NPM | NORTHBROOK POWER MANAGEMENT

October 29, 2019

Office of the Secretary
Federal Energy Regulatory Commission
888 1st Street, NE
Washington, DC 20426

**Re: Little Quinnesec Falls Hydroelectric Project, FERC No. 2536**
**Article 409 - 2019 Exotic Species Monitoring Report**

Dear Secretary:

In accordance with the Commission order approving the monitoring plan for purple loosestrife and Eurasian watermilfoil at the Little Quinnesec Hydroelectric Project, and the *Milfoil Weevil Monitoring and Eurasian Watermilfoil Adaptive Management Plan*, dated April 2010, enclosed is the 2019 biannual report titled *Monitoring the Little Quinnesec Falls Hydroelectric Project for Eurasian Water-milfoil, Purple Loosestrife, and Non-native Common Reed*. Agency correspondence is also enclosed herewith.

In 2019, Eurasian water-milfoil remained under control; the number of plants and the surface coverage relative to the size of the impoundment is very small. No other exotic plants, including purple loosestrife and non-native Common Reed, were observed in the project area.

Very truly yours,

Chuck Ahlrichs
President

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## Chuck Ahlrichs

**Subject:** FW: Review Requested by Oct 10th FW: 2019 Exotic Species Monitoring

**From:** Laatsch, Cheryl - DNR <Cheryl.Laatsch@wisconsin.gov>
**Sent:** Thursday, October 24, 2019 8:54 AM
**To:** Dean Premo <dean.premo@white-water-associates.com>; Chuck Ahlrichs <cahlrichs@nbenergy.com>
**Cc:** Mushel, Joelle A - DNR <Joelle.Mushel@wisconsin.gov>
**Subject:** FW: Review Requested by Oct 10th FW: 2019 Exotic Species Monitoring

See below. No need for a call. Dean, you can followup with Andy or Amanda if needed.

Cheryl Laatsch
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Wisconsin Dept of Natural Resources
N7725 Hwy 28
Horicon WI 53032
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Cheryl.laatsch@wisconsin.gov

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**From:** Hudak, Andrew J - DNR <Andrew.Hudak@wisconsin.gov>
**Sent:** Thursday, October 24, 2019 10:26 AM
**To:** Laatsch, Cheryl - DNR <Cheryl.Laatsch@wisconsin.gov>
**Cc:** Smith, Amanda S - DNR <Amanda.Smith@wisconsin.gov>; Fedak, Rebecca L - DNR <rebecca.fedak@wisconsin.gov>
**Subject:** RE: Review Requested by Oct 10th FW: 2019 Exotic Species Monitoring

Cheryl-

As we discussed earlier, here is a follow-up to Amanda's and Dean's comment so that you can finalize the agency's comments.

The Department agrees that aggressive management of small populations of EWM within healthy diverse stands of native vegetation should not be a priority at this time. DASH is a newer control method that has shown promising results for small pioneering populations and in areas where conditions are sensitive or traditional hand pulling or chemical treatments would not be effective. If in the future, control of EWM within the Little Q project would be proposed, we would recommend DASH to be considered for a control option.

It is good to hear that European Frog bit is on the radar and has been included informally during the AIS surveys. The WDNR would like to continue to advocate that while AIS surveys occur, an emphasis is placed on early detection of species not currently present within Little Q. and at which time an AIS species that is not specifically listed in the AIS licensed plan would be observed, the licensee would notify the Department within 5 business days.

Andrew Hudak
Phone: (920) 662-5117
Andrew.hudak@wisconsin.gov

## Chuck Ahlrichs

**From:** Dean Premo <dean.premo@white-water-associates.com>
**Sent:** Monday, October 21, 2019 8:59 AM
**To:** 'Laatsch, Cheryl - DNR'
**Cc:** Chuck Ahlrichs
**Subject:** RE: Review Requested by Oct 10th FW: 2019 Exotic Species Monitoring

Hi Cheryl,

Chuck asked me to respond to your email and Amanda Smith's comments on AIS monitoring at Little Quinnesec Falls Project. If you think it would be helpful to have a conference call, we would be happy to make ourselves available. In the mean time, I'll summarize our thinking on the topics addressed by Amanda.

We share Amanada's concern regarding European Frogbit. It is certainly on our radar. We look for it and other possible invaders as we conduct our scheduled surveys at the Little Quinnesec Falls Project.

With regard to use of DASH as a tool in addressing Eurasian watermilfoil at LQF, it is worth reiterating that in the 2019 survey we found only 4 sites with EWM and a total count of 14 individual EWM plants in the 349 acre project area. The areas where the few individual EWM are found in the LQF impoundment don't lend themselves to use of DASH because of the shallow water depth (too shallow for SCUBA or snorkeling to effectively occur) and the enormous amount of high quality native aquatic vegetation among which the individual stems of EWM exist. More generally, there has been, and continues to be, such a low level EWM population in the LQF impoundment that there really is no reason for management. Despite numerous upstream sources of EWM, the LQF impoundment has been resistant to EWM population growth. The individual plants that do exist here and there come and go from one survey to the next. We credit much of this condition to the robust community of native plant species.

Dean

Dean Premo, Ph.D., President
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**From:** Laatsch, Cheryl - DNR [mailto:Cheryl.Laatsch@wisconsin.gov]
**Sent:** Friday, October 18, 2019 3:12 PM
**To:** Chuck Ahlrichs; Dean Premo
**Subject:** FW: Review Requested by Oct 10th FW: 2019 Exotic Species Monitoring

Hi guys – Please see Amanda's comments below. Can we set up a conf call to work with Amanda and discuss her request?

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Cheryl Laatsch
Statewide FERC Coordinator
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**From:** Smith, Amanda S - DNR <Amanda.Smith@wisconsin.gov>
**Sent:** Thursday, October 03, 2019 11:09 AM
**To:** Laatsch, Cheryl - DNR <Cheryl.Laatsch@wisconsin.gov>; Hudak, Andrew J - DNR <Andrew.Hudak@wisconsin.gov>
**Subject:** RE: Review Requested by Oct 10th FW: 2019 Exotic Species Monitoring

Hi Cheryl,

Here are my comments:

-Because of the few and scattered nature of the Eurasian watermilfoil, I would strongly suggest that diver assisted suction harvest (DASH) be utilized as a targeted control tool.

-Based on the location of this project area, I strongly recommend that staff keep an extra close look out for the aquatic plant species called European Frogbit. It's been approaching the Midwest over the past couple of years and more recently it's been found in the Eastern U.P. thus the WI/MI border could likely be its port of entry into the state.

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Amanda Smith
Phone: 920-662-5110
Amanda.Smith@wisconsin.gov

## Chuck Ahlrichs

**From:** Gulotty, Elle (DNR) <GulottyE@michigan.gov>
**Sent:** Tuesday, October 1, 2019 1:02 PM
**To:** Chuck Ahlrichs; Nick Utrup; Laatsch, Cheryl (Cheryl.Laatsch@Wisconsin.gov)
**Cc:** Chris Sinclair; Dean Premo
**Subject:** RE: 2019 Exotic Species Monitoring

Hi Chuck,

Thank you for the report. After initial review, I do not have any questions about the report at this time. Any further comments or follow-up about the 2019 report will be provided by October 28th.

Elle

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**From:** Chuck Ahlrichs <cahlrichs@nbenergy.com>
**Sent:** Thursday, September 26, 2019 4:58 PM
**To:** Nick Utrup <Nick_Utrup@fws.gov>; Laatsch, Cheryl (Cheryl.Laatsch@Wisconsin.gov) <Cheryl.Laatsch@Wisconsin.gov>; Gulotty, Elle (DNR) <GulottyE@michigan.gov>
**Cc:** Chris Sinclair <csinclair@nbenergy.com>; Dean Premo <dean.premo@white-water-associates.com>
**Subject:** 2019 Exotic Species Monitoring

Nick, Cheryl, Elle- Please see the attached 2019 bi-annual exotic species monitoring report for the Little Quinnesec Falls hydro facility.

Kindly provide any comments to the report by October 28, 2019.

Thank you,

**Chuck Ahlrichs**
President

NPM

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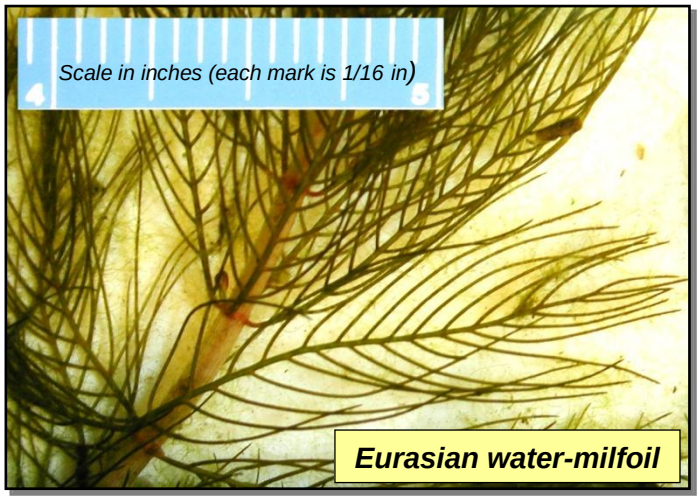
**PROJECT REPORT**

# Monitoring the Little Quinnesec Falls Hydroelectric Project for Eurasian Water-milfoil, Purple Loosestrife, and non-native Common Reed

## FERC Hydro Project No. 2536, Little Quinnesec Falls

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September 2019

**PROJECT REPORT**

# Monitoring the Little Quinnesec Falls Hydroelectric Project for Eurasian Water-milfoil Purple Loosestrife, and non-native Common Reed

**FERC Hydro Project No. 2536, Little Quinnesec Falls**


| | |
|---|---|
| Fieldwork: | Angie Stine, B.S., Field Biologist<br>Tom Plummer, Field Technician<br>Dean Premo, Ph.D., Senior Ecologist |
| Data Analysis And Report | Dean Premo, Ph.D., Senior Ecologist<br>Angie Stine, B.S., Field Biologist |


Cite as: Stine, Angie and Dean Premo. 2019. Monitoring the Little Quinnesec Falls Hydroelectric Project for Eurasian Water-milfoil, Purple Loosestrife, and non-native Common Reed (FERC Hydro Project No. 2536, Little Quinnesec Falls). Report to Northbrook Energy, LLC by White Water Associates, Inc.

WHITE WATER ASSOCIATES, INC.

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## SUMMARY

Monitoring for Eurasian water-milfoil (*Myriophyllum spicatum*), purple loosestrife (*Lythrum salicaria*), and non-native common reed (*Phragmites australis australis*) was conducted on the Little Quinnesec Falls Project (FERC Hydro Project No. 2536) in 2019 as required by Article 409 of the FERC order issuing a project license. Monitoring for Eurasian water-milfoil and purple loosestrife has occurred at this project since 1998 (annually through 2011 and biennially thereafter). Both plants have been reported in the Menominee River basin since 1990, although none in the project area before 2002. Monitoring for common reed has occurred since 2013. Scientists from White Water Associates (an independent consulting firm) conducted fieldwork from a boat and on foot on August 21 and September 5, 2019.

The project area has a robust diversity of native aquatic plants including native water-milfoils. In 2019, we found small numbers of Eurasian water-milfoil at four sites. One of these sites was a new location and the others had historic records of Eurasian water-milfoil.

Over the years of monitoring at the Little Quinnesec Falls Project we have noted that small sub-populations of Eurasian water-milfoil come and go. This variability is again reflected in the 2019 survey results. The reasons for this are unknown, but may indicate the difficulty of Eurasian water-milfoil invading a thriving native plant community and the natural presence of native water-milfoil weevil (*Euhrychiopsis lecontei*) in the project area.

The impoundment water level was very low during the 2019 survey making navigation into some areas difficult or impossible. In spite of this condition, we were able to navigate into most bays and shallow spots where Eurasian water-milfoil had been found in the past. In 2019, we documented only 14 individual Eurasian water-milfoil plants.

The removal of a single purple loosestrife plant in 2010 was apparently successful because no purple loosestrife plants were observed in the project area in 2011, 2013, 2015, 2017, and 2019.

No *Phragmites spp*. (native or non-native) were observed in 2019. *Phragmites spp*. has not been documented in the project area over many years of monitoring.

## INTRODUCTION AND BACKGROUND

In 2019, monitoring for Eurasian water-milfoil (*Myriophyllum spicatum*), purple loosestrife (*Lythrum salicaria*), and non-native common reed (*Phragmites australis australis*) was conducted on the Little Quinnesec Falls Project (FERC Hydro Project No. 2536) as required by Article 409 of the FERC order issuing a project license. Monitoring for these Eurasian water-milfoil and purple loosestrife (both non-native species) has occurred at this project since 1998 (annually through 2011 and biennially thereafter). Monitoring for non-native common reed has occurred biennially since 2013. There have been reports of both Eurasian water-milfoil and purple loosestrife within the Menominee River basin since 1990, although none from the project area prior to 2002. Eurasian water-milfoil has been reported since 1995 from the Twin Falls Flowage about ten miles upstream of the project area.

No Eurasian water-milfoil, purple loosestrife, or common reed were reported from the Little Quinnesec Falls project during surveys conducted for the license application process (1990) and these species were not reported in the project area during monitoring in 1998, 1999, 2000, or 2001. Eurasian water-milfoil was first documented in 2002 by observation of a few plants at two locations. In 2002, several specimens of Eurasian water-milfoil and both native water-milfoil species (*M. sibiricum* and *M. heterophyllum*) were collected from the project area and sent to experts Drs. Donald Les and Michael Moody of the University of Connecticut for further identification by genetic analysis. Their analysis of these specimens indicated that no hybrids were present, only the pure forms of each of the three species. Most locations where Eurasian water-milfoil has been found since 2002 have been small areas containing small numbers of individual plants mixed within a diverse community of native aquatic plants. Since 2006, a couple of relatively small areas hosted larger numbers of Eurasian water-milfoil (one to two hundred individual plants). “Beds” or “colonies” where Eurasian water-milfoil is the dominant plant were not observed in the project area through 2008. In 2009, we reported two areas where Eurasian water-milfoil numbers were such that they could legitimately be referred to as “beds.” In 2010, only one of these two beds continued to thrive. In 2011, not only were no beds of Eurasian water-milfoil present, but only 5 plants were found in the project area. In 2013, approximately 45 Eurasian water-milfoil plants were observed in the project area, with the majority of them seen in one area. Similarly, in 2015, approximately 50 plants were observed, with the majority of them seen in the same

area as in 2013. In 2017, about 70 plants were observed. Some locations with Eurasian water-milfoil in 2017 were historic locations, while a few new sites were recorded. In 2019 there was one new site with seven Eurasian water-milfoil plants and three other historic sites with a total of seven Eurasian water-milfoil plants.

Purple loosestrife was first found in 1998 growing along the Wisconsin shoreline of the river below the Little Quinnesec Dam (about 100 feet below the public access site). This area is within the one-quarter mile of the project survey area. Each year, White Water Associates staff removed these plants by hand pulling, but they persisted until 2005 when they were absent. In 2005 a single non-flowering plant and two flowering plants were found near the first private property residence about 30 feet downstream of the original patch. White Water staff pulled these plants in 2005 and they were absent in 2006. In 2007, six flowering purple loosestrife plants were observed along the Wisconsin shoreline downstream of the rafter's boat launch. These were removed by NewPage staff. Downstream from this area, and outside the project survey area, there were numerous flowering purple loosestrife plants in 2007. The City of Niagara was contacted by NewPage and agreed to dispose of these plants; however, the plants remained in 2008, 2009, 2010, and 2011. In 2010, a single purple loosestrife plant was found in the project area a few hundred feet east of the Highway 141 Bridge located on the Michigan (north) shoreline. It was removed by hand. In 2013, approximately 15 purple loosestrife plants were observed along the banks of the river below the dam. This population increased significantly by 2015 with approximately 40 purple loosestrife plants observed.

The Wisconsin Department of Natural Resources (WDNR) conducted an aquatic invasive species rapid assessment on the Little Quinnesec Falls project area on August 4, 2015. During this survey, Eurasian water-milfoil, narrow-leaf cattail (*Typha angustifolia*), aquatic forget-me-not (*Myosotis scorpioides*), and rusty crayfish (*Orconectes rusticus*) were observed in isolated occurrences (Nault, 2015). These locations were documented and are available via the WDNR's website.

This document reports 2019 monitoring results and presents information and discussion in five sections: (1) Summary, (2) Introduction and Background, (3) Methods, (4) Findings, and (5) Conclusions. Appendix A contains a figure and two tables.

## METHODS

Fieldwork for the 2019 monitoring was completed on August 21 and September 5, 2019. On August 21, Angie Stine and Tom Plummer of White Water Associates conducted the work on the reservoir and the river downstream of the dam. An 18-foot boat and 50 HP engine was used to survey the impoundment and numerous backwaters between the Little Quinnesec Falls Dam and Big Quinnesec Falls Dam on the Menominee River. Most of the backwater wetlands are shallow and densely vegetated with a diversity of aquatic plants. This, combined with low water encountered in 2019, made motor use difficult in these areas. Water clarity conditions were ideal for the 2019 survey. Because of the low water levels, Angie Stine and Dean Premo returned on September 5 with a canoe to survey some of the bays that were not navigable by the larger boat.

Field staff visually surveyed for Eurasian water-milfoil in aquatic plant beds and collected samples by hand and with a plant collecting rake. They closely examined the leaves of suspect plants, counting leaflets (average number of leaflets is the main morphological trait used to separate the native northern water-milfoil (*Myriophyllum sibiricum*) from Eurasian water-milfoil, although there is considerable variability within each species). Generally, the average number of leaflets for native, northern water-milfoil is 5-12 with a reported maximum of 13. The average number for invasive, Eurasian water-milfoil is 14-17 with a maximum of 20 (Czarapata, 2005). Also useful later in the season is the presence of winter buds (turions) on northern water-milfoil, structures not found on Eurasian water-milfoil.

Purple loosestrife, when flowering, is easily identified. Peak blossoming extends from late July through August in northern Michigan. Purple loosestrife is classified as *restricted* by the WDNR (Czarapata, 2005). *Phragmites spp*. is also easily detected visually during late summer surveys. Wetlands and backwaters connected to the project area reservoir were visually inspected for these wetland plants. Binoculars were used to scan the shore of less accessible backwaters. The project area downstream of the Little Quinnesec Falls dam was surveyed on foot.

## FINDINGS

This report section presents the findings from the 2019 survey and integrates select information from past surveys to provide insight into population dynamics of Eurasian water-milfoil and purple loosestrife in the Little Quinnesec Falls project area.

### Eurasian water-milfoil

The project area continues to have a robust diversity and dominance of native aquatic plants. Native water-milfoils in the flowage include *Myriophyllum heterophyllum* and *M. sibiricum*. *Vallisneria americana* and *Potamogeton richardsonii* continue to be some of the most abundant species throughout the flowage. Other species comprising the aquatic plant community include *Elodea canadensis, Elodea nuttallii, Potamogeton spirillus, P. epihydrus, P. diversifolius, P. zosteriformis, P. robbinsii, Heteranthera dubia, Ceratophyllum demersum, Ranunculus longirostris, Utricularia vulgaris,* and *Bidens beckii*.

The aerial photo shown in Figure 1 shows all sites where Eurasian water-milfoil has been detected in the Little Quinnesec Falls project area since 2002. Table 1 displays additional information about these areas, including the coordinates, estimated number of plants observed, and an estimate of plant's surface area. Table 2 summarizes the data over all monitoring years (2002 to present).

Over the years of monitoring at the Little Quinnesec Falls project area, the plants identified as Eurasian water-milfoil exhibit considerable morphological variation. The numbers of leaflets are sometimes intermediate between the northern water-milfoil and the Eurasian water-milfoil.

Considering the Little Quinnesec Falls population of Eurasian water-milfoil from an historical perspective, we have seen some sub-populations increase, some stay the same and some decrease or disappear. The sub-populations observed in 2010 at twenty-four sites disappeared in 2011. Four of these sites had reoccurring populations in 2013. Two new sites were also marked in 2013. Two new sites were observed in 2015. Three new sites were recorded in 2017, while many historic sites recorded no Eurasian water-milfoil observations.

In 2019 only one new site was documented with Eurasian water-milfoil (site AS with seven individual plants) and three historic sites had low numbers of Eurasian water-milfoil (sites R and V had one plant each. Site AQ had five plants.

Over the years of monitoring at the Little Quinnesec Falls Project, we have noted that small sub-populations of Eurasian water-milfoil come and go and (sometimes) come back again. This phenomenon is documented in Table 1. The reasons for this rather tenuous hold of these small sub-populations of Eurasian water-milfoil are unknown, but may indicate the relative difficulty of Eurasian water-milfoil invading a thriving native plant community. The water-milfoil weevil may also play a role in biological control in the project area.

The actual surface area coverage of Eurasian water-milfoil relative to the size of the impoundment is very small (see Table 2 for summary). We used 349 acres as the size of the project area when calculating percentages. Clearly not all of the impoundment is suitable to Eurasian water-milfoil because of depth or water current. Using aerial photo interpretation and in-the-field ground-truthing, we roughly estimate that between 100 and 150 acres of the project area might be suitable Eurasian water-milfoil habitat (primarily consisting of shoreline areas and quiet backwaters). Even if this more conservative estimate of habitat is used the relative amount of coverage of existing Eurasian water-milfoil is miniscule. The sites where Eurasian water-milfoil has been found in the Little Quinnesec Falls project have been fairly shallow backwaters and areas with little current. In all cases, the species is part of a diverse and healthy community of native aquatic plants.

## Purple Loosestrife

In past years, no purple loosestrife was found within the portion of the project area, lying between the Little Quinnesec Dam and the Big Quinnesec Dam. In 2010, however, a single plant was located on an island along the north shore and about 150 yards downstream of the US 141 Bridge (latitude: 45.7934; longitude: -088.0458; see Figure 1). White Water staff carefully bagged the flower head and dug this plant up being careful to extract the entire root mass. The plant was bagged and disposed of in a sanitary landfill. In 2011, 2013, 2015, 2017, and 2019 despite careful inspection, no purple loosestrife were found at this site, indicating a successful removal. No purple loosestrife was documented along the Wisconsin shoreline of the river downstream of the Little Quinnesec Dam.

## Common Reed

No *Phragmites spp*. (native or non-native) were documented in 2019. No common reed has been documented in past years within the Little Quinnesec Falls project area.

## CONCLUSIONS

Eurasian water-milfoil is known for spreading rapidly, usurping space, and dominating the aquatic plant community. Over the years at the Little Quinnesec Falls Project area, the Eurasian water-milfoil has been quite limited in occurrence and numbers. It may be that the robust populations of native plants and the presence of water-milfoil weevil help keep this invasive species in check. Only 14 Eurasian water-milfoil plants were observed in 2019, down from 70 in 2017. This lends support to the contention that the native vegetation, and possibly the water-milfoil weevil, in Little Quinnesec Falls project area keep the Eurasian water-milfoil population under control.

In 2006, we attempted to hand-pull individual Eurasian water-milfoil plants, but found this to be difficult in this setting. First, there is uncertainty about getting the underground portion of the plant and a danger of fragmenting the upper portions and setting some adrift to possibly colonize other areas. The process of wading or swimming and pulling the plants muddies the water making for difficult visibility. We also tried using a rake to pull the plants but the same difficulties exist as with the hand pulling. If the Eurasian water-milfoil plants are pulled early in their growing season, there is a better chance that the plants will not fragment. Nonetheless, the tannic (stained) water makes it difficult to see which plants to pull. The attempt at herbicide control of Eurasian water-milfoil at three project area sites showed little or no effect in 2007. In 2008, increased chemical dosage at these same sites appears to have been effective in reducing Eurasian water-milfoil in the 2008 season, but the plant made a strong comeback at two of these sites in 2009. In 2010, the population of Eurasian water-milfoil at one of these two sites (Site D) was greatly reduced. The reason for this decline is unknown. As documented in a separate 2010 report, the water-milfoil weevil was found to be present in the large sub-population of Eurasian water-milfoil at site K. The population of Eurasian water-milfoil at site K was absent in 2011, presumably influenced by water-milfoil weevil herbivory. Since then, small numbers of Eurasian water-milfoil plants have been present at this site.

The single purple loosestrife plant documented in the project area upstream of the Little Quinnesec Falls dam in 2010 was removed in 2010 and remained absent since. No *Phragmites spp*. (native or non-native) were observed in 2019. *Phragmites spp*. has not been documented in the project area over many years of monitoring.

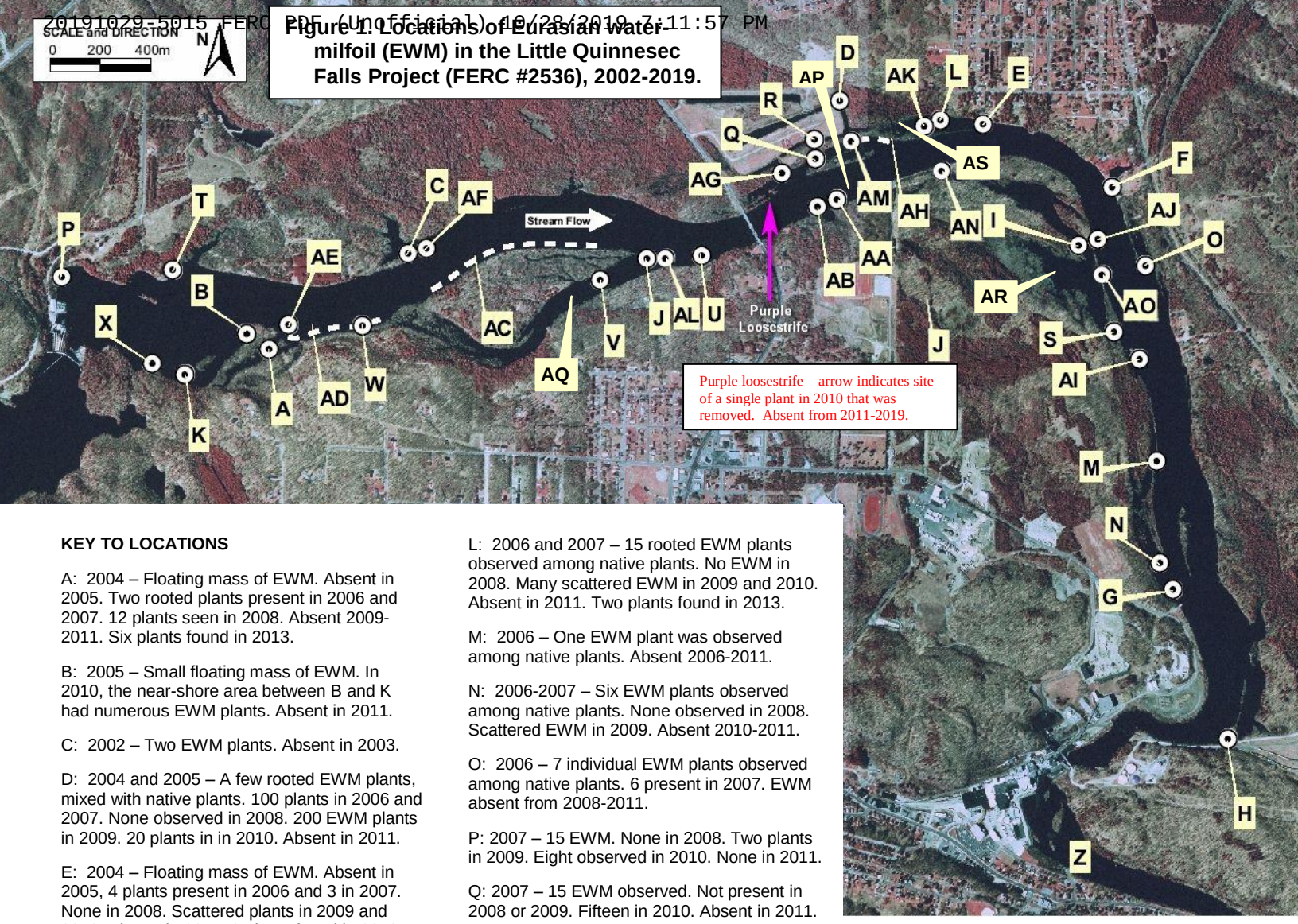
Given the small population of Eurasian water-milfoil and absence of purple loosestrife and common reed within the project area, the biennial monitoring for these non-native species is adequate to detect these non-native species in ample time to implement any warranted management actions.

## LITERATURE CITED

Czarapata, Elizabeth. 2005. *Invasive Plants of the Upper Midwest: an illustrated guide to their identification and control*. University of Wisconsin Press. Pg. 65-68. Retrieved 2015. <http://dnr.wi.gov/topic/Invasives/fact/PurpleLoosestrife.html>

Nault, Michelle. 2015. *Little Quinnesec Falls area.* Email communication.

**Figure 1. Locations of Eurasian water-milfoil (EWM) in the Little Quinnesec Falls Project (FERC #2536), 2002-2019.**




**KEY TO LOCATIONS**

A: 2004 – Floating mass of EWM. Absent in 2005. Two rooted plants present in 2006 and 2007. 12 plants seen in 2008. Absent 2009-2011. Six plants found in 2013.

B: 2005 – Small floating mass of EWM. In 2010, the near-shore area between B and K had numerous EWM plants. Absent in 2011.

C: 2002 – Two EWM plants. Absent in 2003.

D: 2004 and 2005 – A few rooted EWM plants, mixed with native plants. 100 plants in 2006 and 2007. None observed in 2008. 200 EWM plants in 2009. 20 plants in in 2010. Absent in 2011.

E: 2004 – Floating mass of EWM. Absent in 2005, 4 plants present in 2006 and 3 in 2007. None in 2008. Scattered plants in 2009 and 2010. Absent in 2011. 3 plants found in 2013. Ten plants found in 2015.

F: 2004 – Floating mass of EWM. Absent in 2005, but 2 rooted plants present in 2006 and 2007. None observed in 2008-2011.

G: 2004 – Floating mass of EWM. Absent 2005-2008. Scattered plants at bay mouth in 2009. None in 2010 or 2011.

H: 2004 – Floating mass of EWM. EWM absent in 2005 and 2006. EWM present in 2007, but not 2008. Several plants in 2009 and 2010. Absent in 2011.

I: 2002 – This was the original location for EWM in the LQF Project. A few rooted plants were scattered native plants. No change in coverage observed from 2002 to 2005. All EWM absent in 2006. In 2008, 9 plants present. In 2009, 18 EWM were observed. None were observed in 2010 and 2011.

J: 2006 – Floating un-rooted EWM mass in an area of diverse native plants. Three un-rooted plants present in 2007. None observed in 2008. A few plants in 2009 and 2010.

K: 2006 – 3 rooted EWM plants were observed among yellow water lilies. Increased to 100 in 2007 and 200 in 2008. In 2009 and 2010, more numerous plants form a bed. Absent in 2011. 20 EWM plants found among native plants in 2013. 25 EWM plants found among native plants in 2015.

L: 2006 and 2007 – 15 rooted EWM plants observed among native plants. No EWM in 2008. Many scattered EWM in 2009 and 2010. Absent in 2011. Two plants found in 2013.

M: 2006 – One EWM plant was observed among native plants. Absent 2006-2011.

N: 2006-2007 – Six EWM plants observed among native plants. None observed in 2008. Scattered EWM in 2009. Absent 2010-2011.

O: 2006 – 7 individual EWM plants observed among native plants. 6 present in 2007. EWM absent from 2008-2011.

P: 2007 – 15 EWM. None in 2008. Two plants in 2009. Eight observed in 2010. None in 2011.

Q: 2007 – 15 EWM observed. Not present in 2008 or 2009. Fifteen in 2010. Absent in 2011.

R: 2007 – Two EWM. None in 2008. Two in 2009 and eight in 2010. Absent in 2011**. 2019- 1 plant.**

S: 2007 – Six EWM among native plants. Not observed in 2008 or 2009. Eight observed in 2010. Absent in 2011.

T: 2008 – Six EWM observed at river's edge. Same in 2009. No EWM seen in 2010 or 2011.

U: 2009-2010 – 20 EWM scattered along shore with native vegetation. Absent in 2011.

V: 2009-2010 – 15 EWM scattered among native vegetation. Five present in 2011. **One plant present in 2019.**

W: 2009 – One EWM plant in native plants. In 2010, 8 EWM were observed. Absent in 2011.

X: 2009 – Five scattered EWM in native plants. 10 observed in 2010. Absent in 2011.

Z: 2008-2011 – No EWM observed.

AA: 2010 – A single EWM among native plants. Absent in 2011.

AB: 2010 – A single EWM among native plants. Absent in 2011

AC: 2010 – Five EWM among native plants. Absent in 2011.

AD: 2010 – About 50 EWM among native aquatic plants. Absent in 2011.

AF: 2010 – Observed three EWM plants among native plants. Absent in 2011.

AG: 2010 – Observed fifteen EWM among native plants. Absent in 2011.

AH: 2010 – Nine EWM plants among native plants. Absent in 2011.

AI: 2010 – One EWM among native plants. Absent in 2011.

AJ: 2010 – Observed six EWM among native plants. Absent in 2011.

AK: 2010 – A single EWM among native plants. Absent in 2011.

AL: 2013 – 10 plants found among native plants. Six plants observed in 2015.

AM: 2013 – 3 plants found among native plants.

AN: 2015 – 3 observed among native plants.

AO: 2015 – 5 plants found

AP: 2017 – 13 plants found among native plants.

AQ: 2017 – 5 plants found among native plants. **2019- 5 plants.**

AR: 2017 – 38 plants found among native plants. Non-navigable in 2019.

AS: **First observed in 2019 – 7 plants**.

**Table 1. History of Eurasian water-milfoil (*Myriophyllum spicatum* L.) in the Little Quinnesec Falls Project (FERC #2536)[*].**

| Site Code | Year | Lat. & Long. Coordinates | Present (Y/N) | Rooted (Y/N) | Number of Plants | Surface Area (sq. ft.) | Surface Area (acres) | % Project boundary acres (349 acres) | Weevil evidence (Y/N)[1] | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| A | 2004 | 45.78759 -88.03029 | Y | N | 1 | 2 | 0.00005 | 0.000013 | | Floating un-rooted mass (ca. 4 square feet) of *M. spicatum* at entrance to small bay. |
| A | 2006 | | Y | Y | 2 | 4 | 0.00009 | 0.000026 | N | After absence in 2005, two rooted *M. spicatum* in 2006. |
| A | 2007 | | Y | Y | 2 | 4 | 0.00009 | 0.000026 | N | Two rooted *M. spicatum* plants among abundant native milfoil and bladderwort. |
| A | 2008 | | Y | Y | 12 | 24 | 0.00055 | 0.000158 | N | Twelve rooted *M. spicatum* plants among abundant native milfoil and bladderwort. |
| A | 2009 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| A | 2010 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| A | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| A | 2013 | | Y | Y | 6 | 12 | 0.00028 | 0.000079 | N | Six rooted plants found scattered among native vegetation. |
| B | 2005 | 45.78848 -88.03040 | Y | N | 1 | 2 | 0.00005 | 0.000013 | | Small un-rooted mass (ca. 2 square feet) of *M. spicatum* floating downstream. |
| B | 2010 | | Y | Y | 40 | 80 | 0.00184 | 0.000526 | | The shoreline from B southwest to K has these scattered *M. spicatum* among natives. |
| B | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| C | 2002 | 45.79125 -88.02352 | Y | Y | 2 | 4 | 0.00009 | 0.000026 | | Two rooted plants present in 2002, but absent in subsequent years. |
| D | 2004 | 45.79701 -88.00139 | Y | Y | 6 | 12 | 0.00028 | 0.000079 | | A few rooted plants of *M. spicatum*, mixed with a variety of native aquatic plants. |
| D | 2005 | | Y | Y | 10 | 20 | 0.00046 | 0.000132 | | A few rooted plants of *M. spicatum*, mixed with a variety of native aquatic plants. |
| D | 2006 | | Y | Y | 100 | 200 | 0.00459 | 0.001315 | N | Rooted plants have increased in number to ca. 100 rooted plants approximately 150 feet in either direction from the GPS point. |
| D | 2007 | | Y | Y | 100 | 200 | 0.00459 | 0.001315 | N | Rooted plants at about the same number and dispersion as in 2006. |

**Table 1. History of Eurasian water-milfoil (*Myriophyllum spicatum* L.) in the Little Quinnesec Falls Project (FERC #2536)[*].**

| Site Code | Year | Lat. & Long. Coordinates | Present (Y/N) | Rooted (Y/N) | Number of Plants | Surface Area (sq. ft.) | Surface Area (acres) | % Project boundary acres (349 acres) | Weevil evidence (Y/N)[1] | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| D | 2008 | 45.79701 -88.00139 | N | | | | | | | Chemically treated area with no *M. spicatum* and few other macrophytes observed. |
| D | 2009 | | Y | Y | 200 | 400 | 0.00918 | 0.002630 | N | A dense bed of *M. spicatum* observed in 2009 with few other macrophytes. |
| D | 2010 | | Y | Y | 20 | 40 | 0.00092 | 0.000263 | | Many fewer plants and in poorer condition than in 2009. Other native plants present. |
| D | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| E | 2004 | 45.7963 -87.99399 | Y | N | 1 | 2 | 0.00005 | 0.000013 | | Floating un-rooted mass (ca. 2 square feet) of *M. spicatum* found along river's edge. |
| E | 2006 | | Y | Y | 4 | 8 | 0.00018 | 0.000053 | N | After an absence in 2005, 4 rooted plants were present in 2006. There are downslopes from several houses on the bank and docks that accommodate boats and pontoon boats. |
| E | 2007 | | Y | Y | 3 | 6 | 0.00014 | 0.000039 | | Three rooted plants observed in 2007 in conditions similar to 2006. |
| E | 2008 | | N | | | | | | | None were present in the 2008 survey. Few aquatic macrophytes present; significant filamentous algae present. |
| E | 2009 | | Y | Y | 25 | 50 | 0.00115 | 0.000329 | N | *M. spicatum* scattered through the area. |
| E | 2010 | | Y | Y | 15 | 30 | 0.00069 | 0.000197 | | *M. spicatum* scattered through the area. |
| E | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum.* |
| E | 2013 | | Y | Y | 3 | 6 | 0.00014 | 0.00039 | N | Three *M. spicatum* among native milfoil. |
| E | 2015 | | Y | Y | 10 | 30 | 0.00069 | 0.000197 | N | 10 *M. spicatum* among native milfoil. |
| F | 2004 | 45.7921 -87.98744 | Y | N | 1 | 2 | 0.00005 | 0.000013 | | Floating un-rooted mass (ca. 2 square feet) of *M. spicatum* found along river's edge right at the mouth of Fumee Creek. |
| F | 2006 | | Y | Y | 2 | 4 | 0.00009 | 0.000026 | N | Two rooted *M. spicatum* found along river's edge right at the mouth of Fumee Creek. |
| F | 2007 | | Y | Y | 2 | 4 | 0.00009 | 0.000026 | N | Two rooted *M. spicatum* found along river's edge right at the mouth of Fumee Creek. |

**Table 1. History of Eurasian water-milfoil (*Myriophyllum spicatum* L.) in the Little Quinnesec Falls Project (FERC #2536)[*].**

| Site Code | Year | Lat. & Long. Coordinates | Present (Y/N) | Rooted (Y/N) | Number of Plants | Surface Area (sq. ft.) | Surface Area (acres) | % Project boundary acres (349 acres) | Weevil evidence (Y/N)[1] | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| F | 2008 | 45.7921 -87.98744 | N | | | | | | | No *M. spicatum* observed (only native milfoil) |
| F | 2009 | | N | | | | | | | No *M. spicatum* observed (only native milfoil) |
| F | 2010 | | N | | | | | | | |
| F | 2011 | | N | | | | | | | |
| G | 2004 | 45.77982 -87.98366 | Y | N | 1 | 2 | 0.00005 | 0.000013 | | Floating un-rooted mass (ca. 2 square feet) of *M. spicatum* caught along river's edge upstream of fire dock. |
| G | 2009 | | Y | Y | 30 | 60 | 0.00138 | 0.000395 | N | *M. spicatum* distributed around entry of bay. |
| G | 2010 | | N | N | | | | | | No *M. spicatum* noted in area seen in 2009 |
| G | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| G | 2017 | | Y | Y | 3 | 2 | 0.00005 | 0.000013 | | Three plants observed in 2017. |
| H | 2004 | 45.77453 -87.98065 | Y | N | 1 | 2 | 0.00005 | 0.000013 | | Floating un-rooted mass (ca. 2 square feet) caught along river's edge. |
| H | 2007 | | Y | Y | 15 | 30 | 0.00069 | 0.000197 | N | Fifteen rooted *M. spicatum* (each ca. 2 sq. ft.) were observed among a diverse community of native aquatic plants. Eight of these plants were just upstream of the downstream tip of the island on the west side (river side) of the island and seven were just upstream of the downstream tip of the island on east side of the island. |
| H | 2008 | | N | N | | | | | | No *M. spicatum* observed in 2008. |
| H | 2009 | | Y | Y | 6 | 12 | 0.00028 | 0.000079 | N | *M. spicatum* among native aquatic plants. |
| H | 2010 | | Y | Y | 8 | 16 | 0.00037 | 0.000105 | | *M. spicatum* among native aquatic plants. |
| H | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| I | 2002 | 45.79204 -87.98893 | Y | Y | 3 | 6 | 0.00014 | 0.000039 | | A few rooted plants scattered within a species-rich community of native aquatic plants. This was original site for *M. spicatum* in the Little Quinnesec Falls Project area. |

**Table 1. History of Eurasian water-milfoil (*Myriophyllum spicatum* L.) in the Little Quinnesec Falls Project (FERC #2536)[*].**

| Site Code | Year | Lat. & Long. Coordinates | Present (Y/N) | Rooted (Y/N) | Number of Plants | Surface Area (sq. ft.) | Surface Area (acres) | % Project boundary acres (349 acres) | Weevil evidence (Y/N)[1] | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| I | 2003 | 45.79204 -87.98893 | Y | Y | 4 | 12 | 0.00028 | 0.000079 | | A few rooted plants scattered within a species-rich community of native plants. |
| I | 2004 | | Y | Y | 4 | 12 | 0.00028 | 0.000079 | | A few rooted plants scattered within a species-rich community of native plants. |
| I | 2005 | | Y | Y | 4 | 12 | 0.00028 | 0.000079 | | A few rooted plants scattered within a species-rich community of native plants. |
| I | 2006 | | N | | | | | | | All *M. spicatum* were absent. |
| I | 2007 | | N | | | | | | | The low water prevented entry into this bay in 2007. We assume no change since 2006. |
| I | 2008 | | Y | Y | 9 | 18 | 0.00041 | 0.000118 | N | Nine plants scattered in channel between long bay and short bay. |
| I | 2009 | | Y | Y | 18 | 36 | 0.00083 | 0.000237 | N | *M. spicatum* scattered in this bay among native aquatic plants. |
| I | 2010 | | N | | | | | | | No *M. spicatum* observed in this area, in fact much less aquatic vegetation than in past. |
| I | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| J | 2006 | 45.79119 -88.01104 | Y | N | 1 | 2 | 0.00005 | 0.000013 | N | Floating un-rooted mass (ca. 2 sq. feet) of *M. spicatum* in area of diverse native plants. |
| J | 2007 | | Y | N | 3 | 6 | 0.00014 | 0.000039 | N | Floating un-rooted plant fragments (ca. 6 sq. feet) of *M. spicatum* in area of diverse native plants. |
| J | 2008 | | N | | | | | | | No *M. spicatum* observed in 2008. |
| J | 2009 | | Y | Y | 5 | 10 | 0.00023 | 0.000066 | N | A few *M. spicatum* among native plants. |
| J | 2010 | | Y | Y | 12 | 24 | 0.00055 | 0.000158 | | Several *M. spicatum* among native plants. |
| J | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| J | 2017 | | Y | Y | 2 | 2 | 0.00005 | 0.000013 | | Two plants pulled from site. |
| K | 2006 | 45.78674 -88.034822 | Y | Y | 3 | 6 | 0.00014 | 0.000039 | N | Three rooted *M. spicatum* (each ca. 2 sq. ft.) observed in a bed of yellow water lilies. |

**Table 1. History of Eurasian water-milfoil (*Myriophyllum spicatum* L.) in the Little Quinnesec Falls Project (FERC #2536)[*].**

| Site Code | Year | Lat. & Long. Coordinates | Present (Y/N) | Rooted (Y/N) | Number of Plants | Surface Area (sq. ft.) | Surface Area (acres) | % Project boundary acres (349 acres) | Weevil evidence (Y/N)[1] | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| K | 2007 | 45.78674 -88.034822 | Y | Y | 100 | 200 | 0.00459 | 0.001315 | N | Rooted plants have increased in number to ca. 100 rooted plants in an area approximately 100x300 feet. These plants are mixed in with *Nuphar, Vallisneria*, and *Potamogeton richardsonii* |
| K | 2008 | | Y | Y | 200 | 400 | 0.00918 | 0.002630 | N | Rooted plants have increased in number to ca. 200 rooted plants in an area approximately 100x300 feet. These plants are mixed in with *Nuphar, Vallisneria*, and *Potamogeton richardsonii* |
| K | 2009 | | Y | Y | ~400 | ~800 | 0.01836 | 0.005261 | N | Similar area as in 2008, but denser and excluding other plants. It is accurate to characterize this as a bed. Difficult to estimate number of plants |
| K | 2010 | | Y | Y | ~400 | ~800 | 0.01836 | 0.005261 | Y | Similar area as in 2009. Weevil survey here showed all life stages present and plant damage occurring. |
| K | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| K | 2013 | | Y | Y | 20 | 40 | 0.00092 | 0.000264 | Y | Approximately 20 *M. spicatum* observed scattered throughout native vegetation. |
| K | 2015 | | Y | Y | 25 | 60 | 0.00137 | 0.000393 | N | Approximately 25 *M. spicatum* observed scattered throughout native vegetation. |
| L | 2006 | 45.796423 -87.996198 | Y | Y | 15 | 30 | 0.00069 | 0.000197 | N | Fifteen rooted *M. spicatum* (each ca. 2 sq. ft.) were observed among a diverse community of native aquatic plants. |
| L | 2007 | | Y | Y | 15 | 30 | 0.00069 | 0.000197 | N | Low water in 2007 prevented access into all parts of this bay, so it was estimated that the same number of rooted *M. spicatum* were present as in 2006 (among a diverse community of native aquatic plants). |
| L | 2008 | | N | | | | | | | This area was chemically treated in 2007 and 2008. |
| L | 2009 | | Y | Y | 60 | 120 | 0.00275 | 0.000789 | N | Numerous *M. spicatum* throughout the bay. |

**Table 1. History of Eurasian water-milfoil (*Myriophyllum spicatum* L.) in the Little Quinnesec Falls Project (FERC #2536)[*].**

| Site Code | Year | Lat. & Long. Coordinates | Present (Y/N) | Rooted (Y/N) | Number of Plants | Surface Area (sq. ft.) | Surface Area (acres) | % Project boundary acres (349 acres) | Weevil evidence (Y/N)[1] | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| L | 2010 | 45.796423 -87.996198 | Y | Y | 60 | 120 | 0.00275 | 0.000789 | | Numerous *M. spicatum* throughout the bay among native aquatic plants. |
| L | 2011 | | | | | | | | | Thorough search revealed no *M. spicatum*. |
| L | 2013 | | Y | Y | 2 | 4 | 0.00009 | 0.000026 | N | |
| L | 2017 | | Y | Y | 4 | 4 | 0.00009 | 0.000026 | | Four EWM plants observed in 2017. |
| M | 2006 | 45.78440 -87.984675 | Y | Y | 1 | 2 | 0.00005 | 0.000013 | N | An individual rooted plant of *M. spicatum* (ca. 2 square feet) was observed among native plants at the mouth of a small bay. |
| M | 2007 | | N | | | | | | | No *M. spicatum* were observed from 2007 through 2011. One EWM plant observed in 2017. |
| M | 2008 | | N | | | | | | | |
| M | 2009 | | N | | | | | | | |
| M | 2010 | | N | | | | | | | |
| M | 2011 | | N | | | | | | | |
| M | 2017 | | Y | Y | 1 | 2 | 0.00005 | 0.000013 | | |
| N | 2006 | 45.780751 -87.984406 | Y | Y | 6 | 12 | 0.00028 | 0.000079 | N | Six individual rooted *M. spicatum* (each ca. 2 sq. ft.) observed among a community of native plants at the mouth of a small bay. |
| N | 2007 | | Y | Y | 6 | 12 | 0.00028 | 0.000079 | N | Low water conditions during 2007 prevented access to this shallow bay; we assume conditions to be the same as in 2006. |
| N | 2008 | | N | N | | | | | | Low backwater conditions during 2008 prevented access to this shallow bay. |
| N | 2009 | | Y | Y | 6 | 12 | 0.00028 | 0.000079 | N | *M. spicatum* scattered in small bay. |
| N | 2010 | | N | N | | | | | | No *M. spicatum* observed in 2010 or 2011. |
| N | 2011 | | N | | | | | | | |
| O | 2006 | 45.791406 -87.985502 | Y | Y | 7 | 14 | 0.00032 | 0.000092 | N | Seven individual rooted *M. spicatum* (each ca. 2 sq. ft.) observed among a diverse community of native plants in a bay upstream of Verso park. |

**Table 1. History of Eurasian water-milfoil (*Myriophyllum spicatum* L.) in the Little Quinnesec Falls Project (FERC #2536)[*].**

| Site Code | Year | Lat. & Long. Coordinates | Present (Y/N) | Rooted (Y/N) | Number of Plants | Surface Area (sq. ft.) | Surface Area (acres) | % Project boundary acres (349 acres) | Weevil evidence (Y/N)[1] | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| O | 2007 | 45.791406 -87.985502 | Y | Y | 6 | 12 | 0.00028 | 0.000079 | N | Six individual rooted *M. spicatum* (each ca. 2 sq. ft.) observed among a community of native plants in bay upstream of Verso park. |
| O | 2008 | | N | | | | | | | No *M. spicatum* were observed in 2008. This area was chemically treated. |
| O | 2009 | | N | | | | | | | No *M. spicatum* were observed 2009-2011. Two plants observed in 2017. |
| O | 2010 | | N | | | | | | | |
| O | 2011 | | N | | | | | | | |
| O | 2017 | | Y | Y | 2 | 2 | 0.00005 | 0.000013 | | |
| P | 2007 | 45.790 -88.041 | Y | Y | 15 | 30 | 0.00069 | 0.000197 | N | This was a new find in 2007 in an area just below the Big Quinnesec Dam on the north side of the river in a bay with little or no current. Distributed in an area of 10x20 feet. |
| P | 2008 | | N | N | | | | | | No *M. spicatum* were observed in 2008. |
| P | 2009 | | Y | Y | 2 | 4 | 0.00009 | 0.000026 | | Two *M. spicatum* were observed in 2009. |
| P | 2010 | | Y | Y | 8 | 16 | 0.00037 | 0.000105 | | Eight *M. spicatum* were observed in 2010. |
| P | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| Q | 2007 | 45.7949 -88.0025 | Y | Y | 15 | 30 | 0.00069 | 0.000197 | N | This new area was in the area where old man-made excavations (canals) were made. These plants were scattered throughout the backwater channel just outside of the created channels. |
| Q | 2008 | | N | | | | | | | No *M. spicatum* were observed in 2008 or 2009. |
| Q | 2009 | | N | | | | | | | |
| Q | 2010 | | Y | Y | 15 | 30 | 0.00069 | 0.000197 | | *M. spicatum* among native plants. |
| Q | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| R | 2007 | 45.7956 -88.0026 | Y | Y | 2 | 4 | 0.00009 | 0.000026 | N | Two rooted plants present in 2007 among native plants. |
| R | 2008 | | N | | | | | | | No *M. spicatum* were observed in 2008. |
| R | 2009 | | Y | Y | 2 | 4 | 0.00009 | 0.000026 | | Two *M. spicatum* among native vegetation. |

**Table 1. History of Eurasian water-milfoil (*Myriophyllum spicatum* L.) in the Little Quinnesec Falls Project (FERC #2536)[*].**

| Site Code | Year | Lat. & Long. Coordinates | Present (Y/N) | Rooted (Y/N) | Number of Plants | Surface Area (sq. ft.) | Surface Area (acres) | % Project boundary acres (349 acres) | Weevil evidence (Y/N)[1] | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| R | 2010 | 45.7956 -88.0026 | Y | Y | 8 | 16 | 0.00037 | 0.000105 | | Eight *M. spicatum* among native vegetation. |
| R | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| **R** | **2019** | | **Y** | **Y** | **1** | **2** | **0.00005** | **0.000013** | | **One *M. spicatum* near Site R.** |
| S | 2007 | 45.789 -87.987 | Y | Y | 6 | 12 | 0.00028 | 0.000079 | N | Six rooted *M. spicatum* (each ca. 2 sq. ft.) were observed among a community of native plants in quiet water along the river's edge. |
| S | 2008 | | N | | | | | | | No *M. spicatum* were observed in 2008 or 2009. |
| S | 2009 | | N | | | | | | | |
| S | 2010 | | Y | Y | 8 | 16 | 0.00037 | 0.000105 | | *M. spicatum* seen in 2010 among natives. |
| S | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| T | 2008 | 45.79036 -88.03532 | Y | Y | 6 | 12 | 0.00028 | 0.000079 | N | *M. spicatum* observed among native plants in quiet water along the river's edge in 2008 and 2009. |
| T | 2009 | | Y | Y | 6 | 12 | 0.00028 | 0.000079 | N | |
| T | 2010 | | N | N | | | | | | *M. spicatum* absent in 2010 and 2011. |
| T | 2011 | | N | | | | | | | |
| U | 2009 | 45.79145 -88.00748 | Y | Y | 20 | 40 | 0.00092 | 0.000263 | N | *M. spicatum* were scattered along the shore with native aquatic plants |
| U | 2010 | | Y | Y | 20 | 40 | 0.00092 | 0.000263 | | *M. spicatum* were scattered along the shore with native aquatic plants |
| U | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| V | 2009 | 45.79090 -88.01153 | Y | Y | 15 | 30 | 0.00069 | 0.000197 | N | *M. spicatum* were scattered along the shore with native aquatic plants |
| V | 2010 | | Y | Y | 15 | 30 | 0.00069 | 0.000197 | | *M. spicatum* were scattered among native aquatic plants |
| V | 2011 | | Y | Y | 5 | 10 | 0.00023 | 0.000066 | N | |
| V | 2017 | | Y | Y | 3 | 4 | 0.00009 | 0.000026 | | |
| **V** | **2019** | | **Y** | **Y** | **1** | **2** | **0.00005** | **0.000013** | | **One *M. spicatum.*** |
| W | 2009 | 45.78946 | Y | Y | 1 | 2 | 0.00005 | 0.000013 | N | One *M. spicatum* on edge of current among native plants. |

**Table 1. History of Eurasian water-milfoil (*Myriophyllum spicatum* L.) in the Little Quinnesec Falls Project (FERC #2536)[*].**

| Site Code | Year | Lat. & Long. Coordinates | Present (Y/N) | Rooted (Y/N) | Number of Plants | Surface Area (sq. ft.) | Surface Area (acres) | % Project boundary acres (349 acres) | Weevil evidence (Y/N)[1] | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| W | 2010 | -88.02341 | Y | Y | 8 | 16 | 0.00037 | 0.000105 | | Eight *M. spicatum* on edge of current among native plants. |
| W | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| X | 2009 | 45.78698 -88.04108 | Y | Y | 5 | 10 | 0.00023 | 0.000066 | N | *M. spicatum* plants among native plants. |
| X | 2010 | | Y | Y | 10 | 20 | 0.00046 | 0.000132 | | *M. spicatum* distributed among native plants. |
| X | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| Z | 2008 | The area downstream of LQF Dam | N | | | | | | | *M. spicatum* was not observed in the portion of the project area that is downstream of the Little Quinnesec Falls Dam. |
| Z | 2009 | | N | | | | | | | |
| Z | 2010 | | N | | | | | | | |
| Z | 2011 | | | | | | | | | |
| AA | 2010 | 45.79349 -88.00136 | Y | Y | 1 | 2 | 0.00005 | 0.000013 | | A single *M. spicatum* among native plants. |
| AA | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| AB | 2010 | 45.79320 -88.00238 | Y | Y | 1 | 2 | 0.00005 | 0.000013 | | A single *M. spicatum* among native plants. |
| AB | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| AC | 2010 | 0.5 mile of shore between 45.79160 -88.01309 and 45.78988 -88.02192 | Y | Y | 5 | 10 | 0.00023 | 0.000066 | | Five *M. spicatum* scattered among native aquatic plants. |
| AC | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| AD | 2010 | 0.25 mile of shore between 45.78894 -88.02438 and 45.78807 -88.02931 | Y | Y | 50 | 100 | 0.00230 | 0.000658 | | About fifty *M. spicatum* scattered among native aquatic plants in this stretch of shoreline. It seems as though the bed of *M. spicatum* at Site K may be the source of these plants. Fragments observed along the shore here as well as rooted plants. |
| AD | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| AE | 2010 | 45.78848 -88.02931 | N | N | | | | | | Observed quite a few fragments of *M. spicatum* in the strong current that breaks |

**Table 1. History of Eurasian water-milfoil (*Myriophyllum spicatum* L.) in the Little Quinnesec Falls Project (FERC #2536)[*].**

| Site Code | Year | Lat. & Long. Coordinates | Present (Y/N) | Rooted (Y/N) | Number of Plants | Surface Area (sq. ft.) | Surface Area (acres) | % Project boundary acres (349 acres) | Weevil evidence (Y/N)[1] | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | around this point. Likely source is Site K. |
| AE | 2011 | 45.78848 -88.02931 | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| AF | 2010 | 45.79136 -88.02235 | Y | Y | 3 | 6 | 0.00014 | 0.000039 | | Observed three plants of *M. spicatum* among *M. sibiricum* and other native plants. |
| AF | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| AG | 2010 | 45.79438 -88.00425 | Y | Y | 15 | 30 | 0.00069 | 0.000197 | | Observed fifteen plants of *M. spicatum* among dense *Elodea* and some *M. sibiricum* and other native plants. |
| AG | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| AH | 2010 | 200 yard long shore between 45.79535 -88.00065 and 45.79566 -87.99983 | Y | Y | 9 | 18 | 0.00041 | 0.000118 | | Observed nine plants of *M. spicatum* among native plants. |
| AH | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| AI | 2010 | 45.78804 -8798569 | Y | Y | 1 | 2 | 0.00005 | 0.000013 | | Observed one *M. spicatum* among natives. |
| AI | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| AJ | 2010 | 45.79227 -87.98797 | Y | Y | 6 | 12 | 0.00028 | 0.000079 | | Observed six *M. spicatum* among natives. |
| AJ | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| AK | 2010 | 45.796168 -87.99699 | Y | Y | 1 | 2 | 0.00005 | 0.000013 | | Observed one *M. spicatum* among natives. |
| AK | 2011 | | N | | | | | | | Thorough search revealed no *M. spicatum*. |
| AL | 2013 | 45.79121 -88.01059 | Y | Y | 10 | 20 | 0.00046 | 0.000132 | N | New site in 2013 had 10 *M. spicatum* plants among native milfoil plants. |
| AL | 2015 | | Y | Y | 6 | 12 | 0.00028 | 0.000079 | N | Six *M. spicatum* observed among native milfoils. |
| AM | 2013 | 45.79586 -88.00104 | Y | Y | 3 | 6 | 0.00014 | 0.000039 | N | New site in 2013 had 3 *M. spicatum* plants among native milfoil plants. |

**Table 1. History of Eurasian water-milfoil (*Myriophyllum spicatum* L.) in the Little Quinnesec Falls Project (FERC #2536)*.**

| Site Code | Year | Lat. & Long. Coordinates | Present (Y/N) | Rooted (Y/N) | Number of Plants | Surface Area (sq. ft.) | Surface Area (acres) | % Project boundary acres (349 acres) | Weevil evidence (Y/N)[1] | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| AN | 2015 | 45.79473 -87.99699 | Y | Y | 3 | 6 | 0.00014 | 0.000039 | N | New site in 2015 had 3 *M. spicatum* plants among native milfoil plants. |
| AO | 2015 | 45.79094 -87.98744 | Y | Y | 5 | 10 | 0.00023 | 0.000066 | N | New site in 2015 had 5 *M. spicatum* plants among native milfoil plants. |
| AP | 2017 | 45.79596 -88.00098 | Y | Y | 13 | 20 | 0.00046 | 0.000132 | N | New site in 2017 had 13 plants among native milfoils. |
| AQ | 2017 | 45.79029 -88.01308 | Y | Y | 38 | 80 | 0.00184 | 0.000526 | N | New site in 2017 had 38 plants among native milfoils. |
| **AQ** | **2019** | | **Y** | **Y** | **5** | **80** | **0.00184** | **0.000526** | | **Five *M. spicatum* found among native plants.** |
| AR | 2017 | 45.79316 -87.99061 | Y | Y | 5 | 10 | 0.00023 | 0.000066 | N | New site in 2017 had 5 plants among native milfoils. 2019- non-navigable. |
| **AS** | **2019** | **45.79627 -87.99493** | **Y** | **Y** | **7** | **14** | **0.00032** | **0.000092** | | **New site in 2019 with seven *M. spicatum* among native plants.** |

[1]*Field staff began checking for evidence of weevil herbivory on M. spicatum in 2006. In 2010, field staff did not check generally for weevil herbivory since a specific weevil survey was for targeted areas.*

***2019 finds in bold***

**Table 2. Summary of Total Plant Observations of Eurasian Watermilfoil (EWM) in the Little Quinnesec Falls Project (FERC #2536).**

| Year of Survey | Number of Sites Observed with EWM | Estimated Number of Plants | Surface Area (square feet)[1] | Surface Area (acres)[1] | Percent Project Boundary Acres[2] |
|---|---|---|---|---|---|
| 2002 | 2 | 5 | 10 | 0.00023 | 0.0001 |
| 2003 | 1 | 4 | 12 | 0.00028 | 0.0001 |
| 2004 | 2 | 15 | 34 | 0.00078 | 0.0002 |
| 2005 | 2 | 14 | 32 | 0.00073 | 0.0002 |
| 2006 | 8 | 139 | 278 | 0.00638 | 0.0018 |
| 2007 | 13 | 290 | 580 | 0.01331 | 0.0038 |
| 2008 | 7 | 265 | 530 | 0.01217 | 0.0035 |
| 2009 | 16 | 801 | 1602 | 0.03678 | 0.0105 |
| 2010 | 25 | 739 | 1478 | 0.03393 | 0.0097 |
| 2011 | 1 | 5 | 10 | 0.00023 | 0.0001 |
| 2013 | 6 | 44 | 88 | 0.00203 | 0.0006 |
| 2015 | 5 | 50 | 100 | 0.00230 | 0.0007 |
| 2017 | 9 | 70 | 126 | 0.00291 | 0.0008 |
| 2019 | 4 | 14 | 28 | 0.00064 | 0.0002 |

[1] *In most cases, the surface area is based on the total number of plants (rooted and un-rooted) and assumes two square feet of surface area coverage (as viewed from above) for each plant, unless other observations were recorded. Surface area in acres calculated by dividing surface area square feet by 43,560 (the number of square feet in one acre).*

[2] *Calculation of percent project boundary acres assumes 349 acres for the project area.*

Document Content(s)