Terrestrial Early Detection & Rapid Response Crew

2024 Final Report

July 23, 2024 – September 19, 2024

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 2024 APIPP EDRR Crew

Introduction

The 2024 field season was the 13th 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 2024, Michael Van Bavel served as the primary crew leader and Drew Daniels, who was new to the crew this season, served as secondary crew leader. Additional members joining the crew for their first year were Noah Janes, Chase Campbell and Benji Hurlock.

Invasive species monitoring and management activities were conducted from July 23 through September 19, 2024. A total of 9 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 within The Nature Conservancy preserves and Forest Preserve lands, private properties, and along state, county, and local roads throughout the region. Administrative tasks, such as data processing, report writing, and equipment maintenance, were also performed as needed during the project period.

This report summarizes work completed and data collected throughout the 2024 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 2024 Annual Report. Visit https://adkinvasives.com/Resources/Resource-Library/APIPP-Annual-Reports 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, Noah is taking a survey of a roadside tree of heaven site reported via iMapInvasives.

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 work in partnership to minimize the impact of invasive species on the Adirondack region's communities, lands, and waters." 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 2024 field season was to revisit, assess, and perform treatments 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 effective, and determining future priorities. The crew also surveyed for, and when permits/permissions allowed, managed newly documented infestations of emerging 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.

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

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

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 region, but 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	*Anoplophora glabripennis*
Japanese hops	*Humulus japonicus*
Japanese snowball	*Viburnum plicatum*
Oak wilt	*Bretziella fagacearum*
Porcelain berry	*Ampelopsis brevipedunculata*
Slender falsebrome	*Brachypodium sylvaticum*
Small carpetgrass	*Arthraxon hispidus*
Spotted lanternfly	*Lycorma delicatula*

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 most 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. 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. This permit does not provide authority to treat infestations located in standing water, which would 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 species-specific 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 proposed management plans, treatments can commence. The EDRR crew is given a list of these sites, as well as the permit information, to ensure that the appropriate 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 manager attempted to contact the landowner to obtain permission to survey and/or treat. Completed permission forms allow APIPP to conduct mechanical or chemical management activities of invasive species on the property until the population is deemed 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 6:00 am to 4:00 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 priority areas or performing mechanical management activities. Each crew leader documented work activities using TNC's Invasive Plant Mobile Monitoring System (IPMMS) via FieldMaps on GPS-enabled tablets, 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. 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.

Active Ingredient	Trade Name (EPA Registration Number)
Glyphosate	Accord XRT-II (62719-556)
	Rodeo (62719-324)
	Roundup Custom (524-343)
Imazapyr	Arsenal Powerline (241-431)
	Arsenal Applicators Concentrate (241-299)
Triclopyr	Garlon 4 Ultra (62719-527)

Table 3. Herbicide products used throughout the project.

Chemsurf 90 and *AquaChem 90* were commonly incorporated as adjuvants into herbicide applications by the crew. Blue indicator dye was also used.

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 database 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 describes 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.

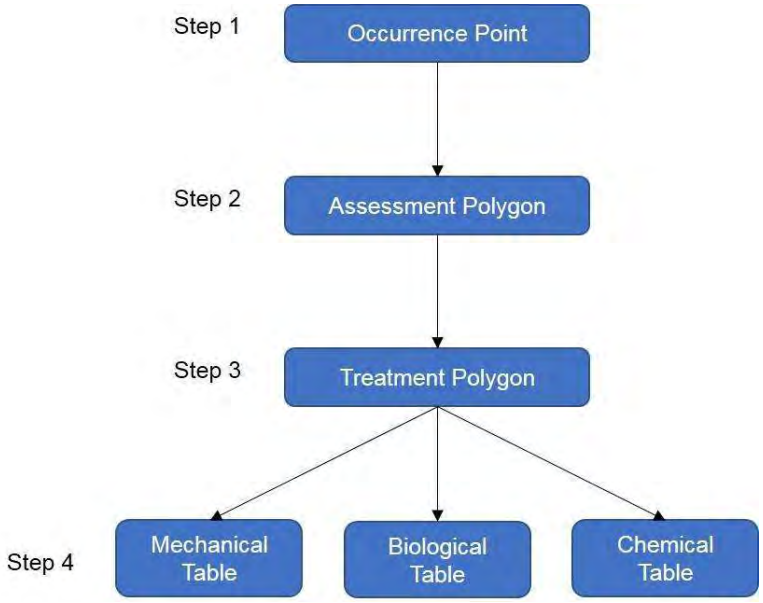

Figure 1. Data collection workflow of the IPMMS

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 has similar structure to the assessment polygon but focuses on control work 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 log management details. 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 solution applied. This chemical treatment data will also be compiled and analyzed subsequent for applicator and State Lands reporting.

Photo 2. Large infestation of knotweed found on a hillside.

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	Total Sites	New Sites	Sites Managed	Sites with No Plants Observed	Sites Assessed Only	Mgmt Time (hrs)	Notes
Autumn olive	2	2	0	0	2	0	Within DEC campground / day use areas only.
Swallow-wort	6	2	0	4	2	0	Treatment projects were completed by APIPP staff prior to the IPC crew starting in 2024. IPC helped locate a new infestation adjacent to State Land and obtained permission for treatment in 2025.
Bush honeysuckle	15	14	1	0	14	0.5	Within DEC campground / day use areas only. This is not a primary management target within the region due to its widespread distribution.
Common reed grass	586	109	186	267	133	115.5	Treatment sites were prioritized to limit spread and target emerging infestations, and by ecological value and proximity to historic treatments.
Japanese knotweed	393	120	87	152	154	58.3	Treatment sites were prioritized to limit spread and target emerging infestations, and by ecological value and proximity to historic treatments.
Japanese stiltgrass	13	3	9	0	4	10	Two neighborhood-scale infestations were treated after new permissions were obtained. Retreatment will be required.
Purple loosestrife	61	55	14	3	44	7.5	All infestations were checked for the presence of *Galerucella* biocontrol beetles prior to chemical or mechanical control. Treatments were confined to smaller/emerging patches.
Reed canary grass	10	10	10	0	0	5	This is not a primary management target within the region due to its widespread distribution.
Tree-of-heaven	27	5	9	5	13	7.5	Primarily located within residential areas of Lake George, sites were treated and new infestations were mapped.
Totals	**1113**	**320**	**316**	**431**	**366**	**204.3**	

Whiteface Mountain

Several years ago, the Veterans' Memorial Highway leading to the summit of Whiteface Mountain was redone. Unfortunately contaminated fill was brought in during the project, 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 and erosion concerns due to limited soil presence, chemical treatment and hand pulling were not viable options to treat these invasive species so hand pruning was used. An exception is eight Japanese knotweed infestations found in lower elevations. Those infestations were historically managed using herbicide.

Whiteface Mountain is among 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 and protecting fragile alpine ecosystems.

Unfortunately, Whiteface Mountain typically exhibits the worst weather the area has to offer, with the summit often windy and temperatures often 10-15 degrees colder than the valley below. 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 managing knapweed (*Centaurea* spp.), sweetclover (*Melilotus* spp.), caraway (*Carum carvi*), dandelions (*Taraxacum spp.*), crown vetch (*Securigera varia*), cypress spurge (*Euphorbia cyparissaias*), 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, 5 contractor bags were filled and approximately 65 hours were spent managing the roadside.

Photo 3. A large mat of stiltgrass found and treated in Bolton Landing

Photo 4. Noah next to a large tree of heaven within a sizeable infestation

Photo 5. Chase getting creative to access a patch of phragmites

Photo 6. The crew surveys along water bodies for species that tend to proliferate on the banks

End of Season Review

This year's crew made great progress during the 2024 summer season. They were able to revisit many priority sites that had been previously treated and/or surveyed. Survey and control work occurred along rights-of-way of 57 state/county roads. In total, the crew assessed just over 1100 sites and conducted management over approximately 21 acres at 311 sites. Major progress has also been made at private and partner agency sites, including the common reed grass sites on property owned by the Lake George Land Conservancy and a tree-of-heaven sites in Lake George and Fort Ann. This year, the crew found approximately 425 historic sites that no longer had any invasive species observed. Due to extensive work by crews in previous years, the crew only managed to find 326 new sites. The focus of surveys has shifted toward smaller county and local routes that remained unassessed for years as well as for emerging species.

Data-collection software updates with helped efficient workflow, such as symbology reflecting site priority status and the flag function. With the fade system, crews can more easily 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, future crews will have easy access to concerns and notes from previous crews.

Having up to date permit tables accessible in IPMMS within the occurrence layer provided clarity on whether sites were eligible for treatment. Previously this was done by locating the physical permit in a binder carried in each truck. While these are still kept on file, the digital table greatly sped up the process of locating a permit and assessing its status.

The development of biocontrol methods on purple loosestrife greatly reduced the amount of those sites needed for treatment by the IPC EDRR team. This increased the amount of time that was available to treat smaller loosestrife sites and other species.

Photo 7. The crew setting vehicles up with various safety and treatment equipment

Recommendations and Conclusion

Recommendations

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

1. **Improve search functionality in IPMMS**

   Searching for specific assigned sites can sometimes require finding nearby landmarks on a separate [personal cell phone] map and cross referencing these with IPMMS in order to navigate to the site(s). Adjusting the IPMMS search function to locate addresses would greatly improve efficiency, especially when cellular service is lacking.

2. **Additional assistance for Whiteface Mountain**

   Treating the Whiteface Veterans' Memorial Highway is one of the more time intensive projects each season. The crew believes that if more staff were part of the eradication crew, long term management will be more effective.

3. **Additional data for private residences**

   Having additional aerial data for private residences, such as property boundaries viewable in FieldMaps, would remove a large degree of ambiguity regarding property ownership in the field. There are several EDRR projects in residential areas where the distinction between properties can be vague. Having access to a layer showing property lines in IPMMS, at least for EDRR project areas, would help address this ambiguity, decrease liability, and increase efficiency.

Conclusions

2024 was the 13th season IPC provided staff for APIPP's terrestrial invasive species project, and their continued effects have helped enable APIPP to be effective in 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 EDRR projects such as treating aggressive tree-of-heaven and Japanese stiltgrass plants, reduced the risk of their spread throughout the region. 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)
Very High or High	**TIER 1** *Early Detection/Prevention* Highest level of early detection survey effort. 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 eastern NA), but introduction pathway exists	**TIER 2** *Eradication* Highest level of early detection response efforts. High impact species with low enough abundance and suitable treatment method(s) available to make eradication feasible within the PRISM. Need delineation surveys to determine extent	**TIER 3** *Containment* 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** *Local Control* 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.
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	X	**TIER 5** *Monitor* 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 nyis.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.