Northbrook Energy, LLC

Filed Electronically

November 20, 2009

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 - 2009 Exotic Species Report

In accordance with the Commission order approving the monitoring plan for purple loosestrife ("PL") and Eurasian water milfoil ("EWM") at the Little Quinnesec Hydroelectric Project, Northbrook Wisconsin, LLC herewith submits the 2009 monitoring report prepared by White Water Associates, Inc.

No evidence of PL was found within the project area. Northbrook will continue dialogue with downstream property owners to aid in the management of PL.

During the 2009 survey, sixteen sites were identified with EWM, an increase from the 2008 survey. Select areas of the impoundment were chemically treated in 2007 and 2008. There was no treatment in 2009. In this year's survey, Sites K (400 plants) and D (200 plants) can be reasonably labeled "beds". However, the actual surface coverage of EWM continues to be very small (<0.04 acre) relative to the size of the impoundment (349 acres), perhaps indicating the difficulty of invading the area's thriving native plant community.

Northbrook proposes another year of no EWM treatment in 2010, followed by weevil treatment at Site K and/or Site D in 2011, if the 2010 survey indicates the same or expanded numbers at those sites. Based on the recommendations of the WDNR and MDNR, by April 30, 2010 Northbrook will develop a weevil treatment plan ("Plan") for resource agency review. We will coordinate with other Menominee River hydropower owners during the development of the Plan. After receiving results of the 2010 survey, Northbrook will consult with the resource agencies to determine the appropriateness and need for implementing the Plan in 2011.

Appropriate signage is located at the boat launch sites detailing control measures for exotic species.

Sincerely,

Chuck Ahlrichs
President

14550 N Frank Lloyd Wright #210
Scottsdale, Arizona 85260
480-551-1221/Fax 480-551-1991

Chuck Ahlrichs

From: Chuck Ahlrichs
Sent: Tuesday, October 27, 2009 7:24 AM
To: 'Jessica Mistak'
Cc: Nick_Utrup@fws.gov; Michael Alexander; Chris Freiburger; angie_tornes@nps.gov; michael.donofrio@wisconsin.gov
Subject: RE: Little Quinnesec Exotic Species Report

Hi Jessica,

Thank you for the fast response. We accept your recommendation to develop a weevil treatment plan by April 30, 2010 to facilitate weevil introduction in 2011, and will propose the action when filing the report with the FERC. However, we believe the appropriateness and need for weevil treatment in 2011 will depend on the results of the 2010 survey, and may require further discussion with the resource agencies prior to implementing the plan.

Regards,
Chuck

Chuck Ahlrichs
Northbrook Energy, LLC
14550 N Frank Lloyd Wright Blvd, Suite 210 Scottsdale, AZ 85260
Email: cahlrichs@nbenergy.com
Voice: +1 (480) 551-1771
Mobile: +1 (312) 550-5827

-----Original Message-----
From: Jessica Mistak [mailto:mistakj@michigan.gov]
Sent: Friday, October 23, 2009 9:53 AM
To: Chuck Ahlrichs
Cc: Nick_Utrup@fws.gov; Michael Alexander; Chris Freiburger; angie_tornes@nps.gov; michael.donofrio@wisconsin.gov
Subject: Little Quinnesec Exotic Species Report

Hi Chuck,
The Michigan DNR has reviewed your October 9 Exotic Species Report for the Little Quinnesec project.

The results show only a few purple loosestrife plants downstream of the project and limited, fluctuating sites with Eurasian watermilfoil within the reservoir. Based on this, we recommend that you continue dialogue with downstream property owners to aid in management of purple loosestrife. We also recommend that you proceed with biological control of the Eurasian watermilfoil using weevils.

However, instead of waiting to develop a weevil treatment plan for agency review by April 30, 2011, we recommend that you proceed with developing a weevil treatment plan for agency review by April 30, 2010 so as not to impede the ability to introduce weevils in 2011. We encourage you to coordinate with other Menominee River hydroelectric project owners such as We Energies and Wisconsin Public Service, as they have some experience with biological control that may prove useful.

Please let me know if you need further information.
Sincerely,
Jessica Mistak

Jessica Mistak, Senior Fisheries Biologist DNR Marquette Fisheries Station
484 Cherry Creek Rd
Marquette, MI 49855

Chuck Ahlrichs

From: Donofrio, Michael C - DNR [Michael.Donofrio@wisconsin.gov]
Sent: Wednesday, October 28, 2009 7:32 AM
To: Jessica Mistak; Chuck Ahlrichs
Cc: Nick_Utrup@fws.gov; Michael Alexander; Chris Freiburger; Tornes, Angie
Subject: RE: Little Quinnesec Exotic Species Report

We concur with MIDNR comments, below

P Michael Donofrio
Lower Fox/ Upper Green Bay Fisheries Supervisor Bureau of Fisheries Management Wisconsin Department of Natural Resources Peshtigo Service Center
101 N Ogden Rd
Peshtigo, WI 54157
(*) phone: (715)582-5050
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(*) e-mail: Michael.Donofrio@Wisconsin.gov

-----Original Message-----
From: Jessica Mistak [mailto:mistakj@michigan.gov]
Sent: Friday, October 23, 2009 11:53 AM
To: cahlrichs@nbenergy.com
Cc: Nick_Utrup@fws.gov; Michael Alexander; Chris Freiburger; Tornes, Angie; Donofrio, Michael C - DNR
Subject: Little Quinnesec Exotic Species Report

Hi Chuck,
The Michigan DNR has reviewed your October 9 Exotic Species Report for the Little Quinnesec project.

The results show only a few purple loosestrife plants downstream of the project and limited, fluctuating sites with Eurasian watermilfoil within the reservoir. Based on this, we recommend that you continue dialogue with downstream property owners to aid in management of purple loosestrife. We also recommend that you proceed with biological control of the Eurasian watermilfoil using weevils.

However, instead of waiting to develop a weevil treatment plan for agency review by April 30, 2011, we recommend that you proceed with developing a weevil treatment plan for agency review by April 30, 2010 so as not to impede the ability to introduce weevils in 2011. We encourage you to coordinate with other Menominee River hydroelectric project owners such as We Energies and Wisconsin Public Service, as they have some experience with biological control that may prove useful.

Please let me know if you need further information.
Sincerely,
Jessica Mistak

Jessica Mistak, Senior Fisheries Biologist DNR Marquette Fisheries Station
484 Cherry Creek Rd
Marquette, MI 49855
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Northbrook Energy, LLC

October 9, 2009

Ms. Jessica Mistak
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National Park Service
626 E. Wisconsin Ave., Ste 100
Milwaukee, WI 53202

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Ms. Louise Clemency
U.S. Fish & Wildlife Service
Green Bay Field Office
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New Franken, WI 54229

Mr. Michael Donofrio
Wisconsin Department of Natural Resources
101 N. Ogden
Pestigo, WI 54157

Re: Little Quinnesec Falls Hydroelectric Project, FERC No. 2536
Article 409, 2009 Exotic Species Report for Agency Consultation

In accordance with the Commission order approving the monitoring plan for Purple Loosestrife and Eurasian Milfoil at Little Quinnesec, we herewith attach the 2009 monitoring report White Water Associates, Inc. for your review and comment.

During the 2009 survey, sixteen sites were identified with Eurasian Water Milfoil (EWM), an increase from the 2008 survey. Select areas of the impoundment were chemically treated in 2007 and 2008. There was no treatment in 2009. In this year's survey, Sites K (400 plants) and D (200 plants) can be reasonably labeled "beds". However, the actual surface coverage of EWM continues to be very small (<0.04 acre) relative to the size of the impoundment (349 acres), perhaps indicating the difficulty of invading the area's thriving native plant community. Northbrook proposes another year of no treatment in 2010, followed by weevil treatment at Site K and/or Site D in 2011, if the 2010 survey indicates the same or expanded numbers at those sites. If indicated, Northbrook will develop a weevil treatment plan for resource agency review by April 30, 2011.

No evidence of Purple Loosestrife was found within the Project area.

Please feel free to provide your comments through email to cahlrichs@nbenergy.com. All comments will be filed with the FERC along with the monitoring report.

Sincerely,

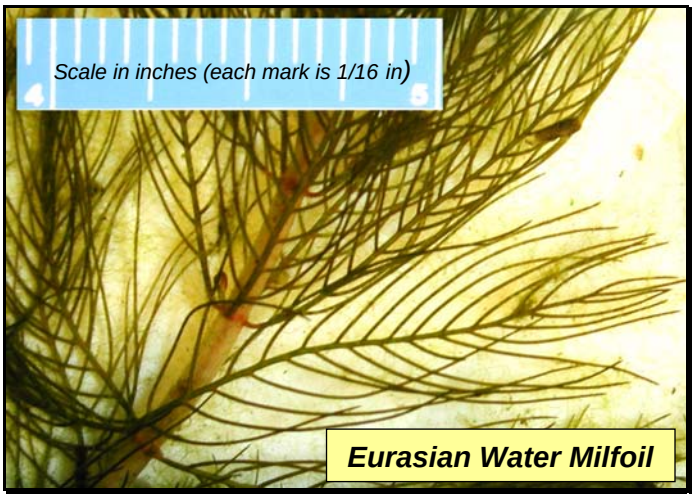
Chuck Ahlrichs

14550 N Frank Lloyd Wright #210
Scottsdale, Arizona 85260
480·551·1221/Fax 480·551·1991

PROJECT REPORT

Monitoring The Little Quinnesec Falls Hydroelectric Project for Eurasian Water Milfoil and Purple Loosestrife

FERC Hydro Project No. 2536, Little Quinnesec Falls



Prepared for:

Northbrook Energy, LLC
14550 N Frank Lloyd Wright Blvd, Suite 210
Scottsdale, AZ 85260
Contact: Chuck Ahlrichs
Email: cahlrichs@nbenergy.com
Voice: (480) 551-1771

Prepared by:

White Water Associates, Inc.
429 River Lane, P.O. Box 27
Amasa, Michigan 49903
Contact: Dean B. Premo, Ph.D., Senior Ecologist
Voice: (906) 822-7889

Date: August 2009

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:	David Tiller, B.S., Field Biologist Bill Artwich, B.S., Field Biologist
Data Analysis And Report	Dean Premo, Ph.D., Senior Ecologist Kent Premo, M.S. Technical Support Scientist David Tiller, B.S. Field Biologist

Cite as: Premo, Dean, David Tiller, and Kent Premo. 2009. 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 2009 as required by Article 409 of the FERC order issuing a project license. Annual monitoring for these species has occurred at this project since 1998. 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 July 29 and 30, 2009.

The project area has a robust diversity of native aquatic plants including native water milfoils. In the 2009 survey, sixteen sites were identified with Eurasian water milfoil (an increase from 2008). Four new sites with small numbers of Eurasian water milfoil were detected in 2009. The other twelve 2009 sites have a history of Eurasian water milfoil in the past. Eleven of the sixteen sites had twenty or fewer Eurasian water milfoil plants. In 2009, Site D and Site K had increased in Eurasian water milfoil density and dominance from the previous year and each could be reasonably labeled a "bed."

In 2009, we documented an increase in the overall number and associated surface area of Eurasian water milfoil in the project area. A large portion of this increase (44%) was due to the re-establishment of Eurasian water milfoil at two sites previously treated with herbicide.

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. The reasons for this are unknown, but may indicate the difficulty of invading a thriving native plant community. At Sites D and L, where native plants were apparently reduced by previous herbicide treatments, the Eurasian water milfoil rebounded in 2009.

The actual surface area coverage of Eurasian water milfoil (<0.04 acre) relative to the size of the impoundment (349 acres) is very small. In most of the sites where it is found, the numbers are few. With exception of Sites K and D, Eurasian water milfoil is not "taking over" the locations in which it is found. In 2009, the previously chemically treated Sites D and L showed higher number of Eurasian water milfoil plants than seen before. Future observations of these treated sites will provide insight to persistence of native flora and Eurasian water milfoil.

Purple loosestrife plants were not observed in the project area in 2009. Nevertheless, a number of plants exist immediately downstream of the project area on private and public land.

INTRODUCTION AND BACKGROUND

In 2009, 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 2009 as required by Article 409 of the FERC order issuing a project license. Annual monitoring for these non-native plant species has occurred at this project since 1998. 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 confirmed within 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. 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 have not been observed in the project area through 2008. In 2002, several specimens of Eurasian water milfoil and both native water milfoil species (*M. sibiricum* and *M. heterophyllum*) were collected from the Little Quinnesec Falls 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.

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 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 staff and agreed to dispose of these plants; however, the plants remained in 2008.

This document reports 2009 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

The fieldwork for the 2009 monitoring was completed on July 29 and 30. David Tiller and Bill Artwich of White Water Associates conducted the work on the reservoir and the river downstream of the dam. A 14-foot boat and 9.9 HP engine was used to survey the shoreline and numerous backwater wetlands from the Little Quinnesec Falls Dam upstream to the Big Quinnesec Falls Dam. Most of the backwater wetlands are shallow and densely vegetated with a diversity of aquatic plants making motor use difficult. Water levels encountered during the 2009 survey, however, allowed access into these backwater wetlands.

We visually surveyed for Eurasian water milfoil in aquatic plant beds and took samples by hand and metal garden rake. We 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 northern water milfoil is 5-11 with a reported maximum of 13. The average number for Eurasian water milfoil is 14-17 with a maximum of 20. Also useful later in the season is the presence of winter buds (turions) on northern water milfoil, structures not found on Eurasian water milfoil. Where Eurasian water milfoil was observed, we also examined for evidence of weevil herbivory.

Purple loosestrife when flowering is showy and easily identified. Peak blossoming extends from late July through August in northern Michigan. All wetlands and backwaters connected to the project area reservoir were visually inspected. Binoculars were used to scan the shore and less accessible backwaters. The project area downstream of the Little Quinnesec Falls dam was surveyed on foot on July 30.

FINDINGS

This report section presents the finding from the 2009 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. zosterformis, P. robbinsii, Zosterella dubia, Ceratophyllum demersum, Ranunculus longirostris, Utricularia vulgaris,* and *Megalodonta 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 presents additional information about these areas, including the latitude/longitude, estimated number of plants observed, and plant surface area involved. Table 2 summarizes the data over all monitoring years (2002 to present).

As in past 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.

In the 2009 survey, we detected sixteen sites in the project area with rooted Eurasian water milfoil. This represents an increase of overall number of sites (fourteen sites were detected in 2007 and four sites were recorded in 2008). Four new sites were detected in 2009, but each of these new sites had relatively small numbers of plants (ranging from 1 to 20). Each of the other twelve 2009 Eurasian water milfoil sites had a history of the species in the past. Eleven of the sixteen sites had twenty or fewer Eurasian water milfoil plants. In 2009, Site D had an estimated 200 plants and Site K had an estimated 400 plants. Both sites had increased in Eurasian water

milfoil density and dominance from the previous year and each could be reasonably labeled a "bed" of Eurasian water milfoil at this time.

The number and surface area of Eurasian water milfoil decreased in 2008 (relative to 2007). Much of this difference resulted from the entire loss of Eurasian water milfoil plants from three areas that were chemically treated in 2007 and 2008. In 2009, we documented an increase in the overall number and associated surface area of Eurasian water milfoil. In 2009, Eurasian water milfoil plants were present at Site D and L in greater numbers than had previously been observed (one year post chemical treatment). In fact, 44% of the increase of plant numbers and surface area in 2009 was due to the re-establishment of Eurasian water milfoil at those two sites.

Site I (see Figure 1) is the original location for Eurasian water milfoil on the Little Quinnesec Falls project area. It consistently had a few rooted plants in 2002, 2003, 2004, and 2005. We did not detect any plants in 2006 or 2007. In 2008, we found nine Eurasian water milfoil plants at Site I in the area between the north and south arms of this bay. In 2009 we observed eighteen plants in the same area.

As exemplified by Site 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 invading a thriving native plant community. At Sites D and L where native plants were apparently reduced by previous herbicide treatments, the Eurasian water milfoil rebounded in 2009.

The actual surface area coverage of Eurasian water milfoil relative to the size of the impoundment remains 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 Fall 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 including *Potamogeton foliosus, Ranunculus longirostris, Utricularia vulgaris, Ceratophyllum demersum* and the native milfoil, *Myriophyllum sibiricum*. In most of the sites

where it is found as a rooted plant, the number of plants is very low. With exception of Sites K and D, Eurasian water milfoil does not appear to be "taking over" the locations in which it is found. The previously chemically treated Site D shows indications of dominance by Eurasian water milfoil. In 2009, Site L (chemically treated in 2007 and 2008) also demonstrated a larger number of Eurasian water milfoil than in the past. Future observations of these chemically treated sites will provide interesting insight regarding the persistence of both the native flora and Eurasian water milfoil.

Purple Loosestrife

As in past years of the survey, no purple loosestrife was found within the portion of the project area, lying between the Little Quinnesec Dam and the Big Quinnesec Dam.

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 project survey 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.

As in 2008, we observed no purple loosestrife plants on corporate property downstream of the Little Quinnesec Dam. There were, however, cut or broken plants on private property (residences) on the Wisconsin side of the river. We also observed more purple loosestrife on the Niagara City Park.

A single pulling of purple loosestrife plants is not sufficient to eliminate the species as it can sprout from fragments of roots left in the soil, or seeds still present in the seed bank. Removal of the flowering stalks each year limits the number of seeds produced and the species' ability to

propagate via seeds. More effective control would require application of herbicide to freshly cut stems. Repeated pulling of the existing stems of loosestrife has prevented it from blooming and spreading and may finally effect its complete eradication at this site.

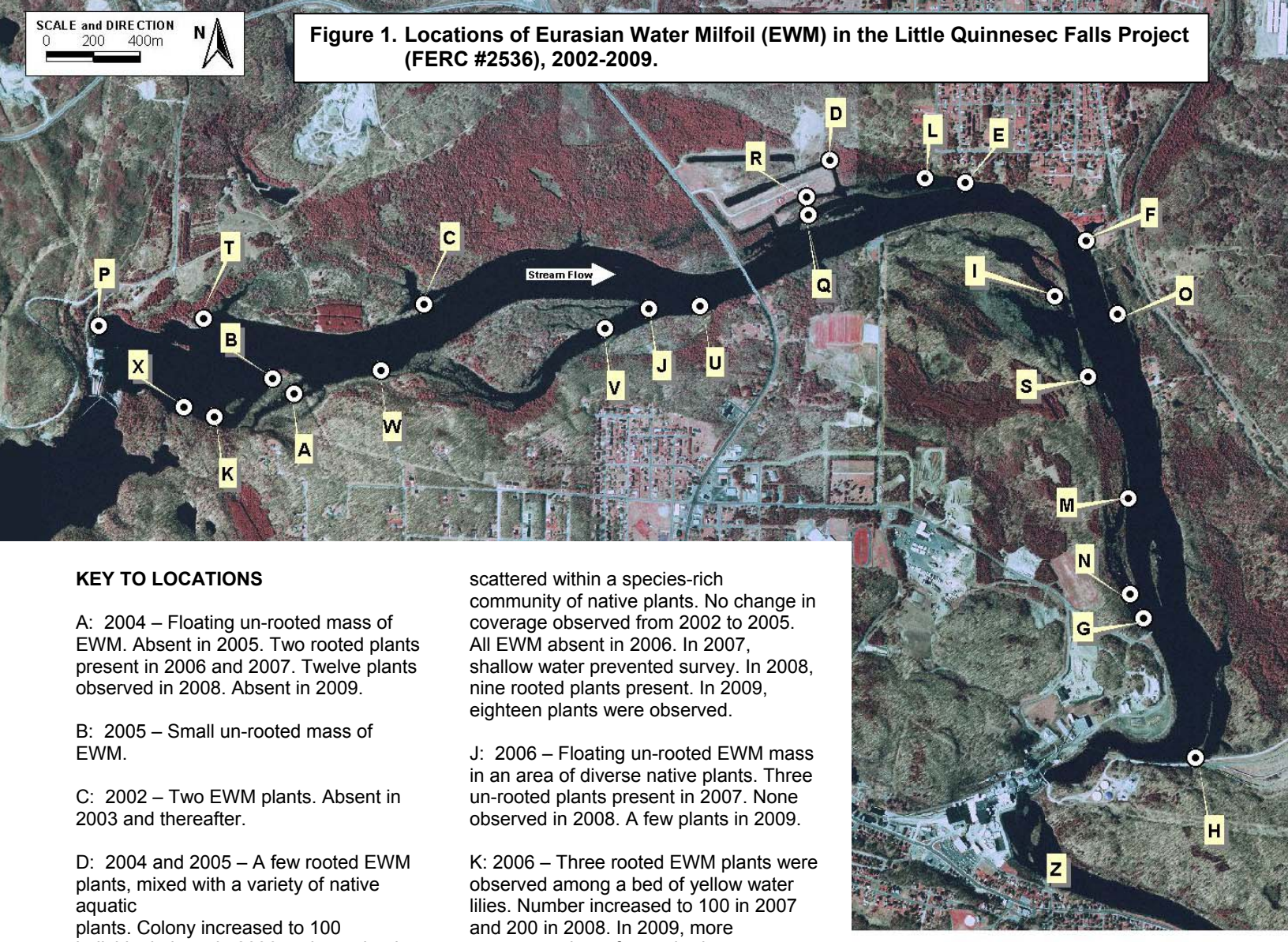
CONCLUSIONS

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 help keep this invasive species in check. In 2009, there was an increase in the number of sites of occurrence of Eurasian water milfoil and an increase in numbers of plants and surface area of coverage. As in the past, however, the actual area of coverage remains very small and most sites have very few plants. Two areas (Sites D and K) have identifiable Eurasian water milfoil beds warrant particular scrutiny in future monitoring. Site D was treated with herbicide in 2007 and 2008 in an attempt to control Eurasian water milfoil, but the population re-established in 2009.

In 2006, we attempted to hand-pull individual Eurasian water milfoil plants, but found this to be an impractical means of control in this setting. First of all 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. 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 very effective in reducing Eurasian water milfoil in the 2008 season, but the plant made a strong comeback at two of these sites in 2009.

Purple loosestrife plants were not observed in the project area in 2009. Nevertheless, a number of plants exist immediately downstream of the project area on private and public land.

Figure 1. Locations of Eurasian Water Milfoil (EWM) in the Little Quinnesec Falls Project (FERC #2536), 2002-2009.



KEY TO LOCATIONS

A: 2004 – Floating un-rooted mass of EWM. Absent in 2005. Two rooted plants present in 2006 and 2007. Twelve plants observed in 2008. Absent in 2009.

B: 2005 – Small un-rooted mass of EWM.

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

D: 2004 and 2005 – A few rooted EWM plants, mixed with a variety of native aquatic plants. Colony increased to 100 individual plants in 2006 and remained at 100 in 2007. None observed in 2008. Bed of 200 EWM plants in 2009.

E: 2004 – Floating un-rooted mass of EWM caught along edge. Absent in 2005, but 4 rooted plants present in 2006 and 3 plants present in 2007. None observed in 2008. Scattered plants in 2009.

F: 2004 – Floating un-rooted mass of EWM along edge. Absent in 2005, but 2 rooted plants present in 2006 and 2007. None observed in 2008 and 2009.

G: 2004 – Floating un-rooted mass of EWM along edge. EWM absent in 2005, 2006, 2007, and 2008. Scattered plants at bay mouth in 2009.

H: 2004 – Floating un-rooted mass of EWM along edge. EWM absent in 2005 and 2006. EWM present in 2007, but not observed in 2008. Several plants in 2009.

I: 2002, 2003, 2004, and 2005 – This was the original location for EWM in the LQF Project. The few rooted plants were scattered within a species-rich community of native plants. No change in coverage observed from 2002 to 2005. All EWM absent in 2006. In 2007, shallow water prevented survey. In 2008, nine rooted plants present. In 2009, eighteen plants were observed.

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.

K: 2006 – Three rooted EWM plants were observed among a bed of yellow water lilies. Number increased to 100 in 2007 and 200 in 2008. In 2009, more numerous plants form a bed.

L: 2006 and 2007 – Fifteen rooted EWM plants were observed among a diverse community of native plants. No EWM in 2008. Many scattered EWM in 2009.

M: 2006 – An individual rooted EWM plant was observed among native plants. Absence noted in 2006-2009.

N: 2006-2007 – Six EWM plants observed among a diverse community of native plants. None observed in 2008. Scattered EWM in 2009.

O: 2006 – Seven individual rooted EWM plants observed among a diverse community of native plants. Six present in 2007. EWM absent in 2008 and 2009.

P: 2007 – Fifteen EWM in a small quiet backwater below Big Quinnesec Dam. Not observed in 2008. Two plants in 2009.

Q: 2007 – Fifteen EWM in a natural riverine side channel. Not observed in 2008 or 2009.

R: 2007 – Two EWM in the area of man-made canals. Not observed in 2008. Two plants in 2009.

S: 2007 – Six EWM along quiet water at river's edge among native plants. Not observed in 2008 or 2009.

T: 2008 – Six EWM observed at river's edge among native plants. Same in 2009.

U: 2009 – Twenty EWM scattered along shore with native vegetation.

V: 2009 – Fifteen EWM scattered among native vegetation.

W: 2009 – A single EWM plant in native plants.

X: 2009 – Five scattered EWM in native plants.

Z: 2008-2009 – Survey area. No EWM observed.

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

Site Code	Year	Latitude & Longitude 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	0.000000		Floating un-rooted mass (ca. 4 square feet) of *M. spicatum* at entrance to small bay.
A	2006		Y	Y	2	4	0.00009	0.000000	N	After absence in 2005, two rooted *M. spicatum* in 2006.
A	2007		Y	Y	2	4	0.00009	0.000000	N	Two rooted *M. spicatum* plants among abundant native milfoil and bladderwort.
A	2008		Y	Y	12	24	0.00028	0.000001	N	Twelve rooted *M. spicatum* plants among abundant native milfoil and bladderwort.
A	2009		N							Thorough search revealed not a single plant.
B	2005	45.78848 -88.03040	Y	N	1	2	0.00005	0.000000		Small un-rooted mass (ca. 2 square feet) of *M. spicatum* floating downstream.
C	2002	45.79125 -88.02352	Y	Y	2	4	0.00009	0.000000		Two rooted plants present in 2002, but absent in subsequent years.
D	2004	45.79701 -88.00139	Y	Y	6	12	0.00028	0.000001		A few rooted plants of *M. spicatum* , mixed with a variety of native aquatic plants.
D	2005		Y	Y	10	20	0.00046	0.000001		A few rooted plants of *M. spicatum* , mixed with a variety of native aquatic plants.
D	2006		Y	Y	100	200	0.00459	0.000013	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	0.000013	N	Rooted plants at about the same number and dispersion as in 2006.
D	2008		N							Chemically treated area with no *M. spicatum* and few other macrophytes observed.
D	2009		Y	Y	200	400	0.00918	0.000026	N	A dense bed of *M. spicatum* observed in 2009 with few other macrophytes.

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

Site Code	Year	Latitude & Longitude 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
E	2004	45.7963 -87.99399	Y	N	1	2	0.00005	0.000000		Floating un-rooted mass (ca. 2 square feet) of *M. spicatum* found along river's edge.
E	2006		Y	Y	4	8	0.00018	0.000001	N	After an absence in 2005, 4 rooted plants were present in 2006. These are downslope from several houses on the bank and docks that accommodate boats and pontoon boats.
E	2007		Y	Y	3	6	0.00014	0.000000		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	0.00148	0.000000	N	*M. spicatum* scattered through the area.
F	2004	45.7921 -87.98744	Y	N	1	2	0.00005	0.000000		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	0.000000	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	0.000000	N	Two rooted *M. spicatum* found along river's edge right at the mouth of Fumee Creek.
F	2008		N							No *M. spicatum* observed (only native milfoil)
F	2009		N							
G	2004	45.77982 -87.98366	Y	N	1	2	0.00005	0.000000		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	0.00034	0.000001	N	*M. spicatum* distributed around entry of bay.

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

Site Code	Year	Latitude & Longitude 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
H	2004	45.77453 -87.98065	Y	N	1	2	0.00005	0.000000		Floating un-rooted mass (ca. 2 square feet) caught along river's edge.
H	2007		Y	Y	15	30	0.00069	0.000002	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	0.000001	N	*M. spicatum* among native aquatic plants.
I	2002	45.79204 -87.98893	Y	Y	3	6	0.00014	0.000000		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.
I	2003		Y	Y	4	12	0.00028	0.000001		A few rooted plants scattered within a species-rich community of native plants.
I	2004		Y	Y	4	12	0.00028	0.000001		A few rooted plants scattered within a species-rich community of native plants.
I	2005		Y	Y	4	12	0.00028	0.000001		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	0.00021	0.000001	N	Nine plants scattered in channel between long bay and short bay.
I	2009		Y	Y	18	36	0.00084	0.000003	N	*M. spicatum* scattered in this bay among native aquatic plants.

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

Site Code	Year	Latitude & Longitude 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
J	2006	45.79119 -88.01104	Y	N	1	2	0.00005	0.000000	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	0.000000	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	0.000000	N	A few *M. spicatum* among native plants.
K	2006	45.78674 -88.034822	Y	Y	3	6	0.00014	0.000000	N	Three rooted *M. spicatum* (each ca. 2 sq ft) observed in a bed of yellow water lilies.
K	2007		Y	Y	100	200	0.00459	0.000013	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, Valisineria*, and *Potamogeton richardsonii*
K	2008		Y	Y	200	400	0.00918	0.000026	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, Valisineria*, and *Potamogeton richardsonii*
K	2009		Y	Y	~400	~800	0.01836	0.000052	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
L	2006	45.796423 -87.996198	Y	Y	15	30	0.00069	0.000002	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	0.000002	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).

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

Site Code	Year	Latitude & Longitude 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	2008		N							This area was chemically treated in 2007 and 2008.
L	2009		Y	Y	60	120	0.00276	0.000008	N	Numerous *M. spicatum* throughout the bay.
M	2006	45.78440 -87.984675	Y	Y	1	2	0.00005	0.000000	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 2009.
M	2008		N							
M	2009		N							
N	2006	45.780751 -87.984406	Y	Y	6	12	0.00028	0.000001	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	0.000001	N	Low water conditions during the 2007 survey prevented access to this shallow bay; we therefore assume conditions to be the same as in 2006.
N	2008		N	N						Low backwater conditions during the 2008 survey prevented thorough access to this shallow bay.
N	2009		Y	Y	6	12	0.00028	0.000001	N	*M. spicatum* scattered in small bay.
O	2006	45.791406 -87.985502	Y	Y	7	14	0.00032	0.000001	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.
O	2007		Y	Y	6	12	0.00028	0.000001	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 in 2009.

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

Site Code	Year	Latitude & Longitude 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
P	2007	45.790 -88.041	Y	Y	15	30	0.00069	0.000002	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	0.000000		Two *M. spicatum* were observed in 2009.
Q	2007	45.7949 -88.0025	Y	Y	15	30	0.00069	0.000002	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							
R	2007	45.7956 -88.0026	Y	Y	2	4	0.00009	0.000000	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	0.000000		Two *M. spicatum* among native vegetation.
S	2007	45.789 -87.987	Y	Y	6	12	0.00028	0.000001	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							
T	2008	45.79036 -88.03532	Y	Y	6	12	0.00028	0.000001	N	We observed among native plants in quiet water along the river's edge in 2008 and 2009..
T	2009		Y	Y	6	12	0.00028	0.000001	N	
U	2009		Y	Y	20	40			N	*M. spicatum* were scattered along the shore with native aquatic plants
V	2009		Y	Y	15	30	0.00069	0.000002	N	*M. spicatum* were scattered along the shore with native aquatic plants

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

Site Code	Year	Latitude & Longitude 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	2009		Y	Y	1	2	0.00005	0.000000	N	One *M. spicatum* on edge of current among native plants.
X	2009		Y	Y	5	10	0.00023	0.000000	N	*M. spicatum* plants distributed among native plants.
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							

[1]*Field staff began checking for evidence of weevil herbivory on M. spicatum in 2006.*

Table 2. Summary of Total Plant Observations of Eurasian Water Milfoil (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	0.000001
2003	1	4	12	0.00028	0.000001
2004	2	15	34	0.00078	0.000002
2005	2	14	32	0.00073	0.000002
2006	8	139	278	0.00638	0.000018
2007	14[3]	290	580	0.01331	0.000038
2008	4	213	426	0.00978	0.000028
2009	16	801	1602	0.0361	0.000097

[1] *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.*

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

[3] *The 2007 report indicated thirteen sites when, in fact, there were fourteen.*