

APIPP HIGHLIGHTS

2022 APIPP HIGHLIGHTS

More than 30 organizations and 100 volunteers share their ideas, time, and resources to advance the mission of the Adirondack Park Invasive Plant Program (APIPP). Together, as these highlights of our collaborative 2022 work show, APIPP and its partners are making major advances in reducing the threats invasive species pose to the Adirondack region. Thank you!



INNOVATION AND PARTNERSHIPS



APIPP STARTED a new research project in 2022 to evaluate mechanical and chemical treatment alternatives to glyphosate for the control of invasive knotweed species (*Reynoutria spp.*).

IN PARTNERSHIP with the St. Lawrence-Eastern Lake Ontario (SLELO) Partnership for Regional Invasive Species Management (PRISM), APIPP piloted the use of environmental DNA for monitoring aquatic invasive species (AIS) in Adirondack watersheds.

DATA ABOUT AIS was collected for the first year of a research project to determine the cost-effectiveness of strategically harvesting Eurasian watermilfoil (*Myriophyllum spicatum*) at several boat launches on Lake Champlain to reduce the number of boats leaving the lake with milfoil on them.

RESEARCH COMPLETED IN 2022 shows that sites with terrestrial invasive plant infestations managed by APIPP are passively restoring to natural habitat. Over 64% of sites treated by APIPP no longer have invasive plants present.

AQUATIC INVASIVE SPECIES DETECTION



VOLUNTEERS, PARTNERS, CONTRACTORS, AND STAFF submitted a record number of 181 monitoring reports for 156 lakes.

FIVE NEW WATERBODIES were found to have AIS, and an additional aquatic invasive plant was found in one lake that was already invaded. The percentage of lakes with AIS observed in 2022 was 25.6, which was slightly higher than the five-year average, but within the normal range.

117 LAKES
WITH AIS
PRESENT

76% OF
LAKES ARE
FREE OF AQUATIC
INVASIVE
SPECIES

NO NEW INFESTATIONS of invasive small-bodied aquatic organisms were found.

NEARLY 76% OF THE 483 Adirondack waterways monitored over the last 21 years are AIS free!

TERRESTRIAL INVASIVE SPECIES DETECTION



STAFF, PARTNERS, VOLUNTEERS, AND CONTRACTORS surveyed 42 New York State Department of Environmental Conservation (NYSDEC) campgrounds, over 110 recreational access points (such as trailheads and boat launches), sections of over 30 Forest Preserve units, and part or all of over 40 state and county road corridors for invasive species.

NEARLY 500 NEW terrestrial invasive species infestations were found, bringing the total number of mapped infestations in the Adirondack region to 7,165.

THE FIRST KNOWN POPULATION of invasive wineberry (*Rubus phoenicolasius*) in the Adirondack PRISM was found on Long Island in Lake George.

APIPP'S NEW SEASONAL FOREST PEST RESEARCH ASSISTANT monitored more than 60 sites and 17 traps for five different forest pests. No new species were found.

INVASIVE SPECIES MANAGEMENT



APIPP MANAGES 14 terrestrial species and has 897 infestations under active management.

THANKS TO SEVERAL YEARS OF WORKING WITH PRIVATE LANDOWNERS, giant hogweed (*Heracleum mantegazzianum*) is now present in only two locations in the Adirondack PRISM. APIPP also worked with private landowners to treat 10 infestations of tree-of-heaven (*Ailanthus altissima*) in 2022.

MANAGEMENT EFFORTS ARE WORKING! Garlic mustard (*Alliaria petiolata*) abundance at NYSDEC campgrounds in the Adirondacks has decreased by 91% since management efforts began, and the species has been locally eradicated from seven campgrounds.

THANKS TO THE WORK OF APIPP PARTNERS, five species of AIS are being managed in Adirondack waterbodies. Five lakes are also participating in APIPP's Lake Management Tracker program to assess the effectiveness of management actions.

COMMUNITY ENGAGEMENT



APIPP RAISED AWARENESS ABOUT INVASIVE SPECIES identification, prevention, and management by partnering with more than two dozen organizations in workshops and events that reached over 1,900 people. APIPP was mentioned over 40 times in print, digital, radio, and television news stories and our social media presence expanded.

APIPP'S "PROTECT YOUR FORESTS" AND "PROTECT YOUR WATERS" outreach materials are available in hundreds of locations across the Adirondack Park. A new *Field Guide to Terrestrial Invasive Species of the Adirondacks* was added to APIPP's suite of outreach materials.

A NEW BOOT BRUSH STATION was developed for the Adirondack Mountain Club. It is slated to be installed near the Adirondack Loj in the spring of 2023.

THE ADIRONDACK WATERSHED INSTITUTE (AWI) of Paul Smith's College is an important spread-prevention partner. AWI staffed more than 40 locations with trained stewards who educated boaters, inspected a total of 70,054 boats, and decontaminated 2,815 boats. Stewards found AIS on 733 boats and prevented these invasive species from entering other waterbodies.

SPECIAL INITIATIVES

THE SPECIAL INITIATIVES DESCRIBED IN THIS SECTION ADVANCE GOALS 1, 2, 3, 6, 7, 10 & 12 OF APIPP'S 2013 STRATEGIC PLAN.

FOREST PEST HUNTERS



SURVEYING FOR HWA.

THANK YOU VOLUNTEER FOREST PEST HUNTERS! APIPP expanded this collaborative community-science program after a successful 2021 pilot. In 2022, the effort to search for hemlock woolly adelgid (HWA) (*Adelges tsugae*) was extended beyond the Lake George region. Partners from the Lake George Land Conservancy, Adirondack Mountain Club, Capital Region PRISM, Ausable River Association, iMapInvasives, and NYS Hemlock Initiative (NYSHI) recruited and trained volunteers to search for HWA and track their findings.

The 2022 HWA effort kicked off with a webinar in February and several field trainings throughout February and March.

The program ran through early April. Throughout the survey season, volunteers adopted 114 trails through an interactive web map, contributed 438 records to iMapInvasives, and donated over 400 hours of their time. Wow!

Building on the success of the HWA program, APIPP launched Forest Pest Hunters for beech leaf disease (BLD) in the fall of 2022 in response to the discovery of this new disease in the Adirondacks. The BLD component of Forest Pest Hunters kicked off with a webinar in mid-September; the survey season ended October 31. During that short survey season, volunteers adopted 33 trails, added 101 records to iMapInvasives, and donated over 100 hours of their time.

Volunteers contributed an astounding 500-plus hours of survey work in 2022. This irreplaceable contribution expanded the Adirondack PRISM's understanding of these two forest pests. Thank you to the Forest Pest Hunter volunteers!

ADIRONDACK INVASIVE SPECIES SUMMIT

APIPP BROUGHT TOP SCIENTISTS TO BLUE MOUNTAIN LAKE to share their expertise with Adirondack partners at the Invasive Species at Our Door: Adirondack Invasive Species Summit. The October event convened experts on two invasive species that threaten the Adirondack region: HWA and hydrilla (*Hydrilla verticillata*).

The summit's morning session included scientists from Harvard Forest, Cary Institute of Ecosystem Studies, and NYSHI. These scientists provided important data to inform a discussion of the impact HWA may have on forest ecosystems in the Adirondacks and on the carbon sequestration potential of NY's forests. The speakers also presented options for managing hemlock forests to reduce these impacts and shared information about the potential for using biocontrols to fight HWA.

Speakers from Lake Champlain Basin Program (LCBP), AWI, University of Georgia, and Finger Lakes Institute of Hobart and William Smith College spoke about hydrilla during the afternoon session. The session began with an introduction to hydrilla, and then went on to cover the invasive plant's current infestation locations, how its presence could impact the Adirondacks, and Adirondack hydrilla prevention programs. Dr. Susan Wilde, Associate Professor with the University of Georgia, spoke about her groundbreaking research that uncovered a link between a bacteria connected with hydrilla and the death of eagles in the Southeast.

The summit was livestreamed on APIPP's Facebook page. The recordings are on APIPP's YouTube channel.



DR. SUSAN WILDE SPEAKING AT THE INVASIVE SPECIES SUMMIT.

2023-2027 STRATEGIC PLAN

THE ADIRONDACK PRISM HAS A NEW STRATEGIC PLAN. The 2023-2027 Strategic Plan unites regional invasive species efforts under four goals and places a greater emphasis on the importance of partners and volunteers in achieving this new shared mission:

To work in partnership to minimize the impact of invasive species on the Adirondack region's communities, lands, and waters.

The work of the partnership is more critical now than ever before. New invasive species continue to be found in the PRISM, forest pests are gaining ground, and our warming climate puts additional pressure on our freshwater and terrestrial ecosystems. While no one entity can tackle these challenges on its own, the diverse partners of the Adirondack PRISM—nonprofit organizations, research institutions, businesses, government, and committed volunteers—are a powerful force for positive action.

The new plan provides a clear path for anyone interested in working on invasive species to contribute to regional efforts. Partners and volunteers can help minimize the impact of invasive species on our aquatic and terrestrial ecosystems, seek innovative solutions, and engage communities in this important work.

The strategic plan was guided by a 10-member steering committee and informed by 43 one-on-one interviews and 56 responses to a survey. Caitlin Stewart, District Manager for Hamilton County Soil and Water Conservation District and one of the steering committee members, perfectly captured the spirit of the new plan. She said, "working on invasive species can seem overwhelming, but by partnering with APIPP our team can focus on priority species. APIPP knows the Adirondack ecosystem and knows our communities, and they let us know how we can best help make a difference."



Adirondack Partnership for Regional
Invasive Species Management



THE 2023-2027 STRATEGIC PLAN'S COVER.

NATIVE PLANT REPORT



WHITE TRILLIUM AT BOQUET RIVER NATURE PRESERVE.

APIPP WANTED TO KNOW if its efforts to manage certain invasive plants restores ecosystems to their natural state. To help answer this question, APIPP contracted with Adirondack Research in the summer of 2021 to complete a native vegetation reestablishment study. The objective of the study was to assess whether sites managed with herbicides to remove knotweed species (*Reynoutria japonica*, *Reynoutria sachalinensis*, and *Reynoutria x bohemica*) or common reed grass (*Phragmites australis*) returned to non-invasive plant community structures that resemble plant communities in their natural, uninvaded states.

To achieve this objective, species richness (number of species present) and plant density (as measured by total percent ground cover of non-invasive plants, percent bare ground, or average density of the five most common non-invasive species) were measured at 71 treatment sites. Sites were along roadsides in the Adirondack Park and included 35 knotweed and 36 common reed grass infestations. Treated sites were compared to nearby reference sites to determine if successful passive restoration is occurring after the invasive plants are treated with herbicides.

The study, completed in 2022, found that sites treated with herbicides to remove invasive plants had a similar community of non-invasive plant species as nearby reference sites. This held true even when the invasive plant infestations had only received one year of herbicide treatment and still had some invasive plants present.

Based on the variables measured in the study, treated sites can revert to a natural state relatively quickly. One reason for the successful restoration in these areas may be that the sites were generally small, and native plants were able to easily colonize as invasive species were removed with chemical treatment.

KNOTWEED CONTROL RESEARCH

KNOTWEED IS A HIGHLY INVASIVE SPECIES that is widespread in the Adirondack PRISM. APIPP manages knotweed in ecologically sensitive areas to mitigate its impacts on priority conservation areas (such as rare habitats, endangered species, and recreational assets). When managing invasive species, it is important to routinely evaluate the effectiveness of management techniques to ensure the most viable treatment option is used.

In a new research project, APIPP set out to assess alternatives to glyphosate for the treatment of knotweed. APIPP tested the efficacy of three herbicides using two application techniques, foliar spray and stem injection, and piloted the use of wire mesh as a mechanical control. This research will help inform future knotweed management strategies and is especially relevant as glyphosate-based herbicides—currently the most common knotweed treatment technique—become subject to increasing regulatory restrictions.

To test the effectiveness of each herbicide and application method, APIPP established sets of 1 m² plots in three knotweed infestations. We measured the diameter and marked all plant stems in each plot, and then randomly assigned a treatment technique. Herbicide applications were performed at peak knotweed growth and the effectiveness of treatments was evaluated at two, four, and six weeks after chemical application.

We calculated effectiveness using a visual estimate of “percent injury” for treated stems in each plot (0% = no impact; 100% = dead stem). Average percent injury in each plot was calculated for each treatment technique. Wire mesh was installed over a single knotweed infestation in August and its effectiveness will be evaluated in 2023.

At six weeks, injection treatments resulted in higher percent injury (greater control of knotweed) than foliar treatments. The most effective treatments were injection of glyphosate and aminopyralid, which both resulted in 96% control. Aminopyralid was the most effective product applied as a foliar treatment, resulting in 69% control, followed by glyphosate with 53% control. Plots will be monitored for knotweed reemergence in spring 2023 and treatments and post-treatment monitoring will continue in summer 2023.

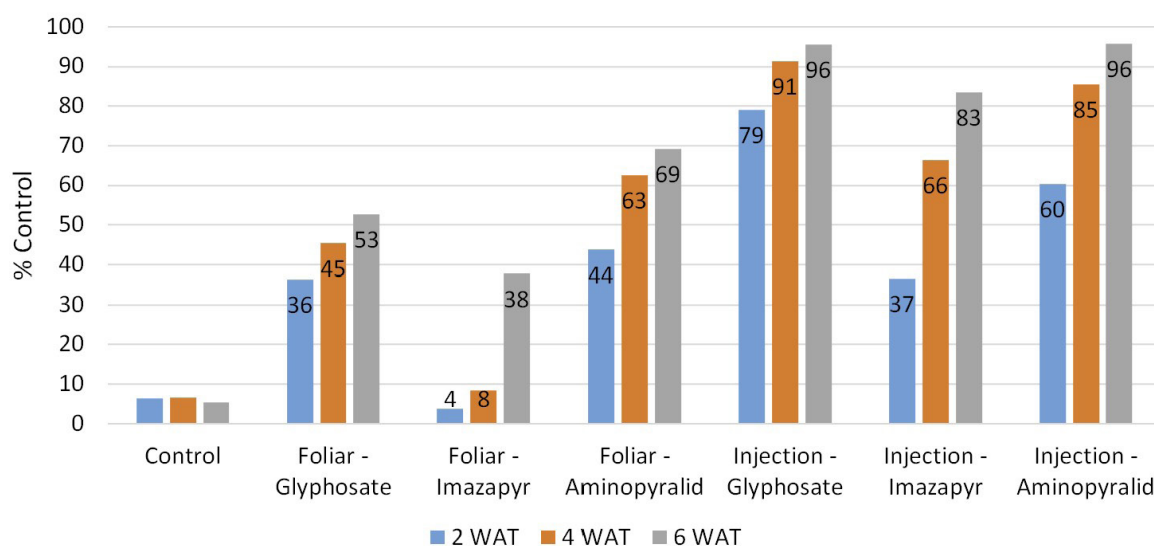


FIGURE 1. AVERAGE PERCENT INJURY OF TREATED STEMS BY HERBICIDE AND APPLICATION TECHNIQUE AT TWO, FOUR, AND SIX WEEKS AFTER TREATMENT (WAT).

CROSS-PRISM AQUATIC INVASIVE SPECIES EDNA PROJECT

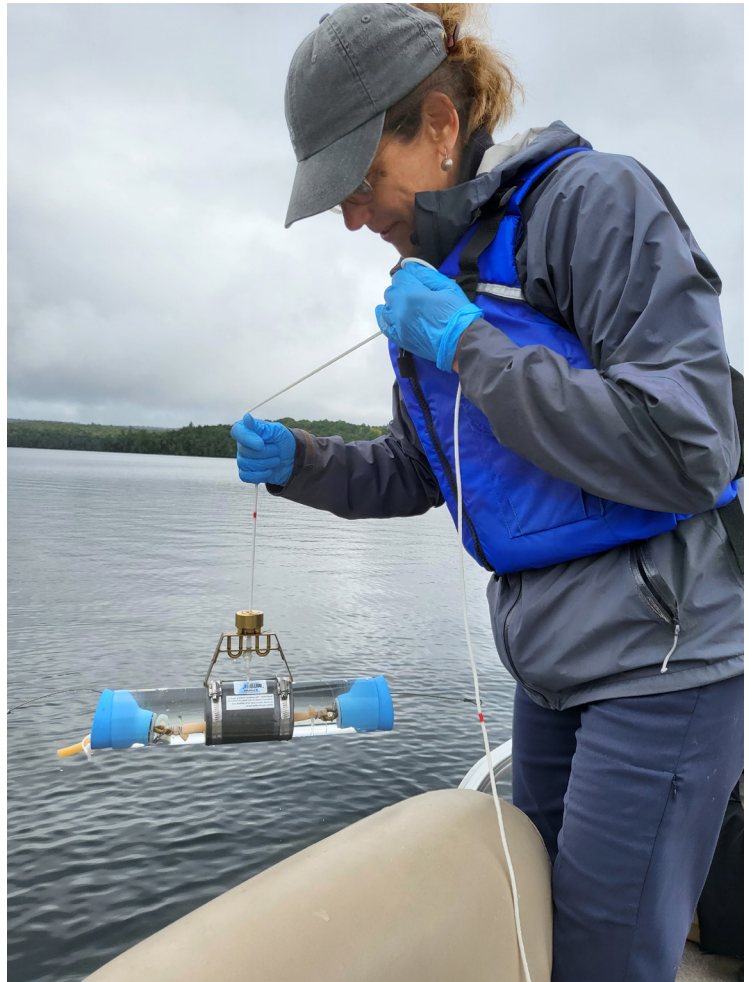
HUMANS HAVE A PROPENSITY TO DRAW ARTIFICIAL BOUNDARIES on the planet that do not reflect the reality of our environment. Town, county, and state boundaries often cut right through lands and waters, asserting a delineation that is not there on the ground. NY's eight PRISM boundaries follow this trend and reflect geographical regions, not invasive species boundaries.

The most ecologically relevant boundaries for AIS are watersheds because they are landscapes connected by the flow of water. There are five watersheds (St. Regis, Raquette, Grass, Oswegatchie, and Black rivers) with headwaters that start in the Adirondack Mountains and flow downhill out of the Adirondack PRISM and into the SLELO PRISM. Lake Ontario and the St. Lawrence River have the highest number of AIS in the region and these rivers that drain to them can be a pathway for AIS to spread upstream.

APIPP teamed up with SLELO to work across the PRISM boundary and sample along these rivers to search for the presence of AIS using eDNA. Environmental DNA, or eDNA, is a method that filters water to collect plant and/or animal cells and tests the samples for the presence of genetic material of specific species. In this project, APIPP and SLELO sampled for nine species including rusty crayfish (*Orconectes rusticus*), round goby (*Neogobius melanostomus*), hydrilla, and Eurasian watermilfoil.

APIPP funded a summer seasonal AIS technician who was shared with the SLELO PRISM. The technician, Gabriel Yerdon, traveled across the region to collect 168 eDNA samples from over 65 locations. Fortunately, initial results indicate that locations where AIS were found are outside of the Adirondack Park and are concentrated near the lower sections of the rivers. Species not previously known in the region, like hydrilla or northern snakehead (*Channa argus*), were not detected in any of the samples. Adirondack PRISM Tier 1 species like round goby and rusty crayfish were found, but were found outside of the PRISM boundary. This cross-boundary project provided APIPP with more information about the location of these species and the potential threat they pose to the Adirondacks.

APIPP also assisted NYSHI with research that uses eDNA to detect HWA. APIPP's seasonal forest pest research assistant, Megan Grega, collected 150 hemlock branch samples from 25 locations near areas known to be infested with HWA and sites outside of the area of known infestation. These samples were processed by NYSHI and results will be shared in early 2023.



COLLECTING AN EDNA SAMPLE.

APIPP SERVES AS THE ADIRONDACK PARTNERSHIP FOR REGIONAL INVASIVE SPECIES MANAGEMENT (PRISM), ONE OF EIGHT PARTNERSHIPS ACROSS NEW YORK STATE (NYS). APIPP IS A PROGRAM FOUNDED BY THE NATURE CONSERVANCY (TNC), THE NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC), THE NYS DEPARTMENT OF TRANSPORTATION (NYSDOT), AND THE ADIRONDACK PARK AGENCY (APA). FUNDING IS PROVIDED FROM THE ENVIRONMENTAL PROTECTION FUND AS ADMINISTERED BY NYSDEC.

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