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NYS DEPARTMENT OF TRANSPORTATION RESPONSE TO E.O. 13112 INVASIVE PLANT SPECIES

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Abstract: On February 3, 1999, President Clinton signed Executive Order 13112 (E.O.) which calls on state transportation agencies to work to prevent and control the introduction and spread of invasive species. Nonnative flora and fauna can cause significant changes to ecosystems, upset the ecological balance, and cause economic harm to our nation's transportation, environmental, agricultural and recreational sectors. For example, introduced plants, such as Phragmites and purple loosestrife, throughout New York State have choked out native plant species and consequently clogged roadway drainage ways and altered environmental habitat. Transportation systems can facilitate the spread of plant and animal species outside their natural range. Those species that are likely to harm the environment, transportation safety, human health, or economy are of particular concern.

The NYS Department of Transportation maintains approximately 16,500 miles of highway and annually spends over \$9.1 million on vegetation management. Funding for this project is integrated as part of the normal department operational vegetation management budget.

The threat from invasive species is increasing with human population growth, global trade and disturbance of the environment. Effectively dealing with the problem of invasive plant species presents a significant conservation challenge, both biologically and politically. The prevention of new plant invasions, early detection and monitoring of infestations of invasive plants, and effective control of established invasions through area-wide partnerships have been identified as key objectives in an overall national strategy for invasive plants.

Stopping potentially invasive species before they spread from transportation corridors may be the best option for short-term protection. The department is implementing a proactive environmental initiative to attempt to eradicate certain existing invasive populations, and control the colonization and spread of species that have demonstrated negative effects to natural systems.

Highway corridors provide opportunities for the movement of invasive species through the landscape. Invasive plant or animal species can move on vehicles and in the loads they carry. Invasive plants can be moved from site to site during spraying and mowing operations. Weed seed can be inadvertently introduced into the corridor during construction on equipment and through the use of mulch, imported soil or gravel, and sod. Some invasive plant species might be inadvertently planted in erosion control, landscape, or wildflower projects. Thousands of miles of New York State rights-of-ways traverse public and private lands. Many of these adjacent lands have weed problems and the highway rights-of-way provide corridors for further spread.

NYSDOT has an opportunity to address roadside vegetation management issues on both their construction activities and maintenance programs with new levels of cooperation and communication with other state agencies and conservation organizations. Under the E.O., Federal-aid and Federal Lands Highway Program funds cannot be used to carry out actions that are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless all reasonable measures to minimize risk of harm have been analyzed and considered.

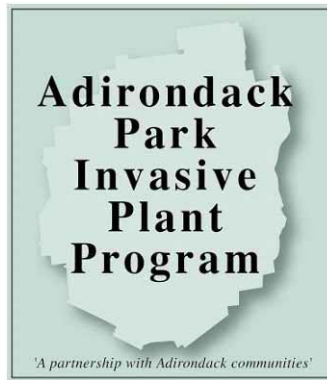
NYSDOT plans on implementing a 10-point invasive transportation vegetation management plan consisting of the following components:

- (1) Developing a prioritized list of threatening flora or fauna based upon regional environments.
- (2) Field and GIS mapping of existing invasive populations.
- (3) Integration of invasive species identification and analysis as part of the department's normal NEPA /SEQR processing.
- (4) Evaluation of potential impacts caused by construction or maintenance activities.
- (5) Development of preventive best management practices.
- (6) Testing, execution and evaluation of eradication measures.
- (7) Annual reviews and updates of the vegetation management plans.
- (8) Progression of innovative design solutions to reduce the opportunities for the introduction or spread of invasive species.
- (9) Promote a climate of interagency cooperation and sharing of coordinated research with public and private sectors.
- (10) Increase employee and public knowledge through outreach training of the effects of invasive species to the users.

An important design component of the plan is consideration of invasive species during all phases of the environmental process. For example, during scoping, discussions with stakeholders should identify the potential for impacts from invasive species and include possible prevention and control measures. The actual NEPA analysis should include identification of any invasive terrestrial or aquatic animal or plant species that could do harm to native habitats within the project study area.

In summary, the NYSDOT is committed to the integration of E.O. 13112 as part of the department's planning, design, construction and operations programs. This E.O. came at an opportune time to become another facet of the department's nationally recognized transportation environmental initiative.

Adirondack Park Invasive Plant Action Plan



Prepared by the Adirondack Park Invasive Plant Program Partners

June 2003

Foreword

Non-native, invasive aquatic and terrestrial plants are expanding in the Adirondack Park to the detriment of native plant communities and associated organisms. Unlike many regions, there is still opportunity to preserve or restore vast areas of the Park's natural landscape and avoid the costly ecological/economic impacts caused by invasive plants.

The Adirondack Park Invasive Plant Action Plan was prepared by partner organizations of the Adirondack Park Invasive Plant Program as a strategic framework to protect the Park's natural environments. The *Plan* outlines "state-of-the-art" strategies to forward the program's mission to document invasive plant distributions, promote integrative management actions, and build consensus for resource protection in the Park. Each strategy is enumerated by clearly defined objectives and tasks that derive from the collective experience and expertise of the program partners. This systematic guidance will enable resource managers and citizens alike to implement local actions within a coordinated, region-wide, invasive species management design. Moreover, the *Plan* will insure that the program remains a "grassroots" effort to offset the ecological, social, and economic costs of invasive species infestations, with a commitment to the stewardship interests of Adirondack residents as a core program value.

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Glossary of Terms

Biodiversity – The variability among living organisms and their environments, including diversity at the genetic, species, population, and ecosystem levels.

Control Methods – Purposeful manipulation of the environment or plant community to reduce infestations of an invasive species.

Containment – Restricting the spread of expansive infestations of an invasive species that are too large or well-established to eradicate.

Ecosystem – A unit of biological organization that encompasses a community of organisms and their physical environment.

Eradication Methods – Purposeful manipulation of the environment or plant community to totally remove a species from an area, including reproductive potential.

Integrated Weed Management – A “system for the planning and implementation of a program, using an interdisciplinary approach, to select a method for containing or controlling an undesirable plant species... using all available methods, including education; prevention; physical or mechanical methods; biological control agents; herbicide methods; cultural methods; and general land management practices.”

Invasive Species – Species that establish numerical dominance outside their historic range and reduce native plant diversity and/or abundance. Invasive species impair the ecological stability of a resource and activities based on the resource.

Monitoring – Repeated systematic observation.

Native Species – Species present in a region at the time of European settlement.

Non-Native Species – Species that are introduced to regions outside their historic range by humans. Non-native species are often called “non-indigenous,” “alien,” and/or “exotic.”

Weed Management Area – An area of common characteristics and specific boundaries that has been designated as a logical area for the management of weeds (i.e., invasive plant species). A weed management area may also refer to the association of land managers and owners working cooperatively to reduce the threat of invasive plants.

I. Introduction and Executive Summary

An Ecological Crisis Impact of Invasive Species

Ecological. The negative impacts of invasive plant species are well known and constitute a significant component of global environmental change. Such impacts range from alterations in species interactions and diversity, nutrient dynamics, primary productivity, patterns of succession, plant/herbivore relationships, and susceptibility of an ecosystem to disturbance. These modifications owe largely to the competitive exclusion of native species by an invasive via resource modification or depletion.

Economic. The spread of invasive plant species is increasing with human population growth and disturbance of the environment, with control measures costing millions of dollars. In 2002, \$22 million was spent to control aquatic plants on 53,000 acres in Florida alone. The state of Vermont spent more than \$3 million dollars and thousands of volunteer hours to control Eurasian watermilfoil between 1982-2001. In many cases, ordinary citizens must bear the cost of invasive species control. For example, the Upper Saranac Lake Association, NY, spent over \$153,000, to control Eurasian watermilfoil between 1999-02.

Invasive plants are a critical threat to the biodiversity, processes, and services of natural ecosystems in the Adirondack Park. Invasive plants form dense infestations that displace native plants and wildlife, producing a highly simplified, species-poor environment. In effect, invasive plants represent a particularly damaging form of “biological pollution.”

The Park still includes large intact ecosystems and high quality natural communities. However, certain features of its geography make it vulnerable to invasive plants. These include the presence of ecologically “sensitive” species, vast remote areas that are difficult to monitor, management restrictions that limit control options, and continued importation of exotic species from outside the region. The growing risk to natural areas in the Adirondacks is signaled by recent movements of invasive plants into the Park’s interior. Fortunately, there is still opportunity to protect this natural landscape using a comprehensive program for invasive species prevention and control.

The Adirondack Park Invasive Plant Program (APIPP) provides the expertise and framework for invasive plant monitoring, management, and community outreach in the Adirondack Park through area-wide partnerships. This “grassroots” strategy emphasizes citizen-based stewardship to detect and respond to invasive plant infestations. The APIPP will also lend essential information for the New York State Nonindigenous Aquatic Species Comprehensive Management Plan, which is currently in development.

Character of the Park

The Adirondack Park is a landscape of global significance. Its borders embrace a vast mosaic of intact forest, wetlands, and waters – forming the largest wilderness area east of the Mississippi River. The Park includes the headwaters of five major river systems which foster some 30,000 miles of free flowing rivers, brooks, streams and pristine riparian habitat. An array of over 11,000 ponds and lakes both spawn and intermingle with these waters, shaping the post-glacial character of Adirondack landscapes. This unique array of environments gives home to a trove of exemplary plant and animal communities, many of which remain intact and unspoiled only within the Park's boundaries.

The Adirondack Park is also a human community with 130,000 permanent residents in 130 different settlements, distributed across one or more of 103 municipalities (towns and villages) in 12 counties. Governance to protect natural resources is distributed among a variety of state and federal agencies, and local governments.

Adirondack Park Invasive Plant Program

In 1998, a small group of state agencies and conservation groups joined efforts to document invasive plant populations along Adirondack roads. This "Adirondack Invasive Plant Working Group" (AIPWG) soon uncovered an explosive pattern of invasive plant growth along the Park's travel corridors. With the assistance of citizen volunteers, the working group established the first Park-wide database for roadside invasive plant distributions and, concurrently, initiated a seasonal campaign to eradicate selected infestations.

A similar, though less articulate, picture of aquatic invasive plant occurrence began to emerge for many of the Park's lakes and ponds via the observations of shoreline owners and academic institutions. Several organizations participating in the working group responded to public requests to document these infestations, implementing a citizen-based, Adirondack Aquatic Invasive Plant Monitoring Program (AAIPMP) with EPA start-up funds in 2001. AAIPMP partners trained Park residents to map and describe invasive plant infestations in lakes and ponds and established an internet-based data repository for species distributions, management activities, and research.

In 2003, the AIPWG and AAIPMP evolved into a single, inclusive Adirondack Park Invasive Plant Program (APIPP). The APIPP provides a comprehensive framework for invasive plant monitoring, management, and community outreach in the Adirondack Park through area-wide partnerships. In fact, public participation is an essential ingredient in this venture. APIPP partners recruit and train residents of the Park as volunteer invasive plant monitors. Data obtained by these "citizen scientists" are compiled in a digital database and distributed on an APIPP website for use by professionals and public alike. A community advisory panel also serves as a conduit for information exchange between the APIPP and residents, and provides insight on local resource protection needs.

The APIPP has entered a pivotal stage of development, with a growing list of partner organizations and renewed commitment to long-term invasive species monitoring and management. With continued funding, the APIPP promises a proactive, consensus-based approach to protect and conserve native ecosystems throughout the Adirondacks for years to come.

Mission Statement

The APIPP mission is to document invasive plant distributions, facilitate integrated plant management strategies, and build consensus for resource protection in the Park through information exchange and partnerships with Adirondack residents and institutions.

Notable Plant Communities in the Adirondack Park.

(Wetlands, Forest, Riparian)

- ◆ Rich sloping fen
- ◆ Perched bog
- ◆ Sliding fen
- ◆ Riverside ice meadow
- ◆ Pitch pine-heath barrens
- ◆ Boreal heath barrens

Program Acronyms

- ◆ **AIPWG** – Adirondack Invasive Plant Working Group. Formed to document and control invasive plant infestations along Adirondack roadsides.
- ◆ **AAIPMP** – Adirondack Aquatic Invasive Plant Monitoring Program. Formed in 2001 to document invasive plant infestations in lakes and ponds and to educate the public on invasive plant issues. Program partners included members of the AIPWG and local scientists.
- ◆ **APIPP** – Adirondack Park Invasive Plant Program. Formed in 2003 by integrating AIPWG and AAIPMP to provide region-wide coordination for invasive plant monitoring and management across terrestrial and aquatic ecosystems.

Vision

The APIPP will coordinate monitoring and management activities designed to prevent and, where possible, mitigate the loss of native biodiversity due to infestations of invasive plants in the Adirondack Park. The APIPP will remain a “grassroots” effort to offset the ecological, social, and economic costs of invasive species infestations, with a commitment to the stewardship interests of Adirondack communities as a core program value.

Program Goals

1. Protect native biodiversity by preventing the establishment of invasive plants in biologically intact habitats of the Adirondack Park and reducing the extent of existing infestations elsewhere within the Parks boundaries.
2. Cultivate stewardship values and practices among residents of the Adirondack Park to conserve biodiversity and mitigate impacts of invasive plant species.
3. Facilitate collaboration and problem solving among environmental practitioners, local government, and the public to control/prevent the spread of invasive plants in the Adirondack Park using sound regulatory, planning, and management practices.

Summary of Strategies

The following strategies are listed in order of priority.

1. Document and map distributions of invasive plants in the Adirondack Park and disseminate this information for use by professionals and the public alike.
2. Prevent new invasive plant infestations within biologically intact habitat.
3. Prioritize existing invasive plant infestations for eradication, reduction, and/or containment actions.
4. Increase awareness of invasive plant issues and support for monitoring and control activities within land management agencies, local government, and among the public through education and outreach.
5. Support research for integrated weed management of invasive species and their impacts.
6. Support development of parallel programs for watershed stewardship and capacity-building among stakeholders to promote invasive plant management within the Park.
7. Designate an official “Adirondack Park Weed Management Area” to facilitate cooperative approaches for invasive plant management.

The Adirondack Park Invasive Plant Program Accomplishments to Date

In just two years, the APIPP (AIPWG and AAIPMP) has developed the services and materials necessary to support invasive plant detection and response across the Adirondacks. Recent accomplishments include, but are not limited to:

- ◆ Implementation of a successful new volunteer aquatic invasive plant monitoring program. During the first season 46 volunteers surveyed 54 lakes – 15 of these waters contained an invasive plant species.
- ◆ Development of a central relational database and related digital maps for invasive plant monitoring and management information.
- ◆ Creation of an internet website for invasive species information to assist community awareness, scientific research, and management planning <http://www.adkinvasives.com>.
- ◆ Design and passage of an Adirondack Park Agency general permit to support invasive plant control activities by the APIPP partners.
- ◆ Targeted removal of invasive plant infestations throughout the Parks Core Conservation Area. During 2002, 91 of 133 known terrestrial invasive plant infestations received control measures and four demonstration sites were established using integrated plant management techniques.

Purpose of the Plan

The *Adirondack Park Invasive Plant Action Plan* provides guidance for a coordinated, long-term, invasive plant monitoring and control program in the Adirondack Park. The *Plan* is founded upon an adaptive management framework to protect native biodiversity and ecosystem integrity. The APIPP recognizes that priority objectives and actions should be evaluated in an iterative fashion in order to accommodate new information, correct

mistakes, and maximize program efficiency. In similar fashion, effective policies for invasive species control may be best achieved through periodic reassessment and consideration of contemporary “field-based observations” and experience.

Invasive Species in the Park

Invasive plants are not yet predominant in the Park but have a high potential to spread and destabilize natural habitats. Recent floral surveys compiled by public and private institutions point to a rapid proliferation of invasive plant species at the Park’s periphery. Seven of these species are listed among the primary invasive species in New York State and have been identified by the APIPP as high priority for monitoring and control in the Park (table 1).

Population Dynamics and Distribution

Small populations of an invasive plant species can increase rapidly after a period of relative “dormancy,” suddenly becoming a difficult and expensive problem to manage. During the period 1985-92, Eurasian watermilfoil (*Myriophyllum spicatum*) infested lakes and ponds in at least 10 of 12 Adirondack counties, and now impairs such significant recreational waters as Lake George, Lake Champlain, and Upper Saranac Lake and its downstream neighbors.

In recent years, invasive plants have penetrated terrestrial habitats within the interior Adirondacks. In 1998, volunteers for the Adirondack Chapter of The Nature Conservancy (ANC) conducted a roadside survey for 10 invasive plant species of concern within a core area of approximately four million acres. They identified 30 roadside sites with purple loosestrife (*L. salicaria*), 10 sites with common reed grass (*P. australis*), and 121 sites with Japanese knotweed (*P. cuspidatum*). The next year they widened their search to “backcountry” areas and documented six additional invasive plant species. As of 2002, 133 roadside infestations had been identified, and 91 of these have received management from APIPP partners. Despite such efforts, several infestations of purple loosestrife and Japanese knotweed have expanded into major riparian drainages and many more infestations are likely within the Park.

The most efficient and cost-effective manner to deter the spread of invasive plants is through early detection and by preventing their establishment in pristine ecosystems. Continued area-wide monitoring, coupled with a well-coordinated management response framework and sustained funding, will be necessary to meet these objectives. Importantly, the APIPP will help build consensus, and reduce conflicts, for natural resource management among stakeholders in the Park.

II. Guiding Principles

The *Plan* addresses several encompassing themes for the conservation of ecological and cultural resources in the Park, and recognizes that these interests are intimately linked. Importantly, the *Plan* follows from the observations and involvement of Adirondack residents and professionals alike.

Institutional Partnering

Prevention of non-native, invasive plant infestations and the early detection and monitoring of existing infestations through area-wide partnerships have been identified as key objectives in a National Strategy for Invasive Plant Management. Partnering affords opportunity to coordinate invasive plant monitoring at a regional scale, establish standard methods for data collection, storage, and dissemination, clarify regulatory jurisdiction and response, enhance educational outreach, leverage funding, and instill shared responsibility for the APIPP.

Documentation and Dissemination

A region-wide strategy for invasive plant management necessitates accurate and up-to-date information on the location and movements of such species. Information provided through scientific

Table 1.
Priority invasive plant species in the Adirondack Park.

Common Name	Scientific Name	Habitats in the Adirondack Park
Purple loosestrife	<i>Lythrum salicaria</i>	glaciated wetlands, roadside ditches, riparian areas
Common reed grass	<i>Phragmites australis</i>	alkaline environments and acidic wetlands
Japanese knotweed	<i>Polygonum cuspidatum</i>	riverbanks and woodland edges
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>	submerged wetlands
Waterchestnut	<i>Trapa natans</i>	floating leafed wetlands
Curly-leaf Pondweed	<i>Potamogeton crispus</i>	submerged wetlands
Garlic mustard	<i>Alliaria petiolata</i>	deciduous forests, wetland edges

Additional species of concern include: *Lonicera* spp. (honeysuckle), and *Iris pseudacorus* (Yellow Iris).

monitoring can be used to prioritize control efforts, identify “at risk” locations or habitat *a priori*, and facilitate rapid management response to new infestations. Timely dissemination of monitoring data will help increase the public awareness of invasive species issues and enable stakeholders to more effectively pursue assistance for “on-the-ground” management and research activities.

Grassroots Participation

A unique opportunity exists in the Adirondacks to work proactively to detect infestations of invasive wetland plants before they become well established, and to prevent further establishment and spread of such species, thus maintaining a high quality natural landscape. Because environmental managers often do not have the resources to implement an invasive species management program over a large area, involving the public is essential. The APIPP works directly with resident volunteers and a Community Advisory Panel to implement plant monitoring, management, and educational activities. In this manner, the program enables communities to fashion invasive species control efforts tailored to their particular needs.

Ecosystem Linkages

Invasive plants are impacting native ecosystems across the range of upland-to-aquatic environments in the Adirondack Park. In many cases, they also interfere with the normal exchange of energy and organisms across these habitats. The *Plan* promotes an integrated invasive plant documentation and control program that facilitates consistent scientific, regulatory, and management responses to protect all native plant communities in the Park. In this context, the APIPP serves as an organizational “umbrella” to coordinate monitoring, management, and outreach activities.

III. Strategies and Objectives

Strategy: Document and map distributions of invasive plants in the Adirondack Park and disseminate this information for use by professionals and the public alike.

Area-wide documentation of invasive plant occurrences provides a basis to identify vulnerable locations, record historical and recent invasive plant movements, and generate stewardship activities for habitat protection. The APIPP focuses on region-wide data collection using a combination of existing programs and those developed as components of the APIPP.

Documentation is afforded through systematic and repeated on-site monitoring of plant community associations within the Adirondack Park. Dissemination includes activities to compile monitoring results, prepare maps, and report on invasive species population patterns.

Until recently, efforts to monitor the extent and spread of invasive plants in the Park occurred as multiple, independent, programs that lacked integration at a regional-scale, were implemented with differing levels of expertise and support, and required more effective techniques for data dissemination and review.

The APIPP strategy for documentation and information dissemination addresses these inadequacies and provides a basis for strategic planning and effective invasive plant management.

Current Status

Note: Past activities referred to under “Current Status” are represented by APIPP rather than AIPWG or AAIPMP, individually. This is meant to reduce confusion and focus attention on APIPP.

In 2002, the APIPP designed and supported the first volunteer aquatic invasive plant monitoring program in the Park. A community advisory panel was established to guide monitoring efforts and facilitate communication with residents among the core community areas identified by APIPP partners. The core-community represents an area within the Adirondacks which residents identify as their geographical “neighborhood,” providing a focus for volunteer recruitment and support. By supporting a community advisory panel of representatives from each core-community, the APIPP receives a “grassroots” perspective of community interests and concerns. This “bottom-up” exchange enables APIPP partners to tailor volunteer training, outreach, and plant control priorities within sub-watersheds of the Park. It also provides a basis for constructive dialog between the public, private interests, and environmental professionals. Similar, though less formal, assistance has been provided to the APIPP by resident volunteers for invasive plant monitoring along roadsides in the Adirondack Park.

In 2002, the APIPP established a central “relational” database for aquatic invasive plant monitoring and management information; a similar database has been established for terrestrial invasive plant data by the ANC and New York Department of Transportation (NYDOT). The APIPP website (www.adkinvasives.com) will be used to disseminate data and information related to invasive plants in the Adirondack Park.

Objective 1: Maintain a program coordinator to facilitate plant monitoring activities, compile and interpret monitoring data, and insure timely distribution of results. Hire a seasonal assistant(s) to support the coordinator during the monitoring season.

Task 1: Obtain personnel funding to support the program coordinator. Estimated cost: \$50,000 per year.

Task 2: Obtain seasonal funding for a two-year period to support a full-time, seasonal assistant(s). Estimated cost: \$12,000 per assistant per five-month period.

Task 3: Establish office space for the program coordinator and seasonal assistants at the ANC headquarters in Keene Valley, NY.

Task 4: Assign responsibility among APIPP partners for advertising and contracting, as related to APIPP employee positions.

Objective 2. Develop and support a volunteer terrestrial invasive plant monitoring program that incorporates roadside as well as back-country surveys.

Task 1: Design a proposal for joint supervision of aquatic and terrestrial invasive plant monitoring projects by the program coordinator. The proposal will include data collection methods and materials, as well as a volunteer recruitment and training strategy for terrestrial species.

Task 2: Partner with the Adirondack Mountain Club and NYDEC to initiate backcountry surveys for invasive species. Methods for data collection and coordination will be determined subsequent to the completion of task 1.

Objective 3. Expand the aquatic volunteer monitoring program to include additional waters and complete those that have received partial surveys.

Task 1: Continue working with the community advisory panel to recruit volunteers and identify high priority waters within the core-community areas.

Task 2: Partner with the Residents Committee to Protect the Adirondacks to help integrate aquatic invasive plant monitoring activities into their Adirondack Lake Assessment Program.

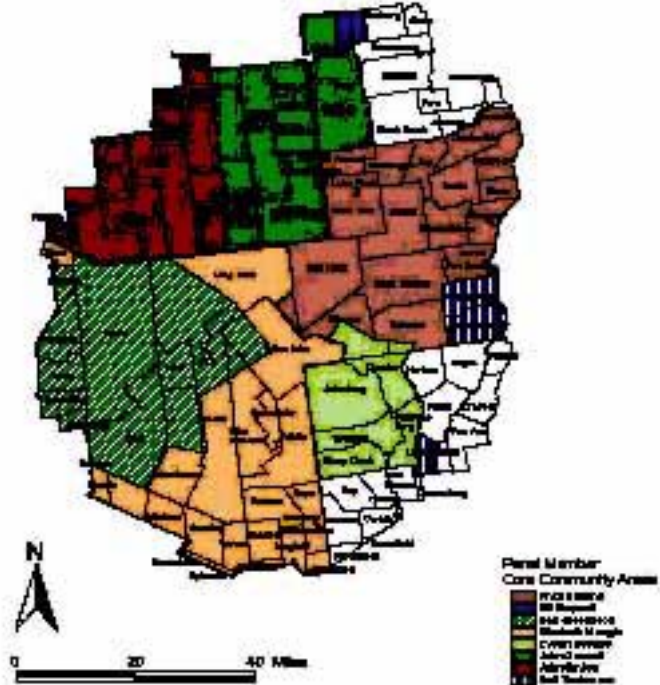
Task 3. Partner with the NYDEC to facilitate continued aquatic invasive plant monitoring activities within their NYS Citizens Lake Assessment Program.

Objective 4. Integrate terrestrial and aquatic invasive species monitoring data within a single digital database shell to facilitate consistent data management and quality control.

Task 1: Work with APIPP partners or contractor to expand the data entry shell designed for the aquatic invasive species database to link with the terrestrial invasive species database.

Task 2: Develop procedures for uniform data entry and quality control for both the aquatic and terrestrial invasive species databases.

Adirondack Park Aquatic Invasive Plant Project Advisory Panel Core Community Areas



Objective 5. Maintain the APIPP website and update invasive species distribution maps on an ongoing basis.

Task 1: Complete uploading of aquatic and terrestrial invasive species information, distribution data, and maps onto the APIPP website.

Task 2: Assign long-term responsibility among the APIPP partners for website maintenance and updates.

Task 3: Establish protocol for partners to preview and comment on new information that will be added to the website.

Task 4: Identify a permanent web hosting site for the APIPP website.

Task 5. Develop common nomenclature and logos for all APIPP informational materials.

Strategy: Prevent New Invasive Plant Infestations Within Biologically Intact Habitat

Prevention refers to those activities that preclude the movement of new invasive plant species into the Adirondack Park. It also includes those activities that bar the movement of invasive species currently within the Park's boundaries, into pristine habitat. For the purpose of this *Plan*, biologically intact habitat refers to plant communities composed entirely of native species, regardless of other forms of disturbance. Prevention is the least time consuming and most cost-effective means to protect native biodiversity from invasive species.

Prevention encompasses components of other strategies, objectives, or tasks outlined in this *Plan*. For example, prevention may be facilitated, in part, by monitoring inter- and intra-state movements of invasive plants, stopping the commercial sale and distribution of invasive plants, eradicating/controlling invasive plant infestations, and increasing public awareness of invasive plant concerns and identification.

To maintain the clarity, the "prevention" strategy is limited to assessments of invasive plant movements across states or larger regions. Other prevention activities are enumerated as separate strategies or their component objectives and tasks.

Current Status

During 2000-2003, APIPP partners provided review and comments for the draft New York State Non-Indigenous Aquatic Species Comprehensive Management Plan. In 2003, APIPP partners met with representatives of the Lake Champlain Basin Program to evaluate opportunities for inter-state communication and assistance related to invasive plant issues.

Objective 1. Identify and monitor "high-risk" invasive plants that have the potential to move into the Park in the future.

Task 1: Track activities of the Northeast Aquatic Nuisance Species Panel and provide expertise for their science and technology and communication, education, and outreach working panels.

Task 2: Coordinate with NY IPC to provide the volunteer monitoring program with information on new species of concern in NYS and the distribution of invasives outside the Park.

Task 3: Review data from University of Connecticut's Invasive Plant Map of New England and provide data pertaining to invasive plant species in the Park.

Strategy: Prioritize existing invasive plant infestations for eradication, reduction, and/or containment actions.

In concert with prevention, early detection of invasive plant infestations, coupled with rapid management response, is critical to successful control of such nuisance species.

Nascent invasive plant colonies can often be eradicated with a minimum of effort. As such colonies grow and spread, however, eradication becomes less feasible, and management priorities shift to containment or, in the worst cases, protection for human uses.

The cost and complexity of management operations increase exponentially with the extent of invasive species infestation. In turn, the probability of achieving management goals decreases.

Current Status

The APIPP has established an interior “Core Conservation Area” (CCA), in which invasive species occurrences are limited and opportunities to prevent new infestations or further spreads are high; the CCA includes the majority of the Park outside of the Champlain, Mohawk and Lower Hudson River valleys. Given its pristine character, the CCA will receive priority for monitoring and “rapid response” techniques focused on species eradication.

The remainder of APWMA, termed the “Border Conservation Area” (BCA), represents an area conforming to the agricultural and more densely populated lands in the Champlain, Mohawk and Lower Hudson River valleys. Invasive plants are regionally abundant in the BCA and many populations have coalesced to create nuisance conditions. In a majority of cases, eradication is no longer feasible. Consequently, the BCA will receive priority for integrated weed management (IWM) control techniques focused on sites of high biodiversity significance. Additionally, within the BCA actions will be taken to minimize recreational use impacts, and prevent new species introductions. Educational outreach will be given high priority in both the CCA and BCA.

In 2002, The Adirondack Park Agency issued a general permit to support invasive plant control activities along roadsides by the APIPP partners. Under this permit, 91 of 133 known invasive plant infestations in the CCA received control measures from APIPP partners.

Two demonstration sites were also established for IWM using chemical controls. These included the use of Rodeo to treat Japanese knotweed along Hague Brook, Hague, NY, and a combination of Rodeo, Roundup Pro, and Triclopyr to control Japanese knotweed at Gulf Brook in Keene, NY. Similarly, herbivorous beetles (*Galerucella californiensis*) were released at two sites in the Champlain Valley to control purple loosestrife.

Objective 1: Continue Plant Control activities on priority infestations

Task 1: Establish a decision making framework to identify high priority sites in the CCA and BCA for invasive plant eradication or control, respectively. Criteria should include but not be limited to: location in watershed, proximity to exemplary communities or protected species, feasibility of control, age of infestation, proximity to other infestations.

Task 2: Develop criteria to identify at risk or high priority waters for protection efforts within the Park. Post this list on the APIPP website.

Task 3: Expand seasonal plant management activities through APIPP partners and provide guidance for best management practices related to invasive plant removal/control and disposal. Identify appropriate organizations to implement control measures.

Task 4: Identify restoration techniques that reduce the risk of site recolonization by invasive plants, following a management application.

Objective 2: Establish protocol for invasive plant control activities on State land

Task 1: Coordinate regulatory procedures between the NYDEC and APA to enable APIPP partners to control invasive plants on state land outside of the NYDOT right-of-way.

Task 2: Identify “point people” within the regulatory agencies who will provide consultation to APIPP partners regarding permit requirements and procedures. These people should also be available to the general public for this purpose.

Objective 3: Facilitate plant management activities implemented by Adirondack communities.

Task 1: Increase public awareness and access to common regulatory permits required for invasive plant management.

Task 2: Document legal liabilities to individuals or groups for various invasive plant control techniques.

Task 3: Provide expertise and data to watershed groups, lake associations, and other stewardship organizations for invasive plant management activities.

Task 4: Identify appropriate plant control techniques and regulatory requirements for individual land owners and businesses.

Objective 4: Establish or support rapid response efforts to remove new invasive plant infestations.

Task 1: Identify opportunities to use lake or land managers and other individuals or organizations providing environmental management services for rapid response applications.

Task 2: Find funding to support a dedicated, seasonal, invasive plant control team. The team should receive training leading to an herbicide applicators license and/or should be scuba certified to participate in aquatic plant management activities. Investigate opportunities to recruit student interns for these positions.

Strategy: Increase awareness of invasive plant issues and support for monitoring and control activities within land management agencies and among the public through education and outreach.

The APIPP supports voluntary non-regulatory protection strategies to prevent and/or ameliorate environmental impacts caused by invasive plants. Such strategies range from early detection to programs to stop the distribution of invasive plants sold through home and garden shops or pet stores.

Education and outreach is a fundamental cornerstone of the APIPP perspective for effective regional-scale invasive species control and management. The APIPP partners advocate that natural resource monitoring and stewardship activities are best leveraged through community-based actions and initiatives. Local awareness of invasive species issues, distributions, and management techniques is critical.

It is also important to note that local and state authorities who administer resource management or maintenance activities understand the significance of their actions in relation to invasive species distributions. Without proper training, such officials or their employees may actually exacerbate the spread of invasive species. Alternatively, they can provide “front-line” assistance to prevent infestations or restore degraded habitat.

Leadership and funding for area-wide invasive species management necessitates the support of policy-makers. The APIPP recognizes the need to communicate the costs of invasive species impacts to ecosystems, human communities, and economies to these individuals. Public awareness and advocacy for the APIPP, in turn, facilitates these efforts.

Ultimately, Adirondack residents, businesses, and governments share a common interest in protecting the Park’s natural resources. An open and inclusive discussion of invasive species issues provides the best means to build consensus for stewardship and to prevent/reduce conflicts among stakeholders.

Current Status

During 2001-2002, the program coordinator provided a variety of presentations and workshops on invasive species to resident groups and public schools throughout the Adirondack Park. The coordinator also met with state officials to discuss staff training and design/placement of public signs and boat washing stations for invasive species control. APIPP partners made several presentations to the APA Commissioners regarding program accomplishments during this period.

Objective 1: Inform specific public user groups (boaters, fishers, etc.) of invasive species impacts and how to prevent them.

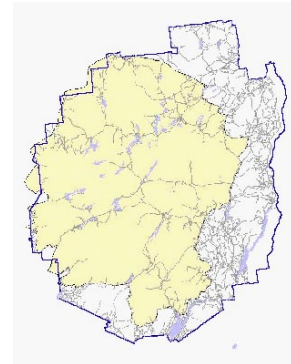
Task 1: Compile a list of all watershed groups, lake associations, and other community-based environmental organizations in the Park.

Task 2: Update and expand signage for aquatic invasive plants at state boat launches.

Task 3: Develop APIPP presentation material for use by the partner organizations and identify persons to provide outreach presentations within public and private sectors.

Task 4: Initiate communication and provide APIPP presentations to area fishing and hunting clubs. Expand number of presentations to watershed groups and lake associations.

The Adirondack Park Weed Management Area (APWMA), including the Core Conservation Area (shaded) and Border Conservation Area (unshaded)



Objective 2: Educate local government officials and employees about invasive species issues.

Task 1: Provide training to NYDEC Environmental Conservation Officers, NYDEC Unit Management Planners, NYDOT, town and county road maintenance crews, and County Sheriff Patrols to identify invasive plants and avoid actions which aggravate their spread.

Task 2: Provide training to Department of Public Works and Town Parks and Recreation personnel in best management practices for invasive species management.

Task 3: Report invasive species infestations to local government officers and provide regulatory and scientific expertise to facilitate control activities. Offer educational presentations to county and town officials at monthly meetings.

Task 4: Synthesize existing information regarding the economic impacts associated with priority invasive plant species (see table 1). Summarize results in a final report that can be disseminated on the APIPP website.

Task 5: Provide NYDEC up-to-date accountings of waters where invasive plants occur for inclusion in their "303(d)" priority waterbodies list.

Objective 3: Involve educational institutions in raising awareness and promoting stewardship.

Task 1: Expand partnership with Paul Smiths College to enhance invasive species education and control efforts within their Watershed Stewardship Program.

Task 2: Adopt or develop invasive species curriculum for K-12 students and work with the Student Conservation Association (SCA) to offer presentations/activities within the Adirondack public school system.

Task 3: Partner with the Adirondack Natural History Museum to develop educational series on invasive species in the Adirondack Park.

Objective 4: Communicate invasive species concerns to business interests.

Task 1: Coordinate with NY IPC efforts to work with home and garden shops, nurseries, pet stores, and aquarium supply stores. Encourage businesses which sell invasive plants to remove these species from their inventory.

Task 2: Communicate with local marinas, boat distributors, dive shops, garden clubs, lawn-care professionals (etc.) about invasive plant issues. Provide these organizations educational materials for distribution among their customers and members.

Task 3: Communicate with professional societies and organizations which represent the aforementioned professions about invasive plant issues in the Park.

Strategy: Support Research for Integrated Weed Management of Invasive Species and Their Impacts.

APIPP recognizes the importance of both basic and applied research to understanding the ecology of invasive plant species, their impact on native ecosystems and evaluating management options for control. The latter includes physical, mechanical, biological, and chemical control techniques.

Integrated Weed Management (IWM) relies on a combination of these methods to effectively control invasive plant infestations, while minimizing collateral damages to the environment. The Federal Noxious Weed Act defines IWM as a "system for the planning and implementation of a program, using an interdisciplinary approach, to select a method for containing or controlling an undesirable plant species... using all available methods, including education; prevention; physical or mechanical methods; biological control agents; herbicide methods; cultural methods; and general land management practices."

Additional research is needed to evaluate the safety, cost, efficacy, and selectivity of IWM combinations on specific target plants and community types. A well-thought scientific approach to invasive plant management will also facilitate understanding, and perhaps acceptance, of IWM strategies by the public and regulatory agencies.

Current Status

Since 2001, researchers from Cornell University have collaborated with various APIPP partners on an experiment to see if an aquatic moth (*Acentria ephemerella*) can control growths of Eurasian watermilfoil in Adirondack waters; Lincoln Pond (Essex Co.) was selected for this moth introduction. Initial results highlighted the negative impact of predaceous fish on moth populations and, hence, milfoil growth. Subsequent moth additions and research will be calibrated to reduce such predation. In 2002, APIPP supported experiments to rear, and release, herbaceous beetles (*Galerucella californiensis*) to control Purple loosestrife infestations in Essex and Clinton counties. APIPP also initiated the Hague Brook Japanese Knotweed Control Demonstration Project to evaluate cut and stem treatment of knotweed with the herbicides Garlon and Rodeo.

Objective 1. Quantify plant community response at APIPP invasive plant control sites.

Task 1: Establish long-term study plots at invasive plant control sites along roadsides to quantify species-to-community level responses subsequent to physical and chemical treatments. Current treatments include: hand-pulling, stem cutting, seed-head harvesting, biocontrol, and spot herbicide treatments. Use results to guide restoration efforts.

Task 2: Outline best management practices for site restoration and monitoring based on findings determined during the execution of task 1.

Objective 2. Evaluate the effectiveness of educational and outreach techniques to raise public awareness of invasive species concerns.

Task 1: Utilize existing information to assess public response to educational media regarding invasive plant issues, e.g., signage, brochures, videotapes, cd-data. This assessment should include communication with invasive species managers throughout the U.S.

Task 2: Solicit volunteer time from marketing professionals to establish effective communication techniques and media for the APIPP.

Objective 3. Facilitate academic research and outreach on invasive species ecology and IWM within the Park.

Task 1: Expand research partnerships with Paul Smiths College, Cornell University, SUNY Plattsburgh, and the Darrin Freshwater Institute to assess IWM techniques that include the use of herbivorous insects in terrestrial and aquatic settings.

Task 2: Investigate the potential to use remote sensing techniques for invasive plant mapping and monitoring along road-networks.

Task 3: Provide guidance and expertise to the Adirondack Research Consortium invasive species working group.

Task 4: Provide coordination and seek funding for invasive species conferences and workshops within the Park.

*Task 5: Assess opportunities to raise and release the herbivorous beetle, *Galerucella californiensis*, (for purple loosestrife control) as a component of public school science projects.*

Strategy: Support development of parallel programs for watershed stewardship and capacity-building among stakeholders to promote invasive plant management within the Park.

The APIPP provides leadership for a “state-of-the-art” invasive species monitoring and control program, promoting a partner-based approach for invasive plant management. Its value is enhanced by supporting related organizations and facilitating invasive species control efforts state-wide. In turn, these parties have claim to the information, infrastructure and successes of the APIPP and opportunity to further enhance their own programs.

Current Status

In 2002, APIPP provided training and database software to the Boquet River Association (BRASS) and Ausable River Association (ASRA) for their inventory of invasive plant species in the Boquet and Ausable River watersheds.

Objective 1. Provide expertise and program review to the Adirondack Research Consortium in its development of invasive plant control strategies.

Task 1: Continue to provide APIPP representation on the ARC Advisory Panel.

Task 2: Communicate ARC goals and activities with partner organizations and the public.

Task 3: Assist in grant development for invasive plant control projects supported by the research consortium.

Objective 2. Coordinate program development with the NYS Invasive Plant Council (IPC), NYS Fish and Wildlife (NYSFW), Lake Champlain Sea Grant, (Lake Champlain Basin Program).

Task 1: Continue to provide APIPP representation on the NY IPC Advisory Panel.

Task 2: Provide consultation for development of a state-wide NY IPC invasive plant database which includes APIPP results. Provide monitoring data to NY IPC and NYFW. The latter group can use such information to develop their Nonindigenous Aquatic Species Comprehensive Management Plan.

Task 3: Exchange informational products for education and outreach with NY IPC, Sea Grant, and the NYFW.

Strategy: Designate an official “Adirondack Park Weed Management Area.”

Effective area-wide monitoring and management of invasive plants or “weeds” necessitates a high level of cooperation among state environmental managers, local government, and other public and private interest groups. This is particularly true in the complex cultural, political, and ecological terrain of the Adirondack Park. In turn, understanding the regional impacts of invasive plants can facilitate dialogue among stakeholders and promote collaboration while reducing ideological conflicts.

The Weed Management Area (WMA) concept is the basis of a National Strategy for Invasive Plant Management in which area-wide partnerships facilitate invasive plant management activities based on ecological relationships rather than jurisdictional boundaries. Collaborating agencies, institutions, and landowners pool resources for joint planning, monitoring, and management activities. These interactions enable cooperators to set local priorities within a regional framework for invasive species control and better communicate the seriousness of invasive species impacts to the public and local/state governments alike. The WMA also enables participants to better pool expertise, channel communication, reduce the risk of environmental damage from control actions, leverage funding, and give emphasis to high priority invasive species.

Current Status

The APIPP partners have taken many of the steps necessary to establish a credible Adirondack Park Weed Management Area (APWMA). In 2001, the APA, NYDOT, TNC, and NYDEC signed an “Adirondack Park Non-Native Invasive Plant Species Initiative: Memorandum of Understanding. The memorandum assigned responsibilities to aforementioned parties to protect the Park’s natural areas against invasive plants. Specific actions included: monitoring and inventory, invasive species autecology and control methods, implementation and evaluation of control methods, education and outreach. The APIPP continues to expand its partner-base within the Park, building a consensus-based approach to invasive plant monitoring and management.

Objective 1: Outline a conceptual framework and rationale for the APWMA.

Task 1. Identify and interview participants in existing WMA's to determine appropriate steps for APWMA formation.

Task 2. Identify partners to assist the formation of the APWMA and determine their respective roles/responsibilities. Conduct scoping workshops to define the intent and benefits of the APWMA.

Task 3. Involve local governments in APWMA planning and implementation. The appropriate level of government (county, town, village) should be identified by consensus among APIPP partners.

Objective 2: Provide leadership and guidance for the development of the APWMA.

Task 1. Establish an APWMA steering committee that reflects the diversity of partner organizations, local government interests, and residents.

Objective 3: Create formal recognition for the APWMA.

Task 1. Conduct a series of public meetings to discuss invasive plant issues with Adirondack residents and the benefits of an official APWMA.

Task 2. Officiate the APWMA with a signed memorandum of understanding among cooperating individuals, groups, and agencies and concurrently release Plan for public review.

Task 3. Develop an informational brochure and news releases to advertise the existence of the APWMA.

Task 4. Report activities of APWMA partners at resource management conferences and provide presentations to state government officials.

Task 5. Include the APWMA within other statewide invasive species programs, such as the New York State Nonindigenous Aquatic Species Comprehensive Management Plan.

Task 6. Update the Plan to reflect actions specific to the implementation and management of the APWMA.

IV. Program Structure

Years 2001-2003

The program coordinator provides guidance and coordination for AAIPMP activities under the supervision of the program director at the Adirondack Park Agency. Partner organizations provide information and counsel to the coordinator and decisions regarding communication, monitoring, and control efforts are made by consensus. Day-to-day decisions for activities involving terrestrial invasive plant control actions are made by the AIPWG members. Day-to-day decisions for AAIPMP development and volunteer monitoring of aquatic invasive plants are made by the AAIPMP director in concert with the program coordinator. A community advisory panel provides communication between AAPMP partners and the public to assist aquatic plant monitoring.

Years 2004 -

The program coordinator will work from the Adirondack TNC office in Keene Valley, NY. The coordinator will be hired subsequent to a national-level search lead by the TNC during summer/fall 2003. Terms of employment for the coordinator will be determined by the TNC, with assistance from the APIPP's principle partners (defined below). The program coordinator will be supervised by TNC executive staff.

The program coordinator will have authority to make day-to-day decisions regarding the integrated APIPP. In this context, the AAIPMP and AIPWG will be formally replaced by the APIPP and will be represented by aquatic and terrestrial invasive plant projects within APIPP. The coordinator will advise and respond to APIPP partners to implement the *Plan* and provide updates to the *Plan* as appropriate. A community advisory panel will be retained to facilitate volunteer activities for both terrestrial and aquatic monitoring efforts.

V. Partner Organizations and Responsibilities

Principle Partners

Principle partners in the APIPP include the following founding organizations: the Adirondack Park Agency, The Adirondack Nature Conservancy, NYS Department of Transportation, NYS Department of Environmental Conservation. The principle partners are responsible for the overall guidance, implementation, and continuance of the APIPP.

Parkwide-Partners

The APIPP success is directly related to the activities and support of collaborating organizations within the Adirondack Park. These groups now include: NYS Invasive Plant Council, The Residents Committee to Protect the Adirondacks, The Adirondack Watershed Institute at Paul Smiths College, The Cornell Cooperative Extension, The Student Conservation Association, The Adirondack Mountain Club, Lake Champlain Sea Grant, The Lake George Land Conservancy, The Boquet River Association, The Ausable River Association, The Darrin Freshwater Institute, The Adirondack Council, Hamilton Co. Soil and Water, and a variety of public interest groups. The APIPP will continue to seek additional partnerships and collaborations to effectively monitor and control invasive plant species in the Park.

Institutional Responsibilities

The following outline of responsibilities shared by the principle APIPP partners is meant to facilitate effective communication among the organizations. Various roles played by these institutions may vary through time.

The Adirondack Park Agency will end regulatory assistance to achieve the goals of the *Plan*, in addition to providing wetland science expertise, authorship on funding proposals, communication with state government, and geographic and educational information and administration of the APIPP.

The Adirondack Nature Conservancy will provide expertise related to natural area management, plant community dynamics, exotic species management and data for species monitoring. The Conservancy will provide office space and support for the program coordinator and will coordinate with the APIPP Community advisory panel and volunteer training via the coordinator.

The N.Y.S. Department of Transportation will coordinate invasive plant control activities using DOT personnel along roadways, assist in data collection and compilation, and report on DOT environmental initiatives.

The N.Y.S. Department of Environmental Conservation will provide expertise relative to wetland science, exotic species management, and fish and wildlife management policy, regulatory jurisdiction, and state environmental funding opportunities.

Biographical Sketch: John Falge is a regional environmental coordinator with the New York State Department of Transportation (NYSDOT). He is a registered landscape architect having graduated in 1985 from the Colorado State University College of Natural Resources with a BLA. He attended SUNY Morrisville between 1976 and 1978 and received a AAS degree in natural resources conservation.

Mr. Falge has previously worked for the National Park Service and USDA Forest Service as a technician, interpreter and ranger. He moved to New York in 1985 and worked for a private AE firm in Buffalo prior to beginning a career in transportation in 1990.

At the present time Mr. Falge is charged with balancing the costs, safety and environmental soundness of the NYSDOT design and operations within his region.

He has extensive contact with both state and federal regulatory agencies as well as NGOs. Public meetings and individual contacts to explain the mission of the department take place on a regular basis.