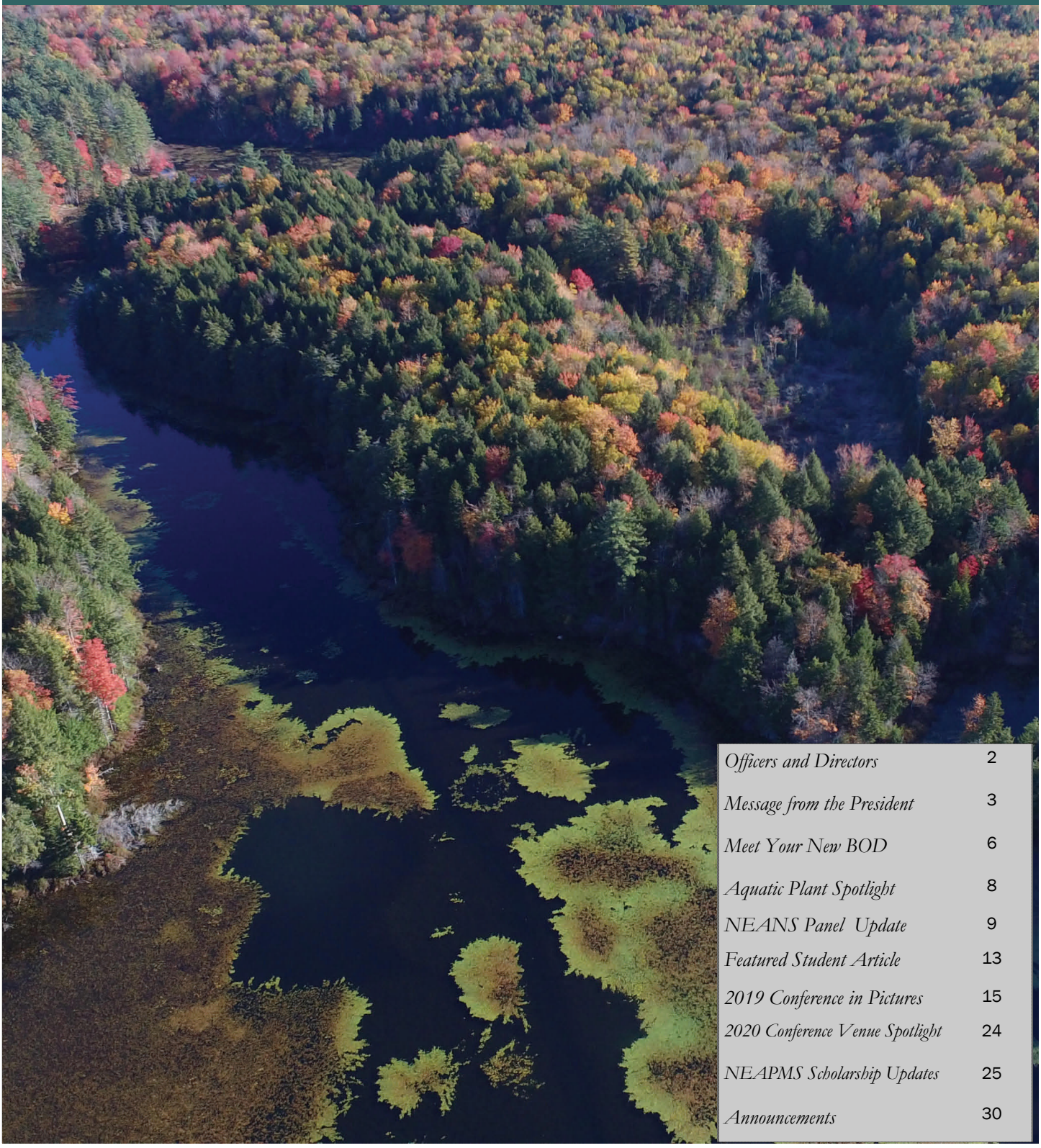
NOR'EASTER

A Newsletter of the Northeast Aquatic Plant Management Society

Volume 18, No. 1



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The Purpose of the Society shall be to assist in the management of aquatic vegetation, to provide for the scientific and educational advancement of the members, to encourage scientific research in all facets of aquatic plant management, to promote an exchange of information among members, and to extend and develop public understanding in the discipline.

Mission Statement, adopted April 20, 1999

On the Cover: A Different Perspective (W. Stevenson)

Perspective from the President
Will Stevenson

Perspectives…

I was asked to craft a short piece about my current thoughts about NEAPMS and the point of view of President. I look back at my years in this industry and think that the industry has grown and matured. When I started working with clients, they simply wanted someone to "manage their pond/lake for weeds and algae".

With the increased access of information, it's not unheard of to now have clients identify the key elements of their own particular aquatic resource issue and direct management when they engage a professional management company or government regulators, for example. It has very much become a shared partnership. This change has truly been remarkable to see in such a short time. With the advent of universally available high-quality cameras and portable encyclopedias and research libraries, the average shorefront homeowner can truly learn about their problems and options in real-time. Thanks Smartphone!

One of the great benefits of our membership is perspective. Our members work with water resources from may perspectives:

- Owner
- Manager
- Regulator
- Benefactor
- Interested party
- Researcher
- Student

All of these perspectives are valuable and we as professionals ought to recognize there is no one perspective to drive a management plan or discussions. Even in talking with clients about fishing, we need to assess a perspective. Is the goal to grow state record fish of a particular species? Or is the goal to have a high-catch-rate to entertain younger anglers/ grandchildren? Or is the goal to have a balanced ecosystem, or possibly the fish species managed is to be a food source? All are reasonable perspectives but necessarily may not have the same management decisions and implications

I like to think one of my strengths as a person is to try to view the same set of facts from multiple perspectives. Work to understand each while building a shared perspective.

One of my lifelong hobbies is photography. My grandfather was a photographer for the U.S. Navy in Pearl Harbor, who by family lore captured many of the iconic images. My father was a professor of business administration who spent many family vacations taking pictures and then hours in the darkroom teaching his sons the intricate details of developing film. Now I'm fortunate to teach my sons the art of photography with equipment passed down from prior generations (not the iPhone, but no longer a darkroom skill set either). I'm a licensed UAV pilot who can fly dual control quad copters with my sons as they learn the lessons of changing one's own perspective on an ever-changing environment. I share with you here (on the next page, as well as the cover of this newsletter) a few of my favorite images of water from a different perspective – allowing us to see water from different physical as well as time perspectives.

The industry in the northeast is much more nuanced now and that nuance-management continues to benefit from all the perspectives we see expressed at our NEAPMS conferences. I challenge us all to continue to embrace the multiple perspectives within our community/ communities, as well as review our own perspectives as we look at the changes within the landscape, technology and regulations that shape the industry we work in and are invested in.

Will, NEAPMS President

Past NEAPMS Presidents
Charles Gilbert (1999/2000)
Gerald Smith (2001)
Gerald Adrian (2002)
Jim Sutherland (2003)
Bo Burns (2004)
Amy Smagula (2005)
Larry Eichler (2006)
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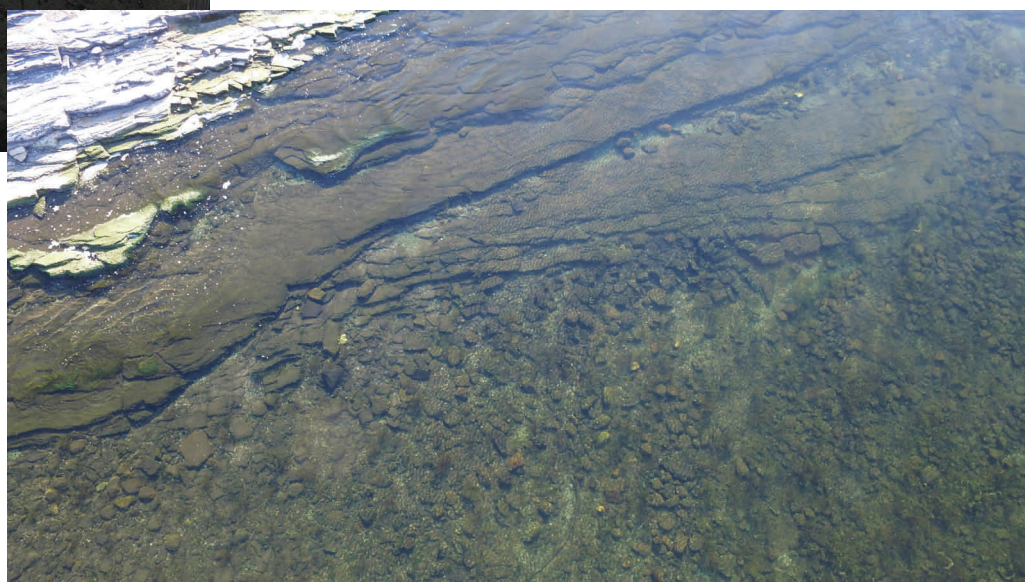
Charles Boylen (2015)
Chris Doyle (2016)
Mark Heilman (2017)
Meg Modley (2018)

"With the increased access of information, it's not unheard of to now have clients identify the key elements of their own particular aquatic resource issue and direct management when they engage a professional management company or government regulators"

Perspective from the President (con't)



Perspectives from the President:
Top Left: Stevenson Family portrait at a lake in New Hampshire.
Top Right: A popular stop in the Badlands in South Dakota.
Bottom Left: A drone's eye view of a beach on Lake Champlain in Vermont.

Your 2019 NEAPMS Board of Directors and Officers

Back Row: Glenn Sullivan, Jon Gosselin, Chris Borek, Bin Zhu, Emily Molden, Amy Smagula, Chris Hanlon
Front Row: Will Stevenson, Cathy McGlynn, Chris Doyle Meg Modley, Greg Bugbee . Not pictured: Kiyoko Yokota, Kara Foley.

Meet your new Student Board Member
Kara Foley

Kara is pursuing a Master's degree in Fisheries, Wildlife and Conservation Biology at North Carolina State University under the direction of Dr. Rob Richardson. Her research is focused on invasive aquatic plant ecology and management. While at NC State, she has worked on many projects that involve establishing native vegetation in Piedmont reservoirs, surveying and mapping submerged aquatic vegetation, teaching educational programs, and researching invasive species control methods in both greenhouse and field settings. These experiences have given her a broad perspective of the aquatic plant management field.

Kara grew up in New Hampshire and was inspired to pursue a career in natural resources after taking a high school conservation biology course. In 2016, she graduated from the University of New Hampshire with a Bachelor's degree in Environmental Science. Post-graduation, she was fortunate to intern under Amy Smagula in the New Hampshire Department of Environmental Services' Exotic Species Program. Through this internship, Kara learned about the importance of aquatic plant management and was inspired to continue her studies in the field.

Kara looks forward to continued work in the field of aquatic plant management and working towards conserving and protecting our natural resources. In her free time, Kara loves to bake, enjoy the outdoors, and spend time with her family and friends.

Check Out Our Website:
www.neapms.net

Unless otherwise noted, all pictures are credited to E. Mayer and C. Doyle

Meet your new board member
Jon Gosselin

Jon is currently an Aquatics Specialist at SePRO. In this role, he's responsible for working with water resource management firms, waterbody stakeholders, and government resource and regulatory agencies to best technically steward their portfolio of aquatic solutions. He's involved with product development, field trials and project support.

Prior to joining SePRO, Jon served as a Marine Science Technician in the U.S. Coast Guard. He conducted pollution investigations and response actions, evaluated the maritime industry for occupational safety compliance, and inspected foreign vessels entering U.S. ports. Jon received his Master's degree from the University of Florida, where he studied agronomy with a focus on aquatic weed science. He attended the University of New Hampshire for his undergraduate studies and enjoyed working on the university's research vessel, as well as in the Jackson Estuarine Laboratory.

Outside of work, Jon loves to ski in the White Mountains, snowmobile in northern Maine and spend time at New Hampshire's Lake Winnipesaukee.

Aquatic plant spotlight:

Crested Floating Heart (Nymphoides cristata)

Kate Arnao
SOLitude Lake Management

Crested floating heart is a diminutive water lily-like macrophyte that has both submersed and floating vegetative structures. The ovate floating leaves of crested floating-heart are bright green and heart shaped, averaging three inches in diameter. Between spring and fall, clusters of small star-shaped white flowers bloom above the surface of the water. The five-petaled flowers are fragrant and have a ruffle lining in the middle of each petal, which is unique to this species. The submersed portion of crested floating-heart includes the stalks and roots that grow into the hydrosoil. Crested floating heart is typically rooted into the bottom sediments of shallow waters, but can be free-floating with tuberous roots supported by the floating leaves.

Crested floating heart is commonly sold in water garden nurseries due to its attractive appearance and showy flowers. Its popularity in the water garden trade has increased in the last decade. Crested floating heart is native to Asia but has invaded parts of the southern United States. It is widespread throughout Florida, first documented in 1995. This aggressive invasive aquatic species has become especially problematic for south Florida canals where is it well established. It occurs at several locations in Texas, and limited locations in Louisiana, and the Carolinas, including the Santee-Cooper Reservoir of South Carolina. These infestations have all been documented in the past seven years. Crested floating-heart has not been documented in the Northeast, but aquatic resource managers should be on the look-out.

Negative impacts of dense beds of crested floating heart include restricting water flow, decreased oxygenation of the water column and the potential for native species displacement. Studies have been conducted at the University of Florida Center for Aquatic and Invasive Plants in order to determine the best herbicide control method of this invasive species. Several different herbicides were tested, including endothall, imazamox, triclopyr, and flumioxazin, at varying dosages. Endothall was the most effective treatment for crested floating-heart, but flumioxazin at higher doses had suitable efficacy as well. The new active ingredient florpyrauxifen-benzyl may have promising activity on crested floating heart according to the manufacturer's website. Hand pulling is also a likely control method for infestations in small areas and/or limited abundance.


Photo: SRTC

"Crested floating-heart has not been documented in the Northeast, but aquatic resource managers should be on the look-out."

Sources:

https://plants.ifas.ufl.edu/plant-directory/nymphoides-cristata/

https://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=282719&isprofile=0&

Hydrilla fragment from a site in the Northeast

"Following reports of hydrilla occurring in the southern portion of the Connecticut River, a task force was formed by the Northeast Aquatic Nuisance Species Panel (NEANS)."

Task Force Finds Alarming Population of Hydrilla in the Connecticut River

Greg Bugbee, Connecticut Agriculture Experiment Center

Hydrilla (*Hydrilla verticillata*) is among the most troublesome invasive aquatic plants in Florida and many other southern states. It crowds out native vegetation, harms fisheries, limits recreation, impedes navigation, and reduces property values. Following reports of hydrilla occurring in the southern portion of the Connecticut River, a task force was formed by the Northeast Aquatic Nuisance Species Panel (NEANS). The task force comprised over 30 experts and performed a preliminary survey of the river from central Vermont/New Hampshire to southern Connecticut.

No hydrilla was found in the New Hampshire/Vermont portions of the river with the northern-most sightings occurring in southern Massachusetts. From the Connecticut border south, hydrilla became common. Portions of the river and its coves downstream from Hartford were alarmingly choked with the weed. The densest beds occurred on shallow shoals and in protected coves. In some coves, hydrilla spread out over the surface making access by survey boat impossible. Finding such dense stands in a northern state is alarming. Furthermore, the Connecticut River hydrilla is far more robust than that seen elsewhere in the State. This could be a result of river flow, nutrients, or genetics.

Prompted by surveillance and genetics analysis organized and funded by NEANS, a manuscript entitled "Evidence for a genetically distinct strain of introduced *Hydrilla verticillata* (Hydrocharitaceae) in North America" is being submitted for publication in the Journal of Aquatic Plant Management. Authored by Nicholas P. Tippery of the University of Wisconsin – Whitewater and Gregory J. Bugbee and Summer E. Stebbins of the Connecticut Agricultural Experiment Station. The research found that the Connecticut River hydrilla is very different from other hydrilla known to grow in the U.S. It appears to be globally unique and where it came from is uncertain. It is most similar to plants in Europe, Japan and Korea.

Below, left: Dense hydrilla South of Hartford, CT. Photo credit: Judy Preston, CT Sea Grant
Below, right: June 2019, the NEANS Panel Prepares to depart for an on the water survey of the Connecticut River in Massachusetts.

Task Force Finds Alarming Population of Hydrilla in the Connecticut River (con't)

"No hydrilla was found in the New Hampshire/Vermont portions of the river with the northern-most sightings occurring in southern Massachusetts. From the Connecticut border south, hydrilla became common."

More information is needed including whether the hydrilla is monoecious or dioecious, what (if any) kinds of flowers it produces, and whether it produces seeds and/or turions. Additional surveillance is also needed to document the extent of the existing population in the Connecticut portion of the river and if the hydrilla is moving north.

At the Spring (2019) NEANS Panel meeting in Springfield, MA, presentations from the USACE, University of Florida and private lake consultants augmented updates from Northeast government officials, who happen to be Panel members. Most of the Panel spent a day in the field surveying the northern-most documented hydrilla site in the Connecticut River (near Agawam, MA), which included demonstrations of point intercept aquatic plant mapping and hydrilla tuber sampling. Moving forward, the Panel recommended protocols to standardize surveillance in 2019 and beyond. A point intercept method will be used in the MA, NH, and VT sections of the River with additional quantification of patch location, size, abundance, depth and sediment type in the Connecticut sections of the river.

For more information. visit the NEANS web page (www.northeastans.org) or contact Gregory Bugbee at gregory.bugbee@ct.gov.

Northeast Aquatic Nuisance Species Panel Spread Prevention Working Group Update

Meg Modley, Lake Champlain Basin/NEIWPCC

"The NEANS Panel will develop a Connecticut River hydrilla management plan with guidance from New York State."

The NEANS Panel Spread Prevention Workgroup met at the last NEANS Panel meeting in early June 2019 to discuss the lessons learned from the USACE Buffalo District regarding the control and monitoring of hydrilla. The members very much appreciated USACE for lending their Buffalo District crew, arranging for guest presenters, sharing field survey techniques and advice on software and equipment use, and providing overall guidance with the NEANS Panel partners.

The following objectives came out of the workgroup meeting:

1) Learn more about the genetics of the known hydrilla infestations present in the Northeast region.

Detail: Member states will collect specimens from known hydrilla sites for genetics analysis to see if there is a different genotype present in the Connecticut River or elsewhere in the Northeast.

2) NEANS Panel states develop a consistent survey method for hydrilla in the Connecticut River.

Detail: NEANS Panel states will use the point intercept hydrilla survey method at 200 meter distance intervals with increased frequency (every 50 meters at minimum) at sites where infestations are found in the Connecticut River.

3) Incorporate tuber sampling (sediment coring) into Connecticut River hydrilla survey and monitoring program at sites where hydrilla in known to occur.

Detail: Using a sediment corer, conduct tuber sampling at confirmed hydrilla sites in the Connecticut River for presence and absence of tubers. More intense tuber sampling will be conducted at sites where management is considered.

4) Develop a strategy for treatment and containment of hydrilla in the Connecticut River.

Detail: Develop a Connecticut River Hydrilla Management Plan with guidance from New York State. Education and outreach materials are under development (tip strips and signage have been produced with NEANS Panel support). The management plan will incorporate education and outreach, spread prevention, long-term management goals, including targeted areas for management (areas of high conservation need, areas that should be managed because they are a likely source for spread, areas that impede human use and enjoyment or the environmental or economic use of the waterway).

5) Engage the state of Connecticut to encourage support for hydrilla monitoring, control, management and spread prevention.

Detail: Engage various Connecticut environmental and water quality groups to raise awareness and support for managing the environmental and economic impacts of hydrilla in the Connecticut River.

Hydrilla stem showing whorled leaves from a site in the Northeast

New York Hydrilla Updates

Cathy McGlynn, New York State Department of Environmental Conservation
Aquatic Invasive Species Coordinator

New York is actively controlling and monitoring several hydrilla infestations. As part of the June 2019 NEANS Panel Meeting (see articles on pages 10-12), New York provided an update on the control efforts regarding the known hydrilla infestations in New York. A summary of these efforts follows:

- The **Erie Canal/Tonawanda Creek** Hydrilla Control Project will start its fifth season of control in July, 2019.
- The **Croton River** Hydrilla Control Project began its third season on June 10, 2019. Extensive aquatic plant monitoring in the Croton River and at high priority locations along the Hudson River is planned for later this year.
- **Tioga County** Hydrilla Control Project
  - **Spencer Pond** herbicide treatment is slated to start in early July, 2019. Pre-treatment aquatic plant surveys have been completed and revealed minimal hydrilla biomass. This is the third season of this project.
  - **Kuhlman Pond** is a 0.5 acre pond downstream of Spencer Pond. Work to monitor and control parrotfeather and hydrilla will begin this summer along with an herbicide application to target the parrotfeather and hydrilla.
- **Cayuga Lake**:
  - Tompkins County (**Ithaca**): USACE will conduct spot treatments in July, 2019; An aquatic consultant is conducting intensive aquatic plant monitoring again this season.
  - Cayuga County (**Aurora**): USACE will conduct treatments at Aurora; Finger Lakes PRISM is performing aquatic plant monitoring.
  - Cayuga County (**King Ferry**): Finger Lakes PRISM hired a contractor to dredge at Don's Marina. Finger Lakes PRISM will be monitoring for hydrilla sprouts to determine if additional control efforts are needed.
- Plans for addressing hydrilla infestations in **Broome County** will be developed this year.
- The Metro/Long Island AIS Task Force is beginning to develop plans for surveying lakes on **Long Island,** where a number of small ponds have already been documented with hydrilla.

How Are We Doing?

What do you think of our newsletter? Please forward any suggestions, or if you would like to contribute an article or update to an upcoming newsletter, to:

Chris Doyle
(cdoyle@solitudelake.com)

"New York is actively controlling and monitoring several hydrilla infestations."

Establishing Native Vegetation in Piedmont Reservoirs

Kara Foley

North Carolina State University

While the ecology and control methods of invasive species are commonly emphasized in the field of aquatic plant management, it is also important to remember that fostering the growth of native species is another fundamental aspect of maintaining healthy aquatic ecosystems. Native vegetation provides waterbodies with many benefits such as water quality improvement, shoreline stabilization, and ecosystem productivity enhancement as a result of enriched food and habitat sources. In man-made reservoirs with limited native seed banks or in naturally-formed lakes with low plant diversity, it is common to encounter barren or sparsely-inhabited littoral zones. These waterbodies that lack vegetation are deprived of the ecological services that a diverse community of native aquatic plant species can provide and are also especially vulnerable to invasion by aggressive, non-native species.

In an effort to introduce more beneficial native aquatic plant species into North Carolina's Piedmont Reservoirs, researchers at North Carolina State University have studied a variety of methods for shoreline revegetation. The most successful methods have been those that utilize temporary cages built within a waterbody's littoral zone in which appropriate native species are planted. These cages are critical components of revegetation projects as they protect young plant populations from ecological pressures, such as herbivory, that would limit development during their most vulnerable early growth stages. This is particularly important in waterbodies where grass carp have been stocked for invasive vegetation management. The ultimate goal of these cages is that, over time, founder colonies of native plants can eventually spread to other uninhabited areas of the waterbody through seed or vegetative reproduction. With time, a self-sustaining system is created and the original cage structures become unnecessary components and can be removed from the system.

Two main cage designs have been successful in North Carolina. The first are simple rectangular cages that are positioned in 4 to 6 feet of water and extend above the water surface so that herbivores, such as grass carp and turtles, are not able to enter the enclosure. Recently, smaller-scale revegetation cubes have also been deployed in selected Piedmont Reservoirs. The cube design is much smaller than a cage and is enclosed on six sides. This design allows for three hundred and sixty degree plant protection when fully submersed, and is a good option for reservoirs that experience frequent water level fluctuations as they can be deployed at deeper depths than the classic shoreline-based cage design.

How Are We Doing?

What do you think of our newsletter? Please forward any suggestions, or if you would like to contribute an article or update to an upcoming newsletter, please contact

Chris Doyle
(cdoyle@solitudelake.com)

"It is also important to remember that fostering the growth of native species is another fundamental aspect of maintaining healthy aquatic ecosystems."

Figure 1: Native vegetation cubes (pre-installation) at Philpott Lake Reservoir (Patrick County, VA)-Photo Credit: K. Foley

Establishing Native Vegetation in Piedmont Reservoirs (Con't)

"When starting a revegetation project, it is necessary to consider physical, ecological and economic characteristics that can influence plant growth and success."

Figure 2: *Justicia americana* inflorescence. Photo Credit: K. Foley.

Figure 3: *Vallisneria americana* with spathes. Photo Credit: K. Foley.

Plant species for these revegetation projects are selected based on what is understood to be native to the region. Ideally, these plants are harvested from other waterbodies within the same watershed or even from areas within the reservoir that has a healthy population of established native plants. In North Carolina, American waterwillow (*Justicia americana*) and eel grass (*Vallisneria americana*) are two commonly planted native species in shallow water cages.

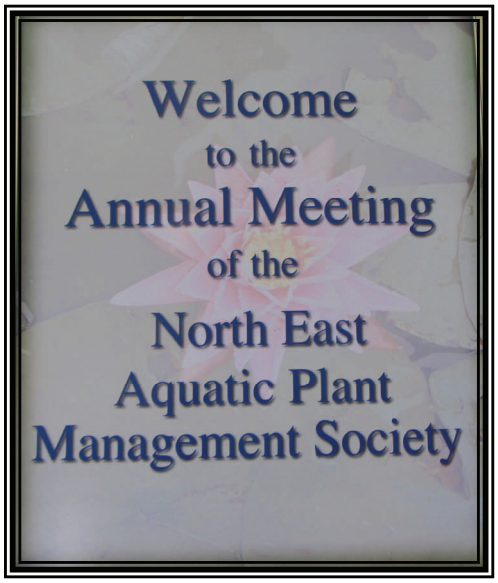
The process of revegetating a waterbody is not simple and usually takes quite a bit of time before successful results are achieved. When starting a revegetation project, it is necessary to consider physical, ecological and economic characteristics that can influence plant growth and success. Physical factors that should be noted include average water depth, water level fluctuation tendencies, and sediment type. The potential for competition with non-native or other native species in the area as well as the possibility of herbivory by other organisms also should be incorporated into project plans. From an economic standpoint, projects may be limited by native species propagule cost or propagation space restrictions.

Looking forward, encouraging the development of strong and healthy native plant communities is an essential component to any waterbody's long term management plan. By doing so, we can ensure that we have sustainable healthy ecosystems that can continue functioning to their full potential for many years to come.

Figure 4 (above): Native *Justicia americana* at Falls Lake Reservoir (Wake County, NC). Photo Credit: K. Foley.

Figure 5 (right): Native vegetation cage at W. Kerr Scott Reservoir (Wilkesboro, NC). Photo Credit: K. Foley

NEAPMS 2019 Conference Pictures



Above: A packed session on Wednesday morning.

Above: The 2019 attendees of the NEAPMS Conference proudly wearing their beanie hats in the courtyard of the Desmond Hotel.

NEAPMS 2019Conference Pictures

Above: Dr. West Bishop presents at the Algae Workshop.
Right: The table displaying an array of algae samples for the Algae Workshop.

Above: Algae Workshop attendees eagerly examine algae samples on hand.

NEAPMS 2019 Conference Pictures

Above Left: The Aquatic Plant Workshop featured 76 different aquatic plants specimens (previously frozen).

Above Right: Aquatic Plant Workshop Attendees crowd around the table that hosted the 2019 aquatic plant quiz.

Below: An Aquatic Plant Workshop attendee gets his quiz graded.

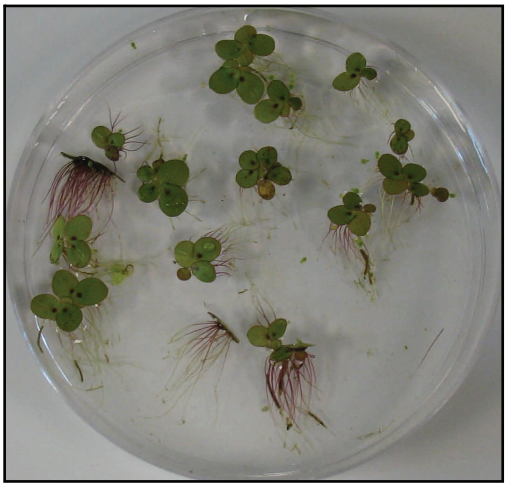
NEAPMS 2019 Conference Pictures

Above: Scott Kishbaugh, NYSDEC (now retired), presents the Keynote Address at the 20th Anniversary Annual Conference regarding the history of the NEAPMS Society as it related to evolution of aquatic plant management in New York State over the past two decades.

NEAPMS 2019 Conference Pictures

Above: Bob Johnson moderates a session, but begins with a retrospective of the Society and its impacts on his career over the past 20 years.

Right: An attendee peruses the offerings at the Silent Auction.



Aquatic Plant Quiz

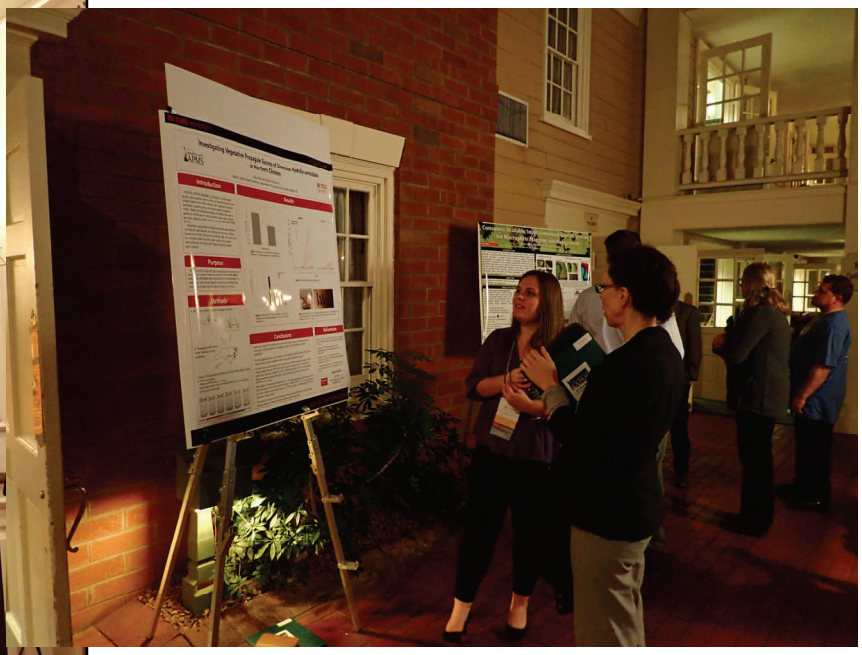
Can you guess the genus and species of the aquatic plant pictured above? (Answer on page 28.)

NEAPMS 2019 Conference Pictures

Above: Treasurer Glenn Sullivan presents outgoing President Meg Modley with an Award.

Above: Editor Chris Doyle presents an outgoing Director Award to fellow Baltimore Ravens fan Mark Lewandowski.

2019 NEAPMS Conference Pictures



Left: Poster Presenter Patrick Goodwin dons the Eradicator Cape for the 2019 Poster Slam Session.
Below: Poster Presenter Kara Foley answers questions regarding her scientific poster for one of the judges.

Announcing The 2020 NEAPMS Scientific Poster Contest

The Board of Directors is pleased to announce the return of the scientific poster contest at the 2020 NEAPMS conference. Prizes provided by a sponsor will be awarded to the best Student Poster. Posters will be judged by an esteemed panel of NEAPMS members on criteria such as design and layout, suitability to the society's goals, study design, and presentation of the content. If you are interested in sponsoring the NEAPMS Poster Contest this year, please contact Glenn Sullivan (gsullivan@solitudelake.com). If you are interested in becoming a Poster Judge, please contact Meg Modley (mmodley@lcbp.org).

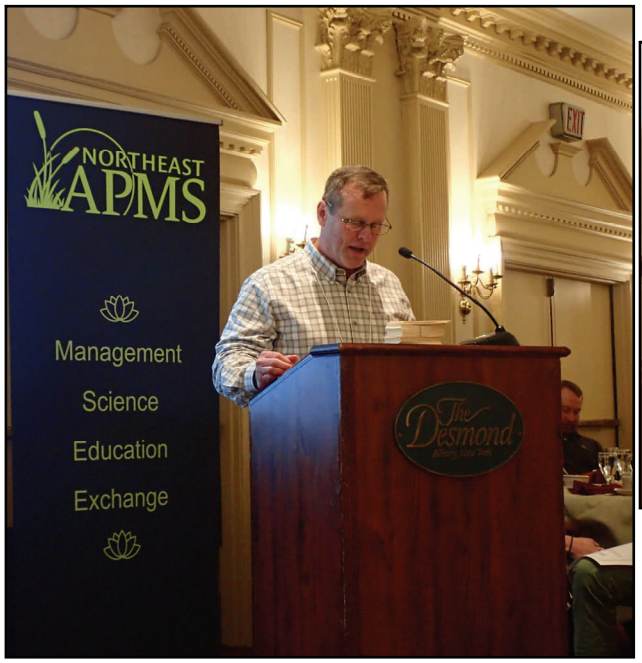
NEAPMS 2019 Conference Pictures

Above: Dr. Ken Wagner presides over the Raffle while directing past Society presidents to draw potential winning tickets.

Right: The first wave of 10 finalists for the 2019 Raffle.

Above: A proud raffle winner of a Yeti cooler system!

NEAPMS 2019 Conference Pictures



Above: Treasurer Glenn Sullivan presents another Aaward.
Upper Right: Eleven Past-Presidents of NEAPMS pose at the 20th Anniversary Award Banquet
Lower Right: Newly-elected NEAPMS President Will Stevenson addresses the attendees at the Annual Banquet.

Above: Attendees can't get enough of the aquatic plant workshop

2020 NEAPMS Conference Venue Spotlight: Lake Placid

Chris Doyle, CLM
SOLitude Lake Management

The 21st Annual Conference of the Northeast Aquatic Lake Management Society will be set in the frigid, yet picturesque village of Lake Placid, New York. Lake Placid is a village in the Adirondack Mountains with a population estimated to be just shy of 2,500 people. The village boasts an area of 1.54 square miles, although about 11% of that is considered open water. Along with nearby Saranac Lake and Tupper Lake, Lake Placid is part of the Tri-lakes region.

In the early 1900s, the region was utilized by tuberculosis patients year-round, as cool mountain air was a common method of treatment at the time. But soon after, the wealthy discovered the region and were drawn to the exclusive Lake Placid Club, designed by Melvil Dewey. Mr. Dewey was the creator of the Dewey Decimal System, a card-based classification system to catalog library books. Before Google, this was how we found reference books to complete our studies "back in the day." By the 1920s, Lake Placid boasted robust winter sports facilities. Dewey's son, Dr. Godfrey, even convinced the International Olympic Committee that the facilities were the best in the United States. Although more well-known for the 1980 Olympic Games, Lake Placid hosted the 1932 Winter Games as well. To this day, only St. Moritz, Innsbruck and Lake Placid have hosted the Winter Olympic Games more than once.

But by far, most Americans associate Lake Placid with the 1980 Olympic Winter Games. This was the site of the semi-final Men's Hockey game that featured a group of American college athletes and amateurs upsetting the heavily favored Soviet Union National Team 4-3, later dubbed the "Miracle on Ice". Two days later, the American National team beat Finland, 4-2, to claim the unlikely Gold Medal, and capture the hearts of the nation at the tail-end of the Cold War.

"Do you believe in Miracles?" Glenn Sullivan does, as NEAPMS is coming to Lake Placid in January of 2020! By the way, the daily mean air temperature in Lake Placid during the month of January is 14.9 °F. So, pack your long johns and an extra pull-over!


Photo: Crown Plaza Hotel, Lake Placid

"Do you believe in miracles?"

Al Michaels, CBS Broadcaster, 1980

For more information about Lake Placid Tourism, check out their website:
www.lakeplaced.com

"The daily mean air temperature in Lake Placid during the month of January is 14.9 °F."

NEAPMS Scholarship Update

Kara Foley, North Carolina State University

Investigating Vegetative Propagule Success of Dioecious Hydrilla verticillata *in Northern Climates*

"It was hypothesized that tubers from the Virginia population would sprout under cooler water temperatures when compared to tubers from a population sourced from Florida."

Thanks to partial funding from NEAPMS, I have been able to take a closer look at the dioecious hydrilla population that occurs in Philpott Lake. Philpott Lake is situated along the Smith River in Martinsville, Virginia and is currently home to the northernmost-known population of the dioecious biotype of hydrilla (*Hydrilla verticillata (L.F.) Royle)* in an Atlantic state. Previous research has suggested that dioecious hydrilla should not be successful in a cool climate, which inspired further investigation of this uncharacteristic Virginian population. The goal of this research is to reevaluate the current understanding of the range constrictions on dioecious hydrilla and to uncover potential implications for future management of this problematic species in the northeastern United States.

A study was designed to compare dioecious hydrilla tuber sprouting success under a range of water temperatures. It was hypothesized that tubers from the Virginia population would sprout under cooler water temperatures when compared to tubers from a population sourced from Florida. After two weeks of exposure to each temperature treatment, it was found that the stem lengths of sprouted Florida tubers were longer at colder water temperatures than those of the sprouted Virginia tubers (Figure 2).

These results suggest that there is a difference in tuber sprouting dynamics between Florida and Virginia hydrilla populations under varying water temperatures. One possible explanation for these results could be that the population of dioecious hydrilla in Virginia may have adapted to cold water environments by delaying germination until water temperatures increase. If this is the case, previously understood control techniques used for dioecious hydrilla may need to be reevaluated for later-sprouting tubers in these more northern populations.

Ongoing research includes a more in-depth comparison of the growth dynamics of the same Florida and Virginia populations of dioecious hydrilla throughout a growing season. With this addition to the study, more information will be gathered regarding the post-sprouting behaviors of these populations will hopefully help us gain insight onto the success of both northern and southern populations of dioecious hydrilla in the United States. With this, we will be able to better understand the ecology of this invasive species and ultimately more effectively manage its growth and subsequent spread.

Figure 1 (above): Hydrilla tubers collected from a site in the Northeast.

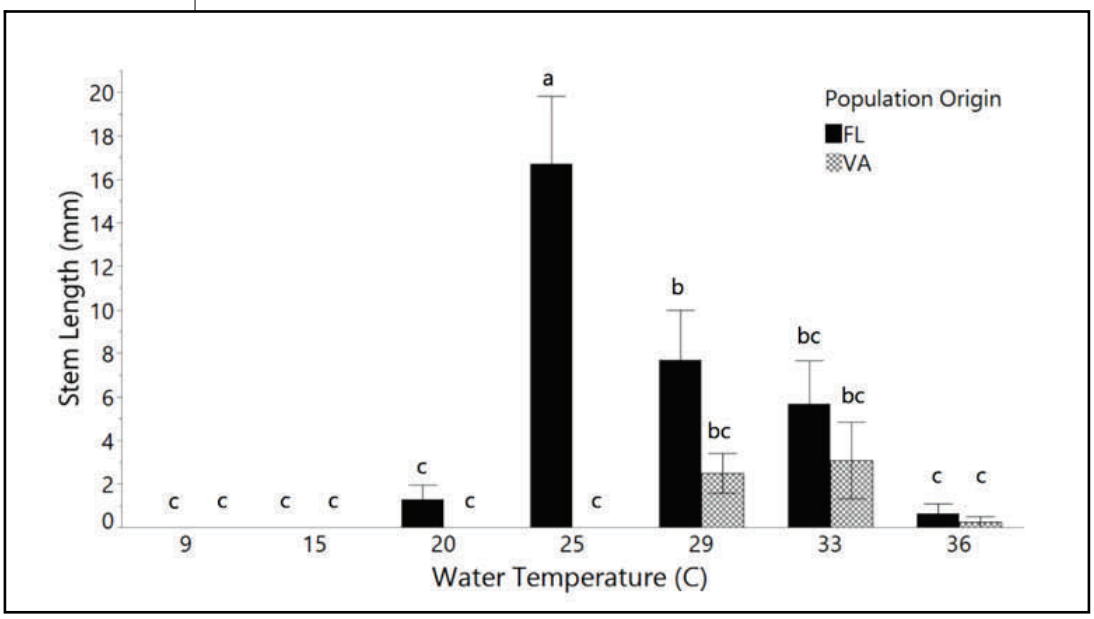


Figure 2 (below): Stem length of sprouted dioecious hydrilla tubers exposed to a temperature gradient. Means separated by Tukey HSD. Bars represent ± SE.

NEAPMS Scholarship Update

John H. Rodgers, Jr. and Tyler Geer
Department of Forestry and Environmental Conservation

Evaluation of Management Options for Nitellopsis obtusa *(Desvaux in Loiseleur) J. Groves, (1919) (Starry Stonewort) in the United States*

The purpose of our research is to identify the best approaches for management of non-indigenous *Nitellopsis obtusa* (starry stonewort) across its current range in the US in an environmentally responsible manner. To accomplish this, the research is organized as three principal objectives: 1) a risk assessment that assembles relevant information and identifies data gaps pertaining to management of *N. obtusa* in the US; 2) thorough evaluation of approaches to manage *N. obtusa* in lakes across the currently infested area; and 3) evaluation of decontamination efforts to prevent off-site movement of *N. obtusa* as well as reintroduction into currently infested lakes.

The scientific risk assessment for management of *N. obtusa* includes the risk of this invasive species in terms of potential distribution, as well as invasiveness and adverse effects due to its growth and spread. This assessment is underway and will be completed (i.e. submitted for publication in a peer-reviewed journal) this summer. A key component of this assessment will be addressing concerns of adverse effects for non-target organisms as a result of different management actions and comparing those risks to the consequences of unabated growth and spread of *N. obtsua*.

To evaluate approaches to manage *N. obtusa* in lakes across the currently infested area, we are vetting chemical, mechanical, physical and strategic combinations (integrated) of tactics for in-lake control of *N. obtusa* populations, conducting screening-level laboratory and field studies to rank management tactics, and focusing definitive field studies on the most effective tactics to obtain confirmatory data during the upcoming year (2019).

We recently completed a study evaluating the effectiveness in MN of algaecide treatments for control of *N. obtusa* in an incipiently infested lake, and it will soon be available as a peer-reviewed journal article. The objectives of the study were to measure and compare pre- and post-treatment responses of *N. obtusa* and co-occurring native macrophytes to measured algaecide exposures in the Lake Sylvia public boat access area, and to compare responses of mitigated *N. obtusa* in Lake Sylvia with an unmitigated population in a nearby water resource (i.e. Lake Koronis, southwestern Stearns County). We found that the use of a chelated copper-based algaecide was effective for control of *N. obtusa* growth and any potential recolonization or re-infestation of the infested area post-treatment. We also found that post-treatment changes in percent occurrence of native macrophyte taxa in the Lake Sylvia treated area were not significant and independent of algaecide applications.

Overall, the results of this early intervention study demonstrate that algaecides can be used to mitigate risks associated with localized populations of *N. obtusa* without exacerbating risks for non-target macrophytes and algae, particularly when *N. obtusa* is exposed early in its seasonal growth cycle and early in its overall invasion process. For evaluation of control tactics for lakes with a longer history and more extensive, mature populations of *N. obtusa*, we conducted studies in Lake Koronis, MN, Lake Tippecanoe, IN, and Lobdell Lake, for evaluation of algaecide treatments. We also collected data about the effectiveness of mechanical harvesting from the Huron chain of lakes, MI and Keuka Lake. These data will be submitted for publication this fall.

"A key component of this assessment will be addressing concerns of adverse effects for non-target organisms as a result of different management actions and comparing those risks to the consequences of unabated growth and spread of N. obtsua."


Photo: Paul Skawinski

"We recently completed a study evaluating the effectiveness of algaecide treatments for control of N. obtusa in an incipiently infested lake"

NEAPMS Scholarship Update (con't)


Photo: michigan.gov

"As N. obtusa is indifferent to political boundaries, the absence of in-lake management and spread prevention in a water resource or a region overshadows efforts in adjacent regions to mitigate N. obtusa"

To evaluate decontamination efforts to limit the spread of *N. obtusa*, we are screening decontamination procedures, including pressure washing, steam spraying or application of algaecides or biocides to boats (bilges) and trailers that could be employed as a layer of protection to prevent dispersal. We have conducted laboratory experiments evaluating the viability of *N. obtusa* fragments and bulbils to desiccation and application of hot water, and will be progressing with evaluations of chemical decontamination tactics this spring. Those data will be submitted for publication this fall.

Overall, there are several key conclusions that we can draw from the progress of our research thus far. First, it is apparent that the potential of *N. obtusa* to expand spatially and produce biomass means that management program costs will grow exponentially over time. *N. obtusa* in Lake Koronis has, in three years, spread from a relatively localized infestation to dominating nearly the entirety of the lake's 16-miles of shoreline. A water resource in Vermont reports a similar story; that management action planned for the fall of 2018 was relinquished as *N. obtsua* had spread such that the planned management action would have had a negligible effect on the infestation. It is critical that management plans be prepared, permits and permissions be acquired, and commitments be established during the winter months, so that control actions can be rapidly and expeditiously initiated at the appropriate time in the spring. Although data gaps still exist regarding the ecology of *N. obtusa* as it relates to management, it is clear that ecological, economic, and socio-political impacts are expected consonant with *N. obtusa* expansion within and among lakes, similar to adverse effects observed in the wake of invasions of *Hydrilla verticillata*, *Myriophyllum spicatum*, and *Eichnornia crassipes*. Therefore, if management action is delayed until we know everything that we would like to know, the damage will be done and options for management will be severely limited.

Finally, our research thus far indicates that it is critical for prevention of the spread of *N. obtusa* (and all invasive species) to be coordinated across the infested region. As *N. obtusa* is indifferent to political boundaries, the absence of in-lake management and spread prevention in a water resource or a region overshadows efforts in adjacent regions to mitigate *N. obtusa*, as uncontrolled growth of *N. obtusa* in a water resource is a constant source of new infestations in surrounding areas. While management goals and triggers will differ among regions for a variety of factors, these goals and the action taken in pursuit of them should be unified as much as possible for management of *N. obtusa* to be successful at scale.

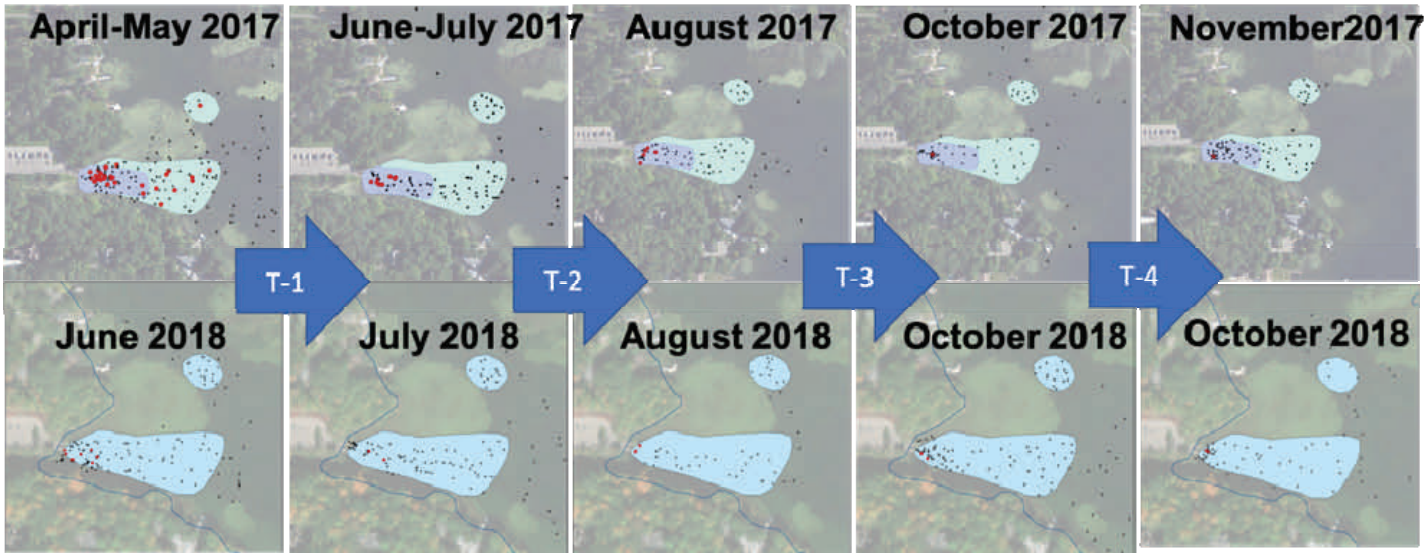


Figure 1: Decline in Starry Stonewort abundance after algaecide treatments (T1-T4) in Lake Sylvia, MN.

NEAPMS Scholarship

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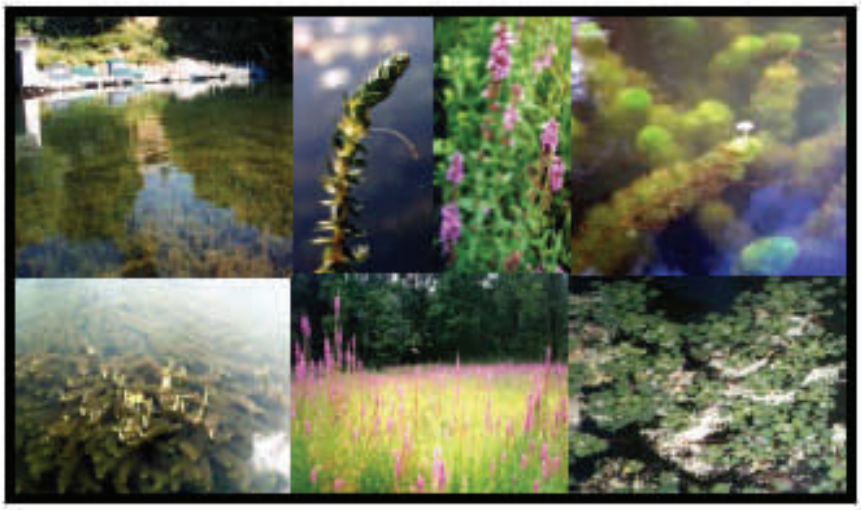
Check Out Our Website: www.neapms.net

Answer from page 17:
Spirodela polyrhiza
(Great Duckweed)

Graduate and Undergraduate Scholarships and Stipends Available!



The Northeast Aquatic Plant Management Society announces the availablility of scholarship monies for students pursuing degrees in AQUATIC PLANT MANAGEMENT.

Graduate scholarships can range up to $5,000.00 depending on the degree pursued and the project proposed.

Undergraduate students interested in participating in an internship in Aquatic Plant Management can be eligible for a stipend to pay for salary and/or related expenses during the internship.

For more detailed information visit the NEAPMS website at www.neapms.net and click on Scholarships

Northeast APMS

Silent Auction

It's never too early to consider contributing an item to the NEAPMS Silent Auction Table at the Annual Conference in January.

For 2020, we want this to be the best Silent Auction yet!

Need a few good ideas? How about these:

- GPS units
- Outdoor Recreational Equipment
- Gift Cards
- Top-Shelf Vermont Maple Syrup
- Fine Local Wine/Micro-brew Beer
- Aquatic Plant Identification Books

100% of the Proceeds from the Silent Auction go straight to the Scholarship Fund!

Silent Auction Questions?

Please Contact:

Ann Bove (aebove@gmavt.net) or
John McPhedran
(john.mcphedran@maine.gov)

Northeast

If you have any questions, comments, or suggestions, please reach out to a Director for discussion at our September Board Meeting.

Check Out Our Website: www.neapms.net

If you'd like to advertise in the Nor'Easter, please contact Glenn Sullivan (gsullivan@solitudelakeom). Both 1/4 page and business card-sized ad space is available.

See you in January in Lake Placid, NY for our Annual Conference!

Photo: The Crowne Plaza, Lake Placid

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July 14-17, 2019:
APMS
San Diego, CA
www.apms.org

October 2-4, 2019:
SCAPMS
Myrtle Beach, SC
www.scapms.org

October 14-17, 2019:
FAPMS
St. Petersburg, FL
www.fapms.org

November 3-6, 2019:
MSAPMS
Baton Rouge, LA
www.msapms.org

November 10-15, 2019
NALMS
Burlington, VT
www.nalms.org

November 20-22, 2018:
TAPMS
Bryan, TX
www.tapms.org