

ORIGINAL



February 22, 2016

FILED
SECRETARY OF THE
COMMISSION

The Secretary
Federal Energy Regulatory Commission
Mail Code: DHAC, PJ-12.3
888 First Street, N.E.
Washington, D.C. 20426

2016 FEB 29 P 2:43

FEDERAL ENERGY
REGULATORY COMMISSION

Re: Grandmother Falls Hydroelectric Project, FERC License No. 2180 – Exotic Species Monitoring Report for CY2008

Dear Secretary:

Article 407 of FERC License No. 2180 required PCA Hydro (PCA) to submit an Invasive Species Management Plan for approval contingent upon review and approval by both the Wisconsin Department of Natural Resources (WDNR) and U.S. Fish and Wildlife Service (FWS). On September 26, 2005, PCA submitted a plan, approved by both WDNR and FWS, to the FERC. The FERC approved the plan, with conditions, on January 19, 2006.

The principal conditions imposed by FERC require that PCA;

- a) Conduct the exotic plant surveys described in the plan annually for five years beginning in 2006, and every five years starting in 2010, and
- b) Solicit comments on the draft annual report from the WDNR and FWS and,
- c) Submit the final annual report to the FERC including any changes recommended by WDNR and FWS.

Enclosed is a copy of the 2015 monitoring report that documents the presence and locations of purple loosestrife, reed canary grass, and Eurasian water milfoil found within the project. As was the case in 2010, curly-leaf pondweed was not encountered during the meander survey nor was giant reed grass seen during the shoreline survey.

In correspondence dated 15 January 2016, PCA provided WDNR and FWS each with a copy of the 2015 annual report for review. The agencies were asked to provide written comments regarding this plan to PCA by the close of business on 15 February 2016; no comments were received.

Therefore, we are submitting to the FERC the 2015 annual report as final per Article 407 requirements. Copies of relevant correspondence are also enclosed.

If you have any questions, please do not hesitate to contact me.

Sincerely,



Kristy L. Neumann
Environmental Manager

Enclosures

cc: Adam Webster (letter only)
John Stelling (letter only)

Biologist
U.S. Fish & Wildlife Service
2661 Scott Tower Drive
New Franken, WI 54229

WDNR Biologist
107 Sutliff Avenue
Rhineland, WI 54501

Michael David Scott
FERC Program Attorney
Wisconsin Dept of Natural Resources
101 S. Webster Street
Madison, WI 53711

Cheryl Laatsch
Statewide FERC Coordinator
Wisconsin Dept of Natural Resources
Horicon Education Center
N7725 Highway 28
Horicon, WI 53032

File GMD 2250
File GMD 2260

GRANDMOTHER FALLS HYDROELECTRIC DAM

FERC PROJECT 2180-WISCONSIN

EXOTIC SPECIES MONITORING REPORT 2015



Prepared for

PCA Hydro, Inc.

January 2016

Prepared through the collaborative efforts of

NES

ECOLOGICAL SERVICES

1250 Centennial Centre Boulevard
Hobart, WI 54155
920.499.5789

Onterra LLC

Lake Management Planning

815 Prosper Road
De Pere, WI 54115
920.338.8860

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A – Photo Log

INTRODUCTION

Article 407 within the Federal Energy Regulatory Commission (FERC) license issued to Packaging Corporation of America (PCA) for the Grandmother Falls Flowage Hydroelectric Project (FERC No. 2180), located in the Town of Bradley, Lincoln County, Wisconsin (Map 1), required PCA to submit an Invasive Species Management Plan for approval. On September 26, 2005, a plan, reviewed by the Wisconsin Department of Natural Resources (WDNR) and the U.S. Fish & Wildlife Service (USFWS), was submitted to and then accepted, with conditions, by FERC on January 19, 2006. The two main conditions associated with the acceptance of the plan were 1) PCA was responsible for conducting initial exotic plant surveys along with follow-up surveys every five years during the licensing period to document invasive species populations within the project area; and 2) a report must be submitted to the WDNR, USFWS and FERC for review and approval.

Initial surveys and reports were completed from 2006-2010 by NES Ecological Services – A Division of Robert E. Lee & Associates, Inc. (NES) and Onterra, LLC. A follow-up survey was conducted during the 2015 growing season to document the presence and location of invasive plant species observed within the project waters (Maps 2- 6) so their occurrence could be compared to previous surveys and tracked over time. Species taken into consideration for the 2015 investigation, as outlined in the Invasive Species Management Plan, include purple loosestrife (*Lythrum salicaria*), giant reed grass (*Phragmites australis*), curly-leaf pondweed (*Potamogeton crispus*), reed canary grass (*Phalaris arundinacea*), and Eurasian water milfoil (*Myriophyllum spicatum*). Yellow iris (*Iris pseudacorus*), a Eurasian exotic of growing concern in Wisconsin was also included in the 2015 survey due to its invasive nature and noted presence along the flowage. Preparation of this report documents the results of the 2015 survey.

METHODS

Meander Survey

Curly-leaf pondweed (CLP) begins growing immediately following ice out, reaches maturity by early to mid June, and then dies off in early to mid-July, the time when most aquatic plants are just reaching peak biomass. Since it is at peak biomass in June, the extent of curly-leaf pondweed is most accurately documented if surveys are conducted during this time period. Therefore, a meander survey of the project water's littoral zone (Map 2) was completed on June 11, 2015, by Onterra. The survey was accomplished by navigating a boat throughout the project area and scanning the water for colonies of curly-leaf pondweed. GPS points were automatically collected to track survey paths (Map 2). Onterra staff also scanned the shoreline and shallow water areas for yellow iris while conducting the survey.

Point-intercept Survey

Point-intercept surveys allow the systematic sampling of submerged plants within project waters and ensure all areas of the littoral zone are visited. Based upon calculation techniques supplied by the WDNR that employ water surface area (624 acres) and shoreland development factor (7.29), a plot resolution of 55-meters was applied to the project waters displayed in Map 3. Using this information, a total of 885 points were selected to be surveyed within the Grandmother Falls Flowage.

Onterra performed a point-intercept survey on August 12 & 13, 2015 within the Grandmother Falls Flowage to detect the presence of Eurasian water milfoil (EWM), remaining CLP and other potential submerged, exotic plant species. Accurately mapping submerged plant colonies is a difficult task because under normal conditions the entire colony, much like an iceberg, is not visible from the surface. To complete this task accurately, additional time is required to determine the extents of each colony through numerous rake tows and/or underwater video. As the colony extent is determined, it is marked with buoys so it can be accurately

mapped from the surface. Each colony was mapped with sub-meter GPS technology using points or polygons (Maps 4-6). EWM and CLP colonies < 40' in diameter were mapped using points and classified as either: *Single or Few Plants*, *Clump of Plants*, or *Small Colony*. Areas >40' in diameter were mapped using a polygon and classified based upon density as: *Highly Scattered*, *Scattered*, *Dominant*, *Highly Dominant* or *Surface Matting*. In addition to those groups identified within the point-intercept plots, EWM found outside the baseline survey points was also recorded as either a colony or a point, given a density rating, and mapped.

Shoreline Survey

Onterra staff scanned the shoreline and shallow water areas for purple loosestrife while conducting the point-intercept survey on August 12 & 13, 2015 and recorded those occurrences with a GPS unit. NES ecologists conducted a follow-up survey of the entire shoreline and shallow water areas of the project waters (Map 1) for exotic emergent species on August 20, 2015. Additional occurrences of purple loosestrife along with reed canary grass and giant reed grass populations within 10 feet of the water's edge were identified, mapped using a GPS unit, and a density rating applied. A colony was determined to be those areas containing large groups (≥ 10 individuals) of plants. A rating of 1 indicates a sparse colony, likely containing a mix of exotics and natives; while a rating of 3 indicates a colony dominated by exotics. However, some exotic occurrences were too scattered to be mapped as colonies. In these cases, individual plants or small groups (≤ 9 individuals) of plants were mapped using points.

In addition to identifying and mapping purple loosestrife, clumps of 1-3 plants identified during the emergent exotic mapping were manually removed.

Photographs from the 2015 survey are located in Appendix A.

RESULTS

Meander Survey

No colonies of curly-leaf pondweed were encountered during the meander survey conducted on June 11, 2015 or the point-intercept survey on August 12 & 13, 2015. To document the mid-June survey, GPS tracking logs were automatically recorded and are displayed on Map 2.

Point-intercept Survey

A total of 885 points were selected within the project waters based on WDNR guidelines; however, only 472 of these points were surveyed due to existing field conditions. The remaining 413 points were either inaccessible by boat ("not visited") or they were at depths of ≥ 10 feet ("too deep"), beyond the depth of plant growth (Map 3).

Eurasian water milfoil populations containing single or few plants were found at four separate locations during the survey conducted in August 2015 (Maps 4-6).

Shoreline Survey

Giant reed grass, once again, was not discovered within the project area during the survey. Reed canary grass, on the other hand, was again found to be very prevalent in preferred habitat types along the shoreline of Grandmother Falls Flowage. Reed canary grass occurrences were captured 183 times throughout the flowage. In previous years, populations of the grass were not mapped due to its prevalence and coverage. Although individual colonies were not mapped for this species in 2015, NES staff documented its' location throughout the flowage so the grasses' presence could be tracked. Each reed canary grass point depicted on

Maps 4-6 indicates a colony with a rating of either 2 or 3 as discussed above. In some cases the points are close enough together that large, nearly monotypic stands of reed canary grass are present. Only one colony of purple loosestrife with a medium density (2) was identified while 64 small clusters were found along the shoreline and mapped (Maps 4-6). No individuals or clumps ≤ 3 plants were identified while conducting the survey; therefore, no purple loosestrife plants were treated or seed heads removed from within the project area in 2015. Yellow iris occurrences were recorded in 4 locations and each was composed of either single or small plant clusters.

DISCUSSION

The 2015 surveys conducted within Grandmother Falls Flowage indicated the presence of purple loosestrife, reed canary grass, Eurasian water milfoil and yellow iris. Curly-leaf pondweed and giant reed grass were not encountered. Based on the results, NES and Onterra came to the following conclusions and management alternatives for each species.

The comprehensive aquatic vegetation surveys conducted initially and again in 2015 did not indicate the presence of curly-leaf pondweed or giant reed grass within or adjacent to the flowage. The species continued absence has led us to believe that it is very unlikely they will suddenly appear in the future. If they do, management recommendations will be proposed at that time.

In 2010, the aquatic vegetation surveys conducted by Onterra identified the occurrence of one Eurasian water milfoil within the project waters near the Tomahawk Dam. No plants were found in this location during the 2015 survey, but 4 other very small populations were observed within the flowage. When conducting these surveys between 2006 and 2010 the identified populations ranged from as many as 16 in 2006 to no plants found in 2009. The fluctuating observations and changing locations seem to indicate that this species may always be present in the project waters, but the Grandmother Falls Flowage does not appear to provide ideal habitat for EWM. If good conditions were present, we would expect larger and more scattered plant colonies to be present within the flowage. NES and Onterra do not recommend treatment of the plants at this time; however, continued monitoring should be conducted to ensure large populations do not become established. A five year monitoring cycle appears to be adequate.

In 2015, one small colony and many small clusters of purple loosestrife were identified throughout the project area. Many (45 of 47) locations identified in 2010 continue to harbor populations of the invasive species with some increasing and others decreasing in size. Besides the previously mapped locations, 19 additional populations were identified including 11 clusters between Miles 4 and 6 which had not contained purple loosestrife (Table 2) (Maps 4-6). Although the density of plants within each population is not high, the species has managed to infest new areas within the flowage during the past five years. To prevent further spread, a combination of seed head removal, herbicide applications and release of *Galerucella* beetles are recommended. The release of *Galerucella* beetles is a cost effective option to help control the spread of the species in the long-term. However, to successfully rear a healthy population of beetles, there can be little or no herbicide application within the host colonies; therefore, we recommend introducing beetles into the densest colonies of purple loosestrife and periodically chemically treating the single stems and clumps of the species that occur along the banks.

Results of the 2015 shoreline survey once again indicate that reed canary grass is prevalent. The Wisconsin DNR recommends a variety of methods for suppression of reed canary grass including prescribed burns, mowing, frequent cultivation or herbicide application. However, the frequency and extent at which reed canary grass was found within the project site suggests that the infestation is beyond feasible control by these methods.

Yellow iris was not previously included in the exotic species survey, but its' aggressive nature warrants inclusion. This particular species can form dense, monotypic stands that displace native vegetation and wildlife. Early detection of this species, as was completed with this survey, allows for a quick response to prevent further establishment. The species should either be physically removed by digging out the plants, ensuring all parts are removed, or through spot herbicide treatments using aquatic approved herbicides. A permit will be required from the WDNR to conduct the applications.

Table 1. Eurasian Water-Milfoil 2010 to 2015 Survey Comparisons (Maps 4-6).

<i>Location</i>	<i>Status Compared to 2010</i>	<i>Comments</i>
Mile 1, upstream from Grandmother Falls Dam	One new population	Population located on east side of river just north of Grandmother Falls Dam
Between miles 1-2, upstream from Grandmother Falls Dam	No populations	
Between miles 2-3, upstream from Grandmother Falls Dam	No populations	
Between miles 3-4, upstream from Grandmother Falls Dam	No populations	
Between miles 4-5, upstream from Grandmother Falls Dam	One new population	Population located on the east side of the river just south of Skanawan Creek
Between miles 5-6, upstream from Grandmother Falls Dam	One new population	Population located on the east side of the river just north of Road Lake Creek
Between miles 6-7, upstream from Grandmother Falls Dam	One new population and one population not located	New population located at the junction of the Spirit and Wisconsin Rivers to the north. The population previously found on the east side of the river near the Tomahawk Dam was not observed.

Table 2. Purple Loosestrife 2010 to 2015 Survey Comparisons (Maps 4-6).

<i>Location</i>	<i>Status Compared to 2010</i>	<i>Comments</i>
Mile 1, upstream from Grandmother Falls Dam	No populations	
Between miles 1-2, upstream from Grandmother Falls Dam	2 colonies (density = 1) became 16 clusters	Populations located on the south side of the river where it bends to the east.
Between miles 2-3, upstream from Grandmother Falls Dam	13 clusters became 1 colony (density = 1) and seven new clusters were identified north of the colony.	The clusters identified in 2010 appear to have become larger forming a colony and a few clusters have appeared north of the colony.
Between miles 2-3, upstream from Grandmother Falls Dam	Four new populations were also identified on the east side of the river in this segment.	Three of the new patches on the east side of the river are located across from the colony. The other new patch was found north of the Little Pine River confluence with the Grandmother Falls Flowage.

Table 2. Continued.

Location	Status Compared to 2010	Comments
Between miles 3-4, upstream from Grandmother Falls Dam	1 small colony became 5 clusters while the other colony became 2 clusters . Five of the previously mapped clusters remained the same while 2 others were not located .	The mapped clusters exist on the island in the river at the southern end of the section.
Between miles 3-4, upstream from Grandmother Falls Dam	2 new populations were found in northern portion of the segment.	The 2 new patches are located north of the island on both the west and east side of the river.
Between miles 4-5, upstream from Grandmother Falls Dam	5 new populations	Clusters are scattered along the east side of the river.
Between miles 5-6, upstream from Grandmother Falls Dam	6 new populations	One cluster is on the east side of the river while the other five are located on the west side. All patches are south of Road Lake Creek.
Between miles 6-7, upstream from Grandmother Falls Dam	2 new populations	One new cluster was found on a small island southeast of the large island while the other new cluster was found on the northeast side of that island.
Between miles 6-7, upstream from Grandmother Falls Dam	Small colony and 9 clusters became 2 clusters	Larger population on the small island located northwest of the large island appears to have decreased in size.
Between miles 6-7, upstream from Grandmother Falls Dam	7 clusters not located while 2 remained the same	Clusters located west of the boat landing were reduced in number.
Between miles 6-7, upstream from Grandmother Falls Dam	Small colony became 3 clusters	Colony located west of the boat launch was reduced in size.
Between miles 6-7, upstream from Grandmother Falls Dam	1 cluster remained the same and the small colony became 1 cluster	Area just east of the boat launch.
Between miles 6-7, upstream from Grandmother Falls Dam	7 clusters not located	Populations located along the east side of the river, north of the large island, were not found.

CONCLUSION

Due to increased occurrences of exotic species it is important to consider continued, periodic surveys (5 year intervals) to track their presence, population growth and spread. Management of these species is also critical to prevent their establishment and spread. Aggressive, non-native species can quickly invade and spread as observed by the sudden appearance of yellow iris and increased observations of purple loosestrife within the Grandmother Falls Flowage in the past five years.

A

APPENDIX A

Site Photographs



Photo 1. GMF Flowage between miles 2&3 – looking Northwest



Photo 2. GMF Flowage between miles 3&4 – looking North



Photo 3. GMF Flowage between miles 3&4 – looking Northeast



Photo 4. GMF Flowage between miles 4&5 – looking South

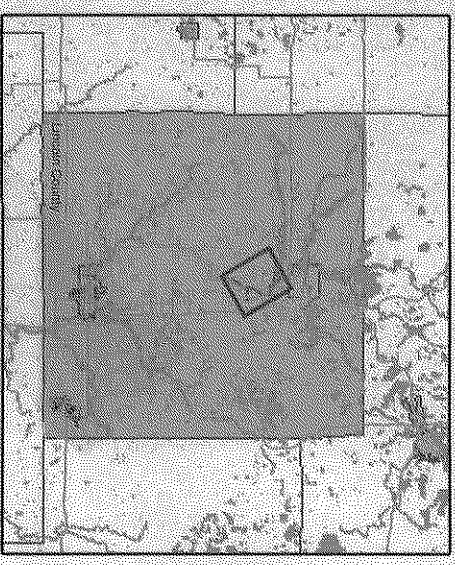


Photo 5. GMF Flowage between miles 6&7 – looking Southeast

Map 1

Grandmother Flowage

Lincoln County, Wisconsin

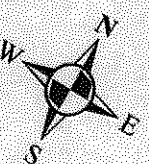


Extent of large map shown in red.

Legend



Project Waters

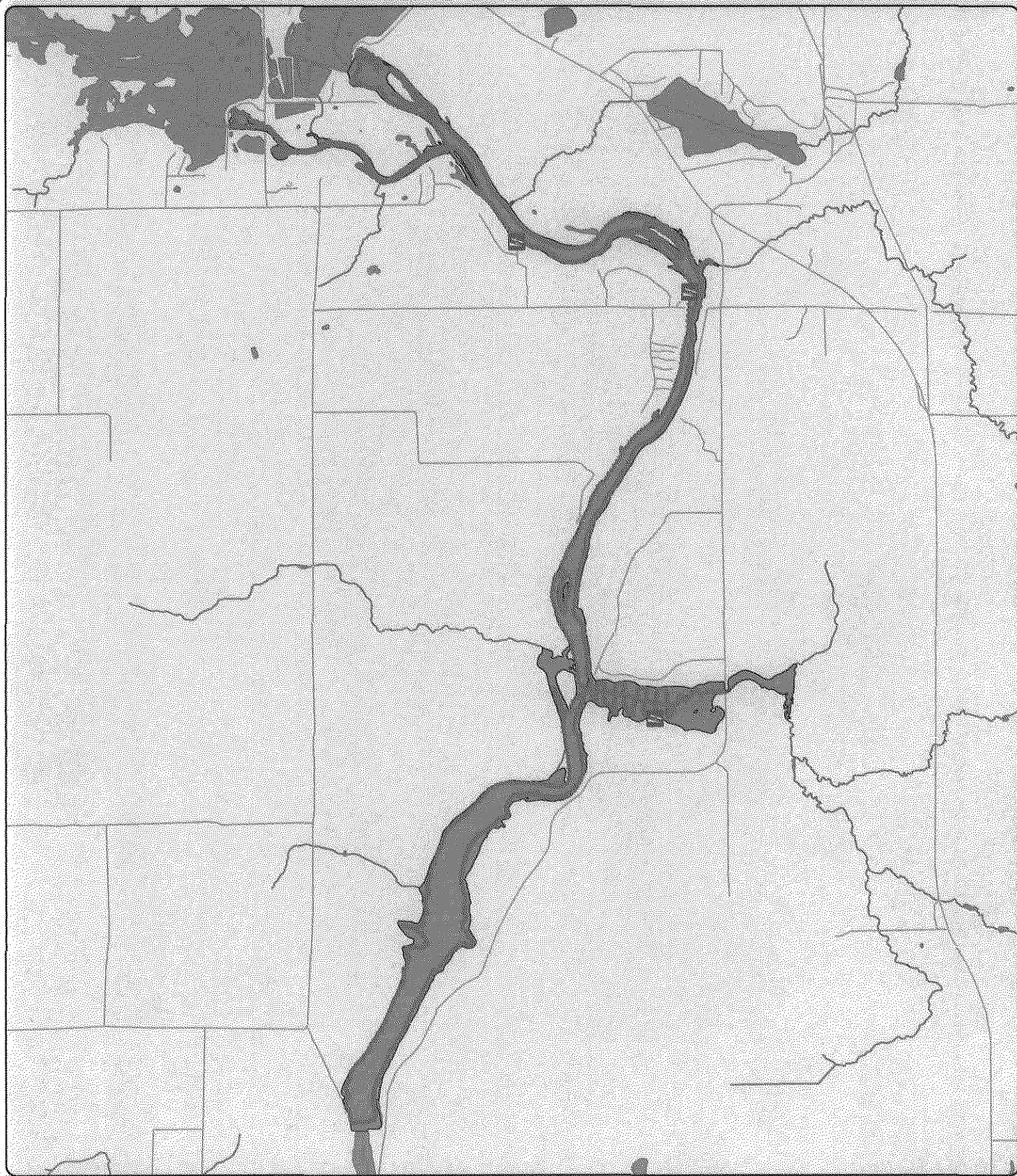


2,100
Feet



Onterra LLC
Lake Management Planning
815 Proctor Road
De Pere, WI 54115
920.536.6600
www.onterra.com

Map Date: December 21, 2015



3,250

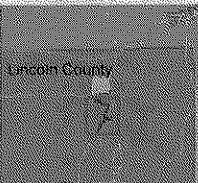


Feet

Onterra LLC
Lake Management Planning

815 Prosper Road
De Pere, WI 54115
920.338.8860
www.onterra-eco.com

Sources:
Aquatic Plant Survey: Onterra, 2015
Roads and Hydro: WDNR
Map Date: December 1, 2015



Extent of large map shown in red.

Legend

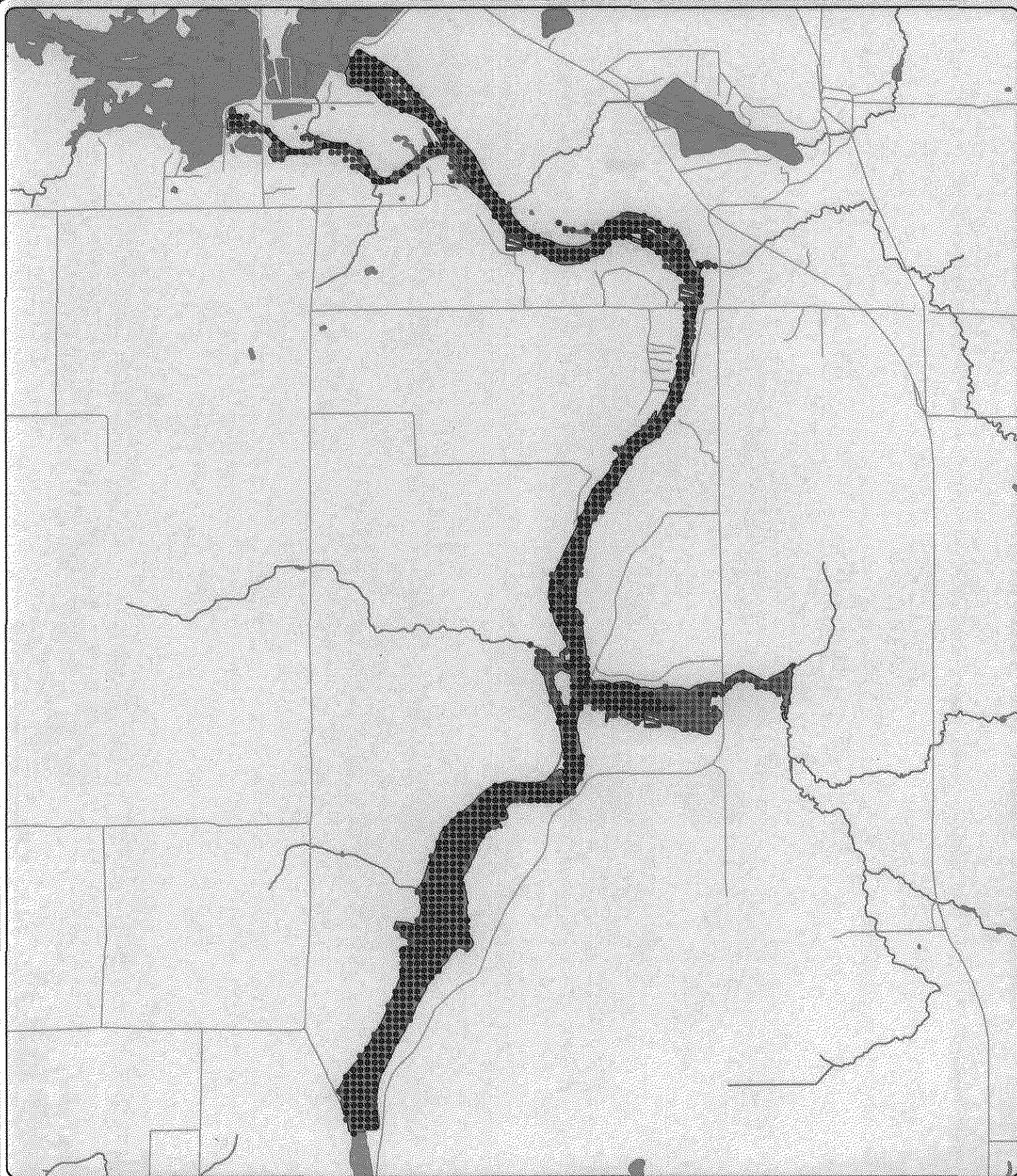


Survey Path
(Points recorded along line
at 30-second intervals)



Public Access

Map 2
Grandmother Falls
Lincoln, County Wisconsin
Early Season AIS
Survey Track - 2015



3,250



Feet

Onterra LLC

Lake Management Planning

815 Prosper Road

De Pere, WI 54113

920.338.8860

www.onterra-eca.com

Sources:
 Roads and Hydro: WDNR
 Bathymetry: Digitized by Onterra
 PI Survey: Onterra, 2015
 Map Date: December 1, 2015
 Filename: GMF_2015_TRFPI.mxd



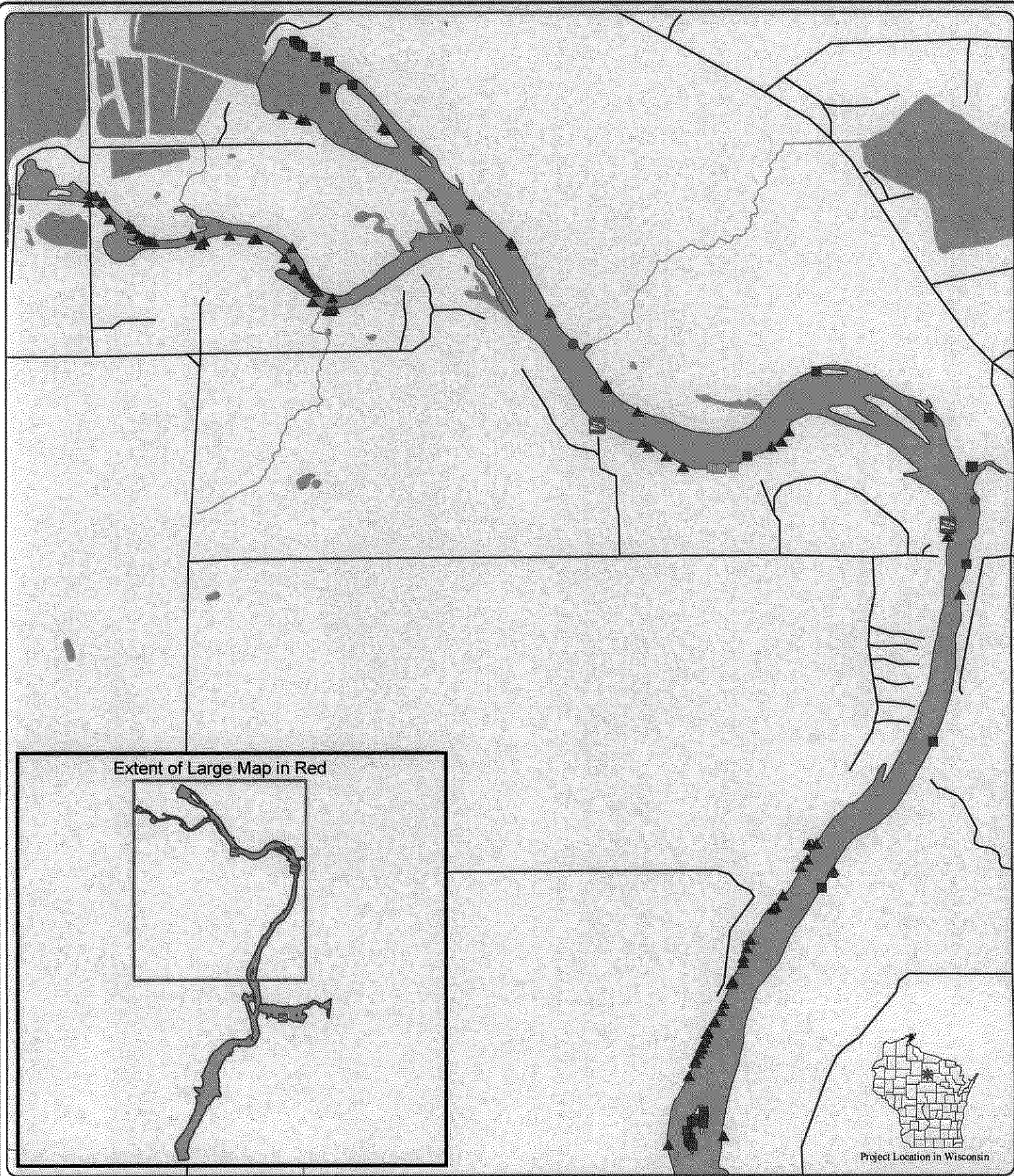
Project Location in Wisconsin

Legend

- Sampled
- Too Deep
- Non-navigable/Terrestrial

Map 3
 Grandmother Falls
 Lincoln County, Wisconsin

**2015 Point-Intercept
 Survey Locations**



Extent of Large Map in Red



Project Location in Wisconsin



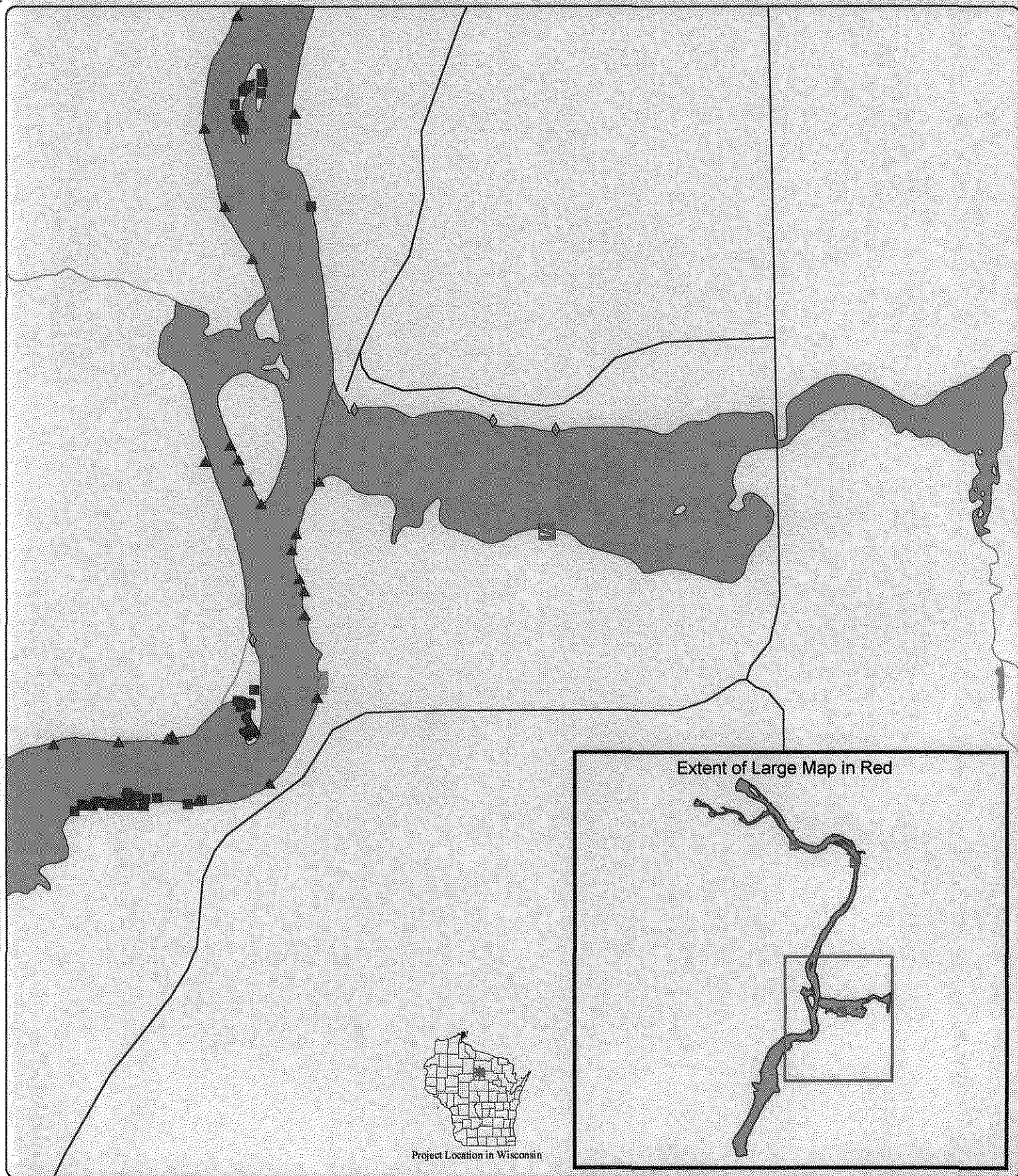
Onterra LLC
 Lake Management Planning
 815 Prosper Road
 De Pere, WI 54115
 920.338.8860
 www.onterra-llc.com

Sources:
 Roads and Hydro: WDNR
 EWM: Onterra, 2015
 Pale Yellow Iris: Onterra, 2015
 Reed Canary Grass: NES, 2015
 Purple Loosestrife: Onterra, NES, 2015
 Map Date: December 1, 2015

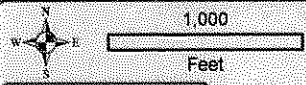
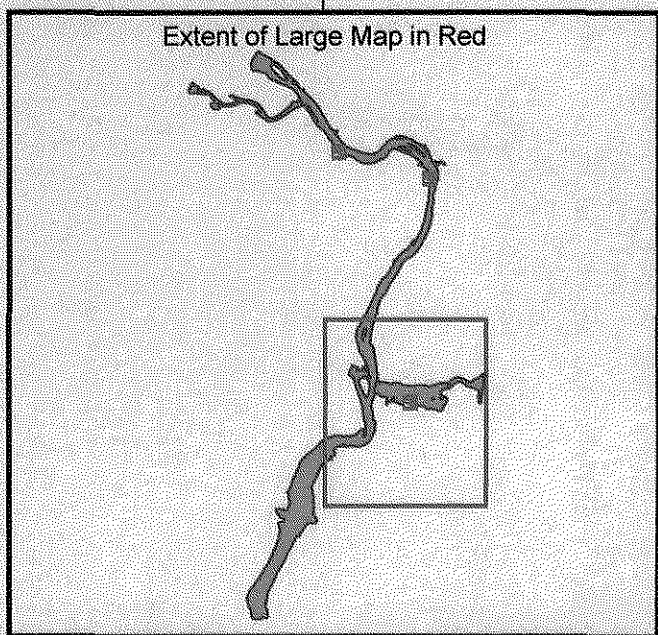
Legend

- EWM Occurrence (August 2015) (Single or few plants)
- ◆ Pale Yellow Iris (June 2015) (Single or few plants)
- ▲ Reed Canary Grass (NES, 8-20-15)
- Purple Loosestrife (Onterra, 8-12-15)
- Purple Loosestrife (NES, 8-20-15)
- Purple Loosestrife Colony (Onterra, 8-12-15)

Map 4 - North Grandmother Falls
 Lincoln County, Wisconsin
2015 AIS Survey Results



Project Location in Wisconsin



Onterra LLC
 Lake Management Planning
 815 Prosper Road
 De Pere, WI 54115
 920.338.8860
 www.onterra-eco.com

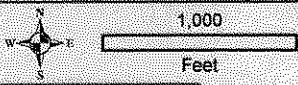
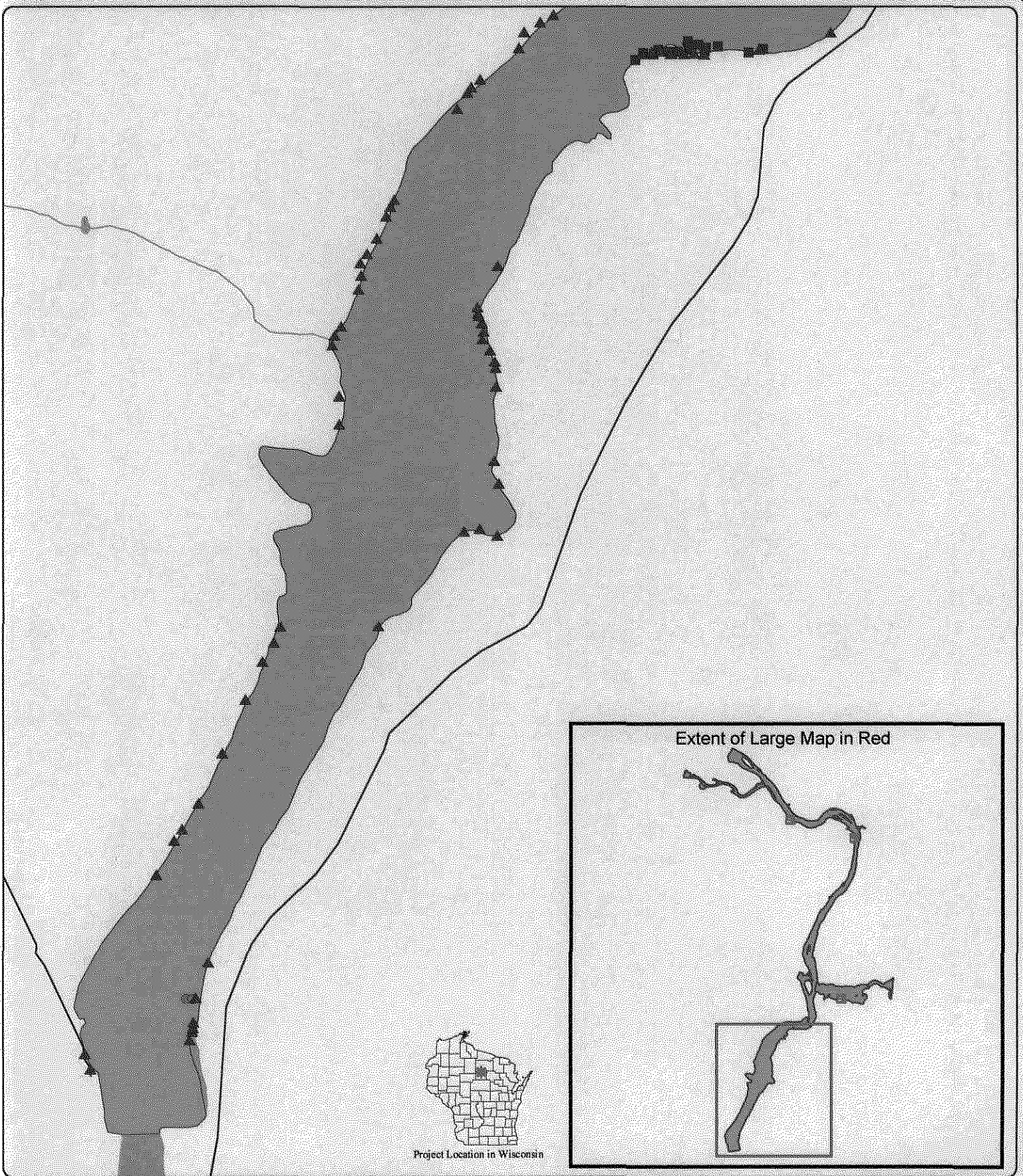
Sources:
 Roads and Hydro: WDNR
 EWM: Onterra, 2015
 Pale Yellow Iris: Onterra, 2015
 Reed Canary Grass: NES, 2015
 Purple Loosestrife: Onterra, NES, 2015
 Map Date: December 1, 2015

Legend

- EWM Occurance (August 2015) (Single or few plants)
- ◆ Pale Yellow Iris (June 2015) (Single or few plants)
- ▲ Reed Canary Grass (NES, 8-20-15)
- Purple Loosestrife (Onterra, 8-12-15)
- Purple Loosestrife (NES, 8-20-15)
- Purple Loosestrife Colony (Onterra, 8-12-15)

Map 5 - Central Grandmother Falls
 Lincoln County, Wisconsin

2015 AIS Survey Results



Onterra LLC
 Lake Management Planning
 815 Prosper Road
 De Pere, WI 54115
 920.338.8860
 www.onterra-cca.com

Sources:
 Roads and Hydro: WDNR
 EWM: Onterra, 2015
 Pale Yellow Iris: Onterra, 2015
 Reed Canary Grass: NES, 2015
 Purple Loosestrife: Onterra, NES, 2015
 Map Date: December 1, 2015

Legend

- EWM Occurrence (August 2015) (Single or few plants)
- ◆ Pale Yellow Iris (June 2015) (Single or few plants)
- ▲ Reed Canary Grass (NES, 8-20-15)
- Purple Loosestrife (Onterra, 8-12-15)
- Purple Loosestrife (NES, 8-20-15)
- Purple Loosestrife Colony (Onterra, 8-12-15)

Map 6 - South Grandmother Falls
 Lincoln County, Wisconsin

2015 AIS Survey Results

January 15, 2016



Biologist
U.S. Fish & Wildlife Service
2661 Scott Tower Drive
New Franken, WI 54229

Aquatic Biologist
WDNR
107 Sutliff Avenue
Rhineland, WI 54501

Re: Grandmother Falls Hydroelectric Project, FERC License No. 2180 – Exotic Species Monitoring Report for CY2015

Dear Agency Representative:

Article 407 of the Federal Energy Regulatory Commission's (FERC) License No. 2180 mandates that PCA Hydro (PCA) prepare an Invasive Species Management plan that must be reviewed and approved by the Wisconsin Department of Natural Resources (WDNR) and U.S. Fish and Wildlife Service (FWS). Said plan was submitted to the agencies, reviewed and ultimately approved by FERC on January 19, 2006. The plan requires that PCA conduct invasive plant surveys annually for five years (beginning in 2006) and submit an annual report to the FERC subsequent to review and approval by both WDNR and FWS. After the 2010 annual report PCA is required to conduct follow-up invasive plant surveys every five years during the remainder of the licensing period. Accordingly, PCA is providing WDNR and FWS each with a copy of the 2015 annual report for review.

The 2015 survey findings can be briefly summarized as follows:

- Curly-leaf pondweed and giant reed grass were not found within the flowage.
- Eurasian water milfoil, single or few plants, were found at four locations.
- One colony of purple loosestrife was identified along with 64 small clusters.
- Yellow iris were recorded in four locations consisting of either single or small plant clusters.
- The extent of reed canary grass infestation precludes the use of traditional suppression actions such as prescribed burns, mowing, cultivation or herbicide application.

We request that you submit any written comments regarding this plan to PCA by the close of business on 15 February 2016. An absence of reply will be considered an acceptance of the report contents.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kristy L. Neumann', followed by a long horizontal line that extends to the right.

Kristy L. Neumann
Environmental Manager

Enclosure

cc: Adam Webster (letter only)
John Stelling (letter only)
GMD 2260