2023 ANNUAL REPORT
THE ADIRONDACK PARK INVASIVE PLANT PROGRAM

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INVASIVE SPECIES
MANAGEMENT
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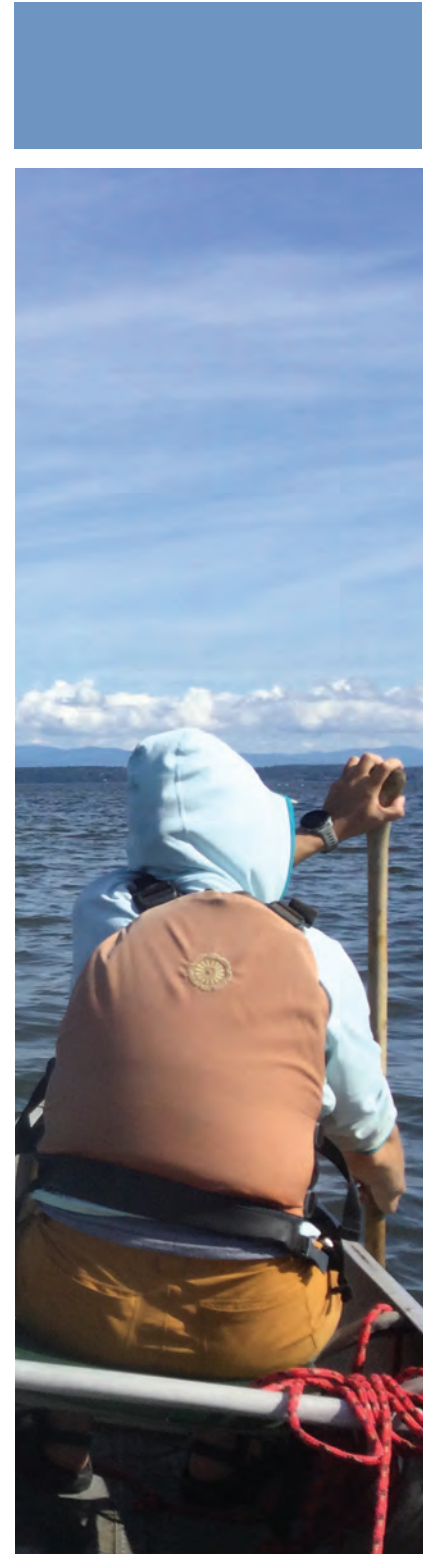
EXECUTIVE SUMMARY

Dear Partners and Supporters,

I am honored to share this 2023 Adirondack Park Invasive Plant Program (APIPP) Annual Report. The report showcases the progress made toward achieving the goals of the new Adirondack PRISM 2023-2027 Strategic Plan. It was an exciting year: APIPP released the first biological controls for emerald ash borer in the Adirondack Park, developed a new tool to determine which areas within a lake are most vulnerable to aquatic invasive species (AIS) invasion, and achieved many other milestones detailed in this report.

The accomplishments outlined on the following pages would not be possible without the strong foundation built by The Nature Conservancy in its 25 years of hosting APIPP, our extraordinary volunteers, and the engagement of more than 30 partners, including our three founding partners—the New York State (NYS) Department of Environmental Conservation (DEC), NYS Department of Transportation, and NYS Adirondack Park Agency.

I am pleased to report that our 2023 monitoring results show that 75% of Adirondack waterways still remain free of AIS—ensuring clean water for future generations. Our terrestrial invasive species management efforts are also highly successful, and we are making new strides in the fight against forest pests that threaten the habitats and carbon sequestration potential of Adirondack forests. Our education programs this year were outstanding, and our following on social media continues to expand.

The strong Adirondack PRISM partnership positions us well to face the challenges ahead as the climate warms and new invasive species take hold in the region. We can already see these changes on the ground in our Adirondack forests and waters. Hemlock woolly adelgid (HWA) can no longer realistically be contained to the Lake George watershed, tree-of-heaven has continued to spread and is now a Tier 3 species, and seven new waterbodies were found to be infested with AIS in 2023.

To meet these challenges head on, I am excited to report that The Nature Conservancy has received notice from NYSDEC that it will be the recipient of a contract for services to continue to staff the Adirondack PRISM from 2024-2028. The APIPP team is excited to carry out the contract and work with our partners and volunteers in the years ahead to minimize the impact of invasive species on the Adirondack region's communities, lands, and waters.

Thank you partners and volunteers!

Sincerely,

Tammara Van Ryn

APIPP STAFF

TAMMARA joined the APIPP team as Program Manager in late 2019. She brings a natural resource and land conservation background to the position as well as experience building partnerships.

**Tammara Van Ryn,
Program Director**

ZACK is the Conservation and GIS Analyst for the Adirondack and St. Lawrence Eastern Lake Ontario (SLELO) PRISMs. Zack brings his prior experience managing APIPP's terrestrial program and skills in data analysis to the team.

Zachary Simek, Conservation and GIS Analyst

BECCA joined the team in spring 2020 as the Terrestrial Invasive Species Coordinator. She adds experience in project management, plant identification, and advanced GIS skills to the team.

Rebecca Bernacki, Terrestrial Invasive Species Coordinator

BRIAN joined APIPP in spring 2021 as the Aquatic Invasive Species Coordinator. He adds his knowledge of plant communities and water quality to the team as well as his experience working with volunteers.

Brian Greene, Aquatic Invasive Species Coordinator

SHAUN joined the APIPP team in May 2022 as the Communications Coordinator. He adds his knowledge in journalism, editing, photography, and graphic design to the team, as well as his experience as a community volunteer.

**Shaun Kittle,
Communications Coordinator**

Special thanks to APIPP's 2023 Invasive Species Seasonal Staff:

Megan Grega, Invasive Species Assistant

Dana Holmlund, Aquatic Invasive Species Assistant

Leah Smisloff, Forest Pest Research Assistant

Becca Tamanga, Invasive Species Management Steward

2023 APIPP HIGHLIGHTS

More than 30 organizations and 100 volunteers share their ideas, time, and resources to advance the mission of the Adirondack Partnership for Regional Invasive Species Management (PRISM), which is supported by the Adirondack Park Invasive Plant Program (APIPP), hosted by The Nature Conservancy. Together, as these highlights of our collaborative 2023 work show, APIPP and its partners are making major advances in reducing the threats that invasive species pose to the Adirondack region.

INNOVATION AND PARTNERSHIPS

APIPP ASSISTED the New York State Hemlock Initiative at Cornell University (NYSHI) with two research projects. One study is evaluating how imidacloprid, a pesticide used to treat hemlock woolly adelgid (*Adelges tsugae*) (HWA), moves within a tree and its roots. Another study is testing the use of environmental DNA (eDNA) to detect the presence of HWA.

APIPP ALSO COLLECTED hemlock branch samples for a study of the hemlock genome that the University of Connecticut is undertaking.

TO ADDRESS THE THREAT of Eurasian watermilfoil (*Myriophyllum spicatum*) and curly-leaf pondweed (*Potamogeton crispus*) to the Adirondack environment and economy, APIPP completed the second year of a pilot project on Lake Champlain. The study is assessing whether strategic removal of these plants at boat launches will reduce the number of boats leaving the lake with aquatic invasive species (AIS) on them.

APIPP ALSO COMPLETED the second year of a research project that evaluated mechanical and chemical treatment alternatives to glyphosate for the control of invasive knotweed species (*Reynoutria spp.*).

A TWO-YEAR CONTRACT with Tetra Tech also wrapped up in 2023, with the completion of the Adirondack Within-Lake AIS Vulnerability Prediction Tool.

AQUATIC INVASIVE SPECIES DETECTION

VOLUNTEERS, PARTNERS, CONTRACTORS, AND STAFF submitted 184 monitoring reports for 141 lakes. APIPP also collected 70 water samples from 22 lakes to test for AIS eDNA.

SEVENTEEN NEW AIS OBSERVATIONS were found across the PRISM. Some of these were on waterbodies with other existing AIS populations, but seven waterbodies with no previously known AIS observations were found to have AIS.

THE PERCENTAGE OF WATERBODIES surveyed with AIS observed in 2023 was 37.6%. That figure is higher than the five-year average but it was the result of APIPP staff using past data to target the most probable areas of infestation. To date, 75% of the 499 Adirondack waterways monitored over the last 22 years remain AIS free.

127 LAKES WITH AIS PRESENT

75% OF LAKES ARE FREE OF AQUATIC INVASIVE SPECIES

TERRESTRIAL INVASIVE SPECIES DETECTION

STAFF, PARTNERS, VOLUNTEERS, AND CONTRACTORS surveyed 41 New York State Department of Environmental Conservation (NYSDEC) campgrounds, over 150 recreational access points (such as trailheads and boat launches), sections of over 30 Forest Preserve units, and part or all of approximately 30 state and county road corridors for invasive species..

NO NEW TERRESTRIAL INVASIVE PLANT SPECIES were identified in the PRISM in 2023; however, nearly 350 new infestations of terrestrial invasive plants were found, bringing the total number of mapped infestations in the Adirondack region to 7,566.

THE PROFESSIONAL EARLY DETECTION AND RAPID RESPONSE (EDRR) CREW from Invasive Plant Control, Inc. (IPC) assessed over 1,100 sites and found approximately 400 that no longer had the target plants present. This is great evidence of the success of past treatments. The crew treated roughly 300 sites.

APIPP'S SEASONAL FOREST PEST RESEARCH ASSISTANT monitored 35 sites to survey for six forest pests. In addition, they released 4,500 biological controls for emerald ash borer (*Agrilus planipennis*) (EAB) and, with NYSHI, over 1,900 biocontrols for HWA.

INVASIVE SPECIES MANAGEMENT

APIPP MANAGES 14 terrestrial species and has 721 infestations under active management.

DESPITE PREVIOUS EFFORTS TO REMOVE TREE-OF-HEAVEN (*Ailanthus altissima*) from the few sites where it was found in the Adirondack PRISM, 13 new sites were identified in 2023. There are now at least 31 known sites, and this species has been moved to a Tier 3 status. APIPP is helping private landowners manage 19 of the sites. Tree-of-heaven is a favorite of spotted lanternfly (*Lycorma delicatula*), an invasive insect that has not yet become established in our region.

THANKS TO SEVERAL YEARS OF COLLABORATION with private landowners, giant hogweed (*Heracleum mantegazzianum*) is now present in only two locations in the Adirondack PRISM.

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

COMMUNITY ENGAGEMENT

APIPP RAISED AWARENESS ABOUT INVASIVE SPECIES identification, prevention, and management by partnering with more than two dozen organizations in over 50 workshops and events that reached over 2,400 people.

APIPP'S NEW *FIELD GUIDE TO TERRESTRIAL INVASIVE SPECIES OF THE ADIRONDACKS* was widely distributed at events and new boot brush stations were installed at the Adirondack Mountain Club's Adirondack Loj and Cascade Welcome Center, and at Point Au Roche State Park.

APIPP WAS MENTIONED OVER 50 TIMES in print, digital, radio, and television news stories and its social media reach continued to expand. APIPP's YouTube views soared, with over 6,500 views and 3,100 "watch hours" in 2023.

NINE NEW PARTNERS joined the Adirondack PRISM: Adirondack Botanical Society, Adirondack Land Trust, Canada Lakes Conservation Association, Chateaugay Lake Foundation, East Shore Schroon Lake Association, Rainbow Lake Association, Raquette Lake Preservation Foundation, Schroon Lake Association, and Upper Saranac Foundation.

SPECIAL INITIATIVES

DEVELOPING TOOLS TO SEARCH FOR "LINGERING" HEMLOCK

APIPP PROGRAM DIRECTOR TAMMARA VAN RYN TAKES A HEMLOCK BRANCH SAMPLE
IMAGE: JERRY AND MARCY MONKMAN/ECOPHOTOGRAPHY

EASTERN HEMLOCK (*TSUGA CANADENSIS*) AND CAROLINA HEMLOCK (*TSUGA CAROLINIANA*) are severely threatened by several non-native pests and pathogens. The Nature Conservancy's North America Program is undertaking a three-year "Trees Species in Peril" project with public agencies, research institutions, and nonprofit partners to advance tree breeding programs and genetic research for five of the most imperiled tree species in the Northeast—including eastern and Carolina hemlock. Breeding pest- and pathogen-resistant trees is essential for long-term climate-resilience restoration efforts.

Identifying hemlock trees that remain healthy despite long-term exposure to HWA and elongate hemlock scale (*Fiorinia externa*) (EHS) is a necessary step for advancing hemlock breeding programs. APIPP Program Director Tammara Van Ryn is working with the Tree Species in Peril team to advance the search for "lingering" hemlock, trees that remain healthy despite intense pest pressure.

Tammara convened a working group of 12 researchers, land trusts, and public agency representatives from across the range of eastern hemlock to develop systems for identifying and reporting lingering hemlock trees. Two protocols were developed, one for individual lingering trees and one for long-term hemlock health monitoring. Community scientists and forest professionals can now report lingering hemlocks via a new TreeSnap app. An app for collecting long-term monitoring data will be developed next year.

In a related project, APIPP staff collected 40 samples of hemlock branches from a wide variety of sites across the Adirondack Park for a University of Connecticut hemlock genome mapping project. Projects like this offer hope for finding eastern hemlocks that are resistant to HWA and EHS so this foundational tree species can remain a part of the Adirondack landscape.

PARTNER ACCOMPLISHMENTS DASHBOARD

APIPP'S ANNUAL REPORT provides a great summary of all the work APIPP staff and volunteers do throughout the year but it does not come close to capturing all of the invasive species prevention, monitoring, and management work conducted within the Adirondack PRISM. APIPP's more than 30 partners also contribute greatly to meeting the PRISM's mission to work together to minimize the impact of invasive species on the Adirondack region's communities, lands, and waters.

To address this gap, APIPP piloted a new Partner Accomplishments Dashboard. APIPP surveyed partners early in 2023 to gather data about their 2022 contributions to the PRISM and 17 partners responded!

This is the first time collective information for activities across the PRISM was gathered and analyzed. For example, a tally of all of the boat steward programs operated by various partners had never been compiled before. Six partners submitted their data, reporting nearly 89,000 boats inspected.

The Partner Accomplishments Dashboard tells an important story of how important partners are to addressing invasive species in the Adirondacks. A survey to gather 2023 accomplishments will be sent to all APIPP partners in early 2024 and the 2023 Partner Accomplishments Dashboard will be posted on www.adkinvasives.com.

EMERALD ASH BORER BIOCONTROL

TO HELP REDUCE THE THREAT OF EAB to Adirondack forests, APIPP added a new biocontrol tool to its toolbox. EAB was first identified within the Adirondack PRISM in 2017 and within the Adirondack Park in 2020. While APIPP monitored the spread of this species, there were few options for management. This year APIPP staff released three stingless wasp species on a central Adirondack property infested with EAB to serve as a biological control for the invasive beetle.

APIPP FOREST PEST RESEARCH ASSISTANT LEAH SMISLOFF RELEASING EAB BIOCONTROLS

The wasps are specialized organisms introduced for the purpose of preying on EAB larvae and eggs, with the goal of reducing the invasive species' population over time. APIPP applied to the Animal and Plant Health Inspection Service's (APHIS) Plant Protection and Quarantine (PPQ) program to receive parasitoids for release at a site in Warren County in 2022. The site was not selected in 2022 due to a limited supply of wasps. Fortunately, the site was approved for 2023 and 2024 releases. APHIS is an agency of the United States Department of Agriculture (USDA).

APIPP released a total of 4,535 individual EAB biological controls during 2023 including 1,400 *Oobius agrili*, 1,611 *Tetrastichus planipennisi*, and 1,524 *Spathius galinae*. Each of the species target EAB in different ways. *Oobius agrili* parasitize EAB eggs, while *Tetrastichus planipennisi* and *Spathius galinae* target EAB larvae. In addition, *Spathius galinae* has a longer ovipositor and can target EAB larvae in trees up to 23 inches diameter at breast height (DBH), while *Tetrastichus planipennisi's* shorter ovipositor is ideal for targeting larvae in smaller trees up to 6 inches DBH.

According to APHIS, these biological controls can kill between 20% and 80% of the EAB in trees up to 8 inches DBH. Ash trees have regenerated in areas where the biological controls have been released. The parasitoids released by APIPP were produced and supplied from the USDA APHIS PPQ EAB Parasitoid Rearing Facility in Brighton, MI. For information about the parasitoids, you can call APHIS at (866) 322-4512.

KNOTWEED MANAGEMENT PARTNERSHIP

APIPP WRAPPED UP ITS FOUR-YEAR COMMITMENT to oversee the Knotweed Management Partnership. The Nature Conservancy was proud to host this program, started by Doug Johnson in 2008 as the Regional Inlet Invasive Plant Program (RIIPP), from 2020-2023.

In the 15 years since RIIPP was founded, hundreds of landowners learned about knotweed and were able to have the knotweed on their properties treated with herbicides. The Nature Conservancy agreed to administer the program in 2020 with the specific goal of reducing the size of infestations on former RIIPP sites over the next four years to make them more manageable for the individual private landowner. Under the Conservancy's tenure this goal was met.

JAPANESE KNOTWEED IN FLOWER

From 2020-2023, with continued support from Doug Johnson and long-time RIIPP regional coordinator volunteers, 214 knotweed infestations were inspected at least once by Ryan Burkum, a licensed pesticide applicator. At Ryan's most recent visit to each site, he treated 123 of these infestations with herbicides to control the growth of knotweed. Impressively, 40% of the sites Ryan inspected no longer had knotweed present by 2023.

The majority of the sites Ryan treated were on private property, and as the Knotweed Management Partnership sunsets, most of the infestations are now small enough for the landowners to reasonably assume management responsibility. APIPP will continue to manage knotweed hot spots on public lands that threaten high-priority ecological resources or on sites that may serve as likely sources of the spread of this invasive plant, such as town highway garage lands.

ADIRONDACK WITHIN-LAKE AIS VULNERABILITY PREDICTION TOOL

FIVE YEARS AGO, APIPP STARTED COLLECTING AIS DATA to use for a special project. For four years APIPP staff and the early detection team from Adirondack Research surveyed lakes, mapped AIS presence, and collected sonar data about the lakes' depth, sediment composition, and height of plant growth in the water. Data was collected from over 170 lakes across the Adirondack PRISM.

APIPP planned to use this data to see if a statistical model could be built to predict where, within a lake, invasive plants would be most likely to establish. The project was designed to build on past research that identified landscape-level characteristics such as elevation, distance to roads, and public boat launches, that make lakes more likely to be invaded. The goal of this project was to help lake associations and others target their survey efforts to the most vulnerable locations, and to increase the likelihood that invasive plant populations can be found when they are small and there is a greater chance of management success.

APIPP worked with data scientists from Tetra Tech to design a model to predict the probability of AIS plant presence. Over 50 different variables were considered, including AIS presence, plant height, lake depth, sediment composition, and landscape features around the lakes such as forests, development, boat launches, and campgrounds.

Tetra Tech built three different test models and "trained" the models with data from 33 lakes. The models were then tested on nine lakes to compare how accurate the models were. A machine learning model was found to be the best predictor with an overall accuracy of 71%. This model used the data inputs of distance to shoreline, distance to forest, amount of development in the area, and amount of agriculture in the area to predict the proability of invasive plant presence. Input data came from national sources and allowed for the modeling of predictions across all the lakes in the Adirondack Park, not only lakes that APIPP had collected data on.

The model predicts and graphically displays areas within lakes that have the highest probability for AIS presence. An online mapping application will be available to the public in 2024 to help partners and volunteers better identify sections of lakes that require extra diligence when searching for invasive plants. More diligent search methods could include conducting extra rake tosses, collecting eDNA samples, or surveying with scuba gear or snorkels.
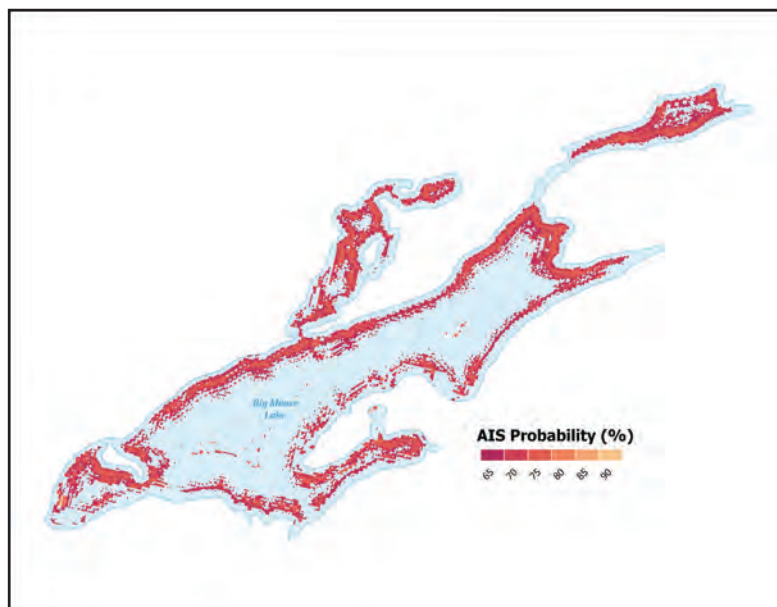

FIGURE 1: DATA COLECTED FOR THE ADIRONDACK WITHIN-LAKE AIS VULNERABILITY PROJECT CAN BE USED TO DISPLAY AIS PROBABLITY WITHIN A GIVEN LAKE

THE ADIRONDACK PRISM 2023-2027 STRATEGIC PLAN

A VISION FOR THE ADIRONDACKS

THIS ANNUAL REPORT SHOWCASES APIPP'S ACCOMPLISHMENTS toward achieving the mission and goals outlined in the Adirondack PRISM 2023-2027 Strategic Plan. The following pages provide information about activities conducted under each goal. Appendix C includes a dashboard of accomplishments APIPP will track annually, as well as a chart summarizing APIPP's progress in implementing each strategy outlined in the plan.

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

GOAL 1
Protect Adirondack PRISM lands from the most significant ecologic and economic impacts of terrestrial invasive plants and animals, including forest pests and pathogens

GOAL 2
Protect Adirondack PRISM waters from the most significant ecologic and economic impacts of aquatic invasive plants and animals

GOAL 3
Build knowledgeable and engaged communities that are empowered to act on invasive species issues

GOAL 4
Engage in research and innovation to improve the monitoring and management of invasive species

INVASIVE SPECIES TIERS AND MANAGEMENT APPROACH

NEW YORK'S IMAPINVASIVES TEAM and the eight PRISMs developed an invasive species categorization method called the Tier Ranking System to help prioritize management goals and unify the terminology used region-to-region. This statewide system categorizes invasive species into Tiers 1 through 4 for each PRISM based on several factors, including the number of documented occurrences of the species in the PRISM. The tiers are an integral part of how APIPP prioritizes the invasive species monitoring and management work reported on under Strategic Plan Goals 1 and 2. Refer to www.adkinvasives.com for current Tier lists.

TIER 1 species are not yet known to occur within a PRISM boundary but are likely to establish and spread if introduced.

PRIORITY ACTION: PREVENTION
Since Tier 1 species are not yet found in the area, but occur in neighboring regions, APIPP works to control these species through education, outreach, and awareness-building initiatives.

TIER 2 species are found in low enough abundance with suitable treatment options available to make eradication possible within the PRISM.

PRIORITY ACTION: ERADICATION
Tier 2 species are a high priority for monitoring and management. These species are best suited for an early detection and rapid response strategy.

TIER 3 species are likely too widespread or well established for the possibility of eradication.

PRIORITY ACTION: CONTAINMENT
Strategic management can contain Tier 3 species to their present location and slow their spread into neighboring areas that remain free of harmful infestations.

TIER 4 species cannot be eradicated from the PRISM geography becaue they are too widespread or to established and management is cost-prohibitive.

PRIORITY ACTION: SUPPRESSION
In these cases, focus shifts to limited, localized suppression efforts targeted at protecting high-priority resources such as rare habitats, endangered species, and recreational assets.

APIPP FURTHER PRIORITIZES INFESTATIONS FOR MONITORING OR MANAGEMENT BASED ON THE FOLLOWING FACTORS:

- Impact of the infestation on conservation priorities (including The Nature Conservancy's resilient and connected lands network), economic resources, or human health.

- Availability of effective tools to control both the infestation and the source(s) of introduction.

- Availability of resources to monitor or manage the infestation.

- Cost-effectiveness of management options and the opportunity cost of deploying resources.

- Input of relevant Adirondack PRISM partners and APIPP working groups.

GOAL 1: PROTECT ADIRONDACK LANDS

2023 SEASON SUMMARY

THE YEAR 2023 MARKED THE THIRTEENTH SEASON in which the terrestrial program coordinated regional terrestrial invasive plant monitoring activities. APIPP staff, including three seasonal staff and six EDRR crew members from IPC, surveyed 41 NYSDEC campgrounds, over 150 recreational access points, sections of over 30 Forest Preserve units, and part or all of approximately 30 state and county road corridors.

The monitoring activities identified approximately 343 new terrestrial plant infestations, bringing the total number of mapped infestations in the Adirondack PRISM to 7,566. It is important to note that these newly found infestations are primarily the result of increased survey efforts and of the ability to survey new areas as sites that were managed in previous years become smaller or locally eradicated and no longer require extensive treatment time.

APIPP advanced priority terrestrial invasive plant management projects addressing 14 species. The projects varied greatly in scale and objective. Some projects focused on local eradication of species with a limited distribution, such scotch broom (*Cytisus scoparius*) and mile-a-minute (*Persicaria perfoliata*),

while others focused on landscape-level suppression of established species such as common reed grass (*Phragmites australis*) and knotweed.

APIPP's priority terrestrial invasive plant management projects include over 2,500 distinct infestations. In total, 721 infestations (28.8%) are under active management and almost 23 acres were managed in 2023. There are 929 sites (37.1%) where the species is deemed locally eradicated after not observing the species for at least three consecutive years, and an additional 380 sites (15.2%) where the invasive species was not observed during a 2023 survey. In total, 81% of APIPP's priority terrestrial invasive species infestations are under active management or have been successfully removed.

APIPP surveyed for six terrestrial forest pests and diseases in 2023: balsam woolly adelgid (*Adelges piceae*), beech leaf disease (BLD) (believed to be associated with a nematode *Litylenchus crenatae mccannii*), EAB, HWA, jumping worms (*Amynthas spp.* and *Metaphire spp.*), and spotted lanternfly. All are known to be present in the PRISM except for spotted lanternfly.

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INVASIVE SPECIES SEASONAL STAFF

APIPP WAS PRIVILEGED to have three terrestrial seasonal staff positions in 2023. Megan Grega joined us for her third summer as the invasive species assistant, Becca Tamagna joined us for her second summer as the invasive species management steward, and APIPP added Leaf Smisloff as forest pest research assistant. Each person brought exceptional plant and forest pest identification knowledge to their position and played a key role in the survey and management of invasive species.

Seasonal staff found that of the 41 NYSDEC-administered campgrounds surveyed, 40 had terrestrial invasive species. In the 12 years of surveying and managing for invasive species at these campgrounds, stewards have reduced garlic mustard (*Alliaria petiolata*) abundance by approximately 86%, leading to local eradication at seven campgrounds and one or two years of documented absence at three others. Seasonal staff have also reduced purple loosestrife (*Lythrum salicaria*) abundance at campgrounds by approximately 99%.

Added seasonal staff capacity also allowed APIPP to survey over 50 miles of trails for forest pests and diseases, release biological controls, monitor a dozen forest pest traps, and perform more thorough surveys for multiple early-phenology species.

MEGAN GREGA
INVASIVE SPECIES ASSISTANT

LEAH SMISLOFF
FOREST PEST RESEARCH ASSISTANT

BECCA TAMANGA
INVASIVE SPECIES MANAGEMENT STEWARD

INVASIVE PLANT CONTROL CREW

EARLY DETECTION AND RAPID RESPONSE CREW FROM INVASIVE PLANT CONTROL, INC. 2023

This year also marked the twelfth season that IPC served as the EDRR crew. Throughout their 9.5-week season, IPC surveyed for and treated invasive species on sections of over 25 Forest Preserve units and along part or all of approximately 30 state and county road corridors. As detailed in the crew's 2023 report, posted on APIPP's website, the crew was able to perform over 1,100 invasive species assessments and treat approximately 300 sites.

While most treatments were to control common reed grass and knotweed species, the crew also helped manage high-priority species in the Adirondacks—such as tree-of-heaven and Japanese stiltgrass (*Microstegium vimineum*). The crew also continued to manage invasive plants along the Veterans' Memorial Highway, which leads to the summit of Whiteface Mountain. In 2023, the crew removed six contractor bags of invasive plant material along the highway to improve habitat for rare and endangered alpine plants.

FOREST PEST HUNTER VOLUNTEERS

FOREST PEST HUNTER VOLUNTEERS greatly expand survey capacity in the Adirondack PRISM. This year, HWA Forest Pest Hunters adopted 72 trails and entered almost 900 observations into iMapInvasives—including more than 200 new positive findings. BLD Forest Pest Hunters adopted 59 trails and entered over 150 observations into iMapInvasives. Collectively, these individuals volunteered over 400 hours of their time. Volunteer Bill Widrig adopted the most trails (23) and entered the majority of the iMapInvasives reports (458). Volunteer Dom Peters was the most active volunteer, and he became a Lake Protector this year as well.

FOREST PEST HUNTER VOLUNTEER DOM PETERS PAUSES TO TAKE A SELFIE WHILE SURVEYING FOR HWA
PHOTO BY DOM PETERS

MANAGEMENT AND NOTABLE SEASON FINDINGS

THE APIPP TERRESTRIAL PROJECT manages or plans to manage 14 terrestrial invasive plants known to be present in the Adirondack PRISM. These species include giant hogweed, Japanese angelica tree (*Aralia elata*), mile-a-minute, scotch broom, wineberry (*Rubus phoenicolasius*), Japanese stiltgrass, black swallow-wort (*Vincetoxicum louiseae*), pale swallow-wort (*Vincetoxicum rossicum*), tree-of-heaven, common reed grass, garlic mustard, knotweed species, purple loosestrife, and yellow iris (*Iris pseudacorus*). Individual survey and management statistics for each species can be found in Table 1 of Appendix A. A searchable map on APIPP's website shows where terrestrial invasive plants occur.


APIPP AIS ASSISTANT DANA HOLMLUND PULLS GARLIC MUSTARD AT CRANBERRY LAKE STATE CAMPGROUND

The good news resulting from the extensive terrestrial invasive species monitoring and management efforts is that no Tier 1 species were found in the region. There are, however, three disconcerting findings. First, tree-of-heaven populations have grown from two known sites in 2017 to 31 at the close of 2023. APIPP conducted extensive outreach to the landowners where these trees grow but was unable to secure permission to treat them at several locations. As a result of the increasing number of infestations and inability to manage them all, this species is now considered a Tier 3 species. In addition, Japanese stiltgrass is becoming more common and may no longer be containable to the southeastern Adirondacks. Lastly, APIPP did not receive a NYSDEC permit to treat the only known infestation of wineberry in the Adirondack Park; therefore, the plants on Long Island in Lake George continue to grow and spread seeds.

WINEBERRY
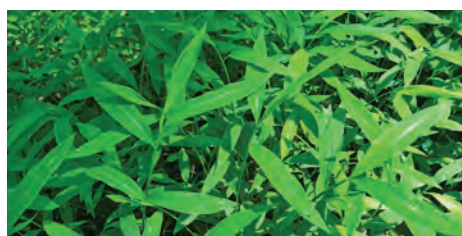
JAPANESE STILTGRASS

TREE-OF-HEAVEN SAMARAS

INVASIVE FOREST PESTS AND DISEASES UPDATE

IN 2023, APIPP TRACKED SIX INVASIVE FOREST PESTS. The BLD nematode was first identified in the PRISM in the summer of 2022 by NYSDEC staff in Herkimer County. Surveys conducted in 2023 by APIPP staff and volunteers and NYSDEC staff detected several infestations in Warren County. There are currently no known ways to manage BLD.

HWA was first detected in the PRISM in 2017 on Prospect Mountain in Lake George. This infestation was promptly treated and was presumed eradicated. Unfortunately, multiple new infestations of HWA were confirmed in 2020 within the Lake George watershed. These infestations have spread and known populations can be found south from Bolton Landing on the western side of the lake, around the southern end of the lake, and north to Clark Hollow Bay in Putnam on the eastern side of the lake. The greatest concentration of HWA is located along the eastern shore. An additional infestation is located just north of the southern Adirondack PRISM boundary, near Spruce Mountain in Saratoga County.

BEECH LEAF DISEASE

APIPP continues to assist with NYSDEC-led management of HWA on public lands in the established Lake George region infestation. APIPP, with assistance from Lake George Land Conservancy, also completed its fourth year of management on Dome Island and treated 317 trees in 2023. Additionally, APIPP assisted Lake George Land Conservancy with its first year of management at its Clark Hollow Bay property.

After first being discovered in the PRISM in 2017 and within the Adirondack Park in 2020, EAB has continued to spread. Currently, Essex, Hamilton, and Lewis counties are the only counties in the state without confirmed infestations. In 2023, APIPP monitored three traps to assess the northward spread of the known infestation in Warren County, and no EAB were found. APIPP's proposed EAB biological control release site in Warren County was chosen by USDA APHIS PPQ EAB Parasitoid Rearing Facility in Brighton, MI to receive parasitoids. In the summer of 2023, APIPP released a total of 4,535 parasitoids and releases will again be conducted in 2024. Finally, APIPP annually surveys five Monitoring and Managing Ash plots that will help monitor for trees that are resistant to EAB.

PARASITOID WASPS, LIKE THE ONE PICTURED ABOVE, ARE USED AS A BIOCONTROL TO MANAGE EAB

Jumping worms are known to be present inside the PRISM in Essex, Franklin, Fulton, Hamilton, Warren, and Washington counties. APIPP conducts surveys for these worm species in order to gain a better understanding of their distribution. A new infestation in Putnam on the eastern side of Lake George was discovered via a survey in 2023.

Surveys were also conducted for balsam woolly adelgid to better understand its distribution. Clinton County was added to the list of counties that are known to have this pest present in 2023. Other counties where balsam woolly adelgid has been confirmed inside the PRISM include Essex, Fulton, Hamilton, Herkimer, Warren, and Washington.

The closest known infestation of spotted lanternfly is in Albany County. APIPP monitored 10 traps for this pest throughout the region. While several dead insects were found within the Adirondack region, no populations of spotted lanternfly are known to exist in the PRISM.

GOAL 2: PROTECT ADIRONDACK WATERS

2023 SEASON SUMMARY

THE ADIRONDACK PARK AIS PROGRAM STARTED IN 2002 and in the intervening years has become a central pillar of APIPP's prevention, monitoring, and management program. Starting in 2002, volunteers and partners were trained on how to identify AIS and survey lakes across the Adirondacks. In that first year, 15 of the 54 lakes monitored were found to have AIS present. Fast forward 21 years and that volunteer monitoring effort still exists as APIPP's Lake Protectors program. It is amazing that APIPP has worked with over 3,000 volunteers and partners who have collectively submitted more than 2,200 surveys throughout the years!
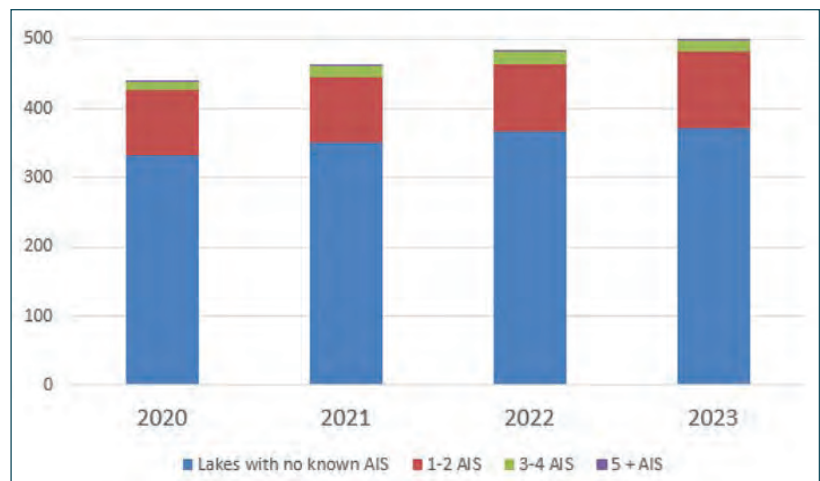
NUMBER OF AIS OBSERVED IN ADIRONDACK PRISM WATERBODIES

All together the Adirondack PRISM AIS monitoring network of volunteers and professionals has surveyed 499 waterbodies across the Adirondack PRISM. Many thanks to the volunteers and partners who have collected data for one year or for all 22 years. Thanks to the dedication and passion of partner lake associations, nonprofit environmental groups, and volunteers, APIPP has been able to amass this community-science driven dataset on where AIS are distributed across the landscape. Each element of this year's monitoring program is described in more detail on the following pages.

AQUATIC INVASIVE SPECIES SEASONAL STAFF

IN THE SUMMER OF 2023, APIPP had the opportunity to hire its first AIS Seasonal Assistant, Dana Holmlund. Dana was an incredible staff member who greatly assisted three major efforts that APIPP undertook. APIPP was also able to secure the services of Leigh Walrath for several specialized surveys.

First, Dana helped with a research project funded by the Lake Champlain Basin Program at five boat launches along Lake Champlain. APIPP hired a diver assisted suction harvesting company that removed over 3,300 pounds of Eurasian watermilfoil and curly-leaf pondweed. APIPP conducted point-intercept monitoring to measure AIS frequency and abundance pre- and post-harvesting to assess change at these sites. Partners at the Paul Smith's College Adirondack Watershed Institute (AWI) collected data on boats leaving these launches with AIS present. APIPP is in the process of analyzing the data to determine the effectiveness of this strategy to reduce the spread of AIS and a report will be available in early 2024. See page 27 for more details on this project.

DANA HOLMLUND
AIS SEASONAL ASSISTANT

A second initiative Dana assisted with was collecting water samples to test for eDNA. APIPP staff went to 22 lakes across the region and collected samples to test for over 35 species. This work is being done in partnership with Cornell University to assess the effectiveness of eDNA as an early detection tool for aquatic plants and animals. Results from these tests will be available in 2024.

And the third initiative involved APIPP part-time technician Leigh Walrath, Dana, and AIS coordinator Brian Greene. In this project, designed to gain a better understanding of potential AIS "hot spots," targeted AIS surveys were conducted on waterbodies connected to waters that are known to have AIS present and at sites that had historic unconfirmed iMapInvasives records. This concerted monitoring effort resulted in many new detections of AIS and documented the spread of known AIS to several hydrologically connected waterbodies. See the Notable Season Findings section on the next page for more detail.

LAKE PROTECTOR VOLUNTEERS

BRIAN GREENE, LEFT, PRESENTS THE 2023 APIPP VOLUNTEER
ACHIEVEMENT AWARD TO DEBBIE SCHWARTING

VOLUNTEERS HAVE BEEN MONITORING ADIRONDACK LAKES consistently for 22 years. This year 23 partner lake associations submitted 37 surveys as part of the Lake Protector program and 11 independent volunteers submitted 28 surveys. Dom Peters, a new volunteer, submitted the most reports (12). Collectively, 141 observations of 10 species were entered into iMapInvasives. The 2023 APIPP Volunteer Achievement Award was given to Debbie Schwarting and her family, who have monitored the same lakes for 22 years!

ADIRONDACK RESEARCH TEAM AND LAKE MANAGEMENT TRACKER

IN THE SUMMER OF 2023, in addition to staff-led projects, this was the ninth year that APIPP contracted with a professional early detection team. The team from Adirondack Research worked in the northern section of the PRISM and surveyed 36 waterbodies and produced a report that is available on APIPP's website.

APIPP worked with seven lake associations to continue monitoring the effectiveness of their management efforts to remove Eurasian and variable-leaf watermilfoil using the Lake Management Tracker protocol. The volunteers from Upper Chateauguay Lake, Moody Pond, Lincoln Pond, Raquette Lake, Paradox Lake, Loon Lake, and Friends Lake collectively took over 1,200 observations. The data can be seen in Appendix B. Lake Management Tracker helps local communities adjust their management as part of an adaptive framework for making decisions based on data.

AIS SEASONAL ASSISTANT DANA HOLMLUND SURVEYING

MONITORING SUMMARY AND NOTABLE SEASON FINDINGS

AIS COORDINATOR BRIAN GREENE TRAINS LAKE PROTECTORS ON FOLLENSBY CLEAR POND

PARTNERS, CONTRACTORS, STAFF, AND VOLUNTEERS collectively submitted 184 monitoring surveys from 141 lakes—see Appendix B for more information. This was another record year of monitoring reports—boosted, in part, by APIPP's increased staff capacity. Overall, 17 new AIS observations were found across the PRISM. Seven of these observations are on waterbodies that did not have previous observations of AIS. See the table in Appendix B for more details.

While this is an increase in the number of new AIS observations found from past years, this was not unexpected given increased strategic staff surveying efforts. Almost all of these introductions were found in waterbodies connected to locations that had long-established, mature populations of the most common AIS species that are spreading fragments via natural expansion. No new invasive species to the region (Tier 1) were found, and none of the waterbodies with new AIS invasions had an active prevention program in place.

Of the waterbodies surveyed in 2023, 37.6% had AIS observed—see Appendix B for more information. Overall, 499 waterbodies have been monitored with 127 of these waterbodies having known AIS populations. This means that 75% of surveyed Adirondack waterbodies still have no known AIS observations, which is consistent with long-term monitoring trends.

AQUATIC SPECIES OF CONCERN

AQUATIC PLANTS

DOING A RAKE TOSS TO FIND EURASIAN WATERMILFOIL

The APIPP aquatic program surveys for six aquatic invasive plants, with high or very-high NYS invasiveness rankings, that are known to be present in the PRISM: Eurasian watermilfoil, variable-leaf watermilfoil, water chestnut (*Trapa natans*), curly-leaf pondweed, fanwort (*Cabomba caroliniana*), and European frog-bit (*Hydrocharis morsus-ranae*). In addition, APIPP surveys for two species not yet present in the Adirondack Park, hydrilla (*Hydrilla verticillata*) and starry stonewort (*Nitellopsis obtusa*). As of 2023, 127 Adirondack waterbodies are known to be invaded by one or more of these aquatic invasive plants.

**WATER CHESTNUT NUTLETS
IMAGE: IMAPINVASIVES**

**FANWORT
IMAGE: IMAPINVASIVES**

AQUATIC ANIMALS

APIPP surveys for five aquatic invasive animals, with high or very-high NYS invasiveness rankings, that are known to be in the PRISM: spiny waterflea (*Bythotrephes longimanus*), fishhook waterflea (*Cercopais pengoi*), Asian clam (*Corbicula fluminea*), zebra mussels (*Dreissena polymorpha*), and Chinese mystery snail (*Cipangopaludina chinensis*). In addition, APIPP trains volunteers to look for three species that are not yet present in the PRISM, quagga mussel (*Dreissena rostriformis bugensis*), round goby, and rusty crayfish (*Faxonius rusticus*).

As of 2023, 21 Adirondack lakes are known to be invaded by one or more of these small-bodied invasive animals. These species are not actively managed to remove their populations but outreach efforts are aimed at containing them to their current waterbodies, thereby limiting their spread. All equipment that contacts waterbodies infested with invasive animals should be decontaminated before moving to another waterbody.

CHINESE MYSTERY SNAILS

ASIAN CLAM

**SPINY WATERFLEA ON A FINGERNAIL
IMAGE: EMILY DEBOLT**

**FISHHOOK WATERFLEA
IMAGE: IMAPINVASIVES**

ZEBRA MUSSELS

GOAL 3: COMMUNITY ENGAGEMENT

APIPP STAFF AT THE NYS INVASIVE SPECIES EXPO IN SARATOGA SPRINGS

EDUCATION

IN 2023, APIPP PARTICIPATED IN OR HOSTED 52 EVENTS AND REACHED OVER 2,400 PEOPLE, breaking the previous 2017 record of 2,268 people reached. The events occurred both in-person and online and included 23 trainings and workshops, 10 webinars, eight tabling events, and three college classes. APIPP staff played an educational role in each of these settings, sometimes tabling alongside partners and colleagues and other times speaking about invasive species to organizations, partners, or members of the public. Some of these events are tailored to a general audience, while others are hosted for people whose intentions are to learn how to identify and report invasive species.

APIPP staff spoke to lake associations around the region about how to identify, manage, and prevent the spread of AIS, and they also spoke to landowners, homeowners, garden clubs, and NYS Department of Transporation (NYSDOT) about terrestrial invasive species and how to manage forest pests. Staff also presented at events like the Adirondack Lakes Alliance Symposium at Paul Smith's College and tabled at events like Adirondack Day in Albany and the inaugural EcoArts Festival at View Arts Center in Old Forge. In addition, APIPP staff presented five workshops at the professional days of the NYS Invasive Species Expo in Saratoga Springs in September and interacted with a wide variety of people during the Expo's public outreach day.

APIPP's webinars were all recorded and uploaded to its YouTube channel, which was launched in June 2020. The channel's engagement has soared, with 17,422 lifetime views, 6,612 of which occurred in 2023, and more than 3,100 hours of total watch time, 1,336 of which occurred in 2023. Some of the 2023 webinars explored new topics, such as the effect climate change has on the presence of invasive species (Climate Change and Invasive Species, February) and why native plants are important to pollinators, people, and the environment (Pollinators, Plants, and Pests, March). The How Deer Shape Forest Ecosystems webinar has proven to be particularly popular—it has acquired more than 470 views since it was uploaded to YouTube in October. Some of the upcoming 2024 webinar topics will be based on webinar feedback surveys conducted this year.

COMMUNICATIONS
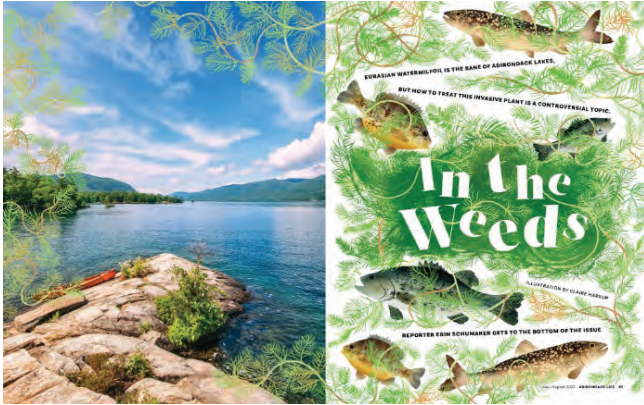
APIPP AQUATIC INVASIVE SPECIES COORDINATOR BRIAN GREENE WAS INTERVIEWED FOR THIS *ADIRONDACK LIFE* FEATURE STORY

APIPP MAINTAINS A STEADY PRESENCE IN LOCAL AND REGIONAL NEWS, with APIPP-related stories oftentimes appearing several times a month in different news outlets. This year, the Adirondack PRISM was mentioned or featured more than 50 times in a variety of news media including print, online, radio, television, and email newsletters.

Many news outlets, like *Adirondack Almanack*, *Adirondack Daily Enterprise*, and *Lake Placid News* consistently published APIPP's press releases. The regular distribution of press releases—one a month, on average—also kept editors and reporters informed about the Adirondack PRISM's work, which resulted in several requests for interviews of APIPP staff. Some of those interviews were used for stories that focused on APIPP's work, while other interviews were used as expert sources for larger stories, such as the In the Weeds feature story on managing Eurasian watermilfoil that appeared in the summer issue of *Adirondack Life* magazine.

In addition to the coverage described above, APIPP stories appeared in other media outlets located throughout the region including the *Adirondack Explorer, Albany Times Union, Lake George Mirror, Lake Placid News, Malone Telegram, Press-Republican, Post Star, WAMC*, and *Sun Community News*. News stories that feature APIPP are often shared via its social media channels and in its eNews email blasts, giving them more reach. The Nature Conservancy has also regularly shared APIPP news stories in its "News Report" email blasts.

OUTREACH

APIPP CONTINUED TO SUPPLY PARTNERS, BUSINESSES, AND NONPROFIT ASSOCIATIONS with its signature outreach materials: Protect Your Waters, Protect Your Forests, and Don't Move Firewood brochures and posters and the Field Guide to Terrestrial Invasive Species of the Adirondacks. The Field Guide was so popular it was reprinted, with slight updates, in 2023. All of these items can be ordered or downloaded for free on APIPP's website.

In addition to the materials made available to partners and others, APIPP added new stickers and magnets to its inventory of outreach materials. There are three versions of the stickers and magnets, each with a corresponding spread-prevention reminder: Don't Move Firewood, Prevent the Spread, and Clean, Drain, Dry. Thanks to their fun design, the stickers have been a popular addition to tabling events, with people of all ages picking them up and sticking them to things like water bottles, notebooks, and backpacks. In doing so, people who display the stickers are helping to spread important information on how everyone can do their part to prevent the spread of invasive species.

APIPP'S NEW STICKERS HAVE BEEN POPULAR AT EVENTS

APIPP STAFF AND PARTNERS AT APIPP'S FALL PARTNER MEETING, HELD ON DECEMBER 6

PARTNER ENGAGEMENT

THE ADIRONDACK PRISM REFRESHED ITS PARTNER OPERATING PRINCIPLES at the end of 2022. The new Operating Principles outline expectations for Adirondack PRISM partners and provided a good opportunity to review the partner list in 2023. Several partners that were no longer active were removed from the list, and nine new partners were added.

The amazing success of Adirondack PRISM invasive species prevention and control efforts is the result of the extraordinary dedication of partners. APIPP continuously engages with its partners, including presenting at workshops and events, training partner's staff, and helping with specialized invasive species management projects. In addition to day-to-day interactions and assistance, and the special projects called out in this report, APIPP hosted or assisted with the following collaborative meetings and projects with partners in 2023.

· Facilitated a Terrestrial Invasive Species Roundtable on February 8 followed by an Aquatic Invasive Species Roundtable on February 9.

· Hosted a partner meeting on April 27 with detailed reports on two APIPP research projects—knotweed management alternatives and within-lake AIS vulnerability prediction—and a featured speaker, Molly Hassett, NYSDEC's Climate Forestry and Carbon Section leader, speaking about how invasive species intersect with NYS's climate goals.

· Hosted a year-end, virtual partner meeting on December 6 to celebrate APIPP's anniversary, share highlights of the 2023 season, and engage partners in a roundtable discussion.

· Convened two meetings of a small AIS spread-prevention working group and two meetings of the Adirondack communicators network.

· Sent 21 "APIPP News" updates to partners via the APIPP listserve.

· Attended a NYSDEC Incident Command System training so as to be prepared to assist the state with coordinated responses to invasive species.

· Worked with NYSDEC and APA to prepare Forest Preserve Work Plans in accordance with the newly revised *Inter-Agency Guidelines for Implementing Best Management Practices to Control Invasive Species on DEC Administered Lands of the Adirondack Park*.

· Continued to work closely with NYSDOT and provide training to NYSDOT staff.

· Served as a member of the NYS Invasive Species Advisory Committee.

· Participated in quarterly meetings with NYSDEC Invasive Species Coordination Section staff and PRISM counterparts, and in monthly PRISM webinars.

· The Nature Conservancy's partnership with NYSDEC requires reporting on all equipment purchased with Environmental Protection Fund moneys. The Conservancy defines durable equipment as items worth more than $5,000 and no such purchases were made in 2023.

GOAL 4: RESEARCH AND INNOVATION

SOME OF THE TOOLS USED TO COLLECT WATER SAMPLES FOR ENVIRONMENTAL DNA SAMPLING

2023 SEASON SUMMARY

APIPP PARTICIPATED IN 11 RESEARCH PROJECTS IN 2023. Several of these are APIPP-led projects which are described in more detail below. Four of the projects involve collaborations with research institutions for which APIPP is providing field support.

HEMLOCK WOOLLY ADELGID ENVIRONMENTAL DNA

LEAH SMISLOFF COLLECTS A HEMLOCK BRANCH SAMPLE TO BE ANALYZED FOR HWA EDNA

FOR THE SECOND YEAR, APIPP PARTNERED WITH NYSHI on a research project to assess the use of eDNA as a novel early detection tool for HWA. APIPP staff collected hemlock branch samples for NYSHI at 28 locations throughout the PRISM. Sample sites were selected based on their proximity to known infestations of HWA. Hemlock foliage samples were collected in June and July and sent to the NYSHI lab at Cornell University for processing. Results of the 2023 sampling were not conclusive. APIPP will continue working with partners in 2024 to investigate the utility of eDNA for detection of HWA.

KNOTWEED MANAGEMENT STUDY

KNOTWEED IS A HIGHLY INVASIVE SPECIES that is widespread in the Adirondack PRISM (Tier 4). APIPP manages knotweed in ecologically sensitive areas to mitigate its impacts on priority conservation areas such as rare habitats, endangered species, and recreational assets. In 2022, APIPP began a research project to assess two alternative herbicides to glyphosate for the treatment of knotweed using two application techniques, foliar spray and stem injection. This research aims to 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.

Monitoring results six weeks post-treatment found that injection 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.

KNOTWEED MANAGEMENT PROJECT STUDY PLOT

Reemergence monitoring conducted one year post-treatment found foliar spray plots had fewer live stems remaining than injection plots. Aminopyralid and imazapyr had the lowest number of reemerging stems for both treatment techniques, likely attributable to the residual soil activity of those pesticide products.

This research confirms that imazapyr- and aminopyralid-based herbicides provide a comparable level of control to glyphosate; however, the differing characteristics of the alternative herbicides (soil residue, aquatic formulations, etc.) mean they cannot replace glyphosate for all treatment scenarios.

IMIDACLOPRID STUDY

APIPP STAFF TREATING A HEMLOCK ON DOME ISLAND FOR HWA.

PESTICIDES ARE AN IMPORTANT COMPONENT OF AN INTEGRATED PEST MANAGEMENT (IPM) STRATEGY to reduce HWA populations and preserve hemlock tree health. Imidacloprid, one of the most common insecticides used to control HWA, can be applied by multiple techniques including basal bark spray, tree injection, and soil application. Once applied, imidacloprid can protect a tree for 5-7 years.

Imidacloprid is generally considered to be "xylem mobile," meaning it only moves upward in treated trees; however, evidence exists suggesting that imidacloprid may also move downward in treated trees with unknown implications and could be shared with adjacent hemlock trees through below-ground connections. Increasing our understanding of potential pathways for off-target impacts increases the efficacy of IPM efforts, including biological control.

In 2023, APIPP assisted NYSHI with novel research to investigate the potential for movement of imidacloprid from treated to non-treated hemlocks. NYSHI researchers established two study sites, one at Mianus River Gorge in the Hudson Valley and one on private property in the Adirondacks, where 20 trees were selected for treatment. At each location, 10 trees were treated via basal bark spray and 10 trees were treated via injection. Foliage samples were collected from treated and adjacent trees three times: pre-treatment, one month post treatment, and approximately six weeks post treatment.

An additional round of samples will be collected in spring 2024 and one-year post treatment. All foliage will be analyzed in the lab to determine the presence and concentration of imidacloprid and its metabolites in treated and adjacent non-treated trees. Information from this project will improve HWA IPM efforts by increasing APIPP's and its partners' understanding of how chemical control is best incorporated with biological control, leading to improved treatment planning and better protection of hemlock ecosystems.

MONITORING AND MANAGING ASH

FIVE MONITRORING AND MANAGING ASH (MAMA) PLOTS were established in 2021 following the protocol developed by the Ecological Research Institute and are monitored annually. MaMA plots make use of naturally occurring native ash (*Fraxinus spp*.) stands to monitor for EAB-induced mortality. The objective is to use these plots to detect the onset of ash mortality thresholds that trigger the search for lingering ash that is potentially resistant to EAB.

ONE OF THE FIVE MONITORING AND MANAG-ING ASH PLOTS IN THE ADIRONDACK PRISM

It is believed that when an ash tree remains healthy in the wake of EAB it contains some degree of genetic resistance to the pest. These lingering ash trees can then be used in breeding programs to breed genetically resistant ash. Two of APIPP's five plots are in stands dominated by black ash (*Fraxinus nigra*), a species that is culturally important for Indigenous basket weaving, as research on resistance in this species is lacking.

Each MaMA plot must contain at least 40 mature ash trees at least 4 inches DBH, be naturally occurring, and cover an area between 0.5 and 10 acres. Within the plot, each of the 40 trees are tagged and their coordinates are recorded along with the tag number. Trees are then measured to determine their DBH, their species is noted, and the canopy is assessed to evaluate the trees' health. Signs of EAB are also noted, if present. Trees within the plot are reevaluated annually until 50% of them have succumbed to EAB. This mortality threshold signals the search for healthy trees in the nearby areas that may be considered lingering ash. As of 2023, no definitive signs of EAB have been encountered in any of the five plots.

EDUCATIONAL WEBINAR EVALUATION

HOW DEER SHAPE FOREST ECOSYSTEMS WAS THE MOST VIEWED WEBINAR OF 2023

APIPP HOSTS ABOUT 10 WEBINARS AND VIRTUAL TRAININGS ANNUALLY, and while the "audiences reached" number has steadily increased, APIPP was curious about the effectiveness of its trainings. Of particular interest was determining whether or not people who attend APIPP trainings, which largely focus on how to identify, manage monitor for, and report invasive species, are taking those actions. To explore that question, APIPP Director Tammara Van Ryn and Communications Coordinator Shaun Kittle enlisted the help of The Nature Conservancy's social sciences team, who developed a strategy for surveying webinar attendees.

Three groups were surveyed in 2023: registrants and attendees of the May 24 *Backyard Invasives* webinar and attendees of the August 2 *Forest Pest Hunters: Surveying for Beech Leaf Disease* webinar. Both pre- and post-webinar surveys were distributed for the *Backyard Invasives* webinar, and a post-webinar survey was distributed for the *Forest Pest Hunters* webinar.

The *Backyard Invasives* pre-webinar survey assessed registrants' demographics, prior knowledge of invasive species, and involvement with monitoring for and reporting invasives. The post-webinar survey assessed what participants learned and what actions they took to monitor for and manage invasive species. The *Forest Pest Hunters* post-webinar survey asked attendees questions including what they liked about the webinar, how it could have been improved, and what topics would be of interest for future webinars. Response rates for the surveys were good and participants largely indicated that they took action and found the webinars to be informative. Ideas for future webinars are being implemented in 2024 and some webinar surveys will be distributed in 2024 with the goal of continuing to assess and improve the effectiveness of APIPP's educational programming.

ENVIRONMENTAL DNA

AN AIS MONITORING TECHNIQUE THAT IS BECOMING MORE COMMON is the collection of water samples to test for the genetic presence of organisms. This is called environmental DNA or eDNA for short. Research has shown, especially for aquatic invasive animals, that this technique excels at detecting species when their populations are still relatively small. While traditional methods like visual surveys or netting could miss a species, eDNA can provide an indication that an invasive aquatic animal is present in a waterbody. This makes it a very good technique to assist with early detection to help find invasive species at low densities, which increases the chances of successful management.

BRIAN GREENE COLLECTS A WATER SAMPLE TO BE ANALYZED FOR ENVIRONMENTAL DNA

One of the challenges is deciding where to monitor with eDNA when there are so many lakes across the region. Fortunately, APIPP was able to use the NY Natural Heritage Program's lake vulnerability tool to select the lakes that have boat launches and the highest risk of species introduction. APIPP selected 22 lakes to monitor across the region. In 21 of these lakes, APIPP sampled a single location once in August and then again in late September. At Schroon Lake, APIPP partnered with the Schroon Lake and East Shore Schroon Lake associations to sample at nine locations around the lake. This will allow APIPP staff to assess the variation in results across a lake. These approaches will help APIPP and others learn how to deploy this technique throughout the Adirondack PRISM.

Currently the samples are at the Cornell University eDNA and Genomics Core Facility, where they are being tested for over 35 different animal and plant species using a multiplex assay technique. APIPP will get the results back in early 2024 and this will inform future monitoring locations and strategy.

LAKE CHAMPLAIN BOAT LAUNCH AIS REMOVAL

CLEANING WATERCRAFT ON LAKE CHAMPLAIN

LAKE CHAMPLAIN IS A LARGE, BEAUTIFUL LAKE that provides incredible benefits to the Adirondack region and draws boaters from all over. Unfortunately, it is also the most invaded waterbody in our region with the highest number of non-native and invasive species. This makes it a potential pathway for AIS to spread from Lake Champlain via motorboats that travel to other lakes.

APIPP tested a management strategy to see if reducing the amount of aquatic invasive plants at the area immediately adjacent to a boat launch would reduce the number of boats leaving the boat launch with AIS present. APIPP received funding from the Lake Champlain Basin Program to work at five boat launches (Port Douglas, Willsboro, Westport, Port Henry, and Ticonderoga). A company was hired to remove invasive curly-leaf pondweed and Eurasian watermilfoil using diver assisted suction harvesting at several of these boat launches. This company worked at the boat launches for 12 days and workers were able to remove over 3,300 pounds of plant material. APIPP staff conducted pre- and post-management surveys of invasive plant locations and abundance in the areas near each boat launch. Each of these boat launches had AWI boat stewards inspecting boats for the presence of invasive plants as they left the boat launch.

The project was successful in collecting multiple types of data from different time periods, which is helping APIPP understand the upsides and challenges of this management strategy. On the upside, some sites had conditions like high water clarity and low native plant levels that made harvesting AIS plants more successful than at other sites. A challenge was the data indicated that one year is not enough time to evaluate the success of the management strategy, or to affect the amount of AIS in the water or the number of boats coming out with AIS on them. This assessment makes sense because invasive plants are resilient and it always takes multiple years of management to reduce their populations. It was therefore unlikely for there to be a big change in the data after only one season of management. APIPP plans to continue management at several of the boat launches to gather additional data about the potential effectiveness of this strategy.

EAB BIOCONTROL RELEASE TOOLS

LCBP AND NEIWPCC

Preventing Aquatic Invasive Species Spread Through Targeted Removal Project

The Lake Champlain project described on the previous page was funded wholly or in part by the United States Environmental Protection Agency (U.S. EPA) under assistance agreement (LC00A00981) to NEIWPCC in partnership with the Lake Champlain Basin Program (LCBP). NEIWPCC manages LCBP's personnel, contract, grant, and budget tasks and provides input on the program's activities through a partnership with the LCBP. The contents of this document do not necessarily reflect the views and policies of NEIWPCC, the LCBP, or the U.S. EPA, nor does NEIWPCC, the LCBP or the U.S. EPA endorse trade names or recommend the use of commercial products mentioned in this document.

PARASATOID WASPS RELEASE PROGRAM

EAB Biocontrol Release Program

The parasitoids described in the story on page 9 were produced and supplied from the United States Department of Agriculture's Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ) EAB Parasitoid Rearing Facility in Brighton, MI. For parasitoid information please call 866-322-4512.

Adirondack Park Invasive Plant Program
2023 Annual Report

Appendix A:
Terrestrial Priority Management Progress Charts

The chart on page A1 provides a status summary of 13 terrestrial invasive species surveyed and managed by the Adirondack Park Invasive Plant Program (APIPP).

The map on page A2 illustrates the distribution of known occurrences of terrestrial invasive species in the Adirondack PRISM and summarizes management success.

The charts that follow starting on page A3 show year-by-year annual management progress for certain Tier 2, 3 and 4 terrestrial species. There are two important notes related to these charts.

1. The increasing number of sites over the years is due to increased survey efforts and the ability to survey new areas as invasive species at some of the sites become locally eradicated.

2. Invasive species are considered locally eradicated after three consecutive years of documented invasive plant absence.
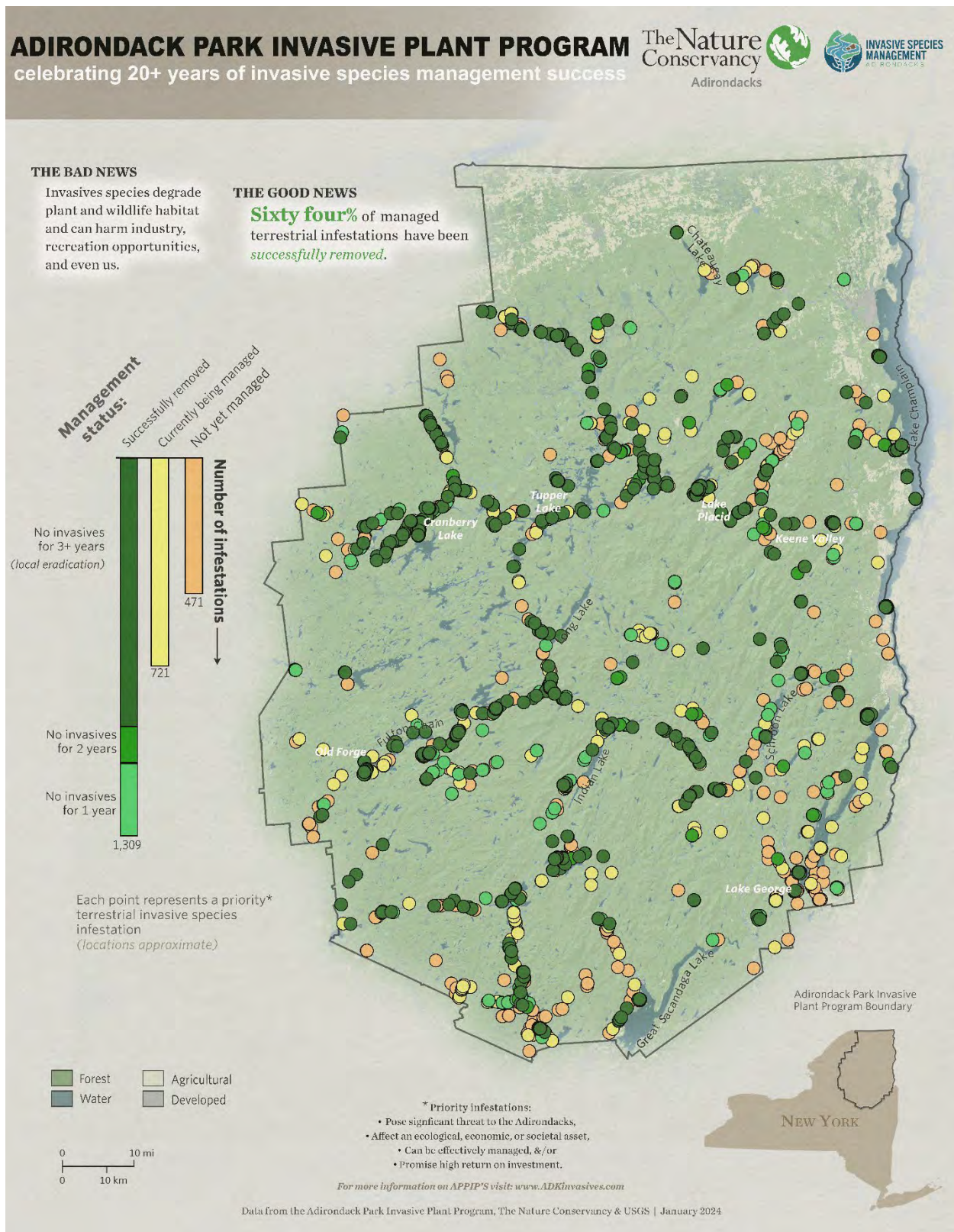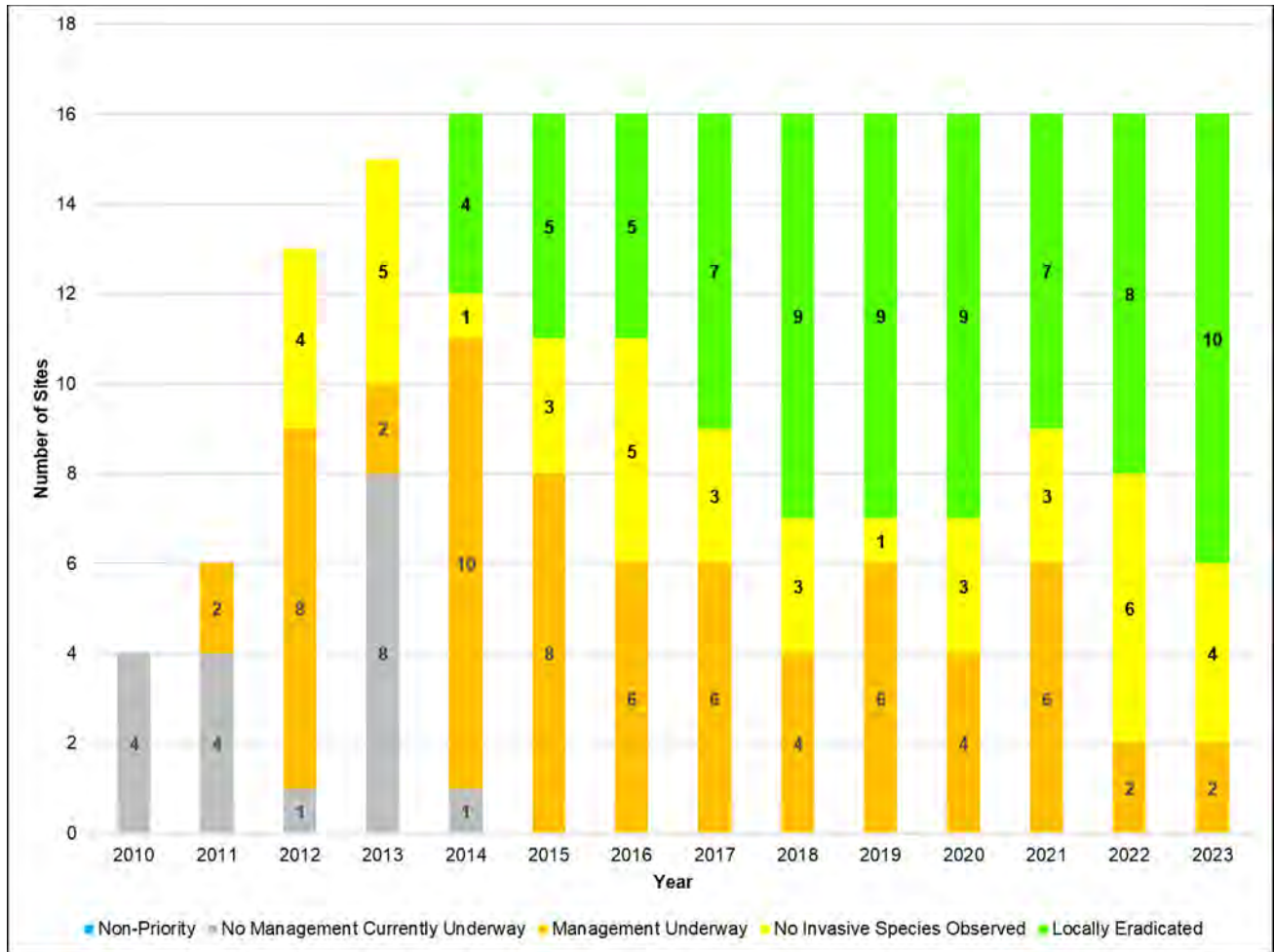

**INVASIVE SPECIES
MANAGEMENT
ADIRONDACKS**

Table 1: Summary of Terrestrial Invasive Species Projects.

Species (Scientific Name)	Figure	Total Mapped Infestations	New (2023) Mapped Infestations	Priority Infestations	Sites Under Active Management*	Sites Treated In 2023*	Size Range of Sites Managed in 2023 (acres)*	Total Area Managed in 2023 (acres)*	Total With At Least 1 Year of Documented Invasive Plant Absence*	Total Locally Eradicated*
Tier 2 - These species are found in low enough abundance, with suitable treatment options available, to make eradication possible within the PRISM.										
Giant hogweed (*Heracleum mantegazzianum*)	1	16	0	16	2	2	<0.001-0.017	0.017	4	10
Japanese angelica tree (*Aralia elata*)	2	1	0	1	0	0	NA	0	0	0
Mile-a-Minute (*Persicaria perfoliata*)	3	5	0	5	4	4	<0.001-0.048	0.049	1	0
Scotch broom (*Cytisus scoparius*)	4	1	0	1	1	1	0.285	0.285	0	0
Wineberry (*Rubus phoenicolasius*)	5	6	0	6	0	0	NA	0	0	0
Tier 3 – These species are likely too widespread or well established for the possibility of eradication. However, strategic management can still contain them to the present location and slow their spread into neighboring areas that remain free of harmful infestations.										
Japanese stiltgrass (*Microstegium vimineum*)	6	30	14	21	5	5	<0.001-0.652	1.114	2	0
Swallow-wort spp. (*Vincetoxicum louiseae & V. rossicum*)	7	88	16	69	37	28	<0.001-1.834	6.294	11	12
Tree-of-heaven (*Ailanthus altissima*)	8	31	13	31	12	12	<0.001-0.492	1.122	7	0
Tier 4 – These species cannot be eradicated from the PRISM geography. Species are too widespread or too established and management is cost prohibitive. In these cases, focus shifts to localized suppression targeted at protecting high-priority resources such as rare habitats, endangered species, and recreational assets.										
Common reed grass (*Phragmites australis*)	9	2,265	96	783	222	156	<0.001-1.140	9.568	93	257
Garlic mustard (*Alliaria petiolata*)	10	970	22	865	226	182	<0.001-0.052	0.313	143	478
Knotweed spp. (*Reynoutria japonica, R. sachalinensis & R. x bohemica*)	11	1574	79	502	164	102	<0.001-0.825	3.927	74	102
Purple loosestrife (*Lythrum salicaria*)	12	971	4	144	39	10	<0.001-0.166	0.195	36	31
Yellow iris (*Iris pseudacorus*)	13	234	2	57	9	7	<0.001-<0.001	0.001	9	39
Summary	**N/A**	**6,192**	**246**	**2,501**	**721**	**509**	**<0.001 – 1.834**	**22.885**	**380**	**929**
*only includes priority sites										

Location and Management Status of Terrestrial Invasive Species

ADIRONDACK PARK INVASIVE PLANT PROGRAM
celebrating 20+ years of invasive species management success

The Nature Conservancy
Adirondacks

INVASIVE SPECIES MANAGEMENT ADIRONDACKS

THE BAD NEWS
Invasives species degrade plant and wildlife habitat and can harm industry, recreation opportunities, and even us.

THE GOOD NEWS
Sixty four% of managed terrestrial infestations have been *successfully removed*.

Management status:
Successfully removed
Currently being managed
Not yet managed

Number of infestations

471

721

No invasives for 3+ years *(local eradication)*

No invasives for 2 years

No invasives for 1 year

1,309

Each point represents a priority* terrestrial invasive species infestation *(locations approximate)*

Forest
Water
Agricultural
Developed

0   10 mi
0   10 km

* **Priority infestations:**
• Pose signficant threat to the Adirondacks,
• Affect an ecological, economic, or societal asset,
• Can be effectively managed, &/or
• Promise high return on investment.

For more information on APPIP'S visit: www.ADKinvasives.com

Data from the Adirondack Park Invasive Plant Program, The Nature Conservancy & USGS | January 2024

Adirondack Park Invasive Plant Program Boundary
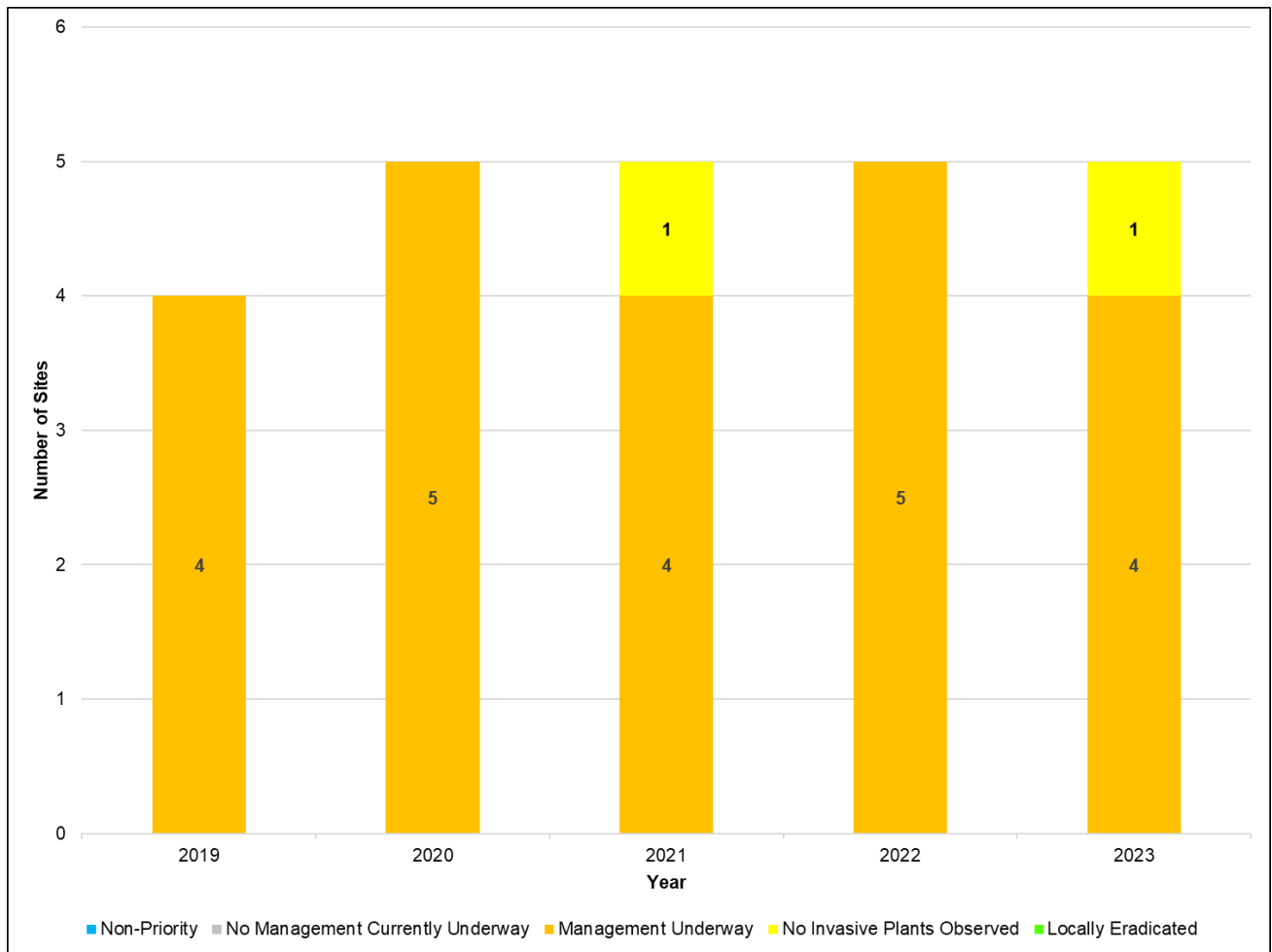
NEW YORK

Figure 1. Annual management progress for the APIPP PRISM Giant Hogweed Eradication Project (2010-2023).
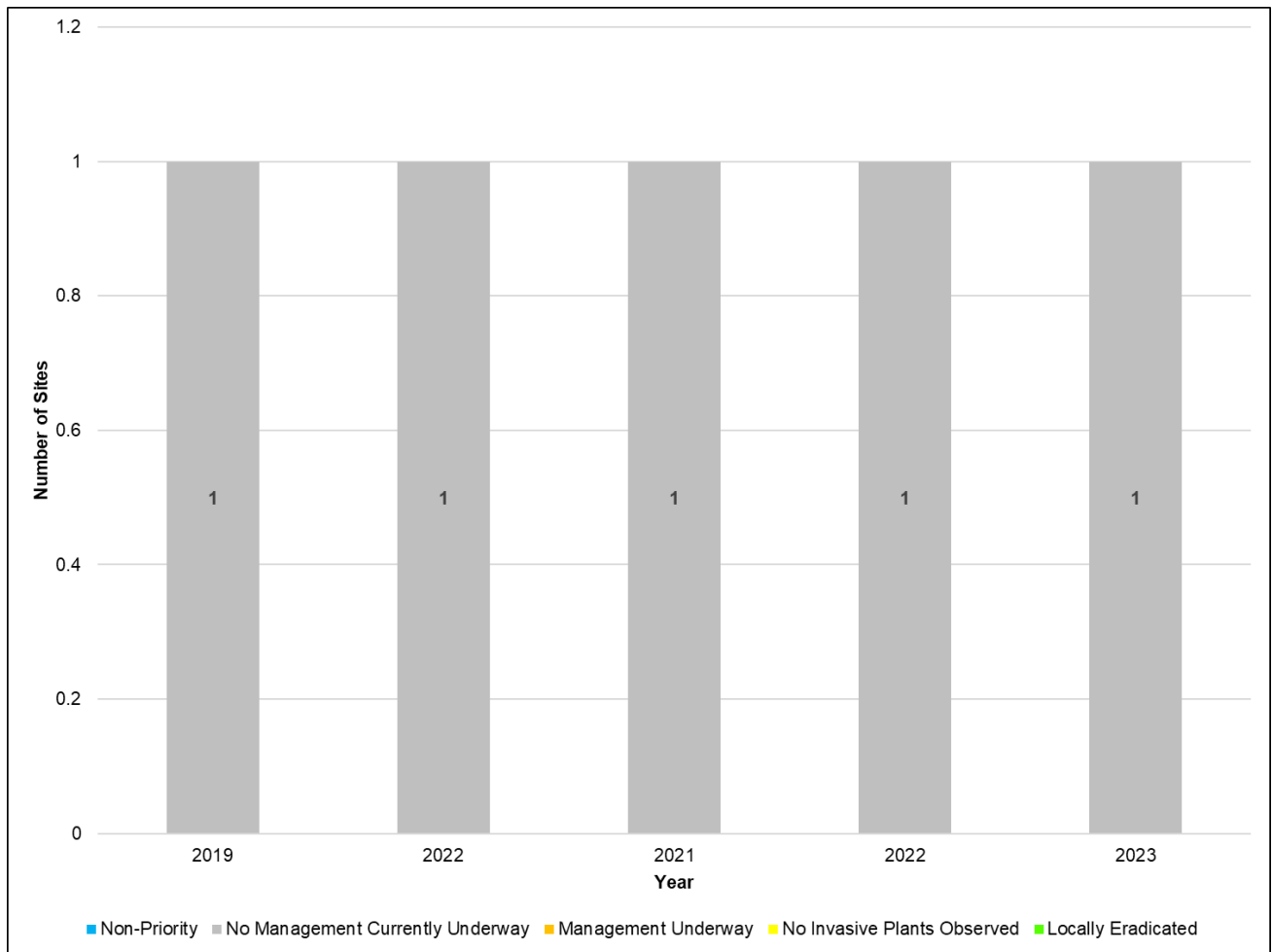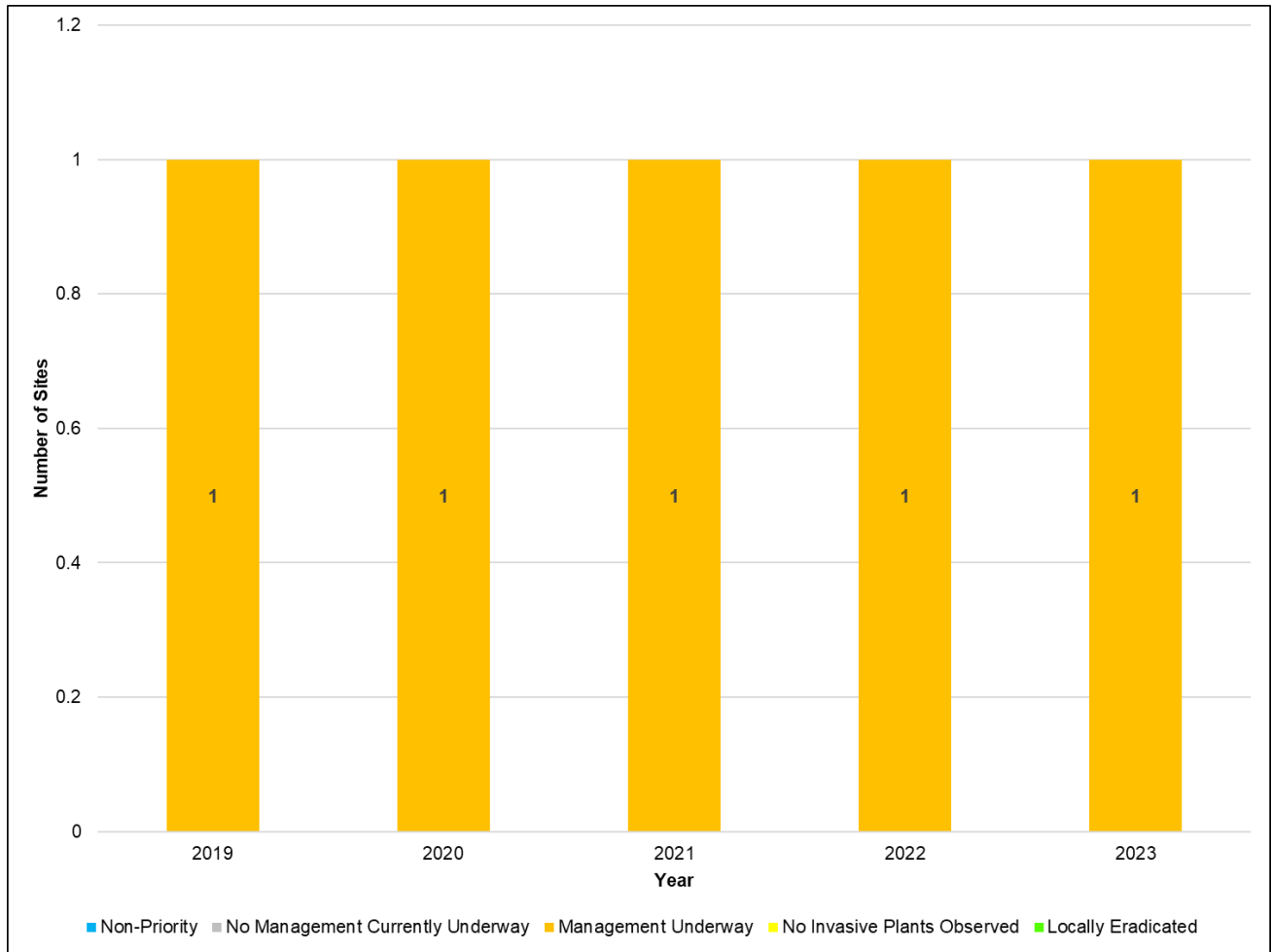
Figure 2. Annual management progress for the APIPP PRISM Giant Japanese Angelica Tree Eradication Project (2019-2023).
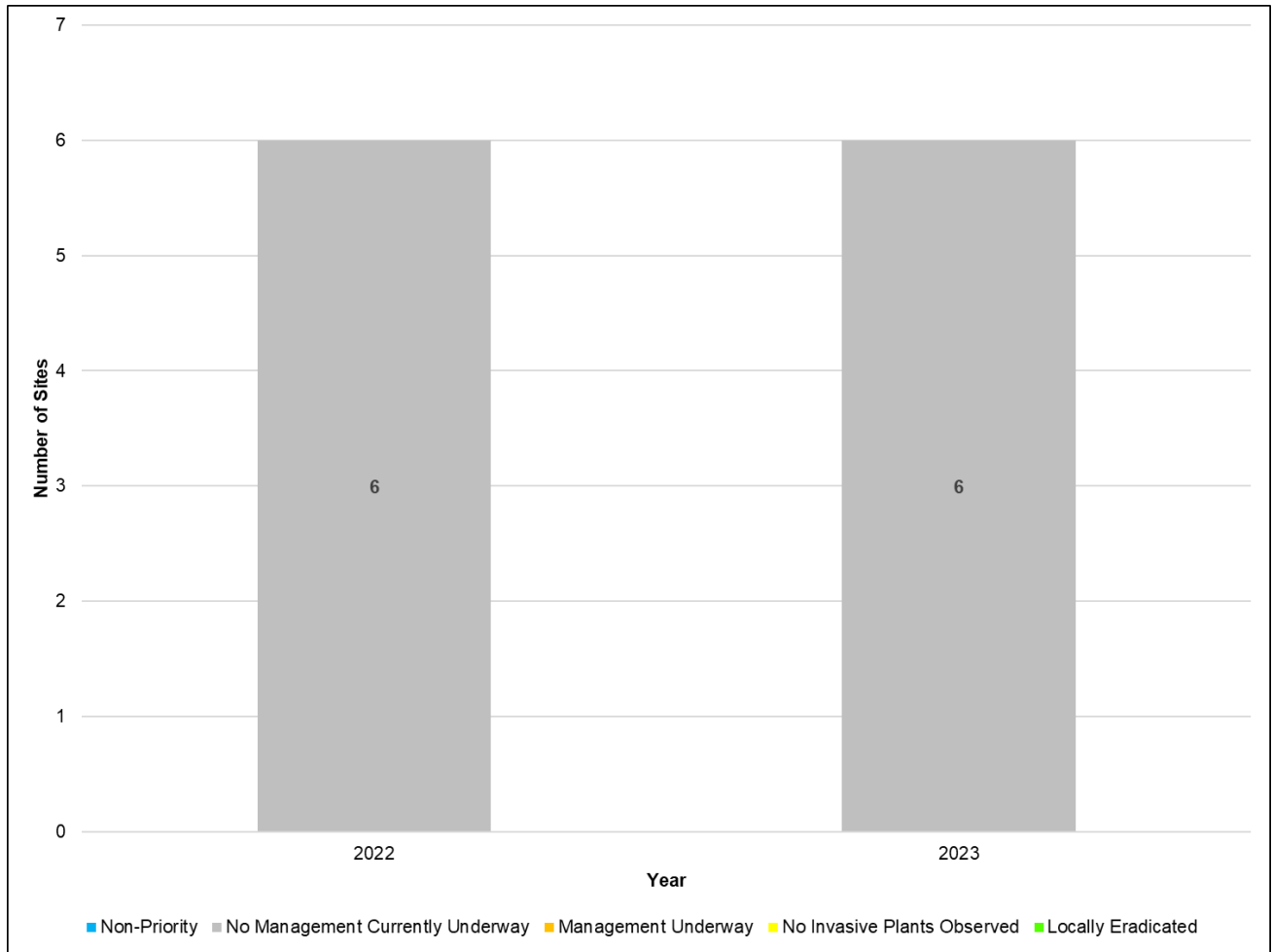
Figure 3. Annual management progress for the APIPP PRISM Mile-a-Minute Eradication Project (2019-2023).
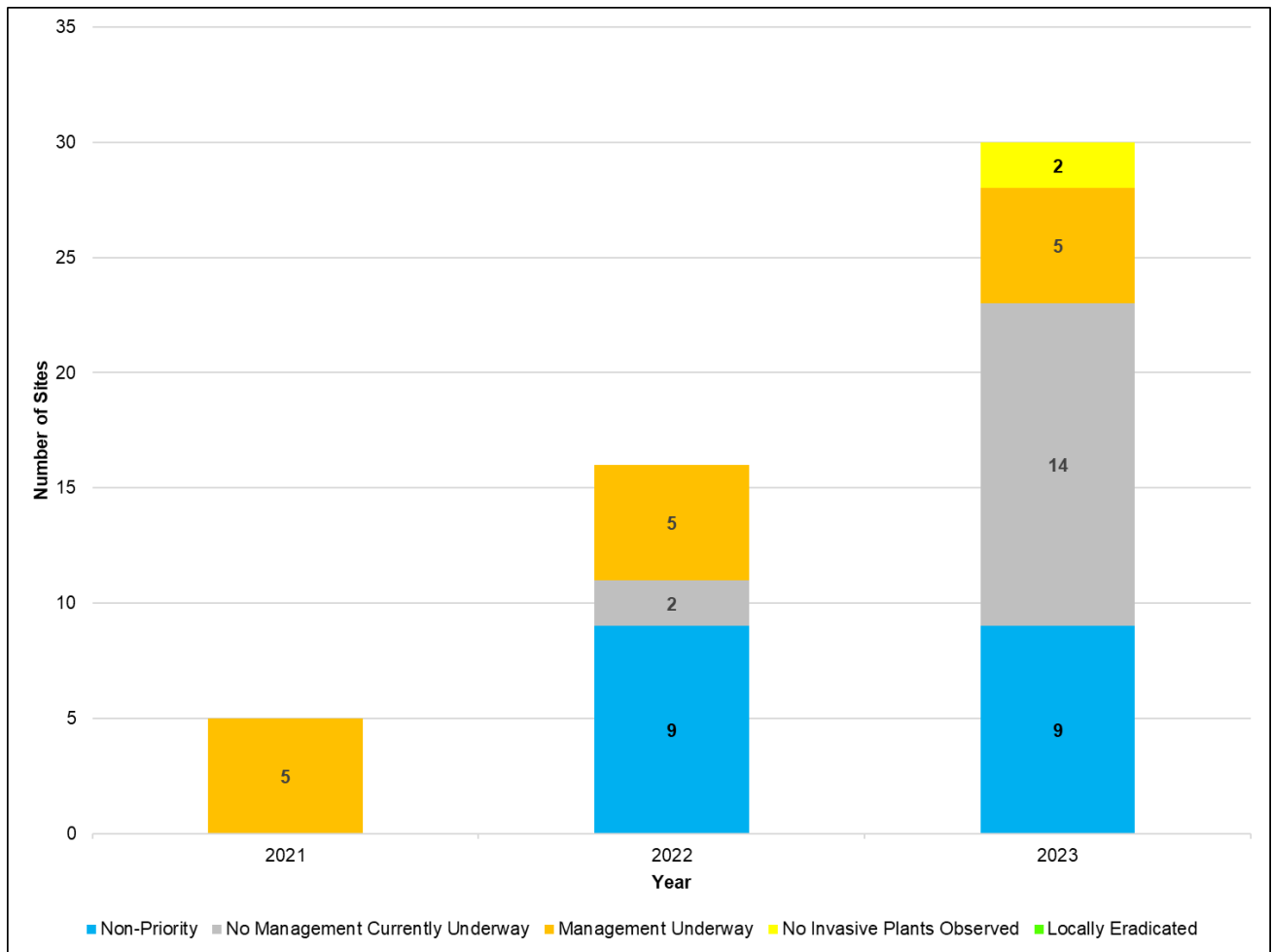
Figure 4. Annual management progress for the APIPP PRISM Scotch Broom Eradication Project (2019-2023).

Figure 5. Annual management progress for the APIPP PRISM Wineberry Eradication Project (2022-2023).

Figure 6. Annual management progress for the APIPP PRISM Japanese Stiltgrass Containment Project (2021-2023).

Figure 7. Annual management progress for the APIPP PRISM Swallow-Wort Containment Project (2014-2023).
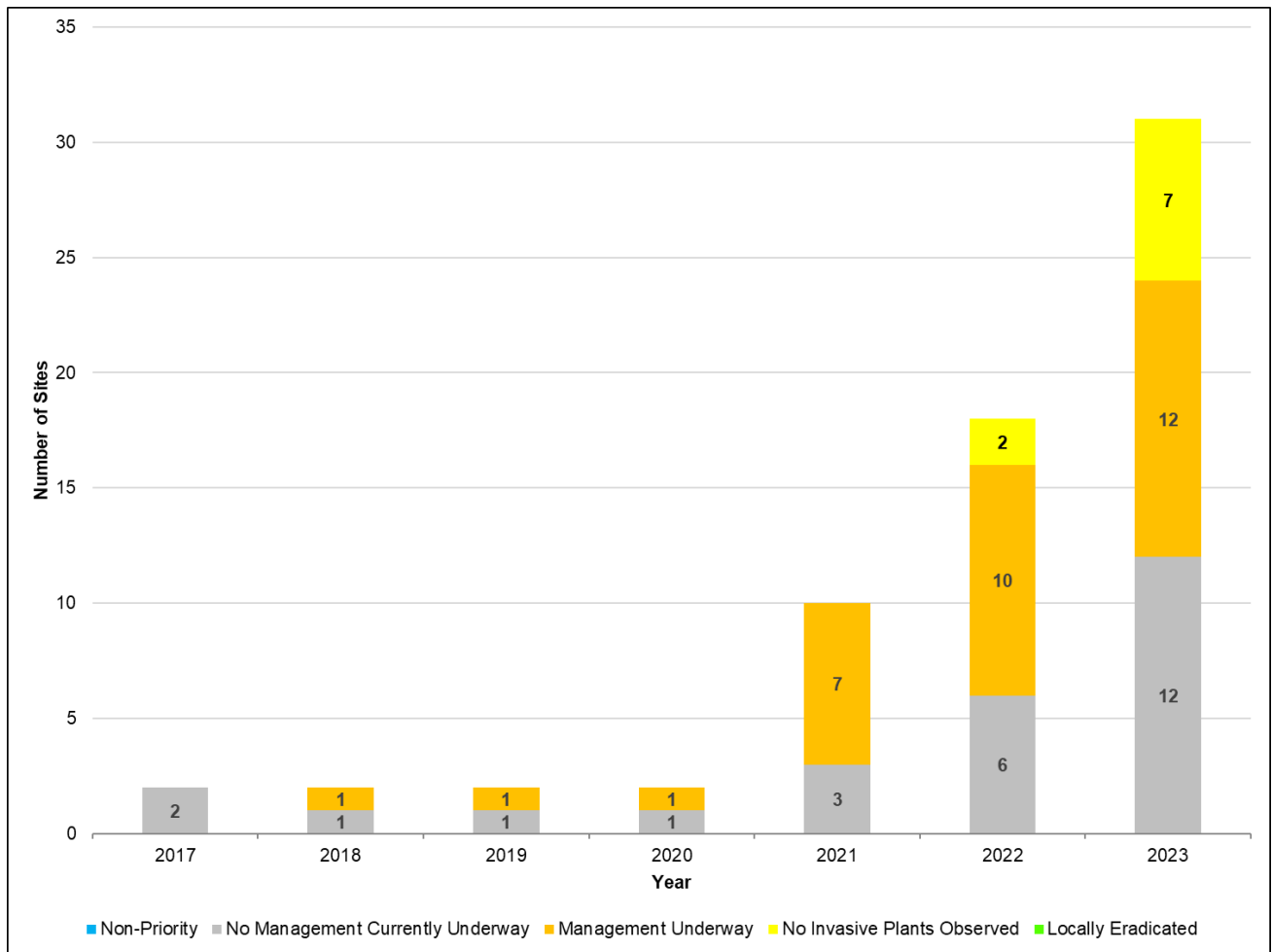
Figure 8. Annual management progress for the APIPP PRISM Tree-of-Heaven Containment Project (2017-2023).

Figure 9. Annual management progress for the Ausable River Watershed Common Reed Grass Suppression Project (2010-2023).

Figure 10. Annual management progress for the APIPP PRISM Garlic Mustard Suppression Project (2012-2023).
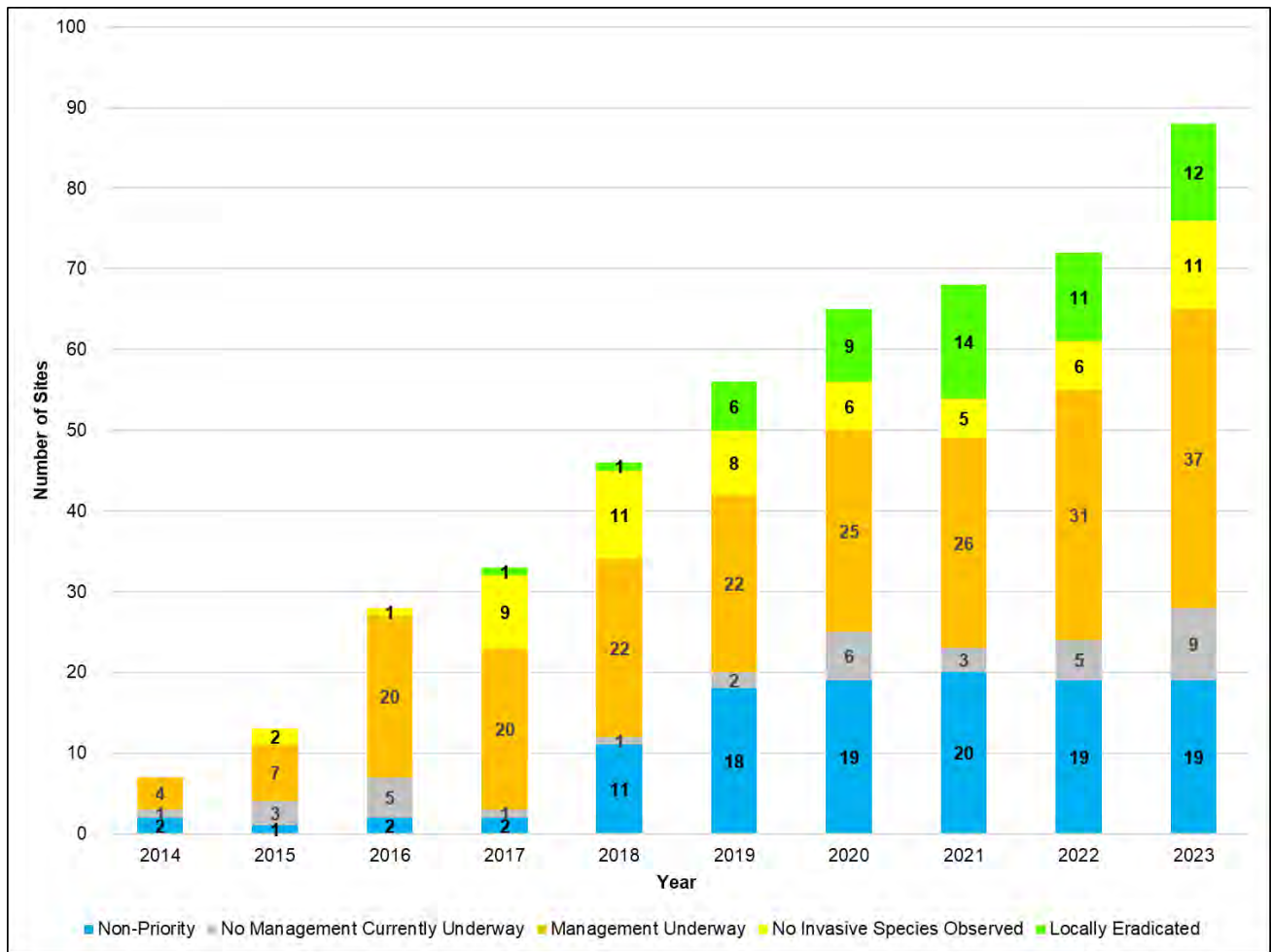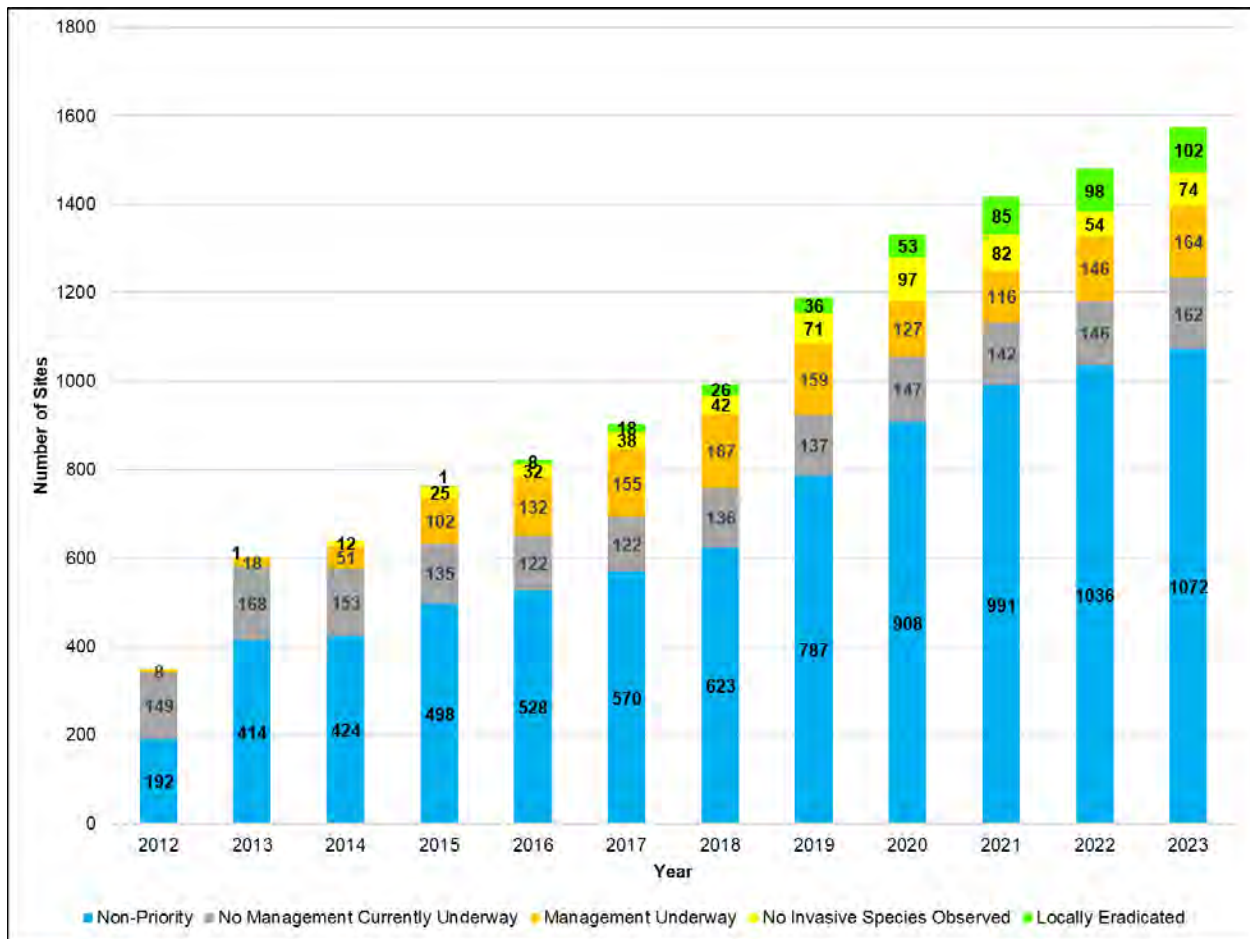
Figure 11. Annual management progress for the APIPP PRISM Knotweed Suppression Project (2012-2023).
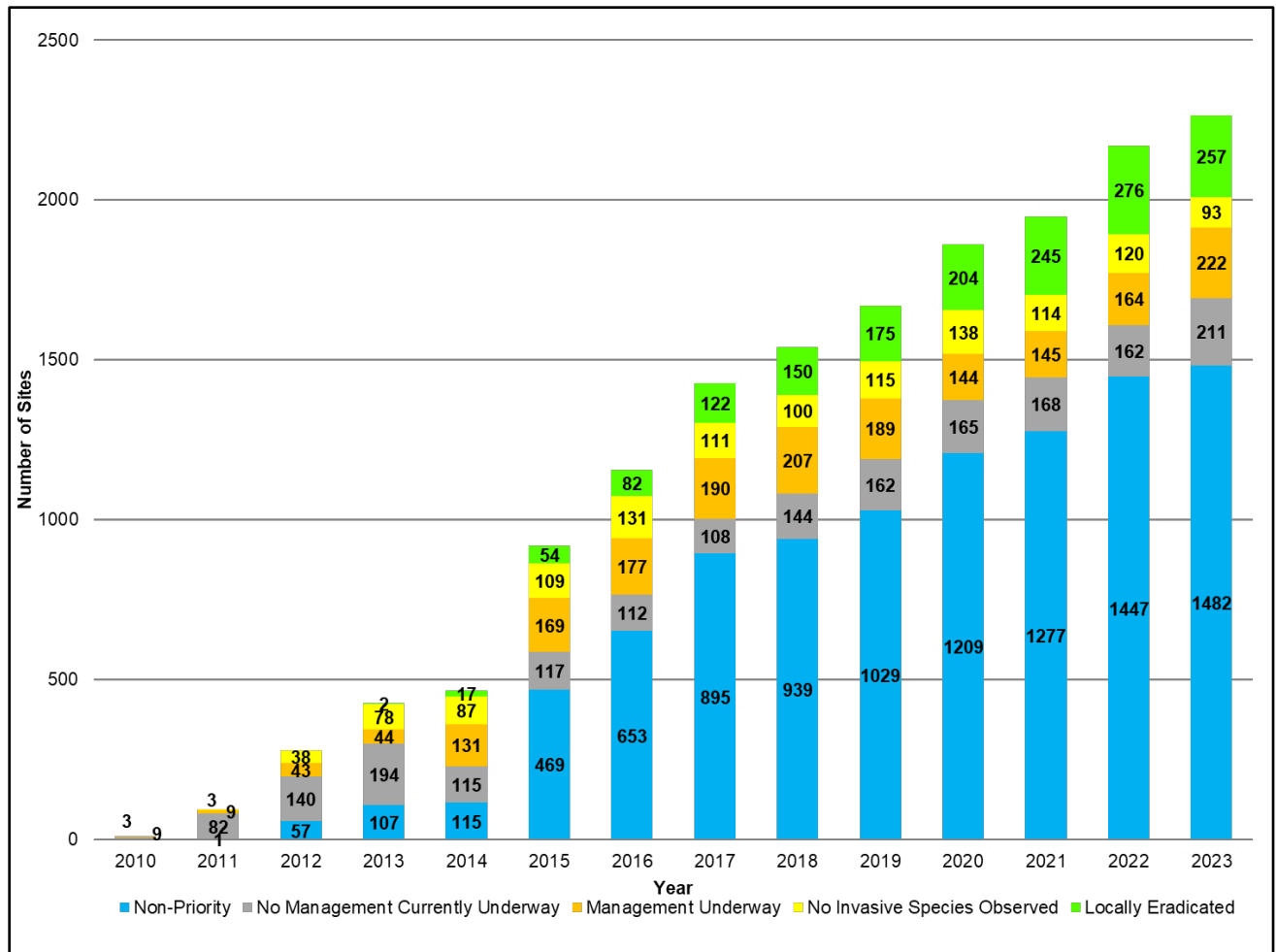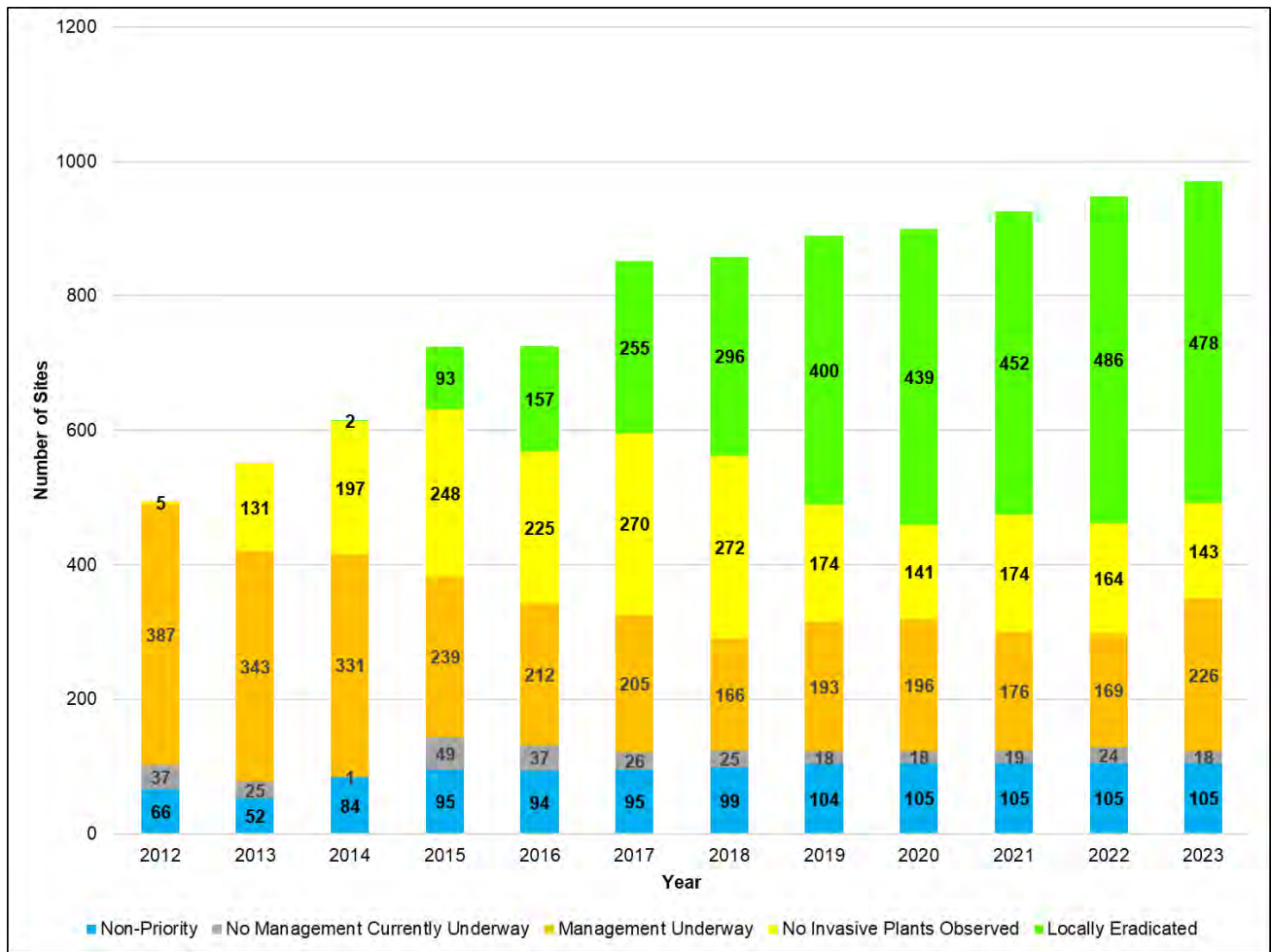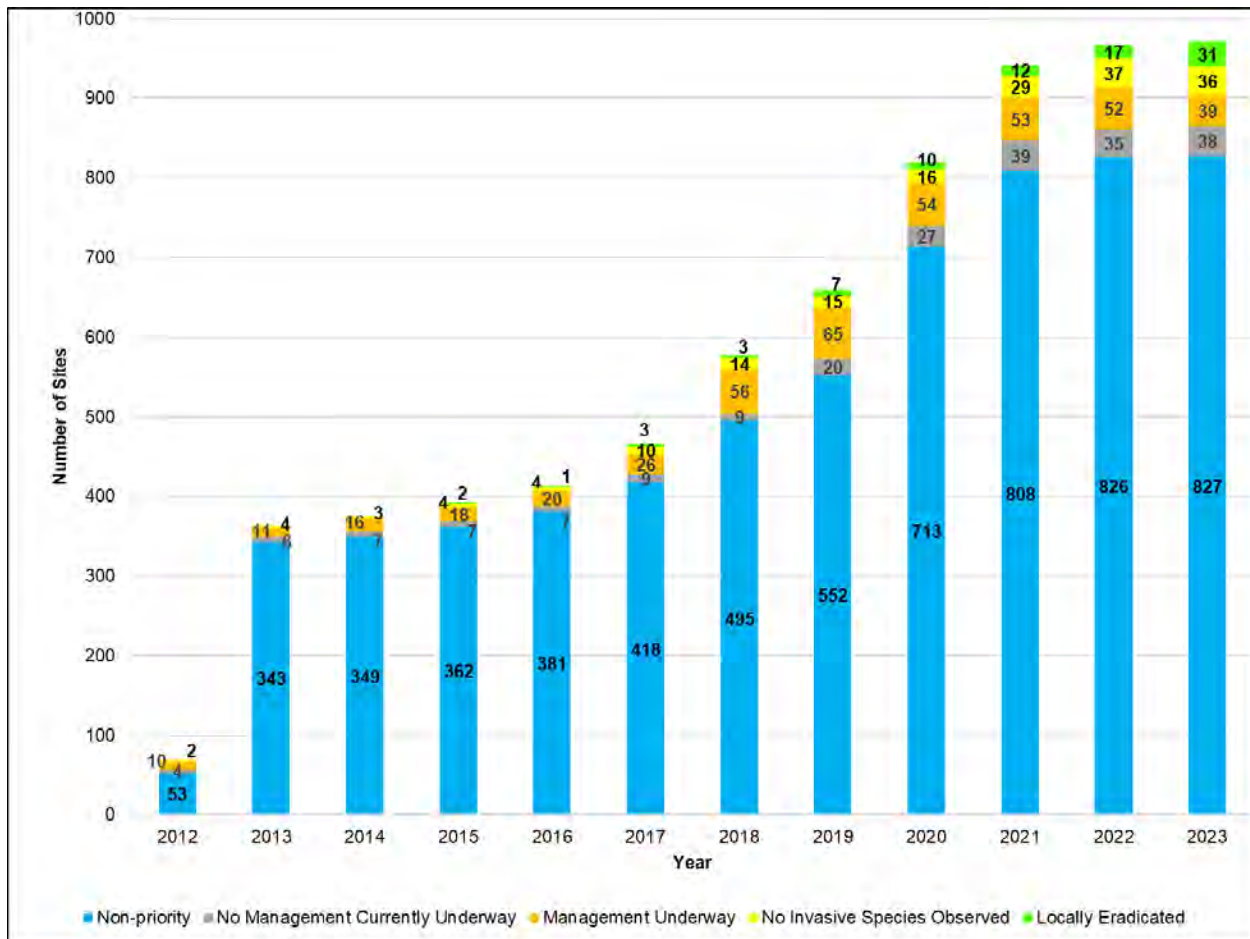
Figure 12. Annual management progress for the APIPP PRISM Purple Loosestrife Suppression Project (2012-2023).
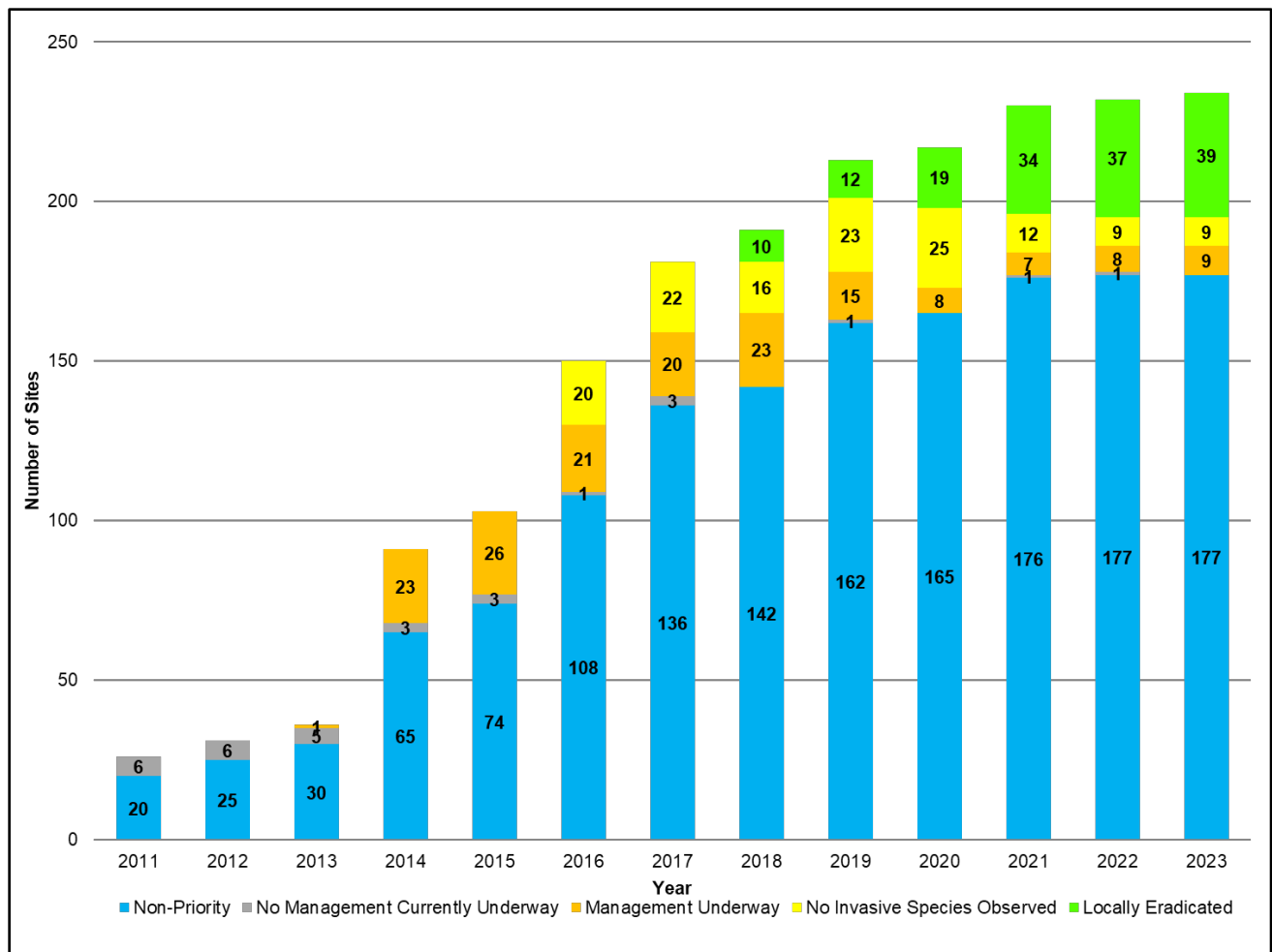
Figure 13. Annual management progress for the APIPP PRISM Yellow Iris Suppression Project (2011-2023).

Adirondack Park Invasive Plant Program
2023 Annual Report

Appendix B:
Aquatic Invasive Species Progress Charts

The charts on the following pages provide additional detail for some of the Adirondack Park Invasive Plant Program's (APIPP) 2023 aquatic invasive species (AIS) program findings.

The map on page B4 shows the distribution of AIS across the Adirondack PRISM and waterbodies with and without AIS detected.

To see a list of newly-invaded waterbodies detected in 2023, see the chart on page B5.

To see a summary of the status of all Tier 2-4 AIS, see page B7.

AIS Surveys Submitted
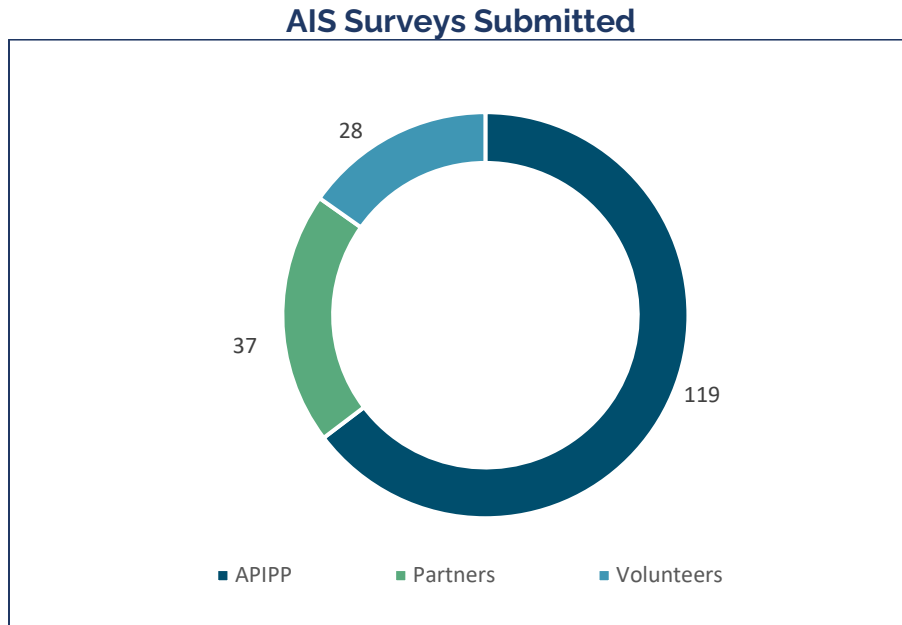
Figure 1 – 2023 surveys of waterbodies for aquatic invasive species submitted to APIPP; 184 surveys were reported by APIPP (APIPP staff and the Early Detection team), Partners (lake associations, environmental non-profits, etc.), and volunteers (general members of the public not affiliated with any organization).

Waterbodies Monitored and Number of Volunteers
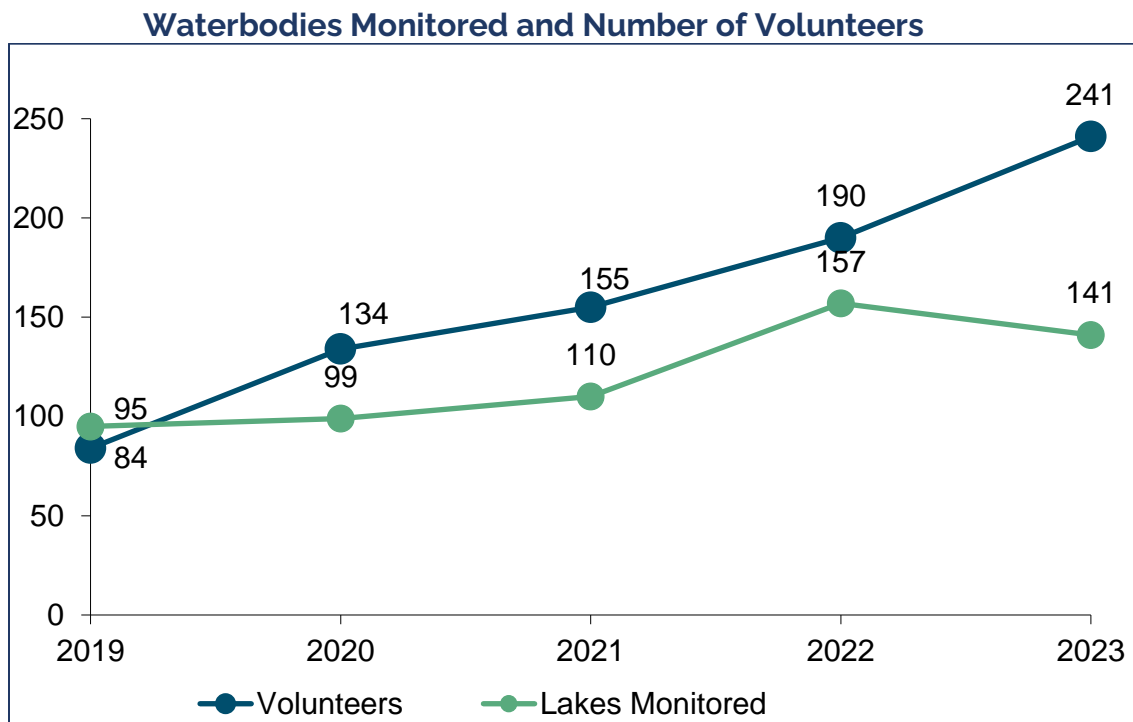
Figure 2 – Line graph from 2019-2023 surveys of total number of waterbodies with a survey (referred to as Lakes, but also includes ponds, wetlands, streams, and rivers) and the total number of volunteers that participated.

Percent of AIS Observed in Surveys
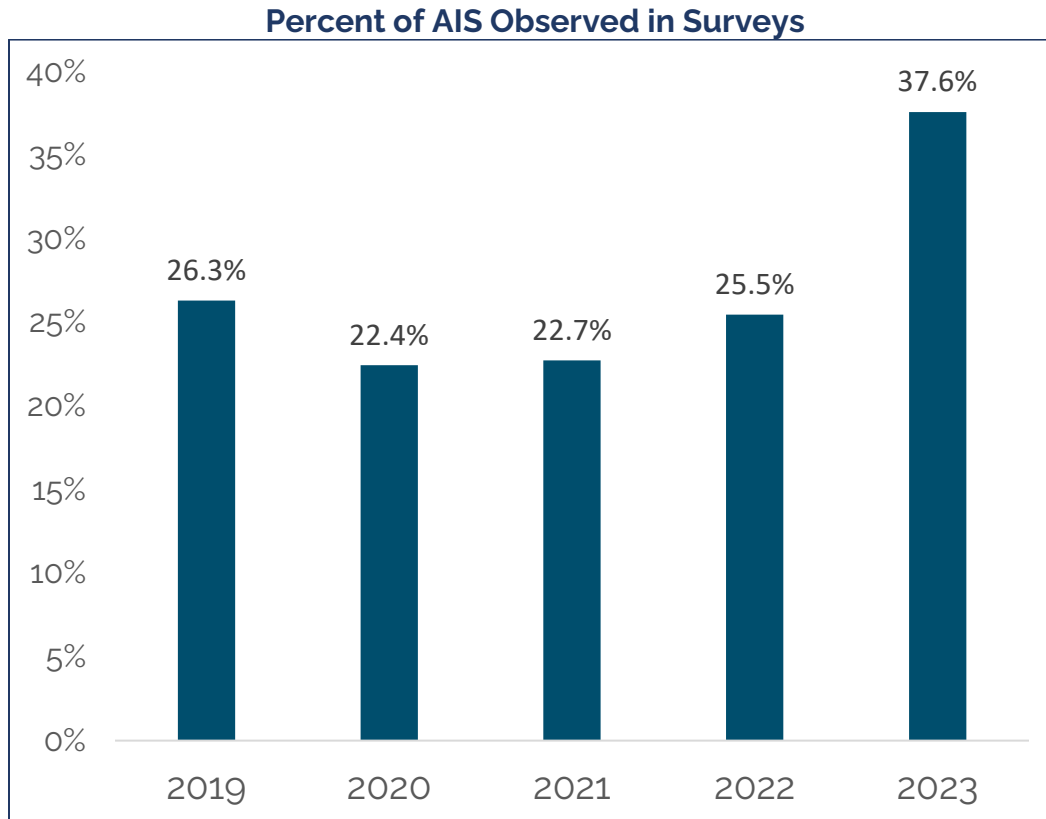
Figure 3 – Percent of waterbodies surveyed with AIS observed. This is calculated by dividing the number of waterbodies with an AIS reported in a survey by the total number of waterbodies surveyed in that year.

Percent of sites with EWM

Few Plants Widely
Scattered 17.6%

Trace to Sparse
7.2%

Moderate to
Dense 5.5%

None 69.6%

Few Plants Widely Scattered	210	Trace to Sparse 86	Moderate to Dense 66	None 830
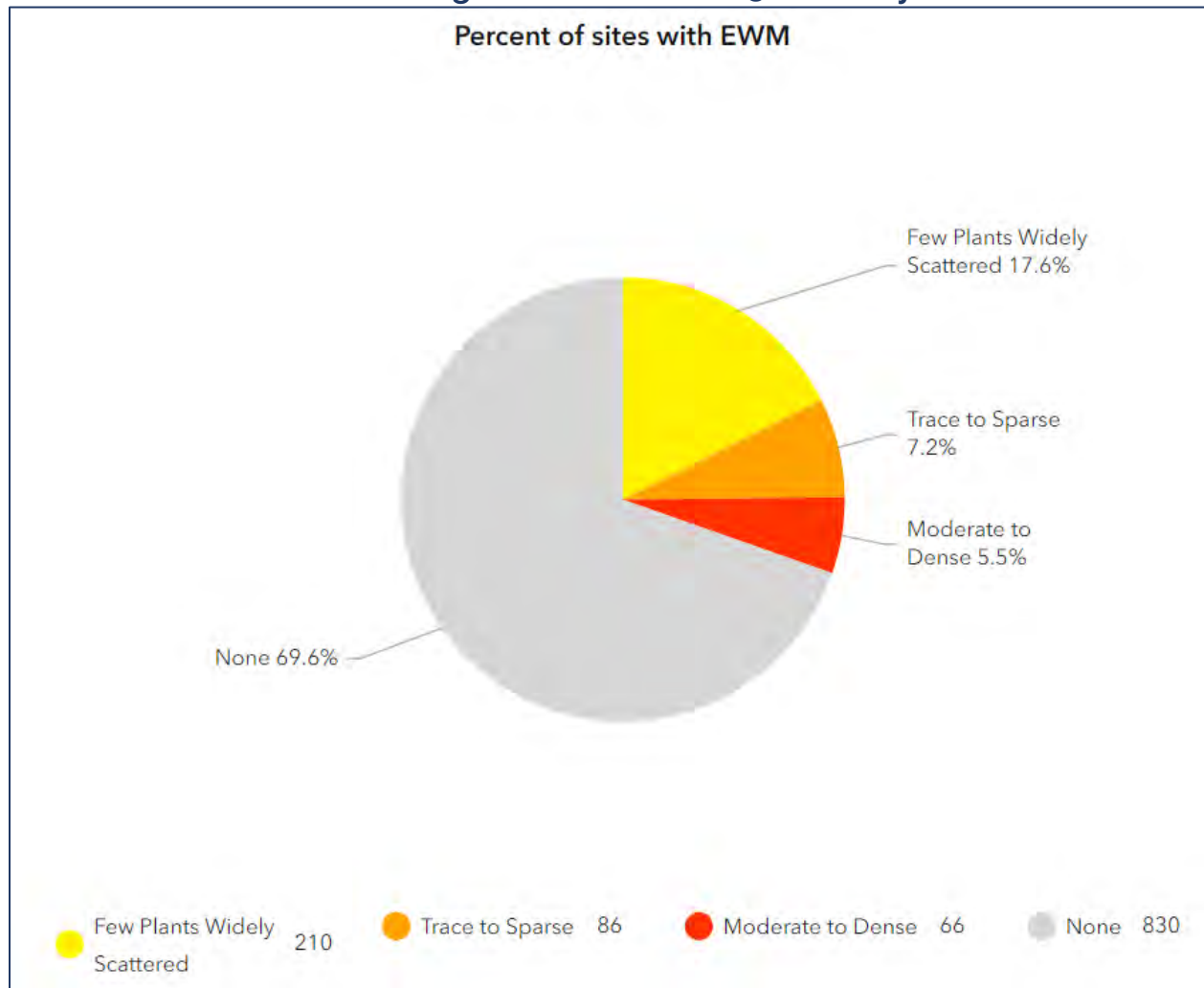
Figure 4 – Lake Management Tracker results from seven lakes showing the percent of sites and their abundance of Eurasian watermilfoil (EWM). Less than 1% of sites monitored had variable leaf milfoil present.

Location and Number of Adirondack Waterbodies Surveyed With and Without AIS Detected - 2023

ADIRONDACK LAKES DEPEND ON US
protect your waters by keeping invasive species out

INVASIVE SPECIES MANAGEMENT ADIRONDACKS

The Nature Conservancy
Adirondacks

Number of aquatic invasive species

0	1-2	3-4	5+
(372)	(109)	(16)	(2)

1 droplet = 1 lake

THE BAD NEWS
Invasives species degrade water quality & impair swimming, fishing & boating.

THE GOOD NEWS
3 out of 4 surveyed lakes are *free* of invasive species.

Chateaugay Lake

Lake Champlain

Lake Placid

Cranberry Lake

Tupper Lake

Keene Valley

Long Lake

Schroon Lake

Old Forge — Fulton Chain

Indian Lake

Lake George

Adirondack Park Invasive Plant Program (APIPP) Boundary

Forest
Unsurveyed Lakes
Agricultural & Developed

0   10 mi
0   10 km

Great Sacandaga Lake

NEW YORK

Data from APIPP, partners, volunteers, The Nature Conservancy & USGS | January 2024

Appendix B: Page B4

Table 1 - New AIS Observations in the Adirondack PRISM in 2023.

Hydrography Database Name	Local Name	Town	AIS observed in 2023	Previous AIS in waterbody	Notes
Patterson Reservoir	Patterson Reservoir	Plattsburgh	Curly leaf pondweed	Eurasian watermilfoil	
Floodwood Pond	Floodwood Pond	Santa Clara	Variable leaf milfoil	Eurasian watermilfoil	
None	Pond near Lake Flower hotels	Saranac Lake	Eurasian watermilfoil	No previous surveys	Connected to invasive populations in Lake Flower by a culvert
None	Pond near Lake Flower hotels	Saranac Lake	Variable leaf milfoil	No previous surveys	Connected to invasive populations in Lake Flower by a culvert
None	Toxic Pond	Saranac Lake	Variable leaf milfoil	No previous surveys	Connected to invasive populations in Lake Flower and another invaded pond by a culvert
None	Great Chazy River	Ellenburg	Eurasian watermilfoil	No previous surveys	Downstream of invasive populations in Lake Roxanne
None	Great Chazy River	Ellenburg	Water chestnut	No previous surveys	Downstream of invasive populations in Lake Roxanne
Saranac River	Saranac River	Caddysville	Eurasian watermilfoil	No previous surveys	Downstream of invasive populations in Union Falls and Franklin Falls
Saranac River	Saranac River	Caddysville	Chinese mystery snail	No previous surveys	
None	East Pond / Tracey Brook	Chazy	European frog bit	Eurasian watermilfoil	Downstream of invasive populations in Lake Alice
St. Regis River	St. Regis River	St. Regis Falls	Chinese mystery snail	European frog bit	
None	Unnamed pond connected to St. Regis River	St. Regis Falls	Chinese mystery snail	European frog bit	Connected to St. Regis River by a culvert

Hydrography Database Name	Local Name	Town	AIS observed in 2023	Previous AIS in waterbody	Notes
Little Square Pond	Little Square Pond	Santa Clara	Variable leaf milfoil	Eurasian watermilfoil	Connected to invasive populations in Fish Creek and Fish Creek Ponds
None	Wetland near Tupper Lake	Tupper Lake	Variable leaf milfoil	No previous surveys	Connected to invasive populations in Tupper Lake by a culvert
None	Dead Creek	Plattsburgh	Water chestnut	No previous surveys	Connected to invasive populations in Lake Champlain
Rock Lake	Rock Pond	Indian Lake	Variable leaf milfoil	No previous surveys	Connected to invasive populations in Lake Durant
Adirondack Lake	Lake Adirondack	Indian Lake	Chinese mystery snail	No AIS previously observed	

Table 2 – Summary of all AIS data from Adirondack PRISM in iMapInvasives.

Species (scientific Name)	Number of waterbodies with species present	New waterbodies in 2023 with species observed	2023 observations submitted to iMapInvasives	Total observations submitted to iMapInvasives
Tier 2 - These species are found in low enough abundance, with suitable treatment options available, to make eradication possible within the PRISM.				
Fanwort (*Cabomba caroliniana*)	4	0	0	7
Water chestnut (*Trapa natans*)	6	2	13	113
Tier 3 – These species are likely too widespread or well established for the possibility of eradication. However, strategic management can still contain them to the present location and slow their spread into neighboring areas that remain free of harmful infestations.				
Asian clam (*Corbicula fluminea*)	1	0	1	93
European frog-bit (*Hydrocharis morsus-ranae*)	8	1	29	80
Fishhook waterflea (*Cercopagis bengoi*)	1	0	0	1
Spiny waterflea (*Bythotrephes longimanus*)	9	0	0	35
Zebra mussels (*Dressina polymorpha*)	1	0	4	250
Tier 4 – These species cannot be eradicated from the PRISM geography. Species are too widespread or too established and management is cost prohibitive. In these cases, focus shifts to localized suppression targeted at protecting high-priority resources such as rare habitats, endangered species, and recreational assets.				
Chinese mystery snail (*Cipangopaludina chinensis*)	12	4	9	23
Curly leaf pondweed (*Potamogeton crispus*)	24	1	25	94
Eurasian watermilfoil (*Myriophyllum spicatum*)	72	3	363	2,917
Variable leaf milfoil (*Myriophyllum heterophyllum*)	53	6	152	841

Adirondack Park Invasive Plant Program (APIPP)
2023 Annual Report

Appendix C: Strategic Plan Impementation Tracking

The graphics and charts on the following pages show APIPP's progress toward implementing the Adirondack PRISM 2023-2027 Strategic Plan. The Strategic Plan can be found on www.adkinvasives.com.

The Strategic Plan calls for the creation of two dashboards and a Tracking Table.

- The Partner Accomplishments Dashboard captures the collective work of Adirondack PRISM partners in meeting the mission outlined in the Strategic Plan. Data is collected annually in late winter for the previous year's accomplishments. The updated Partner Accomplishments Dashboard is generally released in April and can be found on APIPP's website.

- The APIPP Strategic Plan Progress Dashboard illustrates key metrics that track outcomes related to meeting the APIPP staff strategies outlined in the Strategic Plan. It is found on the first page of this Appendix. The purpose of this dashboard is to provide a consistent way of reporting the data each year so that trends can be tracked over time and strategies can be adapted as needed.

- The APIPP Strategic Plan Implementation Tables track progress on implementing each of the objectives outlined under the staff strategies in the Strategic Plan. This table starts on page C5 of this Appendix.

INVASIVE SPECIES
MANAGEMENT
ADIRONDACKS
WWW.ADKINVASIVES.COM

APIPP Strategic Plan Progress Dashboard 2023

This dashboard displays key metrics for how successfully APIPP is implementing the strategies outlined in the 2023-2027 Adirondack PRISM Strategic Plan.

✓Fully implemented   ✓Partially implemented/room for improvement   ✓Not yet implemented

Goal 1: Protect Adirondack PRISM lands from the most significant ecologic and economic impacts of terrestrial invasive plants and animals, including forest pests and pathogens

OUTCOME METRIC 1.1
Percent of Tier 2 infestations under active management and with "no plants observed" (NPO) status

- Baseline: 72%
- Benchmark: 100% of Tier 2 infestations under management within one year of identification
- 2023: 76% (22 of 29 Tier 2 infestations under management/NPO)

72%	100%	76% ✓
2022 BASELINE	BENCHMARK	2023 YEAR-END ACTUAL

OUTCOME METRIC 1.2
Percent of managed sites NPO or eradicated

- Baseline 58% (2018 = 45%; 2019 = 55%; 2020 = 61%; 2021 = 63%; 2022 = 64%)
- Benchmark: Remain at or above 5-year rolling average
- 2023: 64%

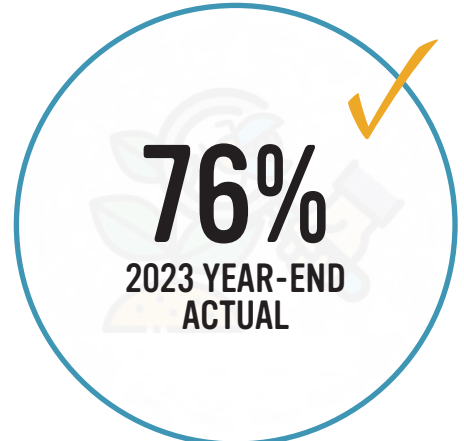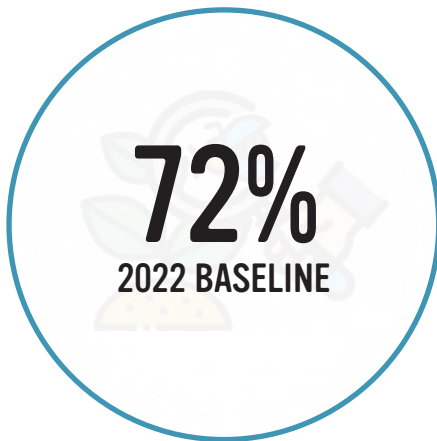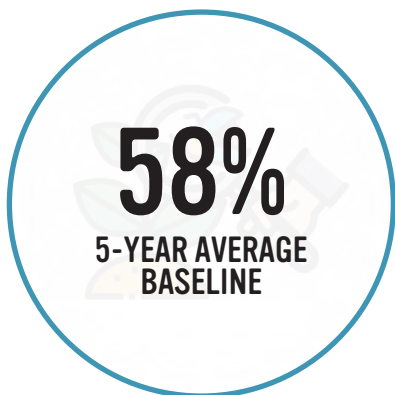| 58%	≥58%	64% ✓
5-YEAR AVERAGE BASELINE	BENCHMARK	2023 YEAR-END ACTUAL

Goal 2: Protect Adirondack PRISM waters from the most significant ecologic and economic impacts of aquatic invasive plants and animals

OUTCOME METRIC 2.1
Annual rate of Tier 1 introductions per decade

- Baseline: Average 8 new species per decade (2000-2020); 2000-2009 = 9; 2010 – 2019 = 7
- Benchmark: No more than 5 Tier 1 introductions per decade
- 2020–2023: 0 new AIS species introduced

8
BASELINE
10-YEAR AVERAGE

≤5
BENCHMARK

0 ✔
2023 YEAR-END
ACTUAL

OUTCOME METRIC 2.2
Monitoring for AIS

OUTCOME METRIC 2.2A
Number of surveys submitted to APIPP

- Baseline: 121.4 (2018 = 91, 2019 = 96, 2020 = 106, 2021 = 132; 2022 = 182)
- Benchmark: Remain at or above 5 year rolling average
- 2023: 184

121
5-YEAR AVERAGE
BASELINE

≥121
BENCHMARK

184 ✔
2023 YEAR-END
ACTUAL

OUTCOME METRIC 2.2B
Number of new invasions, defined as the number of new species observed in a waterbody. This includes both new waterbodies and new species found in already invaded waterbodies

- Baseline: 4 (2018 = 2, 2019 = 3, 2020 = 3, 2021 = 5, 2022 = 7)
- Benchmark: Remain at or below 5-year rolling average
- 2023: 17

4
5-YEAR AVERAGE
BASELINE

≤4
BENCHMARK

17 ✔
2023 YEAR-END
ACTUAL
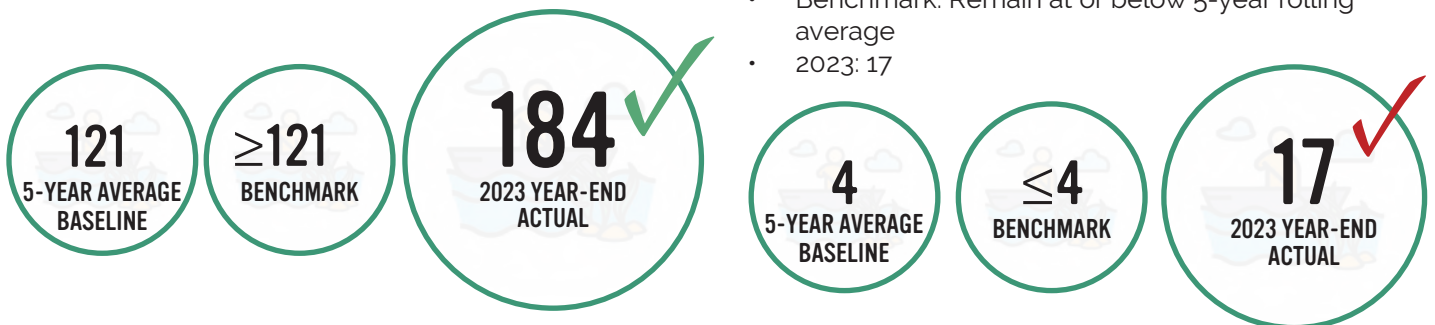
OUTCOME METRIC 2.2C
Percent of surveyed waterbodies in the Adirondack PRISM that are not invaded

- Baseline: 75% (2018 = 75%, 2019 = 75%, 2020 = 75%, 2021 = 76%, 2022 = 76%)
- Benchmark: Remain at or above 75%
- 2023: 75%

75%
BASELINE
2018-2022

≥75%
BENCHMARK

75% ✔
2023 YEAR-END
ACTUAL

Goal 3: Build engaged and knowledgeable communities that are empowered to act on invasive species issues

OUTCOME METRIC 3.1
Number of participants at APIPP-led educational workshops

- Baseline: 616
- Benchmark: Increase by 10% each year
- 2023: 771

616
2022 BASELINE

678
BENCHMARK
10% INCREASE

771
2023 YEAR-END
ACTUAL
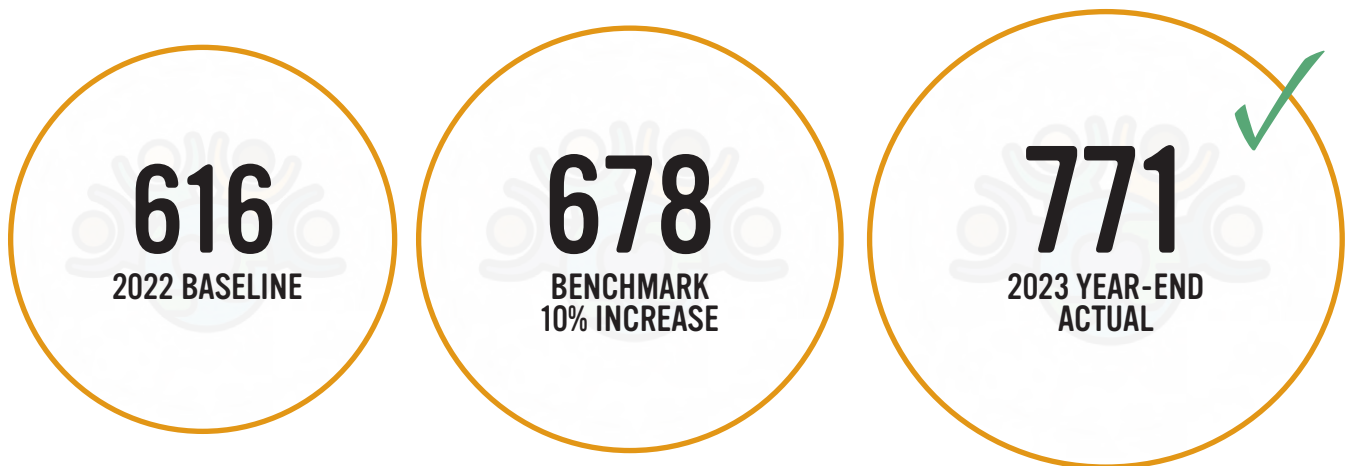
OUTCOME METRIC 3.2
Number of APIPP partners

- Baseline: 28
- Benchmark: Increase by 2 per year
- 2023: 35 (9 new partners in 2023 with a net gain of 7)

28
2022 BASELINE

30
BENCHMARK
ADD 2 PER YEAR

35
2023 YEAR-END
ACTUAL

Goal 4: Engage in research and innovation to improve the monitoring and management of invasive species

OUTCOME METRIC 4.1
Number of research and innovation projects where APIPP is an active participant

- Baseline: 5.6 (2018 = 3; 2019 = 4; 2020 = 5; 2021 = 6; 2022 = 10)
- Benchmark: Remain at or above five-year average
- 2023: 11 projects

5.6
BASELINE
5-YEAR AVERAGE

≥5.6
BENCHMARK

11
2023 YEAR-END
ACTUAL
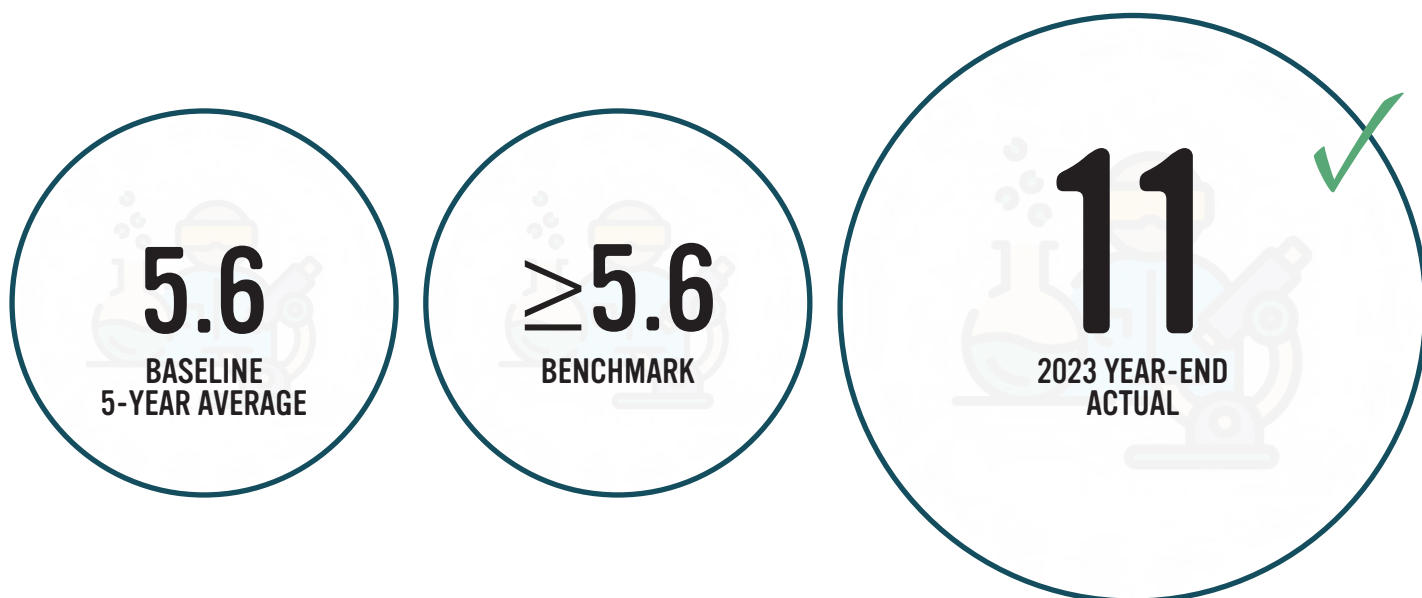
APIPP Strategic Plan Implementation Tracking Table

✓Fully implemented   ✓Partially implemented/room for improvement   ✓Not yet implemented

If the square is blank work was not planned to occur during this time period.

APIPP Priority Strategies	Year 1	Year 2	Year 3	Year 4	Year 5
Goal 1: Protect Adirondack PRISM lands from the most significant ecologic and economic impacts of terrestrial invasive plants and animals, including forest pests and pathogens					
Objective 1.1: Minimize the introduction and spread of terrestrial invasive species					
Prioritize terrestrial invasive species that will be covered in spread-prevention education programs	✓				
Develop specialized terrestrial invasive species spread-prevention materials for land managers (such as NYSDOT and other highway personnel)	✓				
Promote, and assist partners with the creation of, spread-prevention infrastructure to address specific pathways of terrestrial invasive species spread (such as boot brush stations, bike wash stations, construction equipment cleaning stations)	✓				
Objective 1.2: Monitor for terrestrial invasive species					
Prioritize species and locations to monitor based on the species'regional distribution, past monitoring results, "no plants observed" monitoring schedule, rare and endangered species information, and other factors	✓				
Deploy contracted professionals and permanent and seasonal staff (such as campground stewards and forest pest research assistants) to monitor distribution and abundance of priority species, to monitor priority locations, and/or to evaluate management effectiveness at known infestation sites	✓				
Train and coordinate volunteers to monitor for terrestrial invasive species, including forest pests and pathogens	✓				
Objective 1.3: Manage priority infestations of terrestrial invasive species					
Prioritize infestations for management and secure required permits and permissions for treatment	✓				
Deploy permanent and seasonal staff and contracted professionals to manage invasive species as follows: Work to eradicate infestations of Tier 2 species where possible; strategically manage infestations of Tier 3 species to contain their spread; strategically manage and suppress infestations of Tier 4 species that threaten high-value resources	✓				
Objective 1.4: Collaboratively address terrestrial invasive species threats with partners					
Regularly update terrestrial invasive species best management practices	✓				
Provide technical advice to landowners and partners on the identification and management of terrestrial invasive species	✓				
ollaborate with partners to address terrestrial invasive species issues (such as the PRISM terrestrial invasive species coordinators group, regional working groups for emerald ash borer and hemlock woolly adelgid, and statewide giant hogweed and jumping worm working groups) and create additional working groups as needed	✓				

APIPP Priority Strategies	Year 1	Year 2	Year 3	Year 4	Year 5
Goal 2: Protect Adirondack PRISM waters from the most significant ecologic and economic impacts of aquatic invasive plants and animals					
Objective 2.1: Minimize the introduction and spread of aquatic invasive species					
Prioritize aquatic invasive species that will be covered in spread-prevention education programs	✓				
Assist AWI, LGPC, NYSDEC, and lake associations with the watercraft inspection steward and boat decontamination programs by providing information about steward programs and decontamination infrastructure and by offering technical assistance with monitoring and analyzing aquatic invasive species distribution	✓				
Develop specialized aquatic invasive species spread-prevention materials for targeted user groups (such as organizers of fishing tournaments, partners working to slow the spread of invasive species via the canal system)					
Objective 2.2: Monitor the Adirondack PRISM for aquatic invasive species					
Prioritize species and locations to monitor with input from partners	✓				
Deploy contracted professionals and staff to monitor distribution and abundance of priority species and/or to monitor priority locations using a variety of techniques (such as visual surveys, eDNA sampling, remote vehicles)	✓				
Recruit and train partners and "Lake Protector" volunteers to participate in monitoring lakes and streams to detect aquatic invasive species	✓				
Refine the Lake Management Tracker methodology, support the technology, and recruit participants to monitor aquatic invasive species to evaluate management effectiveness and to inform future management strategies	✓				
Objective 2.3: Manage priority infestations of aquatic invasive species					
Lead projects and collaborations to remove small populations of aquatic invasive species that have a high probability of successful eradication or containment across the region (priority locations of Tier 2 and Tier 3 species)	✓				
Help partners and volunteers manage Tier 3 and Tier 4 species by assisting with the assessment of various management techniques, and by providing information about the effectiveness of various management techniques and about the permitting process	✓				
Objective 2.4: Collaboratively address aquatic invasive species threats with partners					
Convene a working group of key Adirondack aquatic invasive species partners to inform members about regional activities, recommend metrics and benchmarks for regional goals, and collaborate on projects	✓				
Participate in regional working groups (such as the PRISM aquatic invasive species coordinators group, Northeast Aquatic Nuisance Species Panel, Lake Champlain Basin Program committees)	✓				
Work with regional partners (such as the New York State Federation of Lake Associations, Adirondack Lake Assessment Program, Citizens Statewide Lake Assessment Program) to incorporate aquatic invasive species monitoring into other monitoring and study programs related to lake threats (such as water quality, harmful algal blooms, climate change)	✓				
Regularly update aquatic invasive species best management practices					

APIPP Priority Strategies	Year 1	Year 2	Year 3	Year 4	Year 5
Goal 3: Build engaged and knowledgeable communities that are empowered to act on invasive species issues					
Objective 3.1: Increase public awareness of, and participation in, meaningful and effective invasive species prevention, monitoring, and management activities					
Create and implement an annual communications plan to reach a broad audience with spread prevention and other invasive species messages using a variety of outreach tools	✓				
Develop an annual APIPP education calendar that includes core educational workshops (such as those for transportation professionals, pesticide applicators, volunteers) and topical workshops (such as those focused on specific pathways of spread, information about new species, management of specific species); include iMapInvasives training information as appropriate; secure speakers and promote workshops	✓				
Participate in NY's Invasive Species Awareness Week	✓				
Respond promptly to requests for information from the public	✓				
Objective 3.2: Share information, resources, and expertise among Adirondack PRISM and statewide partners and build a strong partner network					
Provide a clearinghouse of information via a well-designed and maintained website that includes species information and best management practices, displays monitoring results, and serves as a mechanism for sharing reports, maps, and other resources	✓				
Expand the Adirondack PRISM partnership to engage new constituencies as needs and opportunities arise	✓				
Regularly coordinate with state and regional partners (such as NYSDEC, NYSDOT, NYSDAM, iMapInvasives, other NY PRISMs, AWI, and other Adirondack nonprofits) and create working groups as needed	✓				
Support partners by sharing APIPP expertise and resources at partners' meetings, outreach events, and educational workshops	✓				
Host or participate in conferences focused on sharing the latest invasive species technical information with partners, volunteers, and others	✓				
Host a minimum of two partner meetings each year	✓				
Convene and coordinate with Adirondack partners engaged in communications, outreach, and education	✓				
Objective 3.3: Secure funding, programmatic, and legislative support for invasive species work from local, state, and federal governments					
Provide letters of support for partners seeking funding and share notices of funding opportunities with partners	✓				
Seek funding for special projects as opportunities permit	✓				
Provide information about invasive species issues to policy makers, NY's Invasive Species Council, and others	✓				
Assist state agencies with enforcement by providing information about invasive species laws to the public	✓				
Work with regional partners to better understand invasive species prevention, monitoring, and management capacity constraints (such as lack of qualified pesticide applicators, lack of companies to AIS management, lack of funding) in order to identify opportunities for collective action					

APIPP Priority Strategies	Year 1	Year 2	Year 3	Year 4	Year 5
Engage in research and innovation to improve the monitoring and management of invasive species					
Objective 4.1: Implement and evaluate innovative prevention, monitoring, and management techniques and share findings with partners and the public					
Identify, deploy, and/or evaluate innovative approaches to invasive species prevention, monitoring, and management (such as use of remote sensing, eDNA analysis, new chemical treatment options for terrestrial and aquatic invasive species, biological controls)	✓				
Foster the exchange of knowledge about innovative techniques with partners and the public	✓				
Objective 4.2: Collaborate on invasive species research projects					
Coordinate with the NY Invasive Species Research Institute and other partners to identify and advance priority empirical and applied research projects	✓				
Assist with statewide or region-wide research projects, including monitoring ash species plots for emerald ash borer-induced mortality, monitoring hemlock plots, and assessing the impact of deer on native vegetation	✓				
Complete a within-lake spatial analysis to identify abiotic, biotic, and human factors that predict which areas in a lake would be most susceptible to invasive species invasion	✓				
Identify and prioritize applied research projects (such as revising the 2014 economic impact report, testing outreach message effectiveness, analyzing alternative knotweed treatments, evaluating tools for monitoring and managing common reed grass, assessing the effectiveness of targeted Eurasian watermilfoil removal) and secure funding and partnerships to implement as feasible	✓				
Manage PRISM Operations					
Managing Adirondack PRISM operations is an important task for APIPP staff that contributes to the success of all four goals. Staff will deploy the following priority strategies in carrying out this work.					
Work closely with the NYSDEC Invasive Species Coordination Section to manage TNC's contract with NYSDEC	✓				
Submit all required reports to NYSDEC	✓				
Hire and support APIPP permanent and seasonal staff	✓				
Integrate APIPP staff with TNC's programs	✓				

Adirondack Park Invasive Plant Program
2023 Annual Report

Appendix D:
iMapInvasives Adirondack PRISM Metrics 2023

This report illustrates a few of the metrics (Tabs A and I) compiled by iMapInvasives for the Adirondack Partnership for Regional Invasive Species Management (PRISM). The full report provided by iMapInvasives is posted on www.adkinvasives.com. The full report includes the nine tabs listed below.

Tab A	Top 10 Species Reported in the PRISM Geography. This includes: Detected (confirmed and unconfirmed), Not-Detected, Treated (including number) [See page D1]
Tab B	Number of Unique Species Reported (presence data only)
Tab C	Summary Numbers: Presence, Not-Detected, Searched Areas, Acres of Searched Areas
Tab D	Summary Numbers: Not-Detected and Presence by Data Entry Method
Tab E	Reason for Not Detecting
Tab F	STATEWIDE-Species that are confirmed and new to county
Tab G	PRISM-Species that confirmed and new to county in the PRISM
Tab H	Number of Unique Observers/Users [That Submitted Records in 2023]
Tab I	Top 10 organizations submitting Presence and Not-Detected Records [See page D2]

There are two important notes related to the metrics.
1. The data on the following pages appears as submitted by iMapInvasives; the data is not verified by the Adirondack Park Invasive Plant Program.
2. The data represents iMapInvasives reports from December 10, 2022, to December 10, 2023.

Thank you iMapInvasives for being such a great partner!

INVASIVE SPECIES
MANAGEMENT
ADIRONDACKS

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Table 1: Top Ten Species Reported: Presence (confirmed/unconfirmed), Not-Detected, Treatment (iMapInvasives 2023 Report Tab A).

Presence Detected	Statewide			APIPP	
1	Eurasian Water-milfoil	4,187		European Common Reed	1,364
2	European Common Reed	1,626		Eurasian Water-milfoil	964
3	Curly Pondweed	1,571		Japanese Knotweed	696
4	Multiflora Rose	1,445		Garlic Mustard	368
5	Starry Stonewort	1,394		Purple Loosestrife	302
6	Oriental Bittersweet	1,147		Bush Honeysuckle (species unk	251
7	Giant Hogweed	1,060		Broadleaf Water-milfoil	151
8	Buckthorn	1,029		Beech leaf disease nematode	86
9	Japanese stiltgrass; Nepalese Bro	1,012		Oriental Bittersweet	73
10	Southern Pine Beetle	947		Hemlock Woolly Adelgid	71

Not-Detected	Statewide			APIPP	
1	Hemlock Woolly Adelgid	1,525		Garlic Mustard	981
2	Garlic Mustard	981		European Common Reed	542
3	Giant Hogweed	968		Japanese Knotweed	326
4	European Common Reed	564		Beech leaf disease nematode	324
5	Beech leaf disease nematode	456		Hemlock Woolly Adelgid	316
6	Japanese Knotweed	357		Purple Loosestrife	236
7	Purple Loosestrife	241		Yellow Iris	123
8	Longhorn Tick	163		Bush Honeysuckle (species unk	97
9	Curly Pondweed	155		Water Chestnut	56
10	Eurasian Water-milfoil	149		Carolina Fanwort	55

Treatment	Statewide			APIPP	
1	Garlic Mustard	176		Garlic Mustard	175
2	Japanese Knotweed, Japanese B	99		Japanese Knotweed	82
3	Water Chestnut	98		Purple Loostrife	14
4	Wild Parsnip	54		Pale Swallow-wort	13
5	Autumn Olive	51		Common Buckthorn	9
6	Common reed grass, phragmites	45		Black Swallow-wort	8
7	Japanese Stiltgrass	34		Wild Parsnip	8
8	Purple Loosestrife	32		Yellow Iris	7
9	Pale Swallowwort	23		Tree-of-Heaven	3
10	Oriental Bittersweet	16		Oriental Bittersweet	3

Note: The treatment table for APIPP does not include the 156 sites of European common reed/common reed grass *(Phragmites australis)* managed by APIPP in 2023.

Appendix D: Page D1

Table 2: Top Ten Organizations Submitting Presence and Not-Detected Records (iMapInvasives 2023 Report Tab I).

	Statewide				APIPP			
	Organization name	Total Records	Presence**	Not-Detected	Organization name	Total Records	Presence**	Not-Detected
1	New York State Department of Environmental Conservation (NYSDEC) (NY)	9,959	7,634	2,325	Adirondack Park Invasive Plant Program (APIPP)	7,295	3,735	3560
2	Adirondack Park Invasive Plant Program (APIPP)	7,338	3,757	3581	Warren County	779	777	2
3	Lower Hudson (LH) PRISM - Volunteer	4,458	4,458	0	New York State Department of Environmental Conservation (NYSDEC) (NY)	200	71	129
4	Adirondack Research LLC	2,707	2,648	59	Lake George Association (LGA)	134	134	0
5	Finger Lakes Institute (FLI)	2,145	2118	27	Adirondack Research LLC	59	0	59
6	Western New York Partnership for Regional Invasive Species Management (WNY PRISM) (NY)	2125	2012	113	Roger Tory Peterson Institute of Natural History (RTPI) (NY)	45	0	45
7	Capital Region PRISM (CR-PRISM)	1,521	839	682	Capital Region PRISM (CR-PRISM)	36	7	29
8	St. Lawrence and Eastern Lake Ontario (SLELO) Partnership for Regional Invasive Species Management (PRISM)	1,262	1,128	134	New York Natural Heritage Program (NYNHP) - NY	32	28	4
9	New York Natural Heritage Program (NYNHP) - NY	989	976	13	Adirondack Garden Club	30	21	9
10	Catskill Regional Invasive Species Partnership (CRISP)	821	652	169	Western Pennsylvania Conservancy (WPC) (PA)	26	26	0

** Confirmed and Unconfirmed

Note: The APIPP column does not include the APIPP Volunteer Forest Pest Project, which is the project code Forest Pest Hunters volunteers use to record their observations. In 2023 APIPP Forest Pest Hunter volunteers submitted 955 records: 185 presence records and 770 not-detected records.

Project: APIPP Volunteer Forest Pest Monitoring

Report Name: Project: APIPP Volunteer Forest Pest Monitoring

This report was generated by iMapInvasives

Report Type:	Species List By Geography
Created By User:	Jennifer Dean - Admin
Date Of Report Request:	Wed Jan 24 2024
Layers Queried:	Not-Detected Species, Unconfirmed Present Species, Confirmed Present Species

Filter Parameters Specified:

Beginning Date:	Sat Dec 10 2022
Ending Date:	Sun Dec 10 2023
Project:	

Report Results:

iMapinvasives Presence Records:

Scientific Name	Common Name	Unconfirmed Present Species Count	Species Total
Adelges tsugae	Hemlock Woolly Adelgid	6	6
Lymantria dispar	Spongy Moth	1	1
TOTAL		7	7

iMapinvasives Not-Detected Records:

Scientific Name	Common Name	Total Count
Adelges tsugae	Hemlock Woolly Adelgid	659
Litylenchus crenatae mccannii	Beech leaf disease nematode	153
Lycorma delicatula	Spotted Lanternfly	13
TOTAL		825

Selected Geometry:

Selected Layer:	States