



Ballast Water Treatment The Fednav Experience in the Great Lakes

By: Marc Gagnon, Director, Government Affairs and Regulatory Compliance, Fednav Limited



The 2014 Ballast Water Management Convention of the International Maritime Organization (IMO) is an agreement adopted by IMO Member States in order to help prevent the transport of invasive species in ballast water. But in the twelve years since the Convention was adopted, few ships have been retrofitted with treatment systems, and even fewer ships with design-built systems exist. Although the Convention will take effect on September 8, 2017, many questions remain, including the matter of which technologies actually work as intended under real-life conditions.

As early as 2001, Fednav had begun to invest millions of dollars to test treatment systems and methods. After evaluating the many treatment options available, Fednav conducted its own controlled tests with chlorine, used worldwide as a disinfectant, as the active element. The tests concluded with a high degree of confidence that chlorine disinfection would meet the standards for treatment outlined in the Convention. Consequently, in April 2015, Fednav announced the purchase of twelve ballast water treatment systems from a reputable Japanese manufacturer.

Fednav owns a fleet of fifty-six vessels, including thirty-nine lake-suitable ships called "salties," with an additional four vessels scheduled for delivery by mid-2018. The capital investment faced by Fednav to outfit its fleet with ballast-water treatment systems is on the order of 25 to 50 million dollars. So it is critical that the systems meet regulatory criteria.

The IMO has issued approvals for about sixty system designs. However, the United States Coast Guard (USCG) has not recognized the IMO's approvals, and has initiated its own



Fednav ship. Photo provided by, Marc Gagnon.

standards and approval process. At the time of this writing, there is only one USCG-approved system.

In 2012, as Fednav faced decisions regarding matters of fleet renewal, it felt it was essential that new vessels be equipped with ballast-water treatment systems. However, concerns were being expressed by regulators about the efficacy of UV treatments, so a decision was made to test chlorine treatment. It was found that open-ocean water exchange, augmented by chlorine treatment, came very close to meeting the IMO standard without filtration. It was on this basis that Fednav selected ballast water treatment by chlorination.

With a series of newly-built vessels expected for delivery to Japan in 2015 and 2016, Fednav contracted with JFE Engineering Corporation to supply ballast decontamination systems. The system is IMO-approved and has USCG AMS (a 5-year provisional approval) certification for fresh, brackish and salt water. The system is presently moving through the USCG approval process.

In conclusion, even though the current standard can be met in practice, challenges remain, such as: implementation timeline, USCG rate of approval for new systems, and the severity of the current financial crisis afflicting shipping. Fednav's decision to install non-approved systems before a final ruling by regulators represents a calculated risk, but we did it for three simple considerations: The Great Lakes are a fragile environment that we need to protect; there is a commercial advantage to being an early-adopter; and this is the right thing to do to stop the spread of aquatic invasive species.



Ballast water treatment system. Photo provided by, Marc Gagnon, Fednav.

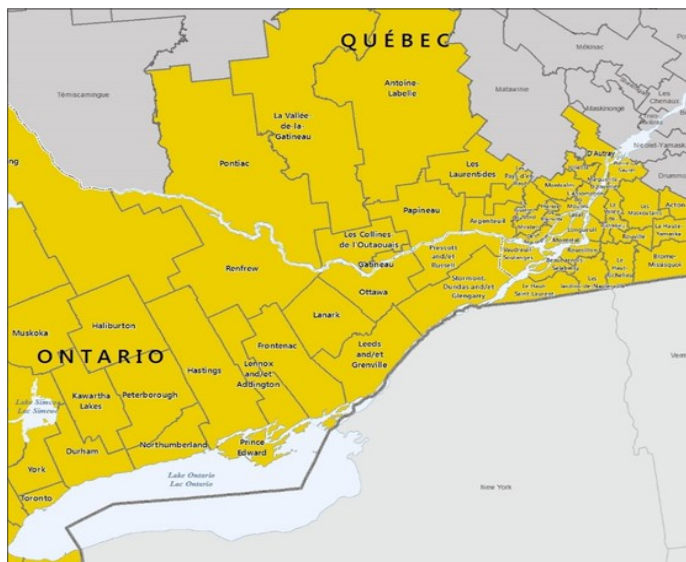
Bad Emeralds

By: Paul Hetzler, Cornell Cooperative Extension St. Lawrence County

Kermit the Frog may have lamented “It’s not easy bein’ green,” but these days, everyone wants to market themselves as “green.” It seems to make us feel good. If “green” is a hot brand, then “emerald” must be tops. Who doesn’t like the Emerald Isle or the Emerald City, and now the Bahia Emerald is on sale for around \$400 million if you’re looking for a bargain. So right out of the box, the emerald ash borer (EAB) is ahead in the PR department. Plus, it’s gorgeous: a tiny streamlined beetle sporting a metallic green paint job with copper highlights. This, coupled with the fact that they’re not at the moment raining from the sky like a plague of locusts, may be why it’s hard to take the EAB threat seriously. But I’m betting a little “tea” will let the air out of EAB’s greenwash balloon.

Right now, the entire northern shore of the St. Lawrence River along the Canadian border from the Thousand Islands region to Cornwall and beyond is heavily infested with the emerald ash borer. Some islands on the Canadian side are infested as well. This puts EAB within a mile, considerably less in some spots, of St. Lawrence County along a roughly seventy-mile stretch of its border. Once they emerge in late spring, EAB often fly between two and three miles to find new egg-laying sites, and research concludes that they are capable of flying nonstop for twenty-miles.

The New York State Department of Environmental Conservation’s EAB Risk Metric considers areas within five miles of an infestation center to be at severe risk of EAB invasion, and anything between five and ten miles at high risk. In other words, according to the NYSDEC, St. Lawrence County residents who live within nine miles of the Seaway are in a high-risk EAB zone, and those within four miles of the river are in a severe-risk EAB zone.



This is a zoomed in section of the Emerald Ash Borer Regulated areas of Canada map created by the Canadian Food Inspection Agency (CFIA) Mapping and GIS Services of London, Ontario.

While EAB is almost surely here already (typically it takes five to seven years for symptoms to show up, but after that, tree mortality escalates rapidly), it will get here, period. This is not an “if” situation. All native ash trees (i.e. those in the genus *Fraxinus*) not chemically treated will be killed by EAB. End of story; no survivors. When an ash tree is killed by EAB, the wood degrades unlike anything we have seen before, with the wood losing five-hundred percent of its shear strength in twelve to eighteen months. This is worth repeating: an EAB-killed tree undergoes a 500% strength loss in as little as one year. Such trees can collapse under their own weight with no causal factor. Trees on private property, as well as those in public rights-of-way, become hazardous if not removed promptly. If your tree is within striking distance of a sidewalk, road, utility line, or footpath, you may be liable.

Because of the strength-loss phenomenon, removing an infested tree always costs more than taking out a live one, sometimes by an order of magnitude. In many cases, treating an ash which is now in good condition can be cheaper in the long run than removal. However, plans must be made well in advance. **It is very important to note that doing nothing is the most expensive option.** Personal-injury lawsuits frequently exceed insurance payouts; just a single judgment could bankrupt a town, village, business or individual. The best way to combat EAB is to be prepared by creating an **EAB Task Force** in your community.

Formed in 2016, the St. Lawrence County Emerald Ash Borer Task Force (EABTF) is a volunteer group composed of local, county and state employees, college and university staff and faculty, and land-management professionals. The goal of the EABTF is to help communities in St. Lawrence County prepare for the impending EAB infestation. Community needs include quantifying the ash trees for which they are responsible; identifying alternatives for treatment and removal; and selecting the options that best match their needs and budgets. In addition, the EABTF wants to help coordinate equipment-sharing and dumpsite consolidation, and facilitate ash treatment and removal group bids in order to secure the lowest prices, and to streamline logistics in general. It is also committed to educating the public about EAB and how to best prepare for it.

The St. Lawrence County Emerald Ash Borer Task Force is looking for citizen volunteers to help their communities conduct tree inventories between September 2017 and October 2018. A day-long training is required before field work can begin, and the task force will provide field supervision as needed, and will be available to answer any questions that may arise. If you, or your civic, church, school or professional group are interested please email: Paul Hetzler at ph59@cornell.edu or John Tenbusch at JTenbusch@stlawco.org

To read more about the NYSDEC’s EAB Risk Metric click on “Emerald Ash Borer Management Response Plan” at http://www.dec.ny.gov/docs/lands_forests_pdf/eabresponseplan.pdf

Species Spotlight: Starry Stonewort (*Nitellopsis obtusa*)

By: Paul Hetzler, Cornell Cooperative Extension St. Lawrence County

It sounds like it could be a punk band or a designer drug, but starry stonewort (*Nitellopsis obtusa*) is an invasive algae that has spread throughout the Great Lakes region since its first North American appearance in 1978 in the St. Lawrence River. Native to Europe and western Asia, starry stonewort was probably introduced by way of trans-oceanic ship ballast water. It was then discovered in Michigan in 1983, and has since infested waterways in Minnesota, Indiana, Pennsylvania, Vermont and Wisconsin. At this time, Michigan has the dubious distinction of having the greatest number of infested sites.

We tend to think of algae as an amorphous slime, the green stuff that we might see on the sides of an aquarium or a birdbath, but starry stonewort is not like that at all. Having a main stem with numerous whorls of four to six branchlets, this large robust algae more closely resembles a vascular plant such as Eurasian watermilfoil. Its name comes from the many small (4-5mm) white, star-shaped bulbils which are produced by its root-like filaments that anchor it to benthic sediments. Individual cells are big—each branch cell is around a millimeter thick, and a cell may grow up to 80 cm long. Altogether, a single plant may reach a length of 2 meters or so.

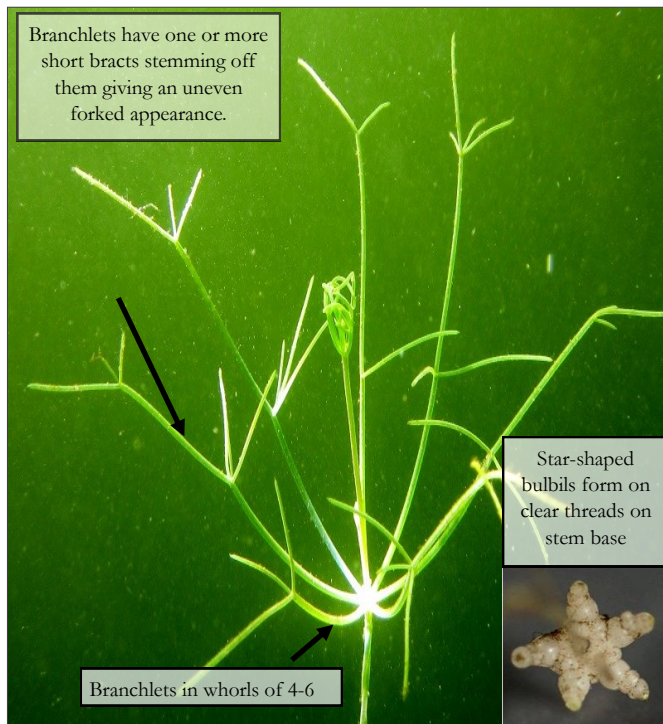


Photo Credit: Michigan Lake and Stream Association, INC.
Starry Stonewort: Essential Information for Lakefront
Property Owners, www.mymlsa.org.

Starry stonewort thrives in alkaline sediments, such as those created by the carbonaceous rock underlying most of the Great Lakes Basin, and much of the St. Lawrence River. Preferring slow-moving water, it can survive in very low-light conditions at depths as great as nine meters. In northern New York State it generally begins to show up in mid-July, achieving peak biomass in September.

Like most invasive aquatic plants, starry stonewort can form dense mats, impeding the movement and breeding of fish and waterfowl, and reducing the recreational value of a water-body. The annual fall die-off and decomposition of these vegetative mats robs water of dissolved oxygen, which stresses many fish species, particularly sensitive ones like trout and salmon. *N. obtusa* is readily dispersed by seasonally strong currents, migratory waterfowl, dredging activities, and boats and trailers, all of which can spread bulbils and stem or branch fragments to new locations.

Unfortunately, what we know about starry stonewort would seem to fit into a Dixie cup, compared to all the issues that remain unknown. This is an atypical invasive in some ways, and there is a dearth of information about certain aspects of its biology. For example, in parts of Germany its population has fluctuated from near-nuisance levels to scarcity in just a few decades, with no management efforts. In the United Kingdom, starry stonewort is considered an endangered species, and in Sweden it is listed as “vulnerable.”

More so than other aquatic plants, it exhibits strong allelopathic tendencies; in fact, the terrestrial invasive garlic mustard came to mind while researching starry stonewort. Garlic mustard, if left alone, will die out from a given site in about a decade as a result of the toxins it exudes through its roots, but it is not known if *N. obtusa* behaves similarly. Starry stonewort is so good at poisoning the sediments in which it grows, it has been known to out-compete and replace other aquatic invasives like Eurasian watermilfoil, fanwort and curly pondweed. At least one researcher has suggested it should be considered as a biocontrol for other invasives, at least in its native range.

So far, the only cool thing about starry stonewort is its name. Beyond that, it is just another in a long line of invasive species that have come to us courtesy of international shipping. With another New York State fishing season underway, **please help curb the spread** of starry stone wort and other invasive species by cleaning all boats, trailers and gear before and after each launch, and disposing of bait responsibly.

Collaborating with NASA's DEVELOP Program to Manage Forest Pests

By: Rob Williams, SLELO Coordinator

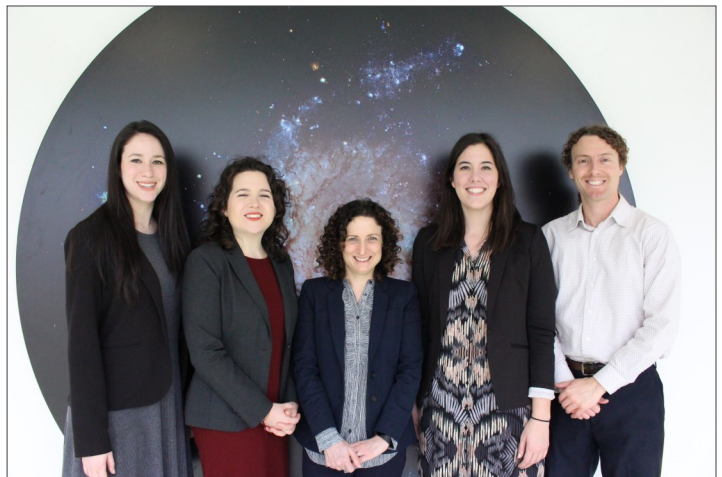
As the hemlock woolly adelgid (HWA) continues to spread across New York and New England, resource managers are tasked with finding ways to limit not only the spread of HWA but also to reduce the potential damage it can cause our forests. According to existing hemlock distribution maps, Tug Hill is second only to the Adirondack region in terms of overall hemlock density in New York State. These maps, however, present a very broad frame of reference and therefore can only provide resource managers with a general view of hemlock distribution.

SLELO PRISM and the Adirondack PRISM have collaborated with NASA's DEVELOP program to create high resolution maps of both Tug Hill and the Adirondack Mountains. These maps allow for visual inspection of hemlock trees at the stand level as well as the canopy level. Having maps with this degree of detail could be helpful in future forest-pest management planning.

In addition to high spatial resolution, these maps can be coupled with hemlock-distribution overlays to reveal high-risk areas. Having this level of detail can aid in determining where HWA may become established, and where prevention and management efforts would likely have the greatest impact. It can also be used to help to prioritize areas where insectaries

for the rearing of biological control agents for HWA, beetles in the genus *Laricobius*, could or should be established.

DEVELOP is part of NASA's Applied Sciences Program, which addresses environmental and public policy issues through interdisciplinary research projects that apply the lens of NASA Earth observations to community concerns around the globe. Through this program, DEVELOP builds capacity in both participants and partner organizations to better prepare them to address the challenges that face our society and future generations.



NASA DEVELOP project team (left to right): Rachel Soobitsky, Ariel Walcutt, Sara Lubkin, Madeline Ruid, Sean McCartney. Photo provided by Sean McCartney. Center Lead NASA DEVELOP National Program

Special Recognition

2017 marks the tenth year that Mike Parks has furnished pesticide-applicator services to SLELO PRISM and its host organization, The Nature Conservancy.

Over the past ten years, Mike's dedication to the protection and enhancement of our natural areas has been well noted. Mike has worked on numerous invasive-species control projects that have included managing some highly aggressive species such as swallow-wort, *Phragmites*, giant hogweed and Japanese knotweed. Mike's participation with the NYS hogweed

eradication program has led to the extirpation of this invasive plant from fifteen sites in the SLELO region. Mike has also played an instrumental role in our Salmon River Initiative by helping to obtain landowner permissions, and coordinating strategic Japanese knotweed control measures.

Mike continues to be a valued part of our team. His expertise, humor and work ethic have set the pace for much of our invasive species management efforts.

THANK YOU MIKE!



Mike Parks, SLELO PRISM Rapid Response Team Leader. Photo provided by, Rob Williams, SLELO Coordinator.

“Preparing for Climate Change and Invasive Species in the Tug Hill Core Forest”

Article Provided by The Nature Conservancy (www.nature.org)

with additional contributions from Brian Roat, TNC CWNV Conservation Lands Manager

In February 2017, The Nature Conservancy received a \$166,925 grant to make Tug Hill a stronghold of climate resiliency. The grant is to help establish a stronger and more diverse forest, able to weather a changing climate, provide corridors for wildlife movement and migration, and ensure that natural processes like clean air and water are generated for people. The grant was awarded by the Wildlife Conservation Society through its Climate Adaptation Fund, established with funding from the Doris Duke Charitable Foundation. A grant from the St. Lawrence and Eastern Lake Ontario PRISM contributed an additional \$15,000 to bolster the project's invasive species resiliency components.

The project will take place on the Tug Hill Plateau, the third largest forest landscape in New York. Tug Hill is a critical link to the Adirondacks to the northeast with its high quality headwaters that ensure water flowing into Lake Ontario is clean and plentiful. The region is also home to a variety of wildlife including black bears, fishers, pine martens and forest birds like the three-toed woodpecker.

But while the forests of Tug Hill are large and relatively unfragmented, decades of repeated, heavy high-grade cutting have resulted in forests with poor timber quality and regeneration of valuable timber species. Such conditions leave landowners with few viable management options in the immediate future and leave forests vulnerable to climate change impacts.

“The Tug Hill region is expected to warm by as much as four to six degrees Fahrenheit by the 2050s,” said Jim Howe, Executive Director of The Nature Conservancy's Central and Western New York Chapter. “This could mean decreases in snowpack and more frequent and intense weather events like ice and wind storms. The forest could also become more vulnerable to pests and pathogens like the hemlock woolly adelgid, which has devastated forests in nearby regions.”

To combat these threats, The Nature Conservancy will collaborate with Cornell Cooperative Extension-Onondaga County, and the State University of New York College of Environmental Science and Forestry (SUNY-ESF) to apply sustainable forestry techniques and establish a more climate-resilient forest on Tug Hill, beginning with 775 acres. Over time, the lessons learned could be applied throughout the entire 150,000-acre Tug Hill Plateau.



Tug Hill Plateau. Photo Credit, Mat Lavine, TNC.

In addition to improving the conditions of existing forest stands, a 2014 clear-cut will be replanted with 45,000 tree seedlings incorporating a diverse mix of native species suited to a changing climate. Included in this planting will be several hedges of eastern hemlock that could act as insectaries for rearing the biocontrol beetle *Laricobius nigrinus* in the event of an infestation of hemlock woolly adelgid on Tug Hill. “If the project succeeds,” said Howe, “it will secure Tug Hill as a stronghold of climate resilience that provides corridors for wildlife, economic value for communities and life-essential services for people—for generations to come.”

If you are interested in planting trees on Tug Hill Please contact Mary Ripka, Volunteer Coordinator for TNC CWNV at 315-387-3600 x 7721 or mripka@tnc.org.



Photo credit: Google.com

Engaging the Public in Citizen Science

By: Mary Ripka, TNC CWNV Volunteer Coordinator

with contributions from Megan Pistolese, SLELO Outreach Coordinator

There is a growing interest in public participation in scientific fieldwork, including citizen-science volunteer projects. Members of the public can engage with the process of scientific investigations through monitoring, data collection, and results interpretation. This type of citizen engagement yields new knowledge by providing access to more and different observations and data than traditional scientific research.

The St. Lawrence Eastern Lake Ontario Partnership for Regional Invasive Species Management (SLELO PRISM) is hoping to expand our geographic range for early detection of aquatic invasive species and demonstrate that new technologies can be effectively used by citizen scientists to strengthen early detection efforts.

Currently SLELO is **seeking volunteers** to aid in two special citizen-science projects: environmental DNA (eDNA) involving water sample collection and underwater video surveillance, and Aquatic Invasive Species Spread Prevention through our boat launch steward program.

Environmental DNA work would take place in Fulton, Oswego, Pulaski, Chaumont Bay and French Creek. Volunteers who assist with Aquatic Invasive Species Spread Prevention will aid our boat launch stewards at Cape Vincent, Henderson Harbor, Sackets Harbor and the Oswego River. Work would involve helping with watercraft inspections and handing out informative brochures.



Citizen Scientists aids eDNA project with Nate Fedrizzi (on right), 2016 eDNA Project Coordinator. Photo Credit: Rob Williams, SLELO Coordinator.



Bryna Kaykin, 2016 Boat Launch Steward, inspecting a watercraft. Photo Credit, Megan Pistolese, SLELO Outreach Coordinator.

*If you are interested in volunteering
please contact
the Volunteer Coordinator
for The
Nature Conservancy's
CWNV Chapter, Mary Ripka,
at 315-387-3600 x 7721 or
mripka@tnc.org*

Upcoming Events

Sponsored by SLELO PRISM & Partners

*We encourage our partners to highlight their upcoming events in each newsletter.
Please contact Megan Pistolese to submit an event at 315-387-3600 ex. 7724;
megan.pistolese@tnc.org*

SLELO Adopt a Forest Pest Trap Training/Monitoring Workshop: Wednesday, April 19th 1pm-3pm at Westcott Beach state park office located at 12224 NYS Rt. 3, Sackets Harbor, NY 13685. Seasonal workers and interns for PARKS and DEC, as well as dedicated volunteers, are encouraged to attend. Help strengthen early detection efforts for emerald ash borer and adopt an emerald ash borer trap to hang and monitor. Help promote the Asian longhorned beetle pool survey.

To pre-register, contact: Megan Pistolese at 315-387-3600; mgan.pistolese@tnc.org.

Pollinator Pathway Workshop: Monday, April 24th 6pm-8pm, at the Thousand Island Land Trust located at 135 John St. Clayton, NY. Learn the importance of native gardening and how to reduce the susceptibility of the urban landscape to the encroachment of invasive species. Pre-registration required.

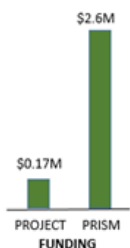
Contact: Megan Pistolese, 315-387-3600 x 7724; megan.pistolese@tnc.org.

Eastern Lake Ontario Invasive Species Symposium: Wednesday, June 7th 8:30am-4pm. Selkirk Shores State Park. Hosted by the SLELO PRISM and The Nature Conservancy with a donation from Douglaston Salmon Run. Continuing education credits pending. **Pre-registration required, contact:** Megan Pistolese at 315-387-3600; megan.pistolese@tnc.org

iMap Training & iMap Mobile Training: Wednesday, June 14th 10am-2:30pm at the Jefferson County Cornell Cooperative Extension located at 203 North Hamilton Street, Watertown. **To Register visit** www.imapinvasives.org.

SLELO PRISM Partner Meeting: Our next full partner meeting is scheduled for May 17th at the Keewaydin State Park Marina Pavilion. Our partners meet the third week of every other month and alternate between Wednesdays and Thursdays. Contact Rob Williams PRISM Coordinator for details or if you wish to present a current topic or project to our partners.

SLELO PRISM—By The Numbers



PRISM Funding (EPF)
= **2.6 million**
Project Funding (federal & State) = **\$170k**



11

Terrestrial Priority
Conservation
Areas Protected



16

Aquatic Priority
Conservation
Areas Protected



21

Sites where restoration
efforts have occurred
using native
plantings



17

Special invasive species
contracted projects
benefiting people and nature



86

Public Exhibits & Events
Sponsored By
SLELO PRISM



1,031

Watercraft Inspections



5073

people directly engaged
(one-on-one) via education
& outreach



278

Acres Managed for
Invasive Species



17

Partner Organizations
Committed to Our PRISM



COORDINATOR'S COLUMN

Charting a Clear Path Forward for Continued Success



Recognizing that New York State is a North American hub for the import/export and spread of invasive species, the NYS Legislature created an invasive species Task Force in 2003, its purpose to recommend to NYS government how to most effectively manage invasive species. Two years later the Task Force emerged with twelve recommendations, almost all of which are currently being implemented, and which continue to demonstrate success. The benefits of these initiatives are far-reaching, and may serve as models for other states and countries. The Task Force proposed that NYS:

- ◇ Develop a leadership structure, e.g. PRISMs
- ◇ Develop comprehensive invasive species management plans
- ◇ Allocate resources
- ◇ Conduct education & outreach
- ◇ Develop an information clearinghouse
- ◇ Hold biennial conferences focused on invasive species
- ◇ Formalize NYS policy and practices on invasive species
- ◇ Establish a research center
- ◇ Encourage non-regulatory prevention
- ◇ Streamline a regulatory process for invasive species
- ◇ Influence federal actions
- ◇ Recognize and fund demonstration projects

Kudos to the many partners who participated in developing these recommendations, and to all those who continue to implement them. Our collective successes have been instrumental in preventing and managing the spread and impacts of invasive species.

New York is now poised to build upon its foundations of success to chart a clear path forward for future invasive species policies and programs. The time is right to establish an Invasive Species Action Agenda that leverages existing initiatives, identifies new opportunities for action, and guides funding and application of strategic approaches throughout the State. Once established, this Action Agenda could be tendered as a proposal to the New York State Invasive Species Advisory Committee and to the New York State Invasive Species Council to help guide future policies and programs and promote the best use of limited resources toward shared goals.

PRISM leaders and partners at all levels have begun a dialog to address the need and potential for developing further suggestions for statewide consideration. The goal is to advance NYS as a leader in invasive species programming, policies and funding by developing and executing an Action Agenda that further safeguards natural assets from the detrimental affects of invasive species.

Having a structured approach from which to proceed should help us to chart a clear path forward for continued success.

~ Rob Williams

Note: A special thanks to Brendan Quirion of APIPP for supplying information referred to in this column.

SLELO PRISM Partners

- | | |
|---|---|
| ◆ NYS Department of Environmental Conservation | ◆ Fort Drum Military Installation |
| ◆ The Nature Conservancy | ◆ Tug Hill Tomorrow Land Trust |
| ◆ Cornell Cooperative Extension Offices | ◆ Tug Hill Commission |
| ◆ NYS Office of Parks, Recreation & Historic Preservation | ◆ Save The River |
| ◆ NYS Department of Transportation | ◆ Audubon - Central NY Chapter |
| ◆ NY Sea Grant | ◆ Thousand Islands Land Trust |
| ◆ Ducks Unlimited | ◆ NY Power Authority |
| ◆ Soil & Water Conservation Districts | ◆ CNY Regional Planning & Development Board |
| | ◆ US Coast Guard Auxiliary |

Acknowledgements:
NYS Invasive Species Council
The NYS Environmental Protection Fund



The Nature Conservancy 
Protecting nature. Preserving life.

C/O The Nature Conservancy, CWNV