

2021 ANNUAL REPORT

THE ADIRONDACK PARK

INVASIVE PLANT

PROGRAM

WWW.ADKINVASIVES.COM

PO BOX 65/8 NATURE WAY, KEENE VALLEY, NEW YORK 12943



**INVASIVE SPECIES
MANAGEMENT**
ADIRONDACKS

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THE ADIRONDACK PARK INVASIVE PLANT PROGRAM (APIPP) SERVES AS THE ADIRONDACK PARTNERSHIP FOR REGIONAL INVASIVE SPECIES MANAGEMENT (PRISM), ONE OF EIGHT PARTNERSHIPS ACROSS NEW YORK STATE (NYS). APIPP IS A PROGRAM FOUNDED BY THE NATURE CONSERVANCY (TNC), THE NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC), THE NYS DEPARTMENT OF TRANSPORTATION (NYSDOT), AND THE ADIRONDACK PARK AGENCY (APA). FUNDING IS PROVIDED FROM THE ENVIRONMENTAL PROTECTION FUND AS ADMINISTERED BY NYSDEC. TO LEARN MORE ABOUT APIPP, INVASIVE SPECIES OF CONCERN, AND HOW TO GET INVOLVED, VISIT WWW.ADKINVASIVES.COM

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Invasive Plant Program

Cover Photo: Paradox Lake, Essex County, New York, by
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Invasive Plant Program’s website: www.adkinvasives.com

EXECUTIVE SUMMARY



BY: TAMMARA VAN RYN

Dear Partners and Supporters,

The Adirondacks are unique, in part, because our region is home to one of the largest intact temperate deciduous forests in the world. The Nature Conservancy (TNC), which hosts the Adirondack Park Invasive Plant Program (APIPP), has identified the region as part of a network of resilient and connected lands and waters that can help mitigate the effects of climate change.

APIPP partners with more than 30 diverse organizations and over 100 volunteers to help protect this unique region from the negative impacts of invasive species. I am pleased to share this 2021 Annual Report which showcases the collective impact of this extraordinary partnership. In this report you will find success stories ranging from satellites being used to guide invasive species surveys from space to volunteers sampling for harmful zooplankton in the depths of our lakes.

APIPP's team, which you can find out more about on page 5, serves as the foundation for the partnership. We were pleased to welcome Brian Greene as the new aquatic invasive species coordinator this year as well as summer stewards Adellia Baker and Megan Grega. And we were sorry

to close the year by bidding farewell to Emily-Bell Dinan, our education and outreach coordinator.

APIPP's partners rallied in 2021 to meet the continued challenges of the COVID-19 pandemic and new infestations of invasive species. Innovation resulting from the pandemic also brought opportunities, such as expanding the reach of our education programs.

Volunteerism also increased as people continued to engage with nature and the outdoors throughout the pandemic. APIPP launched an expanded volunteer hemlock woolly adelgid monitoring program with our partners, and we continued the Knotweed Management Partnership. We also celebrated the 20th year of the Lake Protector volunteer program.

Our aquatic monitoring network surveyed a near-record number of lakes in 2021, confirming that more than 75% of Adirondack waterbodies surveyed are free of aquatic invasive species. Our terrestrial team quickly identified and treated the first infestation of Japanese stiltgrass in our region, and we continued our efforts to contain the spread of hemlock woolly adelgid. We are applying new technologies and expanding partnerships to ensure a resilient landscape for the future.

This report highlights how APIPP staff, volunteers and professional teams from Invasive Plant Control, Inc. and Adirondack Research worked with our partners to advance APIPP's 12 strategic plan goals (listed below) for the Adirondack Partnership for Regional Invasive Species Management (PRISM). In 2021 we started working on a new strategic plan which we look forward to sharing in 2022.

1. Coordination
2. Pathway Analysis
3. Spread Prevention & Vector Management
4. Enforcement & Legislation
5. Education & Outreach
6. Early Detection, Rapid Response & Monitoring
7. Control & Management
8. Information Management
9. Restoration
10. Research
11. Climate Change Adaptation
12. Resource Development & Funding

Together with our partners, we are protecting the Adirondacks from the negative economic, environmental and public health impacts of invasive species. Thank you for all you do to help conserve Adirondack lands and waters.

Sincerely,

Tammara Van Ryn

APIPP STAFF



Tammara Van Ryn, Program Manager

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.



Zachary Simek, Conservation and GIS Analyst

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.



Rebecca Bernacki, Terrestrial Invasive Species Coordinator

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.



Brian Greene, Aquatic 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.



Emily-Bell Dinan, Education and Outreach Coordinator

EMILY-BELL served as the Education and Outreach Coordinator until early December 2021 and shared her environmental education, volunteer management, and design skills with the team and with our partners.



ADELLIA returned to APIPP for her second season, sharing her strong plant identification skills with the team.



MEGAN brought experience managing invasives in other parts of NY to her first year as a steward.

Adellia Baker and Megan Grega, 2021 Invasive Species Management Stewards

2021 APIPP HIGHLIGHTS

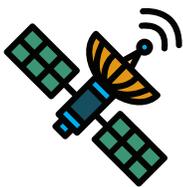
ADIRONDACK PARK INVASIVE PLANT PROGRAM 2021 HIGHLIGHTS

More than 30 organizations and 100 volunteers share their ideas, time, and resources to advance the mission of the Adirondack Park Invasive Plant Program (APIPP). Together, as these highlights of our collaborative 2021 work show, we are making major advances in reducing the threats invasive species pose to the Adirondack region. Thank you!



BY: APIPP STAFF

INNOVATION AND PARTNERSHIPS



APIPP IS COLLABORATING with the City University of New York (CUNY) Advanced Science Research Center to remotely detect hemlock woolly adelgid (HWA) using freely available remote sensing data.

IN PARTNERSHIP with the Lake George Land Conservancy, Adirondack Mountain Club, Capital Region PRISM, iMapInvasives, and the New York State (NYS) Hemlock Initiative at Cornell University, APIPP expanded its volunteer HWA monitoring program and volunteers surveyed over 100 trails in the Lake George region.

FRIENDS OF MOODY POND in Saranac Lake became the seventh lake association to work with APIPP's Lake Management Tracker program to assess the effectiveness of efforts to control Eurasian watermilfoil.

THANKS TO PARTNERSHIPS with private and nonprofit landowners, APIPP established five long-term study sites to monitor ash trees for resistance to emerald ash borer, with the hope of finding resistant trees for future plant breeding programs.

AQUATIC INVASIVE SPECIES DETECTION

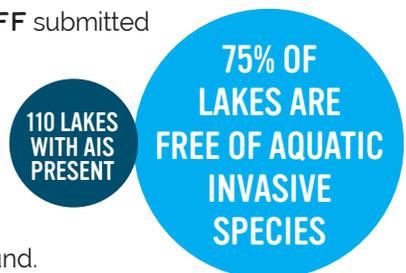


VOLUNTEERS, PARTNERS, CONTRACTORS AND STAFF submitted a near-record number of 131 monitoring reports for 110 lakes.

AQUATIC INVASIVE PLANTS were found in two new lakes and additional plant species were identified in two already-invaded lakes. The percentage of lakes with aquatic invasive species (AIS) observed was 22.7%, which is lower than the five-year average.

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

OVER 75% OF THE 463 Adirondack waterways monitored over the last 20 years are AIS free!



TERRESTRIAL INVASIVE SPECIES DETECTION



STAFF, PARTNERS, VOLUNTEERS AND CONTRACTORS surveyed 38 NYS Department of Environmental Conservation (NYSDEC) campgrounds, over 130 recreational access points (such as trailheads and boat launches), sections of over 30 Forest Preserve units, and part or all of over 40 state and county road corridors.

APPROXIMATELY 460 NEW terrestrial infestations were found, bringing the total number of mapped infestations in the Adirondack region to 6,478.

TWO NEW INFESTATIONS of emerald ash borer were confirmed within the Adirondack Park; one was identified via APIPP's trapping efforts and one was reported by a concerned landowner.

APIPP STAFF, CONTRACTORS AND VOLUNTEERS surveyed more than 550 sites for HWA.

INVASIVE SPECIES MANAGEMENT



APIPP MANAGES 13 terrestrial species and has 860 infestations under active management.

THANKS TO A REPORT FROM A PRIVATE LANDOWNER, APIPP was able to identify and treat the first known infestation of Japanese stiltgrass in the Adirondack Park.

MANAGEMENT EFFORTS ARE WORKING! Garlic mustard abundance at NYSDEC campgrounds in the Adirondacks has decreased by 78% since management efforts began, and the species has been locally eradicated from six campgrounds.

APIPP DOCUMENTED the absence of terrestrial invasive species for three or more years at 947 sites, and for at least one year at 537 sites. In total, 76% of APIPP's priority terrestrial invasive species infestations are currently under active management or have been successfully removed.

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

- Eurasian watermilfoil: 15+ lakes
- Variable-leaf watermilfoil: 5 lakes
- Water chestnut: 3 lakes
- European frog-bit: 2 lakes
- Zebra mussels: 1 lake

PREVENTION, EDUCATION & OUTREACH



APIPP RAISED AWARENESS ABOUT INVASIVE SPECIES identification, prevention, and management by partnering with more than two dozen organizations to deliver 31 presentations that reached nearly 1,700 people. APIPP was mentioned in 26 print, digital, radio or television news stories and our social media presence expanded.

APIPP'S NEW "PROTECT YOUR FORESTS" AND "PROTECT YOUR WATERS" outreach materials were provided to over 100 businesses and organizations and the posters and brochures are available at more than 250 locations.

NEW BOOT BRUSH STATIONS were installed at preserves owned by The Nature Conservancy and APIPP developed two new boot brush stations for the Ausable River Association.

THE ADIRONDACK WATERSHED INSTITUTE (AWI) of Paul Smith's College is an important spread-prevention partner. AWI staffed 44 locations with trained stewards who educated boaters and inspected a total of 84,817 boats.

SPECIAL INITIATIVES

THESE SPECIAL INITIATIVES ADVANCE GOALS 1, 2, 3, 6, 7, 10 & 12 OF APIPP'S STRATEGIC PLAN.

SPOTTED LANTERNFLY AND TREE-OF-HEAVEN



TREE-OF-HEAVEN LEAF. BY: APIPP STAFF

TREE-OF-HEAVEN (*Ailanthus altissima*) is a rapidly growing deciduous tree that can reach 80 feet in height. This tree's rapid growth, coupled with its prolific seed production and ability to sprout suckers from its roots, allow it to outcompete native species for space and resources. It also exudes chemicals from its roots that can suppress the growth of surrounding plants. In addition to being an invasive species itself, tree-of-heaven is the preferred host plant for the invasive spotted lanternfly (*Lycorma delicatula*).

The spotted lanternfly feeds on more than 70 host species and can damage agricultural crops such as grapes and hops and trees such as sugar maple. The insects suck sap from stems and branches which can weaken and damage the plant. The feeding also leaves behind a sticky substance (honeydew) that can form sooty mold and further damage crops.

Fortunately, spotted lanternfly has not yet reached the Adirondacks. We do, however, have several populations of tree-of-heaven. APIPP ranks the tree as a "Tier 2" species (see page 23), which means—based on current knowledge—that eradication from our region is possible.

To protect our region from the threat of these two invasive species, landowners in the PRISM known to have tree-of-heaven on their property were contacted by APIPP in 2021 with an offer to manage this species at no charge. If a landowner responded, APIPP deployed its early detection and rapid response (EDRR) crew to manage the tree-of-heaven. In one case, an arborist was hired to remove a large tree. Treated sites will be monitored annually, and landowners who did not respond will be contacted again in 2022.



SPOTTED LANTERNFLY. BY: LAWRENCE BARRINGER, PA
DEPARTMENT OF AGRICULTURE, BUGWOOD.ORG

HEMLOCK WOOLLY ADELGID

HWA (*ADELGES TSUGAE*) IS A SMALL INSECT that poses big risks to Adirondack hemlock trees. APIPP is working to address this threat with the help of remote sensing and citizen scientists.

SURVEYING WITH SATELLITES AND AIRPLANES

NEW YORK (NY) has a greater abundance of eastern hemlock (*Tsuga canadensis*) than any other state in the continental US. In parts of the Adirondacks, such as the southeastern region around Lake George, hemlock comprises over 80% of forest cover. So how do we find such a small insect across an expansive landscape filled with hemlock trees? The answer may be over our heads.

APIPP is collaborating with CUNY’s Advanced Science Research Center to remotely detect HWA using freely available remote sensing data. While airplanes and satellites cannot detect the insect itself, they can be used to detect changes in tree health that may be associated with HWA presence. This information can help APIPP more strategically deploy on-the-ground surveyors and expand early-detection efforts.

The CUNY team, led by Dr. Andrew Reinmann, is assessing the use of Landsat and Sentinel satellites and NYS Orthoimagery to detect changes in “greenness” of target hemlocks. By calculating normalized difference vegetation index (NDVI) for hemlock forests over multiple years, the team can assess changes in greenness (aka health) of the resource. Stands with a slow, yet significant decline in greenness/health, may indicate presence of HWA and warrant ground surveys (Figure 1).

The research team used field data collected by APIPP and partners in 2020-2021 to further refine the assessment algorithm. In addition, CUNY researcher Dr. Kyle McDonald is working to incorporate synthetic aperture radar (SAR) data into the algorithm. APIPP is optimistic this combined dataset will facilitate more efficient deployment of staff and citizen scientists, ultimately improving opportunities for HWA early detection and treatment intervention.

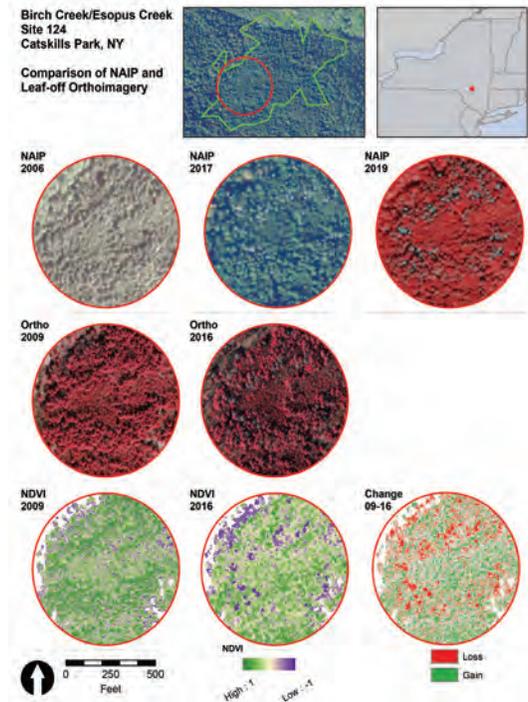


FIGURE 1. EXAMPLE OF REMOTE SENSING DATA. BY: J. BOWERS & A. REINMANN, CUNY ADVANCED SCIENCE RESEARCH CENTER



VOLUNTEER SURVEYING FOR HWA IN THE LAKE GEORGE WATERSHED. BY: KATHY WELCH

VOLUNTEER FOREST PEST HUNTERS

APIPP PILOTED A COLLABORATIVE, citizen-science effort to search for HWA infestations in the Lake George watershed. Partners from the Lake George Land Conservancy, Adirondack Mountain Club, Capital Region PRISM, iMapInvasives, and the NYS Hemlock Initiative at Cornell University helped recruit and train volunteers in how to search for HWA and track their findings.

The program kicked off with an HWA identification webinar in February. A follow-up workshop in March provided more detail for volunteer surveyors. APIPP developed an interactive webmap to enable these citizen scientists to adopt priority trails in the Lake George watershed to survey. The adoption map provided a way for volunteers to select where they would survey and showed regions that needed more attention. The interactive map was so successful that it was adapted for APIPP’s summer Lake Protector program.

The pilot program was a resounding success! A total of 26 individuals adopted 102 trails in the Lake George region and uploaded over 150 “not-detected” observations for HWA into iMapInvasives.

LAKE MANAGEMENT TRACKER AT MOODY POND



FRIENDS OF MOODY POND MEMBERS PROMOTING THEIR FUNDRAISING CHALLENGE. BY: FRIENDS OF MOODY POND, SARANAC LAKE, NY

MANAGING INVASIVE SPECIES can often feel like an impossible task with the arrival of new invasive species and the challenge of removing existing invaders. It is important to be reminded of success stories and of communities taking positive steps to reduce the negative impacts of invasive species. A great example of this is the work of a small community in Saranac Lake, NY, on Moody Pond.

In 2018, a local citizen scientist, Margaret Worden, discovered Eurasian watermilfoil (*Myriophyllum spicatum*) in the pond while volunteering for the APIPP Lake Protector program. In 2019, APIPP helped map the infestation; fortunately, Margaret found the milfoil early and only a small population had established.

The community joined together in 2020 to form Friends of Moody Pond (FMP) and to fundraise to remove the invasive milfoil. FMP raised enough money to hire a crew to hand harvest the milfoil in 2021. A team of FMP volunteers participated in the APIPP Lake Management Tracker program, which helps lake associations monitor the effectiveness of milfoil removal.

Early results indicate management is moving in the right direction. With an additional harvest planned for 2022, it is hoped that the milfoil population can be kept in check and will not negatively impact the pond.

"We've been incredibly impressed with the level of commitment from pond neighbors, the wider Saranac Lake community, and locally-based organizations such as APIPP to work collaboratively on tackling this invasive species challenge," noted FMP Board President Heidi Kretser.

This is a great model for how a small group of committed community members can work together to reduce the impact of invasive species. APIPP extends its appreciation to FMP for being a great partner and for being an active steward of Moody Pond.

KNOTWEED MANAGEMENT PARTNERSHIP

THE KNOTWEED MANAGEMENT PARTNERSHIP helps expand APIPP's knotweed (*Reynoutria japonica*, *Reynoutria sachalinensis*, and *Reynoutria x bohemica*) control efforts. APIPP's involvement with this program began in 2020 when it assumed management of the former Regional Inlet Invasive Plant Program (RIIPP) and adapted the program to also meet TNC's goals.

The objective of the partnership is to reduce the severity of knotweed infestations in ecologically sensitive areas by assisting landowners with herbicide treatment for several years until they can control the infestation on their own. This is a volunteer-led program. Volunteers identify knotweed locations, secure indemnification forms and treatment permissions from landowners, and provide information about how to slow the spread of invasive species.



FOLIAR SPRAY TREATMENT OF KNOTWEED SPP.
BY: APIPP STAFF

In 2021, volunteers helped obtain approximately 85 private landowner and municipal permission forms. APIPP contracted with a certified pesticide applicator to treat these priority areas, and a total of 117 sites were managed. An additional 15 sites were surveyed and found to no longer have knotweed present.

EMERALD ASH BORER RESPONSE

EMERALD ASH BORER (*Agrilus planipennis*) feeds on and eventually kills native ash trees (*Fraxinus spp.*). Ash species are a valuable component of our Adirondack forests. Ash seeds are a food source for birds and mammals. The wood is used for baseball bats, flooring, furniture, and lumber. Some species of ash are also used in crafting traditional Adirondack pack baskets.

In response to the 2020 discovery of the first emerald ash borer finding in the Adirondack Park (Warren County), APIPP set up five emerald ash borer traps in 2021 to help determine the extent of this infestation. Four traps were placed around the initial site, one in each cardinal direction: to the north, the NYSDEC Camp Cayuga, part of the Scaroon Manor Campground; to the west, Riparius Bridge; to the east, Amy's Park; and, to the south, the Warren County Fish Hatchery. A fifth trap was deployed at TNC's Boquet River Nature Preserve in Willsboro.



EMERALD ASH BORER TRAP AT TNC'S BOQUET RIVER NATURE PRESERVE. BY: APIPP STAFF

Traps were in place from June to October, and each trap was equipped with Manuka oil and hexanol lures which were changed every four weeks. Traps were checked every two weeks and the insects collected were sent to the NYSDEC Forest Health Diagnostic Lab for species identification. Trapping resulted in four positive identifications of emerald ash borer at Amy's Park in Bolton Landing. All other traps were found to be free of this pest.

In addition to our trapping efforts, five Monitoring and Managing Ash (MaMA) plots were established following the protocol developed by the Ecological Research Institute. MaMA plots are placed in naturally occurring native ash stands and the plots are monitored annually for ash trees that remain healthy when surrounding trees are killed by emerald ash borer. The hope is that healthy trees ("lingering ash") can someday be used to breed genetically resistant ash trees.

INVASIVE JUMPING WORMS



SURVEYING FOR JUMPING WORMS. BY: APIPP STAFF

JUMPING WORMS (*Amyntas spp.* and *Metaphire spp.*) are invasive earthworms from Asia that threaten forests, gardens, and landscapes. As their name implies, they can be identified by rapid, jerking or "jumping" movements. In addition, they have a milky white band around their body (the clitellum), a feature that distinguishes them from European earthworms.

Jumping worms reproduce quickly, forming dense populations that can negatively alter soil structure and chemistry. They strip the soil of nutrients and expel abundant castings that give the soil a loose, coffee ground-like appearance. Jumping worms can damage plant roots and reduce the diversity and productivity of forest systems. Humans assist in the expansion of the range of this species by inadvertently transporting jumping worms on plants or in soil, compost or mulch. Once established, there are no known controls for this species.

The first confirmed observation of jumping worms in the Adirondack PRISM was reported to iMapInvasives in August 2019; however, unconfirmed reports date back to 2017. In 2021, APIPP launched the first targeted survey effort for this species to better understand its regional distribution. Staff surveyed high-priority locations (such as trailheads and campground waste areas) near previously documented jumping worm infestations. Surveys were also performed opportunistically along roadsides and at private properties in response to public reports.

APIPP staff completed 71 surveys across seven counties. Staff documented invasive jumping worm absence at 62 locations and confirmed its presence at nine sites, including two first-in-county records (Franklin County and Hamilton County). An additional 12 "detected" and four "not-detected" records were submitted by citizen scientists. Knowing where jumping worms are present is critical to helping prevent the spread of this invasive species.

EDUCATION & OUTREACH

THE EDUCATION AND OUTREACH EFFORTS DESCRIBED IN THIS SECTION ADVANCE GOALS 1, 3, 5, 6, AND 7 OF APIPP'S STRATEGIC PLAN.



BY: EMILY-BELL DINAN

PROTECT YOUR WATERS, PROTECT YOUR FORESTS OUTREACH

TO CELEBRATE INVASIVE SPECIES AWARENESS WEEK (ISAW) 2021, APIPP launched a new "Protect Your Waters, Protect Your Forests" outreach campaign. The new posters and four-fold brochures highlight best practices to stop the introduction and spread of terrestrial and aquatic invasive species. APIPP also worked with TNC's "Don't Move Firewood" campaign to create Adirondack-specific materials to reduce the threat of moving invasive species on firewood.



Protect Your Waters materials highlight the need to practice Clean, Drain, Dry principles when boating. Protect Your Forests and Don't Move Firewood materials encourage hikers, bikers, and outdoor enthusiasts to remove mud and debris from footwear and gear, to clean gear before entering and leaving recreation sites, to stay on designed trails and roads, and to purchase firewood where it will be burned. The brochures include

information about more than two dozen invasive species that threaten Adirondack lands and waters.

The new materials were well received by the community. Partners and businesses in the Adirondack PRISM can order them at no charge, and APIPP worked with NYSDEC and AWI to post the materials at popular recreation sites. In total, approximately 44,000 brochures and 2,700 posters were distributed to more than 100 businesses and organizations. The materials were available at 250 locations including 38 towns, 65 campgrounds, recreational outfitters, NYSDEC information kiosks, and boat wash and inspection stations.

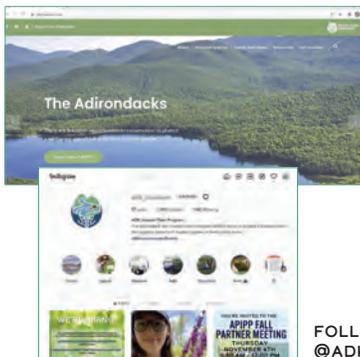
INVASIVE SPECIES AWARENESS WEEK AND "UNINVITED" DOCUMENTARY

THE EIGHTH STATE-WIDE ISAW KICKED OFF on June 6, 2021. The PRISM network, iMapInvasives, and other partners hosted webinars each day during the week-long event. APIPP hosted a workshop for paddlers in partnership with AWI, the Adirondack Mountain Club, and the Northern Forest Canoe Trail. The program highlighted how to identify invasive species and simple steps boaters can take to protect the economy and the environment from the harmful effects of invasive species

In November, APIPP partnered with NYSDEC to host a watch party for the new documentary, Uninvited. Over 80 people attended the noontime screening. The film, produced by NYSDEC and its partners, addresses prominent invasive species and highlights NY's innovative efforts to combat these pests.



DIGITAL OUTREACH TOOLS



VISIT US ONLINE AT WWW.ADKINVASIVES.COM



FOLLOW APIPP ON FACEBOOK @ADKINVASIVES

FOLLOW APIPP ON INSTAGRAM @ADK_INVASIVES

THE ADKINVASIVES.COM WEBSITE is a go-to resource for invasive species identification, best management practices, and scientific publications. It is also a community resource board where viewers can sign up for events and find out about volunteer opportunities.

APIPP maintains an active social media presence. Our Facebook account has nearly 1,000 followers and our followers on Instagram more than doubled in 2021. APIPP was also mentioned in 26 print, digital, radio or television news stories.

2021 WORKSHOPS

APIPP HOSTED 11 VIRTUAL WORKSHOPS and two partner meetings in 2021 covering a wide range of topics from managing for emerald ash borer to roadside vegetation management. Programs were offered for gardeners, paddlers, natural resource professionals, highway personnel, and volunteer citizen scientists. Each of the webinars was recorded and each one is available on APIPP's website to watch at any time.

APIPP also partnered with more than two dozen diverse partners to provide information about invasive species at 18 educational events. By presenting at events ranging from the youth field day coordinated by the Hamilton County Soil & Water Conservation District to a meeting of the Plattsburgh Rotary Club, APIPP staff can bring the spread-prevention message to a wider audience. APIPP reached nearly 1,700 people with its 2021 programming.



AQUATIC PROGRAMS

THE AQUATIC INVASIVES SPECIES MONITORING AND MANAGEMENT EFFORTS DESCRIBED IN THIS SECTION ADVANCE GOALS 2, 3, 6, 7, 8, 9 AND 10 OF APIPP’S STRATEGIC PLAN.



BY: BRIAN GREENE

2021 SEASON SUMMARY

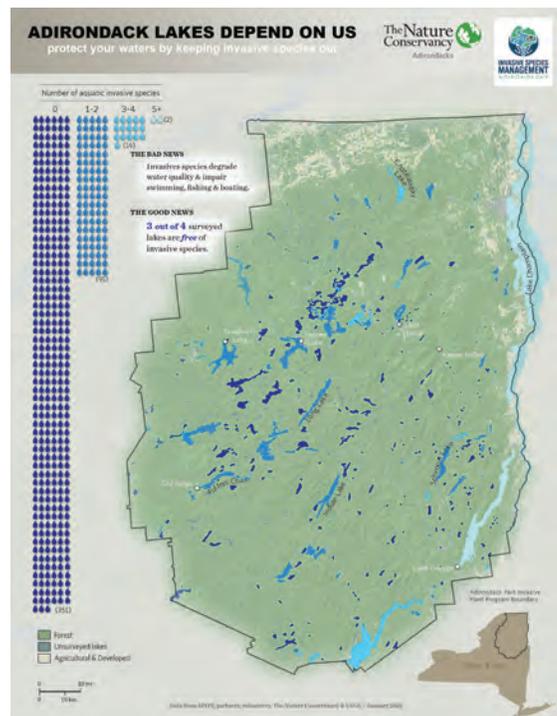
IN 2021 APIPP MARKED THE TWENTIETH SEASON of monitoring for AIS. Reaching this milestone is a tribute to the dedication of our staff, partners, and volunteers!

APIPP had a new AIS coordinator at the helm in 2021, Brian Greene. The volunteer citizen-science monitoring program was refreshed with a new name, Lake Protectors. Monitoring instructions for volunteers were updated and a new lake adoption webmap for volunteers was added. While COVID-19 precautions resulted in trainings being conducted online, Brian appreciated small-group meetings with partners and volunteers who took time to share their knowledge of Adirondack waterways.

This was the seventh year APIPP contracted with a professional early detection team. The team from Adirondack Research surveyed 52 waterbodies in the southeast region. Adirondack Research’s full report is on APIPP’s website.

Partners, contractors, staff, and volunteers collectively submitted 131 monitoring reports (Figure 2) from 110 lakes (Figure 3). The reports identified two newly invaded lakes (Fourth Lake in Warren County and Northville Lake in Fulton County). Additional invasive plants were identified in two lakes that were already invaded. Eurasian watermilfoil was identified in Peck Lake. Eurasian watermilfoil and curly-leaf pondweed (*Potamogeton crispus*) were identified in Stewarts Bridge Reservoir.

Importantly, only 22.7% percent of the lakes surveyed in 2021 had AIS, which is lower than the five-year average (Appendix C, Page C1). Over the past 20 years, 463 lakes have been monitored and 75.6% had no invasive species detected (see Map 1 and Appendix C, Page C4).



MAP 1. ADIRONDACK PRISM WATERBODIES WITH NUMBER OF OBSERVED AIS.

AQUATIC PARTNERSHIPS

APIPP'S EXTENSIVE LAKE MONITORING NETWORK INVOLVES APIPP STAFF, a professional early detection team, lake associations, agencies, and Lake Protector and Lake Management Tracker volunteers. Each part of the network focuses on slightly different aspects of monitoring and collectively the network is able to census lakes across the region to track AIS. The number of volunteers engaged, reports submitted, and lakes monitored were at the highest level in the past four years, demonstrating the long-term success of this network. You can see data for the last 20 years in Appendix C, Page C2.

An interesting finding from the seven lakes that participate in Lake Management Tracker was that, in 2021, conditions were very favorable for Eurasian watermilfoil growth. You can see data showing the resulting increase in this invasive plant abundance in Appendix C, Page C3.



FIGURE 2. NUMBER OF AIS SURVEYS 2021.

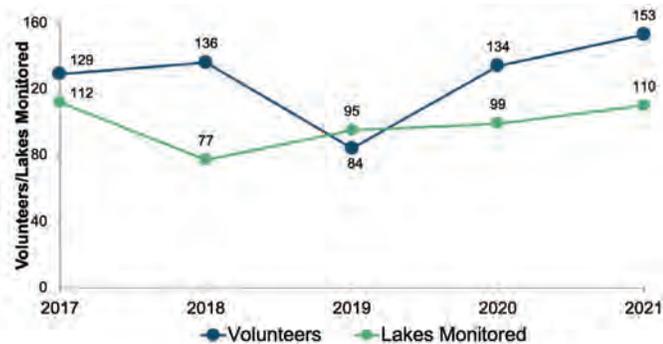


FIGURE 3. NUMBER OF VOLUNTEERS AND LAKES MONITORED 2017-2021.

AQUATIC INVASIVE SPECIES OF CONCERN

SPECIES SURVEYS

AQUATIC PLANTS

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 (*Myriophyllum heterophyllum*), water chestnut (*Trapa natans*), curly-leaf pondweed, fanwort (*Cabomba caroliniana*), and European frog-bit (*Hydrocharis morsus-ranae*). In addition, APIPP surveys for a species not yet present in the Adirondack Park, hydrilla (*Hydrilla verticillata*). As of 2021, 104 Adirondack waterbodies are known to be invaded by one or more of these aquatic invasive plants.

SMALL-BODIED ORGANISMS

APIPP SURVEYS FOR FIVE SMALL-BODIED 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 people to look for two species that are not yet present in the PRISM, quagga mussel (*Dreissena rostriformis bugensis*) and rusty crayfish (*Faxonius rusticus*).

The summer of 2021 marked the ninth season APIPP coordinated small-bodied invasive animal monitoring. Adirondack Research's early detection team and APIPP staff and partners conducted zooplankton tows in the deep areas of lakes and sediment sieves in lakes containing sandy areas. No new infestations of the small-bodied aquatic invasive animals tracked by APIPP were discovered. The Asian clam survey in Lake George was once again conducted by the Lake George Park Commission and partners, and only one new discrete site was confirmed. As of 2021, 18 Adirondack lakes are known to be invaded by one or more of these small-bodied invasive animals. These species are not actively managed.

TIER SYSTEM TO RANK INVASIVE PLANTS & ANIMALS

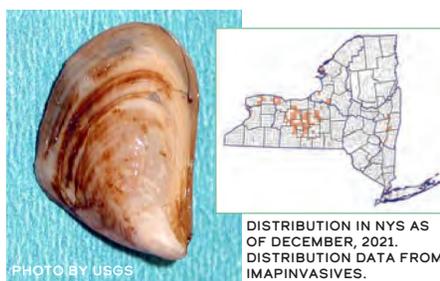
When we talk about invasive species, context matters. Management options are influenced by the severity of an infestation, and by an organism’s biological characteristics and dispersal ability. In order to help prioritize management goals and unify language used region-to-region, iMapInvasives and the eight PRISMs developed a categorization method called the Tier Ranking System. APIPP employs this system to prioritize invasive species based on our program’s ability to carry out prevention, early detection, and management.

TIER 1: EARLY DETECTION

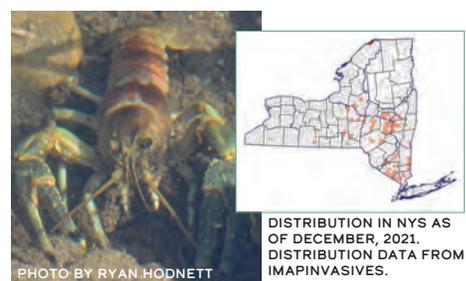
Tier 1 species are not known to occur within a PRISM boundary, but are likely to establish and spread if introduced. Since Tier 1 species are not yet found in the area, but occur in neighboring regions, APIPP works to combat most Tier 1 species through education and outreach programs. With information and identification skills, citizens can play a big role when they find Tier 1 species in the field, report sightings, prevent their introduction by cleaning, draining, and drying boats and gear, and ensure species are not introduced via bait buckets, water gardens, or home aquaria. APIPP classifies three aquatic species as Tier 1 invasives. No Tier 1 species were found in the 2021 surveys.



HYDRILLA
(*Hydrilla verticillata*)



QUAGGA MUSSEL
(*Dreissena rostriformis bugensis*)

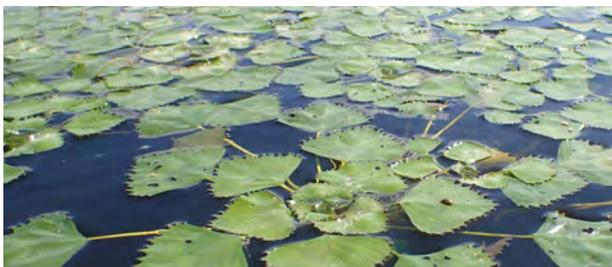


RUSTY CRAYFISH
(*Faxonius rusticus*)

TIER 2: ERADICATION

Tier 2 species are APIPP’s highest priority for early detection and response efforts. To qualify for this classification, these invasive plants and animals are found in low enough abundance, with suitable treatment options available, to make eradication possible within the PRISM.

WATER CHESTNUT (*Trapa natans*)



DESCRIPTION: This is a floating annual plant which forms dense mats that cover large expanses of water. It can impact water quality and native species and impede recreational use.

MONITORING UPDATE: It is known to be reported in three interior waterbodies in the PRISM and in Lake Champlain. There were no new reports of this plant in 2021.

MANAGEMENT UPDATE: APIPP manages one infestation in Lake Alice, in Clinton County, by hand pulling. This is a multiyear effort and each year the number of plants removed decreases; 28 plants were harvested this year (down from 54 in 2020). The Lake Champlain Basin Program manages a large-scale removal project with a focus on the southern end of the lake. At Hadlock Pond, volunteers hand-harvested 12 plants in 2021. Prior management at Loon Lake resulted in a "no plants observed" finding.



BY: [HTTPS://COMMONS.WIKIMEDIA.ORG](https://commons.wikimedia.org)



TIER 3: CONTAINMENT

Plants and animals classified as Tier 3 are likely too widespread or well established for the possibility of eradication. However, strategic management can still contain them to the present waterbodies and slow their spread into neighboring areas that remain free of harmful infestations.

TIER 3 PLANTS

EUROPEAN FROG-BIT (*Hydrocharis morsus-ranae*)



DESCRIPTION: This is a free-floating annual plant that forms dense mats which can limit light penetration and impact native species and which can impede recreational use.

MONITORING UPDATE: It is known to be present in seven waterbodies in the PRISM. There were no new reports of this plant in 2021.

MANAGEMENT UPDATE: APIPP staff mechanically removed small populations of European frog-bit from wetlands connected to the Grasse River near Lampson Falls and from Lake Alice in Clinton County in 2021.

FANWORT (*Cabomba caroliniana*)



DESCRIPTION: This is a free-floating annual plant that forms dense mats which can limit light penetration and impact native species and which can impede recreational use.

MONITORING UPDATE: It is known to be present from historical records in four private lakes in the PRISM. There were no new reports of this plant in 2021.

MANAGEMENT UPDATE: This species is not targeted for management.

TIER 3 ANIMALS

ASIAN CLAM (*Corbicula fluminea*)



DESCRIPTION: This is a filter-feeding, freshwater mollusk that displaces native species, alters the food chain, and may promote algae blooms. It is also a bio-fouler, clogging industrial and commercial water systems.

MONITORING UPDATE: This species is known to be present in the PRISM only in Lake George. There were no new reports of lakes with this species in 2021. One new site was reported in Lake George, bringing the total number of confirmed sites in that waterbody to 29.

MANAGEMENT UPDATE: This species is currently not under active management.

CHINESE MYSTERY SNAIL (*Cipangopaludina chinensis*)

DESCRIPTION: This is a large snail that quickly reproduces and has the potential to decrease native snail populations, host parasites and change water chemistry.

MONITORING UPDATE: These snails are known to be present in 11 lakes in the PRISM. There were no new reports of this species in 2021, but it is likely that this species is underreported.

MANAGEMENT UPDATE: This species is not targeted for management.

FISHHOOK WATERFLEA (*Cercopais pengoi*)

DESCRIPTION: This is an invasive zooplankton that can alter the composition, structure, and function of the ecosystem by outcompeting native zooplankton and juvenile fish.

MONITORING UPDATE: This species was first documented in Lake Champlain in 2018. There were no new reports of this species in 2021.

MANAGEMENT UPDATE: This species is not targeted for management.

SPINY WATERFLEA (*Bythotrephes longimanus*)

DESCRIPTION: This is a macro-zooplankton that can reproduce rapidly through asexual reproduction and that competes directly with juvenile fish and native zooplankton for food. Its long spines also easily attach to fishing lines creating a nuisance for anglers.

MONITORING UPDATE: This species is known to be present in nine lakes in the PRISM. There were no new reports of this species in 2021.

MANAGEMENT UPDATE: This species is not targeted for management.

ZEBRA MUSSEL (*Dreissena polymorpha*)

DESCRIPTION: This is a filter-feeding freshwater mollusk that displaces native species, attaches to and covers surfaces, and has sharp shells that are a nuisance for lake users. Most likely, the majority of waterbodies in the region do not have sufficient calcium levels to support large populations of zebra mussels at the present time.

MONITORING UPDATE: Zebra mussels are only known to be present in the PRISM in Lake Champlain and Lake George. There were no new reports of this species in 2021, but watercraft inspection stewards checking incoming boats did intercept zebra mussels.

MANAGEMENT UPDATE: There is localized management to periodically remove adult zebra mussels.

TIER 4: SUPPRESSION

Species classified as Tier 4 cannot be eradicated from the PRISM geography. Species are too widespread or too established. Management options may be cost prohibitive or outside of existing capacity. In these cases, the focus shifts to localized management over time to suppress infestations in order to protect high-priority resources such as rare habitats, endangered species, recreational assets, or drinking water sources.

CURLY-LEAF PONDWEED (*Potamogeton crispus*)



BY: LESLIE J. MEHRHOFF, UNIVERSITY OF CONNECTICUT

DESCRIPTION: This is a submerged perennial that begins growing early in the year and that can outcompete native species.

MONITORING UPDATE: It is known to be present in 20 lakes in the PRISM. It was newly discovered in three lakes in 2021 (perhaps due to earlier-in-the-season monitoring); Fourth Lake (Warren County), and Northville Lake (Fulton County) and Stewarts Bridge Reservoir (Saratoga County)—both of which are connected to Great Sacandaga Lake.

MANAGEMENT UPDATE: This species is sporadically removed when hand harvesting Eurasian watermilfoil.

EURASIAN WATERMILFOIL (*Myriophyllum spicatum*)



BY: L. BALDWIN, WHATCOM BOAT INSPECTIONS

DESCRIPTION: This is a submerged perennial that grows quickly, forming dense mats that can degrade native habitat and impede recreational use.

MONITORING UPDATE: It is known to be in 62 waterbodies (this does not include the Fulton Chain's second and fourth ponds where it was once reported but is assumed to be locally eradicated). In 2021, it was newly reported in Stewarts Bridge Reservoir and Peck Lake. Reports from around the region indicated that climate conditions in 2021 were ideal for milfoil growth (see Appendix C).

MANAGEMENT UPDATE: This is the most widespread aquatic invasive species across the PRISM. It is also the most frequently managed aquatic invasive species with over 15 partners across the PRISM suppressing populations via hand harvesting and diver-assisted, suction harvesting (DASH). Many thanks to the lake associations, local governments, community groups and others who raise money for management and help reduce the negative impacts of this prevalent species.



BY: UPPER MICHIGAN SOURCE

FIGURE LOCATION: Appendix C, Page C3

VARIABLE-LEAF WATERMILFOIL (*Myriophyllum heterophyllum*)



BY: ALISON FOX, UNIVERSITY OF FLORIDA, BUGWOOD.ORG

DESCRIPTION: This is a submerged perennial that grows quickly, forming dense mats that can degrade native habitat and impede recreational use.

MONITORING UPDATE: It is known to occur in 49 lakes in the PRISM. No new infestations were reported this year.

MANAGEMENT UPDATE: APIPP partners managed variable-leaf watermilfoil in Fish Creek Ponds, Raquette Lake, and Upper Saranac Lake. The plant has also been managed in Lake Placid and Long Lake in the past.

TERRESTRIAL PROGRAMS

THE TERRESTRIAL INVASIVES SPECIES MONITORING AND MANAGEMENT EFFORTS DESCRIBED IN THIS SECTION ADVANCE GOALS 2, 3, 6, 7, 8, 9 AND 10 OF APIPP'S STRATEGIC PLAN.



BY: APIPP STAFF

2021 SEASON SUMMARY

THE YEAR 2021 MARKED THE ELEVENTH SEASON in which the terrestrial program coordinated regional terrestrial invasive plant monitoring activities. APIPP staff, including two seasonal Invasive Species Management Stewards, and four EDRR crew members from Invasive Plant Control, Inc. (IPC) surveyed 38 NYSDEC campgrounds, over 130 recreational access points, sections of over 30 Forest Preserve units, and part or all of over 40 state and county road corridors.

The monitoring activities resulted in approximately 460 new terrestrial infestations being found, bringing the total number of mapped infestations in the APIPP PRISM to 6,478. It is important to note that these newly-found infestations are the result of increased survey efforts and 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 24 priority terrestrial invasive species management projects in 2021, addressing 13 species. The projects varied greatly in scale and objective. Some projects focused on local eradication of species with a limited distribution, such as tree-of-heaven, 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 24 priority terrestrial invasive species management projects include over 3,000 distinct infestations. In total, 860 infestations (28%) are under active management, and over 41 acres were managed in 2021. There are 947 sites (31%) where the species is deemed locally eradicated after not observing the species for at least three consecutive years, and an additional 537 sites (17%) where the invasive species was not observed during a 2021 survey. There are

approximately 750 priority infestations that would require permits or private landowner permissions before management can begin. In total, 76% of APIPP's priority terrestrial invasive species infestations are under active management or have been successfully removed.

APIPP continues to track forest pests. Two new emerald ash borer infestations were confirmed in Warren County; one from APIPP's trapping efforts and one from a concerned landowner. Partners tracked emerald ash borer infestations in Franklin and Clinton counties as well. HWA continues to slowly expand its distribution in the Lake George watershed. In 2021, the major infestation along the eastern shore of Lake George was reported to have expanded north and an isolated infestation was located along the western shore of the lake.

INVASIVE SPECIES MANAGEMENT STEWARDS

APIPP WAS PRIVILEGED to have Adellia Baker and Megan Grega as our 2021 stewards. Adellia and Megan brought exceptional plant identification knowledge to their positions and identified new infestations at several sites they monitored. They also assisted with forest pest monitoring and management, jumping worm surveys, and much, much more. Their work is highlighted in the "Campground Steward Annual Report" posted on APIPP's website.

Adellia and Megan found that of the 38 campgrounds surveyed, 35 were found to have terrestrial invasive species. In the ten years of surveying and managing for invasive species at campgrounds, stewards have reduced garlic mustard (*Alliaria petiolata*) abundance by approximately 78%, leading to local eradication at six campgrounds and one or two years of documented absence at four others. Stewards have also reduced purple loosestrife (*Lythrum salicaria*) abundance at campgrounds by approximately 89%.

2021 SEASON SUMMARY CONTINUED

INVASIVE PLANT CONTROL CREW



EARLY DETECTION AND RAPID RESPONSE CREW FROM INVASIVE PLANT CONTROL, INC. 2021. BY: APIPP STAFF

This year also marked the tenth season that IPC served as the EDRR crew. Throughout their 14-week season, IPC surveyed for and treated invasive species on sections of over 30 Forest Preserve units and along part or all of over 40 state and county road corridors. As detailed in the crew's 2021 report, posted on APIPP's website, the crew was able to perform over 1,700 invasive species assessments and treat approximately 500 sites.

While most treatments were to control common reed grass, knotweed species, and purple loosestrife, the crew also helped manage tree-of-heaven and the first-ever infestation of Japanese stiltgrass (*Microstegium vimineum*) in the Adirondacks. The crew also continued to manage invasive plants along the Veterans' Memorial Highway, which leads to the summit of Whiteface Mountain. In 2021 the crew removed 25 contractor bags of invasive plant material along the highway to improve habitat for rare and endangered alpine plants.

TERRESTRIAL INVASIVE SPECIES OF CONCERN

SPECIES SURVEYS



BY: LESLIE J. MEHRHOFF, UNIVERSITY OF CONNECTICUT

The APIPP terrestrial project manages or plans to manage 15 terrestrial invasive plants known to be present in the PRISM. These species include giant hogweed (*Heracleum mantegazzianum*), Japanese angelica tree (*Aralia elata*), Japanese stiltgrass, mile-a-minute, scotch broom, tree-of-heaven, Japanese tree lilac (*Syringa reticulata*), lesser celandine (*Ficaria verna*), black swallow-wort (*Vincetoxicum louiseae*), pale swallow-wort (*Vincetoxicum rossicum*), yellow iris (*Iris pseudacorus*), common reed grass, garlic mustard, knotweed species, and purple loosestrife.



BY: EMŐKE DÉNES, CC BY-SA 4.0

BY: JAMES ST. JOHN

Species are prioritized for management if they are affecting a conservation, economic, or human health asset, there are effective tools available to control both the infestation and the source(s) of introduction, there are sufficient resources available, and the project will result in a high return on investment. A searchable map on APIPP's website shows where invasive terrestrial plants occur.

INVASIVE FOREST PESTS



BY: CONNECTICUT AGRICULTURE EXPERIMENT STATION

APIPP surveys for two terrestrial forest pests: HWA and emerald ash borer. Both pests are known to be present in the PRISM. APIPP is currently working with partners to actively manage HWA in the Lake George region, including Dome Island which TNC owns. APIPP monitored traps for emerald ash borer in 2021 and is working to identify sites suitable for biological control.

TIER 1: EARLY DETECTION AND PREVENTION

Tier 1 species are not known to occur within a PRISM boundary, but are likely to establish and spread if introduced. Since Tier 1 plants and animals are not yet found in the area, but occur in neighboring regions, APIPP works to control these species through education, outreach, and awareness-building activities.

TIER 1 PLANTS

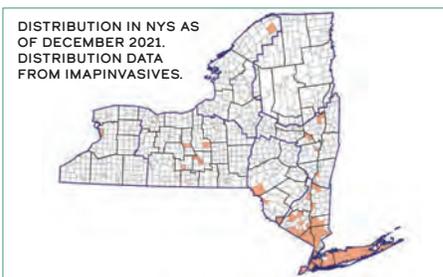
PORCELAIN BERRY (*Ampelopsis brevipedunculata*)



BY: OLIVIER VANPE - CC BY-SA 3.0



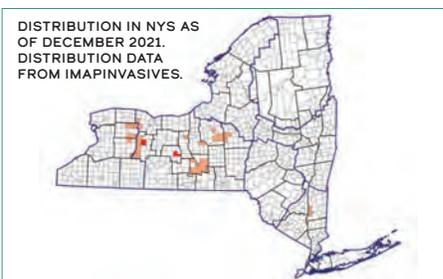
BY: WUERZELE - OWN WORK, CC BY-SA 4.0



SLENDER FALSEBROME (*Brachypodium sylvaticum*)



BY: BRUCE NEWHOUSE



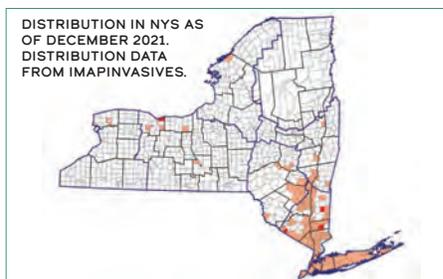
WINEBERRY (*Rubus phoenicolasius*)



BY: LESLIE J. MEHRHOFF



BY: WOUTER HAGENS, CC BY-SA 3.0 <[HTTPS://CREATIVECOMMONS.ORG/LICENSES/BY-SA/3.0](https://creativecommons.org/licenses/by-sa/3.0/)>, VIA WIKIMEDIA COMMONS



TIER 1 ANIMALS



BY: USDA APHIS

ASIAN LONGHORNED BEETLE (*Anoplophora glabripennis*)



BY: SANDER VAN DER WEL, [CC BY-SA 2.0], WIKIMEDIA COMMONS

EURASIAN BOAR (*Sus scrofa*)



BY: L. BARRINGER

SPOTTED LANTERNFLY (*Lycorma delicatula*)

TIER 2: ERADICATION

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

TIER 2 PLANTS

GIANT HOGWEED (*Heracleum mantegazzianum*)



BY: HUUH UET

FIGURE LOCATION: Appendix A, Page A1, Figure 1

DESCRIPTION: Giant hogweed is a biennial herb that grows to 8-14 feet tall. It is characterized by a hollow, green stem with purple blotches and large, deeply-lobed leaves. This plant contains phytotoxic sap that can cause severe skin burns upon contact. It readily invades drainage ditches, fields, and yards.

MONITORING UPDATE: Since 2008, 16 infestations have been mapped in the PRISM. No new infestations were detected in 2021.

MANAGEMENT UPDATE: In 2021, only six infestations (ranging from <0.001 to 0.020 acre) were still present in the PRISM. These six infestations were managed mechanically. A total of 0.050 acre was managed. Seven infestations are considered locally eradicated, and three have at least one year of documented absence, which means that nearly two-thirds of the infestations of this plant have been successfully controlled!

JAPANESE ANGELICA TREE (*Aralia elata*)



BY: TUBIFEX, PUBLIC DOMAIN, VIA WIKIMEDIA COMMONS

DESCRIPTION: Japanese angelica tree is a fast-growing deciduous tree that can grow more than 40 feet tall. Trunks and larger stems are covered in sharp spines. Compound leaves can reach four feet in length. It spreads easily from ornamental plantings via animal-dispersed seed into disturbed areas.

MONITORING UPDATE: One infestation is known in the PRISM, totaling ~0.001 acre. No new infestations were detected in 2021.

MANAGEMENT UPDATE: No management occurred in 2021. Landowner permission is required before management actions can occur. Outreach to obtain landowner permissions is slated for 2022.

JAPANESE STILTGRASS (*Microstegium vimineum*)



BY: KATJA SCHULZ

DESCRIPTION: Japanese stiltgrass is an annual grass that sprawls along the ground as it grows, forming dense mats. The leaves are pale green, lance-shaped and feature a distinctive off-center, silver midrib. It is adapted to low light conditions and will thrive in a variety of habitats.

MONITORING UPDATE: This species was detected for the first time in the PRISM in 2021, moving it from a Tier 1 to a Tier 2 species. Five infestations in the same general area were mapped for a total of 0.871 acre.

MANAGEMENT UPDATE: Thanks to a timely report by a private landowner, all five known infestations totaling 0.871 acre (ranging in size from <0.001 to 0.761 acre) were treated using a combination of mechanical and chemical treatment methods.



BY: LESLIE J. MEHRHOFF

TIER 2 PLANTS CONTINUED

MILE-A-MINUTE (*Persicaria perfoliata*)



BY POOKIE FUGGLESTEIN - OWN WORK, CC0, [HTTPS://COMMONS.WIKIMEDIA.ORG/W/INDEX.PHP?CURID=31888926](https://commons.wikimedia.org/w/index.php?curid=31888926)

FIGURE LOCATION: Appendix A, Page A2, Figure 2

DESCRIPTION: Mile-a-minute is an herbaceous vine that can grow at an astonishing rate of up to six inches per day under ideal conditions. The light-green leaves are triangle-shaped and alternate along the stem. It typically colonizes open, disturbed areas and does best in full sunlight.

MONITORING UPDATE: Mile-a-minute was first detected in the PRISM in 2019. Five infestations have been mapped, totaling approximately 0.126 acre. No new infestations were detected in 2021.

MANAGEMENT UPDATE: Four known infestations, totaling 0.126 acre, (ranging in size from <0.001 to 0.088 acre) were managed in 2021. Three were controlled mechanically and one was treated with a combination of a selective foliar application of glyphosate-based herbicide and mechanical treatment. The fifth infestation has at least one year of documented invasive plant absence.

SCOTCH BROOM (*Cytisus scoparius*)



BY: DARYL MITCHELL

FIGURE LOCATION: Appendix A, Page A3, Figure 3

DESCRIPTION: Scotch broom is a perennial shrub that can grow up to 10 feet tall. It is characterized by its green, five-sided stems, and small, bright-yellow flowers that bloom from late May through June, as well as its green, fuzzy seed pods that turn black when mature. It invades fields, forest edges, roadsides, and canopy openings.

MONITORING UPDATE: One infestation is known in the PRISM, totaling approximately 0.152 acre.

MANAGEMENT UPDATE: One infestation was treated with a selective foliar application of glyphosate-based herbicide in 2021.

TREE-OF-HEAVEN (*Ailanthus altissima*)



BY: LUIS FERNÁNDEZ GARCÍA

FIGURE LOCATION: Appendix A, Page A4, Figure 4

DESCRIPTION: Tree-of-heaven is a deciduous tree that can reach 80 feet in height. The bark has a cantaloupe skin-like texture and is gray in color. Leaves are alternate and compound, with 10-41 leaflets. It prefers open, disturbed sites and can be found along riparian corridors, forests edges and openings, fields, and roadsides.

MONITORING UPDATE: Ten infestations are present in the PRISM, totaling approximately 0.226 acre. Eight new infestations were detected and surveyed in 2021. In addition to the ten surveyed infestations, two new infestations were detected in 2021 via iMapInvasives and have yet to be confirmed.

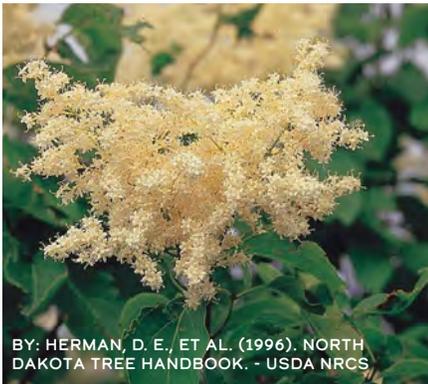
MANAGEMENT UPDATE: Seven infestations (ranging in size from 0.001 to 0.094 acre) were treated with herbicide in 2021. A total of 0.207 acre was managed. One large, mature tree was removed by a professional arborist. Landowner permission is required to treat the remaining known infestations.

TIER 3: CONTAINMENT

Plants and animals classified as Tier 3 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.

TIER 3 PLANTS

JAPANESE TREE LILAC (*Syringa reticulata*)



BY: HERMAN, D. E., ET AL. (1996). NORTH DAKOTA TREE HANDBOOK. - USDA NRCS

DESCRIPTION: Japanese tree lilac may grow as a large shrub or small tree reaching 30 feet in height. It is characterized by opposite, simple, oval leaves and large clusters of white flowers in early summer. It is a popular ornamental and can escape cultivation, invading natural areas such as riparian corridors and floodplains.

MONITORING UPDATE: APIPP identified 24 infestations of this species in 2021. Of these, 18 are part of a naturalized population located along the Ausable River. Other naturalized populations were found in Saranac Lake, Elizabethtown, Wells, and Dresden.

MANAGEMENT UPDATE: No management occurred in 2021.

LESSER CELANDINE (*Ficaria verna*)



BY: MICHAEL OSMENDA, CC BY SA 2.0 VIA WIKIMEDIA COMMONS

DESCRIPTION: Lesser celandine is a low-growing, herbaceous perennial. Its leaves are dark green, kidney-shaped, and arranged in a basal rosette. It readily invades wetlands and open riparian corridors.

MONITORING UPDATE: Since 2018, ten infestations have been reported, totaling approximately 0.127 acre. No new infestations were mapped in 2021.

MANAGEMENT UPDATE: No management occurred in 2021.

SWALLOW-WORT SPP. (*Vincetoxicum louiseae* & *V. rossicum*)



BY: LESLIE J. MEHRHOFF

DESCRIPTION: Swallow-wort species are perennial herbaceous vines that form dense mats which smother native vegetation. This species is characterized by its opposite, dark-green, glossy leaves; small, five-petaled flowers that are present in June; and milkweed-like seed pods. These plants thrive in a wide range of conditions.

MONITORING UPDATE: Since 2004, 69 infestations have been mapped. Four new infestations were mapped in 2021.

MANAGEMENT UPDATE: Throughout the PRISM, 35 swallow-wort infestations have been prioritized for management. Of these, 18 (ranging in size from <0.001 to 1.252 acres) are under active management, 13 are considered locally eradicated and one has at least one year of documented invasive plant absence. Approximately 4.121 acres were managed in 2021.



BY: LESLIE J. MEHRHOFF

FIGURE LOCATION:

Appendix A, Page A5, Figure 5

TIER 3: CONTAINMENT CONTINUED

TIER 3 PLANTS CONTINUED

YELLOW IRIS (*Iris pseudacorus*)



BY: ROBERT FLOGAUS-FAUST - CC BY 4.0 VIA WIKIMEDIA COMMONS

FIGURE LOCATION: Appendix A, Page A6, Figure 6

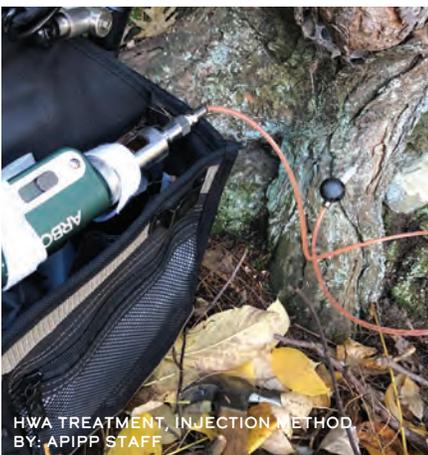
DESCRIPTION: Yellow iris is an ornamental perennial that can grow to 3-4 feet tall and that features broad, lance-shaped leaves that are stiff and erect and yellow flowers that bloom from April to June. It readily invades riparian corridors, the shores of lakes and ponds, wetlands, and drainage ditches.

MONITORING UPDATE: Since 2009, 230 infestations have been mapped in the PRISM. Thirteen new infestations were mapped in 2021. Two yellow iris eradication management projects (Saranac River and St. Regis River) have been prioritized within the PRISM. As both areas are relatively small with few infestations, yellow iris is presented here as a sum of the activities that occur throughout the PRISM as opposed to looking at the individual management projects.

MANAGEMENT UPDATE: In 2021, 41 infestations were prioritized for management. Of these, seven (ranging in size from <0.001 to 0.02 acre) are under active management, nine have at least one year of documented invasive plant absence, and 16 are considered locally eradicated. An additional nine sites require permits or permissions before management can begin. Less than 0.001 acre was managed in 2021.

TIER 3 ANIMALS

HEMLOCK WOOLLY ADELGID (*Adelges tsugae*)



HWA TREATMENT, INJECTION METHOD, BY: APIPP STAFF



BY: USFS

DESCRIPTION: HWA is a small insect (less than 1/16" long) that inserts its piercing-sucking mouthpiece into the twig tissue near the base of hemlock needles causing the tree to wall off the wound. White, woolly ovisacs can be easily identified on the undersides of hemlock branch tips from late fall to early summer.

MONITORING UPDATE: HWA was first detected in the PRISM in 2017 on Prospect Mountain in Lake George. This infestation was promptly treated and is presumed eradicated. Multiple new infestations of HWA were confirmed in 2020 within the Lake George watershed, spanning 250+ acres along the eastern shore near the campground on Glen Island. Small infestations were also found at Shelving Rock, Buck Mountain trailhead, Dome Island and a private property along the southeastern shore of Lake George. In 2021, HWA was confirmed further along the eastern shore of Lake George, extending north to Black Mountain Point. An isolated infestation was also identified on private property along the western shore near Diamond Point.

MANAGEMENT UPDATE: APIPP continues to assist with NYSDEC-led management of the established "Glen Island" infestation where a total of approximately 5,150 trees were treated in 2020 and 2021. APIPP, with assistance from Lake George Land Conservancy, also completed its second year of management on Dome Island and treated 586 trees in 2021.

TIER 4: SUPPRESSION

Species classified as Tier 4 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 efforts targeted at protecting high-priority resources such as rare habitats, endangered species, and recreational assets.

TIER 4 PLANTS

COMMON REED GRASS (*Phragmites australis*)



BY: EMÓKE DÉNES, CC BY-SA 4.0

FIGURE LOCATION: Appendix B
(pages B1-B12) Common Reed Grass
Priority Management Project

DESCRIPTION: Common reed grass is a large perennial grass that can reach upwards of 15 feet in height. Its smooth stem lacks nodes or joints, and its leaves are stiff and sharp. It readily invades wetlands, cultivated areas, and drainage ditches.

MONITORING UPDATE: Since 2000, 1,950 infestations have been mapped throughout the PRISM. In total, 89 new infestations were mapped in 2021.

MANAGEMENT UPDATE: Across the 11 priority management projects, 1,097 sites have been prioritized for management. Of these, 296 sites are under active management, 170 sites have at least one year of documented invasive plant absence, and 322 are considered locally eradicated. The remaining 309 sites generally require permits or permission before treatment can begin. In 2021, 244 sites (ranging in size from <0.001 to 2.037 acres) totaling 19,475 acres were managed. This species was moved from Tier 3 to Tier 4 in 2021.

GARLIC MUSTARD (*Alliaria petiolata*)



BY: SECOND YEAR FLOWERS - DAVID
CAPPAERT, MICHIGAN STATE UNIVERSITY,
BUGWOOD.ORG

FIGURE LOCATION: Appendix A,
Page A7, Figure 7

DESCRIPTION: Garlic mustard is an herbaceous biennial. The first year it grows as a rosette of kidney-shaped leaves. In its second year, it can grow multiple stems up to four feet tall with triangular, sharply-toothed leaves. It readily invades areas of disturbance and slowly expands into the surrounding forest understory.

MONITORING UPDATE: Since 2012, 926 infestations have been mapped in the PRISM. In total, 27 new infestations were mapped in 2021.

MANAGEMENT UPDATE: In 2021, 834 infestations were prioritized for management. Of these, 185 sites are under active management, 176 sites have at least one year of documented invasive plant absence, and 452 are considered locally eradicated. The remaining 21 sites generally require permits or permission before treatment can begin. In 2021, 151 sites (ranging in size from <0.001 to 1,563 acres) totaling 1,784 acres were managed.

KNOTWEED SPP. (*Reynoutria japonica*, *Reynoutria sachalinensis* & *Reynoutria x bohemica*)



JAPANESE KNOTWEED, BY ACABASHI,
CREATIVE COMMONS CC-BY-SA 4.0,
Wikimedia Commons

FIGURE LOCATION: Appendix A,
Page A8, Figure 8

DESCRIPTION: Knotweed species are large bamboo-like perennials that can exceed 18 feet in height, with hollow stems and alternate, heart-shaped leaves. These plants readily invade riparian areas, cultivated lands, yards, and roadsides.

MONITORING UPDATE: Since 2012, 1,373 infestations have been mapped in the PRISM. In total, 92 new infestations were mapped in 2021.

MANAGEMENT UPDATE: In 2021, 536 infestations were prioritized for management. Of these, 143 sites are under active management, 100 sites have at least one year of documented invasive plant absence, and 98 are considered locally eradicated. The remaining 195 sites generally require permits or permission before treatment can begin. In 2021, 97 sites (ranging in size from <0.001 to 0.329 acre) totaling 4,222 acres were managed.

Note: The 117 knotweed sites managed under the Knotweed Management Partnership are not included in these totals.

TIER 4: SUPPRESSION CONTINUED

TIER 4 PLANTS CONTINUED

PURPLE LOOSESTRIFE (*Lythrum salicaria*)

BY: JOUKO LEHMUSKALLIO.

FIGURE LOCATION: Appendix A, page A9, Figure 9

DESCRIPTION: Purple loosestrife is an erect, herbaceous perennial that grows to 3-7 feet in height. Linear-shaped leaves grow oppositely along a square stem and showy, magenta flowers are present from July to September. It readily invades wetlands, cultivated areas, and drainage ditches.

MONITORING UPDATE: Since 2012, 927 infestations have been mapped in the PRISM. In total, 111 new infestations were mapped in 2021.

MANAGEMENT UPDATE: In 2021, 503 infestations were prioritized for management. Of these, 199 sites are under active management, 77 sites have at least one year of documented invasive plant absence, and 39 are considered locally eradicated. The remaining 188 sites generally require permits or permission before treatment can begin. In 2021, 125 sites (ranging in size from <0.001 to 2.730 acres) totaling 10.717 acres were managed chemically, mechanically, biologically or with a combination of treatment methods. This suppression project also relies heavily on the use of biocontrol. Only sites where biocontrols were released this season are included in these totals. Sites where biocontrols were already present were either not managed (and therefore not included in the above management analysis) or had flowers mechanically removed.

TIER 4 ANIMALS

EMERALD ASH BORER (*Agrilus planipennis*)

BY: MACROSCOPICSOLUTIONS/FLICKR

DESCRIPTION: Emerald ash borer is a small (3/8" - 3/4" long), emerald-green beetle with metallic green wings and a purplish-red abdomen. Its extensive larval feeding activity cuts off nutrients and water flow throughout host trees in the *Fraxinus* genus.

MONITORING UPDATE: Emerald ash borer was first identified in the PRISM in 2017 and within the Adirondack Park in 2020. In 2021, APIPP established five trapping locations which led to the discovery of this pest in the Bolton Landing area. In addition, a private landowner reported a finding near the Town of Johnsburg that APIPP confirmed. Within the Adirondack Park, emerald ash borer has still only been confirmed in Warren County.

MANAGEMENT UPDATE: APIPP proposed a site in Warren County to the United States Department of Agriculture Animal and Plant Health Inspection Service (USDA APHIS) for inclusion in a biological control project. If approved, APIPP would be provided with biological control agents for release at this site in 2022 and 2023. APIPP also established five Monitoring and Managing Ash plots (see page 11) that will help monitor for trees that are resistant to emerald ash borer.

SPECIES NOT ACTIVELY MANAGED

APIPP PRIORITIZES INFESTATIONS OF SPECIES for management based on whether the infestation is affecting a conservation, economic, or human health asset, whether there are effective tools available to control both the infestation and the source(s) of introduction, whether sufficient resources are available, and whether the project will result in a high return on investment. Therefore, species may not be prioritized for management if they are locally or regionally widespread, their spread vector cannot be controlled, or if they have a low-to-moderate NYS invasiveness ranking. These non-managed species are occasionally mapped and assessed to provide APIPP with a better understanding of their regional distribution and potential impacts; however, these reports are usually incidental, and APIPP typically does not actively monitor for these species. (APIPP did monitor for jumping worms in 2021.)

While APIPP does not actively manage these species, they are often highlighted in our educational programming to help explain how to identify them and how the public can prevent their spread. APIPP staff also respond to numerous public inquiries about these species and provide guidance and best management practices to property managers interested in carrying out control measures.



CUP PLANT
(*Silphium perfoliatum*)

BY: BARTON ARBORETUM



JUMPING WORMS
(*Amyntas & Metaphire spp.*)

BY: SUSAN DAY / UW MADISON ARBORETUM



AUTUMN OLIVE
(*Elaeagnus umbellata*)

BY: I, KENPEI, CC BY-SA 3.0



BUSH HONEYSUCKLES
(*Lonicera spp.*)

BY: ROB ROUTLEDGE, SAULT COLLEGE



COMMON BUCKTHORN
(*Rhamnus cathartica*)

BY: ANEMONE PROJECTORS, CC BY-SA 2.0



GLOSSY BUCKTHORN
(*Frangula alnus*)

BY: USDA PLANTS DATABASE



JAPANESE BARBERRY
(*Berberis thunbergii*)

BY: WILDFEUER, CC 2.5



MULTIFLORA ROSE
(*Rosa multiflora*)

BY: CC BY-SA 3.0



NORWAY MAPLE
(*Acer platanoides*)

BY: GMIHAIL AT SERBIAN, CC BY-SA 3.0



ASIATIC BITTERSWEET
(*Celastrus orbiculatus*)

BY: CBAILE19, CC0, VIA WIKIMEDIA COMMONS



REED CANARY GRASS
(*Phalaris arundinacea*)

BY: R. A. NONENMACHER, CC BY-SA 4.0



WINGED BURNING BUSH
(*Euonymus alatus*)

BY: I, KENPEI, CC BY-SA 3.0

APIPP PARTNERS

THIS SECTION DESCRIBES HOW APIPP ADVANCES GOALS 1, 4, AND 8 OF ITS STRATEGIC PLAN.



AQUATIC EARLY DETECTION TEAM FROM ADIRONDACK RESEARCH 2021. BY: PATRICK BLY, ADIRONDACK RESEARCH

APIPP'S 2021 PARTNER COORDINATION

THE AMAZING SUCCESS OF ADIRONDACK PARK invasive species prevention and control efforts is the result of the work of many partners (see a complete list of community partners on the inside cover of this report). In addition to the partnerships described elsewhere in this report, APIPP hosted or assisted with the following collaborative meetings and projects with partners in 2021.

- Facilitated an Aquatic Invasive Species Roundtable on February 9 followed by a Terrestrial Invasive Species Roundtable on February 10 for partners to connect during the winter and share summer plans.
- Hosted a virtual partner meeting on April 29 focused on eDNA for invasive species detection. Paul Simonin from Cornell University presented on eDNA for AIS detection and Mark Whitmore from the NYS Hemlock Initiative shared his work using eDNA for HWA detection.
- Hosted a virtual partner meeting on November 4 with featured speakers Michale Glennon from AWI presenting new research on invasive species pathways and Sawyer Gardner from USDA APHIS providing an update on emerald ash borer biocontrols.
- Convened three meetings of a small AIS spread-prevention working group.
- Sent 25 "APIPP News" updates to partners via the APIPP listserv.
- Provided information to NYSDEC on the AIS law and the law banning glyphosate on state-owned land.
- Participated in quarterly meetings with NYSDEC Invasive Species Coordination Section partners and in monthly PRISM webinars, attended the statewide Invasive Species Summit.
- Participated in the NYS Invasive Species Research Institute's project to define metrics of success for invasive species work.

STATE PARTNER UPDATES

STATE PARTNERS are a key part of APIPP's work. We thank these partners for providing the following updates for this annual report. We also thank AWI for the invaluable role it serves preventing the spread of AIS in the Adirondack Park as part of the statewide watercraft inspection steward program.

NEW YORK STATE ADIRONDACK PARK AGENCY (APA)

Adirondack Park Agency



APA STAFF ISSUED ONE PERMIT for the control of AIS. Six new pre-application files were opened at the request of prospective applicants seeking to control Eurasian watermilfoil through the use of aquatic herbicides.

SIX WATERBODIES LOCATED on the Forest Preserve were surveyed for the presence of aquatic vegetation.

APA STAFF PARTICIPATED in the Lake Champlain Rapid Response Task Force's work regarding the potential for round goby (*Neogobius melanostomus*) to enter Lake Champlain through the Champlain Canal.

APA RECEIVED, and is in the process of reviewing, a proposal from private residents to control *Lymantria dispar dispar* (formerly known as gypsy moth) on an island in Lake George should the species be a problem again in 2022.

NEW YORK STATE DEPARTMENT OF TRANSPORTATION (NYSDOT)

TREATMENT AND MONITORING

- **NYSDOT MAINTENANCE CREWS** continue to adapt their mowing schedules to reduce the spread of wild parsnip and purple loosestrife, and to monitor and manage invasive species along rights-of-way and at NYSDOT facilities, including the following notable 2021 projects.
 - Exit 26 of I-87: monitored and treated wild parsnip
 - Remsen-Lake Placid Travel Corridor: monitored areas to be treated in 2022
 - Route 8, Proganics Pilot Project: monitored and manually removed invasive species
 - Warrensburg Residency (R1): monitored and treated invasive species
 - Alder Creek Facility (R2, State Dam Rd): monitored invasive species (there has been no regrowth of common reed grass since 2019); treated the salt barn site
 - Wetland Mitigation Site, near Route 9L in Queensbury: final year of a three-year common reed grass treatment and monitoring contract. The initial treatment in 2019 and follow-up treatment in 2020 were successful in establishing desired wetland vegetation. In 2021, only a few rogue individual invasives remain for final treatment.
- **NYSDOT WORKS WITH ITS CREWS** and contractors to properly wash equipment and properly dispose of contaminated soils.
- **NYSDOT CONTINUES TO PROMOTE** best management practices in the handling of woody debris in construction and maintenance projects.
- **NYSDOT ROUTINELY SCREENS** all new capital project locations for invasive species prior to construction and monitors completed projects.

NYSDOT CONTINUED

TRAINING AND OUTREACH

- **NYSDOT PARTNERS WITH AWI** to operate boat inspection and decontamination stations, including the flagship facility at Exit 18 of I-87.
- **NYSDOT OFFERED** "Invasive Species Detection & Treatment" training to 11 Assistant Resident Engineers.
- **NYSDOT STAFF IN ALL REGIONS** were trained in spotted lanternfly identification. NYSDOT distributed spotted lanternfly flyers and identification cards and installed monitoring traps as part of a multi-agency early detection and rapid response effort.

GUIDANCE, RESEARCH AND STATEWIDE INITIATIVES

- **NYSDOT GUIDANCE** documents for Seeding & Soil Management in the Adirondack Park are nearing completion.
- **THE FINAL GENERIC ENVIRONMENTAL IMPACT STATEMENT**/Master Travel Corridor Unit Management Plan for State Travel Corridors in the Adirondack Park was signed.
- **PILOT AREAS FOR ALTERNATIVE MOWING** and conservation practices consistent with draft revised Vegetation Management Guidelines continue to be identified in anticipation of joining the Monarch Candidate Conservation Agreement with Assurance program.
- **FEDERAL STATE PLANNING AND RESEARCH** (SPR) projects—to develop, test and release biological control agents for common reed grass (Bernd Blossey, Cornell University, Principal Investigator) and swallow-wort species (Dylan Perry, SUNY-ESF, Principal Investigator)—continue. An eDNA research project to detect spotted lanternfly (in collaboration with the NYS Department of Agriculture and Markets and Rutgers University) was initiated.

ADIRONDACK WATERSHED INSTITUTE OF PAUL SMITH’S COLLEGE (AWI)

AWI’S PRELIMINARY REPORT for the watercraft inspection steward program showed stewards at 44 locations inspected a total of 84,817 boats. AWI stewards found that 2.6% of the boats inspected had invasive species present. Thanks to expanded spread-prevention education, this is down from a high of 3.6% in 2018. AWI stewards decontaminated over 3,700 boats in 2021 at 31 locations, and the percent of decontaminated boats rose to 4.4% of boats. The chart below, courtesy of AWI, shows the most common species intercepted by the stewards.

Common	Less Common	Rare
Eurasian watermilfoil	Zebra mussel	Asian clam
Variable-leaf milfoil	Spiny/fishhook waterflea	Bloody red shrimp
Curly-leaf pondweed	Water chestnut	Brittle naiad
--	--	European frog-bit
--	--	Hydrilla
--	--	Quagga mussel
--	--	Rusty crayfish

FIGURE 4. COMMON SPECIES INTERCEPTED BY WATERCRAFT INSPECTION STEWARDS. BY: AWI

NEW YORK STATE LAKE GEORGE PARK COMMISSION (LGPC)



VIEW OF LAKE GEORGE. BY: APIPP STAFF

LAKE GEORGE CONTINUES to operate under a mandatory, trailered-boat inspection program to eliminate any new invasive species from entering the lake. The LGPC boat inspection program, in its eighth year of operations, had more than 34,000 boater contacts at its six locations around the lake.

SINCE THE PROGRAM BEGAN, LGPC boat inspection technicians have stopped and decontaminated approximately 150 boats each year with visible AIS on them, including hydrilla in 2020 and 2021. Thanks to a partnership between NYS, local municipalities and the Lake George Association, there is no cost to boaters for this important program.

LGPC ALSO ACTIVELY MANAGES Eurasian watermilfoil in Lake George and has spent more than \$1.3 million dollars in the last three years in a joint partnership with the Lake George Association. Dense beds of this plant are almost eliminated in Lake George for the first time in decades, although work continues to control this species.

IN ADDITION, LGPC ORGANIZES and conducts an annual Asian clam survey with assistance from partners and volunteers. In 2021 one new population of this invasive mollusk was found, bringing the total number of separate infestations in the lake to 29.

EQUIPMENT AND MATERIALS



UNMANNED AERIAL VEHICLE ASSISTS WITH INVASIVE SPECIES DETECTION. BY: APIPP STAFF

APIPP'S 2019-2023 CONTRACT with NYSDEC requires reporting on equipment purchased with Environmental Protection Fund moneys. TNC defines durable equipment as items costing more than \$5,000. No such purchases were made in 2021. Past purchases include an unmanned aerial vehicle which allows staff to survey large or remote areas for invasive species.

THANK YOU, APIPP PARTNERS, FOR ALL YOUR WORK IN 2021 TO PROTECT THE ADIRONDACKS FROM INVASIVE SPECIES THREATS!

Adirondack Park Invasive Plant Program 2021 Annual Report

Appendix A: Terrestrial Priority Management Progress Charts

The charts on the following pages 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. Increasing number of sites throughout the years is due to increasing survey efforts and the ability to survey new areas as more sites become locally eradicated.
2. Invasive species are considered locally eradicated after three consecutive years of documented invasive plant absence.



**INVASIVE SPECIES
MANAGEMENT**
ADIRONDACKS

Tier 2 Species

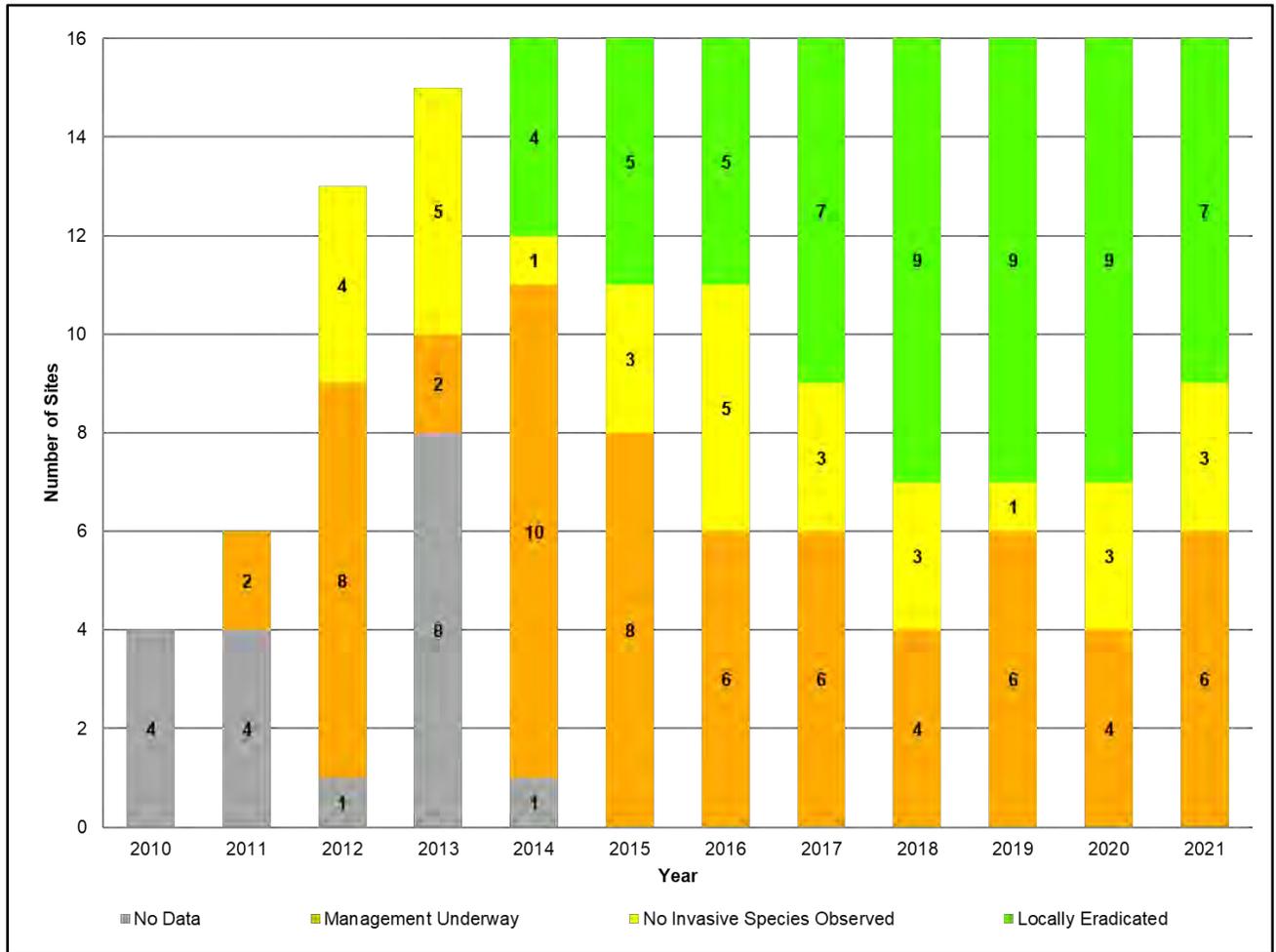


Figure 1. Annual management progress for the APIPP PRISM Giant Hogweed Eradication Project (2010-2021).

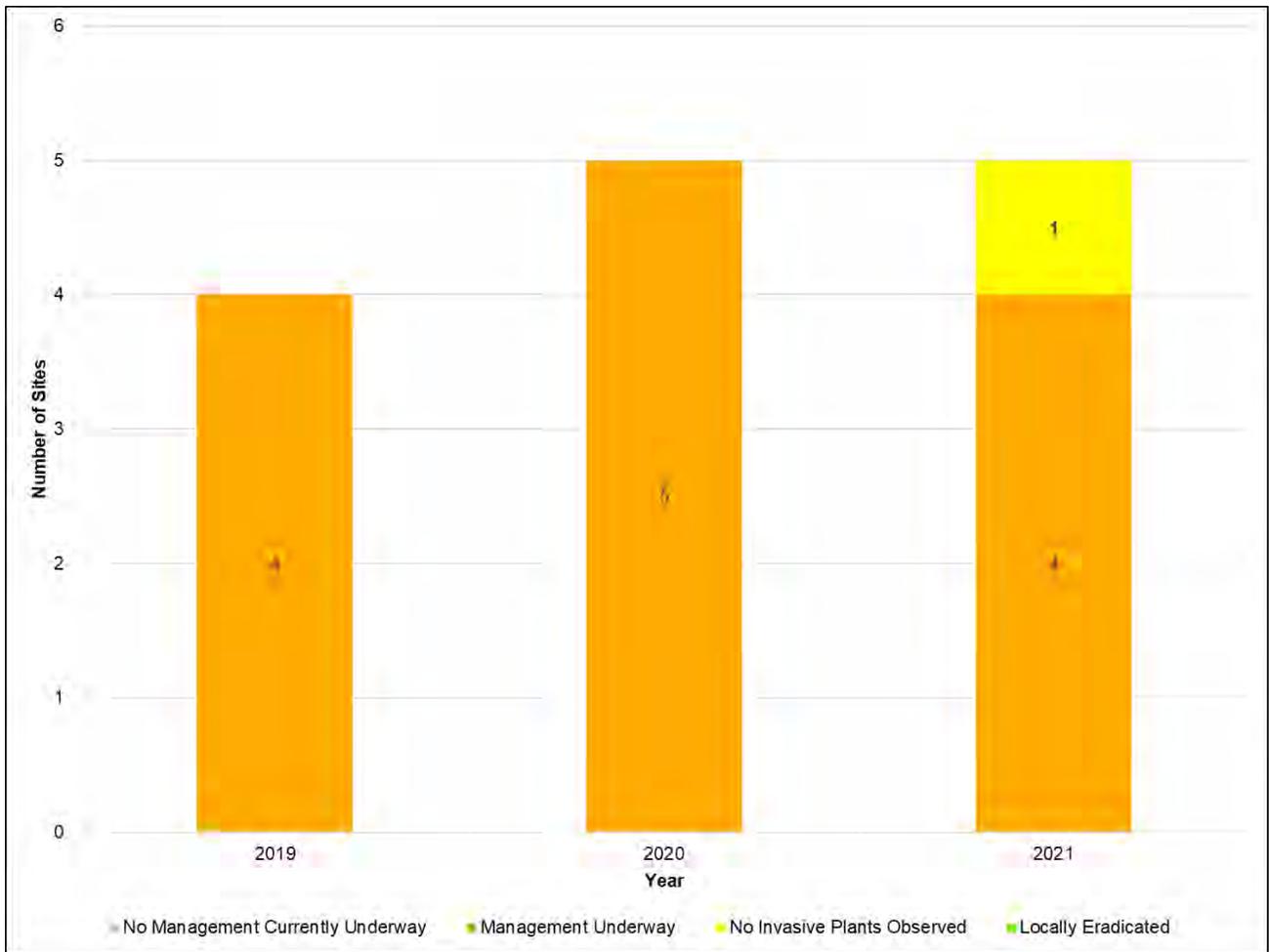


Figure 2. Annual management progress for the APIPP PRISM Mile-a-Minute Eradication Project (2019-2021).

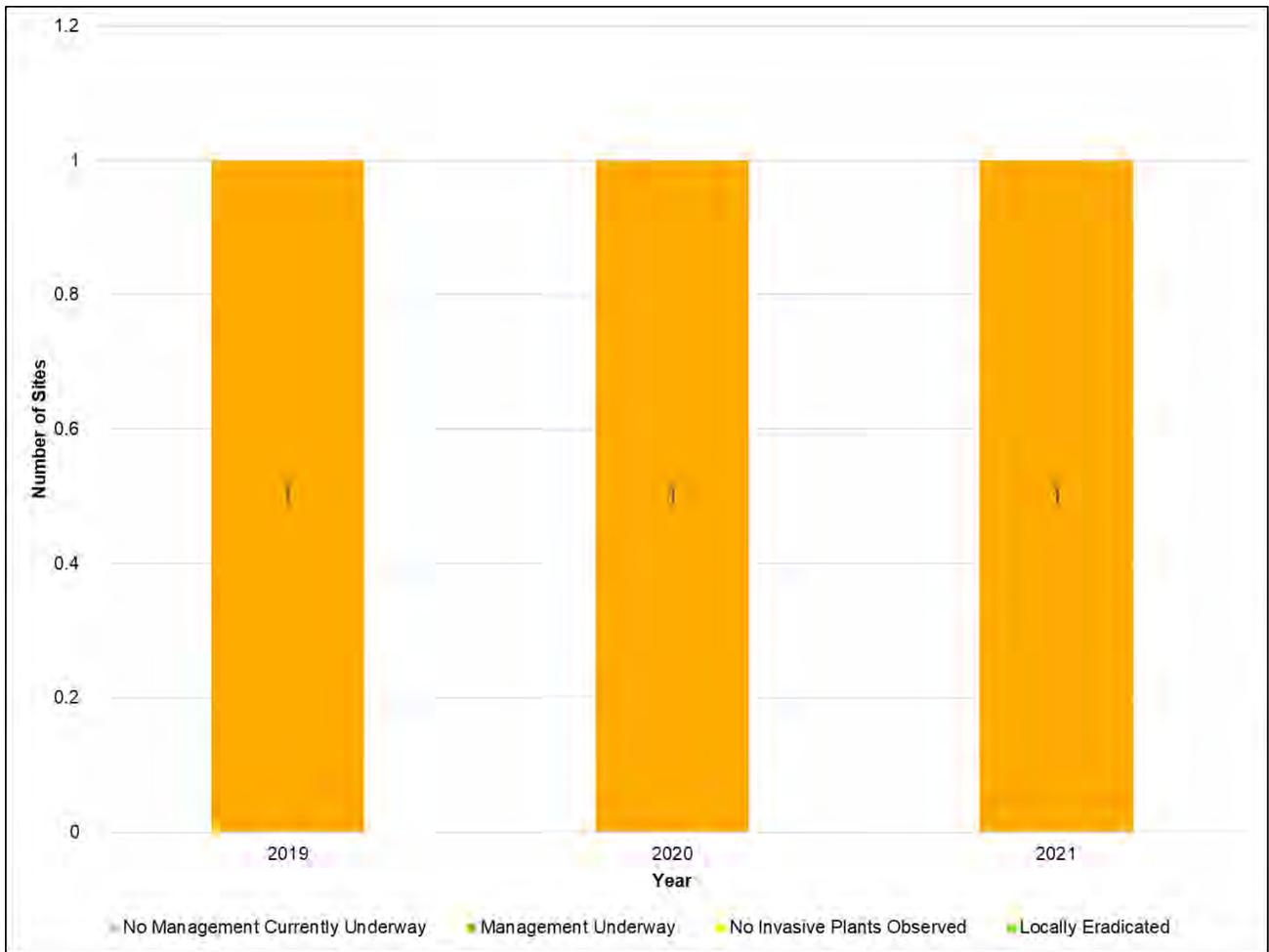


Figure 3. Annual management progress for the APIPP PRISM Scotch Broom Eradication Project (2019-2021).

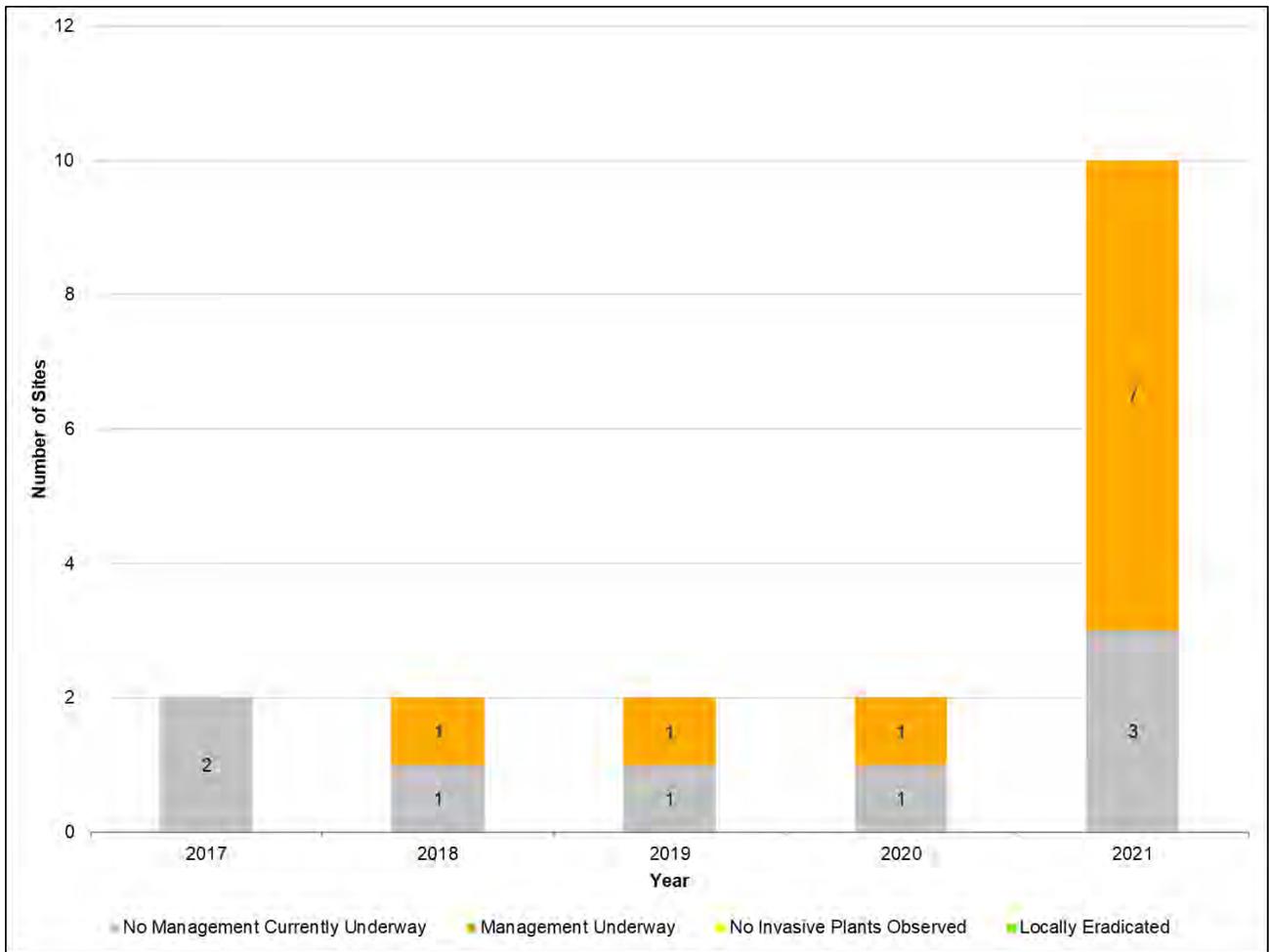


Figure 4. Annual management progress for the APIPP PRISM Tree-of-Heaven Eradication Project (2017-2021).

Tier 3 Species

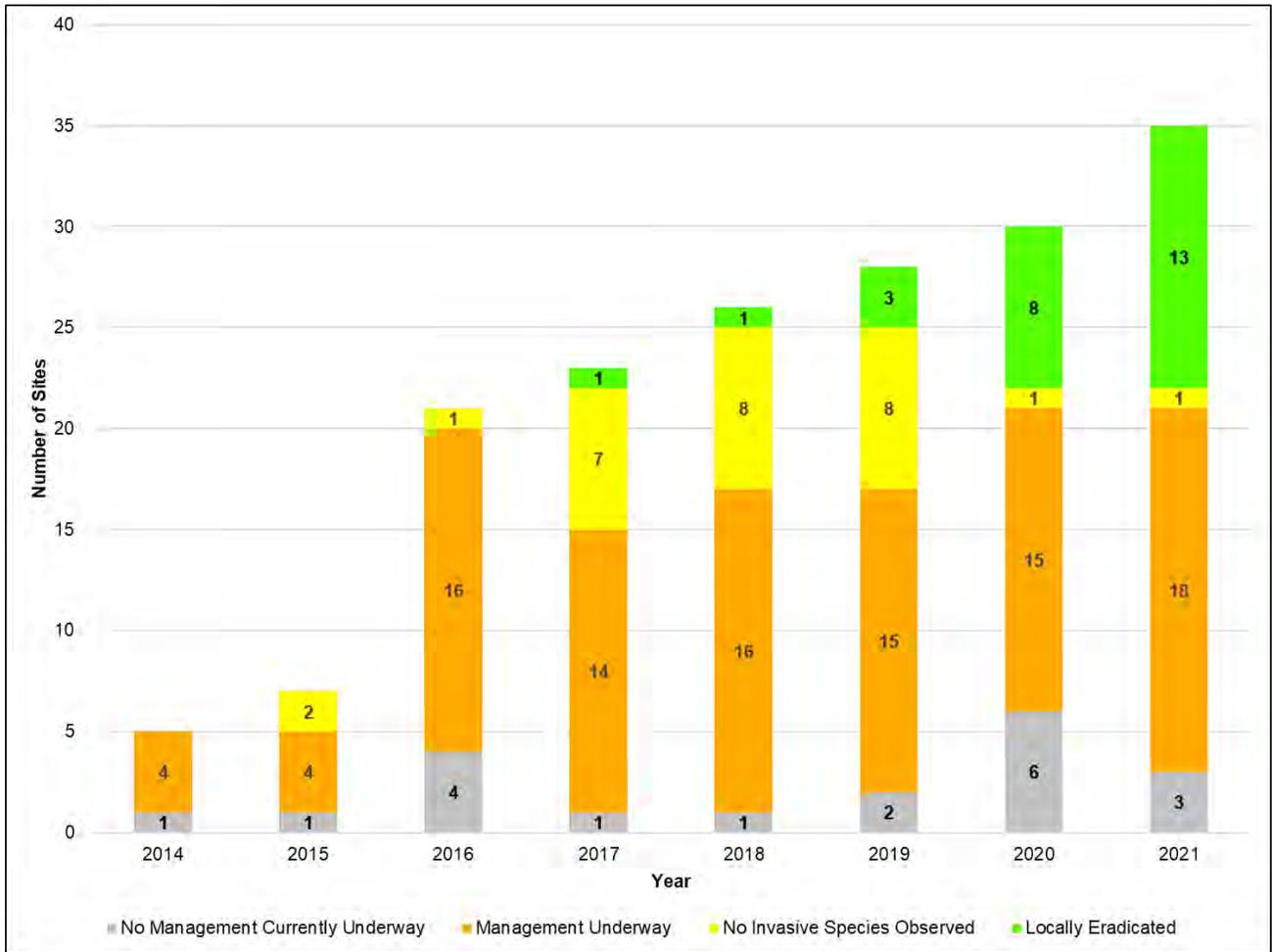


Figure 5. Annual management progress for the Resilient and Connected Land Network Swallow-wort Exclusion Project (2014-2021).

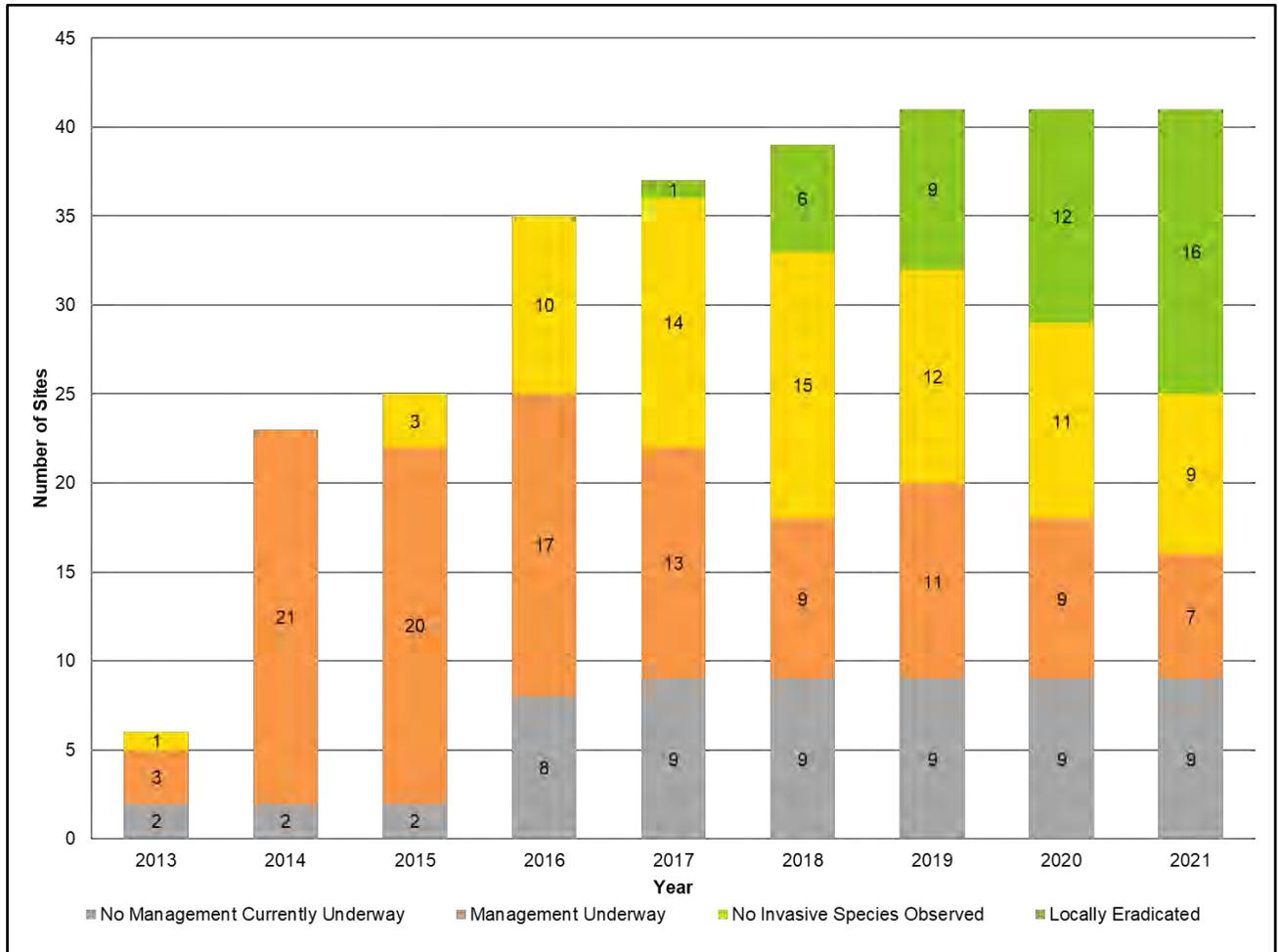


Figure 6. Annual management progress for the Saranac River and St. Regis River Watershed Yellow Iris Eradication Projects (2013-2021).

Tier 4 Species

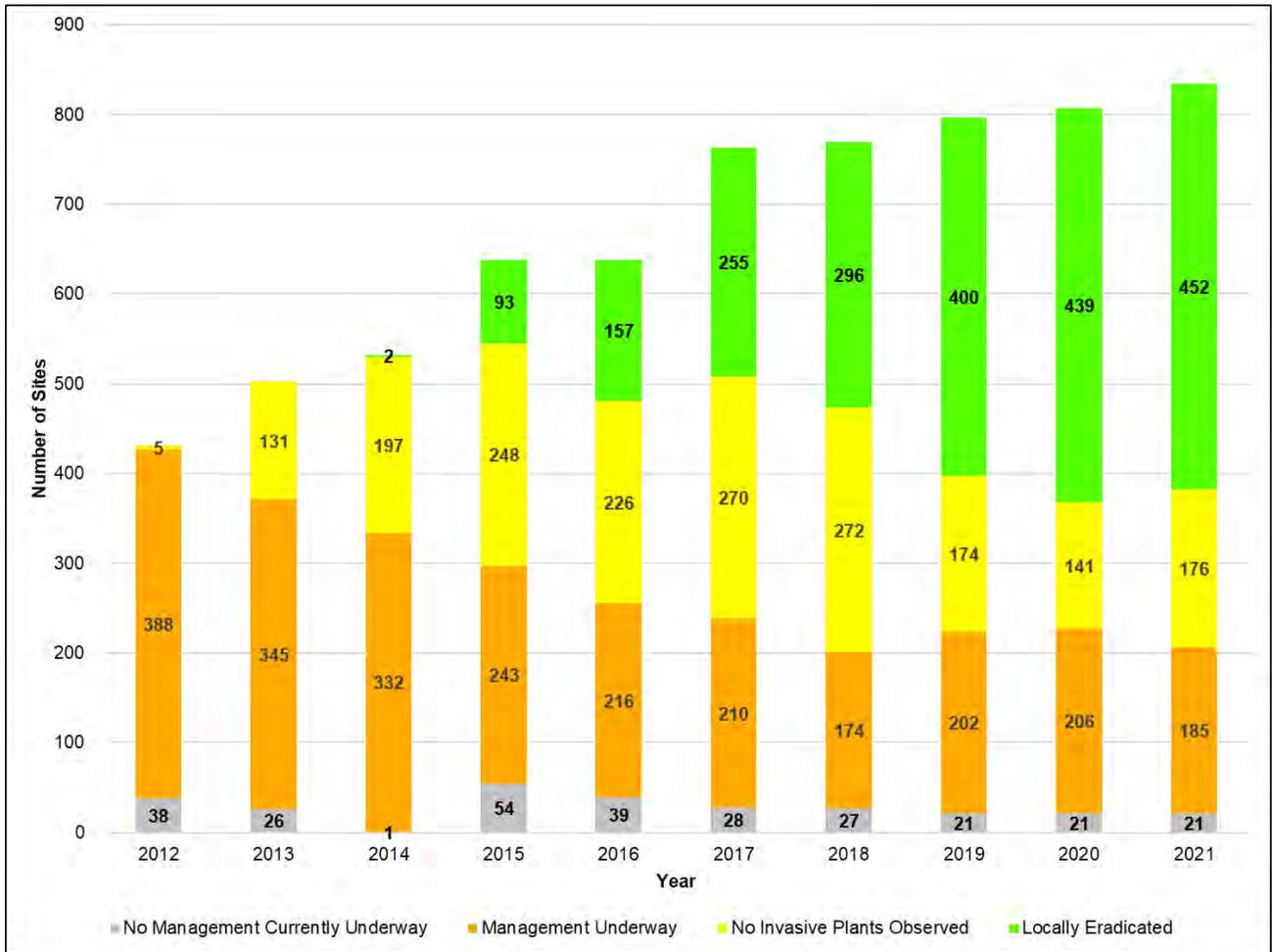


Figure 7. Annual management progress for the Resilient and Connected Land Network Garlic Mustard Suppression Project (2012-2021).

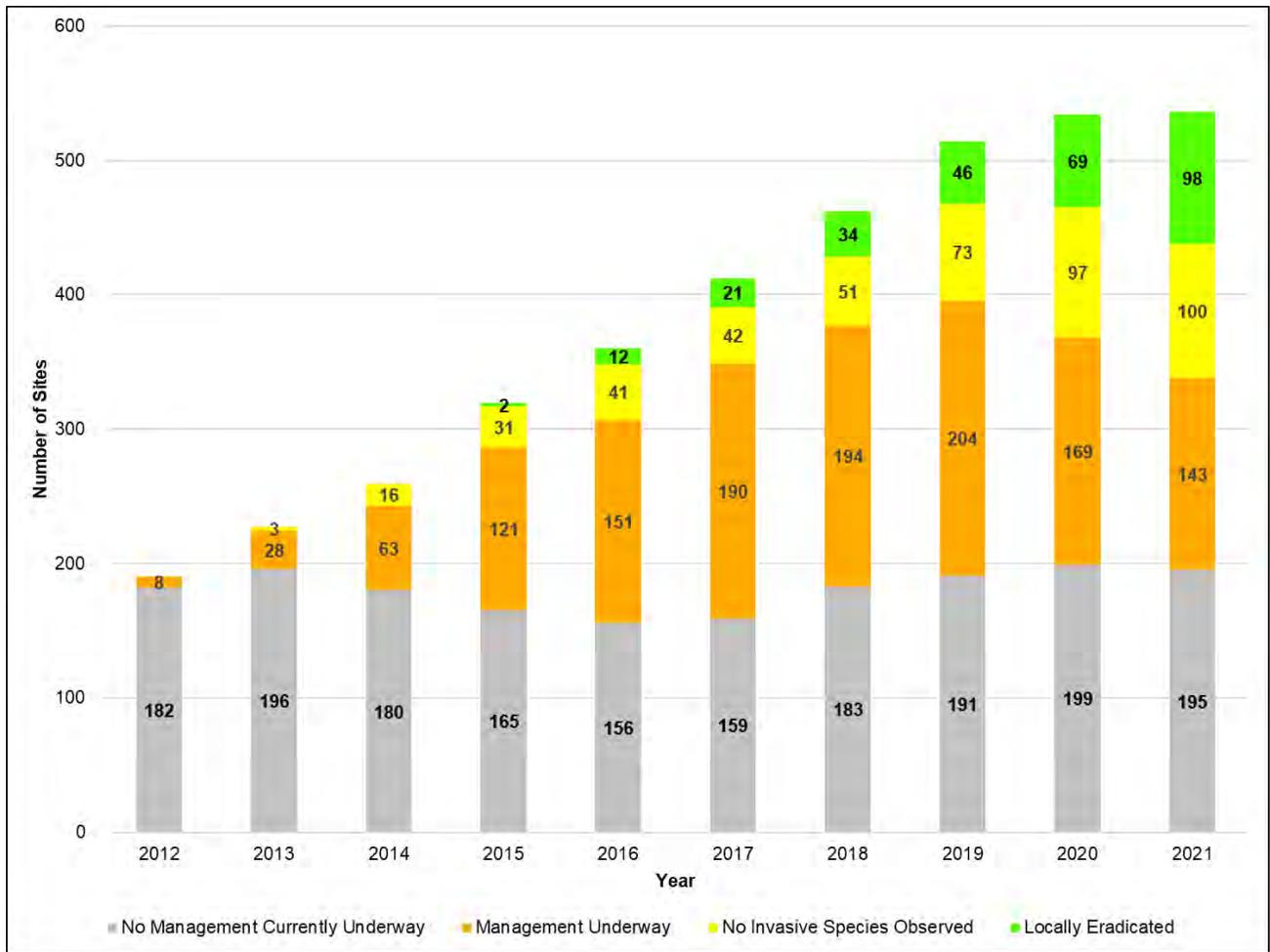


Figure 8. Annual management progress for the Resilient and Connect Land **Network** Knotweed Suppression Project (2012-2021).

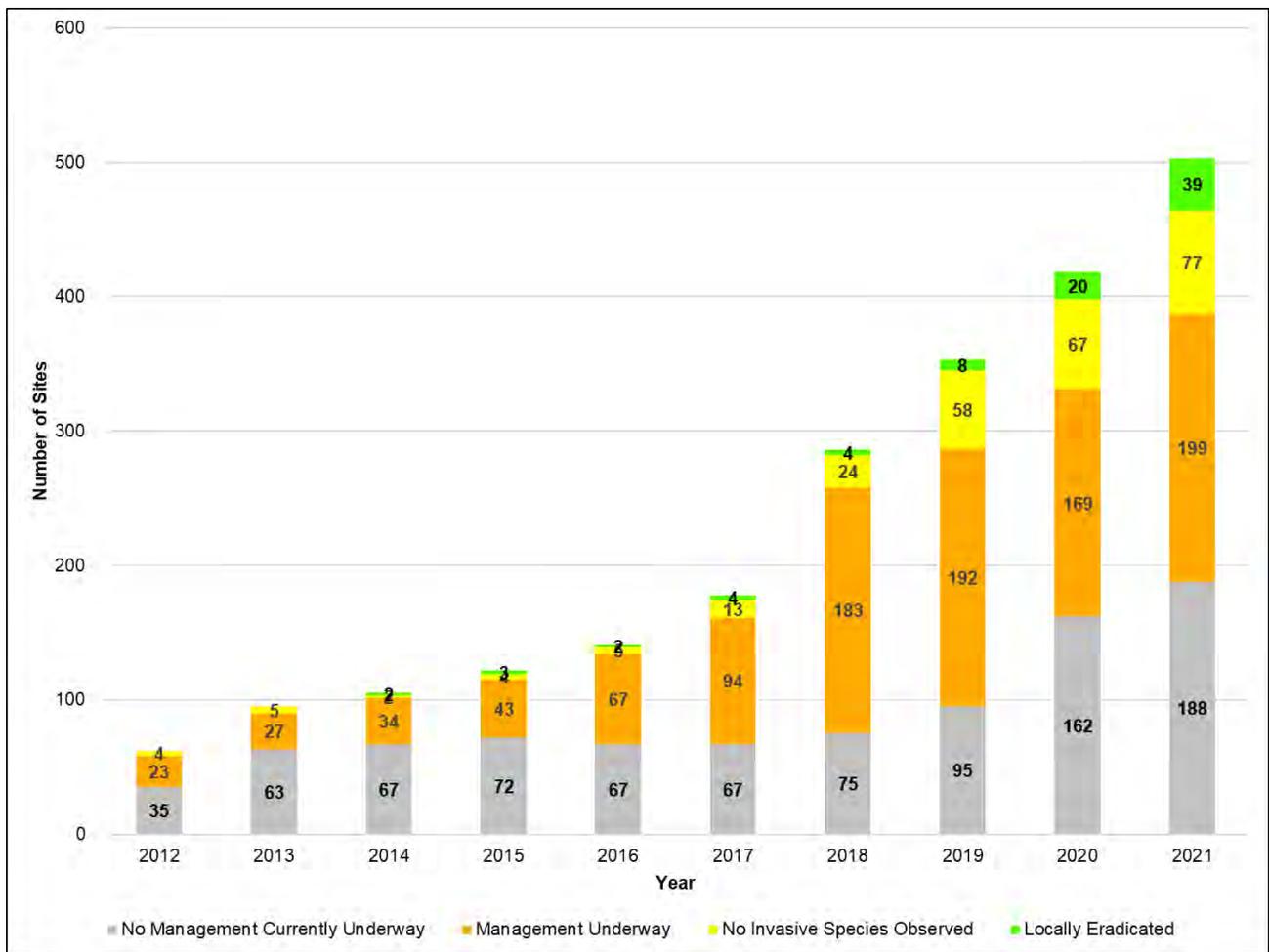


Figure 9. Annual management progress for the Resilient and Connected Land Network Purple Loosestrife Suppression Project (2012-2021).

Adirondack Park Invasive Plant Program 2021 Annual Report

Appendix B: Common Reed Grass Priority Management Project Progress Charts

This appendix provides a summary of the Adirondack Park Invasive Plant Program's 11 common reed grass (*phragmites australis*) management projects. Charts on the following pages show year-by-year annual management progress for each management project. There are two important notes related to these charts.

1. Increasing number of sites throughout the years is due to increasing survey efforts and the ability to survey new areas as more 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 Common Reed Grass Management Projects.

Management Project	Figure	Total Mapped Infestations	New (2021) Mapped Infestations	Priority Infestations	Sites Under Active Management*	Sites Treated In 2021*	Size Range of Sites Managed in 2021 (acres)*	Total Area Managed in 2021 (acres)*	Total With At Least 1 Year of Documented Invasive Plant Absence*	Total Locally Eradicated*
Ausable River Watershed Common Reed Grass Suppression	1	149	13	108	41	34	<0.001 – 0.998	4,509	8	22
Chateaugay-English Watershed Common Reed Grass Suppression	2	71	0	28	4	4	<0.001 – 0.217	0,315	6	3
Lake Champlain Watershed Common Reed Grass Suppression	3	793	21	206	98	78	<0.001 – 2.037	7,001	33	7
Mohawk River Watershed Common Reed Grass Exclusion	4	190	25	178	32	29	<0.001 – 0.212	1,158	13	38
Northeastern Lake Ontario Common Reed Grass Exclusion	5	42	2	38	2	1	0.020	0.020	7	13
Sacandaga River Watershed Common Reed Grass Exclusion	6	145	17	123	25	18	<0.001 – 0.618	2,027	29	37
Salmon River Watershed Common Reed Grass Suppression	7	47	1	8	3	3	0.005 – 0.015	0.031	0	0
Saranac River Watershed Common Reed Grass Suppression	8	91	2	58	10	9	<0.001 – 0.099	0.283	6	29
Southern St. Lawrence Watershed Common Reed Grass Exclusion	9	194	4	189	36	28	<0.001 – 0.444	0.976	37	96
St. Regis River Watershed Common Reed Grass Exclusion	10	99	1	67	10	10	<0.001 – 0.039	0.094	11	38
Upper Hudson Watershed Common Reed Grass Exclusion	11	129	3	94	35	30	<0.001 – 1.194	3,061	20	39
Common Reed Grass Summary	N/A	1,950	89	1,097	296	244	<0.001 – 2.037	19,475	170	322

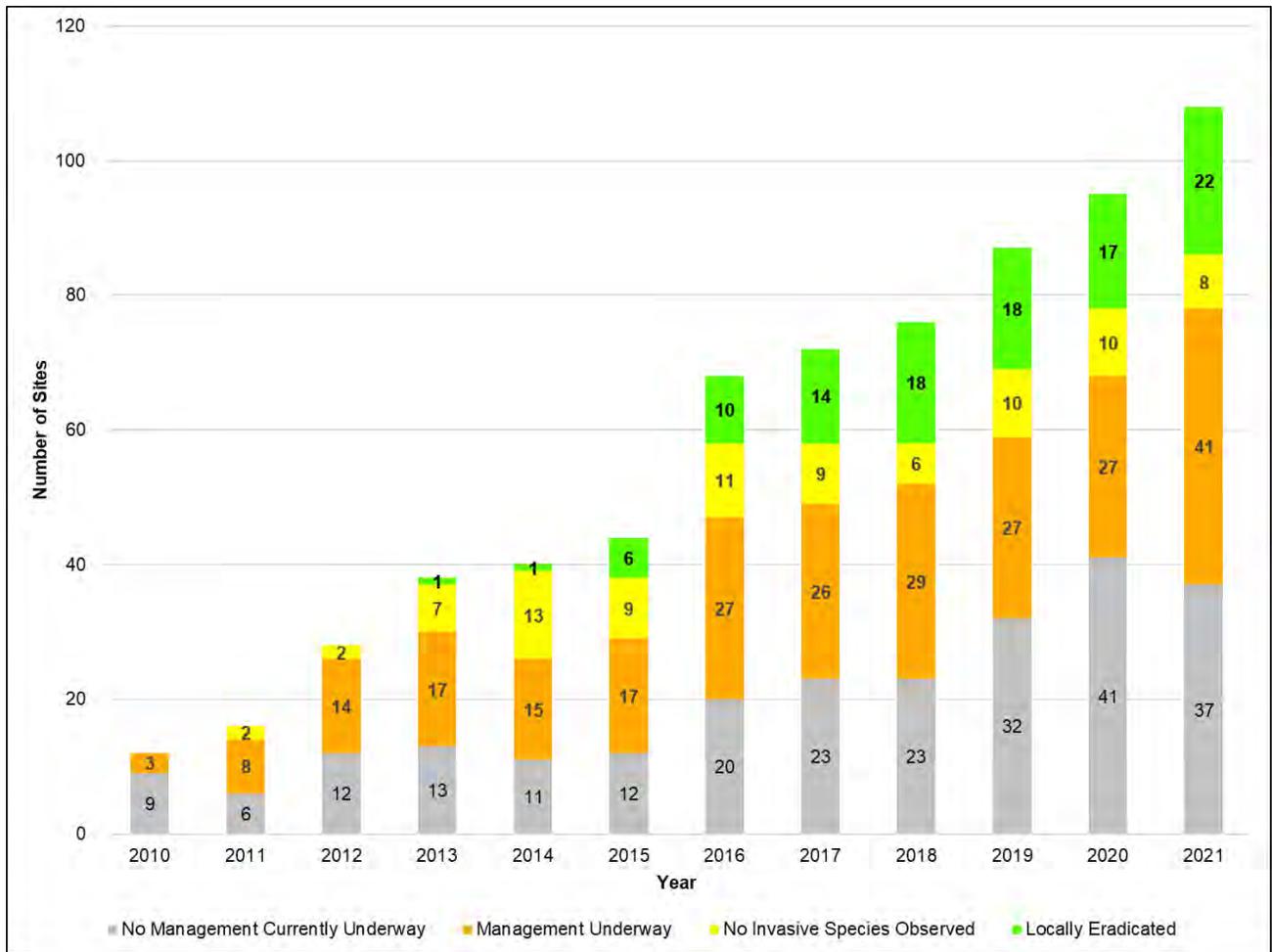


Figure 1. Annual management progress for the Ausable River Watershed Common Reed Grass Suppression Project (2010-2021).

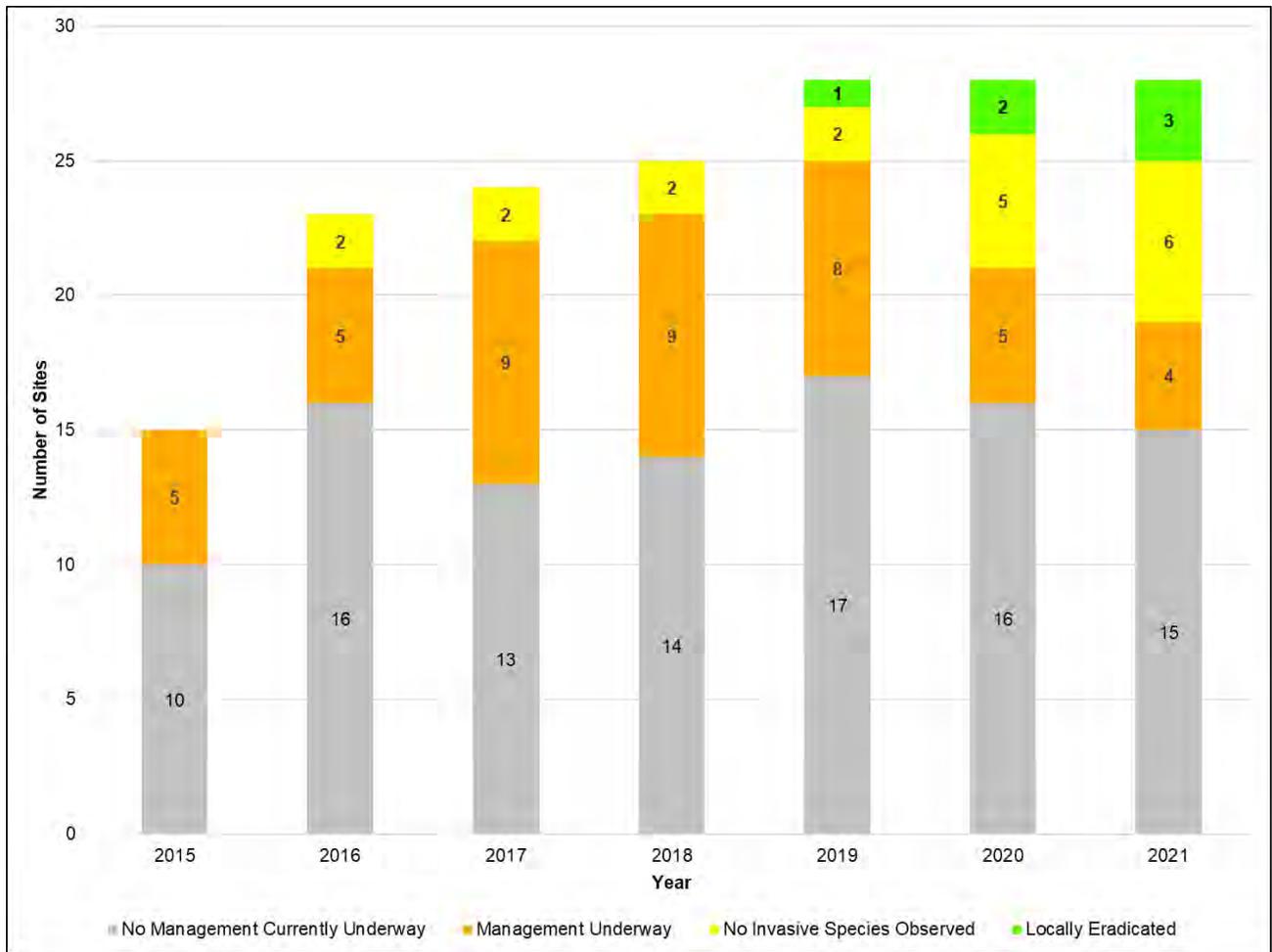


Figure 2. Annual management progress for the Chateauguy-English River Common Reed Grass Suppression Project (2015-2021).

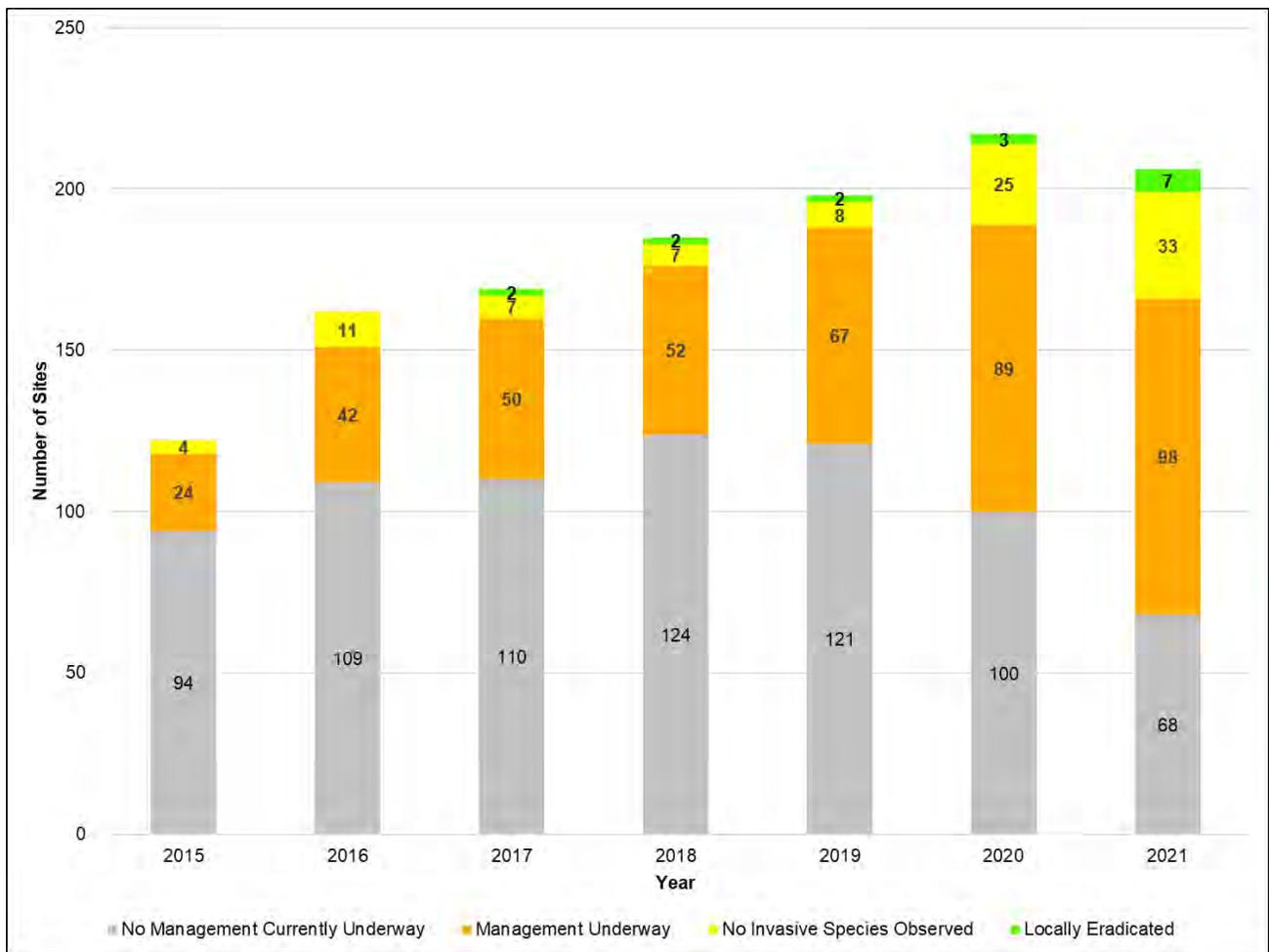


Figure 3. Annual management progress for the Lake Champlain Watershed Common Reed Grass Suppression Project (2015-2021).

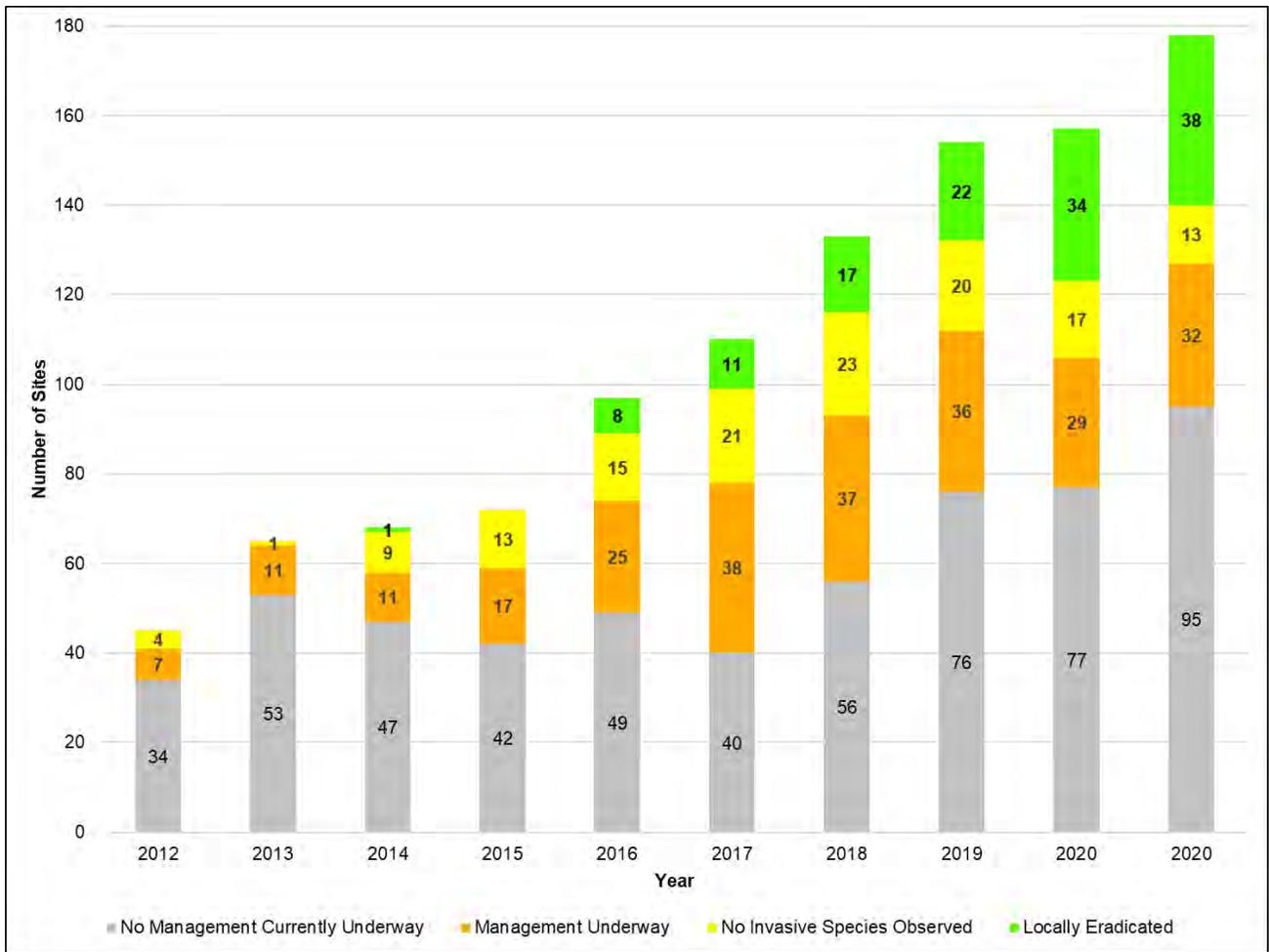


Figure 4. Annual management progress for the Mohawk River Watershed Common Reed Grass Exclusion Project (2012-2021).

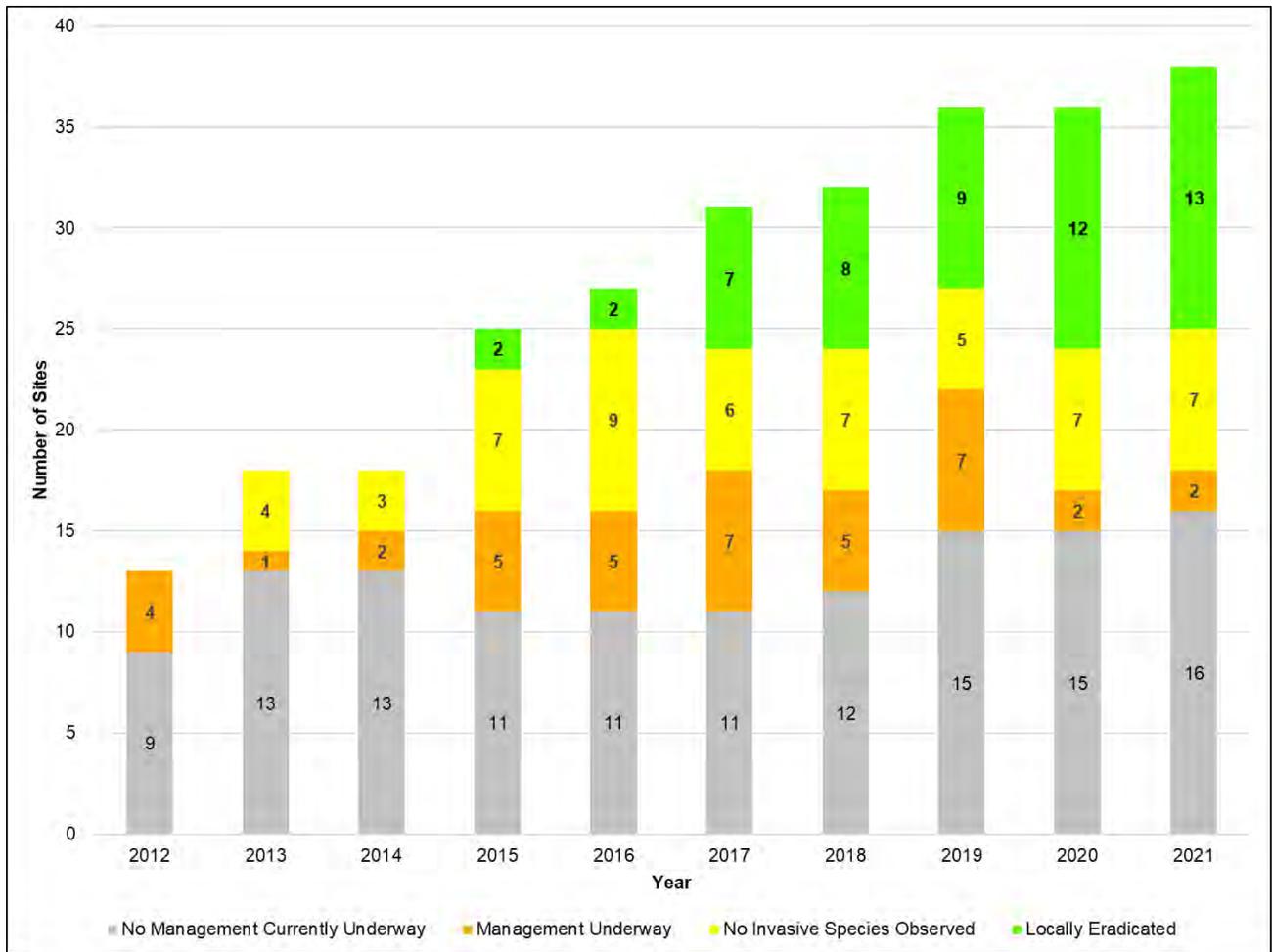


Figure 5. Annual management progress for the Northeastern Lake Ontario Watershed Common Reed Grass Exclusion Project (2012-2021).

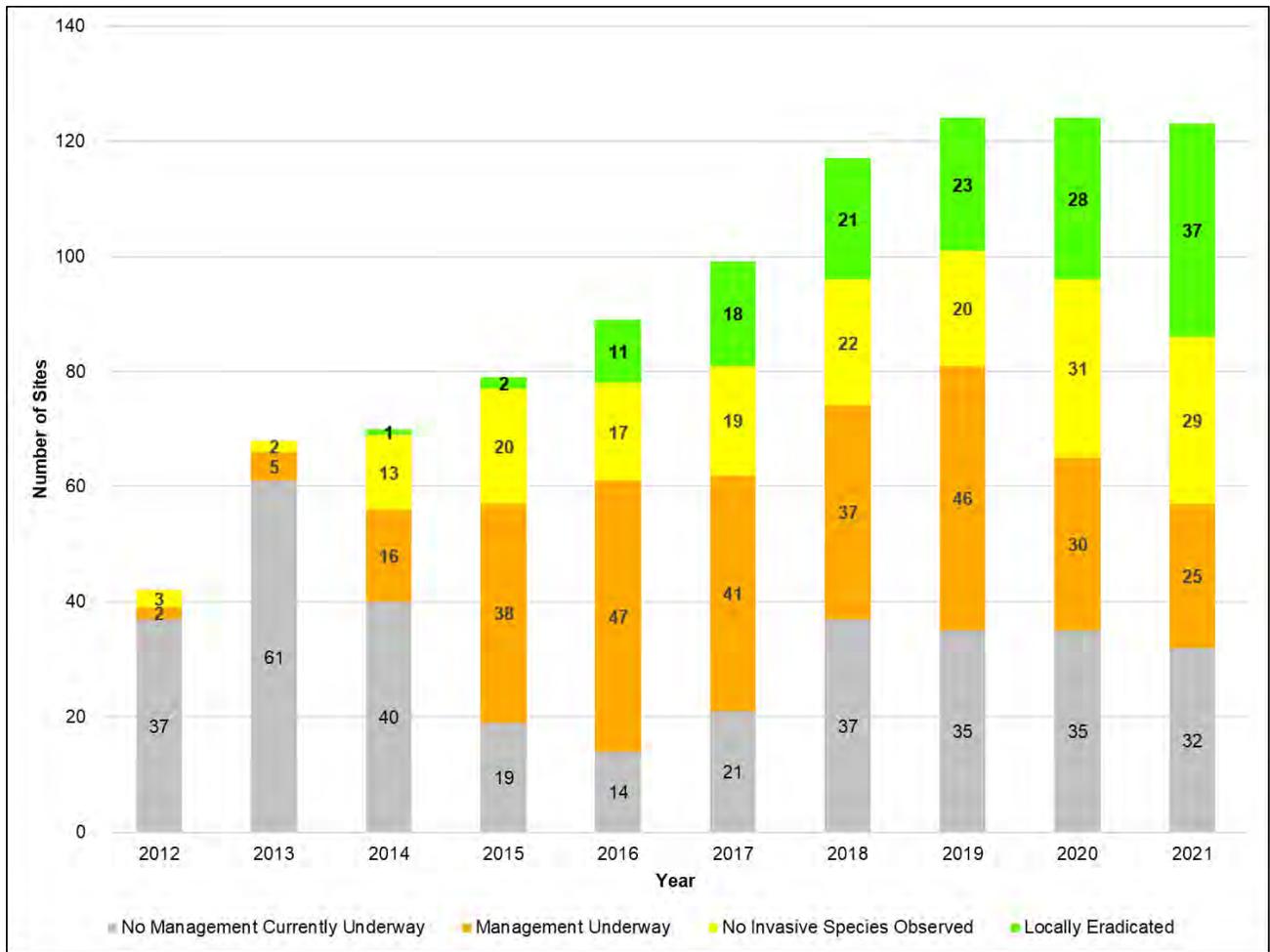


Figure 6. Annual management progress for the Sacandaga River Watershed Common Reed Grass Exclusion Project (2012-2021).

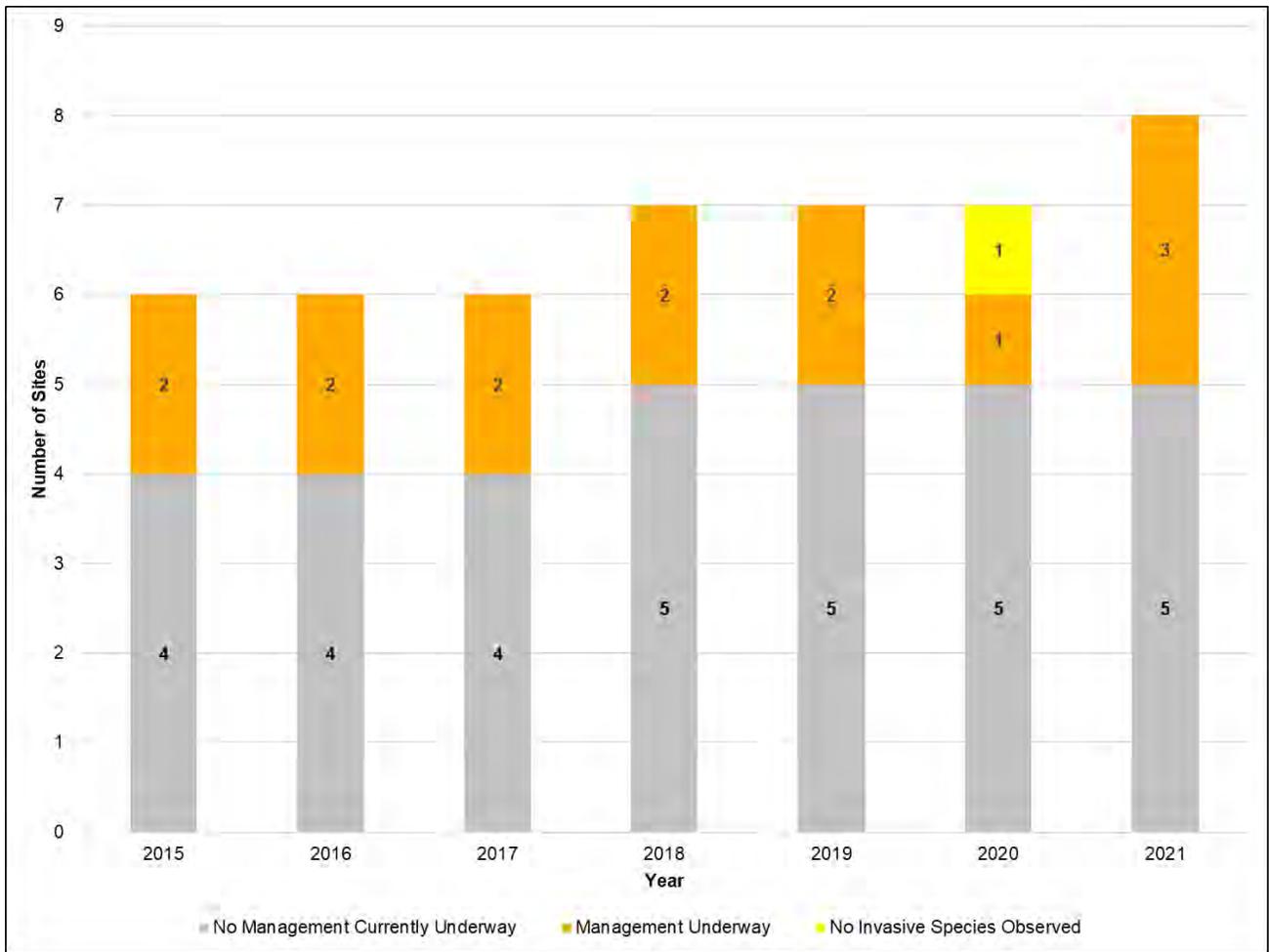


Figure 7. Annual management progress for the Salmon River Watershed Common Reed Grass Suppression Project (2015-2021).

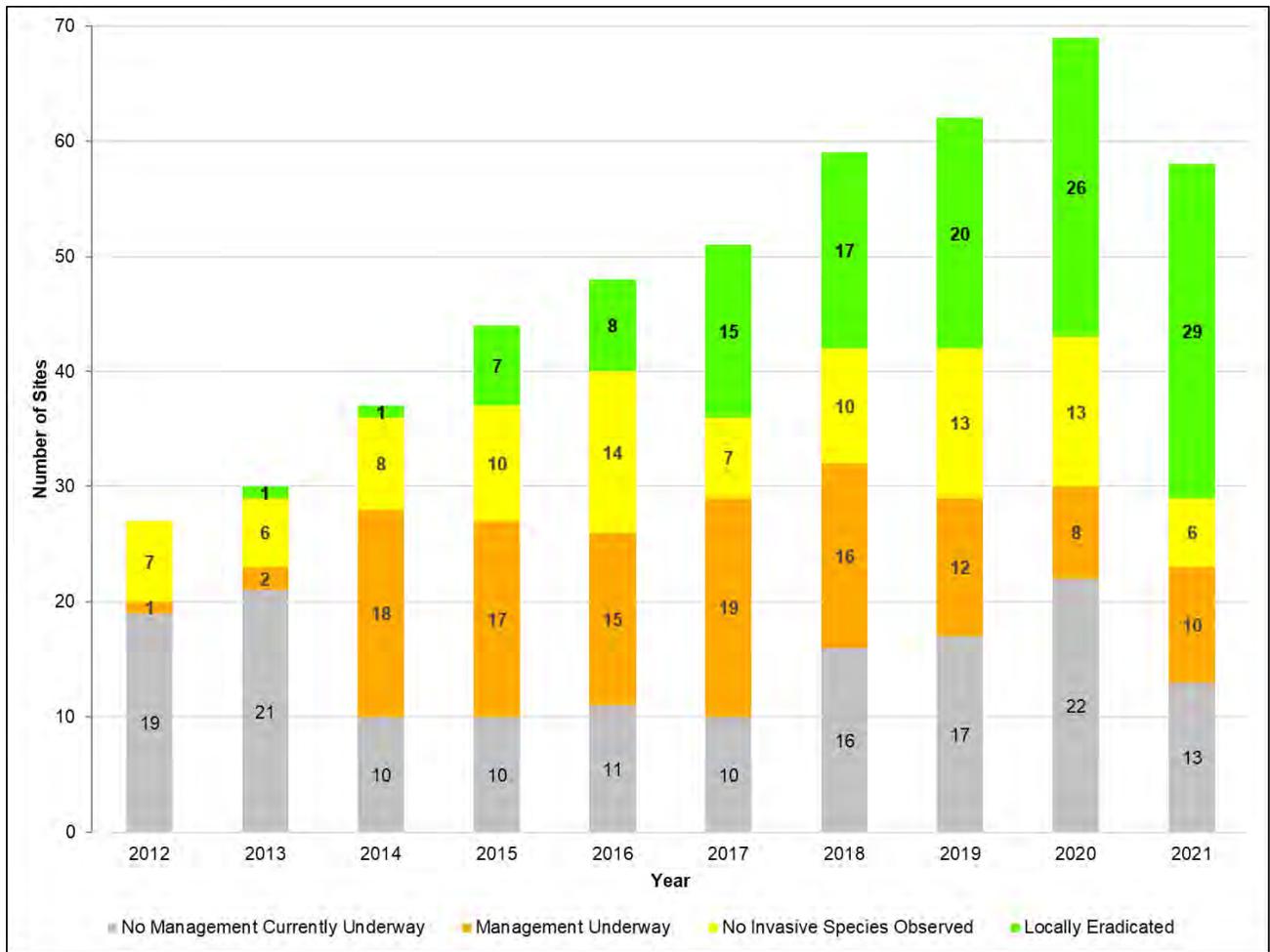


Figure 8. Annual management progress for the Saranac River Watershed Common Reed Grass Suppression Project (2012-2021).

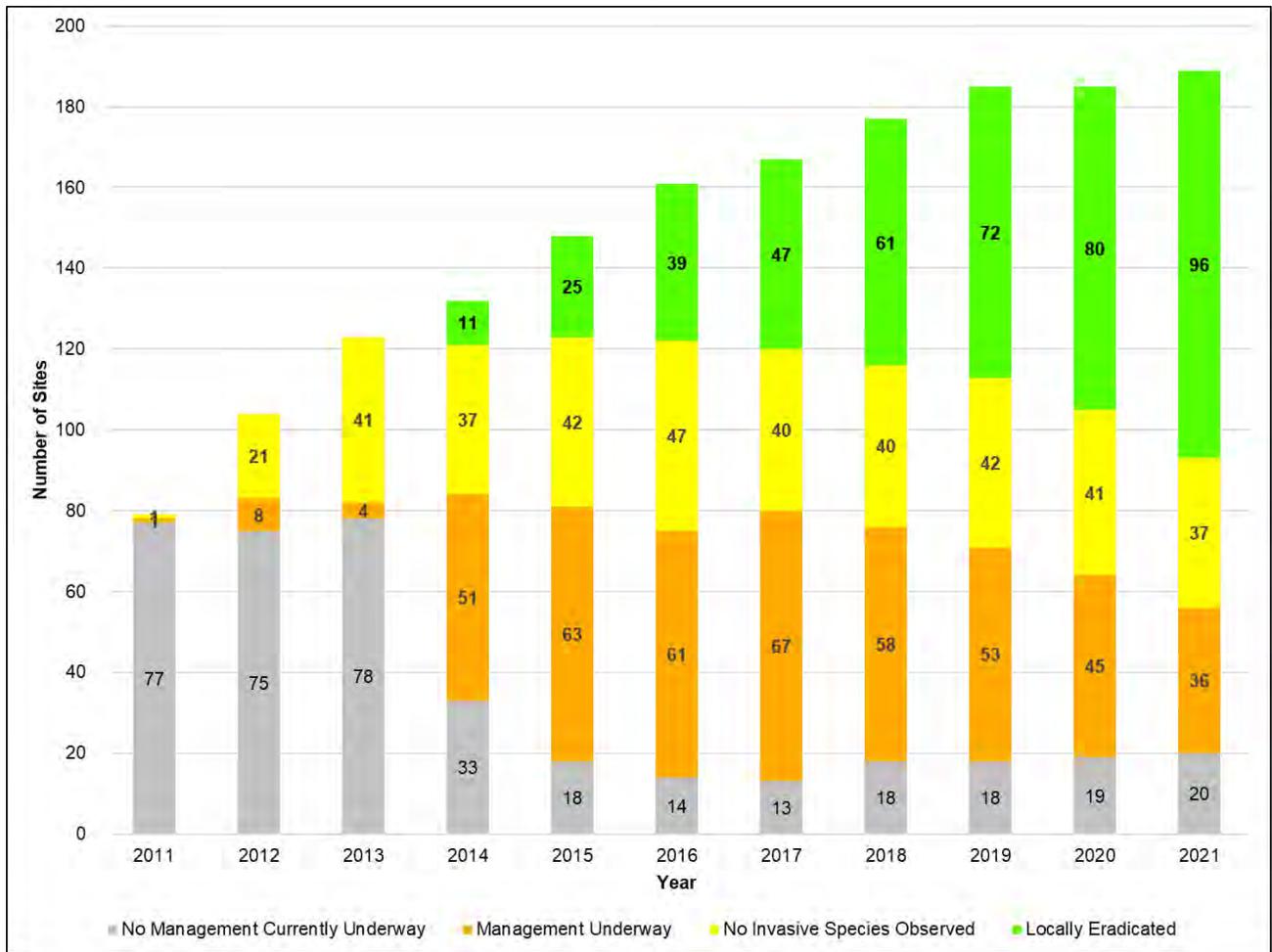


Figure 9. Annual management progress for the Southern St. Lawrence Watershed Common Reed Grass Exclusion Project (2011-2021).

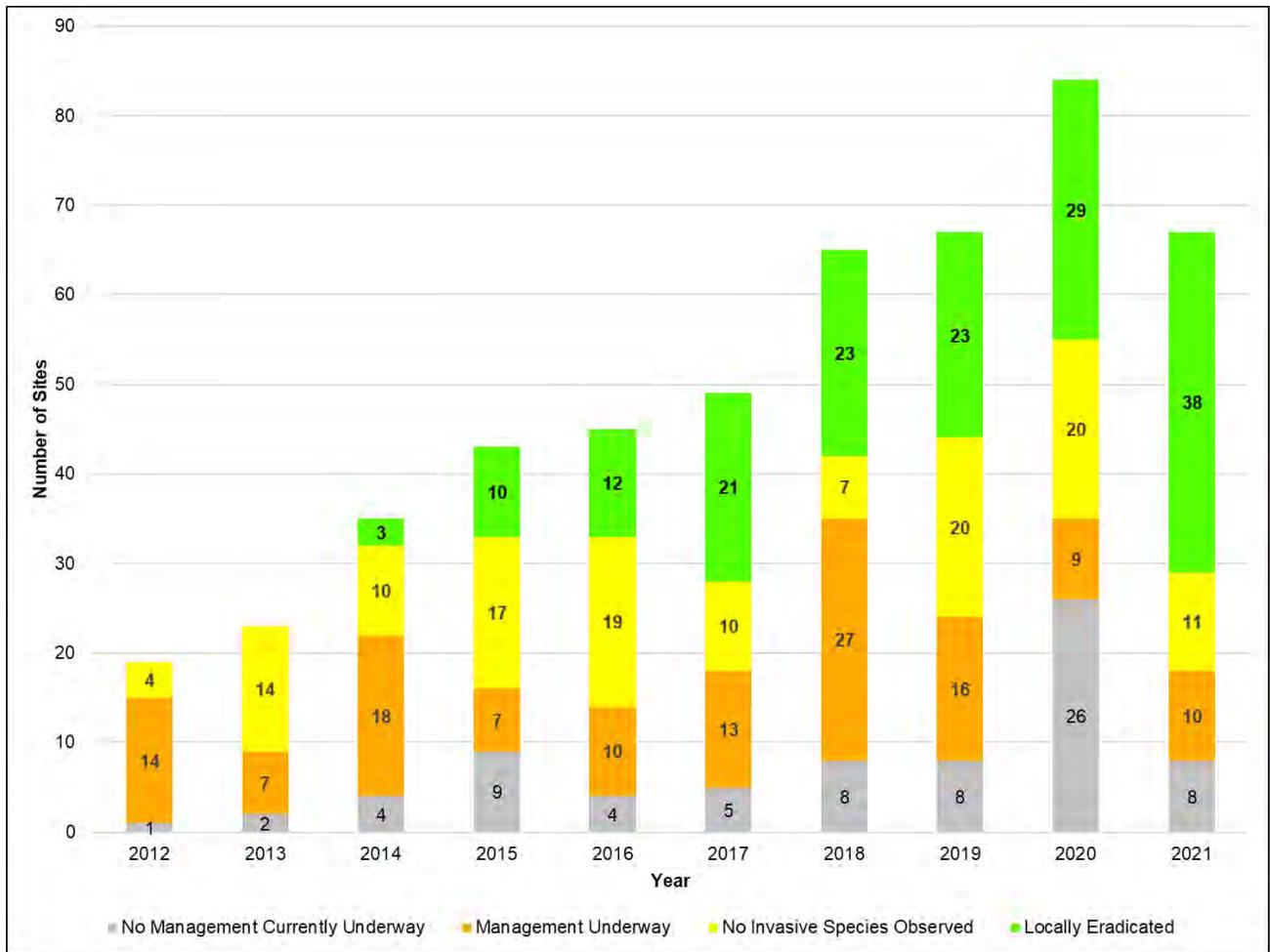


Figure 10. Annual management progress for the St. Regis River Watershed Common Reed Grass Exclusion Project (2012-2021).

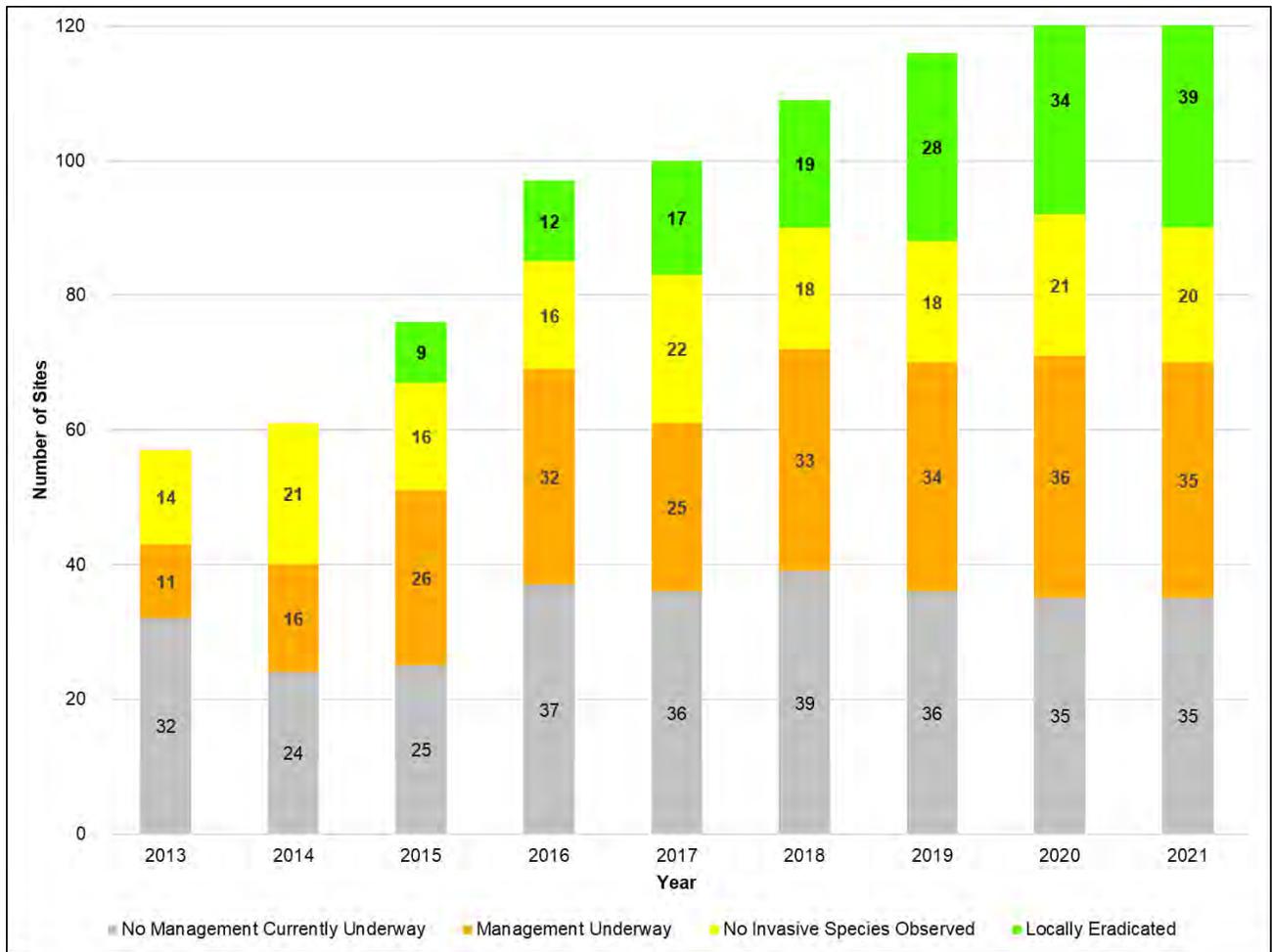


Figure 11. Annual management progress for the Upper Hudson Watershed Common Reed Grass Exclusion Project (2013-2021).

Adirondack Park Invasive Plant Program 2021 Annual Report

Appendix C: Aquatic Invasive Species Progress Charts

The charts on pages C1-C3 provide additional detail for some of APIPP's 2021 aquatic invasive species (AIS) program findings.

The map on page C4 shows the Adirondack lakes that have been surveyed for invasive species and whether or not aquatic invasive species are present.



AIS Observation Rates

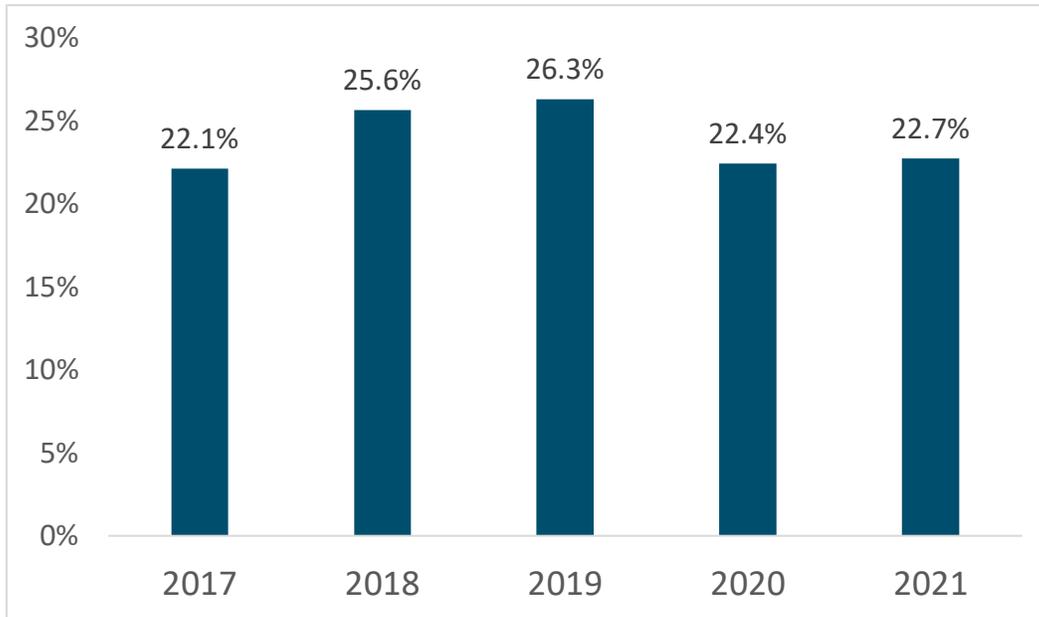


Figure 1. Percent of monitored lakes with AIS observed for the past five years. The five-year average is 23.9%.

Each year APIPP collects reports from staff, partners, and volunteers about AIS observed in lakes. The count of lakes with AIS observed is divided by the total number of lakes surveyed that year. In 2021 there were 25 lakes with observed AIS out of 110 lakes monitored (22.7%).

Volunteers and Lakes Monitored in Adirondack PRISM

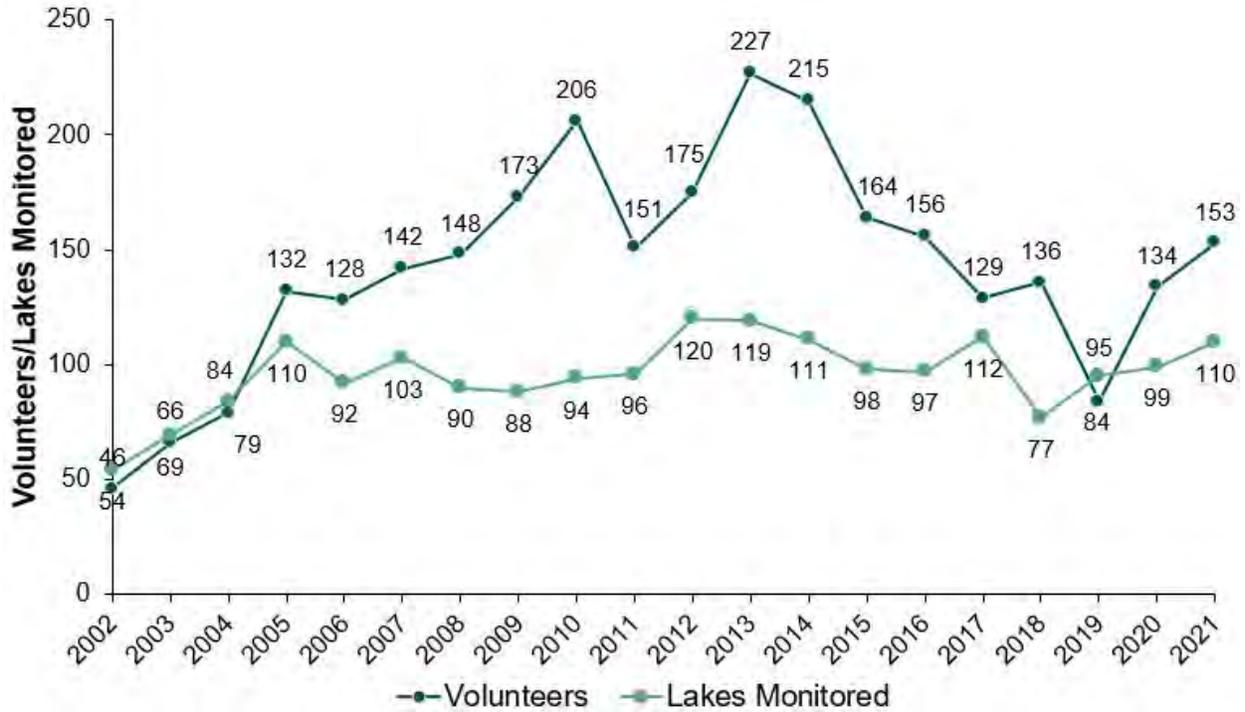


Figure 2. Number of volunteers and number of lakes monitored from 2002 to 2021.

APIPP collects reports from staff, partners and volunteers from across the APIPP PRISM. Each year we tally the number of waterbodies and volunteers to track regional efforts to monitor AIS. The number of volunteers is calculated from the number of non-paid people (partners or volunteers) reported on an AIS survey.

2021 Eurasian Watermilfoil (EWM) Growth Lake Management Tracker Data

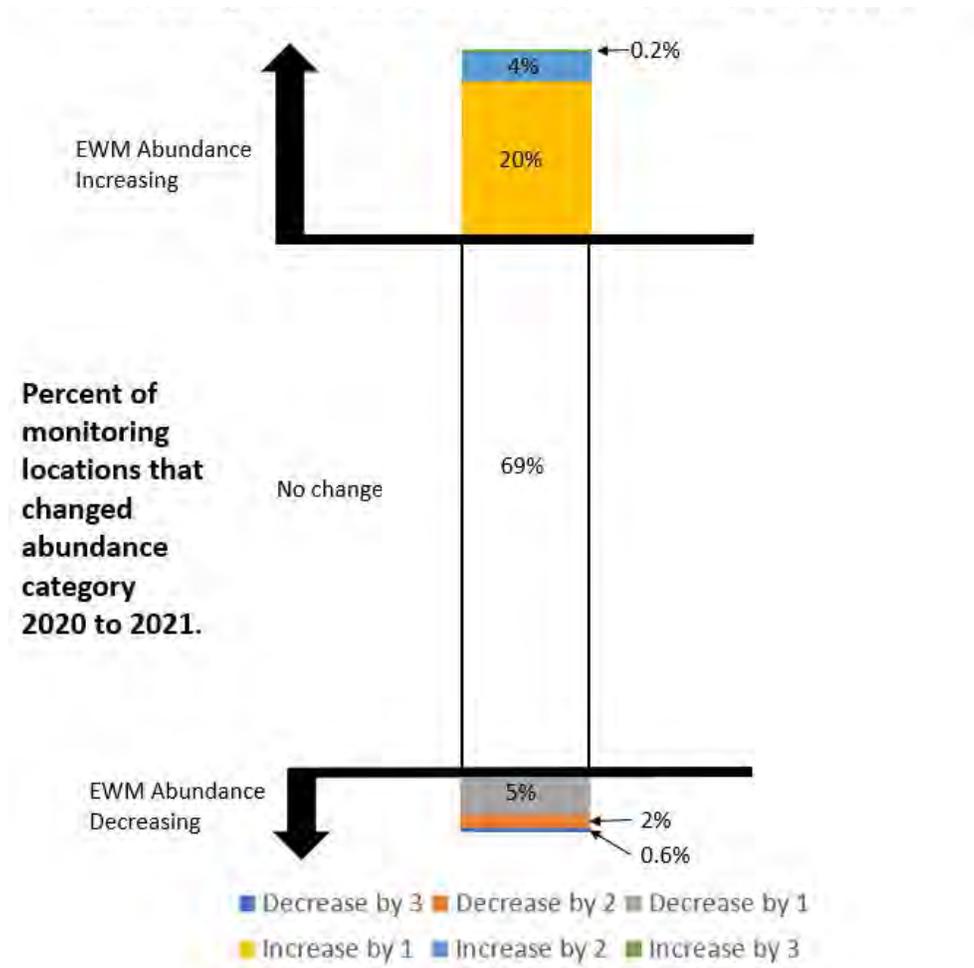


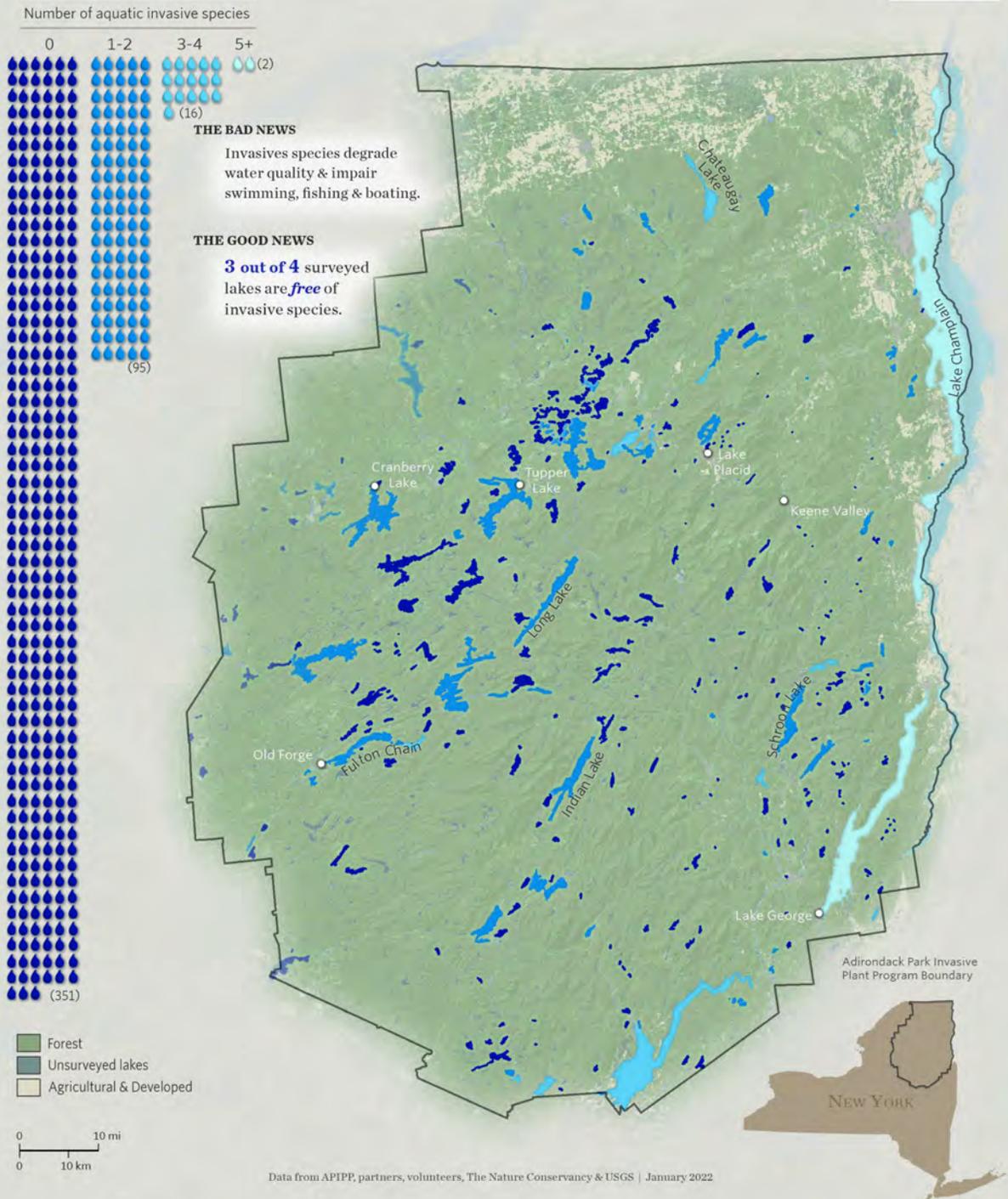
Figure 3. Data compares 476 monitoring locations from 2020 to 2021. Data collected by volunteers from Loon Lake Association and Chateaugay Lake Foundation on Loon Lake and Upper Chateaugay Lake. Graphic created by APIPP December 2021.

With the Lake Management Tracker program, there are set monitoring locations established on the lake where volunteers visually assess the abundance of Eurasian watermilfoil (milfoil) and record their observations in four qualitative categories (no invasives, few plants widely scattered, trace-to-sparse, moderate-to-dense). Volunteers return to these same locations from year-to-year so that changes in abundance can be tracked.

For example, if a location had no milfoil in 2020, and then in 2021 milfoil was observed as “trace-to-sparse,” that would be an increase by 2. If the location was observed to have “few plants widely scattered” in 2020, and then no milfoil in 2021, that would be a decrease of 1. Overall, most locations observed in 2021 stayed the same. Of the locations that changed, however, more sites saw an increase in milfoil than a decrease. The overall net change in abundance was a 16% increase in category density.

Location and Number of Adirondack Waterbodies Surveyed with Aquatic Invasive Species Detected

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



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Appendix D: iMapInvasives APIPP PRISM Metrics 2021

The enclosed report detailing metrics for the Adirondack Park Invasive Plant Program (APIPP) Partnership for Regional Invasive Species Management (PRISM) was provided by iMapInvasives. Thank you iMap for being such a great partner!

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 APIPP.
2. The common names for species used by iMapInvasives may vary from the common names used by APIPP.



**INVASIVE SPECIES
MANAGEMENT**
ADIRONDACKS



APIPP PRISM METRICS 2021

Records by Data Entry Method*	2021*	Total* 2010-Present
Bulk Upload	19	8,965
Mobile App	142	702
On-line	135	1,633
Natureserve Survey 123	130	124
Partner Apps	3,015	3,023
NYNHP Custom Apps	1	5
iMMA	0	4
SAS Pro	1	1
Forest Pest	0	0
Records by Species Type*	2021*	Total* 2010-Present
Animal Insect -Terrestrial	14	184
Animal Other Invertebrate - Aquatic	20	369
Animal Other Invertebrate - Terrestrial	14	18
Animal Vertebrate -Aquatic	18	75
Animal Vertebrate -Terrestrial	0	11
Plant -Aquatic	1,198	2,052
Plant -Terrestrial	2,066	11,759
TOTAL	3,330	14,468

* **Data entry date as of 12/04/2021.** These totals are both unconfirmed and confirmed data. Numbers for 2021 **do not** include approximate data.

2021 Training Classes

Date	Trainer	Training Class Name	Number Trained
3/3/2021	Mitchell O'Neill, Emily-Bell Dinan, Cathy Pedlar	Take Action Against Hemlock Woolly Adelgid – Learn How to Hunt for HWA	68
6/30/21	Brian Greene, Emily-Bell Dinan	Lake Protectors Training Part 2: Citizen Science Survey Methods	45

Top 10 Reported Present Species in 2021

Eurasian Water-milfoil	855
European Common Reed	573
Japanese Knotweed	483
Purple Loosestrife	362
Broadleaf Water-milfoil	298
Garlic Mustard	172
Bush Honeysuckle (species unknown)	95
Reed Canarygrass	93
Yellow Iris	47
Wild Parsnip	40

[View](#) a map of the top 10 reported species in 2021.

Top 10 Not Detected Species in 2021*

Garlic Mustard	658
European Common Reed	336
Japanese Knotweed	153
Yellow Iris	75
Purple Loosestrife	57
Giant Hogweed	56
Hemlock Woolly Adelgid	53
Water Chestnut	50
Common Frogbit	48
Eurasian Water-milfoil	47

Please [login](#) to iMapInvasives to [View](#) a map of the top 10 Not- Detected species in 2021.

Top 10 Treated Species in 2021*

Common reed grass, phragmites	242
Japanese Knotweed	219
Garlic Mustard	152
Purple Loosestrife	122
Black Swallowwort	24
Wild Parsnip	17
Yellow Iris	13
Tree-of-heaven, Ailanthus	7
Giant Hogweed	5
Japanese Stiltgrass	5

Please [login](#) to iMapInvasives to [View](#) a map of the top 10 Treated species in 2021.

* **Data entry date as of 12/04/2021.** These totals are both unconfirmed and confirmed data. Numbers for 2021 **do not** include approximate data.

Top 10 Organizations Submitting Observations in 2021	Observations 2021**
Adirondack Park Invasive Plant Program (APIPP)	4,700
Adirondack Mountain Club (ADK)	107
Capital Region PRISM (CRP)	82
New York Natural Heritage Program (NYNHP) – NY	44
Adirondack Research LLC	24
East Shore Schroon Lake Assn	21
Ausable and Boquet River Associations	18
Piseco Lake Association	14
Lake George Land Conservancy (LGLC)	8
Lake Pleasant-Sacandaga Association	8

**This number includes confirmed and unconfirmed presence and not-detected data.

New to County Species Reported in 2021*			
Chinese Mysterysnail	3/1/2021	Clinton	
Burning Bush, Winged Euonymus	6/25/2021	Clinton	
Chinese Mysterysnail	1/5/2021	Essex	
Emerald Ash Borer - NOT CONFIRMED	8/26/2021	Essex	
Chinese Mysterysnail	1/5/2021	Franklin	
Jumping Worms (species unknown), Asian jumping worms	9/13/2021	Franklin	
Japanese-Tree Lilac	10/1/2021	Fulton	
Emerald Ash Borer	4/26/2021	Hamilton	
Norway Maple	6/9/2021	Hamilton	
Japanese-Tree Lilac	6/17/2021	Hamilton	
Jumping Worms (species unknown), Asian jumping worms	8/3/2021	Hamilton	
Japanese Stiltgrass	9/24/2021	Warren	
Japanese-Tree Lilac	6/25/2021	Washington	
Tench	6/28/2021	Washington	

* Data entry date as of 12/04/2021.



APIPP PRISM Organization METRICS 2021

PRISM Staff/Organizational Contributors in 2021

APIPP Staff/Organizational Members Reporting Species in 2021
Adellia Baker
Megan Grega
Ryan Burkum
Rebecca Bernacki
Brian Greene
Zachary Simek
Emily-Bell Dinan
Larry Master
Erin Vennie-Vollrath
Tammara Van Ryn

Records by Data Entry Method*	2021*	Total* 2010-Present
Bulk Upload	0	4,769
Mobile App	24	96
On-line	9	337
Natureserve Survey 123	122	124
Partner Apps	1,800	3,034
NYNHP Developed Apps	1	1
iMMA	0	0
SAS Pro**	1	1
Forest Pest	0	0

Presence Records by Species Type*	2021*	Total* 2010-Present
Animal Insect -Terrestrial	7	38
Animal Other Invertebrate - Aquatic	3	21
Animal Other Invertebrate - Terrestrial	10	10
Animal Vertebrate -Aquatic	1	1
Animal Vertebrate -Terrestrial	0	0
Plant -Aquatic	10	1,616
Plant -Terrestrial	2,048	6,675
TOTAL	2,079	8,361



Top 10 Treated Species by the APIPP Organization in 2021*	Total 2021*
European Common Reed	242
Japanese Knotweed	221
Garlic Mustard	152
Purple Loosestrife	122
Black Swallow-wort	24
Wild Parsnip	17
Yellow Iris	13
Tree-of-Heaven	7
Japanese Stiltgrass	5
Giant Hogweed	5

*Data entry date as of 12/04/2021. These totals are both unconfirmed and confirmed data. Numbers for 2021 *do not* include approximate data.