Wisconsin Public Service Corporation
700 North Adams Street
P.O. Box 19001
Green Bay, WI 54307-9001

December 5, 2011

Ms. Kimberly D. Bose, Secretary
The Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

Dear Secretary Bose:

Eurasian Water Milfoil Proposed Monitoring & Control Plan - Grand Rapids Hydroelectric Project, FERC #2433

As per the Federal Energy Regulatory Commission (FERC) Order Modifying and Approving Eurasian Water Milfoil (EWM) Control Plan issued May 11, 2009 for the Wisconsin Public Service Corporation (WPS) Grand Rapids Hydroelectric Project FERC #2433 (Grand Rapids), WPS shall provide a letter detailing the status of the EWM control plan objective to the Michigan Department of Natural Resources (MDNR), U.S. Fish and Wildlife Services (USFWS) and the Wisconsin Department of Natural Resources (WDNR) by October 31st for the next three years beginning in 2009. After the 2010 field season, the licensee shall consult with the resource agencies on an appropriate control and /or monitoring schedule and file a new plan to the resource agencies by October 31, 2011 and to the FERC by December 31, 2011. The five components of the plan are as follows:

1. **Determine if native milfoil weevils are present**
2. **Work with other stakeholders within the Upper Menominee River Basin Watershed to exchange information about EWM presence and control strategies and to obtain information on the genetic characteristics of the EWM populations**
3. **Implement measures to help control the spread of EWM to other water bodies**
4. **Compliance with the FERC Order Modifying and Approving Purple loosestrife and EWM Monitoring Plan issued January 2, 1998**
5. **Provide New Plan for Monitoring and/or Control of EWM**

(1) Determine if native milfoil weevils are present

Beginning in 2009, WPS has contracted the services of EnviroScience, Inc. (EnviroScience) to complete surveys on the reservoir to determine the presence, distribution and density of the indigenous milfoil weevil (*Euhrychiopsis lecontei*) (weevil) population within Grand Rapids. In 2009, a total of seven sample locations were established, however suitable EWM samples were only observed at six of the sample locations due to the low EWM population (1.36 acres) and poor EWM plant conditions. From the EWM plants that were able to be analyzed, the survey did indicate that weevils are present within the reservoir and at a population that not only reached but had exceeded what may be a critical density necessary to reduce EWM population. The critical density is believed to be greater than 0.5 weevil/per stem. The 2009 survey results indicated a 1.10 weevils/ per stem ratio.

Because the EWM population observed at the Grand Rapids project observed in 2009 was low compared to other survey years and the plants observed were in poor physical condition, WPS completed a weevil population study again in 2010.

EnviroScience completed the weevil survey during the 2010 field season. EWM populations were once again low (less than 2 acres) however EWM samples were able to be collected and analyzed from all seven locations previously established in 2009. No additional areas of EWM were discovered. The 2010 survey results confirmed weevil densities are high in Grand Rapids and ranged from 0.03 to 5.60 weevil/per stem with a system-wide average of 2.5 weevil/per stem. Well above what is believed to be the critical density to reduce EWM populations.

To further qualify the weevil population estimates, WPS again hired the services of EnviroScience to complete a weevil population study in 2011. EWM samples were collected at four of the seven previous sample locations. EWM populations were reduced at the other three sample locations to a point where EWM samples were unable to be collected. The survey results once again indicated a high weevil population averaging 0.56 weevil/per stem at the remaining four sample locations. One new EWM location was observed. Weevils were not observed at the new EWM location, however being a new location WPS believes weevils will migrate to the area as has been observed at other new EWM locations.

The 2009, 2010 and 2011 Progress Reports of the Milfoil Weevil Population Studies are included in Appendix A.

(2) Work with other stakeholders within the Upper Menominee River Basin Watershed to exchange information about EWM presence and control strategies and to obtain information on the genetic characteristics of the EWM populations.

In 2010 and 2011, the genetics of the EWM samples collected at Grand Rapids were processed as part of the Upper Menominee River Basin Watershed Milfoil Genetics Study. In 2010, the presence of EWM was confirmed at six of the seven sample locations. Hybrid species of EWM and the native water milfoils were observed at four of the seven sample locations. Due to lack of EWM at all seven sample locations, genetic analysis was completed at only four sample locations in 2011. EWM was identified at three of the sample locations and the hybrid species was identified at two of the sample locations.

Populations of weevils have been recorded in all of these sites, regardless of the presence of EWM or the hybrid milfoil species.

(3) Implement measures to help control the spread of EWM to other water bodies.

Since 2009, WPS has reviewed the single Wisconsin and single Michigan boat landings for EWM. In 2009 and 2011, surveys were completed at the boat landings in the spring timeframe. During both surveys EWM populations were not observed.

During the spring of 2010, WPS representatives completed EWM surveys at both Grand Rapids boat landings. EWM was present along with other *Dicotylodonea* aquatic plants at both locations.

In consultation with the resource agencies a herbicide treatment was not completed because of possible effects of herbicide treatment on other *Dicotylodonea* aquatic plants and rare mussel species known to be present in the reservoir.

EWM was observed near the Michigan boat launch and fishing pier during the EnviroScience survey completed on July 12, 2011. However the EWM patches were sporadic and the dominant species

consisted of native aquatic plant species: coontail, elodea, flat-stem pondweed, Sago pondweed and water lily. EWM plants were not yet emerged during the spring survey.

In addition, invasive species awareness signs at each boat landing are checked and if necessary updated on an annual basis. During the most recent review in 2011, the signs were present and up to date. Each sign provided information on proper cleaning of watercrafts and trailers to avoid spreading invasive species.

(4) Compliance with the FERC Order Modifying and Approving Purple loosestrife and EWM Monitoring Plan issued January 2, 1998.

WPS has annually completed surveys for purple loosestrife and every third year completed EWM surveys as approved in the Order Modifying and Approving Purple loosestrife Monitoring Plan issued January 2, 1998.

Purple loosestrife surveys at Grand Rapids have been completed on annual basis since 1998. Purple loosestrife has never been observed during the survey. The most recent purple loosestrife survey was completed on July 11, 2011.

As approved by the FERC order, WPS last completed surveys of the EWM transects on July 9, 2009. EWM was only observed in 3 of the 15 transects encompassing a total of 1.36 acres. The next EWM survey is scheduled for 2012.

(5) Provide New Plan for Monitoring and/or Control of EWM

As per the FERC Order Modifying and Approving EWM Control Plan issued May 11, 2009 for the Grand Rapids Hydroelectric Project, WPS is to file a new plan to the resource agencies by October 31, 2011 and to the FERC by December 31, 2011.

WPS has completed the third year of the three-year study, as outlined in the FERC Order Modifying and Approving EWM Control Plan. The results of the three-year study show that the EWM perimeter has significantly decreased since observing 81 acres in 2008. During the three-year study period the largest EWM perimeter encompassed 10.9 acres. A figure providing the three-year comparison of the EWM populations is included as Appendix B.

In addition, according to the 2011 Progress Report of the Milfoil Weevil Population Study, stands of EWM identified at Grand Rapids generally range from sparse to very sparse, with only one stand having a moderately dense population of EWM. Every survey stand observed included EWM intermixed with native plant species including coontail, elodea, flat-stem pondweed, Sago pondweed and water lily.

The results of the three-year study are also consistent with fluctuation levels observed at Grand Rapids since EWM surveys began in 1998. Since 2006, EWM has shown fluctuations in stand perimeter, with a significant decrease in stand perimeter during the last three EWM survey years. EWM stand perimeters encompassed 15.58 acres in 2006, 47.8 acres in 2007, 81 acres in 2008, 1.6 acres in 2009, 2.0 acres in 2010 and 10.9 acres in 2011. In addition to the EWM stand perimeters, the EWM transects collected since 1998 also indicated a significant fluctuation in all surveys and a significant decrease in EWM abundance in the most recent survey.

A survey year to survey year comparison of relative abundance of EWM for each transect indicates the EWM abundance has decreased 36 times, increased 23 times and remained the same in 31 occurrences. When comparing the most recent EWM transect surveys completed in 2009 to the 1998 survey, a significant decrease in EWM abundance is observed. Nine (9) transects indicated a decrease from the 1998 to 2009 survey, 5 remained the same and one transect increased in relative abundance of EWM. Appendix C includes a summary of EWM relative abundance, along with the EWM survey sheets.

Beginning in 2009 and ending in 2011, survey s on the reservoir to determine the presence, distribution and density of the weevil population at Grand Rapids have been completed. The results of the surveys have indicated that weevil populations are present at Grand Rapids, and at populations well above what is believed to be the critical density to reduce EWM populations.

Based on the results of the three-year study, the native weevil population present at Grand Rapids is a major contributing factor to the fluctuation to the EWM populations that have been observed since 1998. The weevil population appears to fluctuate with the amount of EWM available and maintains the EWM population to a point where it is generally sparse to very sparse relative to the surrounding native aquatic vegetation. However, with any biological population that is affected by carrying capacity, the population of the controlling entity (weevils) can either exceed or lag behind the population of the species being controlled (EWM).

The results of the three-year study show that the EWM is effectively controlled by the native milfoil weevil at Grand Rapids. WPS should only continue with the survey method outlined in the FERC Order Modifying and Approving Purple loosestrife and EWM Monitoring Plan issued January 2, 1998. The Grand Rapids Hydroelectric Project Purple loosestrife and EWM Monitoring Plan is included in Appendix D.

The 2011 Grand Rapids EWM three-Year Study Report and Proposed EWM Monitoring Plan were provided to the Resource Agencies on October 7, 2011. The resource agencies did not provide comment. On November 7, 2011, WPS completed a follow up electronic mail correspondence with the Wisconsin Department of Natural Resources concerning comments. Comments were again not provided. Documentation of Consultation is included in Appendix E.

Should you have any questions relative to this material, please do not hesitate to contact Jamie Nuthals, at (920) 433-1460.

Sincerely,

Terry P. Jensky
Vice President - Energy Supply Operations
for Wisconsin Public Service Corporation

Enc.

cc: Mr. Ed Brandt, WPS
Mr. Bruce Crocker, WPS
Mr. Howard Giesler, WPS
Mr. Gil Snyder, WPS

APPENDIX A

2009, 2010 & 2011 MILFOIL WEEVIL POPULATION STUDY REPORT

APPENDIX B

2009, 2010 & 2011 EWM POPULATION FIGURE

APPENDIX C

EWM RELATIVE ABUNDANCE INFORMATION

APPENDIX D

FERC ORDER MODIFYING AND APPROVING PURPLE LOOSESTRIFE AND EWM MONITORING PLAN ISSUED JANUARY 2, 1998

APPENDIX E

DOCUMENTATION OF CONSULTATION

2009 Progress Report of Milfoil Weevil Population Study Within the Menominee River

Prepared for:

Wisconsin Public Service

Prepared by:

EnviroScience, Inc.,
3781 Darrow Road, Stow, Ohio 44224
(800) 940-4025 · www.enviroscienceinc.com

September 18, 2009

1.0 Introduction

Wisconsin Public Service Corporation (WPS) contracted EnviroScience to further investigate the milfoil weevil (*Euhrychiopsis lecontei*) and its potential to control Eurasian watermilfoil (*Myriophyllum spicatum*) (EWM) within the Menominee River watershed on the Grand Rapids Hydroelectric Project. The study was to evaluate the existing indigenous weevil population, if present, and its distribution throughout the reservoir.

2.0 Weevil Distribution

Eurasian watermilfoil is prevalent within the reservoir. In 2008, EWM was scattered throughout 81 acres of the reservoir. It was originally proposed to collect a minimum of 180 stems to assess the weevil population however, at the time of the survey on July 9, 2009, the milfoil was very sparse and in bad condition. A total of 49 stems were collected from seven areas. Under normal protocol, the survey was achieved by collecting pairs of plants along a transect line placed perpendicular to shore by swimming through selected beds of EWM. The tops of two randomly selected plants were removed at five evenly spaced intervals, for a total of ten plants along each line. However, in most locations the protocol had to be modified by running transects parallel to shore, or sometimes a zigzag pattern, due to the sparseness of the EWM found during the time of the survey. A GPS point was taken at each transect that stems were collected, named T1, T2, T3 and so on (Figure 1). A point was taken for T5 but no stems were found for collection.

A natural population of weevils was found to be distributed throughout the Grand Rapids Reservoir even with the low density of plants. Transect data revealed weevil life stages on most of the stems collected from the survey with the highest population found in the first transect (Table 2.0A).

Figure 1. Wisconsin Public Service, Grand Rapids Reservoir.

Survey Locations

200 100 0 200 Meters

500 250 0 500 Feet

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Wisconsin Public Service

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Table 2.0A Stem Analysis Data at Each Transect

Transect #1:	Meristems	EGGS	LARVAE	PUPAE	ADULTS
Stem 1	1	2	0	0	1
Stem 2	1	3	0	0	0
Stem 3	1	2	1	0	0
Stem 4	1	1	1	0	0
Stem 5	1	0	1	0	0
Stem 6	2	7	0	0	0
Stem 7	2	0	0	0	0
Stem 8	1	1	2	0	0
Stem 9	1	0	0	0	0
Stem 10	1	0	0	0	1
Total	**12**	**16**	**5**	**0**	**2**

Transect #2:	Meristems	EGGS	LARVAE	PUPAE	ADULTS
Stem 1	2	1	0	0	0
Stem 2	1	0	0	0	0
Stem 3	2	0	0	0	0
Stem 4	1	2	0	0	0
Stem 5	1	0	0	0	0
Stem 6	1	0	1	0	0
Stem 7	1	0	1	0	0
Stem 8	1	2	0	0	0
Stem 9	1	0	0	0	0
Stem 10	1	0	0	0	0
Total	**12**	**5**	**2**	**0**	**0**

Transect #3:	Meristems	EGGS	LARVAE	PUPAE	ADULTS
Stem 1	3	0	0	0	0
Stem 2	2	3	0	0	0
Stem 3	1	0	0	0	0
Stem 4	1	0	0	0	0
Stem 5	1	0	0	0	0
Stem 6	1	0	0	0	0
Stem 7	2	1	0	0	0
Stem 8	1	1	0	0	0
Stem 9	1	0	0	0	0
Stem 10	1	0	1	0	0
Total	**14**	**5**	**1**	**0**	**0**

Transect #4:	Meristems	EGGS	LARVAE	PUPAE	ADULTS
Stem 1	2	0	1	0	0
Stem 2	1	0	1	0	0
Stem 3	1	0	1	0	0
Stem 4	2	7	1	0	0
Stem 5	3	4	0	0	1
Stem 6	2	1	0	0	1
Stem 7	2	1	0	0	0
Stem 8	0	0	0	0	0
Stem 9	0	0	0	0	0
Stem 10	0	0	0	0	0
Total	**13**	**13**	**4**	**0**	**2**

Transect #6:	Meristems	EGGS	LARVAE	PUPAE	ADULTS
Stem 1	1	0	0	0	0
Stem 2	2	1	0	0	0
Stem 3	2	0	0	0	0
Stem 4	1	0	0	0	0
Stem 5	3	0	0	0	0
Stem 6	1	0	0	0	0
Total	**10**	**1**	**0**	**0**	**0**

Transect #7:	Meristems	EGGS	LARVAE	PUPAE	ADULTS
Stem 1	1	0	0	0	0
Stem 2	1	0	0	0	0
Stem 3	1	0	0	0	0
Total	**3**	**0**	**0**	**0**	**0**

Table 2.0B Tansect Analysis

Parameter Measured	**Survey July 9, 2009**
Total weevils	54.00
Total stems	49.00
Total weevils/stem	**1.10**
Ave. meristems/stem	1.31

2.1 Discussion

For unknown reasons, the overall health of the macrophytes (monocots and dicots) within the reservoir was in very poor condition. However, laboratory analysis of stems collected during the survey revealed weevil densities had not only reached, but had exceeded, what the literature may indicate a critical density (≥0.5 weevils/stem) necessary to reduce EWM (Newman et al. 1996). While this may be true for lacustrine water bodies, it is unclear if this statement is accurate for riverine systems.

5.0 Literature Cited

Newman, R.M., K.L. Holmberg, D.D. Biesboer and B.G. Penner. 1996. Effects of a potential biocontrol agent, *Euhrychiopsis lecontei*, on Eurasian watermilfoil in experimental tanks. *Aquat. Bot.* 53:131-150.

2010 Progress Report of the Milfoil Weevil Population Study within

Grand Rapids Hydroelectric Project

Prepared for:

Wisconsin Public Service

Prepared by:

EnviroScience, Inc.,
3781 Darrow Road, Stow, Ohio 44224
(800) 940-4025 · www.enviroscienceinc.com

October 8, 2010

Introduction

In 2008, the invasive aquatic macrophyte, Eurasian watermilfoil (*Myriophyllum spicatum*) (EWM) was prevalent within the Grand Rapids Hydroelectric Project (Grand Rapids), with an estimated 81 acres of the invasive plant in the reservoir. EnviroScience Inc. was contracted in 2009 to evaluate the presence, distribution, and density of the indigenous milfoil weevil (*Euhrychiopsis lecontei*) population throughout Grand Rapids and the relative abundance of EWM in the reservoir. The 2009 survey of Grand Rapids found significantly lower EWM than was present in 2008. However, high numbers of milfoil weevils were found on the sparse and widely distributed plants (2009 *Progress Report of Milfoil Weevil Population Study within the Menominee River,* Sept. 17, 2009). A similar dynamic was found in 2009 in the Peavy Falls Reservoir of the Menominee River system.

In 2010, WPS again contracted EnviroScience Inc. to perform a population survey to monitor the presence, distribution, and density of the existing indigenous milfoil weevil population in the Grand Rapids. This report summarizes the findings from the August 3rd survey performed on the Grand Rapids

Results

EWM was present in all seven previously sampled 2009 sites. (Figure 1.), and no additional areas of EWM were discovered during the 2010 survey. EWM density was sparse in six of the seven 2010 sample sites and moderately dense in one. EWM was intermixed with native plants in all of the sites and two of the sites (M6 and M7) had limited stems (≤ 5%) at the water's surface. A total of 70 stems (10 from each site) were collected from Grand Rapids to estimate weevil density.

Weevil densities remain high in Grand Rapids and ranged from 0.03 to 5.60 /EWM stem with a system-wide average of 2.5 weevils/stem (Figure 2). In addition to the weevils found on the samples collected, adult weevils were also seen on EWM plants while collecting samples in sites M2 and M5. Weevils spotted in the field were not collected as this could bias our population estimates. Damage from weevil herbivory was also witnessed in three sites (M2, M4 and M5).

Discussion

In six of seven sites in the Grand Rapids EWM was sparse. These same six sites had weevil densities well above the minimum density presented in the literature for EWM suppression in controlled conditions (0.5 /stem) (Newman *et al.* 1996). The seventh site

had moderate EWM density, a weevil density below 0.5 /stem as well as having the most EWM that reached the surface (estimated at 5%).

Literature Cited

Newman, R.M., K.L. Holmberg, D.D. Biesboer and B.G. Penner. 1996. Effects of a potential biocontrol agent, *Euhrychiopsis lecontei*, on Eurasian watermilfoil in experimental tanks. Aquatic Botany. 53:131-150.

Figure 1 Sample locations for 2010 weevil population study on Grand Rapids Reservoir

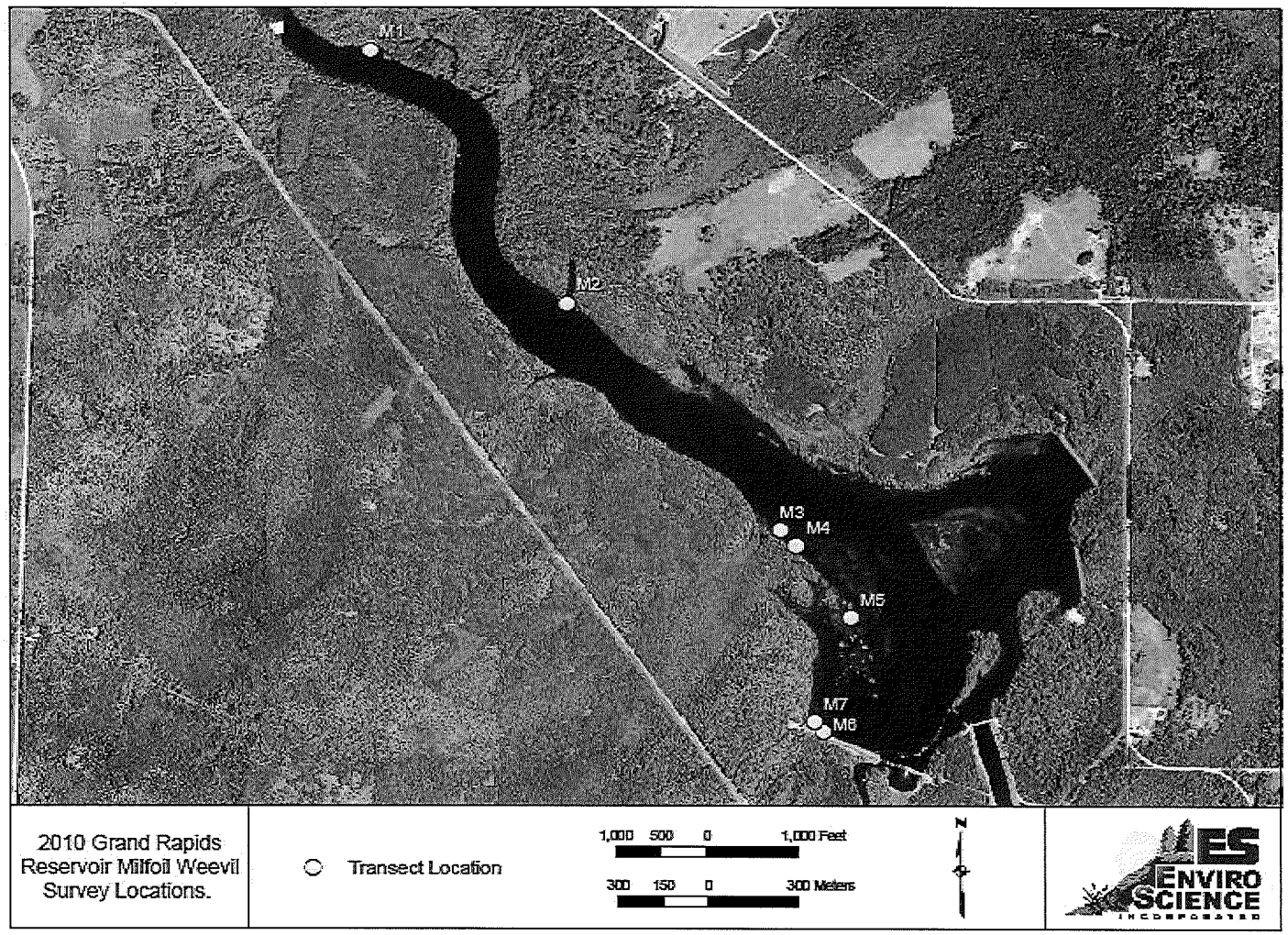

Figure 2. Weevil densities by site in Grand Rapids reservoir 2010

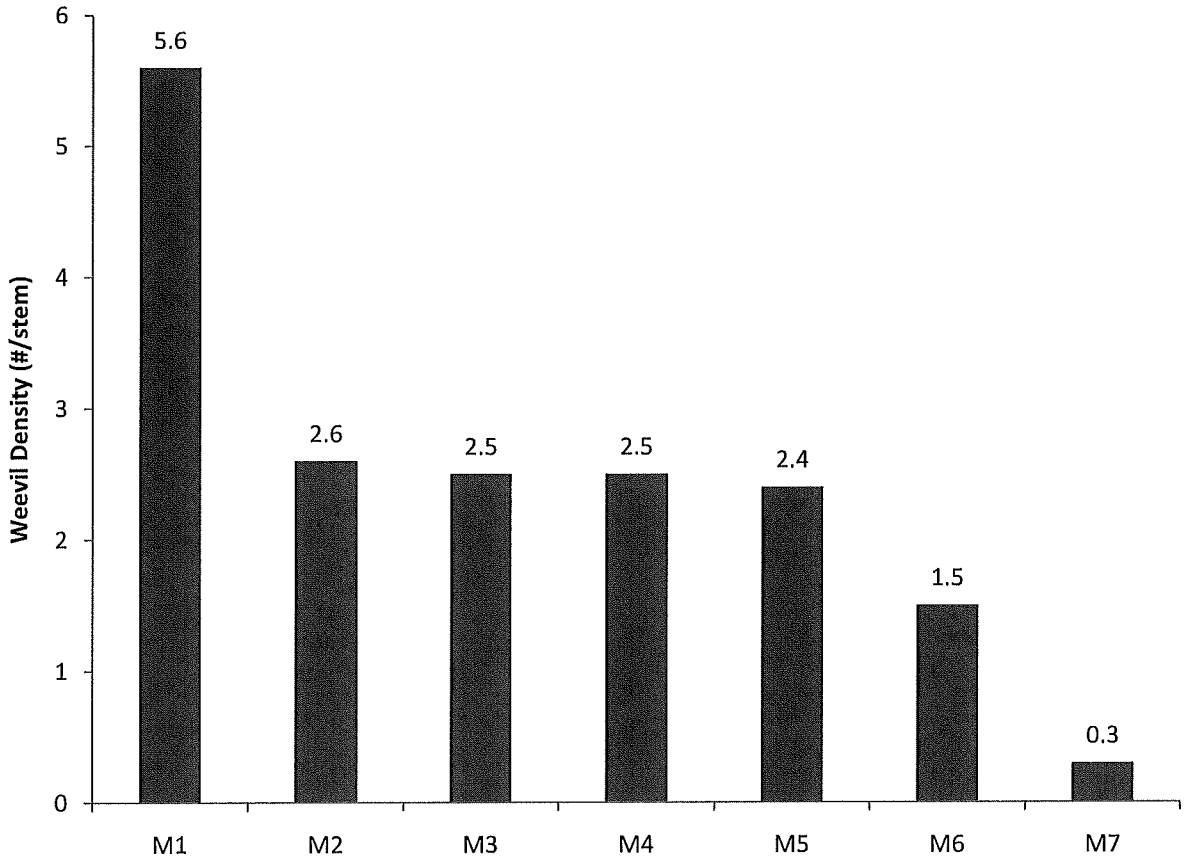

Table 1 EWM stem analysis for weevil densities by site

M1

Stem #	Meristems	Eggs	Larvae	Pupae	Adults
1	1	0	1	0	1
2	1	5	2	0	0
3	1	18	0	0	0
4	2	5	1	0	0
5	1	2	0	0	0
6	1	4	1	0	0
7	1	1	0	0	0
8	1	6	0	0	0
9	1	4	3	0	0
10	1	1	1	0	0
Total	**11**	**46**	**9**	**0**	**1**

M2

Stem #	Meristems	Eggs	Larvae	Pupae	Adults
1	3	3	3	0	0
2	1	5	1	0	0
3	1	2	0	0	0
4	1	2	0	0	0
5	1	0	0	0	0
6	0	3	0	0	0
7	0	0	0	0	0
8	1	0	2	0	1
9	1	1	3	0	0
10	1	0	0	0	0
Total	**10**	**16**	**9**	**0**	**1**

M3

Stem #	Meristems	Eggs	Larvae	Pupae	Adults
1	1	2	0	0	2
2	2	0	0	0	0
3	2	0	1	0	1
4	1	4	0	0	0
5	3	9	0	0	0
6	1	2	2	0	0
7	2	0	0	0	0
8	1	0	0	0	0
9	1	0	0	0	0
10	1	0	2	0	0
Total	**15**	**17**	**5**	**0**	**3**

M4

Stem #	Meristems	Eggs	Larvae	Pupae	Adults
1	1	0	0	0	0
2	2	3	2	0	0
3	3	7	2	0	0
4	2	1	0	0	0
5	2	4	0	0	0
6	1	0	0	0	0
7	2	1	0	0	0
8	1	1	0	0	0
9	2	2	0	0	0
10	2	2	0	0	0
Total	**18**	**21**	**4**	**0**	**0**

M5

Stem #	Meristems	Eggs	Larvae	Pupae	Adults
1	2	12	0	0	1
2	1	6	3	0	0
3	1	0	0	0	0
4	1	1	0	0	0
5	2	0	0	0	0
6	1	0	0	0	0
7	1	0	1	0	0
8	1	0	0	0	0
9	1	0	0	0	0
10	2	0	0	0	0
Total	**13**	**19**	**4**	**0**	**1**

M6

Stem #	Meristems	Eggs	Larvae	Pupae	Adults
1	1	1	0	0	0
2	1	2	0	0	0
3	2	4	2	0	0
4	1	0	0	0	0
5	1	1	0	0	0
6	1	0	0	0	0
7	2	3	0	0	0
8	1	0	0	0	0
9	1	1	0	0	0
10	2	1	0	0	0
Total	**13**	**13**	**2**	**0**	**0**

		M7			
Stem #	**Meristems**	**Eggs**	**Larvae**	**Pupae**	**Adults**
1	2	2	0	0	0
2	1	0	0	0	0
3	1	0	0	0	0
4	1	1	0	0	0
5	1	0	0	0	0
6	1	0	0	0	0
7	1	0	0	0	0
8	1	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
Total	**9**	**3**	**0**	**0**	**0**

2011 Progress Report of the Milfoil Weevil Population Study within

The Menominee River Grand Rapids Reservoir

Prepared for:

Wisconsin Public Service

Prepared by:

EnviroScience, Inc.,
3781 Darrow Road, Stow, Ohio 44224
(800) 940-4025 · www.enviroscienceinc.com

September 30, 2011

Introduction

The invasive aquatic macrophyte, Eurasian watermilfoil (*Myriophyllum spicatum*; herein referred to as EWM) is prevalent within the Grand Rapids Hydroelectric Reservoir located between Marinette County, Wisconsin and Menominee County, Michigan. EnviroScience, Inc. was contracted by Wisconsin Public Services (WPS) from 2009 to present to evaluate the presence, distribution, and population density of the indigenous milfoil weevil (*Euhrychiopsis lecontei*), a specialist herbivore of EWM. Also evaluated was the relative abundance of EWM throughout the reservoir. Findings from both 2009 and 2010 surveys include high numbers of milfoil weevils found on sparsely distributed EWM throughout the survey sites. This report summarizes the findings from the July 12, 2011 survey performed on the Grand Rapids reservoir.

Weevil Abundance Results

Relative EWM density has decreased in previous survey sites M3, M4 and M5, no samples were collected. A new site was created, M8, due to density of EWM and size of the bed. A total of 50 stems (10 from each site) were collected to estimate weevil density. Under normal protocol, the survey was achieved by collecting pairs of plants along a transect line placed perpendicular to shore by swimming through selected beds of EWM. The tops of two randomly selected plants were removed at five evenly spaced intervals, for a total of ten plants along each line. However, in most locations the protocol had to be modified by running transects parallel to shore, or sometimes a zigzag pattern, due to the sparseness of the EWM found during the time of the survey. Weevil densities ranged from 0.00 to 0.83 weevils per stem (Table 1). Field observations included adult weevils in sites M1 and M2. Laboratory analysis revealed weevil life stages in M1, M2, M3 and M7 with weevil-induced damage and herbivory occurring on 50-80% of the samples (Figure 1). No weevil life stages or damage were found in M8.

EWM Abundance Results

Methods

Aquatic vegetation survey procedures used by EnviroScience are patterned after those developed by the State of Michigan and have been designed to ensure easily replicable surveys of the existing aquatic plant communities. The survey is carried out by sampling individual Aquatic Vegetation Assessment Sites (AVAS's) throughout the lakes' littoral zone (i.e. areas where water depth is <20feet). The locations of the AVAS's are determined by dividing up the lake's shoreline into segments approximately 500 feet in length. Each AVAS is sampled by using visual observation (depending on water clarity), and weighted rake tows. Each plant species observed as well as an estimate of density are recorded for each AVAS. Plant species are identified by numbers designated on the survey map's plant species list and densities are recorded by using the following table key:

(a) = found: One or two plants of a species found in an AVAS, equivalent to less than 2% of the total AVAS surface area.

3781 DARROW ROAD, STOW, OHIO 44224
330-688-0111 / TOLL FREE: 800-940-4025 / FAX: 330-688-3858

(b) = sparse: Scattered distribution of a species in an AVAS, equivalent to between 2% and 20%of the total AVAS surface area.

(c) = common: Common distribution of a species where the species is easily found in an AVAS equivalent to between 21% and 60% of the total AVAS surface area.

(d) = dense: Dense distribution of a species where the species is present in considerable quantities throughout an AVAS, equivalent to greater than 60% of the total AVAS surface area.

Results

Starting at the bridge (Co Hwy Jj) and heading downstream, multiple areas were surveyed in search of EWM but nothing was found until M1. EWM density in the weevil distribution sites were as: very sparse in M1 (a), sparse at M2, M6 and M7 (b) and moderately dense in M8 (c). In addition to the weevil surveys performed at all M locations; sites A-D were assessed for relative abundance of EWM (Figure 1). In area named A, less than 10 stems were found. Overall these sites contained sporadic patches of EWM and stem density was sparse. The newly established site M8 was the densest bed, although still considered moderate, found throughout the reservoir. This bed was found to be 2.3 acres in size however, EWM made up 55% of the bed while the rest was Coontail (*Ceratophyllum demersum*) and Elodea (*Elodea canadensis*) and at the surface. The largest bed named C (four acres in size) contained 20% EWM, 50% Coontail, 25% Elodea and 5% *Potamogetan* spp. Sporadic patches of EWM were found in areas depicted as B and D, the area of the boat launch and fishing pier. Every survey site throughout the reservoir included EWM intermixed with native plant species including Coontail, Elodea, Flat-stem pondweed (*Potamogeton zosteriformis*), Sago pondweed (*P. pectinatus*), and Water lily (*Nymphaea* spp.). The total acreage of EWM as of July 12 was 10.9 acres.

Genetic Profile

In 2010 and 2011, the genetics of milfoil samples collected in Grand Rapids reservoir were processed by the Annis Water Resources Institute as part of a Mitigation and Enhancement Fund (MEF) project in the region. In 2010, the presence of Eurasian watermilfoil was confirmed at M 2-5 and M7. Hybrid species of *M. spicatum* and *M. sibiricum* were found at M1, M2, M6 and M7. Results this year from the four sites sampled were: EWM found from M1, M2 and M6 while hybrid species were found at M1 and M7. Populations of weevils have been recorded in all of these sites, regardless of the presence of a hybrid milfoil species.

Discussion

Four sites where EWM was sparse included weevil densities at or above the critical density presented in the literature necessary to cause a decline in EWM (≥0.5 weevils/stem) (Newman and Biesboer 2000). When comparing the presence of weevils in sparse sites to the absence of weevils in the densest site (M8), it appears likely that milfoil weevils are likely contributing to the decline and continued suppression of EWM in this reservoir. Sites containing weevil populations

at the critical density for EWM declines display higher levels of weevil-induced damage than sites that do not contain weevil populations (Figure 2).

The main river channel contained very sparse EWM while the main bay area of the reservoir was sparse to moderate in density. The native macrophyte community was dominant in all areas of the reservoir. This holds true for a lot of the reservoirs within the Menominee River. Seasonal variations are expected. Annual weevil population studies and long-term monitoring in progress at Grand Rapids reservoir and in other reservoirs within the Menominee River system allow for increased understanding of the relationship between weevil populations and EWM densities. Multiple-year data seem to indicate weevils are playing a role in regulating the growth and spread of EWM.

Literature Cited

Newman, R.M. and Biesboer, D.D. 2000. A Decline of Eurasian Watermilfoil in Minnesota Associated with the Milfoil Weevil *Euhrychiopsis lecontei* J Aquat. Plant Manage. 38: 105-111.

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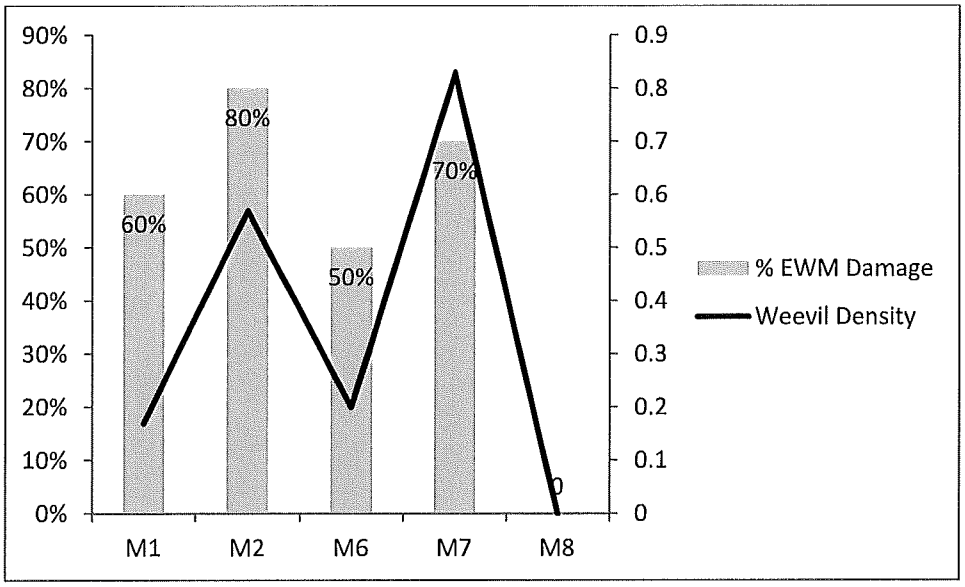

Figure 2. EWM Damage (% of samples damaged) and Weevil Density (#/stem) in Grand Rapids Reservoir

Table 1. Milfoil stem analysis of weevil densities by site in Grand Rapids Reservoir

		M1			
Stem #	**Meristems**	**Eggs**	**Larvae**	**Pupae**	**Adults**
1	2	0	0	0	0
2	2	0	0	0	0
3	3	0	0	0	0
4	5	3	0	0	0
5	1	0	0	0	0
6	4	2	0	0	0
7	3	0	0	0	0
8	6	0	0	0	0
9	2	0	0	0	0
10	4	0	0	0	0
Total	**32**	**5**	**0**	**0**	**0**

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M2

Stem #	Meristems	Eggs	Larvae	Pupae	Adults
1	**1**	**2**	**0**	**0**	**0**
2	1	1	0	0	0
3	2	2	1	0	0
4	1	0	1	0	0
5	1	0	1	0	0
6	4	3	0	0	0
7	3	0	2	0	0
8	2	2	0	0	0
9	2	0	1	0	0
10	4	0	1	0	0
Total	**21**	**10**	**7**	**0**	**0**

M6

Stem #	Meristems	Eggs	Larvae	Pupae	Adults
1	0	0	2	0	0
2	2	0	1	0	0
3	3	0	0	0	0
4	1	0	0	0	0
5	2	0	0	0	1
6	1	0	0	0	1
7	4	0	0	0	0
8	2	0	0	0	0
9	1	1	0	0	0
10	3	0	0	0	0
Total	**19**	**1**	**3**	**0**	**2**

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		M7			
Stem #	Meristems	Eggs	Larvae	Pupae	Adults
1	3	3	2	0	1
2	3	7	0	0	0
3	2	1	1	0	0
4	4	0	2	0	0
5	1	1	0	0	0
6	3	4	0	0	0
7	2	1	0	0	0
8	1	0	1	0	0
9	1	0	1	0	0
10	3	0	0	0	0
Total	**23**	**17**	**7**	**0**	**1**

		M8			
Stem #	Meristems	Eggs	Larvae	Pupae	Adults
1	1	0	0	0	0
2	5	0	0	0	0
3	1	0	0	0	0
4	1	0	0	0	0
5	4	0	0	0	0
6	4	0	0	0	0
7	3	0	0	0	0
8	1	0	0	0	0
9	2	0	0	0	0
10	5	0	0	0	0
Total	**27**	**0**	**0**	**0**	**0**

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TABLE 1
GRAND RAPIDS HYDROELECTRIC PROJECT
SUMMARY OF EWM RELATIVE ABUNDANCE

Transcet #	1998 vs 2001	2001 vs 2004	2004 vs 2006	2006 vs 2007	2007 vs. 2009	1998 vs 2009
1	Decrease	Increase	Decrease	Increase	Decrease	Decrease
2	Decrease	Increase	Decrease	Increase	Decrease	Decrease
3	Same	Increase	Decrease	Increase	Decrease	Decrease
4	Same	Increase	Increase	Increase	Decrease	Same
5	Same	Increase	Increase	Increase	Decrease	Increase
6	Same	Same	Same	Same	Same	Same
7	Same	Increase	Decrease	Increase	Decrease	Decrease
8	Increase	Increase	Decrease	Increase	Decrease	Same
9	Decrease	Same	Same	Same	Same	Same
10	Same	Same	Decrease	Same	Same	Decrease
11	Decrease	Same	Same	Same	Decrease	Decrease
12	Decrease	Same	Same	Increase	Decrease	Decrease
13	Decrease	Decrease	Same	Increase	Decrease	Decrease
14	Same	Decrease	Increase	Same	Decrease	Decrease
15	Increase	Decrease	Same	Increase	Decrease	Same

Example:

Transcet #1	1A	1B	1C
1998	0	1	1
2001	0	0	0

Eurasian Milfoil Abundance					
Grand Rapids			8/18/98		
Transect	0-0.5 Meters	0.5-1.5 Meters	1.5-3.0 Meters	>3.0 Meters	Origin
1A	0	0	NA	NA	45 21.809
1B	1	1	NA	NA	87 39.562
1C	1	0	0	NA	
2A	0	1	1	NA	45 21.841
2B	1	0	NA	NA	87 39.561
2C	0	0	NA	NA	
3A	0	1	NA	NA	45 21.855
3B	0	0	NA	NA	87 39.553
3C	0	0	NA	NA	
4A	0	0	NA	NA	45 22.022
4B	0	0	NA	NA	87 39.467
4C	0	0	NA	NA	
5A	0	0	NA	NA	45 22.092
5B	0	0	NA	NA	87 39.562
5C	0	0	NA	NA	
6A	0	0	NA	NA	45 22.176
6B	0	0	NA	NA	87 39.713
6C	0	0	NA	NA	
7A	0	1	NA	NA	45 21.890
7B	0	0	0	NA	87 39.425
7C	0	0	NA	NA	
8A	0	0	NA	NA	45 21.830
8B	0	0	NA	NA	87 39.608
8C	0	0	NA	NA	
9A	0	0	NA	NA	45 21.995
9B	0	0	NA	NA	87 39.216
9C	0	0	NA	NA	
10A	0	0	NA	NA	45 22.059
10B	1	0	NA	NA	87 38.990
10C	0	0	NA	NA	
11A	0	1	NA	NA	45 22.174
11B	0	1	NA	NA	87 38.985
11C	0	0	NA	NA	
12A	1	0	0	NA	45 22.223
12B	0	1	0	NA	87 39.006
12C	1	1	0	NA	
13A	2	1	NA	NA	45 22.261
13B	2	3	NA	NA	87 39.006
13C	2	1	NA	NA	
14A	3	3	NA	NA	45 22.298
14B	4	3	NA	NA	87 39.006
14C	3	3	NA	NA	
15A	0	0	0	NA	45 22.275
15B	0	0	0	NA	87 39.223
15C	0	0	0	NA	
All transects are 40 feet in length and proceed in an easterly direction from their origin.					

Abundance Scale
0-Absent
1-Present
2-Presence Less Than Half
3-Equal Presence Compared to Other Species
4-Dominant Species Present
5-Total Infestation

Grand Rapids					
Eurasian Milfoil Surveys - 2001					
Transect #	Results at 0.5 feet	Results at 1.5 feet	Results at 3.0 feet	Results at +3.0 feet	Origin
1A	0	0	N/A	N/A	45 21.809
1B	0	0	N/A	N/A	87 39.562
1C	0	0	N/A	N/A	
2A	0	0	N/A	N/A	45 21.841
2B	0	0	N/A	N/A	87 39.561
2C	0	0	N/A	N/A	
3A	0	0	N/A	N/A	45 21.855
3B	0	0	N/A	N/A	87 39.553
3C	0	1	N/A	N/A	
4A	0	0	N/A	N/A	45 22.022
4B	0	0	N/A	N/A	87 39.467
4C	0	0	N/A	N/A	
5A	0	0	N/A	N/A	45 22.092
5B	0	0	N/A	N/A	87 39.562
5C	0	0	N/A	N/A	
6A	0	N/A	N/A	N/A	45 22.176
6B	0	N/A	N/A	N/A	87 39.713
6C	0	N/A	N/A	N/A	
7A	0	0	N/A	N/A	45 21.890
7B	0	0	N/A	N/A	87 39.425
7C	1	1	N/A	N/A	
8A	1	N/A	N/A	N/A	45 21.830
8B	1	N/A	N/A	N/A	87 39.608
8C	0	N/A	N/A	N/A	
9A	0	0	N/A	N/A	45 21.995
9B	0	0	N/A	N/A	87 39.216
9C	0	0	N/A	N/A	
10A	0	0	N/A	N/A	45 22.059
10B	0	0	N/A	N/A	87 38.990
10C	1	0	N/A	N/A	
11A	0	0	N/A	N/A	45 22.174
11B	0	0	N/A	N/A	87 38.985
11C	0	0	N/A	N/A	
12A	0	0	N/A	N/A	45 22.223
12B	0	0	N/A	N/A	87 39.006
12C	0	0	N/A	N/A	
13A	1	1	N/A	N/A	45 22.261
13B	0	0	N/A	N/A	87 39.006
13C	1	0	N/A	N/A	
14A	1	1	N/A	N/A	45 22.298
14B	1	1	N/A	N/A	87 39.006
14C	1	1	N/A	N/A	
15A	0	N/A	N/A	N/A	45 22.275
15B	0	N/A	N/A	N/A	87 39.223
15C	0	N/A	N/A	N/A	

Abundance Scale: 0-Absent, 1-Present, 2-Presence Less Than Half, 3-Equal Presence Compared to Other Species, 4-Dominant Species Present, 5-Total Infestation

Note: All transects are 40 feet in length and proceed in an easterly direction from their origin.

Grand Rapids					
Eurasian Milfoil Surveys - 2004					
Transect #	Results at 0.5 feet	Results at 1.5 feet	Results at 3.0 feet	Results at +3.0 feet	Origin
1A	0	1	0	N/A	45 21.809
1B	0	0	0	N/A	87 39.562
1C	1	0	0	N/A	
2A	0	0	0	N/A	45 21.841
2B	1	2	1	N/A	87 39.561
2C	0	1	1	N/A	
3A	3	2	N/A	N/A	45 21.855
3B	3	3	N/A	N/A	87 39.553
3C	3	3	N/A	N/A	
4A	1	0	N/A	N/A	45 22.022
4B	0	0	N/A	N/A	87 39.467
4C	0	0	N/A	N/A	
5A	0	0	N/A	N/A	45 22.092
5B	0	0	N/A	N/A	87 39.562
5C	1	0	N/A	N/A	
6A	0	0	N/A	N/A	45 22.176
6B	0	0	N/A	N/A	87 39.713
6C	0	0	N/A	N/A	
7A	1	0	N/A	N/A	45 21.890
7B	0	1	N/A	N/A	87 39.425
7C	1	2	N/A	N/A	
8A	0	1	1	N/A	45 21.830
8B	0	1	1	N/A	87 39.608
8C	0	2	1	N/A	
9A	0	0	0	N/A	45 21.995
9B	0	0	0	N/A	87 39.216
9C	0	0	0	N/A	
10A	0	0	N/A	N/A	45 22.059
10B	1	0	N/A	N/A	87 38.990
10C	0	0	N/A	N/A	
11A	0	0	N/A	N/A	45 22.174
11B	0	0	N/A	N/A	87 38.985
11C	0	0	N/A	N/A	
12A	0	0	N/A	N/A	45 22.223
12B	0	0	N/A	N/A	87 39.006
12C	0	0	N/A	N/A	
13A	0	0	N/A	N/A	45 22.261
13B	0	0	N/A	N/A	87 39.006
13C	0	0	N/A	N/A	
14A	2	1	N/A	N/A	45 22.298
14B	3	1	1	N/A	87 39.006
14C	0	0	1	N/A	
15A	0	0	N/A	N/A	45 22.275
15B	0	0	N/A	N/A	87 39.223
15C	0	0	N/A	N/A	

Abundance Scale: 0-Absent, 1-Present, 2-Presence Less Than Half, 3-Equal Presence Compared to Other Species, 4-Dominant Species Present, 5-Total Infestation

Note: All transects are 40 feet in length and proceed in an easterly direction from their origin.

Eurasian Milfoil Surveys - 2006

Grand Rapids

Transect #	Results at 0.5 feet	Results at 1.5 feet	Results at 3.0 feet	Results at +3.0 feet	Origin	Perimeter
1A	0	0	0	N/A	45 21.809	
1B	0	0	0	N/A	87 39.562	
1C	0	0	0	N/A		
2A	0	0	0	N/A	45 21.841	
2B	0	0	N/A	N/A	87 39.561	
2C	0	0	N/A	N/A		
3A	0	0	N/A	N/A	45 21.855	
3B	0	0	N/A	N/A	87 39.553	
3C	2	3	N/A	N/A		
4A	0	0	N/A	N/A	45 22.022	5.1 acres
4B	0	1	N/A	N/A	87 39.467	
4C	0	1	N/A	N/A		
5A	0	1	N/A	N/A	45 22.092	6.3 acres
5B	0	1	N/A	N/A	87 39.562	
5C	1	1	N/A	N/A		
6A	0	0	N/A	N/A	45 22.176	
6B	0	0	N/A	N/A	87 39.713	
6C	0	0	N/A	N/A		
7A	0	0	N/A	N/A	45 21.890	3.7 acres
7B	0	0	N/A	N/A	87 39.425	
7C	0	1	2	N/A		
8A	0	0	N/A	N/A	45 21.830	
8B	0	0	N/A	N/A	87 39.608	
8C	0	0	N/A	N/A		
9A	0	0	N/A	N/A	45 21.995	
9B	0	0	N/A	N/A	87 39.216	
9C	0	0	0	N/A		
10A	0	N/A	N/A	N/A	45 22.059	
10B	0	N/A	N/A	N/A	87 38.990	
10C	0	N/A	N/A	N/A		
11A	0	0	N/A	N/A	45 22.174	
11B	0	0	N/A	N/A	87 38.985	
11C	0	0	0	N/A		
12A	0	0	0	N/A	45 22.223	
12B	0	0	0	N/A	87 39.006	
12C	0	0	0	N/A		
13A	0	0	N/A	N/A	45 22.261	
13B	0	0	N/A	N/A	87 39.006	
13C	0	0	N/A	N/A		
14A	2	4	N/A	N/A	45 22.298	0.48 acres
14B	1	4	N/A	N/A	87 39.006	
14C	1	3	N/A	N/A		
15A	0	N/A	N/A	N/A	45 22.275	
15B	0	N/A	N/A	N/A	87 39.223	
15C	0	0	N/A	N/A		

N/A: Not Applicable

Abundance Scale: 0-Absent, 1-Present, 2-Presence Less Than Half, 3-Equal Presence Compared to Other Species, 4-Dominant Species Present, 5-Total Infestation

Note: All transects are 40 feet in length and proceed away from shore in a direction perpendicular to the shoreline

Grand Rapids						
Eurasian Milfoil Survey – August 1, 2007						
Transect #	Results at 0.5 m	Results at 1.5 m	Results at 3.0 m	Results at +3.0 m	Origin	Perimeter
1A	2	1	1	NA	45 21.809	Transects 1,2,3,4,5,7 & 8 = 38.8 acres
1B	0	1	1	NA	87 39.562	
1C	4	2	4	NA		
2A	1	1	NA	NA	45 21.841	
2B	2	2	NA	NA	87 39.561	
2C	4	4	NA	NA		
3A	5	4	NA	NA	45 21.855	
3B	4	4	NA	NA	87 39.553	
3C	4	4	NA	NA		
4A	4	4	NA	NA	45 22.022	
4B	4	4	NA	NA	87 39.467	
4C	4	4	NA	NA		
5A	2	2	NA	NA	45 22.092	
5B	3	2	NA	NA	87 39.562	
5C	2	3	NA	NA		
6A	0	NA	NA	NA	45 22.176	
6B	0	0	NA	NA	87 39.713	
6C	0	0	NA	NA		
7A	0	0	NA	NA	45 21.890	
7B	0	0	NA	NA	87 39.425	
7C	4	4	3	NA		
8A	1	2	NA	NA	45 21.830	
8B	2	3	NA	NA	87 39.608	
8C	2	2	NA	NA		
9A	0	0	NA	NA	45 21.995	
9B	0	0	NA	NA	87 39.216	
9C	0	0	NA	NA		
10A	0	NA	NA	NA	45 22.059	
10B	0	NA	NA	NA	87 38.990	
10C	0	0	NA	NA		
11A	0	0	NA	NA	45 22.174	
11B	0	0	NA	NA	87 38.985	
11C	0	0	1	NA		
12A	0	1	NA	NA	45 22.223	
12B	0	1	NA	NA	87 39.006	
12C	1	1	NA	NA		
13A	2	2	NA	NA	45 22.261	
13B	1	2	NA	NA	87 39.006	0.2 acres
13C	2	3	NA	NA		0.9 acres
14A	3	3	NA	NA	45 22.298	
14B	3	2	NA	NA	87 39.006	
14C	2	2	NA	NA		6.1 acres
15A	1	NA	NA	NA	45 22.275	
15B	1	NA	NA	NA	87 39.223	
15C	1	NA	NA	NA		
	New EWM bed located on north shore - NNW of Transect # 6				45 22.436 87 39.885	1.8 acres

Abundance Scale: 0-Absent, 1-Present, 2-Presence Less Than Half, 3-Equal Presence Compared to Other Species, 4-Dominant Species Present, 5-Total Infestation. NA: Not Applicable

Note: All transects are 40 feet in length and proceed away from shore in a direction perpendicular to the shoreline

Grand Rapids					
Eurasian Milfoil Surveys - 2009					
Transect #	Results at 0.5 feet	Results at 1.5 feet	Results at 3.0 feet	Results at +3.0 feet	Origin
1A	0	0	0	0	45 21.809
1B	0	0	0	**1**	87 39.562
1C	0	0	0	0	
2A	0	0	0	N/A	45 21.841
2B	0	0	0	N/A	87 39.561
2C	0	0	**1**	N/A	
3A	0	0	0	N/A	45 21.855
3B	0	0	0	N/A	87 39.553
3C	0	0	0	N/A	
4A	0	0	N/A	N/A	45 22.022
4B	0	0	N/A	N/A	87 39.467
4C	0	0	N/A	N/A	
5A	**2**	**1**	**1**	N/A	45 22.092
5B	**1**	1	N/A	N/A	87 39.562
5C	0	0	N/A	N/A	
6A	0	0	N/A	N/A	45 22.176
6B	0	0	N/A	N/A	87 39.713
6C	0	0	0	0	
7A	0	0	0	0	45 21.890
7B	0	0	0	0	87 39.425
7C	0	0	0	0	
8A	0	0	N/A	N/A	45 21.830
8B	0	0	N/A	N/A	87 39.608
8C	0	0	N/A	N/A	
9A	0	0	0	0	45 21.995
9B	0	0	0	0	87 39.216
9C	0	0	0	0	
10A	0	0	0	N/A	45 22.059
10B	0	0	N/A	N/A	87 38.990
10C	0	0	N/A	N/A	
11A	0	0	0	0	45 22.174
11B	0	0	0	0	87 38.985
11C	0	0	0	0	
12A	0	0	0	N/A	45 22.223
12B	0	0	0	N/A	87 39.006
12C	0	0	0	N/A	
13A	0	0	0	N/A	45 22.261
13B	0	0	0	N/A	87 39.006
13C	0	0	0	N/A	
14A	0	0	0	N/A	45 22.298
14B	0	0	0	N/A	87 39.006
14C	0	0	0	N/A	
15A	0	0	N/A	N/A	45 22.275
15B	0	0	N/A	N/A	87 39.223
15C	0	0	N/A	N/A	

Abundance Scale: 0-Absent, 1-Present, 2-Presence Less Than Half, 3-Equal Presence Compared to Other Species, 4-Dominant Species Present, 5-Total Infestation

Note: All transects are 40 feet in length and proceed in an easterly direction from their origin.

GRAND RAPIDS HYDROELECTRIC PROJECT

(PROJECT NO. 2433)

FERC ORDER MODIFYING AND APPROVING PURPLE LOOSESTRIFE AND EURASIAN MILFOIL MONITORING PLAN

DATED JANUARY 2, 1998

ARTICLE 411 The license shall develop and file with the Federal Energy Regulatory Commission (FERC) a plan to monitor the presence and control the spread of purple loosestrife (*lythrum Salicaria*) in project waters.

PURPLE LOOSESTRIFE MONITORING PLAN

OBJECTIVE To monitor the presence and spread of purple loosestrife (*Lythrum Salcaria*) on Grand Rapids Hydroelectric Project lands. Purple loosestrife is an invasive plant that exhibits aggressive characteristics. Wisconsin Public Service agrees to periodically monitor the species and cooperate with the agencies to implement measures to control/eliminate the plant if the results of the surveys warrant it.

METHOD

The monitoring methods will include a shoreline survey of the impoundment and adjacent wetlands that occur within the project boundary. The surveys will be conducted by boat and if applicable, on foot to determine the presences of purple loosestrife and if found, the density of purple loosestrife.

FREQUENCY OF SURVEY

The survey will be conducted annually in July or August, depending upon the weather, during the time when the plants are in bloom.

DOUCMENTATION OF EXISITNG COLONIES

The results of the survey will be displayed on a map of the total project area. A copy of the completed map will be provided to the resource agencies no later than October 31 and to FERC by December 31, every year a survey is completed.

The map will indicate relative populations based on the following criteria:

a. Small Colonies of 1-5 plants
b. Medium Colonies of 6-50 plants
c. Dense Colonies of > 50 plants

CONTROL OF EXISTING COLONIES

Small colonies of 1-5 plants will be cut and/or hand pulled, if stems remain, they will be hand pulled or cut and sprayed with an appropriate aquatic herbicide.

PUBLIC AWARENESS

Public awareness about purple loosestrife will be increased by displaying invasive species signage at both boat landings.

DOCUMETNATION

Documentation of monitoring will be provided to the resource agencies by October 31 and to FERC by December 31. Any comments provided by the resource agencies and any responses to those comments will be included with the FERC filing.

ARTICLE 411 The license shall develop and file with the Federal Energy Regulatory Commission (FERC) plan to monitor the presence and control the spread of Eurasian water milfoil ((*Myriophyllum spicatum*)) in project waters.

EURASIAN WATER MILFOIL MONITORING PLAN

OBJECTIVE To monitor the presence and abundance of Eurasian water milfoil ((*Myriophyllum spicatum*)) on Grand Rapids Hydroelectric Project lands. Eurasian water milfoil is an invasive plant that exhibits aggressive characteristics. Wisconsin Public Service agrees to periodically monitor for the species and cooperate with the agencies to implement measures to control/eliminate the plant if the results of the surveys warrant it.

METHOD

Monitoring methods will include a routine Eurasian water milfoil survey utilizing a boat to take samples. Transects will be approximately 36 feet in length. A total of ten transect shall be collected. Each transect will be positioned at locations previously selected during earlier surveys.

Each transect will be sampled with a rake in three twelve-foot diameter sections. Each section will be sampled in quarters. The first quarter will be sampled at a depth of 0-0.5 meters below the surface, the second 0.5-1.5 meters below the surface, the third 1.5 – 3.0 meters below the surface and the fourth beyond 3.0 meters below the surface. Typically all of the samples occur in water less than 3 meters.

Additionally, a boat meandering survey in likely EWM areas shall be completed for the entire reservoir, if EWM is found the extent of the stand perimeter will document. GPS coordinates will be collected.

FREQUENCY OF SURVEY

The survey will be conducted in July or August of 2014, depending upon the weather, and every three years thereafter.

DOUCMENTATION OF EXISITNG COLONIES

The results of the survey at each transect will be displayed in table form indicating relative abundance of Eurasian water milfoil in each of the aquatic macrophyte samples that were taken. The abundance scale will be documented as the following: 0-Absent, 1-Presence less than half, 2-Equal presence compared to other species, 3-Dominant species, 4-Total infestation. There will be a column in the table indicating if the colony is a new colony or a previously documented colony. A map showing the locations of the transects will also be provided.

CONTROL OF EXISTING COLONIES

If abundance of Eurasian water milfoil within the reservoir becomes great, there will exist excellent habitat for the native weevil (*euhrychiopsis lecontei)*, which are known to exist at the reservoir at a population density that has shown to control Eurasian water milfoil. If monitoring reports support the need to further control this plant, Wisconsin Public Service will cooperate with the resource agencies in developing site specific measures to control Eurasian water milfoil.

PUBLIC AWARENESS

Public awareness about Eurasian water milfoil will be increased by displaying invasive signage at both boat landings.

DOCUMETNATION

Documentation of monitoring will be provided to the resource agencies by October 31 and to FERC by December 31 every year a survey is completed. Any comments provided by the resource agencies and any responses to those comments will be included with the FERC filing.

WISCONSIN DEPARTMENT OF NATURAL RESOURCE CONSULTATION

Nuthals, James D

From: Nuthals, James D
Sent: Monday, November 07, 2011 10:04 AM
To: 'Donofrio, Michael C - DNR'
Subject: Peshtigo CLWMP Comments

Hi Mike,

Just wanted to provide a reminder that comments are due today for the Peshtigo CLWMP and Grand Rapids EWM Plans.

Please let me know if you have any questions or would like to discuss any of the proposals.

Thanks,

James D Nuthals
Natural Resource Management | Environmental Services | Integrys Business Support, LLC

920-433-1460
920-680-7335 *cell*
920-433-1176 *fax*
jdnuthals@integrysgroup.com

www.integrysgroup.com

Providing support for Integrys Energy Group, Integrys Energy Services, Michigan Gas Utilities, Minnesota Energy Resources, North Shore Gas, Peoples Gas, Upper Peninsula Power Company, Wisconsin Public Service, and Wisconsin River Power.

Wisconsin Public Service Corporation
700 North Adams Street
P.O. Box 19001
Green Bay, WI 54307-9001

October 7, 2011

Mr. Michael Donofrio
Wisconsin Department of Natural Resources
Department of the Interior
101 N Ogden Road
Peshtigo WI 54157

Dear Mr. Donofrio:

Eurasian Water Milfoil Proposed Monitoring & Control Plan - Grand Rapids Hydroelectric Project, FERC # 2433

As per the Federal Energy Regulatory Commission (FERC) Order Modifying and Approving Eurasian Water milfoil (EWM) Control Plan issued May 11, 2009 for the Wisconsin Public Service Corporation (WPS) Grand Rapids Hydroelectric Project FERC #2433 (Grand Rapids), WPS shall provide a letter detailing the status of the EWM control plan objective to the Michigan Department of Natural Resources (MDNR), U.S. Fish and Wildlife Services (USFWS) and the Wisconsin Department of Natural Resources (WDNR) by October 31st for the next three years beginning in 2009. After the 2010 field season, the licensee shall consult with the resource agencies on an appropriate control and /or monitoring schedule and file a new plan to the resource agencies by October 31, 2011 and to the FERC by December 31, 2011. The five components of the plan are as follows:

(1) **Determine if native milfoil weevils are present**
(2) **Work with other stakeholders within the Upper Menominee River Basin Watershed to exchange information about EWM presence and control strategies and to obtain information on the genetic characteristics of the EWM populations**
(3) **Implement measures to help control the spread of EWM to other water bodies**
(4) **Compliance with the FERC Order Modifying and Approving Purple loosestrife and EWM Monitoring Plan issued January 2, 1998**
(5) **Provide New Plan for Monitoring and/or Control of EWM**

(1) Determine if native milfoil weevils are present

Beginning in 2009, WPS has contracted the services of EnviroScience, Inc. (EnviroScience) to complete surveys on the reservoir to determine the presence, distribution and density of the indigenous milfoil weevil (*Euhrychiopsis lecontei*) (weevil) population within Grand Rapids. In 2009, a total of seven sample locations were established, however suitable EWM samples were only observed at six of the sample locations due to the low EWM population (1.36 acres) and poor EWM plant conditions. From the EWM plants that were able to be analyzed, the survey did indicate that weevils are present within the reservoir and at a population that not only reached but had exceeded what may be a critical density necessary to reduce EWM population. The critical density is believed to be greater than 0.5 weevil/ per stem. The 2009 survey results indicated a 1.10 weevils/ per stem ratio.

Because the EWM population observed at the Grand Rapids project observed in 2009 was low compared to other survey years and the plants observed were in poor physical condition, WPS completed a weevil population study again in 2010.

EnviroScience completed the weevil survey during the 2010 field season. EWM populations were once again low (less than 2 acres) however EWM samples were able to be collected and analyzed from all seven locations previously established in 2009. No additional areas of EWM were discovered. The 2010 survey results confirmed weevil densities are high in Grand Rapids and ranged from 0.03 to 5.60 weevil /per stem with a system-wide average of 2.5 weevil/ per stem. Well above what is believed to be the critical density to reduce EWM populations.

To further qualify the weevil population estimates, WPS again hired the services of EnviroScience to complete a weevil population study in 2011. EWM samples were collected at four of the seven previous sample locations. EWM populations were reduced at the other three sample locations to a point where EWM samples were unable to be collected. The survey results once again indicated a high weevil population averaging 0.56 weevil/per stem at the remaining four sample locations. One new EWM location was observed. Weevils were not observed at the new EWM location, however being a new location WPS believes weevils will migrate to the area as has been observed at other new EWM locations.

The 2009, 2010 and 2011 Progress Reports of the Milfoil Weevil Population Studies are included in Appendix A.

(2) Work with other stakeholders within the Upper Menominee River Basin Watershed to exchange information about EWM presence and control strategies and to obtain information on the genetic characteristics of the EWM populations.

In 2010 and 2011, the genetics of the EWM samples collected at Grand Rapids were processed as part of the Upper Menominee River Basin Watershed Milfoil Genetics Study. In 2010, the presence of EWM was confirmed at six of the seven sample locations. Hybrid species of EWM and the native water milfoils were observed at four of the seven sample locations. Due to lack of EWM at all seven sample locations, genetic analysis was completed at only four sample locations in 2011. EWM was identified at three of the sample locations and the hybrid species was identified at two of the sample locations.

Populations of weevils have been recorded in all of these sites, regardless of the presence of EWM or the hybrid milfoil species.

(3) Implement measures to help control the spread of EWM to other water bodies.

Since 2009, WPS has reviewed the single Wisconsin and single Michigan boat landings for EWM. In 2009 and 2011, surveys were completed at the boat landings in the spring timeframe. During both surveys EWM populations were not observed.

During the spring of 2010, WPS representatives completed EWM surveys at both Grand Rapids boat landings. EWM was present along with other *Dicotylodonea* aquatic plants at both locations.

In consultation with the resource agencies a herbicide treatment was not completed because of possible effects of herbicide treatment on other *Dicotylodonea* aquatic plants and rare mussel species known to be present in the reservoir.

EWM was observed near the Michigan boat launch and fishing pier during the EnviroScience survey completed on July 12, 2011. However the EWM patches were sporadic and the dominant species consisted of native aquatic plant species: coontail, elodea, flat-stem pondweed, Sago pondweed and water lily. EWM plants were not yet emerged during the spring survey.

In addition, invasive species awareness signs at each boat landing are checked and if necessary updated on an annual basis. During the most recent review in 2011, the signs were present and up to date. Each sign provided information on proper cleaning of watercrafts and trailers to avoid spreading invasive species.

(4) Compliance with the FERC Order Modifying and Approving Purple loosestrife and EWM Monitoring Plan issued January 2, 1998.

WPS has annually completed surveys for purple loosestrife and every third year completed EWM surveys as approved in the Order Modifying and Approving Purple loosestrife Monitoring Plan issued January 2, 1998.

Purple loosestrife surveys at Grand Rapids have been completed on annual basis since 1998. Purple loosestrife has never been observed during the survey. The most recent purple loosestrife survey was completed on July 11, 2011.

As approved by the FERC order, WPS last completed surveys of the EWM transects on July 9, 2009. EWM was only observed in 3 of the 15 transects encompassing a total of 1.36 acres. The next EWM survey is scheduled for 2012.

(5) Provide New Plan for Monitoring and/or Control of EWM

As per the FERC Order Modifying and Approving EWM Control Plan issued May 11, 2009 for the Grand Rapids Hydroelectric Project, WPS is to file a new plan to the resource agencies by October 31, 2011 and to the FERC by December 31, 2011.

WPS has completed the third year of the three-year study, as outlined in the FERC Order Modifying and Approving EWM Control Plan. The results of the three-year study show that the EWM perimeter has significantly decreased since observing 81 acres in 2008. During the three year study period the largest EWM perimeter encompassed 10.9 acres. A figure providing the three year comparison of the EWM populations is included as Appendix B.

In addition, according to the 2011 Progress Report of the Milfoil Weevil Population Study, stands of EWM identified at Grand Rapids generally range from sparse to very sparse, with only one stand having a moderately dense population of EWM. Every survey stand observed included EWM intermixed with native plant species including coontail, elodea, flat-stem pondweed, Sago pondweed and water lily.

The results of the three year study are also consistent with fluctuation levels observed at Grand Rapids since EWM surveys began in 1998. Since 2006, EWM has shown fluctuations in stand perimeter, with a

significant decrease in stand perimeter during the last three EWM survey years. EWM stand perimeters encompassed 15.58 acres in 2006, 47.8 acres in 2007, 81 acres in 2008, 1.6 acres in 2009, 2.0 acres in 2010 and 10.9 acres in 2011. In addition to the EWM stand perimeters, the EWM transects collected since 1998 also indicated a significant fluctuation in all surveys and a significant decrease in EWM abundance in the most recent survey.

A survey year to survey year comparison of relative abundance of EWM for each transect indicates the EWM abundance has decreased 36 times, increased 23 times and remained the same in 31 occurrences. When comparing the most recent EWM transect surveys completed in 2009 to the 1998 survey, a significant decrease in EWM abundance is observed. Nine (9) transects indicated a decrease from the 1998 to 2009 survey, 5 remained the same and one transect increased in relative abundance of EWM. Appendix C includes a summary of EWM relative abundance, along with the EWM survey sheets.

Beginning in 2009 and ending in 2011, survey s on the reservoir to determine the presence, distribution and density of the weevil population at Grand Rapids have been completed. The results of the surveys have indicated that weevil populations are present at Grand Rapids, and at populations well above what is believed to be the critical density to reduce EWM populations.

Based on the results of the three year study, the native weevil population present at Grand Rapids is a major contributing factor to the fluctuation to the EWM populations that have been observed since 1998. The weevil population appears to fluctuate with the amount of EWM available and maintains the EWM population to a point where it is generally sparse to very sparse relative to the surrounding native aquatic vegetation. However, with any biological population that is affected by carrying capacity, the population of the controlling entity (weevils) can either exceed or lag behind the population of the species being controlled (EWM).

The results of the three year study show that the EWM is effectively controlled by the native milfoil weevil at Grand Rapids. WPS should only continue with the survey method outlined in the FERC Order Modifying and Approving Purple loosestrife and EWM Monitoring Plan issued January 2, 1998.

Please provide comments within thirty (30) days upon receiving this information. If you have any questions or seek clarification, please contact me at your earliest convenience.

Sincerely,

James Nuthals
Environmental Services
Natural Resource Management

Enc.

MICHIGAN DEPARTMENT OF NATURAL RESOURCE CONSULTATION

Wisconsin Public Service Corporation
700 North Adams Street
P.O. Box 19001
Green Bay, WI 54307-9001

October 7, 2011

Mr. Paul Piszczek
Michigan Department of Natural Resources
Escanaba Field Office
6833 Hwy 2, 4, and M-35
Gladstone, MI 49837

Dear Mr. Piszczek:

Eurasian Water Milfoil Proposed Monitoring & Control Plan - Grand Rapids Hydroelectric Project, FERC # 2433

As per the Federal Energy Regulatory Commission (FERC) Order Modifying and Approving Eurasian Water milfoil (EWM) Control Plan issued May 11, 2009 for the Wisconsin Public Service Corporation (WPS) Grand Rapids Hydroelectric Project FERC #2433 (Grand Rapids), WPS shall provide a letter detailing the status of the EWM control plan objective to the Michigan Department of Natural Resources (MDNR), U.S. Fish and Wildlife Services (USFWS) and the Wisconsin Department of Natural Resources (WDNR) by October 31st for the next three years beginning in 2009. After the 2010 field season, the licensee shall consult with the resource agencies on an appropriate control and /or monitoring schedule and file a new plan to the resource agencies by October 31, 2011 and to the FERC by December 31, 2011. The five components of the plan are as follows:

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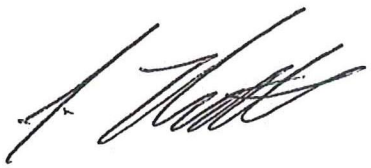
Please provide comments within thirty (30) days upon receiving this information. If you have any questions or seek clarification, please contact me at your earliest convenience.

Sincerely,



James Nuthals
Environmental Services
Natural Resource Management

Enc.

U.S. FISH & WILDLIFE SERVICE CONSULTATION

Wisconsin Public Service Corporation
700 North Adams Street
P.O. Box 19001
Green Bay, WI 54307-9001

October 7, 2011

Mr. Nicholas Utrup
U.S. Fish & Wildlife Service
Department of the Interior
2661 Scott Tower Drive
New Franken, WI 54229-9565

Dear Mr. Utrup:

Eurasian Water Milfoil Proposed Monitoring & Control Plan - Grand Rapids Hydroelectric Project, FERC # 2433

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The 2009, 2010 and 2011 Progress Reports of the Milfoil Weevil Population Studies are included in Appendix A.

(2) Work with other stakeholders within the Upper Menominee River Basin Watershed to exchange information about EWM presence and control strategies and to obtain information on the genetic characteristics of the EWM populations.

In 2010 and 2011, the genetics of the EWM samples collected at Grand Rapids were processed as part of the Upper Menominee River Basin Watershed Milfoil Genetics Study. In 2010, the presence of EWM was confirmed at six of the seven sample locations. Hybrid species of EWM and the native water milfoils were observed at four of the seven sample locations. Due to lack of EWM at all seven sample locations, genetic analysis was completed at only four sample locations in 2011. EWM was identified at three of the sample locations and the hybrid species was identified at two of the sample locations.

Populations of weevils have been recorded in all of these sites, regardless of the presence of EWM or the hybrid milfoil species.

(3) Implement measures to help control the spread of EWM to other water bodies.

Since 2009, WPS has reviewed the single Wisconsin and single Michigan boat landings for EWM. In 2009 and 2011, surveys were completed at the boat landings in the spring timeframe. During both surveys EWM populations were not observed.

During the spring of 2010, WPS representatives completed EWM surveys at both Grand Rapids boat landings. EWM was present along with other *Dicotylodonea* aquatic plants at both locations.

In consultation with the resource agencies a herbicide treatment was not completed because of possible effects of herbicide treatment on other *Dicotylodonea* aquatic plants and rare mussel species known to be present in the reservoir.

EWM was observed near the Michigan boat launch and fishing pier during the EnviroScience survey completed on July 12, 2011. However the EWM patches were sporadic and the dominant species consisted of native aquatic plant species: coontail, elodea, flat-stem pondweed, Sago pondweed and water lily. EWM plants were not yet emerged during the spring survey.

In addition, invasive species awareness signs at each boat landing are checked and if necessary updated on an annual basis. During the most recent review in 2011, the signs were present and up to date. Each sign provided information on proper cleaning of watercrafts and trailers to avoid spreading invasive species.

(4) Compliance with the FERC Order Modifying and Approving Purple loosestrife and EWM Monitoring Plan issued January 2, 1998.

WPS has annually completed surveys for purple loosestrife and every third year completed EWM surveys as approved in the Order Modifying and Approving Purple loosestrife Monitoring Plan issued January 2, 1998.

Purple loosestrife surveys at Grand Rapids have been completed on annual basis since 1998. Purple loosestrife has never been observed during the survey. The most recent purple loosestrife survey was completed on July 11, 2011.

As approved by the FERC order, WPS last completed surveys of the EWM transects on July 9, 2009. EWM was only observed in 3 of the 15 transects encompassing a total of 1.36 acres. The next EWM survey is scheduled for 2012.

(5) Provide New Plan for Monitoring and/or Control of EWM

As per the FERC Order Modifying and Approving EWM Control Plan issued May 11, 2009 for the Grand Rapids Hydroelectric Project, WPS is to file a new plan to the resource agencies by October 31, 2011 and to the FERC by December 31, 2011.

WPS has completed the third year of the three-year study, as outlined in the FERC Order Modifying and Approving EWM Control Plan. The results of the three-year study show that the EWM perimeter has significantly decreased since observing 81 acres in 2008. During the three year study period the largest EWM perimeter encompassed 10.9 acres. A figure providing the three year comparison of the EWM populations is included as Appendix B.

In addition, according to the 2011 Progress Report of the Milfoil Weevil Population Study, stands of EWM identified at Grand Rapids generally range from sparse to very sparse, with only one stand having a moderately dense population of EWM. Every survey stand observed included EWM intermixed with native plant species including coontail, elodea, flat-stem pondweed, Sago pondweed and water lily.

The results of the three year study are also consistent with fluctuation levels observed at Grand Rapids since EWM surveys began in 1998. Since 2006, EWM has shown fluctuations in stand perimeter, with a

significant decrease in stand perimeter during the last three EWM survey years. EWM stand perimeters encompassed 15.58 acres in 2006, 47.8 acres in 2007, 81 acres in 2008, 1.6 acres in 2009, 2.0 acres in 2010 and 10.9 acres in 2011. In addition to the EWM stand perimeters, the EWM transects collected since 1998 also indicated a significant fluctuation in all surveys and a significant decrease in EWM abundance in the most recent survey.

A survey year to survey year comparison of relative abundance of EWM for each transect indicates the EWM abundance has decreased 36 times, increased 23 times and remained the same in 31 occurrences. When comparing the most recent EWM transect surveys completed in 2009 to the 1998 survey, a significant decrease in EWM abundance is observed. Nine (9) transects indicated a decrease from the 1998 to 2009 survey, 5 remained the same and one transect increased in relative abundance of EWM. Appendix C includes a summary of EWM relative abundance, along with the EWM survey sheets.

Beginning in 2009 and ending in 2011, survey s on the reservoir to determine the presence, distribution and density of the weevil population at Grand Rapids have been completed. The results of the surveys have indicated that weevil populations are present at Grand Rapids, and at populations well above what is believed to be the critical density to reduce EWM populations.

Based on the results of the three year study, the native weevil population present at Grand Rapids is a major contributing factor to the fluctuation to the EWM populations that have been observed since 1998. The weevil population appears to fluctuate with the amount of EWM available and maintains the EWM population to a point where it is generally sparse to very sparse relative to the surrounding native aquatic vegetation. However, with any biological population that is affected by carrying capacity, the population of the controlling entity (weevils) can either exceed or lag behind the population of the species being controlled (EWM).

The results of the three year study show that the EWM is effectively controlled by the native milfoil weevil at Grand Rapids. WPS should only continue with the survey method outlined in the FERC Order Modifying and Approving Purple loosestrife and EWM Monitoring Plan issued January 2, 1998.

Please provide comments within thirty (30) days upon receiving this information. If you have any questions or seek clarification, please contact me at your earliest convenience.

Sincerely,

James Nuthals
Environmental Services
Natural Resource Management

Enc.

APPENDICES A, B & C ARE THE SAME AS IS PROVIDED TO THE FEDERAL ENERGY REGULATORY COMMISSION, WPS DID NOT INCLUDE THE APPENDICES IN AN EFFORT TO REDUCE THE OVERALL SIZE OF THE DOCUMENT

Document Content(s)