

Terrestrial Early Detection & Rapid Response Crew

Final Report



June 20, 2022 – September 14, 2022

Report Prepared by Invasive Plant Control, Inc.
For use by the Adirondack Park Invasive Plant Program



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All photos contained within this report are credited to the 2022 APIPP EDRR Crew

Introduction

The 2022 field season was the 11th year that Invasive Plant Control, Inc. (IPC) served as the Terrestrial Invasive Species Early Detection and Rapid Response (EDRR) Crew for the Adirondack Park Invasive Plant Program (APIPP). In 2022, Vance Brown served as the primary crew leader and Annika Skilling, who was new to the crew this season, served as a secondary crew leader. Additional members joining the crew for their first year were Jacob Hamm and Emily Mikulski. Lee Patrick and Eric Rechter also provided support for the crew this year.

Invasive species monitoring and management activities were conducted from June 20 through September 14, 2022. A total of 14 weeks of four-person crew time was spent in the region. Throughout the field season, IPC assessed and/or managed an astonishing number of invasive species infestations within APIPP's jurisdictional boundaries, including both historically managed sites and new infestations. The crew expanded APIPP's terrestrial invasive species database by mapping and/or treating new infestations of target species on previously surveyed and unsurveyed areas within The Nature Conservancy preserves and Forest Preserve lands, on private properties, and along state, county, and local roads throughout the region. Administrative tasks, such as data processing, report writing, and equipment maintenance, were performed as needed during the project period.

This report summarizes work completed and data collected throughout the 2022 field season. A comprehensive analysis of invasive species distribution and management progress is not included in this report but will be provided in APIPP's 2022 Annual Report. Visit www.adkinvasives.com to access past and current annual reports.



Photo 1. The crew is tasked with surveying invasive species in various locations throughout the Adirondack Park. In this photo, Emily Mikulski is searching for knotweed sprouts within native vegetation.

APIPP Overview and EDRR Crew Objectives

APIPP Overview

APIPP serves as the Adirondack Partnership for Regional Invasive Species Management (PRISM), one of eight regional partnerships across New York State funded by the New York State Department of Environmental Conservation (NYSDEC) to conduct invasive species management activities. APIPP is a partnership founded by the Adirondack Chapter of The Nature Conservancy (TNC), New York State Department of Environmental Conservation, New York State Department of Transportation (NYSDOT), and the Adirondack Park Agency (APA). It is hosted by the Adirondack Chapter of TNC. Over 30 partner organizations and hundreds of volunteers assist APIPP in its mission “to protect the Adirondack Region from the negative impacts of invasive species.” APIPP is funded in part by the invasive species line of New York State's Environmental Protection Fund as administered by the NYSDEC. To learn more, visit www.adkinvasives.com.

Response Crew Objectives and Methodology

The EDRR crew's main objective for the 2022 field season was to revisit, assess, and perform treatments on all of APIPP's priority and historically managed target invasive species infestations. The data that the crew collects is vital in determining the extent of invasive species infestations, whether past management actions have been successful, and whether management would be effective moving forward. The crew also mapped and, when permits/permissions allowed, managed newly documented infestations of target species threatening conservation priorities in the region.

Invasive species in New York State are categorized into tiers according to a standard statewide system (Appendix 1). The EDRR crew focuses on surveying and treating species in Tiers 2 through 4. Tier 5 only includes those species that need more research to understand their invasiveness and includes naturalized and cultivated- only species that are not yet invasive in the Adirondack region. Tier 1 includes species that have not yet reached the PRISM. Within these tiers, APIPP further prioritizes infestations of these species for management based on whether the infestation is affecting a conservation, economic, or human health priority; 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. Infestations of species in Tiers 2 through 4 that meet these criteria are prioritized for ongoing rapid response and control efforts (Table 1). Species that are not prioritized for management (those that are locally or regionally widespread, or had a low-to-moderate New York State [invasiveness ranking](#)) are occasionally mapped and assessed to provide APIPP with a better understanding of their regional distribution and potential impacts. Additional information on any of these species can be found on APIPP's Species of Concern [webpage](#).

Table 1. Tier 2-4 terrestrial species in the APIPP PRISM.

APIPP's Tier 2-4 Terrestrial Species		
Common Name	Scientific Name	Management Target
Tier 2 – Eradication		
Giant hogweed	<i>Heracleum mantegazzianum</i>	Yes
Japanese angelica tree	<i>Aralia elata</i>	Yes
Mile-a-minute	<i>Persicaria petiolate</i>	Yes
Scotch broom	<i>Cytisus scoparius</i>	Yes
Tree-of-heaven	<i>Ailanthus altissima</i>	Yes
Wineberry	<i>Rubus phoenicolasius</i>	Yes
Tier 3 – Containment		
Cup plant	<i>Silphium perfoliatum</i>	No
Hemlock woolly adelgid	<i>Adelges tsugae</i>	Yes
Japanese stilt grass	<i>Microstegium vimineum</i>	Yes
Jumping worm	<i>Amyntas spp. & Metaphire spp.</i>	No
Lesser celandine	<i>Ficaria verna</i>	Yes
Swallow-wort species	<i>Vincetoxicum louiseae</i> & <i>V. rossicum</i>	Yes
Tier 4 – Suppression		
Autumn olive	<i>Elaeagnus umbellata</i>	No
Beech-leaf-disease nematode	<i>Litylenchus crenatae mccannii</i>	No
Bittersweet	<i>Celastrus orbiculatus</i>	No
Bush honeysuckles	<i>Lonicera spp.</i>	No
Common buckthorn	<i>Rhamnus cathartica</i>	No
Common reed grass	<i>Phragmites australis</i>	Yes
Emerald ash borer	<i>Agrilus planipennis</i>	No
Garlic mustard	<i>Alliaria petiolate</i>	No
Glossy buckthorn	<i>Frangula alnus</i>	No
Japanese barberry	<i>Berberis thunbergii</i>	No
Japanese tree lilac	<i>Syringa reticulata</i>	No
Knotweed species	<i>Reynoutria spp.</i>	Yes
Multiflora rose	<i>Rosa multiflora</i>	No
Norway maple	<i>Acer platanoides</i>	No
Purple loosestrife	<i>Lythrum salicaria</i>	Yes
Reed canary grass	<i>Phalaris arundinacea</i>	No
Winged burning bush	<i>Euonymus alatus</i>	No
Yellow iris	<i>Iris pseudacorus</i>	No

The EDRR crew was also trained to identify and survey for APIPP's Tier 1 species (Table 2). These species have high or very high state invasiveness rankings and are not yet known to be present in the PRISM, but they do have the potential to expand their distribution into the region over the coming years.

Table 2. Tier 1 terrestrial species in the APIPP PRISM.

APIPP's Terrestrial Tier 1 Species	
Asian longhorned beetle	<i>Anoplophora glabripennis</i>
Eurasian boar	<i>Sus scrofa</i>
Porcelain berry	<i>Ampelopsis brevipedunculata</i>
Slender falsebrome	<i>Brachypodium sylvaticum</i>
Spotted lanternfly	<i>Lycorma delicatula</i>

Permits and Permissions

Under the jurisdiction of a DOT highway work permit, the EDRR crew was authorized to manage any infestations discovered within the state road right-of-way (ROW). Permits were also obtained to work within the county road ROW in Clinton, Essex, Hamilton, and Herkimer counties. The EDRR crew did not manage new infestations within the ROW that were discovered in highly developed or residential areas of the PRISM. In these areas, there is a high likelihood for infestations to extend onto private property, thus requiring additional permissions from the property owner, which can often be a challenge to obtain. If a new infestation was documented beyond the extent of the ROW and was outside of a developed/residential area, the crew conducted a preliminary survey but did not engage in management until the appropriate permissions and/or permits were obtained.

Infestations located in or within 100 feet of a wetland were managed under the jurisdiction of APA General Permit 2014G-1B. This permit allows APIPP to manage terrestrial invasive species within 100 feet of a wetland without the need for site-specific work plans. A summary of all invasive plant management activities that occurred in or near wetlands is submitted to APA by APIPP by February 28th of the following year; however, this permit does not provide authority to treat infestations located in standing water. Those instances require additional NYSDEC permitting under Article 15. If an infestation was observed in standing water, the site was mapped but not managed. All infestations subject to Article 15 were flagged in APIPP's database to be evaluated for permitting in coming years.

Infestations located on NYSDEC-administered lands were managed under the jurisdiction of Forest Preserve Work Plans. Each winter, APIPP's terrestrial invasive species project coordinator reviews all sites on NYSDEC-administered lands. Sites deemed a priority for management are put through a comprehensive site planning and State Environmental Quality Review Act process. Once NYSDEC and APA approve the sites and the planned management approach, sites can be treated. The EDRR crew is given a list of these sites, as well as the permit, to ensure that the permitted management technique is employed.

If an infestation extended onto private property or fell completely within a privately-owned parcel and was considered a high priority for management, the EDRR crew or APIPP's terrestrial invasive species project coordinator attempted to contact the landowner to obtain permission. Completed permission forms allow APIPP to conduct mechanical or chemical management activities of invasive species on the property until the population is eradicated or permission is revoked by the landowner.

The determination of property ownership was the individual crew leader's responsibility. Overall, the goal was to ensure that proper permissions and permitting documents were obtained before management activities occurred.

Field Season Logistics

Typical Workday

The EDRR crew typically worked four 10-hour days per week, from 7:00 am to 5:00 pm. This optimized the crew's efficiency by increasing the amount of time spent in the field as opposed to traveling to and from work sites. Lunch was typically consumed during travel between sites. Given the expansive size of the Adirondack PRISM and significant travel distances to and from work sites, travel time was considered part of the crew's 40-hour work week.

Weather conditions primarily determined the crew's daily activities. Clear days were spent performing invasive species assessment and management activities, while periods of inclement weather were reserved for either mapping new infestations in areas previously un-surveyed by APIPP or performing mechanical management activities. Each crew leader documented work activities using TNC's Invasive Plant Mobile Monitoring System (IPMMS), which provided most of the data included in this report.

Equipment

IPC supplied two pickup trucks to transport the crew and their management equipment. These trucks were outfitted with the pesticide products, tools, and safety equipment needed to complete invasive species management work within the Adirondack PRISM. Having multiple trucks allowed the four-person crew to split into crews of two when needed. The ability to divide into two crews significantly increased efficiency, as the majority of APIPP's management sites are less than 0.1 acre in size and are widely distributed throughout the Adirondack PRISM.

The crew deployed several different pieces of equipment to perform invasive species management activities. Brush cutters, shovels, hatchets, and hand clippers were used for mechanical management work, while backpack sprayers and spray bottles were used to perform pesticide applications. The crew used various backpack sprayers such as the Shindaiwa SP518, Birchmeier Iris 15, and the Jacto CD-400. The herbicide products included in Table 3 were used throughout the project period, either individually or as a mixture.

Table 3. Herbicide products used throughout the project.

Active Ingredient	Trade Name (EPA Registration Number)
Glyphosate	Accord XRT-II (62719-556)
	Rodeo (62719-324)
Imazapyr	Arsenal Powerline (241-431)
	Arsenal Applicators Concentrate (241-299)

Chemsurf 90, AquaChem 90, NuFilm and Bullseye Blue were commonly incorporated as adjuvants into herbicide applications by the crew.

Data Collection and Limitations

Data Collection and Management

A strong emphasis was placed on thorough documentation of the EDRR crew's invasive species survey and management activities. APIPP advances stringent data collection and processing protocols to ensure data quality and facilitate comparative analysis over time. This data is used for a variety of applications including predictive analysis, management outcome analysis, and impact assessments. APIPP meets these comprehensive data collection and analysis goals by utilizing pre- and post-treatment monitoring tools including TNC's IPMMS, global positioning systems (GPS), and geographic information systems (GIS).

APIPP provided the crew with Apple iPad tablets, which operated TNC's IPMMS via the Esri Field Maps application. Invasive species distribution, assessment, and treatment data was collected in the field using each tablet and later synced to a secure TNC server for storage and analysis. The IPMMS tool includes both descriptive- and abundance-related data fields including plant phenology, invasive plant percent cover, habitat type, management goal for the site, and infested acreage.

The most important item for clarification regarding the IPMMS data collection process relates to the differences and relationships between the IPMMS occurrence point, assessment polygon, treatment polygon, and treatment table features (Figure 1). The following paragraphs describe these features and outline the data collection process. When the EDRR crew observed a new infestation of a target species, a GPS occurrence point was recorded near the center of the infestation. The occurrence point classifies which species is present and contains unique naming and attribute information for the specific infestation. After an occurrence point was entered, the EDRR crew collected an assessment polygon for the infestation. An assessment polygon is mapped by circumnavigating the exterior boundary of an infestation. Recording new assessment polygons each season allows us to document changes in acreage and percent cover over time. Non-spatial data such as phenology are also recorded in association with the assessment polygon. Photos were collected for each assessment polygon to further document expansion or decline of an infestation along with any transition to native plant composition. If an infestation had been historically managed, a visual survey was completed before mapping the assessment

polygon. If no target invasive species were observed, a "0" was recorded for percent cover class. APIPP deems an infestation to be locally eradicated after three consecutive years of invasive species absence.

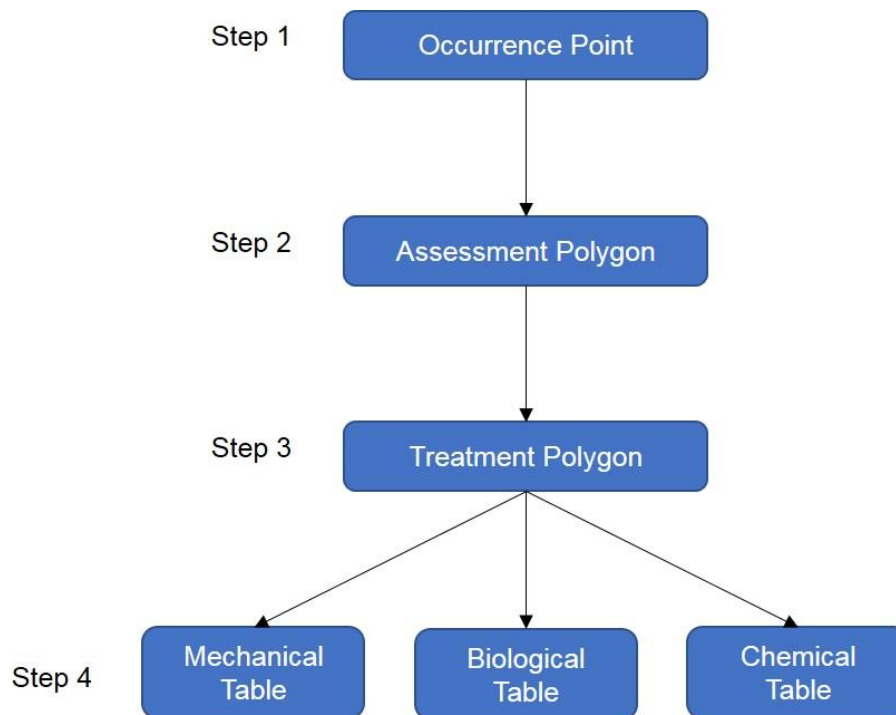


Figure 1. Data collection workflow of the IPMMS

The EDRR crew performed initial management when a new priority infestation of a target species was documented and all required permits and/or permission had been obtained. Follow-up management was conducted on any historically managed infestations where invasive species persisted, and permissions were in place to do so. For all managed sites, the crew created a treatment polygon for the infestation. A treatment polygon is similar to an assessment polygon, but instead it focuses on the management activity that was performed and delineates the area that was managed. Some of the treatment data fields include the time needed to complete management, the management technique utilized, and how many staff participated. If the entire infestation was treated, an infestation polygon matching the assessment polygon was digitized. This increased efficiency by preventing the crew from having to circumnavigate the infestation more than once. If an infestation was partially treated, the treatment polygon was only drawn over the areas that received treatment.

Finally, one or more treatment tables were completed for each treatment polygon to detail the exact management activities that occurred. Treatment tables are specific to the management activity performed (mechanical, chemical, and/or biological) and include fields such as the number of plants removed, herbicide product used, and the total quantity of herbicide applied.



Photo 2. Jacob Hamm conducts an assessment on Route 29A near Canada Lake.

Data Limitations

The crew strived to collect quality data throughout the duration of the project, but there were instances when data errors or inaccuracies occurred. Minor technical errors arose during the data collection process and in most cases could be attributed to GPS inaccuracy. There was also a small degree of user error, which was typically associated with estimating and rounding. For example, the crew was instructed to use quarter-hour increments when recording time spent performing survey and management activities. In some instances, the times recorded may slightly under- or over-estimate the actual amount of time spent performing the activity. This was also standard practice for the crew's daily logs.

Another minor inaccuracy resulted from the treatment polygon mapping process. Treatment polygons were digitized over previously recorded assessment polygons to avoid circumnavigating infestations more than once. This may have produced treatment polygons that were slightly larger or smaller than what was treated. Therefore, the number of acres treated is more accurately represented by the assessment polygons than by the treatment polygons.

These minor errors and inaccuracies will not change the dynamics of this report or significantly influence the following data analysis, but they should be considered when interpreting the information presented.

Management Project Overviews

Table 4. Management Project Overviews. All numbers included in this report are considered draft. Final numbers will be combined with APIPP staff work in the APIPP Annual Report.

Species	Management Project	Routes and/or Geography	Sites Visited	New Sites	Sites Managed	Sites Assessed Only	Sites No Plants Observed	Management Time (hours)	Notes
Scotch Broom	APIPP PRISM Eradication Project	Entire PRISM	1	0	1	0	0	1.25	Treatment site showing good control. There were no new occurrences added by the EDRR crew this season.
Mile-a-Minute	APIPP PRISM Eradication Project	Entire PRISM	4	0	4	0	0	4	Sites are reduced in size and density. All points currently confined to one property.
Phragmites	Ausable River Watershed Suppression Project	I87, Routes 9, 9N 22, 73, 86 & 373	129	43	43	58	28	30.45	Most new sites in project added on I87. Mowing patterns tend to help extend infestations.
	Chateaugay-English Watershed Suppression Project	Route 374	23	0	5	10	8	3	Majority of sites on private property and need further permissions to treat.
	Lake Champlain Watershed Suppression Project	I87, Routes 8, 9, 9N, 9L, 22, 73, 74, 149, 276, 373, 374	265	82	98	115	52	76.6	Most new sites added on I87. Treatment difficult due to mowing patterns, as well as most infestations extending outside ROW. Many sites also within towns/hamlets in the PRISM.
	Mohawk River Watershed Suppression Project	Routes 8, 10, 10A, 29, 29A, 365	133	14	34	53	46	19.5	Sites under management showing great response to treatment. A significant portion is not under treatment pending future treatment permissions.
	Northeastern Lake Ontario Exclusion Project	Route 28	25	0	3	4	18	1.5	Majority of sites with no plants observed this season.
	Sacandaga River Watershed Exclusion Project	Routes 8, 9N, 10, 30	97	16	20	21	56	13.5	Many sites extend onto private property and are large (>.10ac) in size
	Salmon River Watershed Suppression Project	Routes 11B, CR-26, 30	7	0	0	4	3	0	Dense populations on infestation sites. Need further permissions for future treatments.
	Saranac River Watershed Suppression Project	Routes 3, 9, CR-26, 30, 86, 374, state route 186, I87, local roads	49	0	7	10	32	4.5	Sites under management showing good response to treatment protocols.

Species	Management Project	Routes and/or Geography	Sites Visited	New Sites	Sites Managed	Sites Assessed Only	Sites No Plants Observed	Management Time (hours)	Notes
	Southern St. Lawrence Watershed Exclusion Project	CR-27 &60, Routes 3, 28, 28N, 30, 56, 58 and local roads	169	22	27	19	123	14	Sites under management responding to treatment. Majority of sites with no plants observed this season.
	St. Regis River Watershed Exclusion Project	Routes 11B, 30, 86, 458 and local roads	33	0	10	3	20	7	Majority of sites with no plants observed this season.
	Upper Hudson Watershed Exclusion Project	Routes 8, 9, 9N, 28, 28N, 30, 73, 74, 187, and local roads	113	0	35	30	48	45.8	Treatment options are difficult in this area due to site/weather conditions (terrain, flooding, etc.).
Knotweed	Resilient and Connected Land Network Knotweed Suppression Project	Entire PRISM; excludes areas in the northern counties and along the lake shores	390	39	117	127	146	87.75	Treatment of this very persistent plant consists of two herbicides: one for above-ground biomass, and one for residual control of rhizome root system.
	Other	Areas outside of the suppression project	22	0	13	0	9	11.5	Sites showing good response to treatment.
Purple Loosestrife	Resilient and Connected Land Network Purple Loosestrife Suppression	Entire PRISM; excludes areas in the northern counties and along the lake shores	288	8	50	141	97	27.25	Extensive populations exist across the entire PRISM. Infestations are typically mowed by ROW maintenance workers through the summer season, making consecutive year treatments difficult. Biocontrol evidence is also present at many of the sites.
Swallow-wort	Resilient and Connected Land Network Exclusion Project	Varies	33	0	18	3	12	17	Management activities are showing good control over documented infestations. No new occurrences found this season by EDRR crew.
Japanese Stiltgrass	APIPP PRISM Eradication Project	Entire PRISM	2	2	0	2	0	0	New sites most likely due to utility vehicle movement. All sites in southern corner of PRISM.
Tree-of-Heaven	APIPP PRISM Eradication Project	Entire PRISM	15	5	9	5	1	6	Five new sites were added this season. All were on neighboring properties or subdivisions.

Whiteface Mountain

Several years ago, the Veterans' Memorial Highway leading to the summit of Whiteface Mountain was redone. As part of this project contaminated fill was brought in, spreading invasive species. The mountain is home to rare native plants like common blue-eyed grass (*Sisyrinchium angustifolium*). Due to several factors, including the presence of rare plants, chemical treatment is not a viable option to treat these invasive species so hand pulling was used. The exception was eight sites where Japanese knotweed was found in lower elevations. Those infestations were historically managed using herbicide, and this year's crew was pleased to learn that none of the knotweed sites had plants observed this season.

Whiteface Mountain is the most publicly visited area that is managed. Visitors will often approach the crew and pull their vehicles over to inquire about what is being done. This provides a great opportunity for the crew to educate the public about invasive species.

Unfortunately, Whiteface Mountain typically exhibits the worst weather the area has to offer, and the summit is often 10-15 degrees colder than the base and often experiences high winds. The crew typically works on Whiteface on rainy days since hand pulling can be conducted in the rain and chemical treatment cannot.

This season the crew focused on pulling up knapweed (*Centaurea* spp.), sweetclover (*Melilotus* spp.), caraway (*Carum carvi*), dandelions (*Taraxacum* spp.), crown vetch (*Securigera varia*), cypress spurge (*Euphorbia cyparissias*), bladder campion (*Silene vulgaris*), and wild chervil (*Anthriscus sylvestris*). Due to the sheer number of plants the crew removes, work is quantified by the number of contractor bags filled instead of counting per plant. In total, 10 contractor bags were filled and approximately 75 hours were spent managing the roadside.

Cypress spurge has a sap that can be extremely irritating if it gets on the skin or in the eye, so the crew wears gloves as protection. The plant comes up easily and grows in dense mats so it can quickly fill up the contractor bags. Dandelions and bladder campion roots can be frustrating to remove, and the crew used pliers to help pull up their root clusters. Some campion roots were unusually long and required shovels to get out of the ground (Photo 3).



Photo 3. Eric Rechter holding a large bladder campion plant/root, showing how established some of these plants have become.



Photo 4. Jacob Hamm standing near a large tree-of-heaven found in the Port Ann area.

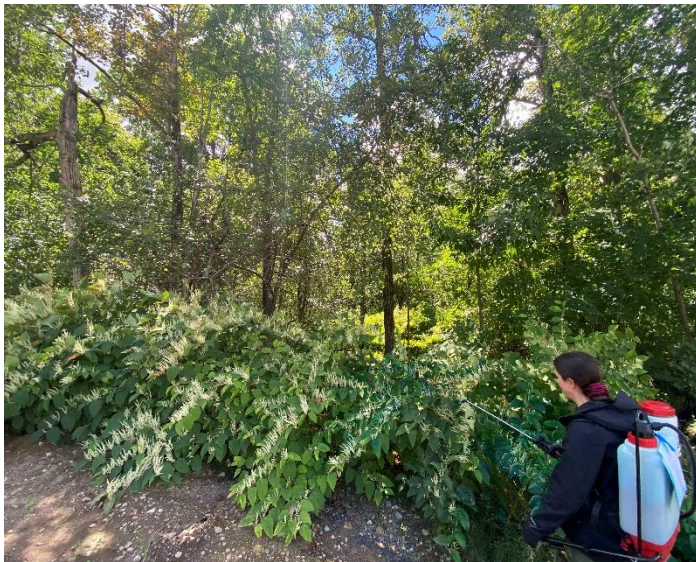


Photo 5. Annika Skilling treating knotweed along the Ausable River in Jay.



Photo 6. Vance Brown treating *Phragmites* along Route 10 in Caroga Lake.

End of Season Review

This year's crew made great progress during the 2022 summer season. They were able to revisit many priority categorized historic sites. In total, the crew assessed over 1,800 sites and performed management at approximately 500 sites. Major progress has also been made at specialty sites, including the common reed grass sites on property owned by the Lake George Land Conservancy and a tree-of-heaven site in Lake George. This year, the crew found approximately 700 sites that no longer had any invasive species observed. Due to extensive work by crews in previous years, the crew only managed to find approximately 260 new sites. The focus of surveys has shifted toward smaller county and local routes that remained unassessed for years.

Data-collection software updates, such as non-priority site presentation and flagging, helped speed up work. With the fade system, crews can skip non-priority areas, leaving more time for treatment of priority sites and sites that were not treated due to time constraints in previous seasons. With the flagging system, crews know what areas to avoid or what to look for at previously treated sites. Also, future crews will have documentation about any concerns from previous crews.

Technological challenges were very limited this season. Most of these issues were related to the database servers not properly syncing with daily log records. This was addressed within the first week, and no further arose issues with that system. Problems with the data collection software and hardware (iPads) were almost non-existent this season. iPads did not overheat or shut down, and there were no problems with the GPS connections. Lack of these issues meant very little time was lost in the field, and more sites could be visited in a day.

Recommendations and Conclusion

Recommendations

IPC provides the following recommendations to increase the EDRR crew's efficiency and effectiveness during future field seasons.

1. Address chemical formulations/ tolerance at historically treated sites

Although great progress is being made in managing these species, some plants are showing signs of resistance/tolerance to the herbicides used for treatment. Different herbicides with varying modes-of action can help alleviate this problem. There is also the added benefit that some chemicals could be more selective towards the target species.

2. Additional assistance for Whiteface Mountain

Treating the Whiteface Veterans' Memorial Highway is one of the more tedious projects of the season. The crew believes that if more people were part of the eradication crew, productivity and effectiveness could be greatly increased. Adding capacity with volunteers could be effective in future years.

3. Provide more information for private property treatments

Many of the treated sites within the ROW extend onto private property. Some of those sites have landowner permission to treat beyond the ROW, while others don't. Many of those permissions were granted in previous years, and possible miscommunication causes breaks in consecutive treatment years. It would be helpful if the data collection software included an acknowledgement that permission has been granted and some form of landowner contact information.

Conclusions

2022 was the 11th season IPC provided staff for APIPP's terrestrial invasive species project, and their continued effects have helped enable APIPP to continue expanding its invasive species monitoring and management projects. As historically managed sites continue to decrease in size and cover following treatment, crews have been able to address a greater number of infestations. The crew's efforts on newer projects, such as treating aggressive tree-of-heaven and Japanese stiltgrass plants, greatly reduces the ability of these emerging species to spread throughout the Adirondacks. Tourism is a major economic driver for the Adirondack region; however, increased tourism also presents opportunities and pathways for the introduction and spread of invasive species. Thanks to APIPP's outreach programs, DEC boat washing stations, and APIPP's EDRR crews, many of the threats of invasive species can be reduced.

Appendix 1: Standardized New York State Invasive Species Tiers

Invasive Species Tiers Standardized species lists for each PRISM				
Impact (current and future)	Difficulty of Eradication / Cost of Control Abundance (in PRISM plus Buffer)			
	None in PRISM	Low (Eradication/ Full containment may be feasible)	Medium (Strategic management to contain infestations and slow spread in PRISM)	High (Established/widespread in PRISM; only strategic localized management)
	TIER 1 <i>Early Detection/Prevention</i> Highest level of early detection survey efforts. Should conduct delineation surveys and assign to appropriate Tier if detected. a) Inside buffer, but not in PRISM b) Outside PRISM and Buffer, but close (eastern North America) c) Far outside PRISM and buffer (not in east NA), but introduction pathway exists	TIER 2 <i>Eradication</i> Highest level of early detection response efforts. High impact species with low enough abundance and suitable treatment method available to make eradication feasible within the PRISM. Need delineation surveys to determine extent.	TIER 3 <i>Containment</i> Target strategic management to slow the spread, as likely too widespread for eradication, but many surrounding regions could be at risk if left unattended. For plants, use the IPMDAT. Possible eradication candidate only if adequate resources and effective control methods available.	TIER 4 <i>Local Control</i> Eradication from PRISM not feasible; focus on localized management over time to contain, exclude, or suppress to protect high-priority resources like rare species or recreation assets. Be strategic when deciding if / where to control.
	Very High or High			
	Medium	Evaluate (Medium Impact) Further evaluate impacts and PRISM resources to see if the species should be assigned to one of the other lists. If this species could feasibly become high impact with climatic or other environmental changes, consider moving to the appropriate High Impact row based on abundance. If too little is known, consider moving to "Monitor".		
Unknown	TIER 5 <i>Monitor</i> Species that need more research, mapping, and monitoring to understand their invasiveness. This includes naturalized species and cultivated-only species that are known to be invasive in other regions but are not yet invasive here. Invasiveness may change with environmental or genetic changes. Should monitor populations on a regular basis to see if they are starting to become invasive and assign to appropriate Tier if invasive infestations detected.			

Buffer: An area chosen by the PRISM that surrounds the PRISM and takes in certain counties, states and provinces. Most PRISMs are using about 100 miles as the buffer.

Impact: Use the PRISM-specific invasiveness rankings if available, or use NYS ranks (see nys.info for existing ranks). For species that are not ranked yet, or PRISM-specific adjustments of state ranks are deemed necessary, use expert opinion and document justification. Low-impact species not included since cannot justify spending resources to control these.

Abundance: This is left as a qualitative metric, since assigning standardized values to categories is not feasible due to the diversity of species dispersal strategies and data gaps.

This ranking system takes into account populations that have escaped into natural areas, but not intentionally (and legally) distributed individuals. For example, a landscape planting would not be counted.