NEW YORK STATE OF OPPORTUNITY. | Lake George Park Commission

Bruce E. Young
Chairman

Dave Wick
Executive Director

To: **Adirondack Park Agency**

From: **Dave Wick, LGPC Executive Director**

Date: **April 1, 2022**

Re: **Economic, social and other benefits to be derived from proposed ProcellaCor treatment of Eurasian watermilfoil in Lake George**

Background

The Lake George Park Commission is a New York State agency charged with the long-term protection of the lake and its users, as defined in NYS Environmental Conservation Law Article 43. One of the primary responsibilities of the Commission is to prevent and manage invasive species within the lake, which it has been doing for more than three decades, at a total cost over that time period exceeding $7 million.

Lake George has long been the object of scientific study. Aquatic plant surveys conducted in 1922 and 1975 revealed no Eurasian watermilfoil (EWM) in Lake George. EWM was first identified in Lake George in 1985, and management began in earnest in 1986. Within two to three years, EWM in Lake George was among the top ten species in relative abundance (Eichler et al. 2002).

The first location that EWM was discovered in Lake George was in Northwest Bay, known by our office as Site #1. For a sense of perspective on the challenges of managing and eliminating this invasive plant, the milfoil at Site #1 has been hand harvested almost every year for more than 30 years, and we are still managing that site today. There are more than 200 known locations with milfoil present in Lake George, ranging from a few scattered plants, up to dense beds that are acres in size. Prioritization of sites to be managed, versus the available resources to do so, are always of paramount concern.

Ecological Impacts of Milfoil

Eurasian watermilfoil is an aggressive and prolific species that negatively impacts recreational uses, water quality, and native macrophytes. Topping out at the water surface, EWM can

significantly impede boating activity, and be a danger to swimmers. Growing in dense, tall monocultures, EWM negatively impacts water quality as its astounding seasonal growth and biomass accumulation give way to a fall/winter senescence that annually releases nutrients to the water column and increases biological oxygen demand on levels that exceed our native populations. With stem fragmentation, a dense root mass, early season growth, accelerated growth rates, high biomass, and shading effects, Eurasian watermilfoil significantly suppresses the growth of native macrophytes. The ability of unchecked EWM to crowd out native macrophytes is a fact that was first quantitatively demonstrated in Lake George (Madsen 1991).

Building on the above, the loss of native macrophytes can have wide reaching ecosystem impacts. The literature indicates that reductions in native macrophytes can have a profoundly negative impact on the ecology of a waterbody as native macrophytes support healthier and larger invertebrate communities, which in turn support fisheries and higher trophic level predators. The following is an excerpt from Wilson and Ricciardi 2009. "The establishment of M. spicatum can reduce the density of many other species of macrophytes, including native milfoils (Grace and Wetzel 1978; Smith and Barko 1990; Boylen et al. 1999). In situations where M. spicatum supports lower invertebrate diversity and biomass than its congeners, the displacement of native macrophytes by M. spicatum could conceivably cause habitat-wide alterations in epiphytic invertebrate communities that have consequences for higher trophic levels. Reductions in the diversity, biomass, and mean body size of epiphytic invertebrates may impact fish and other vertebrate predators by lowering the quality and accessibility of prey (Werner and Hall 1974; Eggers 1977; Kovecses et al. 2005). Overall, these results suggest that the impacts of M. spicatum invasion on epiphytic invertebrates may have multiple indirect effects at local and habitat-wide scales. Structurally similar, even congeneric, macrophytes do not necessarily provide equivalent habitat for invertebrate communities, which appear to be sensitive to subtle differences between macrophyte species."

In the concluding comments from a 1991 publication on EWM, Madsen et al. warn that, "The expansion of Eurasian watermilfoil and formation of dense beds not only creates an impairment of human uses, but will significantly alter the diverse littoral zone vegetation of Lake George, as well as other lakes in which this species occur," (Madsen et al. 1991). Indeed, prolific spread of Eurasian watermilfoil is exactly what we've seen in Lake George and area waterways. As noted above, following introduction EWM quickly became a dominant aquatic plant in Lake George, and no doubt reduces the habitat for native species. This is an unfortunate occurrence throughout New York State and the Adirondacks. A 2010 report by Darrin Freshwater Institute identifies over 300 waterbodies in New York State impacted by Eurasian watermilfoil. Eurasian watermilfoil was first discovered in the Adirondacks at Chateaugay Lake in 1979, and has since spread to at least 55 waterbodies within 12 counties of the Adirondack Park (APIPP 2014).

In a 2014 report by the Adirondack Park Invasive Plant Program (APIPP) regarding invasive

species impacts in the Adirondacks, they note, "Dense pockets of Eurasian watermilfoil provide poor habitat for waterfowl, fish, and other wildlife and alter water quality by decreasing available oxygen and increasing water temperature, leading to a reduction in native plants and animals, including fish. Phosphorous and nitrogen concentrations in water increase due to the decomposition of plant material from Eurasian watermilfoil at the end of the growing season. Eurasian watermilfoil infestations create pockets of stagnant water that provide breeding grounds for mosquitos. The physical presence of Eurasian watermilfoil interferes with swimming, boating, and fishing and has been shown to reduce tourism and property values."

Economic Impacts of Invasive Species

The potential economic impact of invasive species has been well documented in the Lake George and Adirondack regions. Excerpts from two recent studies, one in Lake George (2020) and one for the Adirondacks by the Adirondack Park Invasive Plant Program (APIPP 2014), speak volumes to the risks.

"*Tourism in the Adirondack Region is valued at $1.5 billion dollars annually and generates approximately 19% of employment, amounting to approximately 20,000 jobs (ROOST, 2018)… Together, Warren County and the Lake George Region draw an average 8 million visitors a year and economic activity tied directly Lake George is estimated to be worth around $2 billion annually (Town and Village of Lake George, 2016 and Williams, 2019).*

Should the lake not be maintained or if the water quality was irreparably damaged in some way, it would result in significant economic loss to the Lake George Region and the Adirondack Region as a whole… Visitors to Lake George want to be able to enjoy the lake in a variety of ways, over 85% of visitors to the Adirondacks wish to stay in waterside lodging and approximately 70% seek to swim, fish or boat while visiting the region (Johnstone, 2014). If the water quality of Lake George is not maintained, there [is a] likelihood that many of the visitors who seek water-based activities and lodging would choose to vacation elsewhere, taking tourism dollars outside the region…

… Lake George's most widely spread aquatic invasive plant is Eurasian watermilfoil (Myriophyllum spicatum)… Eurasian milfoil infestations can also have large negative impacts on shoreline property values, a study in Vermont found a decrease in property values of up to 16% for lakes with very dense beds of the invasive species while a similar study of over 170 lakes in the northern forest Region of Wisconsin found that lakes invaded with milfoil experienced an average 13% decrease in land values after invasion (Zhang, 2010; Madsen, 1991; and Horsch, 2009),"

- "Assessment of the Economic Value of Clean Water in Lake George", 2020.

The potential loss in economic value and real property value is a significant risk among Lake

George communities and the Adirondacks as demonstrated in a 2014 report by APIPP.

"*Total direct economic loss from the invasive species evaluated in this report to the recreation and tourism sector in the Adirondack region, including impacts on swimmers, boaters, anglers, and fall tourists, is estimated at $46–$51 million a year… Sixty-nine percent of those surveyed in the White Mountain Region of New Hampshire, similar in some ways to the Adirondacks, said they would decrease visitation if water clarity and purity deteriorated (invasive species can exacerbate issues related to water quality and water purity). This was the most significant deterrent to visitation and was estimated to result in a decrease of 17.5% in visitor days, total sales, household income, and jobs…*

The largest share of the total estimated direct economic impact is the potential impact on property values. The impact of aquatic invasive species, particularly Eurasian watermilfoil, on property values has been studied and found to range from 1% to 16%. Other studies confirm that a reduction in water clarity (and its diminishment from cultural and non-cultural eutrophication) results in decreasing property values. A study in the Adirondacks found that multiple measures of water quality, including the presence of Eurasian watermilfoil, have significant effects on property values overall, even for properties that are not directly on the water. According to this study, the presence of invasive species on the nearest lake decreases property values by $10,459.

The total value of residential properties in the Adirondack Park is estimated to be approximately $14 billion. If we assume a conservative impact of 3% on property values Park-wide, approximately $420 million in property value could be at risk from increasing numbers and densities of aquatic invasive species, such as Eurasian watermilfoil. A slightly less conservative estimate of 6% impact that is still within the low end of the range suggested by the research increases this impact to $840 million. While this is a simplistic method of computing impact, it is a reasonable (and likely conservative) indication of the order of magnitude of the impact if an aquatic invasive species, in isolation or in combination with others, were to spread throughout the Park. Currently, second homeowners pay a premium for property within the Park. The presence of aquatic invasive species can be expected to have a dampening effect on their willingness to pay a premium, which will also have a dampening effect on property values."

- The Actual and Potential Economic Impact of Invasive Species on the Adirondack Park: A Preliminary Assessment, 2014

The reason that the Commission and others throughout the Adirondacks invest in aquatic invasive species prevention and management is because it is absolutely necessary to preserve local water quality and the economy of our communities that are tied to it.

Regional Costs of Invasive Species Prevention and Management

"*Survey findings show that approximately $3.56 million was spent by 88 organizations on invasive species in the Adirondacks in 2013. More than half reported that their spending had increased over the past five years and expect their spending to increase over the next five years, signifying an increase in the invasive species threat and subsequent demand for action… Eighty-five percent of all reported investments on invasive species were directed at aquatic invasive species with 15% targeted at terrestrial invasive species… Aquatic plants (e.g. Eurasian watermilfoil) are currently receiving over half of the total investment in invasive species in the Adirondacks*," (APIPP 2014).

AIS Prevention:

In order to limit the spread and management required of invasive species, these species must first be prevented from entering and leaving waterbodies. To this end, the Commission, with financial support from the EPF, Warren County, local municipalities, and non-profit advocacy groups, operates a cutting-edge boat inspection program to prevent the introduction and spread of aquatic invasive species into Lake George. This program, which costs $500,000/yr to operate on Lake George, is a tremendous benefit not only to Lake George, but through exit inspection, provides a great benefit to other Adirondack waterbodies and communities . A similar program, administered by the APIPP Prism with EPF dollars, is administered throughout the Adirondack Park to prevent the spread of invasives, such as Eurasian Watermilfoil.

EWM Management Goals in Lake George

The Commission and its partners spend hundreds of thousands of dollars annually to curb the spread and impact of this invasive species. The goal of the Commission's EWM management program is to eliminate all known dense and moderate beds, and keep them from re-emerging. This will allow for a financially manageable maintenance level of hand harvesting of sparse populations of EWM in the waterbody. It is unreasonable to anticipate that this invasive species will ever be eradicated in the lake given current technologies, so the goal is to keep this invasive species in check and to minimize recreational and economic impacts. Once all beds are eliminated in Lake George, the ongoing annual maintenance level costs are anticipated to be approximately $150,000-$200,000. Without diligent annual effort, scattered populations of plants will turn quickly into dense beds once again. All options for management are researched by the Commission each year, with the goal of finding the most effective and efficient means to address EWM in a long-term, sustainable way.

Options for Management of Eurasian Watermilfoil

There are four primary options for managing Eurasian Watermilfoil: Benthic barriers, Hand harvesting, Diver Assisted Suction Harvesting, and Aquatic Herbicides.

1. Benthic Barriers can be successful at eliminating beds of milfoil, however they simultaneously eliminate essentially all life in the treatment area. Additionally, they create barren pockets of disturbed lake bed, which are extremely vulnerable to introduction of invasive species, such as EWM. Not only is this method highly disruptive, but it is also extremely labor intensive and includes material costs. Benthic barriers were used as a management option to treat Asian clams in Lake George at a cost of $80,000/acre. The Commission has used benthic barriers to help control EWM for more than two decades, with mixed success, but that practice was abandoned in 2014 due to cost and inefficiency in maintaining these barriers to obtain effective use.

2. Hand harvesting can be successful a means of removing EWM by removing the plant and root parts from the Lake. This method, historically the most widely used method in the Adirondacks, also has its limitations. The success of hand harvesting is highly dependent on the nature of the lake bottom, because the entire root mas of the plant must be removed. In areas with dense sediment or rocky substate, it is impossible to remove the root of the plant, and the plant will re-grow the next year. Additionally, these mode of physical handling and removal of the EWM is highly prone to fragmentation of the stem. Stem fragments can easily lead to new growth; an issue we've observed and worked hard to manage on Lake George. Lastly, hand harvesting is disruptive to the Lake bottom; akin to weeding a garden at a large scale this is physically disruptive to the lake bed and creates localized turbidity. Hand harvesting is conducted throughout the growing season. It is recommended that sites be revisited at least twice in a growing season to ensure adequate removal. Commission experience over three decades of using this method with multiple different contractors shows that a successful harvest sees species return/repopulation rate of 20-40%.

3. Diver assisted suction harvesting (DASH) is similar to hand harvesting. The diver pulls the plant by the roots out from the lake sediment, and puts the plant material (including water and sediments from the lake bottom) into a suction hose which leads to a topside vessel where plant material is screened out and water is returned to the Lake. The vacuum aspect of DASH also tends to result in less fragments leftover, which is a great benefit to reduce re-population of the site. Due to the connection of the diver, vacuum hose, and vessel, this means of EWM removal is relatively immobile. As such, this method is most efficient in areas with dense beds where divers are relatively stationary for long periods of time. Similar to hand harvesting, hand removal of plants with DASH can be highly disruptive to the Lake bottom, and the vacuum/return mechanism of the DASH extends turbidity to the entire water column above and surrounding the treatment area. DASH is conducted throughout the growing season. It is recommended that sites be revisited at least twice in a growing season to ensure adequate removal. Similar to hand harvesting, a successful

suction harvesting effort also sees species return/repopulation rate of 20-40% depending on site conditions.

Given the unique skill sets and equipment required, the availability of contractors that perform physical milfoil management services are limited in the Adirondack Region, and the costs are high. Currently, there are just three companies that provide these services: Aqualogic, AE Commercial Diving, and Invasive Species Dive Solutions (formerly AIM). AE's costs for a single diver using a Diver Assisted Suction Harvester is currently $8,750/week, which is up from $7,500 in 2021.

On Lake George, the Commission has historically had three to four dive crews working concurrently through three months of the summer. These are treatment costs that are simply not viable for most waterbodies, and if not successful, these are costs that are unsustainable for any waterbody/community. Indeed, the $8,750 per week cost for one diver pulling EWM is not only concerning for other waterbodies, but even Lake George, who has more financial resources than most.

4. Systemic Aquatic Herbicides (Specifically ProcellaCOR EC): Research on the systemic aquatic herbicide ProcellaCOR since its development in year 2010, plus more than 250 applications to date in the United States (including more than 100 in the Northeast US) have shown that EWM is selectively eliminated from the native aquatic plant population like no other herbicide in history. ProcellaCOR is applied at approximately 7 parts per billion, which is approximately 1,000 times lower in dosage than the previous generation of aquatic herbicide such as Sonar and Renovate. It has no potable water or contact recreation impacts. Conducted early in the growing season when the plant has limited biomass (10-20%), the plant slowly dies over a period of weeks and falls to the lake bottom. Unlike harvesting methods, no disruption to the lake bottom occurs, and no turbidity is created. The manufacturer of ProcellaCor guarantees complete species removal for at least three years post treatment, with no identified impacts to public health or fauna, and exceedingly limited impacts to native vegetation. There is considerable information available on the efficacy of ProcellaCOR, and this narrative is not intended to replace that information.

EWM Program Management Cost and Long-Term Sustainability

With the limited availability of aquatic dive companies that manage EWM in the Northeast, and the large number of waterbodies that are working to deal with the challenges of EWM, there must be an honest analysis of all of the available tools to manage this invasive species. The annual cost of managing EWM in Lake George over the past decade has averaged approximately $200,000-$300,000 per year. Funds for this program come through an annual allocation from the NYS Environmental Protection Fund, traditionally $100,000 per year. This is supplemented by additional funding from the Lake George Association of a similar amount, and sometimes grant

funding is secured to provide additional needed resources.

If beds of EWM were able to be managed one time and then remain clear for a period of several years, this funding would be sustainable. However, the Commission has found that at least half of the sites it manages will re-populate between 25-100% EWM within only 2-3 years' time. Some sites, particularly ones that are a monoculture of EWM and live in soft sediments, respond well to hand harvesting and suction harvesting efforts. The re-growth in these areas can be as low as 5-10% the following year. These sites still need to be monitored and re-harvested, as an ongoing effort to keep these sites from becoming dense beds once again. Most of the sites that are managed in Lake George are harvested every year, at significant cost. Since not all sites can be managed every year, there are several sites that go for several years without harvesting, allowing significant re-growth and thusly increased cost to manage.

By contrast, as several years of ProcellaCOR treatments have shown throughout the U.S. and Northeast, the use of this aquatic herbicide has shown efficacy of up to 100% milfoil control, for a guaranteed minimum of three years of no re-growth. This represents a staggering difference between these two methodologies, and concurrent cost-reduction.

As an example, Minerva Lake had been using hand harvesting of its EWM populations for several years, at a cost of approximately $70,000 per year, repeatedly. Following approval to apply ProcellaCOR, their 41 acre treatment cost only $27,000 and the treatment was 100% successful at controlling the milfoil population in Minerva Lake. Since the company guarantee is a minimum of three years, that equates to a cost of $9,000 per year total. With the likelihood that any EWM regrowth after that three year timeframe will be significantly less than the pre-treatment, the annual cost drops to even less than $9,000 per year.

This is opposed to $70,000 per year, every year, with no end in sight. The math indicates that the cost of ProcellaCOR to control milfoil over a five year period is approximately 10% of the cost of hand harvesting. The supplemental benefits include no turbidity associated with hand harvesting, no day-long boat/engine/compressor noise associated with DASH methods on that small lake, no annual Town management and oversight of a dive contractor, and less impact on the overall aquatic environment. Final cost of treatment equates to a staggeringly low $700 per acre, with the density of the EWM population not a factor at all (which is critically important in the cost of harvesting efforts). The economics, and environmental benefits, could not be more clear for Minerva Lake.

On Lake George, the costs are not anticipated to be quite so stark for the two demonstration projects that are under consideration currently. With smaller sites (approximately 4 acres each), and deeper water, the cost per acre naturally is higher due to the fixed costs of undertaking the effort. However, it is anticipated that the cost of the treatments will be approximately $8,000 per

acre for the two sites. Historical management costs for the Blairs Bay site average approximately $15,000-$20,000 per acre, with strong regrowth of milfoil the following year. This leads to follow-up harvesting efforts of a lesser but still costly nature, equating to approximately $10,000 per acre. The Blairs Bay site was not harvested for one year due to contractor changeover and equipment issues, and by the following year the EWM site was larger than before management began. At this point, the Commission and LGA agreed to halt any new harvesting efforts in Blairs Bay due to the harvesting program being ineffective. That was 2018, and the dense milfoil bed has only grown in size since.

The Commission is proposing to undertake two small demonstration ProcellaCOR treatments in Lake George not only to address these milfoil sites, but to learn more about the value of such treatments versus the Commission's current DASH management efforts. It is incumbent upon all lake managers to evaluate all of the available tools available to make the best decisions possible for their lakes. Given the federal and state approvals for ProcellaCOR, its groundbreaking long-term efficacy, its almost non-existent impact upon non-target species, these demonstration projects represent a very reasonable introduction of this tool on Lake George.

It is with consideration to the above, the larger environmental and economic impacts of EWM and its management techniques, that the Commission seeks a wetlands permit from the Agency.

Agency Jurisdiction Specific to Blairs Bay and and Native Milfoil, M. alterniflorum

As noted in the plant survey of Blairs Bay (Bombard 2021), the subject wetland is dominated by Eurasian watermilfoil with the species representing 37% of the plant abundance among the sampled sites. Additionally, EWM represents 29% of both the moderate and dense sites that were sampled. However, despite the dominance of Eurasian watermilfoil at this site, by regulation the value of this wetland is deemed to be high due to the presence of a native milfoil, M. alterniflorum.

A plant survey conducted in furtherance of a pending ProcellaCor treatment has found "trace amounts" of native milfoil (Myriophyllum alterniflorum). Specifically, the report states, "this plant is not uncommon in the waters of Lake George, from depths of 3 to 10 deep… It was found at one site in Blair's Bay (3%) in trace amounts. The one site (#3) during the survey with M. alterniflorum noted was listed as 4 feet deep; a diver reported a few plants seen on the stream delta in Blair's Bay," (Bombard 2021).

The Natural Heritage Program has identified this native milfoil species, Myriophyllum alterniflorum, as being "threatened" in New York State. By regulation, the trace presence of this "threatened" plant among a dense Eurasian watermilfoil bed technically raises the value of this wetland area to "1".

It is encouraging and worth noting that despite its categorization, M. alterniflorum is very

common throughout Lake George, and is also documented among other lakes in the Adirondacks. In fact, a preliminary review of literature on the topic reveals M. alterniflorum can be found in the following Adirondack waterbodies:

1. Lake George (Taggett and Boylen 1989)
1. Loon Lake (Taggett and Boylen 1989, Eichler 2005)
2. Schroon Lake (Eichler and Bombard 1993, Taggett and Boylen 1989)
3. Paradox Lake (Eichler and Bombard 1994)
4. Chazy Lake (Eichler and Boylen 2008)
5. Brant Lake (Eichler et al. 1999)
6. Lake Luzerne (Eichler 2009)
7. Upper Saranac Lake (Evans et al. 2013, Wilson and Ricciardi 2009)
8. Chateaugay Lake (Wilson and Ricciardi 2009)
9. Fern Lake (Eichler and Bombard 1993)

With respect to Lake George specifically, which is recognized as having relatively high species diversity, native milfoil appears ubiquitous (Taggett and Boylen 1989). In fact, at the request of the Natural Heritage Program, a 1989 study by RPI of "rare aquatic plants" found that, "Several of the plants were common throughout the lake. The most common were Isoetes macrospora and Myriophyllum alterniflorum… Myriophyllum alterniflorum was found as scattered plants or in small beds. This plant grows in water 1-2m deep," (Taggett and Boylen 1989). Among sampled sites, Myriophyllum alterniflorum was found to have a 24% frequency (see Table #2-1 in Taggett and Boylen 1989). In a subsequent study, it was noted of native milfoil that, "This species typically grows on sandy sediments in shallow water (less than 2 meters) throughout the Lake George basin," (Eichler and Boylen 2007).

Given the small number M. alterniflorum plants in the Blairs Bay EWM treatment area and the prevalence of this species throughout Lake George, any "trace" amounts impacted by the treatment is outweighed by the benefits created by the treatment. Specifically, removal of the dense Eurasian watermilfoil bed will give way to an area that may be reinhabited by native species. And, we would anticipate that the native milfoil will return and grown in the bay, as it does in the littoral zone throughout the Lake. To spare a few M. alterniforum without regard for the degraded quality of the larger remaining wetland, would cause only further proliferation of the invasive species that we know crowds out and threatens our native species.

<u>Summary</u>

Surface waters define our communities, and they are the life blood of a tourist economy that sustains these communities. Any threat to the quality and ecology of these waters threatens all of

us and our progeny. Eurasian watermilfoil and other invasive species are known threats to water-based recreation, ecology, and water quality. We have worked diligently for years to secure our waters with AIS prevention, and we have worked diligently to remediate our waterbodies with AIS management. After 30+ years of professional EWM management that includes benthic barriers, hand harvesting, and DASH, the Commission has found that (1) benthic barriers are two disruptive and prone to reinfestation, and (2) unfortunately, some areas simply don't respond well to physical removal by hand harvesting and DASH. In response, as a Lake management Agency responsible for the water quality of Lake George and the expenditure of resources, the Commission seeks to utilize a new tool in the toolbox for EWM, a selective systemic herbicide. The herbicide, ProcellaCOR, is authorized by EPA and NYS DEC, and recognized as being highly effective at low doses with no identified impacts to public health or fauna, and exceedingly limited impacts to native vegetation. With ProcellaCOR, sites that have not responded well to physical techniques, may finally be remediated and restored to their natural condition.

References:

Adirondack Park Invasive Plant Program (APIPP). 2014. The Actual and Potential Economic Impact of Invasive Species on the Adirondack Park: A Preliminary Assessment.

Bombard, Robert. 2021, Blairs Bay Lake George, New York. 2021 Submersed Aquatic Macrophyte Survey Report. See APA Application

Eichler, Lawrence. 2005. Aquatic Vegetation of Loon Lake, Warren County, New York.

Eichler, Lawrence. 2009. Aquatic Vegetation of Lake Luzerne, NY.

Eichler, Lawrence and Bombard, Robert. 1993. Aquatic Plant Identification Program 1992 Annual Report. Rensselaer Fresh Water Institute.

Eichler, Lawrence and Bombard, Robert. 1994. Aquatic Plant Identification Program 1993 Annual Report. Rensselaer Fresh Water Institute.

Eichler, Lawrence and Boylen, Charles. 2002. Baseline Aquatic Plant Monitoring: Pre-Treatment for a SONAR Demonstration Project at Lake George, New York. Darrin Freshwater Institute.

Eichler, Lawrence and Boylen, Charles. 2007. Aquatic plant population assessments as part of a program to eradicate Eurasian watermilfoil from selected sites in Lake George, New York. Darrin Freshwater Institute.

Madsen, J., Sutherland, J., Bloomfield, J., Eichler, L., and Boylen, C. 1991. The Decline of Native Vegetation Under Dense Eurasian Watermilfoil Canopies. J. Aquat. Plant Manage. 29: 94-99.

Eichler, Lawrence and Boylen, Charles. 2008. Aquatic Vegetation of Chazy Lake, New York. Darrin Freshwater Institute.

Eichler, L., Howe, E., Sutherland, J., and Bombard, R. 1999. An Aquatic Plant Survey of Brant Lake Warren County, New York. Darrin Fresh Water Institute.

Evans, C., Kelting, D., Holmlund, E., and Laxson, C. 2013. Protecting Our Waters through Integrated Milfoil Research, Education, and Management At the Adirondack Watershed Institute Of Paul Smith's College. Adirondack Journal of Environmental Studies. Volume 19.

Lake Champlain Lake George Regional Planning Board. 2020. Assessment of the Economic Value of Clean Water in Lake George.

Taggett, Leslie and Boylen, Charles. 1989. Aquatic Plant Inventory of the Lake George Region. Rensselaer Fresh Water Institute.

Wilson, Sarah J. and Ricciardi, Anthony. Epiphytic macroinvertebrate communities on Eurasian watermilfoil (Myriophyllum spicatum) and native milfoils Myriophyllum sibericum and Myriophyllum alterniflorum in eastern North America. Can. J. Fish. Aquat. Sci. 66: 18–30. 2009.