NPM | NORTHBROOK POWER MANAGEMENT

February 21, 2018

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 - 2017 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 a biannual report titled *Monitoring the Little Quinnesec Falls Hydroelectric Project for Eurasian Watermilfoil and Purple Loosestrife*, dated October 2017.

In 2017, Eurasian water-milfoil ("EWM") 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 phragmites, have been observed in the project area.

In 2018, the licensee will consult with the resource agencies to review thresholds and subsequent actions, taking into account the current understanding of EWM management and the full history of EWM in the project area.

Very truly yours,

Chuck Ahlrichs
President

Cc: Cheryl Laatsch, WDNR
Elle Gulotty, MDNR
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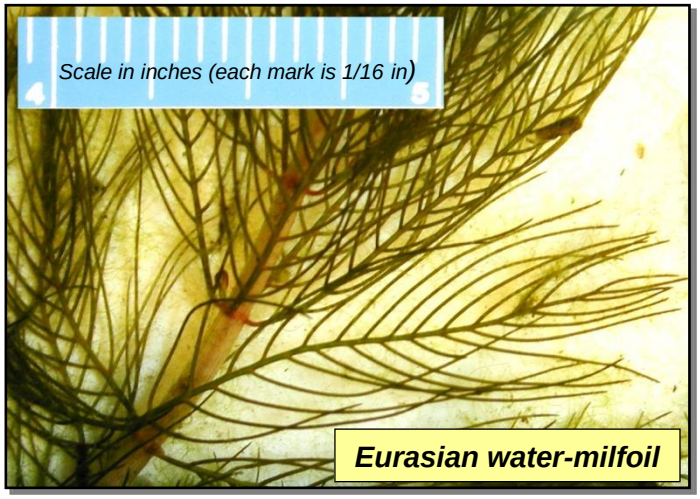
PROJECT REPORT

Monitoring the Little Quinnesec Falls Hydroelectric Project for Eurasian Water-milfoil and Purple Loosestrife

FERC Hydro Project No. 2536, Little Quinnesec Falls



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October 2017

PROJECT REPORT

Monitoring the Little Quinnesec Falls Hydroelectric Project for Eurasian Water-milfoil and Purple Loosestrife

FERC Hydro Project No. 2536, Little Quinnesec Falls

Fieldwork:	Angie Stine, B.S., Field Biologist Steve Haag, Field Technician
Data Analysis And Report	Dean Premo, Ph.D., Senior Ecologist Caitlin Hoenig, B.S., Biologist Angie Stine, B.S., Field Biologist

Cite as: Hoenig, Caitlin, Angie Stine and Dean Premo. 2017. Monitoring the Little Quinnesec Falls Hydroelectric Project for Eurasian Water-milfoil and Purple Loosestrife (FERC Hydro Project No. 2536, Little Quinnesec Falls). Report to Northbrook Energy, LLC by White Water Associates, Inc.

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SUMMARY

Monitoring for Eurasian water-milfoil (*Myriophyllum spicatum*) and purple loosestrife (*Lythrum salicaria*) was conducted on the Little Quinnesec Falls Project (FERC Hydro Project No. 2536) in 2017 as required by Article 409 of the FERC order issuing a project license. Monitoring for these species 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. Scientists from White Water Associates (an independent consulting firm) conducted fieldwork from a boat and on foot on August 3, 2017.

The project area has a robust diversity of native aquatic plants including native water-milfoils. In 2017, three new sites had Eurasian water-milfoil plants present, while other historic sites did not have any. In 2015, five sites had Eurasian water-milfoil present. In 2013, Eurasian water-milfoil plants were found at six sites. In 2011, only one site had Eurasian water-milfoil, and in 2010, Eurasian water-milfoil was present at twenty-five sites. Like the 2013 survey, the largest number of Eurasian water-milfoil plants observed in 2015 was found at Site K. In 2015, approximately 25 Eurasian water-milfoil plants were discovered there scattered throughout the native aquatic vegetation. In 2013, there were approximately 20 Eurasian water-milfoil plants found there. At Site K in 2011, no invasive plants were present, which was a dramatic decrease from 2009 and 2010 when nearly 400 Eurasian water-milfoil plants were observed.

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 2017 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.

With approximately 70 Eurasian water-milfoil plants observed in 2017, and approximately 50 observed in 2015, the actual surface area coverage of Eurasian water-milfoil relative to the size of the impoundment (349 acres) is extremely small. Although Eurasian water-milfoil was absent from Site K in 2017, a population of approximately 25 plants was present in the 2015 survey, and a population of approximately 20 plants was present in 2013. Also present at Site K in 2013 was a natural population of the native water-milfoil weevil

(*Euhrychiopsis lecontei*). The water-milfoil weevil is a biological control agent of Eurasian water milfoil and likely plays a role in the fluctuation of Eurasian water-milfoil populations at this site. No water-milfoil weevils were observed in the 2017 survey.

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 and 2017.

INTRODUCTION AND BACKGROUND

In 2017, monitoring for Eurasian water-milfoil (*Myriophyllum spicatum*) and purple loosestrife (*Lythrum salicaria*) 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 non-native species has occurred at this project since 1998 (annually through 2011 and biennially thereafter). 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.

Neither Eurasian water-milfoil nor purple loosestrife were reported from the Little Quinnesec Falls project during surveys conducted for the license application process (1990) and neither species was found 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 EWM in 2017 were historic locations, while a few new sites were recorded.

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. In 2017 the surrounding vegetation was too high to observe any loosestrife plants.

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 2017 monitoring results and presents information 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 2017 monitoring was completed on August 3, 2015. Angie Stine and Steve Haag 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 river 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 making motor use difficult. Water clarity conditions were ideal for the 2017 survey.

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). Wetlands and backwaters connected to the project area reservoir were visually inspected. 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 2017 survey and integrates 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 observations of EWM.

In the 2011 survey, we detected only one site in the project area with rooted Eurasian water-milfoil. This was a dramatic decrease from the twenty-five sites documented in 2010 (the highest number of sites recorded in the project area). In 2013, rooted Eurasian water-

milfoil was found at six sites. Four of these sites had Eurasian water-milfoil populations present at some point within the last 5 years, while the remaining two sites were new locations. In 2015, rooted Eurasian water-milfoil was found at five sites. Three of these sites had populations present within the last 5 years, while the two remaining sites were new locations. The three new locations recorded in 2017 had rooted plants present, as well as six sites that had previous EWM presence.

At one of the new sites, AP, located between points AM and D, thirteen Eurasian water-milfoil plants were observed.

At site AQ, 5 Eurasian water-milfoil plants were observed. This site is located in the bay beyond point V.

Lastly, at site AR, thirty-eight Eurasian water-milfoil plants were observed in the bay beyond point I.

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, and 2017 despite careful inspection, no invasive plants were found at this site, indicating a successful removal.

Purple loosestrife has been found each year starting in 1998 until present growing along the Wisconsin shoreline of the river downstream of the Little Quinnesec Dam about 100 feet downstream of the public access site. This area is within the one-quarter mile of the project area. Each year, White Water Associates staff removed these plants by hand pulling, but the plants 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 Associates staff pulled these three plants in 2005 and this site was absent of plants in 2006 and 2007. In 2007, we observed no purple loosestrife on the Michigan side of the river below the Little Quinnesec Falls Dam. In 2007, six purple loosestrife plants were located on the Wisconsin side of the river, downstream of the rafter's boat launch. NewPage staff removed, bagged, and disposed of these plants. Additional purple loosestrife plants were observed on the Wisconsin shoreline outside of the project survey area along the Niagara City Park. The City of Niagara was contacted by NewPage staff and agreed to dispose of these plants.

From 2008 through 2011, purple loosestrife plants were observed downstream of the Little Quinnesec Falls Dam, on the Wisconsin side of the river, from about 50 yards downstream of the boat landing parking area to approximately one-half miles below the boat landing parking area. In 2013, approximately 15 purple loosestrife plants were present in this area. This number increased significantly by 2015, with approximately 40 purple loosestrife plants observed. In 2017, the surrounding vegetation was too high to observe any purple loosestrife.

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. Although approximately 70 Eurasian water-milfoil plants were found in 2017, and 50 in 2015, the marked decline observed from 2009 to 2011 provides hope that the native vegetation, and possibly the water-milfoil weevil in Little Quinnesec Falls project area can 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. As in the past, numerous purple loosestrife plants exist immediately downstream of the project area on private and public land.

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.

Appendix A

Figure 1

Table 1

Table 2

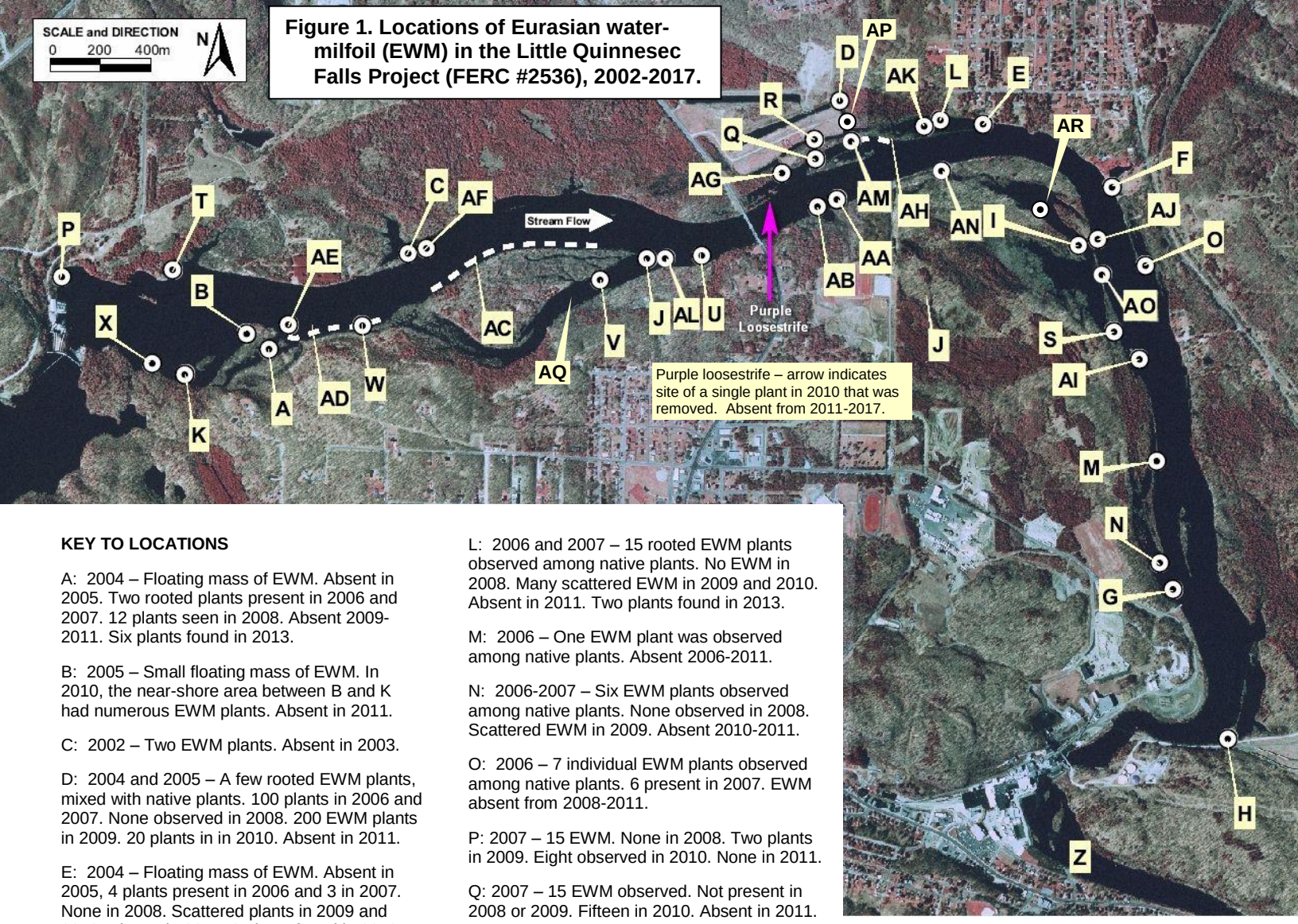

Figure 1. Locations of Eurasian water-milfoil (EWM) in the Little Quinnesec Falls Project (FERC #2536), 2002-2017.

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.

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.

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.

AE: 2010 – Observed fragments of EWM floating in the strong current. 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 – Observed nine EWM plants among native plants. Absent in 2011.

AI: 2010 – A single 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 EWM observed among native plants.

AO: 2015 – 5 plants found amount native plants.

AP: 2017 – 13 plants found among native plants.

AQ: 2017 – 5 plants found among native plants.

AR: 2017 – 38 plants found 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
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*.
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**		
W	2009	45.78946 -88.02341	Y	Y	1	2	0.00005	0.000013	N	One *M. spicatum* on edge of current among native plants.
W	2010		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*.

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
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 around this point. Likely source is Site K.

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
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.**
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.**

[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.*

2017 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	542	0.01244	0.0036
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	118	0.00271	0.0007
2017	9	70	126	0.00291	0.0008

[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.*

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

MICHIGAN DNR CORRESPONDENCE

Chuck Ahlrichs

From: Dean Premo <dean.premo@white-water-associates.com>
Sent: Wednesday, January 17, 2018 9:39 AM
To: 'Gulotty, Elle (DNR)'
Cc: Chris Sinclair; 'Laatsch, Cheryl - DNR'; 'Utrup, Nick'; 'Kruger, Kyle (DNR)'; Andrew.Hudak@wisconsin.gov; Chuck Ahlrichs
Subject: RE: 2017 Eurasian Watermilfoil & Purple Loosestrife Monitoring Report for Little Quinnesec Falls Project

Elle,

As you point out, the January 25, 2012 FERC Order (Order Modifying Exotic Species Plan Pursuant to Article 409 for Project No. 2536-078) allowed for biannual surveys of Purple Loosestrife and Eurasian water-milfoil on the Little Quinnesec Falls (LQF) Project and also ordered that *Phragmites spp*. be added to the same biannual monitoring. Since that time, we have conducted three such surveys on the LQF Project (2013, 2015, and 2017). During those surveys *Phragmites spp.* were not observed in the project area. We did not explicitly state this absence of *Phragmites* in the corresponding reports. In future reports we will specifically document our observations on absence/presence of this invasive plant and, if present, characterize the location(s). We will also modify the title of future reports to include *Phragmites* as one of the targeted subjects for monitoring.

Dean

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From: Gulotty, Elle (DNR) [mailto:GulottyE@michigan.gov]
Sent: Thursday, January 11, 2018 7:36 AM
To: Chuck Ahlrichs; Dean Premo
Cc: Chris Sinclair; 'Laatsch, Cheryl - DNR'; 'Utrup, Nick'; Kruger, Kyle (DNR); 'Andrew.Hudak@wisconsin.gov'
Subject: RE: 2017 Eurasian Watermilfoil & Purple Loosestrife Monitoring Report for Little Quinnesec Falls Project

Hi Folks,

It seemed at the time I pointed out the discrepancy there were two natural 'fixes': 1) Revise the action level/trigger criteria 2) Revert the sampling schedule. I expected the licensee to recommend a way of resolving the discrepancy for now, and then evaluate whether the plan as a whole is doing what was intended.

I was interested in how the discrepancy happened- and found the January 25, 2012 Order attached. My understanding based on the FERC Order is that FWS and MDNR were willing to entertain a compromise on the frequency of monitoring for EWM and PL but that the Licensee was going to incorporate *Phragmites* spp. in the monitoring. FERC: "The request

to extend the reporting period to biannually should still provide the necessary information on the populations of Eurasian watermilfoil and other invasive species such as purple loosestrife and, with the modification to include Phragmites in the monitoring program, should be approved."

So, I am now, also wondering – did I miss survey information for *Phragmites spp.*, per the 2012 order?

Thank you,
Elle

From: Chuck Ahlrichs [mailto:cahlrichs@nbenergy.com]
Sent: Tuesday, January 09, 2018 10:22 AM
To: Gulotty, Elle (DNR); Dean Premo
Cc: Chris Sinclair; 'Laatsch, Cheryl - DNR'; 'Utrup, Nick'; Kruger, Kyle (DNR); 'Andrew.Hudak@wisconsin.gov'
Subject: RE: 2017 Eurasian Watermilfoil & Purple Loosestrife Monitoring Report for Little Quinnesec Falls Project

+Andrew Hudak

Happy New Year All-

We concur with Elle's observation that current action criteria in the 2010 AM plan for EWM is inconsistent with the 2012 change in sampling frequency, and suggest that we discuss a modification to reflect current conditions and management science. And with respect to Elle's and Andrew's introduction of the potential desire to modify sampling methodology and/or the monitoring and management of other AIS, we are open to further discussion. However, we wish to separate those fresh topics from the immediate need to file with FERC the 2017 monitoring report and final agency comments on the results.

Thank you,
-Chuck

From: Gulotty, Elle (DNR) [mailto:GulottyE@michigan.gov]
Sent: Thursday, December 14, 2017 3:12 PM
To: Dean Premo <dean.premo@white-water-associates.com>
Cc: Chris Sinclair <csinclair@nbenergy.com>; Chuck Ahlrichs <cahlrichs@nbenergy.com>; 'Laatsch, Cheryl - DNR' <Cheryl.Laatsch@wisconsin.gov>; 'Utrup, Nick' <Nick_Utrup@fws.gov>; Kruger, Kyle (DNR) <KRUGERK@michigan.gov>
Subject: RE: 2017 Eurasian Watermilfoil & Purple Loosestrife Monitoring Report for Little Quinnesec Falls Project

Dean (and others),

On one hand, I think you missed my point: the current action criteria in the AM plan are inconsistent with the monitoring frequency (every other year sampling, vs action if increase in consecutive years). Minimally, that discrepancy needs to be addressed/clarified.

However, on the other hand: I agree that if we can take the time to incorporate additional science and management information that has become available since the 2010-2011 plan, it would be wise to do so, and be consistent with the intent of the AM plan. WDNR and MDNR are planning to have a discussion about AIS management along the MI/WI border, which I am expecting to include areas of interest from agency folks, and hopefully be relevant for the hydro facilities in that region. Absent objections from WDNR, I certainly would be happy to incorporate in that discussion recommendations you might be pondering.

As an FYI-for-now, I am interested in potentially broadening the scope of aquatic plant surveys to be better able to detect and address other nuisance species if they crop up. While I consider the figure regarding % of available habitat occupied by EWM to be just one of a suite of useful metrics, responding to and managing "pioneering" populations is different than well-established populations, and the current action criteria (based on beds) may not be appropriate or effective even if the minimum correction above were made.

Looking forward to folks' responses,

Thank you,
Elle

From: Dean Premo [mailto:dean.premo@white-water-associates.com]
Sent: Thursday, December 14, 2017 2:04 PM
To: Gulotty, Elle (DNR)
Cc: 'Chris Sinclair'; 'Chuck Ahlrichs'; 'Laatsch, Cheryl - DNR'; 'Utrup, Nick'; Kruger, Kyle (DNR)
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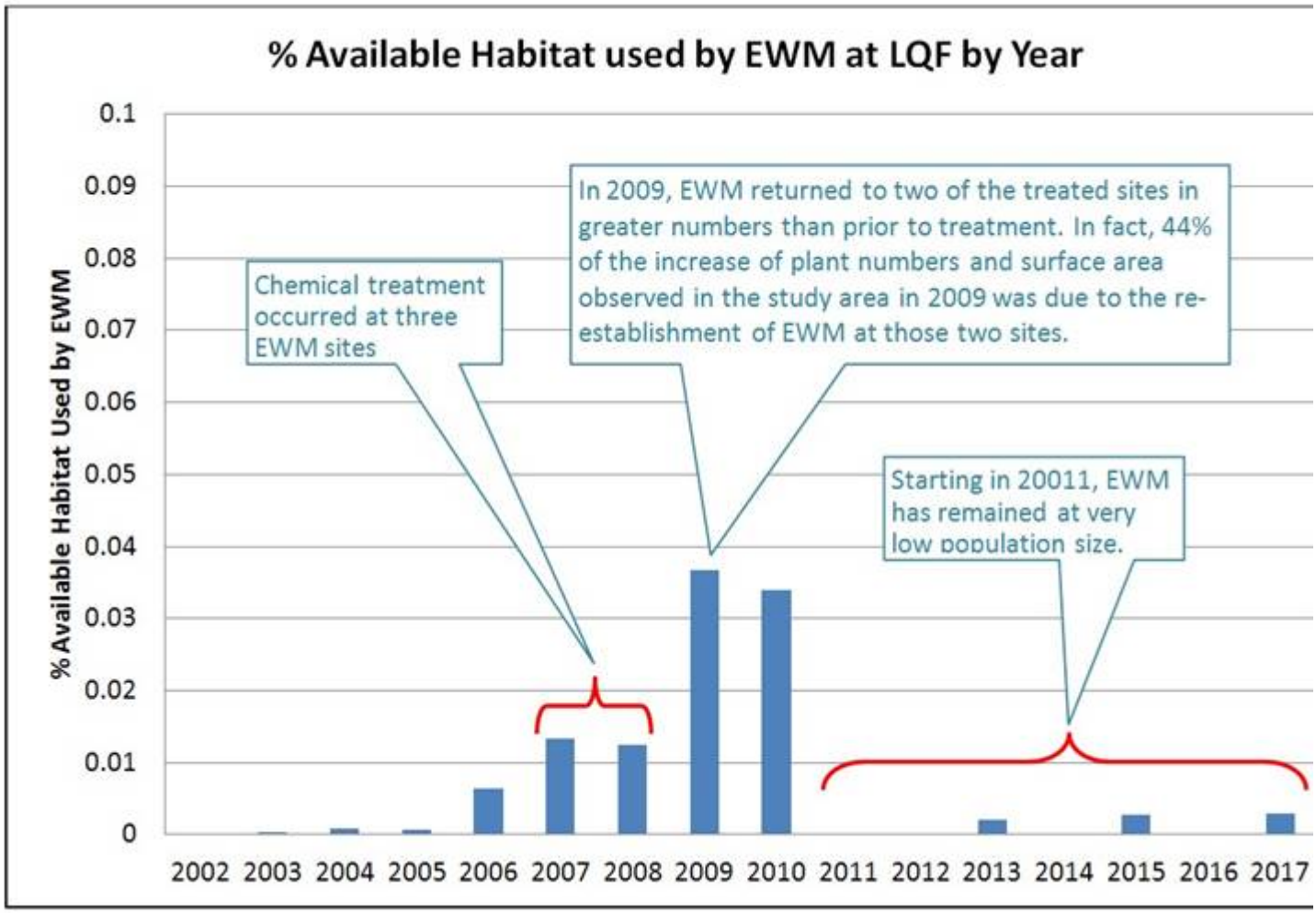

I look forward to additional discussion on this topic.

Dean

Dean Premo, Ph.D., President
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- Expansion of EWM population in areas that constitute beds for two consecutive years, and
- Population of milfoil weevils in the beds is below the threshold likely for effective control

Thank you,

Elle Gulotty
Resource Analyst

Habitat Management Unit
DNR Fisheries Division

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Marquette, MI 49855
PH: 906-228-6561 ext. 3002

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Cc: Chris Sinclair
Subject: RE: 2017 Eurasian Watermilfoil & Purple Loosestrife Monitoring Report for Little Quinnesec Falls Project

+ Elle Gulloty

From: Chuck Ahlrichs
Sent: Tuesday, November 28, 2017 2:37 PM
To: Utrup, Nick (Nick_Utrup@fws.gov) <Nick_Utrup@fws.gov>; Laatsch, Cheryl (Cheryl.Laatsch@Wisconsin.gov) <Cheryl.Laatsch@Wisconsin.gov>; Kruger, Kyle (KRUGERK@michigan.gov) <KRUGERK@michigan.gov>
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All- Please see the attached 2017 bi-annual exotic species monitoring report for the Little Quinnesec Falls hydro facility. No purple loosestrife were found, and Eurasian watermilfoil remains well under control; thus, the trigger criteria contained in the April 2010 Adaptive Management Plan have not been met.

Please provide comments to the reports at your earliest convenience.

Thank you,

Chuck Ahlrichs
President

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14550 N Frank Lloyd Wright Blvd, Suite 210, Scottsdale, AZ 85260
T: 480.551.1771 | M: 312.550.5827 | F: 480.551.1991
www.NorthbrookPower.com

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Subject: 2017 Eurasian Watermilfoil & Purple Loosestrife Monitoring Report for Little Quinnesec Falls Project

Chuck,

I hope all is well with you. I have attached the 2017 Eurasian Watermilfoil & Purple Loosestrife Monitoring Report for Little Quinnesec Falls Project. We appreciate the opportunity to serve.

Dean

Dean Premo, Ph.D., President
White Water Associates, Inc.
429 River Lane, P.O. Box 27
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Fax:(906) 822-7977
E-mail: dean.premo@white-water-associates.com
Web: http://www.white-water-associates.com

WISCONSIN DNR CORRESPONDENCE

Chuck Ahlrichs

From: Laatsch, Cheryl - DNR <Cheryl.Laatsch@wisconsin.gov>
Sent: Friday, December 15, 2017 7:20 AM
To: Gulotty, Elle (DNR) (GulottyE@michigan.gov); Chuck Ahlrichs; Dean Premo; 'Utrup, Nick'
Subject: FW: 2017 Eurasian Watermilfoil & Purple Loosestrife Monitoring Report for Little Quinnesec Falls Project

Please see below

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Cheryl Laatsch
Statewide FERC Coordinator
Bureau of Environmental Analysis and Sustainability
Wisconsin Dept of Natural Resources
N7725 Hwy 28
Horicon WI 53032
(T) 920-387-7869 (Fax) 920-387-7888
Cheryl.laatsch@wisconsin.gov

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From: Hudak, Andrew J - DNR
Sent: Thursday, December 14, 2017 3:47 PM
To: Laatsch, Cheryl - DNR <Cheryl.Laatsch@wisconsin.gov>
Subject: RE: 2017 Eurasian Watermilfoil & Purple Loosestrife Monitoring Report for Little Quinnesec Falls Project

Cheryl-

Please forward along to all appropriate contacts.

I agree that it may be time to revisit the AIS monitoring and management plan for LQF. Since this plan has been written, the State of Wisconsin has made a shift in EWM management especially when it comes to herbicide application treatments for control or relief. It is my professional opinion that levels of EWM present in LQF does not warrant any active control with herbicides nor would the WDNR support any type of "spot treatment" for milfoil in a flowing water system with short retention times. The WDNR has in recent years found success controlling small pioneer populations with a DASH (Diver Assisted Suctioning Harvester) unit but as it stands, the EWM appears to be seasonally controlled by a thriving weevil population. The current survey methodology is not consistent nor would be a recommended technique for any type of quantitative plant community statistics. The Department has developed a point intercept method that does very well at assessing the overall plant community and provides statistics on plant community dynamic changes over various years.

I firmly believe efforts should be made in AIS plans to shift focus away from surveys or control of only a select few species such as EWM, PLS, and zebra mussels. This has been common practice in many of the current licenses around the State. To truly be an adaptive plan I would support efforts to establish a survey methodology and timing that would provide reasonable assurance that **NEW** aquatic invasive species that are not currently established in a system are documented as soon as possible. This allows the Department to initiate our rapid response protocol to evaluate that

particular species and determine if any control efforts are needed or to help protect nearby waterways. I have many thoughts on how an adaptive management plan could be structured and would be willing to discuss a new AIS plan if this is desired by the facility.

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

From: Laatsch, Cheryl - DNR
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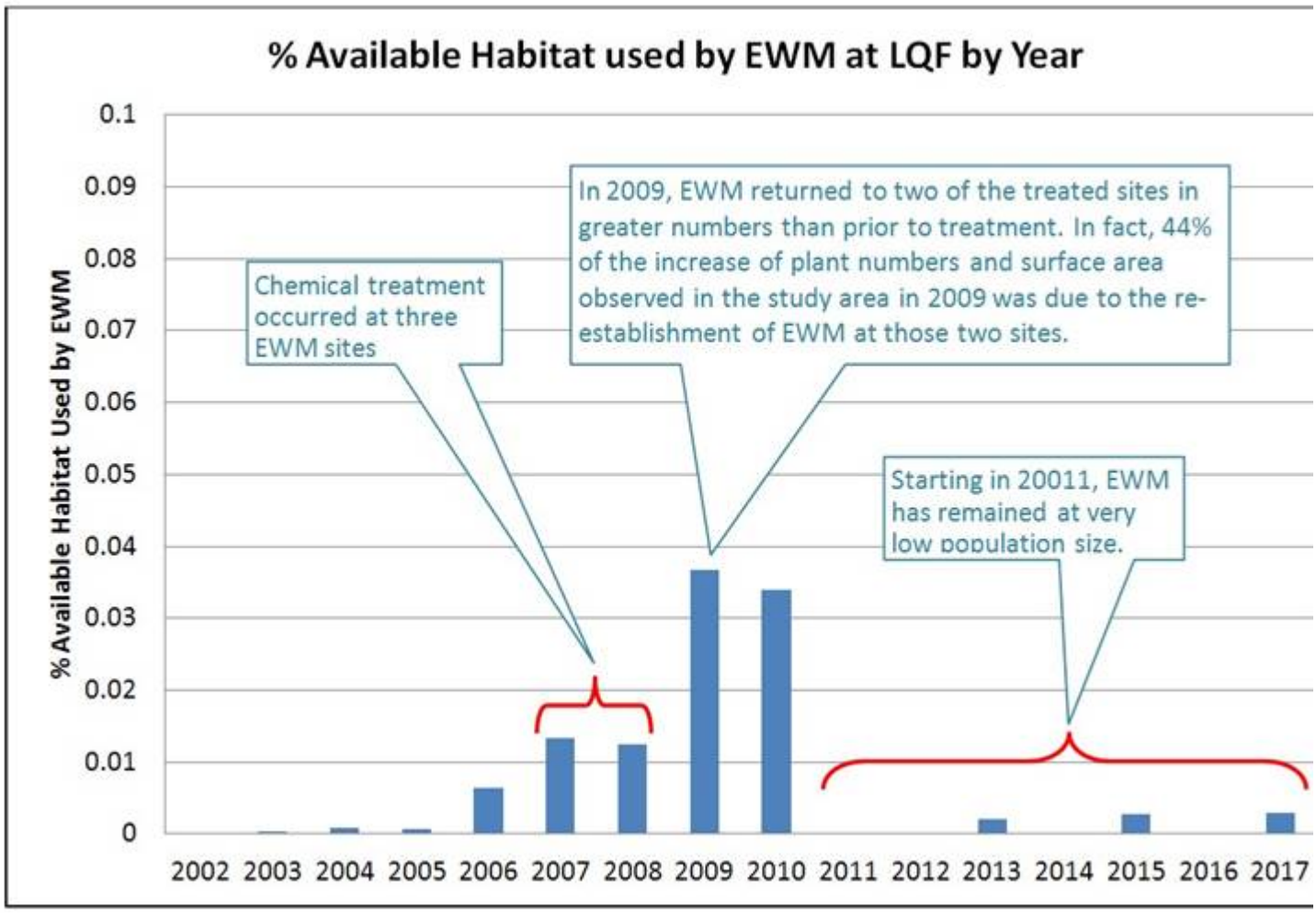

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USFWS CORRESPONDENCE

None other than licensee's transmittal of the draft report.