fingerlakesinvasives.org

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Introduction

Letter from the Coordinator

Partners,

We have successfully closed the books on the 2018-2019 fiscal year and our first five year contract. It has been a great first chapter to our invasive species story and we look forward to continuing our partnerships moving forward.

The Finger Lakes-PRISM saw much growth over this past year. We trained **409** people in the iMapInvasives mapping system and recorded 2,038 observations for the region. We engaged partners to place bootbrush stations across the region and currently have 61 across trails and parks. We sponsored Clean, Drain, Dry billboards across the Finger Lakes resulting in 941,317 impressions. *Hydrilla verticillata* detected in King Ferry, NY in the fall of 2018 was mitigated in March, 2019 while a new infestation of yellow-groove bamboo (*Phyllostachys aureosulcata)* was confirmed in Monroe County, the first observation in upstate New York. Finally, the Finger Lakes PRISM strategic plan goals were further met through prevention, coordination with partners, early detection/rapid response, education and outreach to the community and K-12 students, information management and communication, and legislation and support from federal, state and local funding sources.

Invasive species work in the region included facilitating, managing, and supporting invasive species programming across the region. The education and outreach program touched 153,892 people across the various modes of outreach including tabling, hikes, presentations, workshops, and hands-on events. Field crews were on the land and water to survey, identify, report, and control invasive species in the region. During this quarter, an adult spotted lanternfly was reported in Yates County. Since then, the Finger Lakes PRISM and partners have been working with NYSDEC and NYSDAM to help with outreach, survey, or other needs associated with this deadly invasive species.

Some highlights from the FLI Finger Lakes PRISM 2018-2019 fiscal year include:

- **8** workshops with **248** community members engaged on invasive species*
- **21** Tabling events with over 151,873 people in attendance*
- **17** Presentations conducted that conveyed invasive species programming to **584** people*
- **409** people trained to use iMapInvasives and 2,038 observations
- Watercraft stewards inspected **34,772** boats at **19** launches and engaged **81,448** people
- **31** events held across the region in honor of NYISAW reached **3,456** participants
- Water chestnut control team removed **1,540 acres** of water chestnut across **21** sites and surveyed **3,769 acres** for high priority aquatic invasive species
- **23.9** acres of giant hogweed were controlled and an additional **110** acres were surveyed for high priority terrestrial invasives
- Facilitated Cayuga County *Hydrilla verticillata* task force, actively sought funds for treatment, worked with USACE Hydrilla Collaborative and state and federal government to seek funds, and presented at various meetings on the need for funding.

These are just a few of the highlights from the work across the region. We have many things for which to be proud in our Finger Lakes PRISM region. We look forward to our next five year chapter in invasive species work in the region!

In service,

Hilary R. Mosher, Coordinator, Finger Lakes-PRISM

Acknowledgements

We are thankful to our host organization, the Finger Lakes Institute at Hobart and William Smith Colleges, and our New York State (NYS) partners which include the NYS Department of Environmental Conservation (DEC) Invasive Species Coordination Unit, the NYS Invasive Species Council, the NYS Invasive Species Research Institute, the NYS Invasive Species Clearinghouse at Cornell University, and the New York Invasive Species Database known as iMapInvasives.

I am also very thankful to our Steering Committee, Agriculture, Aquatic, Education & Outreach, and Terrestrial Working Group members for their dedication, expertise, and commitment to furthering the mission of the Finger Lakes PRISM. A big thank you to our grant collaborators and partners who work tirelessly to survey, identify, report, and control invasive species across the region. There is no 'Partnership' without our partners and we are grateful for your service.

The Finger Lakes PRISM is funded by the Environmental Protection Fund, through contract between the NYS Department of Environmental Conservation and Hobart and William Smith Colleges.

Finger Lakes Partnership for Regional Invasive Species Management

About

The Finger Lakes Partnership for Regional Invasive Species Management (Finger Lakes-PRISM) is a collaborative program designed to address the threat of invasive species. Housed within the Hobart and William Smith Colleges Finger Lakes Institute (FLI), the program is one of eight across New York that focuses on managing invasive species, developing detection programs, employing response efforts, providing education programs and outreach, and working with communities. PRISM programs are administered through the New York State Department of Environmental Conservation.

Hobart and William Smith are nationally recognized liberal arts colleges defined by a longstanding focus on educating across academic disciplines and an intellectual environment that cultivates faculty and student connections. With a strong commitment to inclusive excellence, the Colleges have a distinguished history of interdisciplinary teaching and scholarship, curricular innovation and exceptional outcomes. Hobart and William Smith provide robust programs in career development, study abroad, service, leadership and athletics. There are 45 majors and 67 minors. With an enrollment of 2,237, more than 60 percent of students study abroad through the No. 1 global education program in the country and all participate in community service. Located in the heart of the Finger Lakes region, Hobart and William Smith enjoy a lakeside campus on the shore of Seneca Lake. Originally founded as two separate colleges (Hobart for men in 1822 and William Smith for women in 1908), Hobart and William Smith students share the same campus, faculty, administration and curriculum.

Background

In response to the 2005 report to the NYS Invasive Species Task Force, eight Partnerships for Regional Invasive Species Management (PRISMs) were formed statewide to address the economic, ecological, and human health impacts of invasive species within New York (Figure 1). Developed based on the Cooperative Weed Management Areas (CWMA) from the western United States, the PRISMs represent a unified strategy in dealing with invasive species.

The Finger Lakes-PRISM covers the 17 counties of the Finger Lakes and brings together the resources of a diverse range of organizations to prevent, detect, control, and manage invasive species; ultimately reducing their proliferation and impacts. With the cost to control invasive species within the United States at estimated between $120B and $137B annually (Pimentel *et al*. 2005, Runyon *et al.* 2012), the Finger Lakes-PRISM allows for sharing and leveraging of limited resources within the partnership while representing a highly-visible program that builds community awareness and participation.

Prior to securing funding in 2014, the Finger Lakes PRISM consisted of a group dedicated to forwardin the mission of invasive species management. The Finger Lakes PRISM launched terrestrial, aquatic,

Figure 1. Partnerships for Regional Invasive Species Management (PRISMs) in New York State

and education & outreach working groups and developed a 2008 work plan with five major objectives including: strengthening partnership, identifying funding sources, education and outreach, eradication and control, and monitoring and inventory. Without funding and a structure to support the Finger Lakes PRISM, the group stopped convening as a unit. In late 2013, the Finger Lakes PRISM contract was awarded to the Finger Lakes Institute at Hobart and William Smith Colleges and by the beginning of the 2014-2015 fiscal year, the program was fully functioning. Working groups and steering committee members were solicited to participate and a five-year strategic plan was developed for 2016-2021 available online http://fingerlakesinvasives.org/wp-content/uploads/2014/01/PRISM-Invasive-species-strategic-plan-002.pdf. With help from the steering committee, the Finger Lakes PRISM publishes an annual work plan which helps guide the work and focus of the program (Appendix B).

Finger Lakes Region

With breathtaking vistas and a wealth of historical perspectives, the Finger Lakes hosts travelers, recreationists, and avid enthusiasts from across the world who visit the beautiful land and lakes. Native American legend explains that the Creator looked upon this land with special favor and when reaching out to bless it, left an imprint of His hand on the landscape. Hence, the Finger Lakes were created, per legend.

Of course, geological history has a different, more scarring tale to tell about its origin. During the Pleistocene, a glacial sheet over a mile thick in locations gorged out the land and created enormous holes that filled in to become lakes as the glaciers retreated across the landscape. The incredible gorges, waterfalls, and natural panoramas of the area were born from this incredible geological process. Notably, the Finger Lakes region offers state parks such as Letchworth and Watkins Glen, ranked numbers one and three respectively in the 2015 USA Today's Reader's Choice Award for Best State Park (Appendix C), as well as the Finger Lakes National Forest, and the gorges of Ithaca (Figure 2), among others.

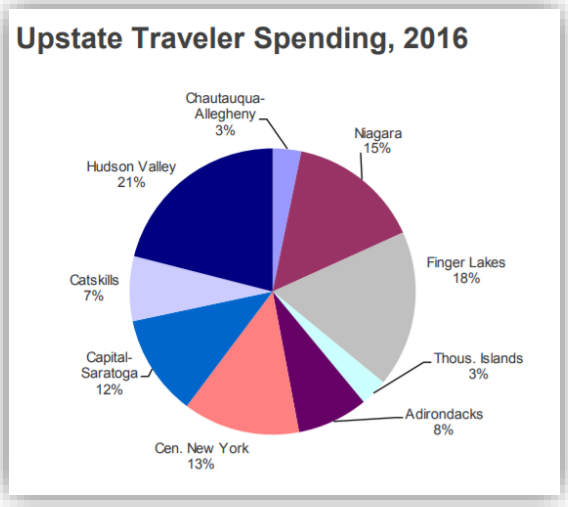
Figure 2. Map of the Finger Lakes region

Some other prominent features include:

- Harriet Tubman Home in Auburn, NY,
- Waterloo, the birthplace of Memorial Day,
- the home of aviation pioneer Glenn Curtiss, in Hammondsport,
- Elmira, home to Mark Twain in his later years
- Corning Museum of Glass
- Hornell, a major railroad center
- Conesus, the oldest producer of pure grape sacramental wine in the Western hemisphere

- Seward House of Auburn, a National Historic Landmark
- Seneca Falls, home of the Women's Rights National Historic Park, National Women's Hall of Fame, and setting for Frank Capra's classic movie 'It's a wonderful life'
- Hemlock-Canadice State Forest covers two lakes and has 6,684 acres
- Hemlock is home to the state's oldest pair of nesting bald eagles dating back to the 1960s
- Montezuma Audubon Center

The Finger Lakes PRISM region encompasses over 7.3 million acres with the City of Rochester to the west, the City of Syracuse to the east, and Elmira-Corning to the south. According to census data from 2010, 2,351,253 people live in the Finger Lakes region which encompasses Broome, Cayuga, Chemung, Chenango, Tompkins, Tioga, Steuben, Wayne, Yates, Cortland, Livingston, Madison, Monroe, Onondaga, Ontario, Schuyler, and Seneca counties . The mean household income of the region is $63,978 and the average individual percent poverty rate is 13.39% (Census Data, 2010). Given the unique features, aesthetic value, and ease of access to major cities, the Finger Lakes region is reported to be the largest tourism area in New York State, north of the Hudson Valley (Finger Lakes Tourism Alliance, 2016). In fact, in 2016, travelers to the Finger Lakes region added $3B in traveler spending and supported 59,326 jobs, equating to 5% of the total traveler spending within NYS and 18% of the upstate traveler spending. The amount of traveler spending to the Finger Lakes then is more than any other region outside of the New York City, Long Island, and Hudson Valley tourist locations, which collectively, made up nearly 80% of traveler spending. (Finger Lakes Tourism, 2016).
*Tourism data excludes the financial impact of Madison, Broome, and Chenango counties, which were included in the Central New York tourism data.



Fishing also has a major impact in the Finger Lakes region. According to the Economic Contributions of Recreational Fishing per U.S. Congressional Districts report produced by Southwick Associations for the American Sportfishing Association (October 2015), NY anglers contributed nearly $4B to the NY economy of which the Finger Lakes region accounted for over 25% of the total angler contributions ($1.032B).

There are over 40 State Parks and Historic Sites within the region ranging from Hamlin Beach State Park in Monroe County to Green Lakes State Park in Onondaga County (Appendix C). Additionally, the Finger Lakes boast Zurich Bog, a National Natural Landmark with its unique wetland preserve that is home to several threatened and endangered species on 650 acres in the town of Arcadia. The Finger Lakes is also home to the Finger Lakes National Forest in Hector, NY, a beautiful 16,600 acre retreat in the watersheds of Seneca and Cayuga Lakes.

Problem Statement

Invasive species (IS), as defined by the NYS DEC, pose a significant threat to the Finger Lakes region given the multitude of vectors for transmission. Especially of concern to our region is the massive population of giant hogweed, common reed located along almost every major transportation corridor, and an actively managed population of Hydrilla in the Cayuga inlet and Tinker Nature Park. These invasives and others are taking foothold in our region even as other populations are poised for invasion via the Erie Canal and other transmission routes. It is imperative that we protect our ecosystems and safeguard our picturesque region from additional outbreaks of new or invading species.

Mission

The mission of the Finger Lakes Partnership for Regional Invasive Species Management (Finger Lakes PRISM) is to reduce the introduction, spread, and impact of invasive species within the Finger Lakes PRISM region through coordinated education, detection, prevention, and control measures (adopted by the Steering Committee, June 2014).

Vision

The Finger Lakes PRISM is recognized as the primary organization for invasive species detection, prevention, control, and education and outreach within the 17-county region of the Finger Lakes. The Finger Lakes PRISM will work collaboratively with its partners and the public to provide education and mitigate the impacts of invasive species within our region.

Invasive Species Protection Zones:

- Boat launches
- Primary inlets and tributaries
- Marinas and bait shops
- Highly Probable Areas Invasion (HPA)
- Areas low on the invasion curve and efforts can make a difference—i.e., Japanese knotweed in the Finger Lakes National Forest is in very low abundance;
- Edge of ecological important communities;
- Transportation corridors/right-of-ways;

Priority invasives of concern:

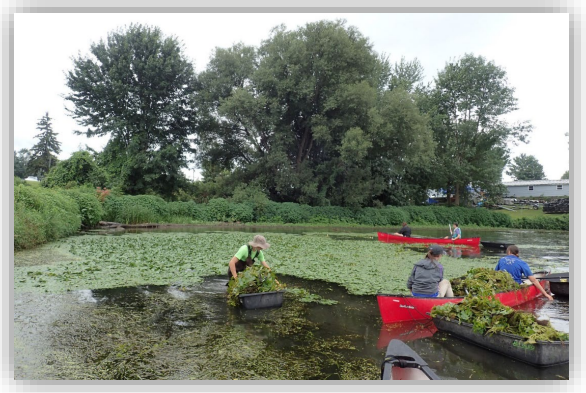
- Water chestnut, *Trapa natans* *
- *Hydrilla verticillata**
- Water lettuce, *Pistia stratiotes*
- Starry stonewort, *Nitellopsis obtusa*
- Bloody red shrimp, *Hemimysis anomala*
- Round goby, *Neogobius melanostomus*
- Oriental weatherfish, *Misgurnus anguillicaudatus* (Cantor, 1842)
- Asian clam, *Corbicula fluminea*
- *Dreissenids* (Zebra and Quagga mussels)
- Emerald ash borer, *Agrilus planipennis*
- Giant hogweed, *Heracleum mantegazzianum*
- Hemlock woolly adelgid, *Adelges tsugae*
- Japanese knotweed, *Fallopia japonica (*Houtt.)
- Oriental bittersweet, *Celastrus orbiculatus*
- Swallow-wort (pale and black), *Cynanchum spp.*
- Japanese stiltgrass, *Microstegium vimineum*
- Mile-a-minute vine, *Persicaria perfoliata*
- Slender falsebrome, *Brachypodium sylvaticum*

*Also listed on the Great Lakes Governors and Premiers List of Least Wanted Species in the Great Lakes

SUMMARY of Finger Lakes PRISM 2018-2019 Fiscal Year

FLI at HWS FUNDING THAT SUPPORT INVASIVE SPECIES PROGRAMMING:
USDA NRCS Giant hogweed control and outreach project (2016-2020)
USFS Ganondagan I, II, Finger Lakes National Forest, and Rochester Museum and Science Center Cummings Nature Center projects (2016-2018, 2017-2019)
EPA GLRI Water Chestnut Control Project (2016-2019)
EPA GLRI Hydrilla Control and Outreach Project (2017-2019)
EPA GLRI SSW Collaborative in the GLB (2017-2019)
USFWS Spread Prevention in the Finger Lakes (2012-2020)
NYSDEC Spread Prevention program in the Finger Lakes (2017-2020)
Watercraft steward private program funds: Canandaigua Lake Watershed Association/Council, Conesus Lake Association/CCE Livingston, Monroe County SWCD, Onondaga & Cayuga Counties

SUMMARY OF IS PROJECTS
Water chestnut (EPA GLRI funding 2017-2019)
A water chestnut strike team and lead were hired, trained, and directed to survey and manage water chestnut as part of an EPA GLRI grant which was extended for an additional season through spring 2019. Wayne County Soil and Water Conservation provided funding to support additional people to work as part of the strike team. The team (n=7) began on June 25, 2018 and spent 39 days surveying 21 sites (3,769 acres). Water chestnut management through hand-pull, mechanical harvest, and chemical treatment occurred throughout 1,540 acres across 21 sites, over 800 more acres and three more sites than in 2017. The area measurements were calculated using hand-held GPS units and mapping software (Google Earth Pro and ESRI ArcGIS).

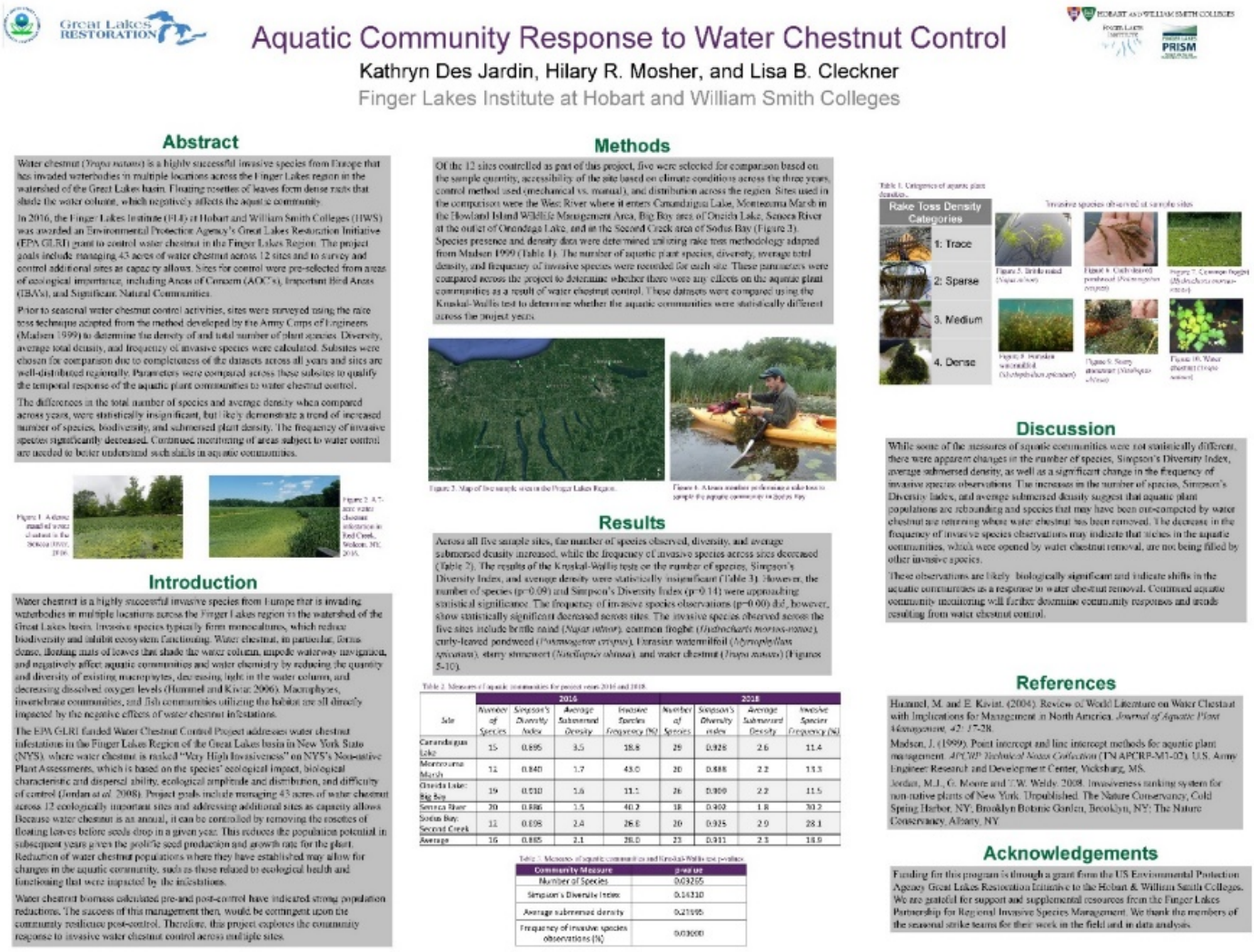


Volunteers hand-pulling a water chestnut mat at the Oneida Lake Marina. About 2,000 pounds were pulled this day. Photo credit: Kathryn Des Jardin

This project has made significant strides towards reducing the population of water chestnut through survey, management, and outreach to the region. Although populations seem to have rebounded from flooding events in 2017, the project team is on the verge of complete control of populations in locations such as Braddock Bay, the Genesee River, Cayuga Lake, and Lewis Point on Oneida Lake (90.9%, 60.4%, 89.3%, and 93.8% reductions by weight in population, respectively) while also having increased the capacity of the region to address newly discovered populations reported due to the increased presence at outreach events and training sessions.

Education and outreach to the region was highlighted by the 31 events that took place over the New York Invasive Species Awareness Week (July 8-14), participation at events such as Science Exploration Days, Owasco Lake Days, volunteer water chestnut pulls, and high participation from

volunteers across eight lakes for the macrophyte survey program.



Aquatic Community Response to Water Chestnut Control

Kathryn Des Jardin, Hilary R. Mosher, and Lisa B. Cleckner
Finger Lakes Institute at Hobart and William Smith Colleges

Abstract

Water chestnut (*Trapa natans*) is a highly successful invasive species from Europe that has invaded waterbodies in multiple locations across the Finger Lakes region in the watershed of the Great Lakes basin. Floating rosettes of leaves form dense mats that shade the water column, which negatively affects the aquatic community.

In 2016, the Finger Lakes Institute (FLI) at Hobart and William Smith Colleges (HWS) was awarded an Environmental Protection Agency's Great Lakes Restoration Initiative (EPA GLRI) grant to control water chestnut in the Finger Lakes Region. The project goals include managing 45 acres of water chestnut across 12 sites and to survey and control additional sites as capacity allows. Sites for control were pre-selected from areas of ecological importance, including Areas of Concern (AOC's), Important Bird Areas (IBA's), and Significant Natural Communities.

Prior to seasonal water chestnut control activities, sites were surveyed using the rake toss technique adapted from the method developed by the Army Corps of Engineers (Madsen 1999) to determine the density of and total number of plant species. Diversity, average total density, and frequency of invasive species were calculated. Subsites were chosen for comparison due to completeness of the datasets across all years and sites are well-distributed regionally. Parameters were compared across these subsites to qualify the temporal response of the aquatic plant communities to water chestnut control.

The differences in the total number of species and average density when compared across years, were statistically insignificant, but likely demonstrate a trend of increased number of species, biodiversity, and submersed plant density. The frequency of invasive species significantly decreased. Continued monitoring of areas subject to water control are needed to better understand such shifts in aquatic communities.

Introduction

Water chestnut is a highly successful invasive species from Europe that is invading waterbodies in multiple locations across the Finger Lakes region in the watershed of the Great Lakes basin. Invasive species typically form monocultures, which reduce biodiversity and inhibit ecosystem functioning. Water chestnut, in particular, forms dense, floating mats of leaves that shade the water column, impede waterway navigation, and negatively affect aquatic communities and water chemistry by reducing the quantity and diversity of existing macrophytes, decreasing light in the water column, and decreasing dissolved oxygen levels (Hummel and Kiviat 2006). Macrophytes, invertebrate communities, and fish communities utilizing the habitat are all directly impacted by the negative effects of water chestnut infestations.

The EPA GLRI funded Water Chestnut Control Project addresses water chestnut infestations in the Finger Lakes Region of the Great Lakes basin in New York State (NYS), where water chestnut is ranked "Very High Invasiveness" on NYS's Non-native Plant Assessments, which is based on the species' ecological impact, biological characteristic and dispersal ability, ecological amplitude and distribution, and difficulty of control (Jordan et al. 2008). Project goals include managing 45 acres of water chestnut across 12 ecologically important sites and addressing additional sites as capacity allows. Because water chestnut is an annual, it can be controlled by removing the rosettes of floating leaves before seeds drop in a given year. This reduces the population potential in subsequent years given the prolific seed production and growth rate for the plant. Reduction of water chestnut populations where they have established may allow for changes in the aquatic community, such as those related to ecological health and functioning that were impacted by the infestations.

Water chestnut biomass calculated pre-and post-control have indicated strong population reductions. The success of this management then, would be contingent upon the community resilience post-control. Therefore, this project explores the community response to invasive water chestnut control across multiple sites.

Methods

Of the 12 sites controlled as part of this project, five were selected for comparison based on the sample quantity, accessibility of the site based on climate conditions across the three years, control method used (mechanical vs. manual), and distribution across the region. Sites used in the comparison were the West River where it enters Canandaigua Lake, Montezuma Marsh in the Howland Island Wildlife Management Area, Big Bay area of Oneida Lake, Seneca River at the outlet of Otrobanda Lake, and at the Second Creek area of Sodus Bay (Figure 3). Species presence and density data were determined utilizing rake toss methodology adapted from Madsen 1999 (Table 1). The number of aquatic plant species, diversity, average total density, and frequency of invasive species were recorded for each site. These parameters were compared across the project to determine whether there were any effects on the aquatic plant communities as a result of water chestnut control. These datasets were compared using the Kruskal-Wallis test to determine whether the aquatic communities were statistically different across the project years.

Results

Across all five sample sites, the number of species observed, diversity, and average submersed density increased, while the frequency of invasive species across sites decreased (Table 2). The results of the Kruskal-Wallis tests on the number of species, Simpson's Diversity Index, and average density were statistically insignificant (Table 3). However, the number of species ($p=0.09$) and Simpson's Diversity Index ($p=0.14$) were approaching statistical significance. The frequency of invasive species observations ($p=0.00$) did, however, show statistically significant decreased across sites. The invasive species observed across the five sites include brittle naiad (*Najas minor*), common frogbit (*Hydrocharis morsus-ranae*), curly-leaved pondweed (*Potamogeton crispus*), Eurasian watermilfoil (*Myriophyllum spicatum*), starry stonewort (*Nitellopsis obtusa*), and water chestnut (*Trapa natans*) (Figures 5-10).

Table 2. Measures of aquatic communities for project years 2016 and 2018.

Site	2016 Number of Species	2016 Simpson's Diversity Index	2016 Average Submersed Density	2016 Invasive Species Frequency (%)	2018 Number of Species	2018 Simpson's Diversity Index	2018 Average Submersed Density	2018 Invasive Species Frequency (%)
Canandaigua Lake	15	0.895	3.5	18.8	29	0.928	2.6	11.4
Montezuma Marsh	12	0.840	1.7	43.0	20	0.888	2.2	13.3
Oneida Lake: Big Bay	19	0.910	1.6	11.1	26	0.909	2.2	11.5
Seneca River	20	0.886	1.5	40.2	18	0.902	1.8	30.2
Sodus Bay: Second Creek	11	0.698	2.4	26.8	20	0.935	2.9	28.1
Average	16	0.885	2.1	28.0	23	0.931	2.5	18.9

Table 3. Measures of aquatic community and Kruskal-Wallis test results.

Community Measure	p-value
Number of Species	0.09205
Simpson's Diversity Index	0.14310
Average submersed density	0.21995
Frequency of invasive species observations (%)	0.00000

Discussion

While some of the measures of aquatic communities were not statistically different, there were apparent changes in the number of species, Simpson's Diversity Index, average submersed density, as well as a significant change in the frequency of invasive species observations. The increases in the number of species, Simpson's Diversity Index, and average submersed density suggest that aquatic plant populations are rebranding and species that may have been out-competed by water chestnut are returning where water chestnut has been removed. The decrease in the frequency of invasive species observations may indicate that niches in the aquatic communities, which were opened by water chestnut removal, are not being filled by other invasive species.

These observations are likely biologically significant and indicate shifts in the aquatic communities as a response to water chestnut removal. Continued aquatic community monitoring will further determine community responses and trends resulting from water chestnut control.

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Acknowledgements

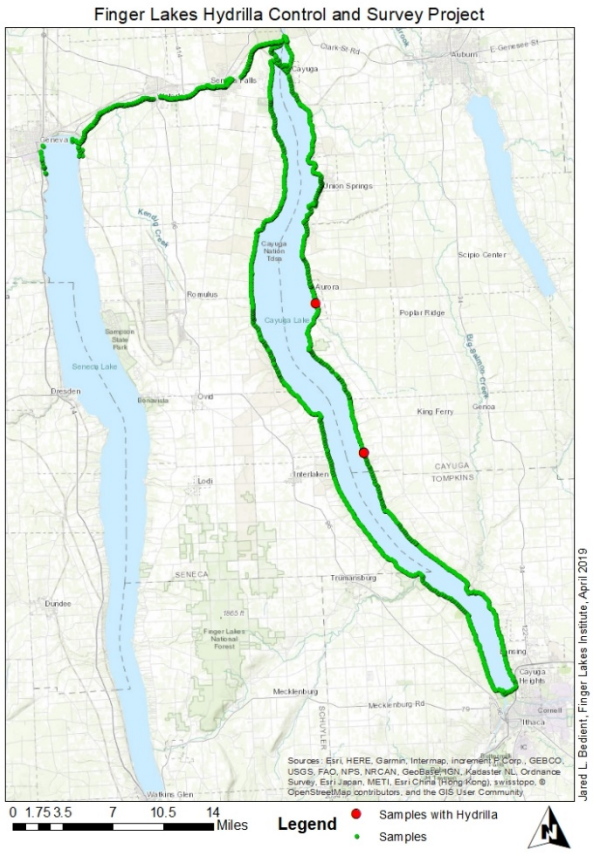
Funding for this program is through a grant from the US Environmental Protection Agency Great Lakes Restoration Initiative to the Hobart & William Smith Colleges. We are grateful for support and supplemental resources from the Finger Lakes Partnership for Regional Invasive Species Management. We thank the members of the seasonal strike teams for their work in the field and in data analysis.

Hydrilla Control and Outreach (EPA GLRI funding 2017-2019)

The Hydrilla survey crew, funded by an EPA GLRI grant, sampled for Hydrilla and other high priority invasives from October 1, 2018 until the 5 December 2018 where they conducted 1,089 rake tosses in Cayuga Lake and the Cayuga-Seneca Canal. The field crew recorded over 23 days in the field, and covered 62.3 linear miles of shoreline.

One new population of Hydrilla was documented in King Ferry, Cayuga County. After additional sampling in the area, it was determined to be a small infestation contained within a marina. A significant amount of oversight and management occurred, including working with NYS Department of Environmental Conservation (NYSDEC), the US Army Corps of Engineers (USACE, Buffalo Office), and regional NYSDEC permitting agents, to determine the appropriate management strategy to ensure eradication of the population.

It was determined that dredging of the marina to remove Hydrilla tubers and turions was the most appropriate management strategy. The FLI, in consult with the NYSDEC, USACE (Buffalo Office), and regional NYSDEC permitting agents, submitted the proper dredging permits to NYSDEC and USACE. Once approved, dredging occurred from 15 March 2019 to 28 March 2019. One-hundred fifty (150) cubic yards of sediment were removed using an excavator and hauled off-site for upland disposal. Work was completed during the annual Cayuga Lake drawdown and sandbags were used as a barrier to prevent lake water from entering the marina docks area. Water onsite was pumped out through a sand bag filter, and vegetative material was collected in a sediment basin and disposed of with the dredge material. As part of the procedure, a temporary rock workpad and cofferdam were constructed prior to dredging and removed once dredging was completed. Sediment was placed directly into a truck for hauling offsite via an excavator. All equipment and vehicles used onsite were thoroughly cleaned and pressure washed of dredged material. Wash water did not enter any lake, pond, stream, wetland, or drainage ditch. Material was transported in closed trucks and disposed of via burial in a pit and covered with soil, located in an upland area, per the NYSDEC permit requirements.

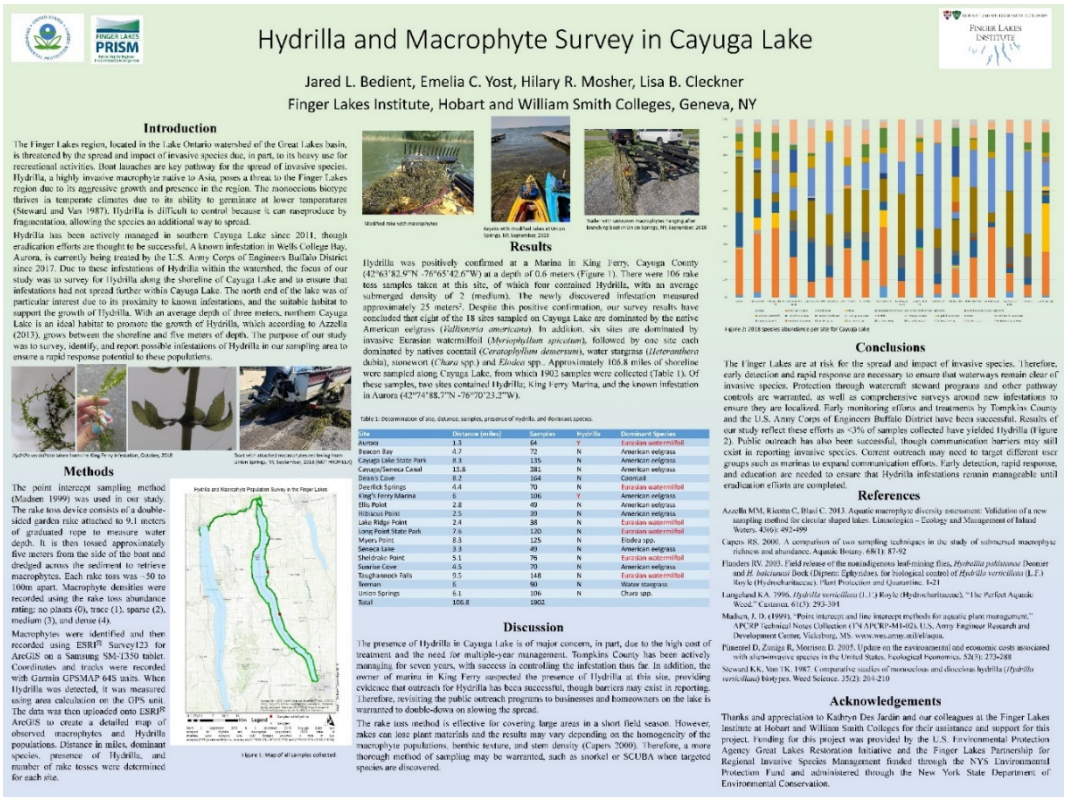


Dredging of a marina in King Ferry, NY to remove Hydrilla verticillata (photo Kathryn Des Jardin)

Outreach to the community occurred at various events during this project period. The Hydrilla field crew presented at the Cayuga Lake end of season meeting held at Wells College in November 2018. Nearly 50 people were in attendance and presenters included the FLI Hydrilla field crew (Jared Bedient, Emmy Yost), USACE (Mike Greer), and Racine-Johnson (Bob Johnson) regarding Hydrilla work in the Lake Ontario watershed. Information regarding the Long Point SP watercraft steward coverage was presented by the FLI Watercraft Steward Program Coordinator (Sam Beck-Andersen).

Cleaning the equipment used to dredge Hydrilla from King Ferry, NY

Additionally, the field crew worked with the Cayuga Lake Watershed Network to create a table of all the boat launches in the Finger Lakes region, their ownership type, and launch capability. This list will be used as part of the outreach program to disseminate outreach materials to new partners and decrease the knowledge gap to locations who have not participated in the Hydrilla outreach program previously. The Hydrilla field crew has supported this program by drafting newsletter articles, modifying the survey protocol, and creating tools for surveys to take place in the Lake Ontario watershed.



Hydrilla and Macrophyte Survey in Cayuga Lake

Jared L. Bedient, Emelia C. Yost, Hilary R. Mosher, Lisa B. Cleckner

Finger Lakes Institute, Hobart and William Smith Colleges, Geneva, NY

Introduction

The Finger Lakes region, located in the Lake Ontario watershed of the Great Lakes basin, is threatened by the spread and impact of invasive species due, in part, to its heavy use for recreational activities. Boat launches are key pathway for the spread of invasive species. Hydrilla, a highly invasive macrophyte native to Asia, poses a threat to the Finger Lakes region due to its aggressive growth and presence in the region. The monoecious biotype thrives in temperate climates due to its ability to germinate at lower temperatures (Steward and Van 1987). Hydrilla is difficult to control because it can resprouce by fragmentation, allowing the species an additional way to spread.

Hydrilla has been actively managed in southern Cayuga Lake since 2011, though eradication efforts are thought to be successful. A known infestation in Wells College Bay, Aurora, is currently being treated by the U.S. Army Corps of Engineers Buffalo District since 2017. Due to these infestations of Hydrilla within the watershed, the focus of our study was to survey for Hydrilla along the shoreline of Cayuga Lake and to ensure that infestations had not spread further within Cayuga Lake. The north end of the lake was of particular interest due to its proximity to known infestations, and the suitable habitat to support the growth of Hydrilla. With an average depth of three meters, northern Cayuga Lake is an ideal habitat to promote the growth of Hydrilla, which according to Azzella (2013), grows between the shoreline and five meters of depth. The purpose of our study was to survey, identify, and report possible infestations of Hydrilla in our sampling area to ensure a rapid response potential to these populations.

Methods

The point intercept sampling method (Madsen 1999) was used in our study. The rake toss device consists of a double-sided garden rake attached to 9.1 meters of graduated rope to measure water depth. It is then tossed approximately five meters from the side of the boat and dredged across the sediment to retrieve macrophytes. Each rake toss was ~50 to 100m apart. Macrophyte densities were recorded using the rake toss abundance rating: no plants (0), trace (1), sparse (2), medium (3), and dense (4).

Macrophytes were identified and then recorded using ESRI® Survey123 for ArcGIS on a Samsung SM-T350 tablet. Coordinates and tracks were recorded with Garmin GPSMAP 64S units. When Hydrilla was detected, it was measured using area calculation on the GPS unit. The data was then uploaded onto ESRI® ArcGIS to create a detailed map of observed macrophytes and Hydrilla populations. Distance in miles, dominant species, presence of Hydrilla, and number of rake tosses were determined for each site.

Results

Hydrilla was positively confirmed at a Marina in King Ferry, Cayuga County (42°63'82.9"N -76°65'42.6"W) at a depth of 0.6 meters (Figure 1). There were 106 rake toss samples taken at this site, of which four contained Hydrilla, with an average submerged density of 2 (medium). The newly discovered infestation measured approximately 25 meters². Despite this positive confirmation, our survey results have concluded that eight of the 18 sites sampled on Cayuga Lake are dominated by the native American eelgrass (*Vallisneria americana*). In addition, six sites are dominated by invasive Eurasian watermilfoil (*Myriophyllum spicatum*), followed by one site each dominated by natives coontail (*Ceratophyllum demersum*), water stargrass (*Heteranthera dubia*), nonswort (*Chara* spp.) and *Elodea* spp. Approximately 108.8 miles of shoreline were sampled along Cayuga Lake, from which 1902 samples were collected (Table 1). Of these samples, two sites contained Hydrilla; King Ferry Marina, and the known infestation in Aurora (42°74'88.7"N -76°70'23.2"W).

Table 1: Determination of site, distance, samples, presence of Hydrilla, and dominant species.

Site	Distance (miles)	Samples	Hydrilla	Dominant Species
Aurora	1.3	64	Y	Eurasian watermilfoil
Beacon Bay	4.7	72	N	American eelgrass
Cayuga Lake State Park	8.3	135	N	American eelgrass
Cayuga/Seneca Canal	15.8	381	N	American eelgrass
Deans Cove	8.2	164	N	Coontail
Decrick Springs	4.4	70	N	Eurasian watermilfoil
King's Ferry Marina	6	106	Y	American eelgrass
Ellis Point	2.8	49	N	American eelgrass
Hibiscus Point	2.5	39	N	American eelgrass
Lake Ridge Point	2.4	38	N	Eurasian watermilfoil
Long Point State Park	7.6	120	N	Eurasian watermilfoil
Myers Point	8.3	125	N	Elodea spp.
Seneca Lake	3.3	49	N	American eelgrass
Sheldrake Point	5.1	75	N	Eurasian watermilfoil
Sunrise Cove	4.5	70	N	American eelgrass
Taughannock Falls	9.5	148	N	Eurasian watermilfoil
Terrain	6	90	N	Water stargrass
Union Springs	6.1	106	N	Chara spp.
Total	106.8	1902		

Discussion

The presence of Hydrilla in Cayuga Lake is of major concern, in part, due to the high cost of treatment and the need for multiple-year management. Tompkins County has been actively managing for seven years, with success in controlling the infestation thus far. In addition, the owner of marina in King Ferry suspected the presence of Hydrilla at this site, providing evidence that outreach for Hydrilla has been successful, though barriers may exist in reporting. Therefore, revisiting the public outreach programs to businesses and homeowners on the lake is warranted to double-down on slowing the spread.

The rake toss method is effective for covering large areas in a short field season. However, rakes can lose plant materials and the results may vary depending on the homogeneity of the macrophyte populations, benthic texture, and stem density (Capers 2000). Therefore, a more thorough method of sampling may be warranted, such as snorkel or SCUBA when targeted species are discovered.

Conclusions

The Finger Lakes are at risk for the spread and impact of invasive species. Therefore, early detection and rapid response are necessary to ensure that waterways remain clear of invasive species. Protection through watercraft steward programs and other pathway controls are warranted, as well as comprehensive surveys around new infestations to ensure they are localized. Early monitoring efforts and treatments by Tompkins County and the U.S. Army Corps of Engineers Buffalo District have been successful. Results of our study reflect these efforts as <3% of samples collected have yielded Hydrilla (Figure 2). Public outreach has also been successful, though communication barriers may still exist in reporting invasive species. Current outreach may need to target different user groups such as marinas to expand communication efforts. Early detection, rapid response, and education are needed to ensure that Hydrilla infestations remain manageable until eradication efforts are completed.

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Acknowledgements

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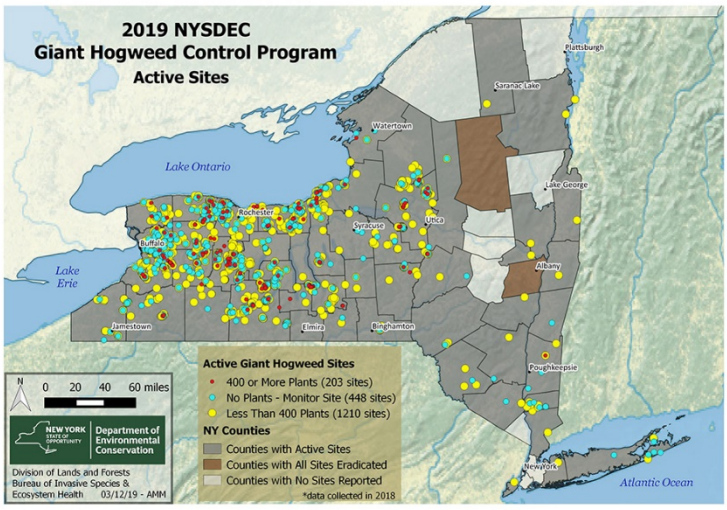
Giant hogweed in Finger Lakes (USDA NRCS funding 2016-2020)

Three field crew members were hired and trained alongside the NYSDEC giant hogweed project and one 0.50FTE education and outreach coordinator were funded by this project. This greatly increased the capacity of the region to control and provide outreach regarding giant hogweed.



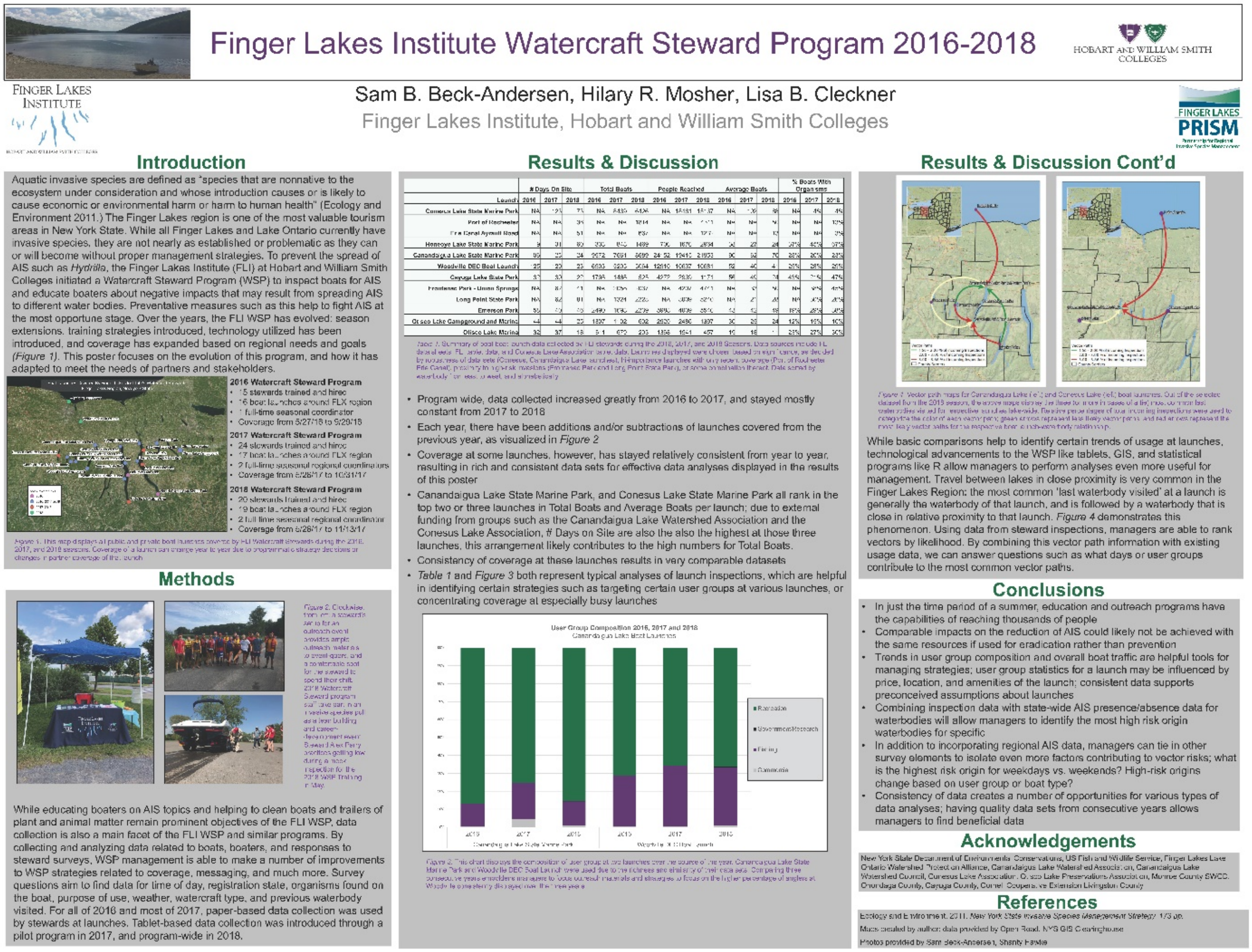
The giant hogweed project had presence at activities/events/meetings to increase information and outreach regarding giant hogweed. This is exemplified by the reporting of giant hogweed in Seneca County where previously, no giant hogweed was reported. Additionally, the Finger Lakes PRISM was able to increase collaboration with partners in Monroe, Cayuga, and Wayne County to develop/refine materials and solicit information about giant hogweed outreach in these areas. Working with the staff at NYSDEC, new giant hogweed maps were created for Monroe and Wayne Counties that included a more robust determination of control area based on parcel size. The maps included survey and control areas for Monroe and Wayne Counties. In 2018, 110 acres have been surveyed for giant hogweed and 23.9 acres have been controlled in these two counties. There has been a 20.09% change in number of sites controlled and monitored for giant hogweed over 2015 data which represents the Finger Lakes PRISM contribution to the state control program.

Table 1. Number of sites in Monroe and Wayne counties prior to USDA NRCS funding (2015) and sites since funding (2017, 2018). The management of plants highlight sites that contain zero plants (monitoring only) through sites containing over 1000 plants. There is also a column for sites where the number of plants is unknown.

County	*Sites with plants*	*Sites without plants*	*Eradicated 0 plants for 3 years*	*Monitor 0 plants*	*1-19 plants*	*20-99 plants*	*100-199 plants*	*200-399 plants*	*400-999 plants*	*1000+ plants*	*unknown plant #*
Monroe 2015	101	50	30	20	38	25	9	12	7	10	
Monroe 2017	98	78	42	36	50	16	8	8	4	12	
Monroe 2018	110	94	55	39	57	20	12	7	7	7	
Wayne 2015	113	52	11	41	37	21	14	9	16	15	1
Wayne 2017	138	67	37	30	58	28	17	11	14	10	
Wayne 2018	137	83	46	37	70	27	9	11	11	9	

FLI spread prevention program (USFWS and NYSDEC funding)

The Finger Lakes Institute hired and trained 19 watercraft stewards to engage the public in pro-environmental behaviors such as Clean, Drain, Dry and preventing the spread of aquatic invasive species. Regular season steward coverage ended on Labor Day. In all, the FLI program covered 20 launches, conducted 34,772 boat inspected, and engaged 81,448 people.



1. Coordination with Partners

Partnership and Collaborative work

Watercraft stewards being trained on plant ID

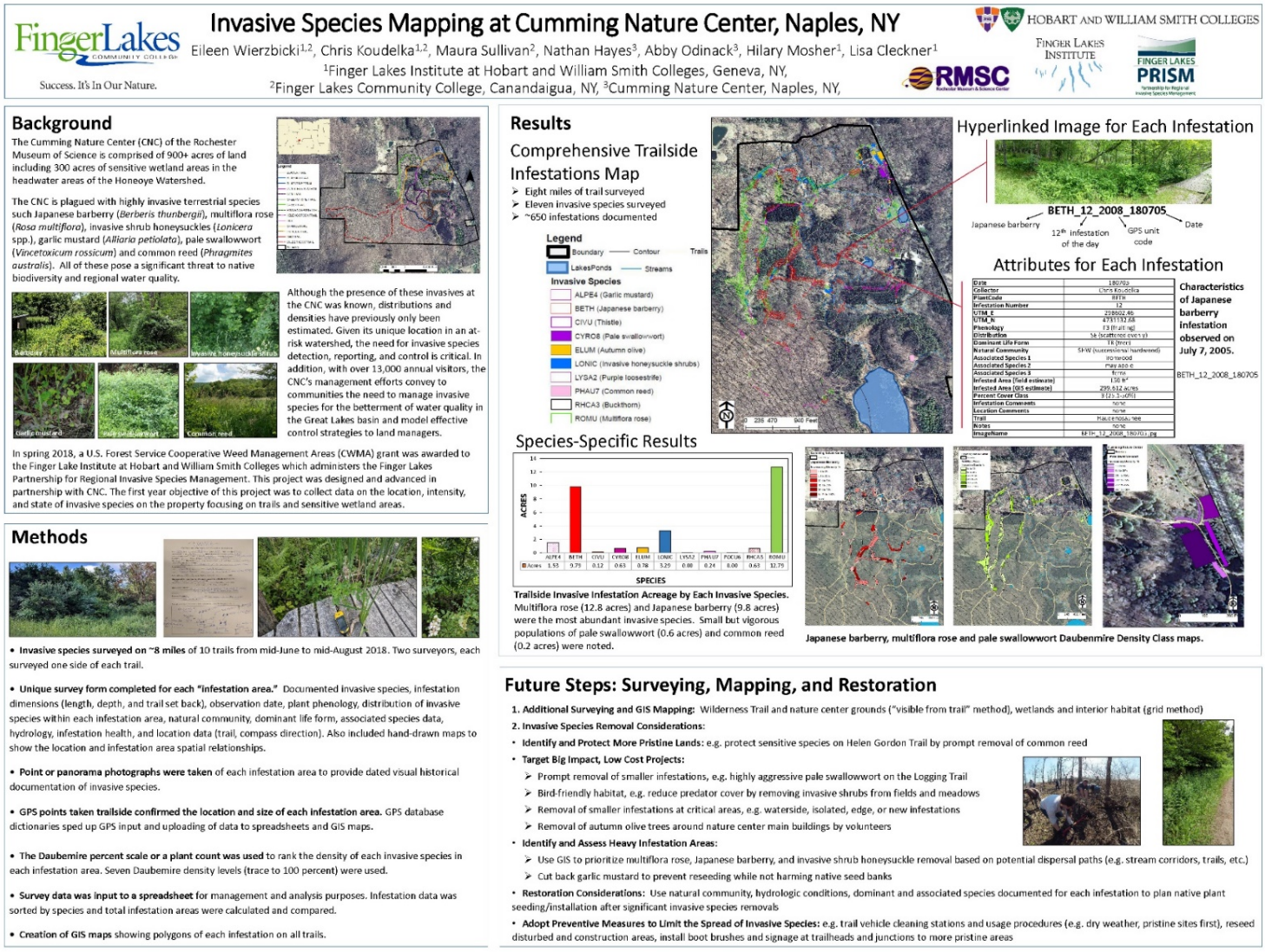
Over the past fiscal year, the Finger Lakes PRISM actively recruited partners from the region using networks established such as the working groups and steering committee as well as social media, use of the Cornell listserv, presentations at various meetings, and networking with stakeholders. The steering committee and working groups met to discuss invasive species issues throughout the PRISM. Through these groups, the Finger Lakes PRISM has made strides to involve partners and allow for open communication and opportunities for engagement across the region. The working groups and steering committee updated the high priority invasive species, kept apprised of partner activities, and sought to collaborate on activities within the region. Supporting MAM work, ED/RR of AIS with Water Chestnut project. Coordination with partners included:

- Supporting, managing, and facilitating giant hogweed work in the region
- Supporting MAM control in the region
- Supporting, managing, or facilitating invasive species project work at Ganondagan State Historic Site, Finger Lakes National Forest, and Cumming Nature Center

Finger Lakes PRISM spring partner meeting, 2018

- Supporting Finger Lakes Regional Watershed Alliance mission and objective to preserve and protect the watershed with a collective regional voice; to join forward to advocate for mutually beneficial regional changes, and promote collective actions that represent the desires of the entire Finger Lakes region
- Supporting county water quality and technical committees through presentations and attendance at meetings throughout the region
- Supporting AIS outreach and education projects for Livingston County Watershed Education Center on Conesus Lake; Canandaigua Lake Watershed Association (Development of Clean, Drain, Dry Public Service Announcement video); Keuka Lake Association (support for watercraft stewards), Cayuga Lake Watershed Network (support of Hydrilla Hunters and to distribute Hydrilla information sheets to boat launches

- Providing Hydrilla project management for the King Ferry infestation through conference calls with the landowner, New York State Department of Environmental Conservation, United States Army Corp of Engineers, and managing a team of Hydrilla surveyors on Cayuga Lake
- Supporting Hydrilla management and education & outreach across the Finger Lakes region
- Supporting the starry stonewort (SSW) collaborative through participating in conference calls, working with the SSW Collaborative Manager to disseminate information to the region, and collecting data on SSW occurrences in the state
- Supporting watercraft steward prevention and control at boat launches in the Finger Lakes region by disseminating information regarding the program to stakeholders and hosting partner meetings where information was presented by the AIS Coordinator
- Co-chair of the Upper Susquehanna Conservation Alliance Invasive Species Working Group



Partnership Meetings

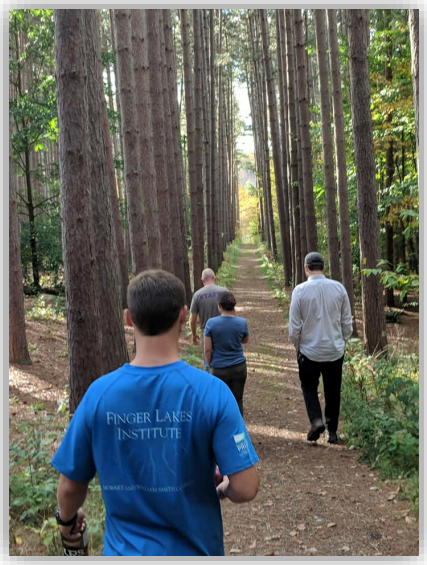
During the 2018-2019 fiscal year, the Finger Lakes PRISM hosted a full partnership meetings were held in spring and fall of 2018 whereby nearly 50 people were in attendance. Additionally, the Finger Lakes PRISM and FLI hosted the Finger Lakes Research Conference on January, 2019 where 140 people were in attendance to hear presentations from experts on the round goby, starry stonewort, and other threats to the Finger Lakes region.

Participation in the 2018 FLPRISM working group meeting.

Listserv:

The Finger Lakes PRISM listserv added 75 people to the list in 2018, an increase over the past year. The listserv serves as an important way to communicate with the community about invasive species and events within the Finger Lakes PRISM. The Finger Lakes PRISM averages two emails to the list per week to keep the members informed about important invasive species work across the region.

Social media:



Finger Lakes PRISM full partner meeting at Cumming Nature Center, fall 2018.

The Finger Lakes PRISM maintains a Facebook, Instagram, and Twitter presence. Facebook has had 533 page followers since its creation who follow the posts specific to invasive species in the region. Twitter has had 379 followers, 690 tweets, and is following 509 twitter-users. The Finger Lakes PRISM also has an Instagram account and has posted 41, has 117 followers, and is following 148 accounts.

Educational Materials and Media:

The Finger Lakes PRISM has created brochures, helped edit factsheets and other outreach materials, and projects have been highlighted in various media outlets including the Rochester Democrat and Chronicle, the Messenger Post, Finger Lakes Times, WXXI, and Fox News Rochester. A Finger Lakes Field Guide and Fact Sheets were created and published with funding from the EPA GLRI and help from various partners under the leadership of our Water Chestnut Project Manager, Kathryn Des Jardin.

Prepared by Hilary R. Mosher, Finger Lakes PRISM Coordinator

Website Platform:
The fingerlakesinvasives.org website to promote all things invasives in the region. Based on an analysis by Website Grader, the Fingerlakesinvasives.org website received a 72 and a rating of 'OK' and rated number 2 in traffic compared to NYIS.info and other state invasive species websites.

County Soil & Water Conservation Districts implement County Water Quality Strategies to address nonpoint source water pollution and other water quality issues through County Water Quality Coordinating Committee. While some committees are more active than others, the Finger Lakes PRISM has had representation at nearly two-thirds of the active water quality meetings during the year (Table 2).

County	Activity Level
Tompkins	Actively participating in outreach meetings by proxy
Tioga	No information about meetings available
Steuben	Actively participating
Wayne	Actively participating
Livingston	Actively participating
Madison	No information about meetings available, recently put on meeting notes
Monroe	Actively participating, presented at meetings, on list for meeting agenda and notes
Onondaga	Presented at meetings, on list for meeting agenda and notes
Ontario	Presented at meetings, on list for meeting agenda and notes, participation by proxy
Schuyler	Actively participating
Seneca	Actively participating

Selected Partner Projects

2. Recruit and Train Volunteers

The Finger Lakes PRISM engaged in various recruitment and training opportunities across the region during the past fiscal year. Volunteer training occurred throughout various programs and included invasive species identification workshops and iMapInvasives trainings. Between the period between 4/1/18 to 3/31/19, 409 people were trained to use the database iMapInvasives for the region.

The Finger Lakes Institute hosted a training for watercraft stewards from across the region in May, 2018. There were over 30 people people prevent the spread and impact of AIS, and how to engage in education and outreach to recreationists to enable the public to remain diligent in the fight to #stoptheinvasion through Clean, Drain, Dry practices. Weekly updates and meetings were held at FLI to enhance steward knowledge and ability to identify high risk invasive species.

In July, teachers from around the region came together at Muller Field Station in Ontario County for two days of hands-on invasive species training. The course content included both

terrestrial and aquatic invasive background, identification, and reporting and teachers were able to model projects to include in their classrooms.

In 2018, a Finger Lakes Macrophyte Project trained 24 volunteers across eight Finger Lakes participated in the year one program to survey, identify, and report high-priority invasive species. Luckily, no Hydrilla or additional water chestnut was reported.

By the numbers
339 community members attended Finger Lakes PRISM workshops
584 community members attended a presentation by the Finger Lakes PRISM
409 community members were trained to use iMapInvasives to map invasive species
151,873 community members attended events where outreach materials were available

3. Identify and Meet the Finger Lakes PRISM Education and Outreach Needs

The Finger Lakes PRISM actively worked with community member and stakeholders to bridge the gap between resources and need in the community. For NYISAW, partners were provided with materials for their projects and programs and included fact sheets, NYSIAW buttons, and marketing materials. In addition to the iMapInvasives training and ID session, education and outreach was conducted at meetings, conferences, briefings, and water quality coordinating committees.

As part of the EPA GLRI water chestnut control project, the FLI team published a Finger Lakes Invasive Species Field Guide and Fact Sheets that are available for free on the website. Over 250 copies have been disseminated to over 20 organizations to increase information sharing and knowledge regarding invasive species.

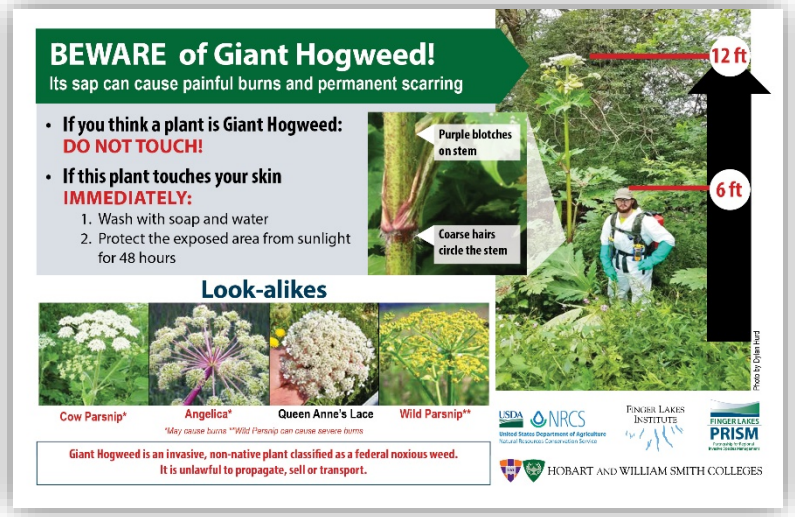
The Finger Lakes PRISM held 8 workshops where 248 people were educated on spread prevention and invasive species identification and reporting. Additionally, we presented at 17 programs to 584 community members and tabled at 21 events where an estimated 151,873 people were in attendance.

Partnering with Wildlife Forever, the Finger Lakes PRISM secured billboards that promote Clean, Drain, Dry messaging across the state. The billboards remained in place through the end of 2018.

In January, 2019, the FLI and Finger Lakes PRISM hosted the Finger Lakes Research Conference. Over 140 people were in attendance to hear presentations from experts on invasive species and other threats to the Finger Lakes. Participants were able to learn more about the round goby, starry stonewort, and status of our Keuka Lake fishery.

The Finger Lakes PRISM also engaged partners to help place bootbrush station to promote the Play, Clean, Go campaign that encourages people to remove seeds or other invasive species that may hitch a ride on shoes while hiking. Currently, we have over 60 bootbrush stations in well-advertised locations for recreationists. Partners are excited to help design and implement this outreach tool that help brings awareness of invasive species in the region.

Several program outreach materials were created and disseminated to the community. These included the Finger Lakes Field Guide and supplemental Fact Sheets made available to partners and on the website. Additionally, other flyers and program materials were created and disseminated across the region, as needed.



The education program at FLI, run by Nadia Harvieux, is focused on developing curricular materials and resources that support and extend middle school and high school inquiry-based environmental education. The FLI creates, disseminates, and coordinates a variety of educational initiatives in the Finger Lakes region including the Science on Seneca and Finger Lakes Regional Stream Monitoring programs. Programs include invasive species presentations, workshops, or training to students in K-12, training to teachers, and engagement with the community. Overall engagement during the 2018-2019 year reached 91 people and breaks down as follows for invasive species-specific programming

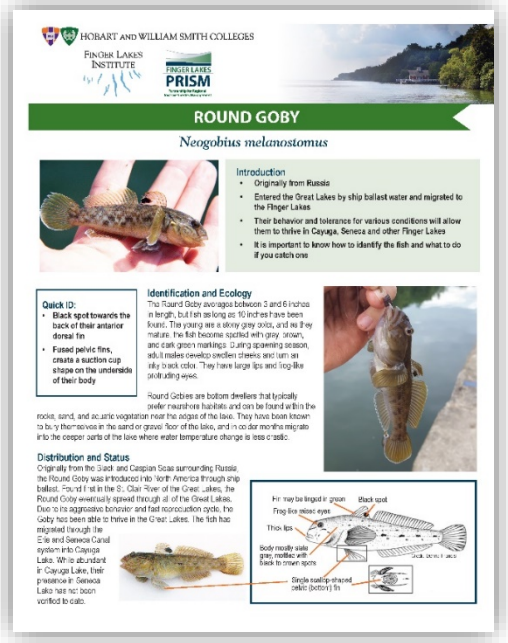
4. Monitoring Network for Early Detection of Invasive Species

iMapInvasives trainings and invasive species identification and detection sessions were held throughout the 2018 season and 409 people were trained. During this period, there were 2,038 observations made in the Finger Lakes.

Survey for invasive species as part of Allendale Columbia School's 7th grade science exploration days.

Thanks to funding from the US EPA GLRI, USFS CWMA, and USDA NRCS, the Finger Lakes Institute water chestnut field crew was able to survey 3,769 acres for high-priority AIS, the Hydrilla team surveyed all of Cayuga Lake for early detection species covering nearly 63 miles of shoreline, and the giant hogweed field crew surveyed 110 acres for high priority terrestrial invasive species. These projects have been invaluable due to leveraging of the PRISM programming and securing external funding for adding more eyes on the ground to reduce the spread and impact of invasive species.

The Department of Biology at Hobart and William Smith Colleges has a strong interest in invasive species. Susan Cushman, (Research Scientist) is working with the angler community to raise awareness of the round goby (*Neogobius melanostomus)* in the Finger Lakes. Working with student interns, Cushman engaged anglers and created a fact sheet to provide information about the goby. Cushman is working on identifying the preferred food source for the goby based on stomach content analysis.


HOBART AND WILLIAM SMITH COLLEGES
FINGER LAKES INSTITUTE
FINGER LAKES PRISM

ROUND GOBY

Neogobius melanostomus

Introduction
- Originally from Russia
- Entered the Great Lakes by ship ballast water and migrated to the Finger Lakes
- Their behavior and tolerance for various conditions will allow them to thrive in Cayuga, Seneca and other Finger Lakes
- It is important to know how to identify the fish and what to do if you catch one

Quick ID:
- Black spot towards the back of their anterior dorsal fin
- Fused pelvic fins, create a suction cup shape on the underside of their body

Identification and Ecology

The Round Goby averages between 3 and 6 inches in length, but fish as long as 10 inches have been found. The young are a silvery grey color, and as they mature, the fish become spotted with gray, brown, and dark green markings. During spawning season, adult males develop swollen cheeks and turn an inky black color. They have large lips and frog-like protruding eyes.

Round Gobies are bottom dwellers that typically prefer nearshore habitats and can be found within the rocks, sand, and aquatic vegetation near the edges of the lake. They have been known to bury themselves in the sand or gravel floor of the lake, and in colder months migrate into the deeper parts of the lake where water temperature change is less drastic.

Distribution and Status

Originally from the Black and Caspian Seas surrounding Russia, the Round Goby was introduced into North America through ship ballast. Found first in the St. Clair River of the Great Lakes, the Round Goby eventually spread through all of the Great Lakes. Due to its aggressive behavior and fast reproduction cycle, the Goby has been able to thrive in the Great Lakes. The fish has migrated through the Erie and Seneca Canal system into Cayuga Lake. While abundant in Cayuga Lake, their presence in Seneca Lake has not been verified to date.

Fin may be tinged in green
Black spot
Frog like raised eyes
Thick lips
Body mostly olive gray, mottled with black to brown spots
Single sucking-shaped pelvic (bottom) fin

Meghan Brown (Associate Professor of Biology) teaches an invasion ecology course and works with the bloody-red shrimp (*Hemimysis)* in Cayuga Lake and has published on the effects of *Bythotrephes longimanus* in waterbodies and effects of other species invasions in the Finger Lakes. Brown also maps the current spread of invasives, explores ways to limit their range expansion, and quantifies the effect of invasives on native species. Kristen Brubaker (Assistant Professor of Environmental Studies) teaches a capstone course focusing on invasive species, and Beth Newell (Professor of Biology) works with students to address EAB and European fire ants. Brad Cosentino, Assistant Professor of Biology, is studying the impact of the invasive earthworm on native populations of salamanders in the Finger Lakes.

Other programming in the Finger Lakes to increase our monitoring networks include:

- Scouting camp and others train people to survey for invasive species, Girl Scout badge for invasive species warriors and ecology badge program
- Facilitate monitoring networks with teachers at Allendale Columbia, Hobart and William Smith Colleges, University of Rochester, and Rochester Institute of Technology to train students to identify and report invasive species

Finger Lakes Macrophyte Survey program tools

Project spotlight:

The Starry stonewort collaborative is an EPA GLRI-funded program which aims to build connections and functional capacity for the project. Monthly conference calls with an expert panel were initiated to discuss project ideas and gain their feedback and opinions about how best to proceed with each stage off the project. A first webinar attended by 40 people from across the Great Lakes basin (GLB) was given by the project manager providing an overview of the collaborative. The presentation (https://hws.box.com/s/fno614mp31j0s118v7qnjzbsebih2ej9) included background, current status and next steps. This resulted in 4 almost immediate requests for more information about getting involved at the collaborator and citizen science levels as well as feedback and ideas about SSW control. A second webinar is scheduled for June 2019 to be given by expert panelists in Wisconsin and Minnesota that will describe a successful cooperative training program they hold in August.

The Starry Stonewort Collaborative

David Carr, Hilary Mosher and Lisa Cleckner

Finger Lakes Institute at Hobart and William Smith Colleges

Project Background and Scope

Starry Stonewort (SSW, *Nitellopsis obtusa*) is an aquatic invasive macroalgae from Eurasia that closely resembles a vascular plant. It invades lakes, ponds, and slow-moving water bodies where it attaches to the sediment using rhizoids and grows to 2m (Kipp et al., 2017).

The first occurrence of SSW was documented in 1978 in the St. Lawrence River between New York (NY) and Ontario, Canada. Ballast water is the prime suspect for entry and subsequent spread throughout the Great Lakes basin (GLB).

Left unchecked the SSW will cause harm to natural environmental systems and inhibit use of waterways, which can potentially result in economic impacts.

With funding from the Environmental Protection Agency Great Lakes Restoration Initiative, The Starry Stonewort Collaborative project for the Great Lakes Basin will enhance the capacity of experts, resource managers and local stakeholders to address starry stonewort infestations by:

- providing general knowledge of SSW *Ecology* and provision of access to this information
- expanding *Outreach* efforts at all levels but focusing on local communities and organizations.
- reviewing and disseminating of the best *Control* techniques, information and best management practices (BMP's)

Rake toss sample, Keuka Lake Outlet, Penn Yan, NY

A bed of Starry Stonewort, Keuka Lake Outlet, Penn Yan, NY

Collaborator locations and identified *Nitellopsis Obtusa* sites across the Great Lakes Basin

A Collaborative Approach - Ecology, Outreach and Control

A key component of the project is a collaborative framework of 20+ scientists, stakeholders and resource managers who will help with outreach efforts, resource exchange and participate in webinars and conference calls.

Additionally a 7 person Expert Panel will help guide the project, assisting with peer review of papers, overview of best management practices (BMPs), outreach assistance and providing informational webinars.

Collaborator and panelist work will be applied to the three focus areas:

- **Ecology** – sharing of ongoing field work and laboratory research and analysis for better understanding of *Nitellopsis obtusa* characteristics and life cycles
- **Outreach** – providing insights into the best outreach and education strategies for community involvement in SSW identification and reporting
- **Control** – assisting in gathering and sharing best management practices and techniques from all areas of the GLB

A dedicated SSW web site with a library of existing and new information will be developed for use by researchers, scientists and citizens. Locations and descriptions of identified SSW infestations will be maintained in online databases such as the United States Geological Survey Nonindigenous Aquatic Species program (NAS) and iMapInvasives data management system.

Expected Outcomes

- creation and dissemination of BMPs for infestations of SSW throughout the GLB
- development and distribution of factsheets describing SSW and its control
- creation and implementation of prevention strategies
- rapid assessment and response plans
- development and maintenance of a dedicated SSW website and online library
- extensive community level volunteer engagement and training across the GLB

Nitellopsis obtusa showing reproductive structures (Bulbils)

Long-term Benefits

- **Ecology**
  - enhanced or restored fish and native plant habitat
  - understanding relationship with water quality
  - greater knowledge of SSW growth and expansion
- **Outreach**
  - improved access to white papers, peer-reviewed journal articles, and other resources
  - increased community knowledge (including students) about the harm, impact and management of SSW
- **Control**
  - better collaboration of efforts among experts, resource managers, and stakeholders
  - enhanced understanding and application of BMP's and field techniques
  - decrease in SSW infestations and fewer new invasions across the GLB

5. Support Academic Research through Citizen Science

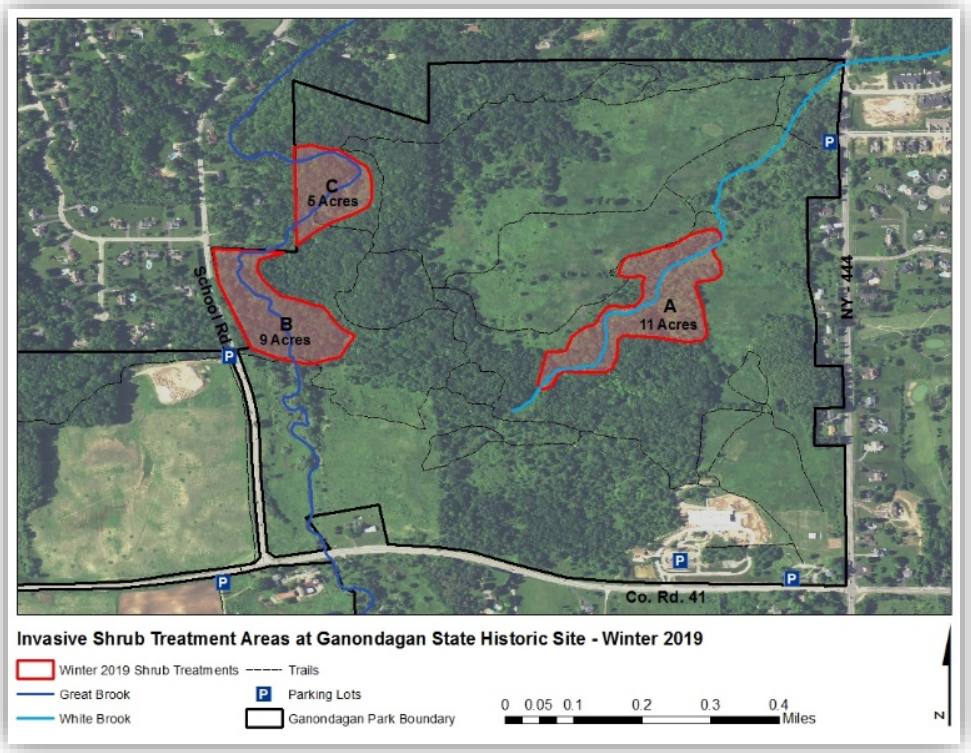
The Finger Lakes PRISM working groups determined the needs of the region for invasive species issues. The identified projects were sent to Carrie Brown-Lima, Coordinator for the Invasive Species Research Institute. The organisms of interest for the region included Hydrilla, EAB, and hemlock woolly adelgid. Hydrilla is being actively managed in the Finger Lakes and HWA is ravaging our important hemlocks. The Finger Lakes region encompasses 17 counties and there are many invasive species here or encroaching on our region. Some of the major organisms of concern from the working groups are listed above but include HWA, EAB, and Hydrilla. Work currently supported includes investigating round goby distribution in the Finger Lakes (Susan Cushman, HWS), participation on the prioritization project with NYISRI, and collaboration with Chris Badurek, SUNY Cortland, using the FLNF data to help create a risk model for invasion on the forest.

Hydrilla verticillata in Tioga County

6. Implement Eradication Projects to Remove Invasive Species

Highlights of eradication projects in the Finger Lakes:
Water Chestnut: 1,540 acres managed, 3,769 acres surveyed for high priority invasive species, 41,185 pounds of biomass removed, 404.5 volunteer hours

Giant hogweed: 342 sites managed for giant hogweed and 229 sites with active control. 110 acres were surveyed for giant hogweed and other high priority species and 23.9 acres controlled.



Hydrilla: 150 cubic yards of sediment removed from King Ferry, NY to remove Hydrilla verticillata from the sediment.

Ganondagan State Historic Site: 25 acres of invasive shrubs controlled via herbicide as part of the USFS CWMA grant through the Finger Lakes Institute at Hobart and William Smith Colleges.

7. Description of Obstacles to Achieving Objectives (Steering Committee, 2015)

- Making sure that partners knew about the PRISM and communicated events
- The Finger Lakes region consists of 17 counties and has incredibly diverse ecosystems
- There are many waterbodies for consideration including five watersheds
- The 11 Finger Lakes often overshadow the smaller waterbodies
- The waterbodies often overshadow the agricultural and terrestrial invasive species
- State agency regions or jurisdictions don't line up with PRISM boundaries and often no 'dedicated' representative to sit on one PRISM or another
- Lack of funding for significant control of infestations such as common reed, Japanese knotweed, Eurasian watermilfoil
- Lack of dedicated boat washing stations that have proven effective in controlling invasives within the lakes
- Lack of strong relationship/coordination/communication with CCE education efforts
- Lack of name recognition of Finger Lakes PRISM for coordination with partner organizations
- Southern Tier has a focus limited to forest and streams
- Water and transport connections to outside the region
- Members will come and go (soft funding, loss of institutional knowledge)
- Bias on steering committee towards Aquatics; need more Ag & Terrestrial
- Some parts too far from Great Lakes and Chesapeake Bay to get funds
- Lack of organizations for forestry; lack of connections
- Terrestrial IS affect aquatics but people may not make the connection; lack of holistic view of IS and interest in different ecosystems
- Terrestrial and Ag don't have a rallying point that lakes provide
- Prevention – can't prove a negative
- Messaging is telling people what they should not be doing
- Initial messaging/framing may not serve the cause (can we only watch IS spread) We vs Them can be set up (need good framing)
- Lack of skills on risk messaging
- Message of hopelessness leads to negative environmentalism
- Realistic messaging is needed
- Too much to do; too many species
- Groups with hierarchies that need to be understood and respected (Native Nations, Amish)
- General public has low skills for identification
- Lack of support for ID
- Unclear what level of service should/could be provided since the level of service varies
- Consistency of approach is difficult
- Unclear what are the top few priorities, what species are not consistently prioritize/priorities not communicated
- Regionality: different regions have different priorities

8. Potential Solutions to Obstacles and/or Resources Needed (Steering Committee, 2015)

- PRISM System is in place~~, CCE IS team in place~~
- Finger Lakes in the region serve as a rallying point
- Academic institutions, FLI: expertise, research
- Cornell NYS Invasives Species Institute hired coordinator
- Diversity of the region: ecosystem, climate (a lot of, water, open space)

- Impact of Lake Ontario to moderate weather/temperatures
- Geography: central NY, bordered by 4 PRISMS
- People: volunteerism, passionate, good communication (DEC, DOT, Parks meet together), capacity for communication
- Stakeholders: Lake Associations, NYS Forest Owners, etc.
- Economic drivers are tied to natural resources, gets the attention of legislators
- Federal lands- National Forest & Montezuma
- Active TNC and land trusts
- Southern Tier has large warm water stream
- Water Connections to outside the region
- Clean Drain Dry NYS regulation
- Preventions Act
- ~~CCE invasives species team~~
- Army Corps regulations to limit IS in mitigation
- DEC regulation IS Part 575 and Part 576
- Public awareness is growing as increased legislation occurs
- Finger Lakes PRISM is part of Great Lakes basin – funding potential, Sea Grant and other working on the region
- Several PRISM programs in place for years and leading the way
- National model for PRSIM type system – in place since early 90s
- Funding: Great Lakes restoration funds, current 5 year funding
- Elected officials are thinking about IS
- Lake Associations, trail associations, NYS forest owner's assoc., rod and gun clubs/federations, Isaak Walton league, etc.
- High profile IS that provide the opportunity to engage people. HWA tie terrestrial and water systems together
- Opportunities to engage Higher Educational Institutions, public agencies, and NGOs
- NRCS: EQIP, WHIP funds could be used
- There is a constant need for increased resources, human and otherwise. With a region as expansive as the Finger Lakes, it is impossible to carry-out all the education and outreach, prevention, and early detection/rapid response work that is needed to effectively manage invasive species. In the near term, a prevention specialist and administrative support are of utmost priority to obtain to provide support to the Finger Lakes PRISM.

9. Coordinate with other PRISMs and Office of ISC

The Finger Lakes PRISM actively participated in events and regional conferences during the fiscal year 2018/2019. Each month, New York has a Statewide Invasive Species Speaker Series where each PRISM provides an update for the region. The Finger Lakes PRISM has participated on each of these calls and has supported the Office of Invasive Species Coordination and other PRISMs by attending in-person meetings and the Invasive Species In-service sponsored by Cornell Cooperative Extension in Ithaca, NY. Additionally, Finger Lakes PRISM wrote several letters of support for work in the WNY PRISM, SLELO PRISM, work at Cornell, work on eDNA in collaboration with the SLELO PRISM, and for NYS Parks.

In support of the Strategic Recommendations for New York State Invasive Species Education & Outreach, the Finger Lakes PRISM supported events held within the region for New York Invasive Species Awareness Week (NYISAW). Programs included Hydrilla Hunts, surveys for macroinvertebrates in the Finger Lakes, Bioblitz, invasive species hikes, tabling events, and watercraft steward outreach. Partners were able to communicate their successes and look

forward to participating in the 2019 NYS ISAW. Additionally, the Finger Lakes PRISM attended both in-person PRISM meetings and attended the Great Lakes Action Agenda Meetings, and Great Lakes Panel on ANS to stay abreast of the issues that will affect the Finger Lakes.

10. Support NY ISC regular IS conference

The Finger Lakes PRISM attended and presented at the Invasive Species track of the Cornell Cooperative Extension Agriculture and Food Systems In-Service in Ithaca, NY in November, 2018. The Finger Lakes PRISM has remained in contact with the NY ISC and is willing to present or serve as a proxy for any and all conferences or workshops in the region.

Partner Reports

Number of Partners Responding: **7**
Total Amount Spent on Invasive Species: **$104,500**
Total Participants Reached: **1,146 reached**
Total Staff Time: **666.5 hours**
Total Volunteer Hours: **534 hours**
Total Trainings: **39 with 312 participants**
Total Presentations: **7 with 525 participants**
Total Tabling**: 5 events with 300 participants**

Cayuga Lake Watershed Network, Hilary Lambert, Steward/Executive Director

Program Highlights

- Hydrilla Hunters program & i.d. kits distributed lakewide
- Coordinator for outreach for Cayuga Lake south-end & Aurora hydrilla areas
- Season-end public reporting – Hydrilla
- Published newsletter articles about invasive species and the Hydrilla Happenings
- We updated our Hydrilla Information flyer, and it was included in each of the 300 (estimated) hydrilla i.d. kits distributed at 40 sites around Cayuga Lake, which also included DEC identification materials.
  Amount spent on IS: $6,000
  Staff time: 300 hours
  Volunteer hours: 500hrs
  Total Participants: 100 active Hydrilla hunters, 100 paddlers, 25 municipal officials, and five Hydrilla-active board of directors. 240 total

Cayuga County Planning, Michele Wunderlich, Associate Planner

Program Highlights

http://cayugacountywater.org/blog/

- Asian Clam survey on Owasco Lake.
- Protect Cayuga County from Invasive Species! trainings
- Invasive Species, Conservation Field Days, Emerson Park, Owasco Lake Day
- SWCD did harvesting of Owasco Lake, Cayuga Lake, Lake Como and Little Sodus Bay and handpulled the waterchestnut in Little Sodus Bay.

- Conservation Field Days reaches approximately 125 children per day.
- Citizen Articles to increase information disseminated to the community
  Amount spent on IS: $6,000
  Staff Time: 108.5 hours
  Volunteer hours: 3; 1 participant
  Invasive Species Trainings: 3; 39 participants
  Invasive Species Presentations: 2; 300 participants
  Invasive Species Tabling: 1; 100 participants reached

Cornell Cooperative Extension Broome County, Kevin Mathers, Resource Educator

Program Highlights

- Hosted iMapInvasives NY training;
- Conducted workshop/training on EAB/HWA & Jumping Worms;
- Tabled about IS at Regional Farmer's Market
- Master Forest Owner volunteer visit landowners and include discussions of invasive forest insect pests and plants
  Amount spent on IS: $5,000
  Staff Time: 200 hours
  Volunteer Time: 50 hours
  Total Participants: 100

Cornell Cooperative Extension Yates County, Laura Bailey, Natural Resource Educator

Program Highlights

http://yates.cce.cornell.edu/; https://www.facebook.com/CCEYates/

- Hosted iMapInvasives NY training;
- Conducted workshop/training on HWA and MFO workshops
- Presentation at the Yates Co. Master Gardener program and Soil and Heath Management workshops
- Master Forest Owner volunteer visit landowners and include discussions of invasive forest insect pests and plants
- Created spotted lanterfly and tree of heaven identification and fact sheets
- Published articles about starry stonewort management efforts and detecting and observing HWA through the year.
  Amount spent on IS: $5,000
  Staff Time: 250 hours
  Volunteer hours: 3; 1 participant
  Invasive Species Trainings: 2; 32 participants
  Invasive Species Presentations: 2; 140 participants
  Invasive Species Tabling: 3; 100 participants reached

Cornell University, New York Hemlock Initiative, Caroline Marschner, Outreach coordinator for NYS Hemlock Initiative

Program Highlights

Finger Lakes: The Finger Lakes PRISM is the home of NYSHI, and we have a strong partnership; NYSHI staff sit on the PRISM steering committee and working groups, and we conducted 32 events in the PRISM for a total of 1,063 contact hours. We presented at the spring full partner meeting and attended the fall partner meeting and had a poster for the Finger Lakes Research Conference.
Volunteer hours: 49; 11 surveys
Invasive Species events: 32 events for a total of 1,063 contact hours

Honeoye Valley Association, Don Cook, Board Member

Program Highlights

- Plants surveys, steering committee meetings for the Finger Lakes PRISM and Finger Lakes Regional Watershed Alliance Meetings that communicate PRISM information.
  Volunteer hours: 28; 4 participants
  Invasive Species Trainings: 2; 10 participants
  Invasive Species Presentations: 3; 85 participants
  Invasive Species Tabling: 1; 100 participants reached

New York State Department of Transportation, Jon Harman, Landscape Architect

Program Highlights

https://www.dot.ny.gov/index

- Equipment washing on construction sites, IS control with herbicide, pulling & disposal.
  Areas within the highway boundaries
- Phragmites removal and disposal on construction projects consisting.
  Amount spent on IS: $87,500
  Staff Time: 8 hours, 1 participant

US Forest Service projects funded through the Great Lakes Restoration Initiative in Finger Lakes region					
Project Title	Project Description	Appropriation Year	Measurable (Goal or Target)	Actual Accomplishments	Percent Complete
Ganondagan Guardians restore the resiliency of an historically significant site for the Seneca Nation	Survey, control, and restore a culturally significant site. The project will re-establish 60-acres to grasslands with native warm-season grasses based on entries from the Seneca Nation in the late 17th century.	2015	200 acres mapped for invasive species in conservation target areas; 25 acres controlled mechanically for invasive species that impact water quality on Ganondagan Historic Site; 60 acres restored to native grassland that will increase water quality on Ganondagan Historic Site; 20 acres restored to native flora in conservation target areas on Ganondagan Historic Site; 25 acres chemically controlled for invasive species that impact water quality on Ganondagan Historic Site	250 acres mapped; 60 acres controlled mechanically for invasive species that impact water quality on Ganondagan Historic Site; 60 acres restored to native grassland that will increase water quality on Ganondagan Historic Site; 40 acres restored to native flora in conservation target areas on Ganondagan Historic Site; 27 acres chemically controlled for invasive species that impact water quality on Ganondagan Historic Site	100%
Finger Lakes National Forest Invasive Species Roundup	Finger Lakes National Forest Invasive Species Roundup	2016	72 acres controlled for invasive species that impact water quality on the FLNF; 15 acres planted with native flora in conservation target areas on FLNF; 15 acres assessed post-treatment for treatment efficacy; 30 miles of trail mapped for invasive species in conservation target areas (those with potential to impact water quality)	30.02 acres controlled for invasive species that impact water quality on the FLNF; 30 miles of trail mapped for invasive species in conservation target areas (those with potential to impact water quality)	45%

Grassland and Floodplain Forest Restoration on Ganondagan State Historic Site	Grassland and Floodplain Forest Restoration on Ganondagan State Historic Site	2016	100 acres surveyed and mapped for invasive species; 100 acres manually or mechanically controlled for invasive species that impact water quality; 30 acres chemically controlled for invasive species that impact water quality; 100 acres of floodplain forest, wetlands and adjacent uplands restored; 30 acres of grassland restored that will improve water quality; 40 acres restored using native flora in conservation target areas	100 acres surveyed; 160 acres manually or mechanically controlled for invasive species that impact water quality; 40 acres chemically controlled for invasive species that impact water quality; 75 acres of floodplain forest, wetlands and adjacent uplands restored that will improve water quality; 79 acres of grassland restored that will improve water quality; 40 acres restored using native flora in conservation target areas	95%
Detecting, Preventing, and Controlling Highly Invasive Species	Detect, prevent, and control IS on 15 miles of trail at RMSC's Cumming Nature Center	2017	15 miles of trail and 300 acres surveyed and mapped with iMap Invasives & ARCGIS; 99 acres controlled for invasive species that impact water quality at CNC; 15 acres seeded with native flora; 99 acres assessed post-treatment for efficacy	12.8 miles of trail surveyed and 3.40 acres of invasive species treated along trailways using herbicide.	20%

11. Summary of project expenses

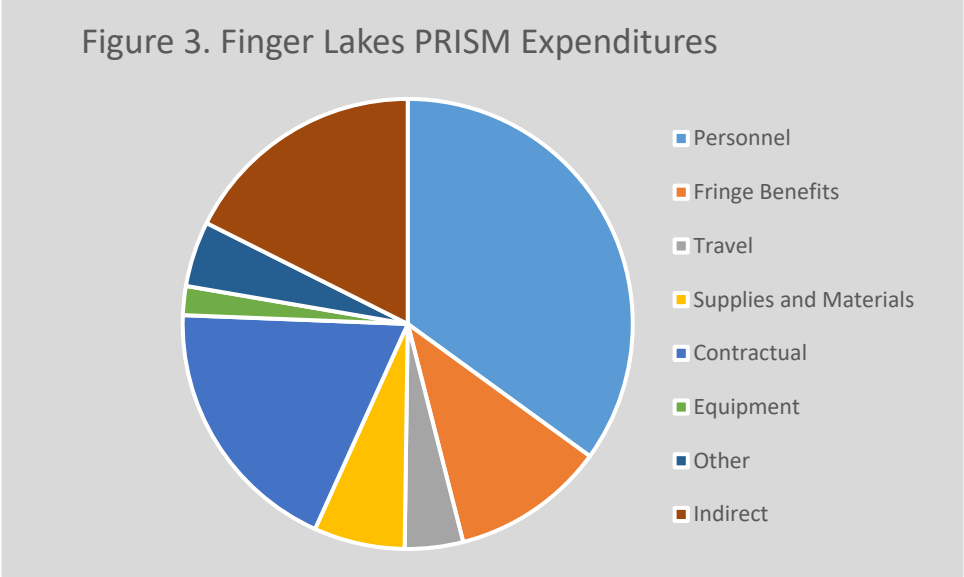


Figure 3 depicts the breakdown of program expenses by category for the 2018-2019 fiscal year to run the Finger Lakes PRISM program.

Conclusion

The 2018-2019 year was an extraordinary year with engagement from engagement from hundreds of individuals, organizations, and municipalities. While there is much work to be done in the future, we take pride in the fact that together we made strides towards increasing regional partnerships, identifying and leveraging our resources, and increasing our capacity. Over the lifetime of the Finger Lakes PRISM, we have secured over $3.7M dollars in invasive species management, survey, and control in collaboration with partners across the region. With the start of a new five year contract in April, 2019, we are poised to make a significant progress in the management of invasive species.

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The Economic Impact of Tourism in NY. Tourism Economics. Online at: http://www.fingerlakes.org/uploads/pages/pdf/NYS%20Tourism%20Impact%20-%20Finger%20Lakes.pdf Accessed on February 21, 2015.

Appendices

Appendix A. List of Participating Members of Steering Committee and Working Groups

Partners

Steering Committee

Christopher Anderson, NYS DOT, Environmental Specialist, Region 3
Kathy Bertuch, Program Manager, Central New York Regional Planning Development Board
Pauline Burnes, NYS DOT Region 6, Hornell, NY (retired, on email list for SC news and updates)
Lisa Cleckner, Director, Finger Lakes Institute
Aimee Clinkhammer, Watershed Coordinator, Finger Lakes Water Hub
Don Cook, Finger Lakes Regional Watershed Alliance, New York State Federation of Lake Associations
Bruce Gilman, Professor, Finger Lakes Community College
Dorothy Gronwall, Honeoye Valley Lake Association
Terry Gronwall, Honeoye Valley Lake Association
Carri Marschner, Invasive Species Specialist, NYS Hemlock Initiative, Cornell University,
Web Pearsall, NYS DEC, Region 8, Fisheries
Mary Underhill, Conesus Lake Watershed Manager, Livingston County Planning Department
Gregg Sargis, Director of Ecological Management, The Nature Conservancy, (on email list for SC news and updates)
Laura Bailey, Invasive Species Education Program, Cornell Cooperative Extension Yates County
Richard Steele, NYSDOT, Region 3

Agriculture WG (on hiatus)

Marion Zuefle, IPM Experimental Station, Geneva, NY
Elaine Dalrymple, Schuyler County Soil and Water Conservation District

Aquatic WG

Fred Blom, President, NYS B.A.S.S. Nation
Lisa Cleckner, Director, Finger Lakes Institute
Don Cook, Finger Lakes Regional Watershed Alliance, New York State Federation of Lake Associations
Bruce Gilman, Professor, Finger Lakes Community College
Dorothy Gronwall, Honeoye Valley Lake Association
Terry Gronwall, Honeoye Valley Lake Association
Roxanne Johnston, City of Ithaca (on email list for AWG for news and updates)
Web Pearsall, NYS DEC Region 8, Fisheries
Mary Underhill, Conesus Lake Watershed Manager, Livingston County Planning Department
Dave Scudder, President, Save Our Sodus
Laura Bailey, Invasive Species Education Program, Cornell Cooperative Extension
Michele Wunderlich, Associate Planner, Cayuga County Planning and Economic Development

Education & Outreach WG

Fred Blom, President, NYS B.A.S.S. Nation

Kristina Farrare, Team Coordinator**,** Forestry, Agriculture & 4-H Youth Development**,** Cornell Cooperative Extension, Onondaga County, (on email list for AWG for news and updates)
Bill Foster, Cayuga Lake Floating Classroom
Bruce Gilman, Professor, Finger Lakes Community College
Rebecca Hargrave, Assistant Professor, SUNY Morrisville
Hilary Lambert, Executive Director, Cayuga Lake Watershed Network, (on email list for EOWG for news and updates)
Anna Stalter, Associate Curator and Extension Botanist, CALS School of Integrative Plant Science, (on email list for EOWG for news and updates)
Laura Bailey, Cornell Cooperative Extension, Invasive Species Education Program
Russ Welser, Cornell Cooperative Extension, Ontario County
Michele Wunderlich, Associate Planner, Cayuga County Planning and Economic Development
Carri Marschner, Invasive Species Specialist, Finger Lakes Hemlock Initiative, Cornell University

Terrestrial WG

Sylvia Albrecht, Citizen Advocate
Kathryn Amatangelo, Assistant Professor, The College at Brockport SUNY
Mary Beth Deller, Botanist and Non-native Invasive Plant Program Coordinator, USDA Forest Service
Kristina Ferrare, Team Coordinator**,** Forestry, Agriculture & 4-H Youth Development**,** Cornell Cooperative Extension, Onondaga County
Mark Gooding, NYS DEC, Forester 3, Region 8
Bruce Gilman, Professor, Finger Lakes Community College
Jules Ginenthal, Cornell Plantations, Natural Areas Stewardship Coordinator, (on email list for TWG news and updates)
Jason Gorman, Finger Lakes Land Trust, (on email list for TWG news and updates)
Jon Harman, Landscape Architect, NYS DOT, Region 4
Rebecca Hargrave, Assistant Professor, SUNY Morrisville
Gary Koplun, NYS DEC, Region 8
Bruce Natale, Cayuga County Planning
Walt Nelson, Horticulture Program Leader, Cornell Cooperative Extension Monroe County (on email list for TWG news and updates)
Chris Olney, Finger Lakes Land Trust, (on email list for TWG news and updates)
Marcus Riehl, NYS Parks, (on email list for TWG news and updates)
Anna Stalter, Associate Curator and Extension Botanist, CALS School of Integrative Plant Science, (on email list for TWG news and updates)
Zeb Strickland, Cornell Plantations, (on email list for TWG news and updates)
Emily Staychock, Cornell Cooperative Extension, Invasive Species Education Team
Kristy Sullivan, Cornell Cooperative Extension, (on email list for TWG news and updates)
Carri Marschner, Invasive Species Specialist, Finger Lakes Hemlock Initiative, Cornell University after July 2015

Appendix B. 2017-2018 Work Plan for the Finger Lakes PRISM

2018/2019 Work Plan
Scope of Work Element
1. Coordinate PRISM partner invasive species (IS) management activities **Utilize electronic and social media networks and communication outlets to engage partners and share information (listserv, etc)** **Coordinate full partnership meetings on a regular basis (2 full partnership per year) and working group meetings (Steering Committee, Agriculture, Aquatic, Education & Outreach, Terrestrial Working Groups) as necessary** **Utilize the FL-Website as a means of information sharing (fingerlakesinvasives.org)** **Share information on IS management activities and participate in activities as appropriate**
2. Recruit and train volunteers **Present IS issues at various community outreach and education events (WQCC, school groups, etc.)** **Utilize electronic and social media networks and communication outlets to engage partners and share information (listserv, etc)** **Host iMapInvasives trainings per year or as needed** **Use CCE Master Gardeners, Master Forest Owners, lake associations, and other groups for volunteers**
3. Identify and meet PRISM Education and Outreach needs **Present IS issues at various community outreach and education events (WQCC, etc.)** **Coordinate with E&O WG to assess FL regional needs** **Create and maintain a robust website that fulfills all the needs of the FL region** **Encourage and support partners to develop E&O materials** **Create and distribute E&O materials to partners** **Create a toolbox for outreach that includes educational materials and information**
4. Establish monitoring network for early detection of invasive species **Train watercraft stewards, volunteers, and community members within the region** **Create and maintain an ED/RR protocol for the region and for specific, high priority organisms** **Utilize the WG and SC to gather information from partners about invasive species distribution in the region** **Create and maintain a priority IS list and ISPZ** **Create a database of groups that are likely users of priority locations (areas likely to be invaded)** **Utilize the iMap Invasive training and software app to increase participation in monitoring** **Create and support a train the trainer program to encourage use of iMapInvasives** **Host or support iMapinvasive workshops to input data into program for the region**
5. Support academic research as needed through citizen science **Create and support a train the trainer programs**

Support CSLAP, iMap, and other avenues for data collection **Utilize the CSLA model to collect terrestrial data** **Utilize the Finger Lakes PRISM website as a means of sharing data** **Utilize groups such as Boy Scouts, Hikers, biking, etc. to collect data for the region** **Identify research needs for prevention, ED/RR, and control**
6. Develop a PRISM Strategic Plan **Develop a strategic plan to include input from all partners based on NYS format**
7. Develop Finger Lakes PRISM-specific IS Management Plan **Coordinate with leading researchers to develop species-specific management plans** **Coordinate with conservation targets to develop a location-specific plan** **Identify funding sources for implementation of IS Mgmt plans**
8. Implement eradication projects to remove invasives species **Utilize the partnership to leverage resources for IS work** **Support demonstration and eradication projects** **Utilize BMPs for control** **Monitor management areas for restoration success**
9. Develop annual work plan **Develop 2019 AWP utilizing SC and WGs**
10. Develop annual report to include: **Progress towards priority objectives outlines in strategic plan**
11. Coordinate access to private and public lands **Develop a protocol/plan to access lands for IS work** **Create a plan to provide information for private owners about permitting, funding, etc. and make available on website**
12. Coordinate with other PRISMs and OISC **Keep an open dialogue and collaborate with other PRISMs and the NYS ISAC** **Provide updates during PRISM calls as needed** **Attend PRISM leader in-person meetings and other IS conferences**
13. Support NY ISC regular invasive species conference **Support regular conference through participation, presentation, and attendance**