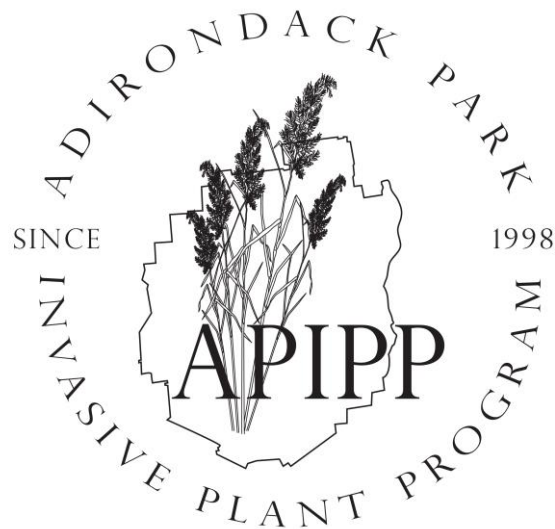


Adirondack Partnership for Regional Invasive Species Management

Invasive Species Strategic Plan



2013 – 2017

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TABLE OF CONTENTS

Executive Summary	4
Introduction.....	6
Adirondack PRISM Description	7
Justification	9
Mission and Vision.....	10
Problems, Underlying Causes, and Pathways	10
Priority Issues.....	19
Strategic Plan Development.....	21
Goals, Objectives, Strategies/Actions	22
Coordination	22
Pathway Analysis.....	25
Spread Prevention and Vector Management.....	27
Enforcement and Legislation	29
Education and Outreach.....	31
Early Detection, Rapid Response, and Monitoring	35
Control and Management.....	40
Information Management.....	44
Restoration	46
Research.....	47
Climate Change Adaptation	49
Resource Development and Funding	51
Appendices.....	53
A. NYS Invasive Species Program Organizational Chart and Supporting Programs.....	53
B. PRISM Staff and Partners	54
C. Invasive Plants in the Adirondack PRISM.....	57
D. Invasive Species Distribution Maps.....	62
E. Abbreviations	69

EXECUTIVE SUMMARY

Invasive species are one of the top threats to lands and waters in the Adirondack region. Since the late 1990s, organizations, agencies, and volunteers collaborated to implement a landscape-level partnership, the Adirondack Park Invasive Plant Program (APIPP), to protect the region from the harmful impacts of invasive species. This partnership-based, integrated, and comprehensive approach to invasive species prevention and management served as the model for Partnerships for Regional Invasive Species Management (PRISM) in New York. PRISMs are one of the State's approaches to deliver on-the-ground invasive species programming. In 2008, APIPP secured funding through the Environmental Protection Fund to serve as the Adirondack PRISM and operates under a contract with the New York State Department of Environmental Conservation.

The Adirondack region is well positioned to successfully address invasive species. The landscape includes large, intact forests and comparatively little disturbance, fewer people, fewer invasive species, and smaller infestations than elsewhere in New York. Furthermore, APIPP has operated in the region for more than a decade. Its diverse partnership base provides the infrastructure, expertise, information, and credibility necessary to take initiatives forward to safeguard the region from invasive species.

Although the region remains relatively free of invasives, the urgency to act now is greater than ever. Invasive species in the region can spread exponentially if left unchecked, and changing temperatures, precipitation, and weather-related disturbances will likely exacerbate invasive species problems in the future. Immediate action is needed to preempt invasives from becoming widely established and degrading natural resources, recreational opportunities, local livelihoods, and cultural legacies.

Effective invasive species programming requires planning at the regional level, setting near-, mid-, and long-term priorities, identifying clear outcomes, tracking successes and challenges over time, adapting programming as needed, and using limited resources as efficiently as possible. The partnership, and the plan going forward, focuses on the following high priorities:

- Coordinating stakeholders and collaborating on invasive species solutions;
- Preventing new infestations by implementing innovative prevention programs, such as the boat launch steward program at water access sites, and policies, such as the Invasive Species Prevention Act and local Aquatic Transport Laws;
- Enhancing a region-wide early detection network that utilizes professionals and volunteers to detect and report new infestations;
- Formalizing Regional Response Teams, including an Aquatic Response Team and a Terrestrial Response Team, comprised of seasonal crews with the training and capacity to implement swift controls on new infestations;
- Implementing strategic management on existing infestations to limit their spread;
- Launching an invasive species education, marketing, and advertising campaign that informs all New Yorkers and visitors to New York about how to stop the spread of invasive species; and,
- Leveraging resources to the region to implement the full suite of actions required to stop the spread of invasive species.

These represent some of the most important and immediate needs in the region; however, it is generally understood that numerous actions at multiple scales involving diverse stakeholders are necessary to successfully combat invasive species. This Strategic Plan outlines the range of goals and strategies that partners in the Adirondack PRISM intend to advance in the next five years.

INTRODUCTION¹

Invasive species are non-native species that cause significant harm to humans or the environment and are considered a form of biological pollution. While most non-native species are benign or beneficial, an estimated 10 - 15% threaten the environment, agriculture, forestry, fisheries, and human health. Invasive species invasions are rapidly increasing due to global trade and travel. Recent arrivals in NY include emerald ash borer, Chinese mitten crab, snakehead fish, didymo, and hydrilla. Other invasive species such as the Asian carp, currently in the Mississippi, are rapidly approaching. Invasive species arrive without their native predators and diseases to control their populations. They also include non-native pathogens such as West Nile virus, which has sickened and killed humans and birds, and hemorrhagic septicemia virus (VHS), which has killed tens of thousands of fish in NY and other Great Lakes states. Native species often lack resistance to non-native pathogens and can be rapidly decimated.

Much of the work to track, prevent, eradicate, and control invasions falls to the individual states. The State of NY is addressing invasive species on many fronts. Recognizing the growing problem, in 2003, NYS established an Invasive Species Task Force (ISTF), a multi-stakeholder team of NYS agencies and conservation and trade organizations co-led by New York State Departments of Environmental Conservation (DEC) and Agriculture and Markets (DAM)² to explore invasive species issues and provide recommendations to the Governor and Legislature by November, 2005. The ISTF report made 12 key recommendations intended to position the State to effectively address invasive species.

One of the ISTF recommendations was to establish a permanent leadership structure to coordinate with federal, state, and local programs to address the gaps in regulatory and administrative authorities; avoid duplication of efforts; develop integrated and consensus-based program priorities; and, identify funding and research needs. The New York Invasive Species Council (NYISC) and NY Invasive Species Advisory Committee were since established³ and DEC formed the Office of Invasive Species Coordination⁴ in December 2007 to support and coordinate with these bodies to implement the ISTF Recommendations (Appendix A).

The ISTF envisioned regional private-public partnerships to strategically deliver core invasive species management functions including coordinating partners, engaging and training volunteers, educating citizens, establishing early detection and rapid response networks, and conducting on-the-ground eradication and control efforts. Eight such Partnerships for Regional Invasive Species Management (PRISM) cover NY (Fig. 1). The Adirondack Park Invasive Plant Program serves as the Adirondack PRISM.



Figure 1. Eight Partnerships for Regional Invasive Species Management

¹ Text provided by the Office of Invasive Species Coordination.

² Chapter 324 of the *Laws of New York, 2003*

³ Chapter 26 of the *Laws of New York, 2008*

⁴ The Office of Invasive Species Coordination was renamed the Invasive Species Coordination Unit in 2012.

ADIRONDACK PRISM DESCRIPTION

Geographic Region

The Adirondack PRISM encompasses approximately 10,244 square miles and includes 12 counties and 119 towns (Fig. 2). Counties having portions within the PRISM are St. Lawrence, Lewis, Oneida, Herkimer, Fulton, Saratoga, Warren, and Washington. Counties located entirely within the PRISM include Hamilton, Essex, Franklin, and Clinton.

The region contains 12 major watersheds ranging in size from 175,602 acres for the Grasse River to 1,087,692 acres for the Upper Hudson River (Fig. 3). These 12 watersheds drain in several directions and are connected to Lake Ontario, the St Lawrence River, Lake Champlain, the Mohawk River, and the Lower Hudson River.

The majority of the PRISM includes the Adirondack Park (Fig 4). The Park was created in 1892 by the State of New York and is the largest publicly protected area in the contiguous United States. It is 5.8 million acres in size and covers approximately 25% of the total land area of New York State. The State of New York owns approximately 43 percent, or roughly 2.6 million acres of land within the Park's boundaries. The remaining 3.4 million acres are privately owned.

There are 133,500 year round residents in the Adirondack Park, with a seasonal population of an additional 150,000. The population of Franklin and Clinton Counties, which extend outside of the park but are within the PRISM, is estimated at 70,500. Millions of tourists visit the region each year for its historic, cultural, outdoor, and recreational opportunities.

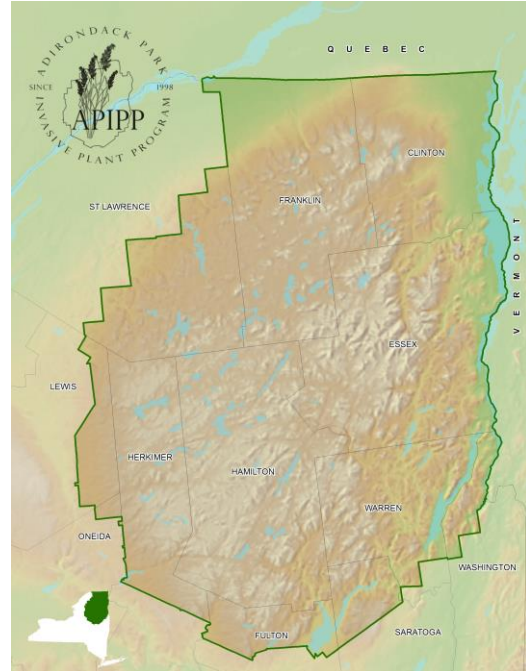


Figure 2. Adirondack PRISM boundary by county.

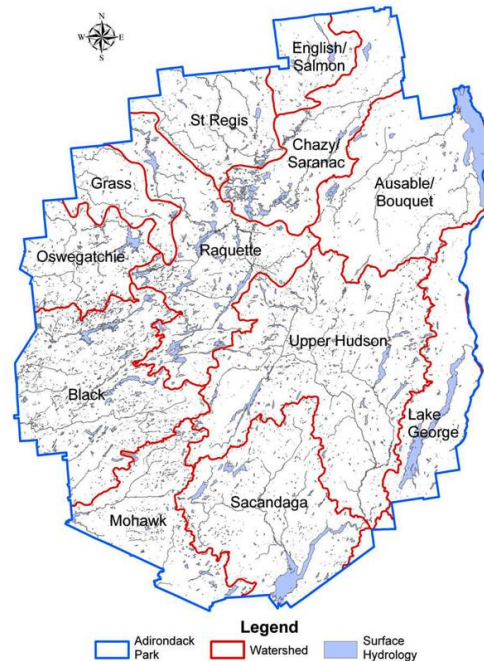


Figure 3. Watershed boundaries in the Adirondack Park.

Natural Resources

The Adirondack PRISM includes diverse terrestrial and aquatic systems (Table 1). The region boasts a wide variety of habitats, including globally unique wetland types and old growth forests. The Champlain Valley and northern Franklin and Clinton Counties are rich in agricultural lands, the High Peaks region contains rare alpine communities, and much of the Adirondack Park is comprised of boreal forests, mixed temperate deciduous forests, and aquatic systems including 3,000 lakes, 30,000 miles of rivers and streams, and more than 800,000 acres of wetlands.

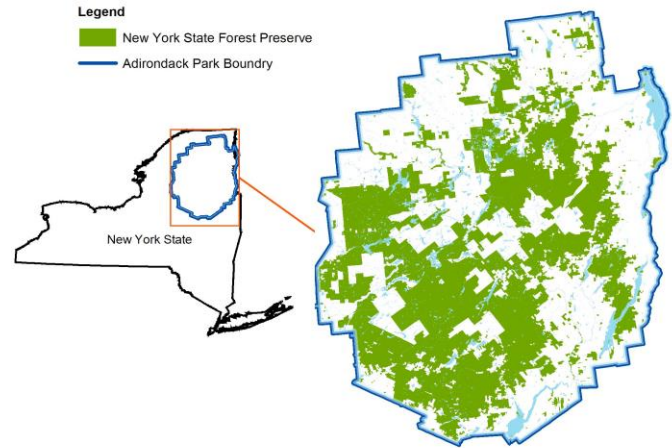


Figure 4. The Adirondack Park is a six million acre park comprised of public and private lands.

Public lands range from remote backcountry to state-operated campgrounds and include more than 1,800 miles of marked trails available for people of all interests and abilities. Public lands offer hiking, camping, canoeing, hunting, fishing, trapping, snowmobiling, skiing, mountain biking, and rock climbing opportunities. The remaining private lands are devoted principally to forestry, agriculture, and open space recreation and include settlements, farms, timberlands, businesses, homes, and camps.

Table 1. Distribution of land cover in the Adirondack PRISM.⁵

Land Cover	ACRES	SQ MILES
Unknown	519	1
Developed	105,969	166
Agriculture	227,324	355
Water	409,584	640
Forest	4,912,427	7,676
Shrubland - Alpine	5,162	8
Disturbed	147,709	231
Wetland	747,744	1,168
Total	6,556,438	10,245

⁵ Data provided by iMapInvasives, 2011.

JUSTIFICATION

The proliferation of invasive species may be the greatest regional threat to water quality and forest health, and the rising cost of management is unsustainable. Invasive species of the past such as Dutch elm disease and American chestnut blight are reminders of the far-reaching impacts that invasives can have on ecosystems, economies, and society. With increasing numbers of invasives on the move, the need for invasive species prevention and management is clear. Invasive species are already a significant drain on local economies. Millions of dollars are spent each year in the Adirondacks to manage invasive species such as Eurasian watermilfoil, Asian clam, and Japanese knotweed, among others. The economic backbone of the Adirondack region is supported by tourism. Adirondack woods and waters are main ingredients of the tourism package that attract visitors, and thus healthy forests and clean water are key for maintaining jobs. Water affects the quality of life of Adirondack residents in several important ways, including property values, drinking water quality, and ecosystem health. Diverse, healthy forests are a prerequisite for a thriving wood products and maple sugar industry and fall foliage touring – all staples of Northern Forest communities.

Since 1998, agencies and organizations in the Adirondack region worked collaboratively through APIPP's partnerships to address invasive species at the landscape level (Appendix B). APIPP was honored to serve as the model for seven other regional partnerships now established in NY. In 2008, APIPP secured funding through the Environmental Protection Fund and serves as the Adirondack PRISM via a contract with the DEC.

The opportunity to prevent widespread degradation in the Adirondack region from invasive species is real. Adirondack ecosystems are still largely intact compared to nearby regions (Figure 5). Unique opportunities exist to capitalize on factors including remoteness, lack of development, and fewer vectors that may offer some protection against invasions. The expertise and infrastructure exist in the region to deliver effective invasive species programs.

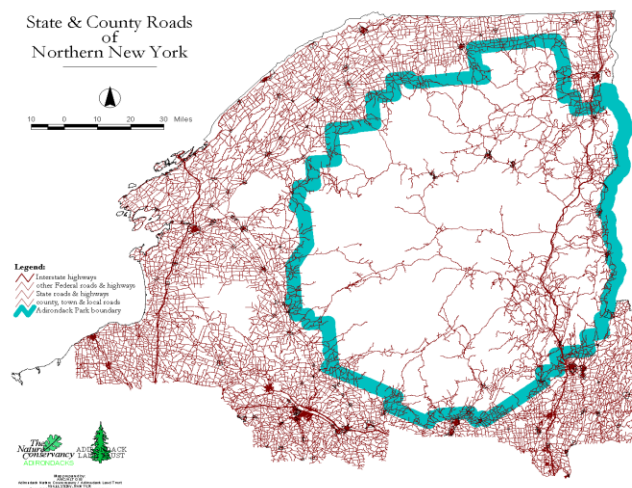


Figure 5. The limited roadway network in the Adirondack region reduces the number of invasive species pathways. Fewer numbers of invasive species and smaller infestations present a unique opportunity to prevent widespread degradation by invasive species.

Impacts of invasive species in the Adirondack region will continue to increase if current populations are left unchecked and new invasive species enter the region. A changing climate, including increases in weather-related disturbance, will likely further exacerbate problems.

While range expansions of native species are not addressed within the scope of this Plan, non-native invasive species that are currently limited by temperature may be able to survive and thrive in the region. If coordinated, strategic action is enhanced and sustained, systems will be in place to limit the spread of invasive species and protect the ecologic and socioeconomic vitality of the Adirondacks. This Plan provides guidance on actions to prevent, control, and limit the impacts of invasive species that have invaded or may invade the Adirondack region.

MISSION

The mission of the Adirondack PRISM is to protect the Adirondack region from the negative impacts of invasive species.

VISION⁶

The vision of the Adirondack PRISM is to foster regional collaboration and coordination wherein the threat of invasive species will be minimized and the vitality of the Adirondack region's varied ecosystems and socioeconomic prosperity will be preserved. Specifically, the vision of the strategic plan is that, within five years, the Adirondack PRISM will have secure funding to sustain its infrastructure for cooperative invasive species prevention and management, including coordination, prevention, early detection, rapid response, and education, as well as the capacity to address all priority invasive species issues within the PRISM. Partners will have the tools to prevent new invasions from affecting the PRISM's rich natural and cultural heritage, including waterways, public lands, private lands, forests, fisheries, and farmland. Invaded areas will be managed for maximum benefit of native ecosystems, biodiversity, forestry, fisheries, and agriculture. Public awareness and participation will be increased to a level where most interested residents and visitors understand the issues.

OVERVIEW OF INVASIVE SPECIES PROBLEMS

Terrestrial Invasive Plants

More than 40 invasive and potentially invasive terrestrial plants are documented in the Adirondack region (Appendix C). APIPP partners and volunteers began systematically mapping the distribution of invasive plants in 1998. Infestations tend to be distributed along roadsides, in hamlets and villages, on private lands, and in campgrounds. Partners prioritize species for prevention and management that pose the greatest risk of spreading into natural areas and causing ecological harm such as species displacement and alteration of ecosystem form and function (Table 2). As of the writing of this report, the average size of infestations of priority species in the core of the Adirondacks is less than 0.08 acres, making elimination of many infestations and exclusion of future invasions a realistic objective.

⁶ Vision statement adapted from the Long Island Invasive Species Management Area Strategic Plan

Table 2. Terrestrial invasive plants that are currently in the Adirondack PRISM and prioritized for regional inventory and control. Additional invasive plants may be selected for inventory and control at select priority locations.

Common Name	Scientific Name
Purple loosestrife	<i>Lythrum salicaria</i>
Japanese knotweed	<i>Fallopia spp.</i>
Garlic mustard	<i>Alliaria petiolata</i>
Common reed grass	<i>Phragmites australis</i>
Yellow iris	<i>Iris psuedacorus</i>
Giant hogweed	<i>Heracleum mantegazzianum</i>
Black and Pale Swallow-worts	<i>Vincetoxicum spp.</i>

Aquatic Invasive Species

The number of aquatic invasive species (AIS) in the Adirondacks is likely fewer than 49, which is the number of known aquatic non-native and invasive species in Lake Champlain as of 2012; however, the total number remains open to speculation since systematic monitoring for all taxa of AIS in the region is incomplete.

APIPP coordinates more than 100 volunteers to help monitor approximately 100 waters each year for aquatic invasive plants. Monitoring has indicated that two out of three waters surveyed are free of aquatic invasive plants. In 2012, APIPP broadened its monitoring program beyond plants and added volunteer training programs for identification and survey techniques for aquatic invasive animals. As of 2012, at least 80 waters had one or more AIS.⁷ At least eight aquatic invasive plants and five aquatic invasive animals (excluding fish) are present in Adirondack waters (Table 3). Fish are categorized as either native or non-native to the region and are not included in the tally of invaded lakes (Table 4).

The most widespread AIS in the region are Eurasian and variable-leaf watermilfoils. In recent years, boat launch stewards reported that curly-leaf pondweed and water chestnut nutlets are frequently transported on watercraft, though these plants are relatively limited in their distribution in the region. Species located in the region that are monitored for potential invasiveness include swollen bladderwort (*Utricularia inflata*) and Southern naiad (*Najas guadalupensis*). These species have exhibited seasonal population fluctuations that can reach nuisance levels in some lakes. Additional species of concern in NY but not yet detected in the region are hydrilla (*Hydrilla verticillata*) and Brazilian elodea (*Egeria densa*).

Invertebrate invaders such as zebra mussels, Asian clam, and spiny waterflea are in the region, and two of these are undergoing significant range expansions. The discovery of Asian clam beds in Lake George prompted an ambitious rapid response control effort in 2011. In 2012, spiny waterflea infestations were discovered in the Champlain Feeder Canal and Lake George.

⁷ Fish are categorized as either native or non-native to the region and are not included in the tally of invaded lakes.

Table 3. Aquatic invasive species in the Adirondack PRISM.

Common Name	Latin Name
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
Variable watermilfoil	<i>Myriophyllum heterophyllum</i>
Curly-leaf pondweed	<i>Potamogeton crispus</i>
Fanwort	<i>Cabomba caroliniana</i>
Water chestnut	<i>Trapa natans</i>
European frog-bit	<i>Hydrocharis morsus-ranae</i>
Brittle Naiad	<i>Najas minor</i>
Yellow floating heart	<i>Nymphoides peltata</i>
Zebra mussel	<i>Dreissena polymorpha</i>
Asian clam	<i>Corbicula fluminea</i>
Spiny waterflea	<i>Bythotrephes cederstroemi</i>
Chinese mystery snail	<i>Cipangopaludina chinensis malleata</i>

Table 4. Common Adirondack fish fauna are classified into three groups including native, non-native and native but widely introduced. Adapted from George (1980), as presented in the Department of Environmental Conservation (DEC) final Siamese Ponds Wilderness Area Unit Management Plan.

Native to Adirondack Upland

Blacknose dace	Creek chubsucker
White sucker	Longnose dace
Longnose sucker	Slimy sculpin
Northern redbelly dace	Lake chub
Redbreast sunfish	Common shiner
Finescale dace	Round whitefish

Native Species Widely Introduced throughout the Adirondack Upland¹

Brook trout	Cisco
Brown bullhead	Lake trout
Pumpkinseed	Creek chub

Non-native to Adirondack Upland

Golden shiner	Smallmouth bass
Chain pickerel	Yellow perch
Largemouth bass	Fathead minnow ²
Brown trout	Rainbow trout
Splake	Atlantic salmon
Lake whitefish	Walleye
Rainbow smelt	Central mudminnow
Bluegill	Redhorse suckers (spp.)
Northern pike	Black crappie
Rock bass	Fallfish ⁴
Bluntnose minnow ⁵	Banded killifish ³
Pearl dace	Spottail shiner ⁶
Alewife	

¹ These native fishes are known to have been widely distributed throughout the Adirondack uplands by DEC, bait bucket introduction, and unauthorized stocking. This means that their presence does not necessarily indicate endemicity. Other species listed above as native have been moved from water to water in the Adirondack upland, but the historical record is less distinct.

² Not mentioned by Mather (1883) from Adirondack collections, minor element southern Adirondack uplands (Greeley 1930-1935).

³ Early collections strongly suggest dispersal as a bait form.

⁴ Adventive through stocking.

⁵ Not mentioned by Mather (1884) from Adirondack collections, widely used as bait.

⁶ Smith, Lavett C. (1985) *The Inland Fishes of New York State*, 522 pp.

Forest Pests and Pathogens

A variety of invasive forest pests and pathogens are affecting deciduous and evergreen species in Adirondack forests. Some pests have been in the region for decades, such as beech bark disease, common pine shoot beetle, gypsy moth, and balsam woolly adelgid while others are recent arrivals, such as *Sirex* wood wasp. Forest pests approaching the region include emerald ash borer. Still others, such as Asian longhorned beetle, may be halted by successful spread prevention measures, and species such as hemlock woolly adelgid may be limited by the cold climate. The DEC and DAM, and United States Department of Agriculture (USDA) lead inventory, management, and education programs for select species. Colleges, universities, and research institutions may oversee research programs for both recent arrivals and more well established species. APIPP partners assist state and federal agencies with various initiatives such as raising awareness about preventing the spread of forest pests, helping to deploy survey traps, and working with communities to plan for or facilitate response.

Mammals

Feral swine (*Sus scrofa*) is an animal of increasing concern over fairly wide portions of the U.S. In recent years they have been identified in several northern states, including NY. Rapid expansion of range is perhaps most attributed to movement of animals and subsequent release or escape to new habitats. Feral swine can compete directly with native wildlife for resources, damage agriculture and natural vegetation, and harbor several diseases of concern to livestock, pets, and humans. The DEC, DAM, and USDA have an active survey program underway in NY. In the Adirondacks, APIPP works with DEC and landowners to manage the population confirmed in the Town of Peru, Clinton County.

Birds

Starlings and house sparrows are fairly well established across the PRISM, are well adapted to open landscapes and fragmented habitats, are cavity nesters, and can be aggressive competitors to several native species with similar nesting requirements. Because they are so well established and no viable control methods are known, no prevention and management actions are currently underway.

New and Emerging Invasive Insect Pests of Agriculture

There are a variety of new and emerging non-native insect pests of vegetable crops. Currently, Cornell Cooperative Extension, New York State Integrated Pest Management (NYSIPM), the DEC through pesticide education and special registrations, and APIPP are partners in the effort to provide early detection and rapid response.

The viburnum leaf beetle (VLB), first found in North America in 1947 in the Niagara Peninsula of Ontario, was discovered in New York State in northern Cayuga County (Fair Haven Beach State Park) in July 1996. Native plantings of arrowwood (*Viburnum dentatum* complex) in the park were found to be heavily damaged by larval feeding. Many of these shrubs were nearly totally defoliated. By 2008, VLB had spread to many areas of Ontario, the Canadian Maritime Provinces, Maine, New York, Pennsylvania, Vermont, Massachusetts, and Ohio.

VLB cause “one-two-three punch” damage: larvae feed gregariously skeletonizing the newly expanding leaves May-June; adults feed heavily on the foliage July-September; and females lay their eggs in terminal twigs. Heavy infestations by VLB can defoliate shrubs, cause dieback, and eventually kill plants. Valued ornamental plantings of the popular European cranberrybush (*V. opulus*), American cranberrybush (*V. trilobum*) and arrowwood (*V. dentatum*) viburnum can be especially ravaged by larval and adult VLB feeding.

The brown marmorated stink bug (BMSB), a serious pest of many fruits and vegetables, has been found as far north as Washington County. The BMSB causes extensive internal injury to fruit which is sometimes not noticed until the fruit is cut open. BMSB can also be a nuisance pest in homes when it seeks overwintering sites in the autumn, reappearing in spring. Northeastern IPM Center as well as NYSIPM and Cornell Cooperative Extension are significantly involved in tracking, researching, and providing information on BMSB.

The Western bean cutworm (WBC) has been moving in from the western United States. In 2009, moths of WBC were confirmed in NY, and pheromone trapping in 2010 and 2011 showed that the pest was broadly distributed in NY. Numbers have not been high enough to cause economic damage so far, but based on the experiences of states to the west, numbers will likely increase in the next several years and WBC will be one of the suite of worm pests (European corn borer, corn earworm, and fall armyworm) to be managed in sweet and field corn as well as dry beans.

The leek moth is native to northern Europe and was first found in Ontario in 1993. The first sighting in the U.S. was in 2009 in Plattsburgh, Clinton County. Leek moth has since been confirmed in several northern NY counties and northwestern Vermont. The leek moth larva is a serious pest of all *Alliums* including leeks, onions, garlic, shallots, and chives. It is a leaf-mining caterpillar that can reduce yields and reduce crop storability.

The spotted wing drosophila (SWD), a species of fruit fly, has been moving northward in NY. It was confirmed in Clinton County, St. Lawrence County, and Jefferson County in September 2012. This is a serious pest of late season berry crops, especially raspberries and blueberries as well as other soft summer fruits such as cherries, peaches, nectarines, apricots, and grapes. Unlike its common vinegar fly relatives, which are primarily attracted to rotting or fermented fruit, SWD attacks fresh, ripe fruit by laying eggs under the soft skin. The larvae quickly hatch and grow in the fruit, destroying the fruit's commercial value.

The Swede midge, a serious, tiny insect pest of Brassicaceae (cabbage and mustard family) was first found in Ontario in 2000. In 2004, it was confirmed on a broccoli farm in Niagara County, NY. It has been slowly moving east and now has been confirmed in St. Lawrence and Franklin Counties. In August 2012, it was found in western Vermont along the Champlain Valley and has

been in northern Vermont for a couple of years. There have been no confirmed sightings in Clinton or Essex Counties as of 2012. Larvae feeding damages the growing points on broccoli and cauliflower, which prevents heads from forming. Swede midge larvae also disfigure other brassica crops including cabbage and kale.

Alfalfa snout beetle (ASB) is a very serious root-feeding weevil that is found only in northern NY and southern Ontario. The loss of many alfalfa stands are blamed on winter kill, however, many of these fields are killed by undetected alfalfa snout beetle infestations. Adult ASB are dusty black in color, wingless, have a hard shell, and a snout. The adult beetle is ½ to ¾ inch long. Every beetle is female and capable of reproducing parthenogenetically, which is reproduction without mating. The ASB legless larvae are ½ inch long and live under the soil surface for about 2 years eating fleshy roots such as alfalfa, Queen Anne's lace, or strawberries. When adults emerge in the spring they migrate in mass numbers often in a northeast or northwest direction. New infestations can be caused by transporting ASB beetles, larvae, or eggs to other farms or fields on dirty equipment in hay or in roadside ditch cleanings.

UNDERLYING CAUSES AND PATHWAYS⁸

The means and routes by which invasive species are imported and introduced into new environments are called "pathways." Some non-native organisms that are intentionally imported escape from captivity or are carelessly released into the environment and become invasive. While most importations are legal, smuggling of invasive species also occurs. Some invasive species arrive as hitchhikers on commodities such as produce, nursery stock, and livestock. Other invasive species are stowaways in transport equipment, such as packing materials or a ship's ballast water.

The potential pathways of introduction for invasive species into and around the Adirondacks are numerous. New approaches to managing invasive species and pathways in the PRISM need to be developed and prevention technologies and practices researched. Meanwhile, new introductions of invasive species populations into and throughout the PRISM occur regularly. Identifying the pathways and prioritizing them for management are necessary to expend resources in the most efficient and effective manner possible and to have the greatest chance of preventing introductions in the long-term.

Developing an understanding of how each invasive species interacts with the ecosystem it invades and identifying factors contributing to its success are essential for assessing the impacts a species has, or may have. It is also critical to the development of effective management techniques. Numerous variables may contribute to or aggravate the spread of invasive species including disturbance, land or water use, fragmentation, eutrophication, deer abundance, and climate change. It is important to assess the infestation in the context of its larger setting so that prevention and management actions treat the problem, not a symptom.

Roads and Utility Corridors

Roadways and utility right-of-ways serve as conduits for invasive species. New road construction as well as re-construction can contribute significantly to the spread of invasive

⁸ Includes excerpts from the St. Lawrence Eastern Lake Ontario Strategic Plan, 2012 – 2016

species. Maintenance of roadways can also play a critical role in spreading invasives along roadsides and right-of-ways. Mowing and ditching equipment and procedures can spread seeds during their operation. Transporting equipment from one location to another without thorough cleaning can also transport seeds.

Both the construction and maintenance of utility corridors can be a vector for transporting invasive species. Overhead and subsurface corridors require frequent maintenance which creates disturbed areas allowing invasives to become established. Invasive species propagules can also be transported on equipment.

Ornamental Plantings

Plant growers and providers, gardeners, and landscape designers intentionally and unintentionally introduce invasive plants for ornamental land and water gardens or structural purposes.

Soils Transport and Land Development

Soil is often imported and/or exported to and from development sites based on need. The movement of fill or soil from one site to another can spread invasive plant propagules both within the region and from other regions into the area. Japanese knotweed and Phragmites are commonly brought to new areas in this way because of the ability of the plant to reproduce from tiny fragments of virtually every part of the plant. These fragments can take root in areas and establish new populations in areas previously free of invasives. Seeds are also contained in untreated soil, allowing for long-distance transportation of any invasive plant.

Land development for private or commercial use has the potential to promote the spread of invasive species through transmission corridors, heavy equipment usage, transport and/or ground disturbance. The lack of or improper cleaning of equipment prior to transport also contributes to the spread of invasive species.

Boating and Fishing

Recreational boating and fishing is a significant pathway for the movement of AIS. Boats are known vectors of aquatic plants and animals that can hitchhike on trailers, in engine motors, live wells, bilge water, and on anchor lines and other rope and equipment, and species such as didymo can easily be spread by droplets of water on fishing gear and can persist in the moisture of felt-soled boots over long periods. Boating events and fishing tournaments are commonly held throughout the Adirondack region and attract boaters and anglers from all over the country.

Bait

Biologists have recognized “bait bucket introductions” as a common means of spreading aquatic invaders. One example is the rusty crayfish (*Orconectes rusticus*). Native to the central and midwest U.S., the rusty crayfish has spread to other states including NY, Massachusetts, New Jersey, and Pennsylvania. This species was likely spread by anglers who transported them for use as fishing bait, largely via bait buckets. The rusty crayfish is aggressive and larger than most native crayfish, so it outcompetes them, and its size makes it unattractive prey for many fish. It also destroys the aquatic plant beds that serve as cover and food for other aquatic organisms, as

well as nursery habitat for sport fish. In addition, rusty crayfish prey on fish eggs, further harming local fish populations (Don't Dump That Bait, 2011).

Sea Planes

Seaplanes can inadvertently transport AIS between water bodies on their floats. It is important that pilots take appropriate preventative measures to clean the aircraft and remove all plant fragments or attached organisms before and during every take off.

Canals

Canals connect previously disconnected watersheds and serve as a pathway for invasive species spread. In the Adirondack PRISM, the Champlain Canal connects the southern end of Lake Champlain to the Hudson-Mohawk watershed, which is, in turn, connected to the Great Lakes drainage basin by the Erie Canal System. The Richelieu River, which flows out of the northern end of Lake Champlain and ultimately into the St. Lawrence River, has a similar potential to move nonindigenous species into and out of the Lake Champlain Basin. Several feasibility studies are underway to identify potential AIS mitigation options for the Champlain Canal, but a great deal more work and funding will be required to eliminate the threat of AIS introductions via canals.

Firewood

Forest pests and pathogens pose a major threat to the health of the forest ecosystems and economy in the region. Movement of firewood and other wood products is considered the primary vector.

Packing Materials and Infected Nursery Stock

Invasive species, primarily forest and agricultural pests and pathogens, can be contained in wood packaging materials made of unprocessed raw wood or wooden shipping pallets, or be transported as hitchhikers on live plants or soils.

Commercial/Retail

Some invasives can be linked to the commercial and retail industry. These include the aquarium industry, retail sales in live fish markets, and the exotic pet industry. Often, these exotic plants and animals are released into natural areas when the owner no longer wants to care for them or the animals outgrow their facilities. AIS may also be mislabeled and sold by pet, aquarium trade, and nursery retailers. In addition, live fish markets have been linked to the introduction of non-native fish species, including the snakehead fish and several varieties of carp. Since some species cannot survive in small tanks for extended lengths of time, market owners have been accused of discarding them in local waterbodies when the fish are not sold quickly (LaManche, 2007). Online sales and unregulated shipments of invasive species can also occur.

Logging Roads

Forestry can contribute to the introduction and spread of invasive species through forestry practices and occasionally the intentional introduction of species for commercial forestry, agroforestry, and other purposes. Under some circumstances, forest roads may also initiate or accelerate infestations through increased levels of human activities in previously inaccessible areas, unintentional transport of infected equipment, and disturbance.

Recreation

Plant propagules from invasive species can stow away on hiking boots, hay used during horse back riding, waders, clothing, docks/floating docks, tires, bumpers, wheel wells, or the underside of vehicles and equipment used in recreational activities. These can be transported great distances before falling off in a new location. Activities such as stream fishing, hiking, hunting, biking, all-terrain-vehicle riding, and other activities can be a mechanism for transporting invasive species.

Border Crossings

Both controlled and passive rail, road, and water crossings between the U.S. and Canada can serve as a gateway for the introduction of invasive species.

Natural Spread

Natural spread can occur through wind dispersal or extreme weather events. Streams and connected waterways carry plant materials and animals throughout a watershed via water flow. Insects will naturally disperse by flight. Plant propagules can also attach to fur, feathers, or feet and also be spread by animals in undigested feces.

PRIORITY ISSUES

Coordination

Coordination among agencies, organizations, and communities within the PRISM is essential to avoid duplication and ensure that needs within the region are identified and met and that programs are effectively and efficiently delivered. Coordination is also necessary with state, regional, and national efforts to inform and learn from similar programs throughout NY, the Northeast, and the U.S.

Prevention and Preparedness

The first line of defense for minimizing impacts of invasive species is to prevent future introductions and further spread. Encouraging both regulatory and non-regulatory programs and policies can help bolster this first line of defense. As in other regions of the U.S., attention to invasive species in NY has historically been a reactionary response. Resource managers have generally focused on addressing problems associated with specific invasive species already introduced and only after populations reach nuisance proportions. Similarly, it is only after reaching nuisance proportions that invasive species problems attract significant attention from the public. Developing the infrastructure and consciousness to prepare for invasive species rather than to react to them after they arrive will help ease the burden on communities, save money, and better protect resources in the long-term.

Early Detection and Rapid Response

Developing a comprehensive understanding of the presence and distribution of all invasive species in the PRISM through early detection surveys and monitoring programs is a prerequisite for formulating effective strategies to prevent new introductions, to limit the spread of existing invaders, and to abate the negative impacts of established ones. Because of the geographic magnitude of the Adirondack PRISM and the tremendous terrestrial and water resources including 12 major watersheds, over 11,000 lakes and ponds, 30,000 miles of rivers and streams, and millions of acres of forest as well as significant agricultural areas, an effective early detection and monitoring program will depend on utilizing citizen scientist volunteers. A successful program includes training, mentorship, coordination, data management, and quality control. Once invasive species become established, eradication is nearly impossible and ongoing management is costly and complicated. New infestations must be detected early and acted upon swiftly to minimize economic, social, and ecological impacts, as well as to allow for the possibility of elimination. This requires coordination among multiple agencies and organizations, planning to balance rapid response deadlines with regulatory timetables, and available resources and personnel, through regional response teams. Formulating a rapid response protocol and designating a rapid response network will help to minimize future impacts of invasive species in the PRISM.

Strategic Management

Several species presently in the PRISM are actively managed to limit their distribution and to minimize their ecological, social, and economic impacts. Management activities, however, are costly to implement and, in most cases, will not result in complete elimination of an invasive species population. Eurasian watermilfoil, for example, has been actively managed in Lake George since 1987. Because of the costs associated with managing invasive species, and

because of the potential impacts on non-target species, existing management alternatives, as well as new techniques and approaches, should be evaluated carefully for their effectiveness at producing the desired results as well as for their secondary impacts. To the greatest extent possible, selected management actions should: 1) optimize the use of limited resources; 2) have negligible negative impacts on non-target species, natural ecological communities, ecological processes, and human activities; and 3) not threaten public health or safety. Efforts should also be taken in advance of starting a management project to determine if the project is likely to be successful. A successful management project should not only control an invasive species, it should also achieve intended goals which could be conservation goals, such as maintaining or restoring the viability, health, and resilience of desired species, natural communities, and/or ecosystem processes; economic goals; human health protection; recreational use; or, meeting legal obligations.

Education

Education is a key to effectively prevent the spread of invasive species in the long-term. Spread prevention is achieved through persistent, comprehensive, and consistent educational outreach programs and trainings that target multiple audiences. Coordination among the various organizations delivering outreach programs is also necessary to maintain consistency and to increase the likelihood of voluntary compliance with spread prevention measures. Evaluating, improving, and expanding educational outreach programs will lead to increased public support, cooperation, and compliance necessary for reducing invasive species in the Adirondack PRISM. Ideally, messaging and programming will be coordinated across multiple spatial scales, including other PRISMs, throughout NY, and neighboring states and provinces.

Funding

Dedicated and sustained funding in support of the Plan and partner projects is a vital part of success and effectiveness. The challenge of invasive species cannot be managed by piecemeal and sporadic funding. Numerous groups and organizations in the Adirondack region spend millions of dollars every year to prevent or mitigate the impacts of invasive species. Cooperators view this Plan as a tool to leverage additional resources through state and federal grants and local and private assistance to support coordinated regional planning and implementation of priority actions. In 2005, the NY Invasive Species Task Force recommended an initial \$10 million per year in dedicated, sustained funding via the Environmental Protection Fund in support of invasive species programs in NY as an important first step in fighting invasive species statewide.

STRATEGIC PLAN DEVELOPMENT

The purpose of strategic planning is to set overall goals and develop objectives, strategies, and actions to achieve them. It involves stepping back from everyday activities and asking where a program is headed and what its priorities should be. The development of the Adirondack PRISM Strategic Plan was informed by *Adirondack Park Aquatic Nuisance Species Management Plan* (2005), guidance from the Office of Invasive Species Coordination (now known as the Invasive Species Coordination Unit), and other PRISM strategic plans including those from Long Island, the Catskills, and the St. Lawrence Eastern Lake Ontario region. The Plan incorporates many of the same concepts to ensure coordination and consistency.

A subset of APIPP staff and partners comprised the writing team, which formed in 2010. Since then, the Plan was reviewed by the writing team and distributed on the APIPP PRISM Listserve for partner input multiple times. It was also discussed at various bi-annual APIPP meetings. On April 30th, 2013, the APIPP partners in attendance at the APIPP spring meeting voted unanimously to approve the plan.

The following Goals provide a framework for the Objectives and Strategies/Actions to accomplish the mission of protecting the Adirondack region from the negative impacts of invasive species.

GOALS

- A. Coordination
- B. Pathway Analysis
- C. Spread Prevention and Vector Management
- D. Enforcement and Legislation
- E. Education and Outreach
- F. Early Detection, Rapid Response, and Monitoring
- G. Control and Management
- H. Information Management
- I. Restoration
- J. Research
- K. Climate Change Adaptation
- L. Resource Development and Funding

Although these Goals are not listed in order of priority, it is generally accepted that the first line of defense for minimizing invasive species impacts is to prevent invasive species introductions and spread. Each Goal is inextricably linked to spread prevention. In addition, central to all of the Goals of this Plan are the PRISM staff (see Action A1a) and the PRISM Committee Structure (see Action A1c) whose roles are to coordinate implementation of the Strategies/Actions and to coordinate development of future iterations of this Strategic Plan. Of note is that many of the actions described in the Plan are underway.

GOAL A. COORDINATION

Objective A1. Coordinate Plan Implementation at the PRISM Level and Coordinate with Invasive Species Efforts at the State and Northeastern Regional Levels

Strategies/Actions

A 1a. Sustain PRISM Staff

Sustain annual funding for PRISM staff to coordinate partners and implement the Plan and associated objectives and conduct specific Plan Actions as appropriate.

A 1b. Sustain Partner Invasive Species Staff

Maintain invasive species staff working directly in the PRISM (eg. Lake Champlain Sea Grant, Lake Champlain Basin Program) and staff working at the state level lending support to the PRISM (eg. ISCU, NYISRI, NY IS Clearinghouse, Cornell CCE Invasive Species Program, PRISMs) who can work with PRISM staff to help implement Plan Actions as appropriate.

A 1c. Coordinate the PRISM Steering, Aquatic, and Terrestrial Committees

Maintain Committees and develop new work groups as needed to guide Plan implementation, set priorities on an annual basis, report successes, and coordinate with other state and regional committees and initiatives.

A 1d. Identify New Partners to Invite to Participate in the PRISM

Engage new representatives, organizations, and community leaders in the region (business, industry, municipal, academic, volunteer groups etc.) who may be interested in or benefit from partnering on invasive species related issues.

A 1e. Coordinate with other NY PRISMs

Participate in monthly PRISM conference calls and quarterly PRISM leader calls, and coordinate PRISM activities and Plan implementation with other NY PRISMs.

A 1f. Coordinate with the NY Invasive Species Coordination Unit, including Contributing to the Development and Implementation of the NY Invasive Species Comprehensive Management Plan and/or ISCU 5 Year Workplans

Communicate with the ISCU staff about progress, challenges, and needs with the implementation of the Adirondack PRISM Plan. Ensure coordination, review, and input into the development and implementation of statewide planning documents.

A 1g. Coordinate with the NYS Invasive Species Council and Advisory Committee

Coordinate information exchange with the NY ISC and NY ISAC by communicating PRISM needs to the PRISM representative on ISAC.

A 1h. Coordinate with Parallel Initiatives in the Northeast

Continue participation in the Northeast Regional ANS Panel, Invasive Plant Atlas of New England, and other regional and local panels and workgroups as appropriate.

A 1i. Maintain Status of PRISM Cooperative Agreement

Periodically review (approximately every 5 years) and update the PRISM Cooperative Agreement to ensure accuracy and relevance.

A 1j. Maintain Strategic Plan

Periodically review (approximately every 5 years) and update the PRISM Strategic Plan to ensure accuracy and relevance.

A 1k. Coordinate with Complementary Local / Regional Planning Initiatives

Integrate invasive species priorities and activities into local, watershed, and regional planning initiatives, such as the Champlain Watershed Improvement Coalition of NY, Economic Development Councils, Cleaner Greener Sustainability Planning, ADK Futures, River/Watershed plans, Local Waterfront Development Plans, DEC Unit Management Plans etc.

Objective A2. Communicate PRISM Activities and News

Strategies/Actions

A 2a. Maintain Website

Improve look and content of APIPP's existing website to make information readily available to the public and professionals. Also maintain the Adirondack PRISM page on the NY Invasive Species Clearinghouse.

A 2b. Utilize PRISM Listserve

Distribute PRISM, partner news, announcements, and action items on the PRISM listserve.

A 2c. Maintain APIPP Activity Blog and Explore Use of Additional Social Media, eg. Facebook, Twitter, Tumblr

Investigate new ways of reaching new audiences and meeting Plan goals and objectives utilizing social media.

A 2d. Report Seasonal and Annual Activities through Biannual Newsletters, Annual Workplan, and Annual Report

Prepare and distribute a spring/summer and fall/winter newsletter, an annual workplan that is linked to the Strategic Plan, and an annual report.

A 2e. Communicate PRISM Highlights and News through Press Releases

Utilize news and radio to announce PRISM achievements, training opportunities etc.

A 2f. Communicate PRISM Highlights and News to Local, State, and Federal Elected Officials

Ensure that elected officials are informed about progress, needs, and challenges in the PRISM.

Outputs

- Number of partners in PRISM network
- Number of staff and partner staff working on invasive species
- Cooperative Agreement
- Strategic Plan
- Website
- Listserve
- Blog
- Newsletters
- Annual workplan and Annual report
- Press releases
- Recommendations shared with ISCU, ISC, and ISAC
- Coordinated actions with complementary planning initiatives

Outcomes

- Coordinated efforts resulting in effective program development and program delivery across the PRISM
- Streamlined communication
- Reduction of invasive species threat
- Increased resource protection
- Greater regional awareness of priorities and needs
- Greater state awareness about Adirondack PRISM shared priorities and needs
- Increased resources leveraged to the region

GOAL B. Pathway Analysis

Objective B1. Conduct Pathway Analysis

Strategies/Actions

B 1a. Identify Pathways of Invasive Species Transport

Utilize informational resources from regional, state, and federal pathway analysis efforts to assist in identifying and examining potential pathways of invasive species spread into the region. Develop list of existing and potential pathways of invasive species introduction to and within the Adirondack PRISM.

B 1b. Prioritize Pathways for Pathway Management

Use invasive species biology and distribution data to prioritize which pathways serve as the greatest risk of introducing and spreading invasive species that will impact systems and species, including those with high social or ecological value. Create a list of priority pathway management actions, and develop programs to address those pathways, to be included in Goal C. Periodically review pathways of significance.

Objective B2. Assess Underlying Causes of Invasion to Freshwater and Terrestrial Systems and Work to Address These Underlying Issues

Strategies/Actions

B 2a. Determine Susceptibility of Aquatic Habitats to IS Invasion and Associated Invasive Species Establishment and Expansion

Conduct literature review to determine what environmental or anthropogenic conditions make freshwater systems more susceptible to invasion (including lake management techniques and watershed activities, winter drawdown, state boat launches, public access sites, beaches, parks, erosion, drainage, salt etc.), and make recommendations on how those conditions can be improved.

B 2b. Determine Susceptibility of Terrestrial Habitats to IS Invasion and Associated Invasive Species Establishment and Expansion

Conduct literature review to determine what environmental or anthropogenic conditions make terrestrial systems more susceptible to invasion (including forestry management techniques and watershed activities, disturbance, erosion, deer browse, soil compaction), and make recommendations on how those conditions can be improved.

Outputs

- List of pathways, including prioritized pathways, in the PRISM
- Analysis of causes of invasion in terrestrial and aquatic systems and solutions to mitigate those conditions

Outcomes

- Improved understanding of transport of invasive species and more effective programming and direction of resources to limit future introductions and spread

- Improved understanding of susceptibility to invasion and recommendations on how to mitigate those conditions

GOAL C. Spread Prevention and Vector Management

Objective C1. Implement Spread Prevention Programs and Encourage Practices to Intercept Invasive Species within the PRISM

Strategies/Actions

C 1a. Expand the Adirondack Regional Watershed Stewardship Program

Support and expand existing efforts by the Paul Smith's College Watershed Stewardship Program, Lake George Association, Lake Champlain Basin Program, Ausable River Association, lake/river associations, and communities to position paid and/or volunteer stewards at water access sites to inspect recreational watercraft and gear. Lend guidance to groups in other parts of the state as requested. Consider hosting "how-to" sessions.

C 1b. Collaborate with State Partners to Intercept IS at State Facilities and within State Jurisdictions (State Campgrounds, State Rights-of-way, Border Crossings)

Work with the DEC to provide campground attendants with information and actions they can take to advise visitors about invasive species (eg. inspect for aquatic species on watercraft, advise about firewood transport). Work with state DOT and local highway departments to promote spread prevention measures (equipment cleaning; clean fill) and best management practices during routine maintenance and design, including information in project specifications and subcontracts. Support efforts to provide Border Security with the information and tools needed to adequately safeguard borders from the transport of invasive species.

C 1c. Collaborate with Utility Companies to Mitigate Spread of Invasive Species

Identify staff within the utility industry and collaborate with ongoing efforts to institutionalize standards for spread prevention measures and best management practices and equipment cleaning, including information in project specifications and subcontracts.

C 1d. Collaborate with Businesses / Industry

Explore opportunities for businesses and industry to improve corporate practices and raise consumer awareness to reduce invasive species introductions and encourage resource protection.

C 1e. Evaluate Efficacy of Boat Wash Stations and Inspections

Compile and review data and published research from within and outside of NY to inform an analysis about the efficacy of inspections and decontamination.

C 1f. Develop / Evaluate New and Better Methods of Intercepting Invasive Species at Points of Entry

Use existing studies and regional case studies to assess the efficacy and education value of various invasive species interception strategies (eg. Internet Landing Inspection Device (I-LID), inspection stations, boot brushes at priority trailheads, etc).

C 1g. Encourage Development of Hazard Analysis and Critical Control Point Plans

Support a full-time appointment within USFWS to encourage and provide training to private and public organizations in developing hazard analysis and critical control point plans to prevent the spread of invasive species in their daily business and resource management operations.

Objective C2. Prioritize Areas in the PRISM to Prevent the Spread of Invasive Species

Strategies/Actions

C 2a. Designate Invasive Species Prevention Zones in the Adirondack PRISM

Evaluate large intact areas free, or relatively free, of invasive species that will be prioritized locations for prevention, early detection, and response actions. Develop management plan for each ISPZ.

C 2b. Identify Priority Areas for Inspection and Decontamination around the Region

Based on information assessed in C 1e, identify locations in the PRISM where inspection and decontamination may be appropriate and effective in preventing landscape level spread of AIS.

Outputs

- Number of water access sites with stewards
- Number of stewards
- Number of recreationists reached
- Number of state facilities or jurisdictions involved in prevention programs
- Number of innovative technologies piloted and adopted elsewhere
- List of partners with completed HAACCP Plans
- Number of ISPZ
- Number of completed ISPZ management plans
- Number of wash stations

Outcomes

- Safeguards in place to prevent the spread of invasive species
- Reduced risk of introductions
- Increased rate of interdictions and/or Fewer introductions
- Increased resource protection
- Effective use of limited resources

GOAL D. Enforcement and Legislation

Objective D1. Raise Public Awareness of Existing Laws Controlling the Transport of Invasive Species

Strategies/Actions

D 1a. Maintain a Current and Comprehensive List of NYS Laws and Local Statutes and Rules/Regulations Pertaining to Invasive Species

Compile, centralize, and maintain existing relevant NYS laws and local statutes and rules and regulations.

D 1b. Inform the Public about Invasive Species Regulations

Educate the public through presentations and publications about laws pertaining to the propagation, sale, collection, possession, importation, purchase, cultivation, transport, distribution, and introduction of invasive species, the reasoning behind the laws and regulations, and the environmental and economic consequences of not complying with them. Encourage locations with invasive species laws to post signage and inform residents and visitors.

Objective D2. Improve Enforcement of Invasive Species Laws and Regulations

Strategies/Actions

D 2a. Provide Training to Law Enforcement Officials about Invasive Species Regulations, as Requested

Provide training to state and local officials, fish and wildlife conservation officers, and other appropriate law enforcement officials about invasive species and laws and regulations pertaining to the propagation, sale, collection, possession, importation, purchase, cultivation, distribution, and introduction of invasive species.

D 2b. Encourage Improved Enforcement of Invasive Species Laws and Regulations

Recommend increased enforcement, possibly through inspection checkpoints, of laws and regulations controlling the propagation, sale, collection, possession, importation, purchase, cultivation, transport, distribution, and introduction of invasive species. Explore opportunities to leverage additional resources to help offset costs to enforcement agencies.

Objective D3. Identify Needs for New Legislation

Strategies/Actions

D 3a. Examine Effectiveness of Existing Enforcement Procedures and Policies and Propose Improvements or New Regulations/Legislation Controlling the Propagation, Sale, Collection, Possession, Importation, Purchase, Cultivation, Distribution, and Introduction of Invasive Species

Develop evaluation protocols to determine efficacy of existing procedures and policies.

Review and evaluate existing invasive species laws, regulations, and permit review processes. Evaluate effectiveness of existing policies and regulatory inhibitors. Pursue changes and recommend new legislation as appropriate.

Outputs

- Compilation of NYS rules and regulations
- Training program and summary materials for the public and enforcement officials
- Recommendations for new rules and regulations

Outcomes

- Greater public awareness about the problems of invasives and associated regulations
- Improved enforcement and compliance with rules and regulations
- Fewer invasive species introductions
- Reduced impacts on target resources
- Fewer dollars spent on management

GOAL E. Education and Outreach

Objective E1. Develop an Awareness and Education Program in the PRISM

Strategies/Actions

E 1a. Prepare a Communications Plan for Increasing Awareness among Priority Audiences

Prepare a communications plan that describes key invasive species messages, approaches and actions to raise public awareness about invasive species, and measures of the efficacy of approaches in changing behavior. Determine goals for behavioral change, refine message to target audiences, and identify the appropriate avenues to reach them. Target audiences may include landowners, hikers, campers, boaters, anglers, outdoor guides, gardeners, nurseries, private foresters, civic organizations, youth camps, businesses, tourism centers, tradeshow, boat dealers, boating magazines, boater events, border crossings, teachers, students, interest groups, visitors, zoning and planning boards, state and local officials, and the general public.

E 1b. Enhance Education and Outreach Program in the PRISM

Define education and outreach goals, identify gaps in programming, and describe the opportunities, infrastructure, and expertise required to conduct a more effective invasive species education program.

Objective E2. Coordinate, Implement, and Evaluate Comprehensive Educational Programs for Multiple Audiences

Strategies/Actions

E 2a. Sustain Adirondack Invasive Species Awareness Week

Facilitate the organization and hosting of activities throughout the PRISM to engage residents and visitors of all ages on the issues of invasive species.

E 2b. Integrate Invasive Species Information into Existing Training and Licensing Programs (DMV, fishing/boating/hunting licenses)

Integrate information into existing training and licensing programs for the public, state and local governments, and special interest groups. Coordinate the content of the outreach program with other state, regional, and national efforts as appropriate.

E 2c. Identify Opportunities to Work with Tourism and Business Community

Compile a contact list of tourism professionals and organizations in the region and solicit feedback on effective ways and means to get information to travelers and visitors before they reach the Adirondacks.

E 2d. Develop a PRISM Invasive Species Prevention Participating Business Program

Evaluate Lake George Park Commission’s Program that engages businesses around the lake to help distribute invasive species information which utilizes consistent messaging and branding regarding preventing the introduction of invasive species. Adapt as necessary to expand throughout the Adirondack PRISM.

E 2e. Develop Strategy to Collaborate with Schools, Colleges, Universities and Summer Camps

Explore opportunities to integrate invasive species information into primary and secondary education classrooms and summer camps. Collaborate with instructors to produce invasive species activities, resources, and tool kits and make available to Adirondack teachers, schools, and summer camps. Coordinate with NYS Board of Education, as appropriate. Collaborate with faculty and students at colleges and universities. Contact the Lake Champlain Basin Program Champlain Basin Education Initiative to talk to teachers about invasive species integration into curriculum.

E 2f. Develop Informational Programs about Invasive Species Identification, Management, and Permitting Requirements

Increase awareness among the general public and target audiences about species identification, management techniques, and associated advantages, disadvantages, and costs. Outline permitting requirements.

E 2g. Host a Semi-Annual Invasive Species Forum or Summit

In collaboration with partners, organize a semi-annual invasive species forum in the PRISM (every 2 years) that showcases local projects, addresses needs, and provides a venue for discussing priority invasive species issues in the Adirondack region.

Objective E3. Produce and Deliver Adirondack PRISM Invasive Species Information and Materials

Strategies/Actions

E 3a. Develop and Deliver Displays and Presentations

Use information gathered in Actions E1a and E1b to develop, distribute, or present visual displays and presentations at appropriate venues and events throughout the Adirondack PRISM. Develop or redesign new materials as needed.

E 3b. Prepare and Distribute Publications

Use information gathered in Actions E1a and E1b to develop or acquire new informational publications as necessary, and increase distribution and exposure of the materials to target audiences. Explore innovative ways of distributing invasive species information to a broader audience, such as through APIPP’s invasive species column in the newspaper (printed or online) or through APIPP’s doorhanger notification cards, and with partner efforts, such as the Adirondack Forest Preserve Education Project, a partnership to raise awareness about good stewardship practices while recreating on Forest Preserve.

E 3c. Develop and Utilize Public Service Announcements

Use information gathered in Actions E1a and E1b to develop or redesign public service announcements (PSA) as needed. Create at least one new PSA per year. Distribute PSA's to media outlets throughout the PRISM. Purchase air time to increase their exposure.

E 3d. Organize Mass Mailing to Landowners in the Adirondack Region

Identify opportunities and materials suitable to raise awareness among landowners of the Adirondack region through direct mailings.

E 3e. Post and Maintain Invasive Species Advisory Signs

Assist with the redesign of invasive species advisory signs as needed (eg. AIS signage at boat launches, Didymo signage at river access points, forest pest alerts) and continue to work with partners to post them at all access areas and other appropriate locations in the Adirondack PRISM. AIS signs in the Adirondack PRISM should continue to designate infected lakes.

Objective E4. Support Statewide Education and Outreach Initiatives

Strategies/Actions

E 4a. Support the Development of a Statewide Invasive Species Branding, Marketing, and Advertising Campaign

Advocate for and participate in the development of a statewide invasive species awareness / education campaign to engage residents and visitors of all ages. If a statewide campaign is not possible, then consider launching an awareness / education campaign in the Adirondack PRISM or with neighboring PRISMs. Ensure consistency with national invasive species educational campaigns such as the National Aquatic Nuisance Species Task Force's *Stop Aquatic Hitchhikers*, and *Don't Move Firewood*.

E 4b. Support the NY Invasive Species Clearinghouse and Cornell Cooperative Extension Invasive Species Education Program

Utilize and populate the nysis.info website, a central repository for invasive species-related information in NY. Communicate PRISM education and outreach needs to CCE invasive species staff and collaborate with them to meet those needs.

Outputs

- Communications plan, priority audiences, and approaches identified
- Education program goals and gaps identified
- Publications
- Signage
- Number of presentations and number of citizens reached
- Semi-annual forum or summit
- Positive incentive program for businesses and number of participating businesses
- School activities and number of participating schools
- Branding/marketing and media campaign

Outcomes

- Greater public awareness about invasive species
- Increased public involvement in stewardship efforts
- Improved compliance with spread prevention measures and best management practices
- Elevated public support for invasive species programming
- Increased collaboration and consistent messaging among partners within and outside of the region

GOAL F. Early Detection, Rapid Response, and Monitoring

Objective F1. Maintain Priority Species List

F 1a. Utilize NYS Environmental Invasive Species Ranking Assessment System to Inform the Selection of Priority Species

Review NYS ranks of non-native species. Complete PRISM ranking forms on species known in or to be approaching the region. Compile species ranks and make available on the PRISM website. Update accordingly as new information becomes available.

F 1b. Maintain Comprehensive List of Invasive Species, including Early Detection Species Priorities, in the PRISM

Maintain the list of invasive species and their distributions both within the PRISM and those with the potential to become established. Coordinate listing with other local, state, and regional invasive species efforts.

Objective F2 . Identify Monitoring Needs

Strategies/Actions

F 2a. Compile Information about Existing Monitoring Programs and Identify Information Gaps

In coordination with other local, state, and regional invasive species efforts, utilize existing working groups (eg. All Taxa Biological Inventory) and information from Adirondack monitoring programs, as well as research conducted in other regions, to assist in identifying and examining monitoring needs.

F 2b. Standardize Monitoring and Mapping Protocols

Compile existing protocols and develop standardized protocols, as needed. Consider benefit of collecting additional plant and animal community information in addition to invasive species information.

F 2c. Evaluate Methods to Mark Infestations in the Field, if Appropriate

Evaluate different methods for marking infestations so that they are detectable by staff, volunteers, and scientists and avoidable by recreational users (eg. marking milfoil infestations or marking infestations along the roadway right-of-way). Benefits also include avoiding duplication of inventories and spreading of infestations.

F 2d. Identify and Maintain List of Taxonomists to Assist Invasive Species Identification

Identify names and contact information of experts to assist the identification of invasive species and develop protocols to follow to submit inquiries and specimens.

F 2e. Evaluate New Technologies for Early Detection and Monitoring of Invasive Species

Stay current on innovative approaches to detect invasive species in terrestrial and aquatic settings.

Objective F 3. Coordinate Regional Early Detection Monitoring of Invasive Species

Strategies/Actions

F 3a. Recruit, Train, and Coordinate Citizen Scientists

Identify appropriate citizen groups, or existing working groups such as ATBI, to recruit to assist monitoring programs. Develop training programs accordingly, and provide associated coordination, training, data management, and quality control.

F 3b. Engage Private Landowners and Organizations to Assist Early Detection Efforts on Private Lands

Engage private landowners, volunteer groups (eg. Regional Inlet Invasive Plant Program), industry (eg. foresters, logging companies), businesses (eg. private campgrounds and utilities) to assist with surveys on private lands, logging roads, utility right of ways, private campgrounds, etc.

F 3c. Enhance Early Detection and Monitoring of Aquatic and Terrestrial Invasive Plants

Continue APIPP's invasive plant early detection and monitoring program for species currently infesting lands and waters such as purple loosestrife, garlic mustard, swallowwort, Eurasian watermilfoil, and water chestnut, among others, and for those plant species not yet reported in the PRISM. Compile information annually from monitoring efforts. Explore opportunities to increase citizen involvement in terrestrial invasive plant detection.

F 3d. Enhance Early Detection and Monitoring of Invasive Aquatic Vertebrates

Continue to survey and document the range of invasive fish species and help detect the occurrence of newly introduced species as part of ongoing fish surveys. Hold aquatic invasive animal identification trainings to assist in the collection of baseline data of aquatic invasive animals in the PRISM.

F 3e. Enhance Early Detection and Monitoring of Invasive Aquatic Invertebrates

Continue monitoring lakes, including Lake George, for the presence of invasive aquatic invertebrates such as zebra mussel veligers, Asian clam juveniles, and spiny waterflea. Initiate the notation of the occurrences of nonindigenous aquatic species while analyzing zooplankton taken throughout Adirondack waters. Hold aquatic invasive animal identification trainings to assist in the collection of baseline data of aquatic invasive animals in the PRISM.

F 3f. Enhance Early Detection and Monitoring of Forest Pests and Pathogens

Continue monitoring trees for the presence of forest pests, such as emerald ash borer, Asian longhorned beetle, and hemlock woolly adelgid.

F 3g. Enhance Early Detection and Monitoring of Feral Swine

Continue to survey and document the range of invasive wildlife species and help detect the occurrence of newly introduced species as part of the ongoing wildlife surveys.

F 3h. Enhance Early Detection and Monitoring of Agricultural Insect Pests

Collaborate with CCE and the agricultural community to detect and understand impacts of agricultural pests on important crops in our region.

Objective F 4. Analyze Invasive Species Distribution Data and Prioritize Areas to Monitor

F 4a. Conduct Distribution Analyses and Monitor High Risk Areas

Study distribution trends related to vectors, environmental conditions, and the likelihood of spread of invasive species currently in the PRISM to uninfected lands and waters in the PRISM. Use modeling to predict where species are most likely to spread to inform and prioritize monitoring actions, prevention efforts, and management activities.

Objective F 5: Promote Long-term Monitoring of Management and Restoration Activities

Strategies/Actions

F 5a. Standardize Pre- and Post-Management / Restoration Monitoring Protocols

Develop guidelines to measure the efficacy of management actions, including assessments of native and invasive plant recovery and fish and wildlife assemblages. These guidelines should be manageable and easily replicated by a variety of user groups.

Objective F 6. Develop and Coordinate Rapid Response Protocol for Addressing New Populations of Existing Species and of New Species in the Adirondack PRISM

Strategies/Actions

F 6a. Formalize Rapid Response Protocol

In coordination with state, regional, and national rapid response plan development, and using the Lake Champlain Rapid Response Protocol as a model, develop an Adirondack PRISM Rapid Response Protocol for addressing new invasive species to the region. Identify roles and responsibilities for leadership, training, and coordination associated with the network, to include outlining a regulatory structure of a rapid response framework.

F 6b. Formalize PRISM Response Teams

Form an Invasive Species Rapid Response Network, including an Aquatic Response Team and a Terrestrial Response Team, to detect new invasive species populations and to implement emergency control activities to eliminate a new population of an existing species, or a new species entirely, to prevent populations from reaching expansive levels.

Objective F 7. Facilitate the Development of Community Response Preparedness Plans

Strategies/Actions

F 7a. Encourage Communities and Organizations to Develop Community Preparedness Plans to Respond to Invasive Species

In coordination with CCE and other response planning initiatives, provide guidance to community leaders, organizations, and resident groups on how to prepare for responding to a new, high priority invasive species outbreak.

Objective F 8. Expand the APIPP Volunteer Program and Increase Participation

Strategies/Actions

F 8a. Develop a Comprehensive Invasive Species Volunteer Program

Review current volunteer profiles (this might include the total number recruited and how many are still volunteering); review current volunteer opportunities offered; identify strengths and gaps in the existing volunteer program; and, consider additional volunteer opportunities and/or new audiences to reach out to.

F 8b. Formalize Volunteer Involvement

Communicate specific ways in which various groups of volunteers (eg. citizen scientists, landowners, school groups, etc.) can assist activities based on programmatic needs and volunteer areas of interest (eg. surveyors, plant-pullers, educators, first responders, long-term monitors, etc.).

Outputs

- Completed Non-native Plant Assessment ranking forms
- List of priority species, including early detection species
- Monitoring protocols established
- List of high priority areas to survey
- Early Detection Monitoring Network
- Number of volunteers
- Baseline distribution of invasive species in PRISM
- Pre- and post-treatment monitoring protocol
- Response protocol
- Response Teams
- Number of sites surveyed/treated/controlled
- List of taxonomic experts
- Number of community preparedness plans
- Number of opportunities for volunteer engagement

Outcomes

- Efficiencies in detection and response
- Public awareness and support of invasive species programming
- Increased resource protection

GOAL G. Control and Management

Objective G1. Prioritize and Select Management Goals

Strategies/Actions

G 1a. Maintain Plant Management Matrix

Keep current the description of the species in the region and the thresholds for where and when management occurs.

G 1b. Utilize the Invasive Plant Management Decision Analysis Tool (IPMDAT) to Inform the Selection of New Projects

Use the IPMDAT to evaluate new management projects and determine whether those projects should proceed. Create a list of priority projects. Track management over time. Periodically update the prioritized list.

Objective G 2. Streamline Regulatory Procedures for Management

Strategies/Actions

G 2a. Review and Submit Recommendations for Regulatory Programs and Permitting Improvements

Assess the regulatory process related to invasive species to identify redundancies or inadequacies and submit recommendations for improvements (eg. Interagency Guidelines for the Management of Invasive Plants on Forest Preserve in the Adirondack Park, wetland permitting, etc.)

G 2b. Centralize Guidance Documents for Permitting Processes

Develop an online repository containing frequently asked questions about invasive species and management and associated forms such as jurisdictional inquiry form and highway work permits and invasive species control permit applications.

Objective G 3. Provide Guidance on Best Management Practices and Projects

Strategies/Actions

G 3a. Maintain Current List of Best Management Practices (BMPs)

Compile, review, and update existing BMPs to manage invasive species and develop guidelines with broad watershed applicability for use by community members, partners, state and local officials, and highway departments.

G 3b. Promote the utility of NYS DEC's and NYS Federation of Lake Association's "Diet for a Small Lake" as a Reference Document

Utilize and promote "Diet for a Small Lake" and "A Primer on Aquatic Plant Management in New York State" to provide guidance on how to prepare a lakewide aquatic invasive plant management plan.

G 3c. Compile and Communicate Containment Strategies

Consider containment strategies for invasive species during rapid response and management programs including booms, barriers, restrictions, quarantines, and signage.

G 3d. Maintain List and Assessment of Management Projects

Compile a list of management projects including criteria such as locations, strategy, successes/challenges, funding, year initiated, active/inactive, and contacts, etc. that can be shared with groups engaging in management projects. Update lists regularly as new information becomes available.

G 3e. Maintain List and Assessment of Management Projects; Develop List of Contractors

Develop a list of contact information for certified applicators, managers, etc. to whom organizations and the public can be referred who are interested in attaining assistance with management projects. Update lists regularly as new information becomes available.

Strategy G 4. Continue or Accelerate Existing Control and Other Management Programs

G 4a. Aquatic Invasive Plant Management

Set strategic goals for regional aquatic invasive plant management. Implement and expand aquatic plant management programs in the PRISM in order to maintain the plant populations at, or below, nuisance levels and to prevent further spread. Private, public, and state-owned waters should be considered.

G 4b. Train Volunteers to Hand-harvest Aquatic Invasive Plants

Adapt training programs developed in other states to train citizens to hand-harvest aquatic invasive plant infestations. Provide associated coordination, supervision, and monitoring, as appropriate.

G 4c. Terrestrial Invasive Plant Management

Set strategic goals for regional terrestrial invasive plant management. Continue to implement monitoring and control programs for priority species including purple loosestrife, Phragmites, garlic mustard, yellow iris, Japanese knotweed, swallow-wort etc.

G 4d. Statewide Purple Loosestrife Biocontrol Program

Continue to implement the purple loosestrife biological control and monitoring program at Adirondack sites, including Wadhams, Elizabethtown, Peru, Saranac River, Willsboro, Westport, and Lake Placid. Encourage communities to lead biocontrol projects in appropriate locations.

G 4e. Statewide Giant Hogweed Control Program

Continue to manage giant hogweed infestations in the Adirondack region and collaborate with DEC's Giant Hogweed Control Program.

G 4f. Aquatic Invasive Invertebrate Management

Support partners' efforts to remove zebra mussels and Asian clam at high-risk sites. Control priority populations of organisms resulting from Objective F.

G 4g. Aquatic Invasive Vertebrate Management

Support efforts led by the DEC to manage invasive fish populations.

G 4h. Forest Pest and Pathogen Management

Support efforts among state, federal, and private partners to manage forest pest populations.

G 4i. Feral Swine Management

Support efforts among state and federal partners to manage invasive wildlife populations.

G 4j. Inform and Direct Research Activities, eg. Technology Transfer

Use information from Strategy G4 to inform and direct research activities in Strategy J1.

Strategy G 5. Engage Private Landowners, Organizations and Industry to Assist in Management

Strategies/Actions

G 5a. Expand the Regional Inlet Invasive Plant Program

Lend guidance and support efforts to expand this community-based approach to Japanese knotweed control in the Adirondack region.

G 5b. Collaborate with Private Landowners / Lake Associations

Reach out to landowner groups and lake associations to provide them with the informational tools to help manage priority infestations on private lands and waters.

G 5c. Collaborate with Industry

Reach out to industry groups (eg. foresters, logging companies, contractors, landscapers and utility professionals) to provide them with the informational tools and support to manage priority infestations within their jurisdictions.

G 5d. Collaborate with Local Governments

Reach out to municipalities to provide them with the informational tools and support to help manage priority infestations.

G 5e. Collaborate with the Agricultural Community

In collaboration with CCE, reach out to the farming community to provide informational tools and support to manage priority infestations on their lands and mitigate pest impacts on their crops.

Outputs

- List of priority AIPPP management projects, plant management matrices, and IPMDAT worksheets
- List of local management projects underway, and contractors
- Guidance documents, including current BMPs and planning templates
- Permits, and improved regulations and policies

Outcomes

- Reduced threat to target habitats, resources, communities, etc.
- Improved management efficacy
- Broader participation and investment in invasive species control
- Recovery of target flora and fauna
- Improved ecological form and function
- Greater resilience to future invasions

GOAL H. Information Management

Objective H 1. Maintain Current Regional Invasive Species Distribution Database

Strategies/Actions

H 1a. Use WIMS (Weed Information Management System) to Track Terrestrial Invasive Plant Distribution and Treatment Data

Track occurrence, assessment, and treatment information for infestations in the Adirondack PRISM and upload to iMapinvasives.

H 1b. Integrate the Adirondack Aquatic Database and iMapInvasives

Share data stored and collected in APIPP's online aquatic invasive species database with iMapinvasives. Integrate iMap data collection and reporting protocols into the Aquatic Project.

H 1c. Use GIS to Analyze Terrestrial and Aquatic Species Distribution Trends in the PRISM

Use distribution data and other variables to map, analyze, and inform prevention and management priorities.

Objective H 2. Increase Opportunities for Sharing Invasive Species Information throughout the Adirondack PRISM and Beyond

Strategies/Actions

H 2a. Contribute Data to and Promote Use of iMap

Share invasive species distribution data with partners throughout the PRISM and state and encourage partners to contribute data to iMapinvasives.

H 2b. Contribute Data to SUNY ESF ArcGIS Information Group

Share invasive species distribution data with the ArcGIS Information Group, a repository for varied datasets detailing conditions on forest preserve.

H 2c. Coordinate Information Exchange with other Programs

Stay informed of and share results with monitoring actions and planning efforts in Adirondack watershed systems, Forest Preserve, transportation and utilities.

Outputs

- Current WIMS database
- Current Aquatic database
- Accurate data being used in shared databases, ArcGIS, iMap, etc.
- Number of registered iMap users

Outcomes

- Improved access to information by managers and the public
- Consolidation of datasets
- Strategic prevention and management
- Measures of success clearly communicated
- Coordinated action

GOAL I. Restoration

Objective I1. Implement Restoration of Impacted Ecosystems

Strategies/Actions

I 1a. Assess and Prioritize Invaded Communities

Identify where and under what circumstances restoration activities should go beyond removal of the problem species, ie. native species should be restored and how restoration will be maintained (eg. long-term monitoring, assessment, and adaptive management).

I 1b. Restore Degraded Systems

Use information from USFWS, NRCS, and other agency cost-sharing programs to control and eradicate infestations of invasive species and restore ecological form and function. Evaluate success based on monitoring and measures set forth in F5.

Outputs

- List of priority areas for restoration

Outcomes

- Recovery of target flora and fauna
- Improved form and function
- Greater resilience to future invasions

GOAL J. Research

Objective J1. Identify Priority Research Projects in the PRISM

Strategies/Actions

J 1a. Form Scientific Review Advisory Board

Consider forming a technical scientific committee that will help to identify priority research questions, needs, projects, and methods.

J 1b. Compile List of Priority and Ongoing Research in the Region

Maintain description of faculty and student research on invasive species occurring in the Adirondack region.

Objective J2. Collaborate with Schools, Colleges, and Universities to Meet Research Needs

Strategies/Actions

J 2a. Foster Information Sharing between PRISM and Academic Institutions

Track research projects underway such as investigating the ecological role of current invasive species, assessing role of potential invaders, evaluating social perspectives about invasives, and efficacy of management techniques.

J 2b. Provide Forum for Sharing Regional Research Projects

Promote regular sharing of research projects in the Adirondacks via existing or new forums (eg. Adirondack Research Consortium, APIPP's annual report etc).

J 2c. Collaborate with the NY Invasive Species Research Institute

Share regional priorities, needs, and projects with the Coordinator of the Invasive Species Research Institute. Provide regional information as requested.

Objective J3. List of Possible Research Projects

Strategies/Actions

J 3a. Evaluate Distribution and Possible Impacts of Invasive Earthworms

Conduct experiments to better understand earthworm populations, their distributions, and impacts on associated fauna (eg. salamanders).

J 3b. Investigate Impact of Watched Species and Cryptogenic Species

Evaluate which conditions are favorable for invasion by species native to the U.S. but with potential to be regionally invasive and their associated impacts, eg. variable leaf watermilfoil (*Myriophyllum heterophyllum*) and swollen bladderwort (*Utricularia inflata*).

J 3c. Evaluate Controls for Invasive Plants

Continue to evaluate the effectiveness, efficiency, and impacts of past and ongoing invasive species physical control activities within NY, including the use of barriers, hand-pulling, excavation, and lake drawdowns etc.; mechanical controls, including the use of suction harvesting, mechanical harvesting, hydroraking, or mowing etc.; chemical controls; and biological controls. There is a need for replicated field experiments to evaluate effectiveness and sites should be of varying geo-physical conditions.

J 3d. Evaluate Physical, Mechanical, Chemical and Biological Controls for Invasive Animals

Conduct research to develop controls and/or evaluate impacts of invasive species including alewife in Green Pond, zebra mussels and Asian clam in Lake George, other aquatic invaders, wildlife (eg. feral swine), or forest pests and pathogens.

J 3e. Evaluate Social Perspectives about Invasive Species

Conduct research to better understand social perceptions of IS and efficacy of messaging to change behaviors.

J 3f. Utilize eDNA to Determine Susceptibility and Distribution of Aquatic Invasive Species in Adirondack Waters

Conduct research to better understand capabilities and application of using eDNA to detect presence of AIS.

Outputs

- Scientific Advisory Board
- Invasive species research network
- List of research projects underway, priority research projects/needs identified
- Number of faculty involved
- Number of students involved
- Number of projects underway

Outcomes

- Improved communication between scientists and managers
- Applied needs met through relevant research
- Reduction in duplicative research
- Improved science-based decision making
- Increased efficacy in prevention and management projects

GOAL K. Climate Change Adaptation

Objective K1. Evaluate How Climate Change May Further Expand or Reduce Invasive Species in the Adirondack PRISM

Strategies/Actions

K 1a. Compile Existing Information about How Climate Change is Expected to Alter Invasive Species Problems in Natural Areas and Human Communities

Conduct literature searches, including reviewing NYSERDA's Climaid report (2011), and interview ecologists/scientists as needed to determine possible changes and impacts of climate change and appropriate adaptation strategies. Consider implications for invasive plants, aquatic invasive species, and forest pests and pathogens and associated prevention and management.

K 1b. Develop List of Guiding Principles

Based on K 1a, develop a list of guiding principles and adaptation strategies that PRISM partners, communities, and resource managers can take (eg. increased detection networks, monitoring of management efficacy, increased resourcing for extended growing seasons, etc).

K 1c. Implement Guiding Principles into Planning and Projects

Based on K 1b, incorporate principles into project planning and project work and facilitate incorporation by partners and communities.

Objective K2. Communicate with Communities and Resource Managers about Steps to Take to Prepare for / Respond to Invasive Species in a Changing Climate

Strategies/Actions

K 2a. Develop Climate Change Communications Strategy

Work with partners to develop a communications and outreach strategy to inform the public, elected officials, and resource managers about how best to prepare for invasive species problems in a changing climate.

K 2b. Serve as an Informational Resource following Extreme Weather Events

Assist localities by providing invasive species guidance on actions to take to minimize invasive species impacts following extreme disturbance events (eg. floods, fire, drought). Reach out to affected communities to identify the invasive species threats that may have been aggravated due to extreme weather events and provide recommendations for prevention, management, and mitigation.

Outputs

- References cited for research and programmatic papers
- Assessment of projected changes
- List of guiding principles for climate change adaptation
- Communications strategy for reaching priority audiences

Outcomes

- Improved detection and response efforts to species in a changing climate
- Community preparedness following severe weather events

GOAL L. Resource Development and Funding

Objective L1. Identify Funding Need, Develop Fundraising Plan, and Seek Funding

Strategies/Actions

L 1a. Compile Costs of Plan Implementation

Estimate costs of implementing each objective and/or strategy, as appropriate.

L 1b. Develop Case Statement for Regional Invasive Species Programming

Prepare a written statement explaining the need for and benefits of implementing a regional invasive species program.

L 1c. Develop Fundraising Plan and Seek Funding to Support Plan Implementation

Identify state, federal, grant, and private funding sources to support strategy implementation, noting highest priority actions.

Objective L2. Identify Opportunities to Cost Share Projects

Strategies/Actions

L 2a. Assess Creating Weed and Watershed Management Improvement Districts

Assess the utility of forming weed and/or watershed management improvement districts to help fund local management actions. Identify localities that implemented a tax district and summarize advantages and disadvantages.

L 2b. Evaluate Mechanisms to Collect Tax Deductible Donations from the Public to Support Local Prevention and Management Programs

Evaluate organizational options for communities in need of collecting tax deductible donations (eg. Adirondack Community Trust, Adirondack Sustainable Communities Inc.)

L 2c. Investigate Innovative New Ways of Raising Funds to Support Project Work

Collaborate with partners to explore opportunities to leverage resources to the region.

Objective L 3. Assess the Economic Impact of Invasive Species on the Adirondack PRISM to Help Leverage Support for Funding the Implementation of the Plan

Strategy/Action

L 3a. Conduct Economic Impact Analysis

Evaluate options and methods for conducting a cost-benefit assessment of prevention and management in the Adirondack region.

Outputs

- Description of itemized funding need
- Fundraising plan
- Case statement
- Economic impact study

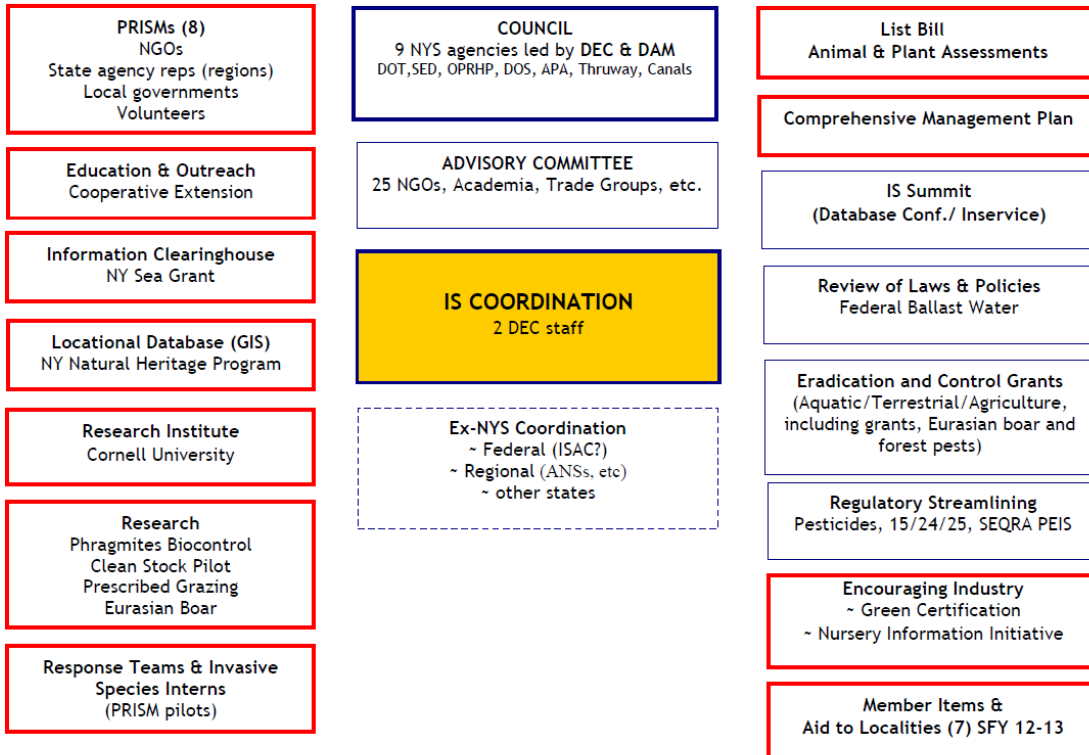
Outcomes

- Understanding of the true costs of prevention and management
- Improved public support for invasive species programming
- Resources to support priority actions

APPENDIX A. NYS Invasive Species Program Organizational Chart and Supporting Programs

Invasive Species Coordination in New York State

RED - Contracts SOLID LINES - Statutory Tasks (ECL 9, Title 17) DASHED - Not in Statute



April 2013

APPENDIX B. PRISM Staff and Partners

1998 Founding Principle Partners⁹

Adirondack Chapter of The Nature Conservancy
NYS Adirondack Park Agency
NYS Department of Environmental Conservation
NYS Department of Transportation

2009 Additional Invited Principle Partners¹⁰

Lake Champlain Basin Program
National Grid
NYS Department of Agriculture and Markets
Paul Smith's College
Sustainable Forestry Initiative, Empire State Forest Products Association

Advisory and Cooperating Partners¹¹

Adirondack Council
Adirondack Mountain Club
Au Sable River Association
Boquet River Association
Cornell Cooperative Extension County Programs (Clinton, Essex, Hamilton, St. Lawrence and Warren, and CCE Invasive Species Program)
East Shore Schroon Lake Association / Adirondack Lake Alliance
Hamilton County Soil and Water Conservation District
Lake Champlain Lake George Regional Planning Board
Lake Champlain Sea Grant
Lake George Land Conservancy
Lake George Park Commission
United State Department of Agriculture, APHIS/PPQ
Chateaugay Lake Foundation
Lake George Association
Lewis Creek Association, Vermont
Rainbow Lake Association
Upper Saranac Lake Foundation

Staff

Program Director
Aquatic Invasive Species Project Coordinator
Terrestrial Invasive Species Project Coordinator
Seasonal Intern

⁹ Organizations that formed the partnership in 1998 and help sustain its operation through present day.

¹⁰ Organizations that were invited to join the founding partners in a steering committee / administrative role. Invited principle partners had a regional or statewide focus and represented new constituencies that could bring new expertise, energy, and innovation to the partnership.

¹¹ Core organizations that attend APIPP's spring and fall partnership meetings and committee meetings as needed, and participate in planning and implementation throughout the year. Principle partners also serve in this capacity.

Cooperators¹²

More than 500 Volunteers
Adirondack Association of Towns and Villages
Adirondack Cooperative Loon Program
Adirondack Information Group, Inc.
Adirondack Lake Survey Corporation
Adirondack Landowners' Association
Adirondack Museum
Adirondack North Country Association
Adirondack Park Local Government Review Board
Adirondack Watershed Alliance
All Taxa Biodiversity Inventory
Bass Angler Sportsmen Society
Becket-Chimney Corners YMCA
CAP-21
Clinton and Essex County Master Gardeners
Darrin Fresh Water Institute
Essex County Adirondack Garden Club
Great Sacandaga Lake Advisory Committee
Hudson River Black River Regulation District
Lake George Watershed Conference
Massawepie Scout Camps
Natural History Museum of the Adirondacks
NYS Office of Parks, Recreation and Historic Preservation
NYS Department of State
North Country School and Camp Treetops
Protect!
Regional Inlet Invasive Plant Program
Regional Office of Sustainable Tourism
Student Conservation Association
SUNY ESF Wanakena, Newcomb
SUNY Plattsburgh
Town of Inlet
Town of Minerva
Trout Unlimited
Warren County Soil and Water Conservation District
Wildlife Conservation Society

Shoreowner groups including, but not limited to

6th and 7th Lakes Association
Beaver Lake Association
Bellmont Mountain View Indian Lakes Foundation
Big Moose Property Owners' Association
Big Wolf Lake Association

¹² Organizations, resident groups, and volunteers who are involved in PRISM activities on an individual basis or as-needed and opportunities arise. There may be additional participating cooperators than are listed.

Blue Mountain Lake Association
Brandreth Lake Association
Brant Lake Association
Brantingham Lake Association
Canada Lake Association
Chateaugay Lakes Association
Chazy Lake
Cranberry Lake Boat Club
East Caroga Lake Protective Association
Friends Lake Association
Fulton Chain of Lakes Association
Great Sacandaga Lake Association
Gull Pond Association
Hadlock Lake Association
Horseshoe Pond/Deer River Flow Association
Indian Lake Association
Jones Pond Association
Lake Colby Association
Lake Placid Shoreowners Association
Lake Pleasant Sacandaga Association
Lake Luzerne
Little Long Lake Association
Livingston Lake Association
Long Lake Association
Long Pond Association
Loon Lake Association
Lower Saranac Lake Association
Minerva Lake
Mirror Lake Association
Mt Arab Eagle Crag Association
Mt View and Indian Lakes Association
Osgood Pond Association
Paradox Lake Association
Piseco Lake Association
Raquette Lake Property Owners' Association
Schroon Lake Association
Silver Lake Association
St. Regis Chain of Lakes Association
Star Lake Protective Association
Spy Lake Association
Upper Saranac Lake Association
West Caroga Lake Association

APPENDIX C. Invasive and Non-native Plants in the Adirondack PRISM

Adirondack PRISM: Invasive and Non-Native Plants					
Updated April 2013					
Scientific Name	Common Name	Growth Habit¹	Habitat²	NYS Threat Ranking³	Species Distribution and Abundance⁴
<i>Ailanthus altissima</i>	Tree-of-heaven	tree	forest	M (68)	Restricted
<i>Ampelopsis brevipedunculata</i>	Porcelain-berry	woody vine	forest	H (71.26)	Not Present
<i>Egeria densa</i>	Brazilian waterweed	submerged plant	aquatic	H (74.71)	Not Present
<i>Hydrilla verticillata</i>	Hydrilla	submerged plant	aquatic	VH (91.40)	Not Present
<i>Microstegium vimineum</i>	Japanese stilt grass	graminoid	forest	VH (85.00)	Approaching
<i>Nitellopsis obtusa</i>	Starry stonewort	algae	aquatic		Approaching
<i>Polygonum perfoliatum</i>	Mile a minute vine	forb/herb	forest	VH (91.11)	Approaching
<i>Pueraria montana var. lobata</i>	Kudzu	herbaceous vine	forest	VH (84.44)	Approaching
<i>Cyanum rossicum</i>	Pale swallow-wort	herbaceous vine	forest	VH (87.63)	Restricted
<i>Cynanchum louiseae</i>	Black swallow-wort	herbaceous vine	forest	VH (89.69)	Common
<i>Heracleum mantegazzianum</i>	Giant hogweed	forb/herb	grasslands or mowed	H (72.00)	Common
<i>Najas minor</i>	Brittle naiad	submerged plant	aquatic	M (64.84)	Common
<i>Nymphoides peltata</i>	Yellow floating heart	floating plant	aquatic	H (74.47)	Restricted
<i>Trapa natans</i>	Water chestnut	floating plant	aquatic	VH (82.00)	Common
<i>Acer platanoides</i>	Norway maple	tree	forest	VH (82.00)	Widespread

Scientific Name	Common Name	Growth Habit¹	Habitat²	NYS Threat Ranking³	Species Distribution and Abundance⁴
<i>Acer pseudoplatanus</i>	Sycamore-leaved maple	tree	forest	H (71.11)	Common
<i>Aegopodium podagraria</i>	Goutweed	forb/herb	grasslands or mowed	M (67.50)	Widespread
<i>Alliaria petiolata</i>	Garlic mustard	forb/herb	forest	VH (84.00)	Widespread
<i>Anthriscus sylvestris</i>	Wild chervil	forb/herb	grasslands or mowed	H (78.75)	Widespread
<i>Artemisia vulgaris</i>	Mugwort	forb/herb	grasslands or mowed	H (79.31)	Widespread
<i>Berberis thunbergii</i>	Japanese barberry	shrub	forest	VH (91.00)	Widespread
<i>Berberis vulgaris</i>	Common barberry	shrub	forest	M (68.75)	Widespread
<i>Butomus umbellatus</i>	Flowering rush	forb/herb	emergent wetland	Not Assessed	Widespread
<i>Cabomba caroliniana</i>	Fanwort	submerged plant	aquatic	H (72.34)	Common
<i>Celastrus orbiculatus</i>	Asiatic bittersweet	woody vine	forest	VH (86.67)	Widespread
<i>Centaurea jacea</i>	Brown knapweed	forb/herb	grasslands or mowed	M (62.34)	Widespread
<i>Centaurea biebersteinii</i>	Spotted knapweed	forb/herb	grasslands or mowed	H (78.89)	Widespread
<i>Eleagnus angustifolia</i>	Russian olive	shrub	grasslands or mowed	M (68.00)	Widespread
<i>Eleagnus umbellata</i>	Autumn olive	shrub	grasslands or mowed	VH (94.00)	Widespread
<i>Euonymus alatus</i>	Winged euonymus	shrub	grasslands or mowed	VH (81.25)	Widespread
<i>Hieracium lachenalii</i>	European hawkweed	forb/herb	grasslands or mowed	Not Assessed	Widespread
<i>Hieracium murorum</i>	Wall hawkweed	forb/herb	grasslands or mowed	Not Assessed	Widespread
<i>Hydrocharis morsus-ranae</i>	European frog-bit	floating plant	aquatic	VH (85.57)	Common

Scientific Name	Common Name	Growth Habit ¹	Habitat ²	NYS Threat Ranking ³	Species Distribution and Abundance ⁴
<i>Iris pseudacorus</i>	Yellow iris	forb/herb	emergent wetland	H (76.00)	Widespread
<i>Ligustrum vulgare</i>	Wild/Common/European privet	shrub	forest	M (67.82)	Common
<i>Ligustrum obtusifolium</i>	Privet	shrub	forest	H (76.67)	Common
<i>Lonicera japonica</i>	Japanese honeysuckle	woody vine	forest	VH (83.51)	Common
<i>Lonicera tatarica / morrowii / maackii / x bella / xylosteum</i>	Tartarian, Morrow's, Amur/Bush, Bell's, Fly/European honeysuckles	shrub	forest	VH (84.44/85.54)	Widespread
<i>Lythrum salicaria</i>	Purple loosestrife	forb/herb	emergent wetland	VH (91.00)	Widespread
<i>Mycelis muralis (Lactuca muralis)</i>	Wall lettuce	forb/herb	forest	Not Assessed	Widespread
<i>Myriophyllum heterophyllum</i>	Variable water milfoil	submerged plant	aquatic	VH (93.62)	Widespread
<i>Myriophyllum spicatum L.</i>	Eurasian water milfoil	submerged plant	aquatic	VH (100.00)	Widespread
<i>Pastinaca sativa</i>	Wild parsnip	forb/herb	grasslands or mowed	Not Assessed	Widespread
<i>Phalaris arundinacea or canariensis</i>	Reed canary grass	graminoid	wetland	H (77.78)	Widespread
<i>Phragmites australis</i>	Common reed grass	graminoid	wetland	VH (92.00)	Widespread
<i>Polygonum cuspidatum (Fallopia japonica, F. sacchalinensis and F.x bohémica)</i>	Japanese knotweed, Giant knotweed, Bohemian knotweed	forb/herb	riparian	VH (97.94)	Widespread
<i>Potamogeton crispus</i>	Curlyleaf pondweed	submerged plant	aquatic	H (79.79)	Widespread
<i>Ranunculus ficaria</i>	Fig buttercup/lesser celandine	forb/herb	riparian	VH (85.56)	Restricted
<i>Rhamnus cathartica</i>	Common buckthorn	shrub	forest	VH (81.00)	Widespread
<i>Rhamnus frangula</i>	Glossy buckthorn	shrub	forest	Not Assessed	Widespread
<i>Robinia pseudoacacia</i>	Black locust	tree	forest	VH (81.11)	Widespread

Scientific Name	Common Name	Growth Habit ¹	Habitat ²	NYS Threat Ranking ³	Species Distribution and Abundance ⁴
<i>Rosa multiflora</i>	Multiflora rose	shrub	grasslands or mowed	VH (89.00)	Widespread
<i>Rosa rugosa</i>	Rugosa rose	shrub	grasslands or mowed	M (63.44)	Common
<i>Silphium perfoliatum</i>	Indian cup plant	forb/herb	riparian	H (77.78)	Widespread
<i>Typha x glauca</i>	Hybrid cattail	forb/herb	emergent wetland	Not Assessed	Widespread
<i>Utricularia inflata</i>	Swollen bladderwort	submerged plant	aquatic	Not Assessed	Common
<i>Cirsium arvense</i>	Canada thistle	forb/herb	grasslands or mowed	H (71.00)	Widespread
<i>Cirsium vulgare</i>	Bull thistle	forb/herb	grasslands or mowed	Not Assessed	Widespread
<i>Euphorbia cyparissias</i>	Cypress spurge	forb/herb	grasslands or mowed	H (75.32)	Widespread
<i>Melilotus alba</i>	White sweet clover	forb/herb	grasslands or mowed	Not Assessed	Widespread
<i>Melilotus officinalis</i>	Yellow clover	forb/herb	grasslands or mowed	Not Assessed	Widespread
<i>Buddleja davidii</i>	Butterfly bush	shrub	forest	L (45.45)	Common
<i>Carum carvii</i>	Wild caraway	forb/herb	grasslands or mowed	Not Assessed	Restricted
<i>Datura stramonium</i>	Jimsonweed	forb/herb	grasslands or mowed	M (50.00)	Common
<i>Digitalis grandiflora</i>	Big-flowered foxglove	forb/herb	forest	Not Assessed	Common
<i>Digitalis purpurea</i>	Common/Purple foxglove	forb/herb	forest	M (53.33)	Common
<i>Eleagnus multiflora</i>	Cherry silverberry	shrub	forest	Not Assessed	Restricted
<i>Epipactus helleborine</i>	Broad-leaved helleborine	forb/herb	grasslands or mowed	Not Assessed	
<i>Robinia hispida</i>	Bristly locust	shrub	forest, edge	L (48.28)	Restricted

Scientific Name	Common Name	Growth Habit ¹	Habitat ²	NYS Threat Ranking ³	Species Distribution and Abundance ⁴
<i>Salix cinerea</i>	European gray willow	shrub	forested wetland	Not Assessed	Not Present
<i>Salix fragilis</i>	Crack willow	tree	forested wetland	Not Assessed	Restricted
<i>Sorbaria sorbarifolia</i>	False spirea	forb/herb	riparian	Unknown	Common
<i>Syringa reticulata</i>	Japanese tree lilac	tree	forest	Unknown	Approaching
<i>Vinca minor</i>	Common periwinkle	herbaceous vine	forest	M (57.14)	Widespread
<i>Wisteria floribunda, sinensis</i>	Wisteria	woody vine	forest, edge	M (58.76)	Restricted
<i>Eichhornia crassipes</i>	Water hyacinth	floating plant	aquatic	NA	Not Persisting
<i>Myriophyllum aquaticum</i>	Parrot feather	floating plant	aquatic	H (76.67)	Not Present
<i>Paulownia tomentosa</i>	Princess tree	tree	forest	M (51.11)	Not Persisting
<i>Pistia stratiotes</i>	Water lettuce	floating plant	aquatic	NA	Not Persisting

Footnote 1: Growth Habit = tree, shrub, woody vine, herbaceous vine, forb/herb, or graminoid

Footnote 2: Habitat = aquatic, forest, emergent wetlands, forested wetlands, riparian, grassland or mowed, disturbed bare soil

Footnote 3: Threat Ranking = Refer to "New York State Ranking System for Evaluating Non-Native Plant Species for Invasiveness" (Jordan, M.J., G. Moore and T.W. Weldy)

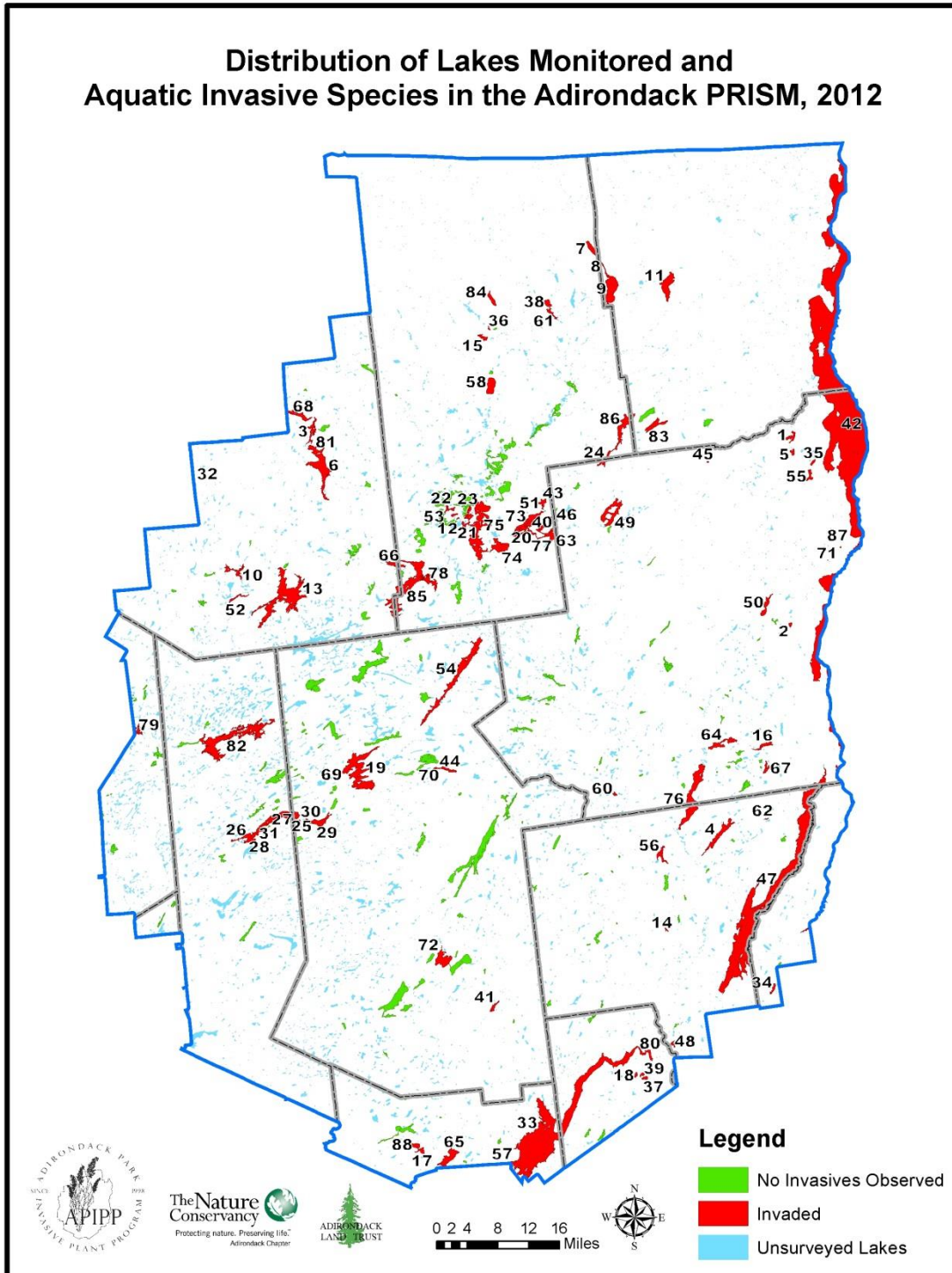
Footnote 4: Species Distribution and Abundance at PRISM Level in natural areas = Approaching (Not present but known to be in adjacent PRISMs); Restricted (Occurs in three or fewer natural areas (locations that are at least ¼ mile apart) with no infested area >1 acre or containing >100 individuals); Common (Present in 4–10 natural areas, or with one occupied location >1 acre or containing >100 individuals); Widespread (Present in >10 minimally managed areas); Not persisting (Present but not known to overwinter); Unknown (new discovery)

Species Distribution and Abundance categories informed by AIPP and iMapInvasive databases and field observations.

APPENDIX D. 2012 Invasive Species Distribution Maps

Distribution of lakes within the Adirondack PRISM that contain aquatic invasive species.

**Please refer to the table below to find lakes that correspond to numbers on the map.*

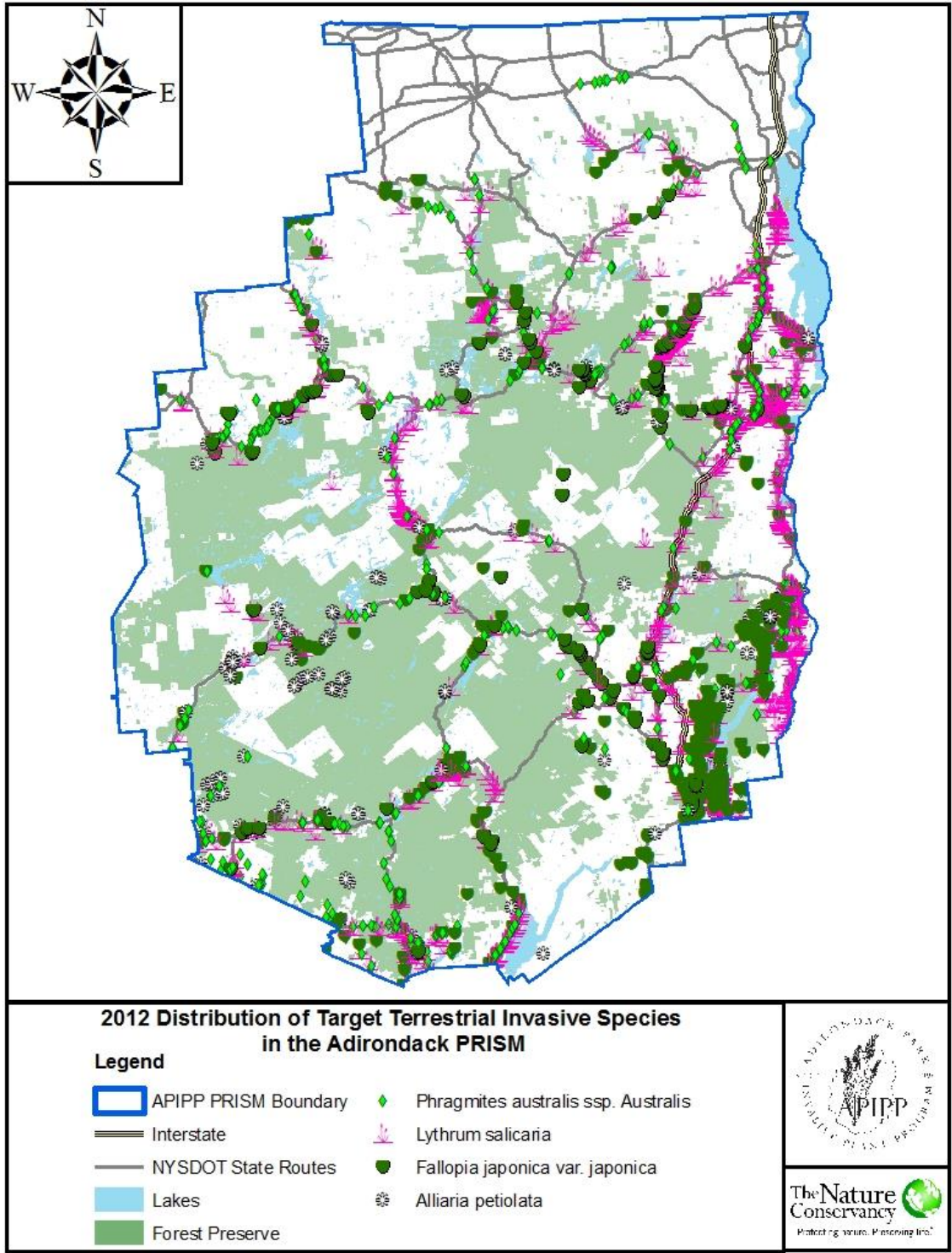


LIST OF ADIRONDACK WATERS WITH AQUATIC INVASIVE SPECIES		Key					EF - European Frog-bit						
		EWM - Eurasian Watermilfoil					Fan - Fanwort						
		VLM – Variable-leaf Milfoil					SWF - Spiny Waterflea						
		CLP – Curly-leaf Pondweed					BN - Brittle Naiad						
		WC - Water Chestnut					AC - Asian Clam						
		ZM - Zebra Mussel					YFH - Yellow Floating Heart						
Name (Alphabetized)	#	EWM	VLM	CLP	WC	ZM	EF	Fan	SWF	BN	AC	YFH	
Augur Lake	1	X											
Bartlett Pond	2	X											
Blake Reservoir	3		X										
Brant Lake	4	X		X									
Butternut Pond	5	X											
Carry Falls Reservoir	6		X										
Chateaugay Lake (Lower)	7	X											
Chateaugay Lake (Narrows)	8	X											
Chateaugay Lake (Upper)	9	X											
Chaumont Pond	10		X										
Chazy Lake	11	X											
Copperas Pond	12	X											
Cranberry Lake	13		X										
Daggett Pond	14	X											
Deer River Flow	15	X											
Eagle Lake (Essex - Ticonderoga)	16	X											
East Caroga Lake	17	X											
Efner Lake	18							X					
Eldon Lake	19		X										
First Pond, Saranac Chain	20	X											
Fish Creek Ponds	21	X											
Floodwood Pond	22	X											
Follensby Clear Pond	23	X											
Franklin Falls Flow	24	X		X									
Fulton Chain, Fifth Lake	25	X	X										
Fulton Chain, First Lake	26		X										
Fulton Chain, Fourth Lake	27	X	X										
Fulton Chain, Second Lake	28	X	X										
Fulton Chain, Seventh Lake	29	X	X										
Fulton Chain, Sixth Lake	30	X	X										

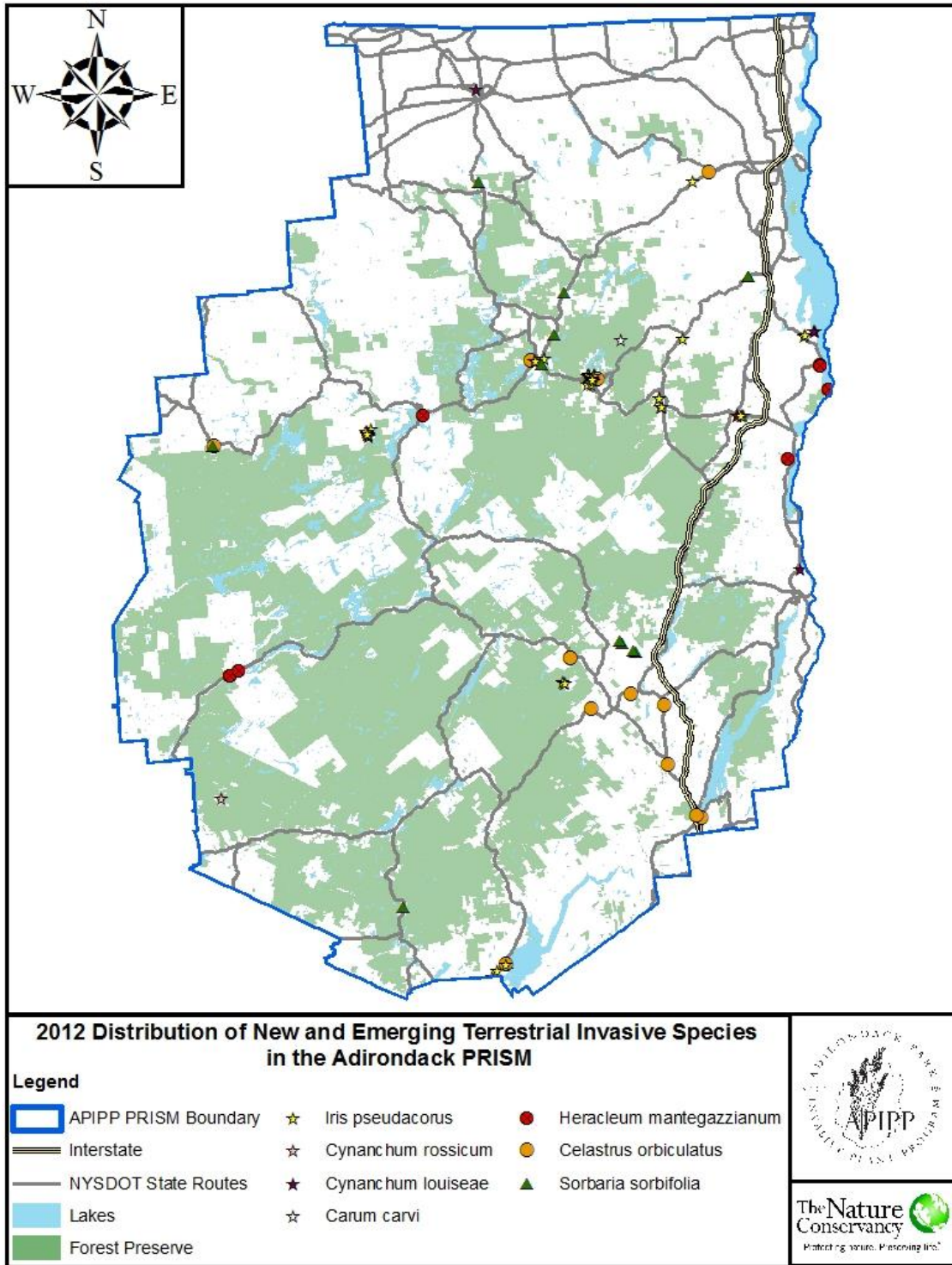
Name (Alphabetized)	#	EWM	VLM	CLP	WC	ZM	EF	Fan	SWF	BN	AC	YFH
Fulton Chain, Third Lake	31		X									
Grasse River at Lampson Falls	32						X					
Great Sacandaga Lake	33	X							X	X		
Hadlock Pond	34	X		X	X					X		
Highlands Forge Lake	35	X										
Horseshoe Pond (Franklin - Duane)	36	X										
Hunt Lake	37							X				
Indian Lake (Franklin)	38	X										
Jenny Lake	39							X				
Kiwassa Lake	40	X										
Lake Algonquin	41	X										
Lake Champlain	42	X	X	X	X	X	X			X		X
Lake Colby	43	X										
Lake Durant	44		X									
Lake Eaton (Essex)	45						X					
Lake Flower	46	X	X	X								
Lake George	47	X		X		X			X	X	X	
Lake Luzerne	48	X		X								
Lake Placid	49		X									
Lincoln Pond	50	X										
Little Colby Pond	51	X										
Little River Flow	52		X									
Little Square Pond	53	X										
Long Lake (Hamilton)	54		X									
Long Pond (Echo Lake - Essex County)	55	X										
Loon Lake (Warren County)	56	X										
Mayfield Lake	57	X		X								
Meacham Lake	58	X										
Mill Pond (Saratoga County)	59							X				
Minerva Lake	60	X										
Mountain View Lake	61	X										
North Pond	62	X										
Oseetah Lake	63	X	X									
Paradox Lake	64	X		X								
Peck Lake	65								X			

Name (Alphabetized)	#	EWM	VLM	CLP	WC	ZM	EF	Fan	SWF	BN	AC	YFH
Piercefield Flow	66		X									
Putnam Pond	67	X										
Rainbow Falls Reservoir	68		X									
Raquette Lake	69		X									
Rock Pond (Hamilton)	70		X									
Rogers Pond	71						X					
Sacandaga Lake	72								X			
Saranac Lake, Lower	73	X		X								
Saranac Lake, Middle	74	X										
Saranac Lake, Upper	75	X										
Schroon Lake	76	X		X								
Second Pond, Saranac Chain	77	X	X									
Simon Pond	78		X									
Soft Maple Reservoir	79		X									
Stewarts Bridge Reservoir	80								X			
Stark Falls Reservoir	81		X									
Stillwater Reservoir	82		X									
Taylor Pond	83	X										
Titus Lake	84	X										
Tupper Lake	85		X									
Union Falls Flow	86	X	X									
Webb Royce Swamp	87						X					
West Caroga Lake	88	X										

Distribution of priority terrestrial invasive species occurrences within the Adirondack PRISM. *occurrences are only those recorded in the APIPP database; absence data does not necessarily represent that species are not present.



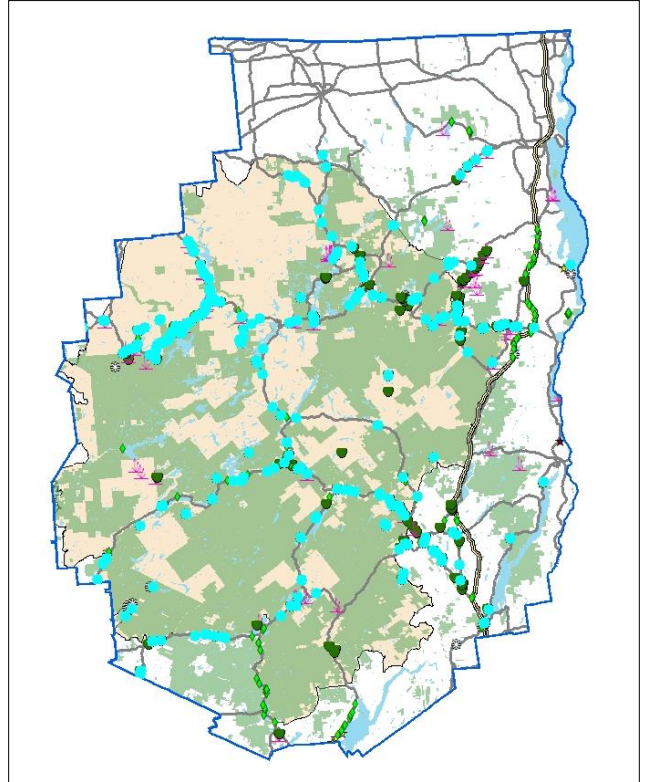
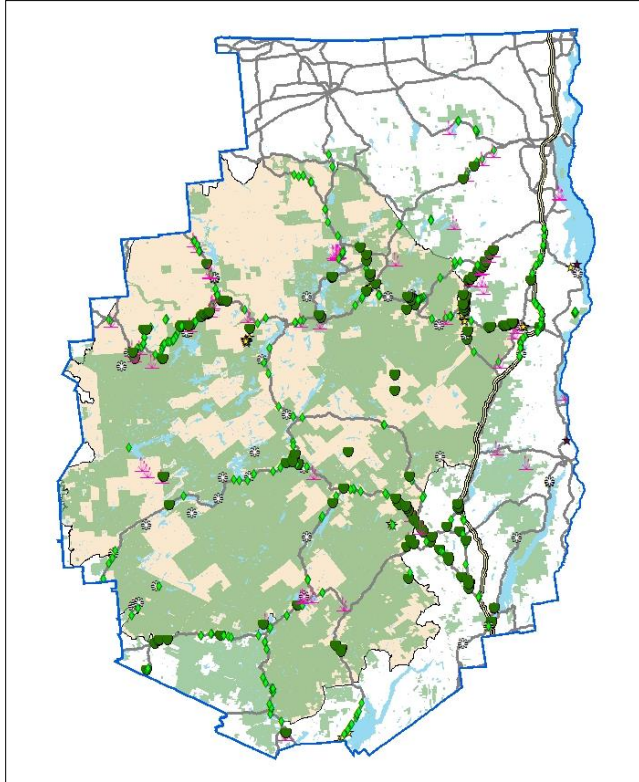
Distribution of new and emerging terrestrial invasive species occurrences within the Adirondack PRISM. *occurrences are only those recorded in the APIPP database; absence data does not necessarily represent that species are not present.



Distribution of sites mapped and managed by the Adirondack Terrestrial Regional Response Team in 2012.

A. Sites mapped (symbols represent various species)

B. Sites managed (turquoise points represent sites managed)



The Terrestrial Regional Response Team treated 261 infestations totaling 15 acres in priority areas distributed across the region. This represents managing 49% of invasive species mapped in the Adirondack region, and 82% of the priority infestations in the core. The core area - shown in green and beige - represents the priority area of the Adirondacks where prevention and management efforts are concentrated.

APPENDIX E. Abbreviations

AIS	Aquatic invasive species
ANS	Aquatic nuisance species
APIPP	Adirondack Park Invasive Plant Program
ATBI	All Taxa Biological Inventory
CCE	Cornell Cooperative Extension
CCEISP	Cornell Cooperative Extension Invasive Species Program
CRISP	Catskill Regional Invasive Species Partnership
CWICNY	Champlain Watershed Improvement Coalition of New York
EPF	Environmental Protection Fund
IPM	Integrated Pest Management
ISCU	Invasive Species Coordination Unit
LISMA	Long Island Invasive Species Management Area
NEANS Panel	Northeast Aquatic Nuisance Species Panel
NRCS	Natural Resources Conservation Service
NYIS.INFO	New York Invasive Species Information Clearinghouse
NYISC	New York Invasive Species Council
NYISAC	New York Invasive Species Advisory Committee
NYISRI	New York Invasive Species Research Institute
NYSDEC	New York State Department of Environmental Conservation
NYSERDA	New York State Energy Research and Development Authority
NYSIPM	New York State Integrated Pest Management
NYSISTF	New York State Invasive Species Task Force
OISC	Office of Invasive Species Coordination
PRISM	Partnership for Regional Invasive Species Management
SLELO	St. Lawrence Eastern Lake Ontario PRISM
TNC	The Nature Conservancy
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service