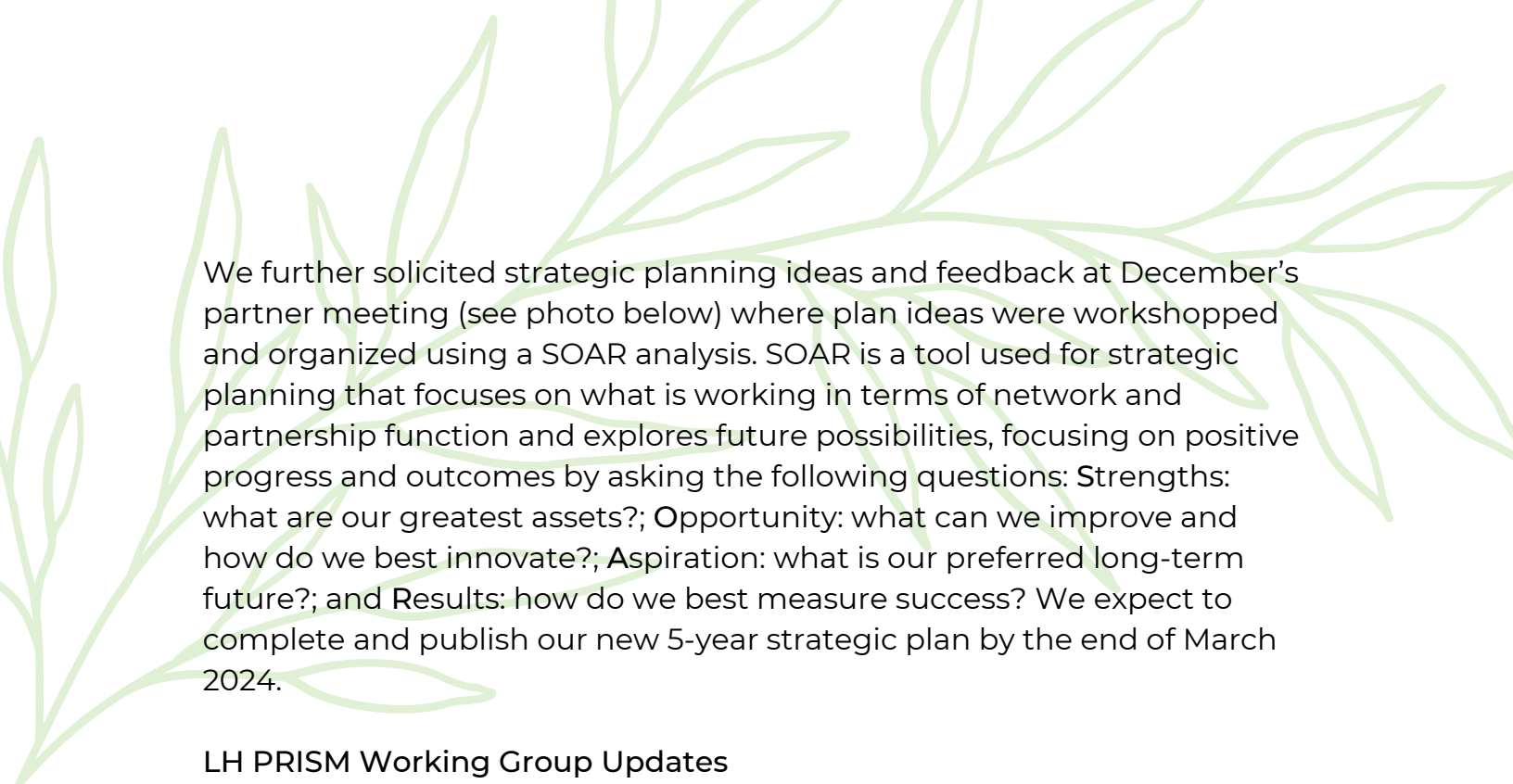
“The LH PRISM is always pushing me to think harder about the solutions to problems that I face and provides a new perspective on how to prioritize invasive species issues within a conservation framework.”

-PRISM Partner

“ —

“I love being outside and hiking in new areas, and my collaboration with LH PRISM allows me to help care for the places I enjoy.”

-PRISM Volunteer

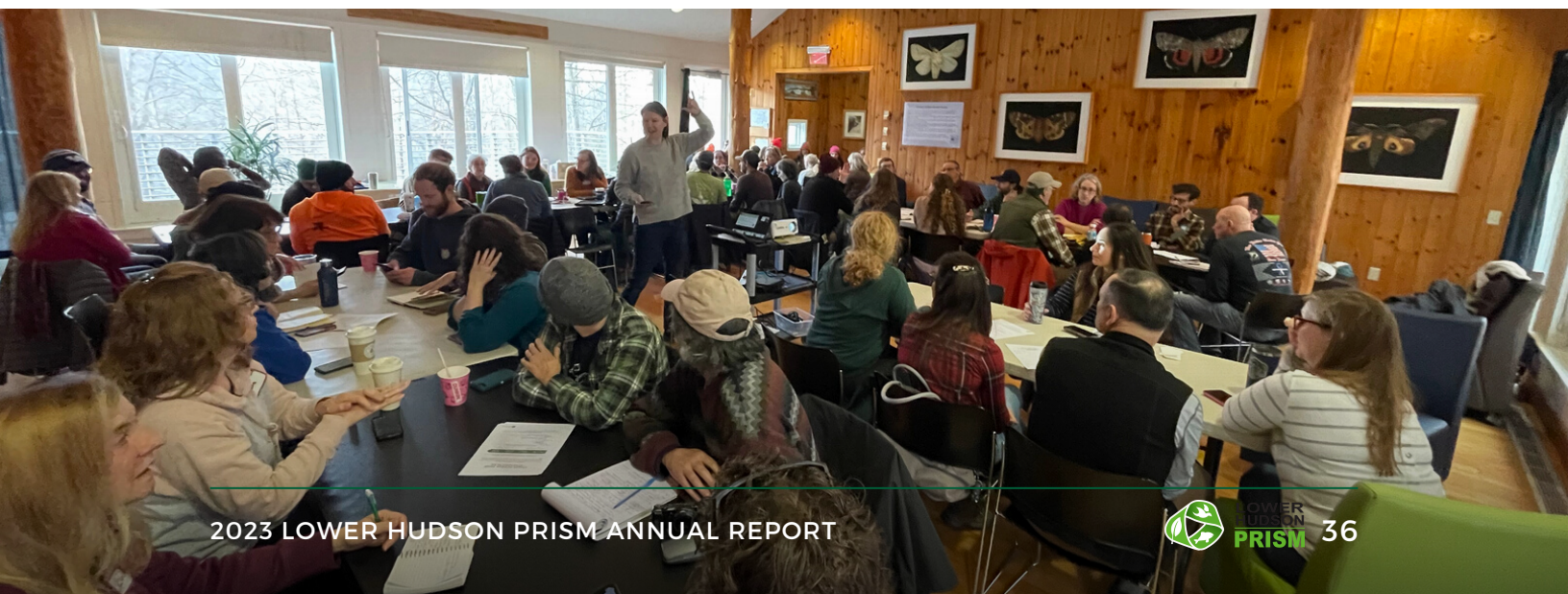


We further solicited strategic planning ideas and feedback at December's partner meeting (see photo below) where plan ideas were workshopped and organized using a SOAR analysis. SOAR is a tool used for strategic planning that focuses on what is working in terms of network and partnership function and explores future possibilities, focusing on positive progress and outcomes by asking the following questions: **Strengths:** what are our greatest assets?; **Opportunity:** what can we improve and how do we best innovate?; **Aspiration:** what is our preferred long-term future?; and **Results:** how do we best measure success? We expect to complete and publish our new 5-year strategic plan by the end of March 2024.

LH PRISM Working Group Updates

Working groups, formed from partners and non-partner participants that express interest in working on a proposed priority topic for our region, perform a significant portion of LH PRISM's strategic planning work outside of regular partner meetings. This working group structure has worked well towards meeting and, in some cases, exceeding annual action plan goals.

In 2023, the Education and Outreach Working Group focused on how to best interact with and reach new audiences with invasive species messaging. The goal was to share information on how to inspire the public to get involved in LH PRISM work and provide clear steps for action. Discussion topics included volunteer recruitment strategies, behavioral change techniques, invasive species storytelling tips, and video content creation dos and don'ts.



The Terrestrial Species Categorization Working Group helps to update our region's invasive species categorization document which classifies many of the invasive species into 5 tiers: Tier 1- threat, Tier 2- emerging, Tier 3- established, Tier 4- widespread and Tier M- monitor. The group utilizes new information on terrestrial species invasiveness, distribution patterns, foreseeable impacts, potential for spread, and effectiveness of best management practices and offers expert feedback on these classifications. Updated terrestrial species categorizations for LH PRISM can be found at the New York Natural Heritage Program's Tier List webpage (note: filter for LH PRISM geography): <https://www.nynhp.org/invasives/species-tiers-table/>

Most invasive species management projects are completed with the goal of improving ecological health through increasing biodiversity or protecting conservation targets. However, best management practices for invasive species removal are not one size fits all solutions. Management plans must often be site specific and account for many considerations related to the protection of native plants and/or wildlife to achieve a local goal. The Native Species Protection Working Group aimed to refine management strategies by identifying those considerations, determining the best way to ensure land managers know of rare, threatened, and/or endangered species and significant natural communities on their properties, and grapple with the idea that a catered management plan may have competing interests for different native species. Information and ideas compiled by this working group were distributed to partners and local land managers to allow for more informed management decisions to be made.



Hemlock health assessment walk at Mianus River Gorge.



LH PRISM's Native Species Protection Working Group works to protect sensitive native habitats and species like this red eft spotted at Sam's Point Preserve (above left) and pink lady's slipper orchid (above right)

The Forest Pest and Pathogens Working Group discussed options, obstacles and pathways for forest pest control in the LH PRISM region with a particular emphasis on management prioritization techniques to combat hemlock woolly adelgid and beech leaf disease. The group began by analyzing the NYS Hemlock Initiative (NYSHI)'s prioritization process and the need to collect data throughout our region on hemlock stands utilizing the regional and private land prioritization models with NYSHI. The group also helped develop a survey and monitoring protocol for lingering hemlocks and beech in the region to better inform what areas we could target for management.

The Aquatic Invasive Species Working Group focused on establishing priorities for management and survey work in inland aquatic systems in the Lower Hudson PRISM region. The group helped provide the expertise and infrastructure to connect with other aquatics stakeholders in the region and to other ongoing state, regional and community programs. The group discussed and shared best management practices and designed strategic approaches for how to prioritize active project sites, working in concert with DEC's new Region 3 Aquatics Coordinator and the Hudson River AIS Task Force.

Partner Education and Outreach Metrics

The overarching objectives of LH PRISM's education and outreach programming are to educate the public about invasive species, help ensure our partners and staff deliver coordinated messages that align with statewide priorities, and to empower those we reach to take informed action on the prevention, identification, reporting and management of invasive species.

LH PRISM celebrated our largest volunteer engagement year to date in 2023, with 10,267 volunteers dedicating 33,009 hours to invasive species-related projects. This nearly doubled the amount of volunteer hours that were devoted in LH PRISM's previous record-setting year of 2022 – quite an incredible feat! This momentous effort underscores how much our community presence continues to grow and how effective our invasive species messaging has translated into tangible, boots-on-the-ground action.

In addition to the training sessions led by LH PRISM staff that were noted in previous sections of this Annual Report, LH PRISM partners hosted 292 training workshops designed to teach volunteers to carry out invasive species-related tasks such as surveying, monitoring or removing invasive species. These training sessions reached an additional 3,651 participants. Partners held another 264 education and outreach-oriented events, including invited talks, in which invasive species were the primary focus (but not necessarily tied to a specific volunteer task or community science project as in the previously mentioned workshop training metrics). These additional invasive species-focused educational events reached another 4,062 participants.



A view of the Gunks entices followers on social media.



Capturing photo/video content for social media.

Online Education and Outreach Metrics

In 2023, our education and outreach efforts reached new heights in terms of audiences and individuals engaged. The Lower Hudson PRISM Facebook page increased its reach by 24% since last year (up to 18.6K individuals), and the Lower Hudson PRISM Instagram account increased its reach by 246.7% (up to 43.7K individuals).

This year, we delved into the realm of Facebook and Instagram “reels” to get the word out about various topics ranging from partner initiatives to promoting NYS Invasive Species Awareness Week (NYISAW). On Instagram and Facebook specifically, our reels have gained over 89K total views. Certain reels stood out including the NYISAW promo which gained nearly 25K views and included cameos from all PRISMs throughout the state. By drawing in viewers via entertaining and at times light-hearted content, we have engaged with new audiences, particularly those between the ages of 18 and 34.

We also continued our production of short-form videos across platforms to engage the public and our volunteers. Videos were produced highlighting hemlock woolly adelgid ID and reporting, invasive species “101,” a biocontrol release at Mianus River Gorge, and Play. Clean. Go. PSAs, among others. This content helped us reach 1,000s of new individuals allowing us to build invasive species knowledge and awareness. Long-form video resources were also created to showcase invasive species management techniques and deer fence installation for restoration projects. These videos were meant for both the public and our partners/professionals in the field and have been well-received.

We also communicated with our volunteers and supporters about upcoming events, highlights, and accomplishments through our monthly newsletters. This stewardship and invasive species-focused newsletter has 3,531 subscribers totaling 25,434 opens in 2023.

Partner Management and Monitoring Metrics

The LH PRISM supports and optimizes regional ecosystem health through strategic invasive species management. The strategies for achieving this goal include managing invasive species according to prioritization modeling, establishing early detection monitoring networks, supporting rapid response capacity and organizing eradication and control efforts. Effective information exchange between partners, state agencies, and other stakeholders on best management practices, challenges and successes is critical to collective progress in invasive species work.



LH PRISM fall partner meeting at Vassar College.



LH PRISM Coordinator, Brent Boscarino, looks on as Budd Veverka (Mianus River Gorge) and Emily Phillips (Manitoga) record hemlock health data



Westchester County Parks partner representative, Taro Ietaka, searches for invasive apple trees at a county park

On top of the PRISM staff-led management projects highlighted in previous sections of this annual report, LH PRISM partners engaged in an additional 630 management projects across 3,400 acres of land and water throughout the LH PRISM region. Partners also monitored an additional 2,101 acres of land following treatment in previous years to help ensure positive progress towards achieving long-term management goals. These collective efforts also supported 587 high school, college or recent graduate interns in invasive species-related work demonstrating our commitment to youth engagement efforts in the Lower Hudson region.

Focus on Spotted Lanternfly Monitoring and Management

Spotted lanternfly continued its expansion throughout the Lower Hudson PRISM region in 2023. LH PRISM staff worked closely with partners and NYS Department of Agriculture and Markets (DAM) on SLF trapping and treatment, prioritizing early detection sites, those with high recreational use and visibility, and those with agricultural and economic value. We also placed significant emphasis on education efforts with homeowners to ensure community members had ready access to approved management options to make well-informed decisions on what to do about SLF on their own properties.

The primary treatment goal at partner properties and regional parks was not local eradication but was instead to slow the spread into areas of important economic value (such as vineyards and orchards) and to help mitigate impacts to the recreational use of our parks and trails. Treatment was primarily accomplished through vacuum harvesting with a high intensity period of harvesting happening in late spring into summer. Altogether, LH PRISM staff and collaborating partners helped to remove 7,527 nymphs from the environment from April through July 2023 with volunteers dedicating over 215 hours to vacuum treatment and squashing throughout this time period. These efforts also included chemical treatment (Golden Pest Spray Oil for egg masses and Dinotefuran on host *Ailanthus*) and host tree removal efforts with the help of LH PRISM partner, Trillium Invasive Species Management, Inc. and Glenn Sungela of New York State Parks respectively.

LH PRISM staff also helped to organize SLF trapping efforts with collaborating partners under the guidance of NYS DAM staff. Altogether, 68 traps were distributed throughout the LH PRISM region with most of the focus in early detection sites in Dutchess, Putnam, Westchester and Ulster Counties. In previous years, most traps had been deployed in Rockland and Orange Counties but given the significant jump in SLF numbers in these counties in the past year, we focused efforts more in these highly infested areas on vacuum and chemical treatment. Partner volunteers checked the majority of the traps installed in 2023 and reported to LH PRISM staff on a biweekly basis. PRISM staff members were then responsible for submitting numbers to Survey123 through the official NYS DAM SLF project site. Altogether, 67 volunteers and PRISM partner representatives dedicated 676 hours to SLF trap checking, reporting and removal in 2023.



Specimen of spotted lanternfly.



SECTION 2:

LH PRISM PARTNER SUCCESS STORIES

One of the most impactful ways of celebrating collective achievements in invasive species work is sharing success stories that inspire others to action. The following examples represent a snapshot of the breadth of invasive-species related projects our partners embarked upon in 2023.





Friends of Rye Nature Center

The Friends of Rye Nature Center tackled a 1-acre area that had been overrun with invasive wisteria and wineberry. Staff and volunteers spent about 2 months cutting back all the invasive vegetation and removing large Norway Maples that were overshading native vegetation in the understory. Following this effort, staff worked together with about 35 volunteers to establish a tree and flower pollinator garden where 51 trees and 53 native wildflowers were planted. To ensure that invasive vines did not grow back up the newly planted trees, cardboard, rocks, and large logs were placed around the base of the trees. Staff and volunteers will now continue monitoring how pollinators utilize the space in the spring of 2024.



Volunteers and staff at Rye Nature Center establishing a tree and flower pollinator garden.



Hudsonia Ltd.

Hudsonia Ltd. has been compiling and analyzing data on habitat functions and other ecosystem services provided by phragmites, knotweed, and purple loosestrife. This, and similar, information is being used by landowners and managers in decisions about when, how, and which invasive plant species to manage and whether adaptive management techniques may be necessary in certain circumstances. For example, Hudsonia has documented considerable nesting by birds in knotweed, which suggests that knotweed stands should be checked for breeding birds prior to treatment, or that treatment be delayed until late summer. Hudsonia is also monitoring occurrences of *Lonicera maackii* and *Amorpha fruticosa*, on Fox Creek in the vicinity of Gallupville, Schoharie County. *L. maackii* seems to be scarce north of the Hudson Highlands and *A. fruticosa* had been limited to the Hudson River shores but is spreading inland now.



NYC Parks

NYC Parks piloted a new forest restoration and management method for invasive species work within restoration sites. The team used a pneumatic air spade, typically used in arboriculture to assess and protect roots of mature trees, to expose the roots of porcelainberry, an aggressive vine that often dominates many forest restoration sites both before and sometimes after planting. With this method, the team was able to make targeted herbicide applications to root nodes that would otherwise have been inaccessible, increasing treatment efficiency and effectiveness and eliminating the potential for off-target damage to native plants. After this application, newly planted trees and shrubs are much more likely to survive to maturity. The team has since developed plans to expand the use of the air spade for such treatments in many more planting sites in 2024.





Jay Heritage Center

Jay Heritage Center (JHC) continues to expand its Invasive Species Education (and Removal) Programs and Workshops. These hands-on opportunities have been incorporated into JHC's programming since 2011, helping volunteers, school groups, park stewards and other non-profit environmental partners like the African American men of Westchester (AAMW) learn how to properly identify and remove common invasive species found in the Westchester County area. JHC's e-blasts also include a section called "And now, a word on invasive species..." in which eight invasive species of concern that have been found at the Jay Estate (and were subject to management efforts) were highlighted including Japanese barberry, tree of heaven, multiflora rose, and black jetbead. Links to the LHPRISM website continue to be made available for readers to learn more about the partnership. JHC is grateful for our ongoing collaboration and guidance from the LHPRISM and in particular the help of the ISF Task Force in September to manage a wide area of highly invasive jetbead.



Above: Invasive species identification and removal has become an annual spring program through JHC and African American Men of Westchester partnership.
Below: ISF Crew identified and removed invasive jetbead.



Volunteers and staff tackle invasive species at The Native Plant Center.



The Native Plant Center

The Native Plant Center is located on the 218-acre campus of Westchester Community College in Valhalla, NY, which includes more than 100 acres of natural areas, hedgerows rife with invasive plants, plus 2 acres of native plant demonstration gardens. High school students from the White Plains Youth Bureau tackled invasives during two of their workdays at The Native Plant Center. The beds and pathways of the 2,400-square-foot Community Garden on campus had become a shoulder-high thicket of mugwort (*Artemisia vulgaris*). The Native Plant Center taught the students how to identify and remove the plant, and they tackled the invasion with youthful vigor. They also participated in invasive plant removal, along with college students and adults, in the meadow in the Lady Bird Johnson Demonstration Garden at The Native Plant Center, which celebrated its 25th anniversary in 2023.

The flora and fauna of the Westchester Community College campus presented some interesting discoveries in 2023. Garden Manager Patricia Butter documented the return of rare native Golden Northern Bumblebees (*Bombus fervidus*), NY S1 endangered, over the course of two days foraging on wild bleeding heart (*Dicentra eximia*) and Larkspur (*Delphinium tricornis*) plants that were set out for the annual native plant sale. Patty had first documented this rare bee in The Native Plant Center gardens in 2022. On July 3, 2023 she documented on iNaturalist the first appearance of a spotted lanternfly nymph on campus. Patty also collected specimen records of newly naturalized species: Crowdipper (*Pinellia ternata*), Japanese Flatsedge (*Cyperus japonicus*), Wych Elm (*Ulmus glabra*), Clammy Goosefoot (*Dysphania pumilio*); all of these are new records for Westchester County.



Removing invasive species and planting native species along the OCA trail.



Friends of the
Old Croton Aqueduct

Friends of the Old Croton Aqueduct (FOCA)

This year the removal of invasive species on the Old Croton Aqueduct was targeted to specific sections of the trail to encourage the emergence of native species and to make space for the restoration planting that was scheduled for the fall. This strategy proved to be extremely successful. In one section, numerous *Chelone glabra* (turtlehead) plants are now thriving where multiflora rose bushes were removed in previous years and where stiltgrass was removed this year. Aster novi-belgii plant (New York asters) are now thriving in a section where invasive species had been removed over the years. This was a section that Wildwoods Restoration Project chose to supplement with additional native plants including goldenrods; this is predicted to attract more pollinators to the area. A third section in which FOCA has been successful in removing invasive species was also targeted for restoration planting. More than 600 native plants were installed in those areas. Finally, removal of invasive species along an historic stone wall resulted in the emergence of many native ferns and other native species. Sections of the trail are now lush with native plants and whole swaths are free of the barberry bushes that have plagued trail walkers and serve as a breeding ground for ticks.



Lesser celandine marked for removal by NSOLF.



Westchester County Parks utilizing an SLF vacuum.



**NORTH SALEM
OPEN LAND FOUNDATION**

North Salem Open Land Foundation (NSOLF)

NSOLF staff and volunteers were able to eradicate a patch of mile-a-minute and lesser celandine after years of monitoring and management – a huge success! There is still a ways to go but efforts are yielding success in reclaiming ground and seeing native species return to once invaded sites. NSOLF also increased the number of our volunteer land stewards that helped restore Trees for Tribes sites and aided in a lot of invasive species management projects on NSOLF properties.



Westchester County Parks

Westchester County Parks had a lot of great successes in SLF removal and education in 2023. The team removed 9.37 total canisters of SLF, scraped over 55 egg masses, and created an educational reel that reached over 4k views. Staff and volunteers also removed ~1 acre of mugwort and replaced it with native plants in the meadows at Lenoir Preserve. The Lasdon Park team also cleared a 2-acre vineland on the perimeter of the property adjacent to Rte 35 where a native hedgerow habitat will be planted in 2024. This is a highly visible area and many visitors and passersby have commented on how great it looks. The team is hopeful that community members will come out to observe the transformation from vineland to native hedgerow habitat in the years to come.



Gunks Climber's Coalition

In 2023, the Gunks Climbers Coalition (GCC) completed the first two phases of a three phase project to treat over 1,500 trees impacted by hemlock woolly adelgid on the Shawangunk Ridge. The project spans 218 acres over five properties. Successes have included working with and educating the community, outreach to our membership partners, successfully fundraising for treatment, and undergoing the treatment itself. GCC plans to finish treatment and set up monitoring plots in 2024.



New York Restoration Project

One of NYRP's forest restoration sites for 2023 was an area badly damaged by storms and a capital construction project over the last decade. This site lost most of its native canopy over the last few years and was becoming overrun with invasive species. The rocky slopes at the site were also seeing significant erosion. Once home to the dusky salamander (endangered in NYC) this site was a great candidate for some restoration work. NYRP used the downed trees for cribbing to terrace the slopes, removed over 1,000lbs of trash, removed roughly 5,000lbs of invasive material, planted 289 native trees, installed 2,674 native plugs, and hosted 25 volunteers to help. NYRP plans to monitor this site regularly and conduct invasive species management on a monthly basis for the foreseeable future. They are hoping to see some salamanders thriving in this area soon.



NYRP working to restore a site after invasives removal.



Trillium Invasive Species Management

Trillium has been working together with New York State Parks at Iona Marsh for a handful of years with new areas targeted every year. Once completely covered in a sea of phragmites, the marshes have been able to rebound due to chemical treatments of patches of phragmites. While Trillium is not the only group responsible for the revitalization of this important ecosystem, it is an amazing feeling to know that the work done there has directly contributed to restoring these wetlands to their native landscape. This year, Trillium targeted and treated phragmites within a 90 acre portion of the property.



SECTION 3: LH PRISM SUBCONTRACT PROJECT REPORTS

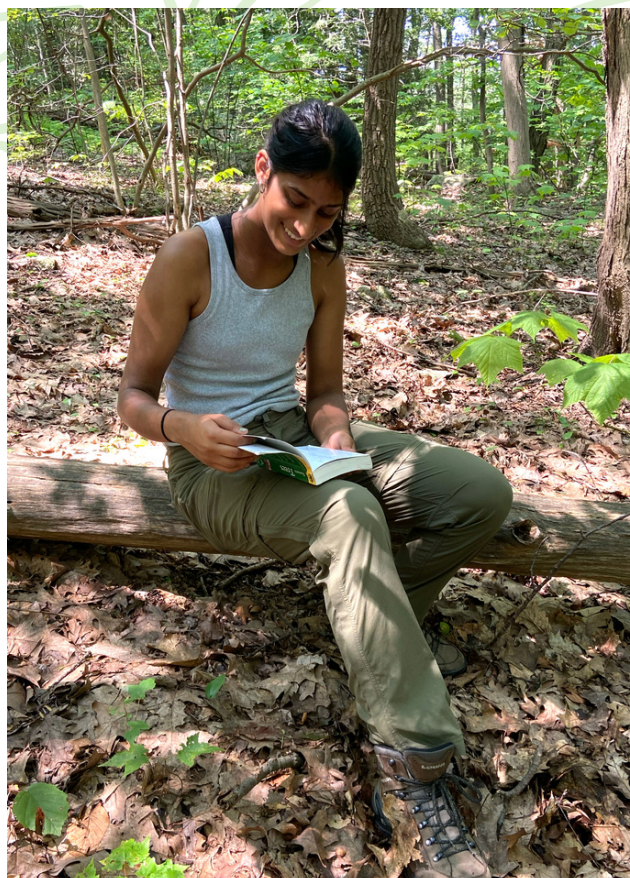
From left to right is Bomin Kim, Katie Terlizzi, Maya Gollerkeri and Sophia Durone setting up survey plots at Black Rock Forest.



Black Rock Forest: Development of an easy-to-follow survey protocol

Black Rock Forest (BRF) manages 3920-acres in the Hudson Highlands as a biological field station with programs in education, conservation, and research. In the last twenty years, casual observations suggest that plant invasions have increased substantially within BRF lands but these invasions have not been fully mapped or monitored. In partnership with the LH-PRISM, Black Rock Forest developed an easy-to-follow survey protocol to map the extent of invasion in a portion of the Forest.

The first phase of the project was to create a suite of focal species to include in the final survey. Forest staff focused on LH-PRISM categorized tier 2 and 3 species to determine which species were nearby and therefore most likely to have gone undetected in BRF. After an analysis of nearby occurrence reports and habitat requirements, 11 species were selected as focal species for the project: hardy kiwi, silvertree, chocolate vine, winter creeper, glossy buckthorn, Japanese holly, Japanese primrose, black jetbead, Japanese spiraea, Linden viburnum and Siebold's viburnum.



Katie Terlizzi and Maya Gollerkeri testing survey protocols at Black Rock Forest.

BRF hosted two Barnard College undergraduate student interns for the summer. Interns, Maya Gollerkeri and Sophia Durone, were trained to identify the 11 focal species, the most common tier 4 species and our most common native overstory tree species. We developed a protocol to survey the forest using a gridded design with points every 100 meters. The goal was to survey all grid cells within a ~ 300-acre management unit of the forest. Data were collected on the presence of invasive plant species and other potential explanatory variables such as native forest type, distance to roads, and other human disturbances.

By the end of the field season, 63 plots were surveyed and none of the focal species were observed, but many more common invasive shrubs were prevalent. The data collected was used to make a series of maps and focus removal efforts. BRF Staff and volunteers removed 6 dump truck loads of invasive shrubs from priority areas – these were mainly burning bush, multiflora rose, and Japanese barberry. Additionally, the new survey protocol was shared with over 50 LH-PRISM partners at the partner's meeting in December 2023. We hope to continue our work on early detection and eradication of invasive species to conserve the native species and communities within Black Rock Forest.



Cornell Cooperative Extension Rockland County: Addressing Invasive Species in Rockland Public Parks



Scenes from CCE Rockland's subcontract project.

Cornell Cooperative Extension Rockland County (CCE Rockland) partnered with the County of Rockland Division of Environmental Resources to address the issue of invasive species in public parks. CCE Rockland and Park Operations Manager, Michael DiMola, were able to provide extensive trainings on invasive species to the park staff and rangers. The trainings were offered throughout the seasons to provide insight on the phenology of different invasive species and how that influences effective management plans. The Parks Department was very receptive to the trainings and was thoroughly engaged in dialogue and how best to tackle the multitude of invasive species in public parks. The trainings also provided insight into some of the current maintenance practices and the standard operating procedures for management of invasive species in public parks. One issue addressed during trainings is that some of the invasive species in public parks are ones that were intentionally planted as ornamentals. Removal suggestions and native plant alternatives were provided in the trainings. CCE also consulted with Rockland Environmental Management Council (EMC) on their trainings, project work and maintenance plans. Invasive species management in public parks is one of the areas of concern for the EMC and this project provided good insight into the issue and how to address it. The relationships developed between Cornell Cooperative Extension, the parks department and the EMC are very valuable. These connections provide a solid foundation for invasive species collaborations in Rockland County public parks. Through this connection, CCE was alerted to unknown infestation sites of both spotted lanternfly and spongy moth.

From May-August, two interns from Rockland Conservation Service Corps worked with CCE staff on invasive species initiatives. They were able to focus their efforts on invasive species surveying and removals in primarily three Rockland County parks. The two interns were able to cover over 40 acres of county parkland removing by hand over 1,500 invasive species. During their time at the parks, they were able to connect with the public visitors and provide educational outreach on invasive species identification, spread prevention and ecology to over 250 Rockland residents. During their time working in public parks, they found two new spotted lanternfly infestations and were able to use the vacuums to remove over 300 SLF and collect data on which instar stages are best targeted for vacuum removals.

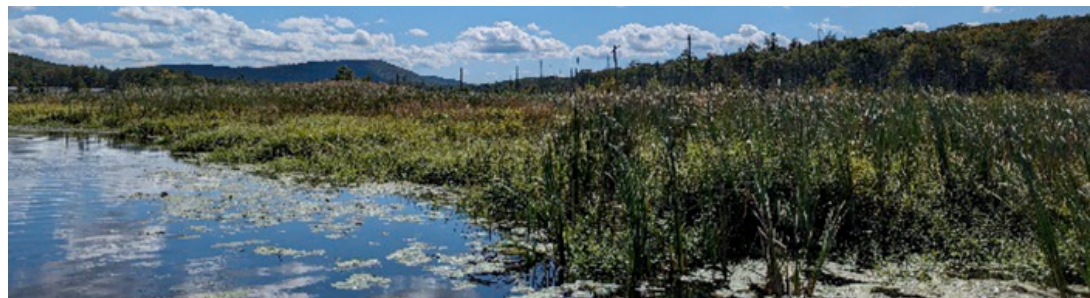


Town of Lloyd: Chodikee Lake

The Town of Lloyd, in collaboration with GEI Consultants, conducted a full lake assessment of Chodikee Lake that included coordination and management of volunteer efforts to remove water chestnut from the lake, an early season full-lake aquatic plant survey and a late season full-lake aquatic plant survey and emergent invasive species survey. The assessment was designed as the first phase in developing an invasive species management plan for both Chodikee Lake and the larger Black Creek Watershed.

GEI staff organized a volunteer training/water chestnut pull on June 10, 2023. The volunteers consisted of citizens, members of the Lloyd Environmental Conservation Committee (ECC), New York State Department of Environmental Conservation (NYSDEC), and GEI staff. Volunteers were trained on proper water chestnut identification, harvesting, and disposal techniques. The majority of the plant harvesting was completed near the inlet of Black Creek. This area is very shallow with water chestnut plants present within 1 to 3 feet of water. The largest patches were observed to the east of the mouth of the creek. A total of approximately 170 lbs. of water chestnuts were harvested from the lake during the initial volunteer training. The second pull was conducted on July 1st with nine volunteers and a total of 235 lbs. were removed for an approximate total of 405 lbs. removed in 2023.

Aquatic plant survey methods involved a point intercept style survey. Pre-determined waypoints from previous survey efforts were re-visited with a total of 110 waypoints surveyed in 2023. A total of 21 separate aquatic taxon were documented during both the June and September 2023 surveys. Of these taxa, seven were emergent species, one was a planktonic cyanobacteria, one was a filamentous algae, two were floating plant species, three were floating leaved plants, and the rest were submersed aquatic plants. The most abundant species encountered during both surveys was white water lily with a mean percent cover over 40% at both survey times. The next most abundant species included the yellow water lily largeleaf pondweed and curly leaf pondweed. Curly leaf pondweed abundance declined from June to September, consistent with seasonal changes in phenology. Water chestnut was most abundant in the southern end of the lake, near the inlet of Black Creek. There were a total of 16 species commonly found during the emergent plant assessment, three of which are invasive within the area of the LHPRISM. The three invasive species encountered were common reed, purple loosestrife and reed canary grass, all of which are ranked as tier 4 species (widespread) in the LHPRISM.



Scenes from the Town of Lloyd, in collaboration with GEI Consultants at Chodikee Lake.

Collaborative Invasive Species Management and Prevention Internship



the *Fresh Air* fund
SHARPE RESERVATION

During the summer of 2023, the Fresh Air Fund (FAF), Hudson Highlands Land Trust (HHLT), and Vassar College (VC) hosted four Invasive Species Management and Prevention Interns. The internships were full time, paid positions that lasted at least 10 weeks and provided resume-building experiences. The interns performed monitoring and mapping of invasive species that are a high priority at individual sites and/or regionally. They worked to control invasive species in high priority conservation areas using both mechanical removal and biological control. The interns monitored forest pests by conducting Beech Leaf Disease (BLD) surveys and establishing and monitoring spotted lanternfly (SLF) traps. They also assessed biocontrol projects. They attended an orientation at Fordham University's Louis Calder Center where they learned about the Trail Conference, Lower Hudson PRISM, iMapInvasives, introductory plant identification, and how to use visual media to tell a story. Afterwards, they continued to share the knowledge they gained throughout their internships. They worked to educate the general public and targeted audiences about invasive species through social media posts, direct engagement, printed materials, tours, volunteer groups, interactive story maps, and educational videos. In addition to the work completed at individual sites, the interns were part of a network and served as a resource for each other. Overall, the internship marked another successful summer of science-based invasive species management across 3,300 acres of preserved land.



Invasive Species Management Interns Mohamed Soumah, Judeline Rodriguez, Chiara Castanada and Lauren Pacheco.



WLT Conservation Apprentice, Gigi, identifies plants in the field at WLT's Little Pond Preserve.



WLT conservation apprentice Alex maps beech trees at the Frederick P. Rose Preserve in Lewisboro.



Westchester Land Trust: Beech Leaf Disease Restoration Collaboration

Westchester Land Trust partnered with regional conservation nonprofits to pilot projects related to forest restoration in areas affected by beech leaf disease. This project had two main goals:

1. Hire two summer conservation apprentices, whose work would include a focus on mapping beech stands and collecting data on the effects of beech leaf disease. Westchester Land Trust hired Gigi Pothiwit and Alex Warren for a 9-week apprenticeship. Alex's final project focused on developing methods to map beech stands from aerial imagery. The apprentices also collected data on forest regeneration in beech stands affected by BLD using "ten tallest" methodology.
2. Create an "equipment bank" to build local capacity for restoration work in beech stands. The concept was to purchase supplies for restoration projects in bulk and then distribute the supplies to local nonprofits and municipalities to promote conservation work. The decision-making process was overseen by the BLD Coalition, a group of land managers from regional conservation organizations. Westchester Land Trust purchased \$4,000 of supplies, including deer fence, fencing hardware and cables, tree tubes, and oak stakes. Through a competitive application process, 4 organizations were awarded supplies to complete restoration projects: Greenburgh Nature Center, Croton Arboretum Inc, North Salem Open Land Foundation, and the Village of Hastings.



Westchester Parks Foundation: All-of-Westchester Internship Program

From April to November 2023, Westchester Parks Foundation (WPF) recruited and hired two paid interns to engage in fieldwork and community outreach. This project addressed Goal 1, Objective D of LHPRISM's 2023 Action Plan: fostering academic relationships, and Goal 4, Objective D: reaching members of groups that are underrepresented in the field of environmental science and conservation. WPF Volunteer Program staff attended outside training workshops and conducted internal development to (1) create messaging and recruitment strategies that are inclusive and (2) design a conservation work experience that values diverse voices. Recruitment materials reached 51 local schools and organizations and resulted in 42 applications from young people in the Yonkers area. Our 2 interns, Laura Mendoza and Jovan Thompson, set the goal to learn as much as they could about various career paths as well as to lead and educate community members about invasive species. Jovan and Laura gained approximately 130 hours each of professional experience. The interns developed knowledge of structural pruning, organized and led a native tree care event, performed maintenance on 268 plantings, and created new educational games for our WPF table at community events.



WPF's All-of-Westchester Interns Laura Mendoza (left) and Jovan Thompson (right)

APPENDIX I: INVASIVES STRIKE FORCE CREW MONITORING & MANAGEMENT SITE METRICS

Project Site	Surveyed (Acres)	Infested (Acres)	Treated (Acres)	High Density sq ft*	# Plants removed	Hours	Species
Arnika	19.11	6.69	2.49	-	3,270	96	Japanese spiraea
Bear Mtn	16.13	1.77	1.57	-	2,542	127	Scotch broom
Black Rock	0.96	0.11	0.11	-	59	19	Glossy buckthorn, Japanese angelica tree, rusty willow
Brinton Brook	1.83	0.36	0.10	-	133	72	Hardy kiwi
Bronx River Res Mt Vernon	0.19	0.06	0.02	-	626	30	Incised fumewort
Bronx River Res Tuckahoe	1.25	1.09	0.16	-	225	40	Siebold's viburnum
Croton Point Park	5.66	2.31	2.19	-	273	83.5	Chinese bushclover, paper mulberry, Sycamore maple
Dover	329.45	84.82	84.00	-	16,514	737	Sticky sage
Foundry Cove	0.33	0.03	0.03	1,236	-	21	Small carpetgrass
Giant hogweed	15.28	1.14	1.14	-	718	96	Giant hogweed
Goshen	17.14	14.01	0.22	-	420	16	Castor aralia
Granite Mountain	3.11	1.96	0.52	-	2,059	84	Burning bush, Japanese angelica tree, linden viburnum
Great Swamp	1.00	0.98	0.85	-	1,987	94	Autumn olive, Japanese barberry, oriental bittersweet, border privet, burning bush,

APPENDIX I (CONT'D): INVASIVES STRIKE FORCE CREW MONITORING & MANAGEMENT SITE METRICS

							common buckthorn, honeysuckle shrub
Harriman	17.02	2.23	2.23	-	3,695	210	Scotch broom
High Tor	3.02	0.09	0.09	-	45	17	Black swallowwort, Chinese silver grass, pale swallowwort
Jay Heritage Center	0.35	0.24	0.16	-	718	70	Black jetbead, mugwort, multiflora rose, wineberry
Kudzu	20.21	3.18	1.40	52,835	117	252	
Lenoir	1.15	0.75	0.34	13,725	276	72	Chocolate vine, five leaved aralia
Lewisboro Land Trust	1.63	1.40	1.40	-	1,518	130	Japanese barberry
Mianus River Gorge	0.05	0.006	0.006	-	15	12	Japanese tree lilac
Mt Beacon	0.04	0	0	-	0	5.5	Small carpetgrass
Nature Study Woods	0.97	0.33	0.23	-	1,546	24	Incised fumewort
Ogden Foundation	3.78	0.32	0.32	-	1,656	15	Scotch broom
Pine Croft	1.68	0.28	0.28	-	103	20	Cutleaf blackberry
Pound Ridge	0.75	0	0	-	0	8	Sticky sage
Rye Nature Center	50.07	22.19	20.27	23,288	504	194	Chinese wisteria, Japanese angelica tree, Japanese stiltgrass, tree of heaven

APPENDIX I (CONT'D): INVASIVES STRIKE FORCE CREW MONITORING & MANAGEMENT SITE METRICS

Shrub Oak	0.05	0.007	0.007	-	77	6	Small carpetgrass
Sterling Forest	0.44	0.08	0.08	-	77	6	Silver vine
Storm King	1.30	0.78	0.78	-	4,728	96	Scotch broom
Three Arrows	46.23	32.60	32.60	-	4,423	79	Japanese spiraea
Vassar College and Ecological Preserve	8.75	1.92	1.92	-	2,283	223	Castor aralia, Japanese tree lilac, linden viburnum, sapphireberry, white poplar
Ward Pound Ridge Res	1.61	0.86	0.45	-	661	108	Autumn olive, Toringo crabapple, common reed
Yeshiva	1.61	0	0	-	0	6	Silver vine
*High Density sq ft reported when species are too dense to be counted during management							

APPENDIX II: KEY LH PRISM iMap INVASIVES REPORTING RECORDS

Appendix II: Key LH PRISM iMap Invasives Reporting Records

Summary Numbers: Presence, Not-Detected, Searched Areas, Acres of Searched Areas by PRISM

Date entered range: 12/10/2022 to 12/10/2023

	Presence		Not-Detected Records	Searched Areas	Acres of Searched Areas
	Confirmed	Unconfirmed			
Statewide	31,142	2,754	20,188	38,094	253,667
LH	5,915	578	8,000	14,386	17,212

The acres of searched area field is a calculation from GIS.

Top Ten Species Reported: Presence (confirmed), Not-Detected, Treatment

Date entered range: 12/10/2022 to 12/10/2023

Presence Detected	Statewide	LH
1	Eurasian Water-milfoil 4,187	Multiflora Rose 954
2	European Common Reed 1,626	Oriental Bittersweet 733
3	Curly Pondweed 1,571	Japanese stiltgrass 579
4	Multiflora Rose 1,445	Japanese Barberry 500
5	Starry Stonewort 1,394	Buckthorn 462
6	Oriental Bittersweet 1,147	Tree-of-Heaven 229
7	Giant Hogweed 1,060	Wineberry 177
8	Buckthorn 1,029	Winged Spindletree 162
9	Japanese stiltgrass; Nepalese B 1,012	Common Carp 94
10	Southern Pine Beetle 947	Garlic Mustard 90

Top Five Organizations Submitting Presence and Not-Detected Records

Date entered range: 12/10/2022 to 12/10/2023

** Confirmed and Unconfirmed

Note: 25,000 more LH PRISM volunteer points were submitted in 2023 for upload but have not yet been processed by iMap. These points will be included in the 2024 Annual Report

	Statewide	
	Organization name	Total Records
1	New York State Department of Environmental Conservation (NYSDEC) (NY)	9,959
2	Adirondack Park Invasive Plant Program (APIPP)	7,338
3	Lower Hudson (LH) PRISM - Volunteer	4,458
4	Adirondack Research LLC	2,707
5	Finger Lakes Institute (FLI)	2,145



Thank you!

We would like to thank our partners, staff, and volunteers for another productive year! None of this work would have been possible without your enthusiasm and dedication. With your help, we have helped make a positive impact on our region's ecosystems and biodiversity.