

# Terrestrial Early Detection & Rapid Response Crew Final Report



**July 10, 2023 – September 13, 2023**

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 2023 APIPP EDRR Crew

## Introduction

The 2023 field season was the 12th 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 2023, Michael Van Bavel served as the primary crew leader and Reed Middendorf served as a secondary crew leader. Additional members joining the crew for their first year were Evan Flint, Isaac Patrick, Victoria Chargualaf and Rachel Simmons.

Invasive species monitoring and management activities were conducted from July 10 through September 13, 2023. A total of 9.5 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 2023 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 2023 Annual Report. Visit [www.adkinvasives.com](http://www.adkinvasives.com) to access past and current annual reports.



**Photo 1.** The crew is tasked with surveying for invasive species in various locations throughout the Adirondack Park region. In this photo, Michael Van Bavel is searching for Japanese stiltgrass sprouts within an established wooded area in a residential neighborhood

## 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](http://www.adkinvasives.com).

### Response Crew Objectives and Methodology

The EDRR crew's main objective for the 2023 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 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
<b>Tier 2 – Eradication</b>		
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
Wineberry	<i>Rubus phoenicolasius</i>	Yes
<b>Tier 3 – Containment</b>		
Cup plant	<i>Silphium perfoliatum</i>	No
Hemlock woolly adelgid	<i>Adelges tsugae</i>	Yes
Japanese stiltgrass	<i>Microstegium vimineum</i>	Yes
Jumping worm	<i>Amyntas spp. &amp; Metaphire spp.</i>	No
Lesser celandine	<i>Ficaria verna</i>	Yes
Swallow-wort species	<i>Vincetoxicum louiseae</i> & <i>V. rossicum</i>	Yes
Tree-of-heaven	<i>Ailanthus altissima</i>	Yes
<b>Tier 4 – Suppression</b>		
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>Agilus 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>
Japanese hops	<i>Humulus japonicus</i>
Japanese snowball	<i>Viburnum plicatum</i>
Oak wilt	<i>Bretziella fagacearum</i>
Porcelain berry	<i>Ampelopsis brevipedunculata</i>
Slender falsebrome	<i>Brachypodium sylvaticum</i>
Small carpetgrass	<i>Arthraxon hispidus</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 28<sup>th</sup> 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 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 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. 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 the Shindaiwa SP518 for backpack sprayer applications and ZEP hand sprayers for hack and squirt treatments. 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

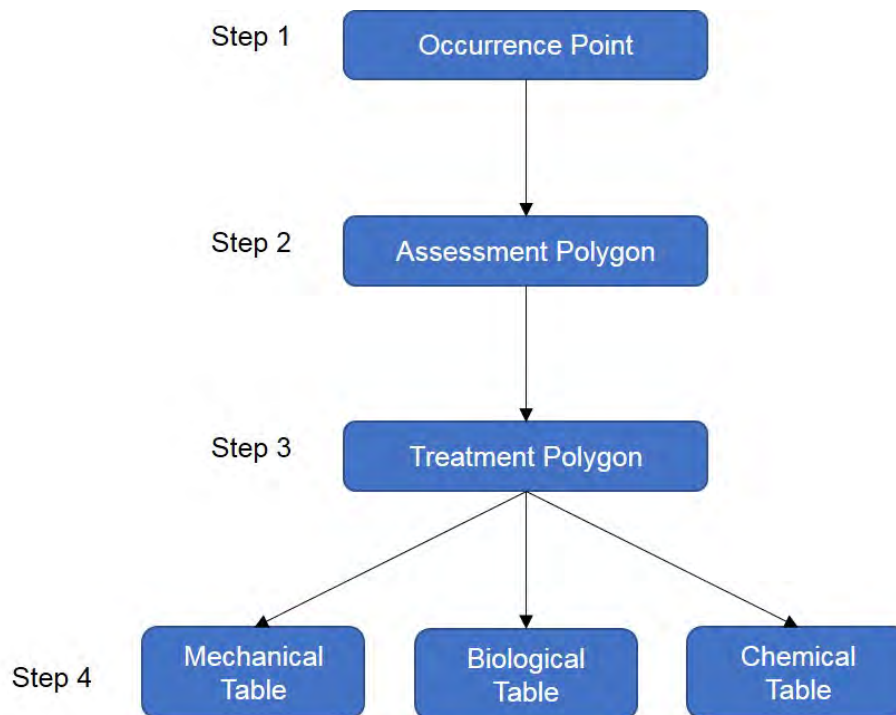
A strong emphasis was placed on thorough documentation of the EDRR crew's invasive species survey and management activities. APIPP advances stringent data collection and processing protocols to ensure data quality and facilitate comparative analysis over time. This data is used for a variety of applications 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. AIPPP 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. Rachel Simmons with a phragmites patch near I-30.**

## 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	Sites Visited	New Sites	Sites Managed	Sites Assessed Only	Sites No Plants Observed	Management Time (hours)	Notes
Black swallowwort	23	1	4	8	11	8.5	Treatment is showing good control. Sites smaller than in past.
Knotweed	367	69	85	151	131	52.5	Treatment of this very persistent plant consists of two herbicides: one for above-ground biomass, and one for residual control of rhizome root system. Several new long-term sites were begun this year.
Japanese Stiltgrass	6	1	4	0	2	4	New sites most likely due to utility vehicle movement. All sites in southern corner of PRISM.
<i>Phragmites</i>	678	82	176	240	262	107.5	Many sites were in or around water as a result of the increased rain this season.
Scotch broom	1	0	1	0	0	1	Treatment site showing good control. There were no new occurrences added by the EDRR crew this season.
Wild Parsnip	3	1	2	1	0	2	Treatment performed at request of NYSDEC due to the hazard posed
Tree-of-Heaven	20	7	8	7	5	13.25	Seven new sites located this season. All were found in the Lake George area.

## 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 pruning 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 trimming 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, 6 contractor bags were filled and approximately 71 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.

At the request of summit stewards, the crew transitioned to hand pruning plants at the base rather than fully pulling them from the soil. This was done to help reduce erosion until the topsoil can be restabilized by opportunistic flora.



**Photo 3. Reed Middendorf looking for phragmites mixed in with native grasses.**



**Photo 4. Reed Middendorf treating a patch of knotweed sprouts.**



**Photo 5. Michael Van Bavel on the way to treat a patch of knotweed in a wooded edge.**



**Photo 6. Reed Middendorf looking for phragmites.**

## End of Season Review

This year's crew made great progress during the 2023 summer season. They were able to revisit many priority categorized historic sites. In total, the crew assessed around 1,100 sites and performed management at approximately 300 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 tree-of-heaven sites in Lake George and Fort Ann. This year, the crew found approximately 400 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 160 new sites.

Data-collection software updates, such as non-priority site presentation, flagging, and the permit table 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. The newly added permit tables additionally made checking for permission from both state entities and private parties much faster, easier, and more reliable.

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 site visits were completed quickly and efficiently.

# Recommendations and Conclusion

## Recommendations

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

### 1. Targeted homeowner outreach missions

It was found throughout the year that there are certain communities with significant infestations of various species where several homeowners are actively working on manual control. It is theorized that these communities would be much more accepting of assistance from APIPP in the future. It could be very beneficial if the EDRR team could have a way to designate these areas for a larger scale outreach mission.

### 2. Additional manpower for Whiteface Mountain

Treating the Whiteface Veterans' Memorial Highway is a highly time intensive. Due to the time constraints of the season and the prioritization of other goals, less time was spent on protecting the alpine zone on Whiteface than in past years. If it were possible for a volunteer or other such group to be brought to Whiteface this would greatly increase the amount of work completed.

### 3. Clearer base maps

Due to the sheer number of individual sites, with varying years of treatment data, saving every piece of information for every site is not feasible. However, if clearer base maps were available to the crew, more locational information could be gleaned to increase the efficiency of the EDRR crew in locating sites.

## Conclusions

2023 was the 12th 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

		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)
Impact (current and future)	Very High or High	<b>TIER 1</b> <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	<b>TIER 2</b> <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.	<b>TIER 3</b> <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 IPMIDAT. Possible eradication candidate only if adequate resources and effective control methods available.	<b>TIER 4</b> <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.
	Medium	<b>Evaluate (Medium Impact)</b> 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	<b>X</b>	<b>TIER 5</b> <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.