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September 15, 2010

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

**Subject:** **2010 Purple Loosestrife Monitoring Report**
**White River Hydro (P-2444), Superior Falls Hydro (P-2587), Hayward Hydro (P-2417), Big Falls Hydro (P-2390-01), And Thornapple Hydro (P-2475)**

Dear Secretary:

Enclosed is a copy of the 2010 purple loosestrife monitoring report for the above-referenced hydro projects. The operating license issued by the Federal Energy Regulatory Commission (FERC) for each project directs the Licensee to annually monitor project shorelines for purple loosestrife presence. The results are then documented and submitted to the resource agencies and the Commission.

This year's surveys were conducted in August during a period of peak loosestrife flowering. The results were then compared to previous surveys in order to determine any trends. Superior Falls, White River, and Big Falls continue to remain free of any infestations. Thornapple Flowage showed a modest increase in loosestrife presence while Lake Hayward's population remains relatively stable.

Should you have any questions regarding this report, please feel free to contact Matthew Miller of this office by telephone at (715) 737-1353 or by electronic mail at matthew.j.miller@xcelenergy.com.

Sincerely,

William Zawacki
Director, Hydro Plants

Enclosure: 2010 Purple Loosestrife Report

c: Mr. Nick Utrup (U.S. Fish and Wildlife Service)
Mr. Jeff Scheirer (Wisconsin DNR)
Project Files

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# 2010 Purple Loosestrife Monitoring Report For Superior Falls Flowage, White River Flowage, Lake Hayward, Big Falls Flowage And Thornapple Flowage.

Xcel Energy

September 15, 2010

**Results Of The 2010 Purple Loosestrife Monitoring At Superior Falls Flowage, White River Flowage, Lake Hayward, Big Falls Flowage And Thornapple Flowage.**

## 1.0 INTRODUCTION

The operating licenses for the above-referenced hydro projects directed the Licensee to develop a purple loosestrife (Lythrum salicaria) monitoring plan for project shorelines. The plans were developed with input from the Wisconsin Department of Natural Resources (WDNR), the U.S. Fish and Wildlife Service (USFWS), and the National Park Service (NPS). The plan directs licensee to annually monitor project shorelines during the period of peak purple loosestrife biomass (late July through August). The following report is a summary of the surveys that were performed in August 2010, including a comparison with surveys from previous years.

## 2.0 METHODS

The Superior Falls and White River Flowages were surveyed on August 11, while Lake Hayward was surveyed on August 12. Project lands downstream of the Hayward Hydro Project were also surveyed. Big Falls and Thornapple Flowages were surveyed on August 26. The survey dates coincided with peak flowering whereby purple loosestrife could easily be identified and documented for relative abundance. Field observations were conducted by boat with the aid of binoculars.

Shorelines infested with purple loosestrife were divided into two classes, either present or common and abundant. Areas categorized as present or common indicated a single plant or a few plants scattered along the shoreline. Those areas categorized as abundant indicated a large concentration of plants approaching a near monotypic stand. The areas of infestation were then documented on a bathymetric map and the length of infested shoreline was calculated with a planimeter. This method has a tendency to overestimate the amount of shoreline that is infested, as a single dot on the map often indicates just one plant. However, it does provide a reliable indication of the relative abundance of purple loosestrife and whether it is increasing or decreasing in coverage from year to year.

## 3.0 RESULTS

3.1 Superior Falls Flowage. No purple loosestrife was observed on the Superior Falls Flowage. The findings were consistent with surveys conducted from 1998-2009. A survey of flowage waters was also conducted for Eurasian Milfoil (Myriophyllum spicatum) and no plants were found. This is also consistent with the results of past surveys.

3.2 White River Flowage. There was no documentation of purple loosestrife on the White River flowage. The findings were consistent with surveys conducted from 1998-2009.

3.3 Lake Hayward. The presence and abundance of purple loosestrife on Lake Hayward has been relatively stable over the last several years. This year's survey indicated a modest increase in areas categorized as present or common, while those areas of abundant infestation remained stable. The increase in the present/common category can be primarily attributed to single plant infestations. Over the last several years, Licensee has observed that these single plant infestations appear to be sporadic as riparian owners often mow or cut down plants either inadvertently or by design. These single specimens can appear one year and not the next due to the actions of landowners. This year's heavy summer precipitation, following a near seven-year drought, may also have played a role in the increase of single plant infestations by providing ideal growing conditions for seeds that had been lying dormant.

Licensee is aware of past control efforts by the National Park Service in the Hayward Project tailwaters. This year's survey revealed a single plant that was located immediately below the spillway.

Purple loosestrife has historically been most abundant near the Smith Lake Creek inlet. Field observations this year indicated little change from 2009. The table below summarizes the results of surveys from Lake Hayward since they began in 1997.

| Year | Shoreline Miles (Present) | Shoreline Miles (Abundant) |
|---|---|---|
| 1997 | 0.3 | 0.70 |
| 1998 | Shoreline coverage not determined | |
| 1999 | 1.08 | 0.25 |
| 2000 | 1.28 | 0.10 |
| 2001 | 1.13 | 0.19 |
| 2002 | 0.90 | 0.07 |
| 2003 | 0.10 | 0.07 |
| 2004 | 0.54 | 0.0 |
| 2005 | 0.54 | 0.0 |
| 2006 | 0.82 | 0.04 |
| 2007 | 0.80 | 0.04 |
| 2008 | 0.46 | 0.07 |
| 2009 | 0.47 | 0.06 |
| **2010** | **0.57** | **0.06** |

Licensee donated money to the Hayward High School's Environmental Studies class a number of years ago to initiate a biological control program for purple loosestrife on Lake Hayward. The class cooperated with the WDNR to secure a population of leaf-eating beetles (*Galerucella calmariensis* or *G. pusilla)* which specifically targets purple loosestrife plants. The beetles were then transplanted to those areas with the

greatest concentration of plants. Their efforts appear to have been very successful, especially in those areas classified as abundant. Continued monitoring will help evaluate the long-term benefits of the biological control program.

3.4 Big Falls Flowage. There were no purple loosestrife plants found on the shoreline of Big Falls Flowage. Again, this was similar to the results of previous surveys conducted from 1998-2009.

3.5 Thornapple Flowage. The presence of purple loosestrife showed a modest increase compared to 2009 levels. Purple loosestrife was found to be present or common along 0.79 miles of shoreline this year compared to 0.45 miles in 2009. The near-record precipitation in northern Wisconsin this summer, following seven years of severe drought, may also have contributed to an increase in pioneering plants. In addition, all areas categorized last year as abundant were now classified as present this year.

Significant increases in purple loosestrife are unlikely due to a combination of past bio-control efforts and a lack of available habitat. Shoreline areas where pioneering plants were observed were often the result of a recent disturbance (lawn cutting, brush removal, etc.) along privately developed shorelines. In contrast, single specimens recorded in one year may be absent the next due to lawn mowing and other landscape activities, only to reappear the following year.

There were no areas of abundant loosestrife infestations in 2010. The wetland areas, however, continue to account for the greatest concentration of loosestrife plants. The table below summarizes the findings from surveys conducted from 1998-2010 on the Thornapple Flowage.

| Year | Shoreline Miles (Present) | Shoreline Miles Common | Shoreline Miles (Abundant) |
|---|---|---|---|
| 1998 | *Shoreline coverage not determined* | | |
| 1999 | 2.36 | 0.27 | 0.67 |
| 2000 | 1.64 | - | 0.70 |
| 2001 | 2.52 | - | 0.67 |
| 2002 | 2.52 | - | 0.48 |
| 2003 | 2.10 | - | 0.48 |
| 2004 | 2.33 | - | 0.45 |
| 2005 | 2.15 | - | 0.42 |
| 2006 | 1.76 | - | 0.39 |
| 2007 | 1.40 | - | 0.33 |
| 2008 | 1.30 | - | 0.15 |
| 2009 | 0.45 | - | 0.06 |
| 2010 | 0.79 | - | 0.00 |

In July of 2004, Licensee cooperated with the Lake Holcombe Improvement Association (LHIA) to introduce a beetle population to the shorelines of the Thornapple Flowage that specifically targets purple loosestrife plants. Approximately

20,000 beetles were introduced in the wetland areas of the flowage where purple loosestrife densities have historically been highest. Earlier introductions of these beetles at Licensee's Hayward and Holcombe projects have been met with great success. The continuing decline of loosestrife presence and abundance indicates that the beetles have had a significant impact. This is the first year since monitoring began that no part of the flowage shoreline was classified as abundant. Future surveys will hopefully continue to document this trend. Licensee will continue to monitor purple loosestrife densities on the flowage throughout the term of the license.

## 4.0 CONCLUSION

Purple loosestrife was not documented on the White River Flowage, the Superior Falls Flowage or the Big Falls Flowage. Lake Hayward has experienced a drastic decline in purple loosestrife since 2000 due to the introduction of a beetle population which specifically targets the plant. The presence and abundance of loosestrife now appears to have stabilized over the past few years. The modest increase in single plant infestations this year may have been related to landscaping or lawn care actions by riparian owners. The long-term drought may have also have limited the spread of single specimens prior to this year. Finally, the significant rainfall recorded this summer may have provided ideal growing conditions for dormant seeds and the resulting pioneering plants.

Much of the Thornapple Flowage shoreline is scattered with purple loosestrife plants, with heavier concentrations confined to the wetland areas in the central portion of the impoundment. The number of pioneering plants increased modestly in 2010. More importantly, there has been a significant decline over the last decade in both the present and abundant categories. Much of this is likely attributable to the biological control efforts of 2004. It may have taken several years for the beetle population to become well established, with their impact only now appearing over the last few years.

LAKE Hayward Flowage
SECTION 26, 27
RANGE 9 W
TOWN Hayward
TOWNSHIP 41 N

This is the only hydrographic map of this lake available, produced from original charts of Dept. of Natural Resources — Madison

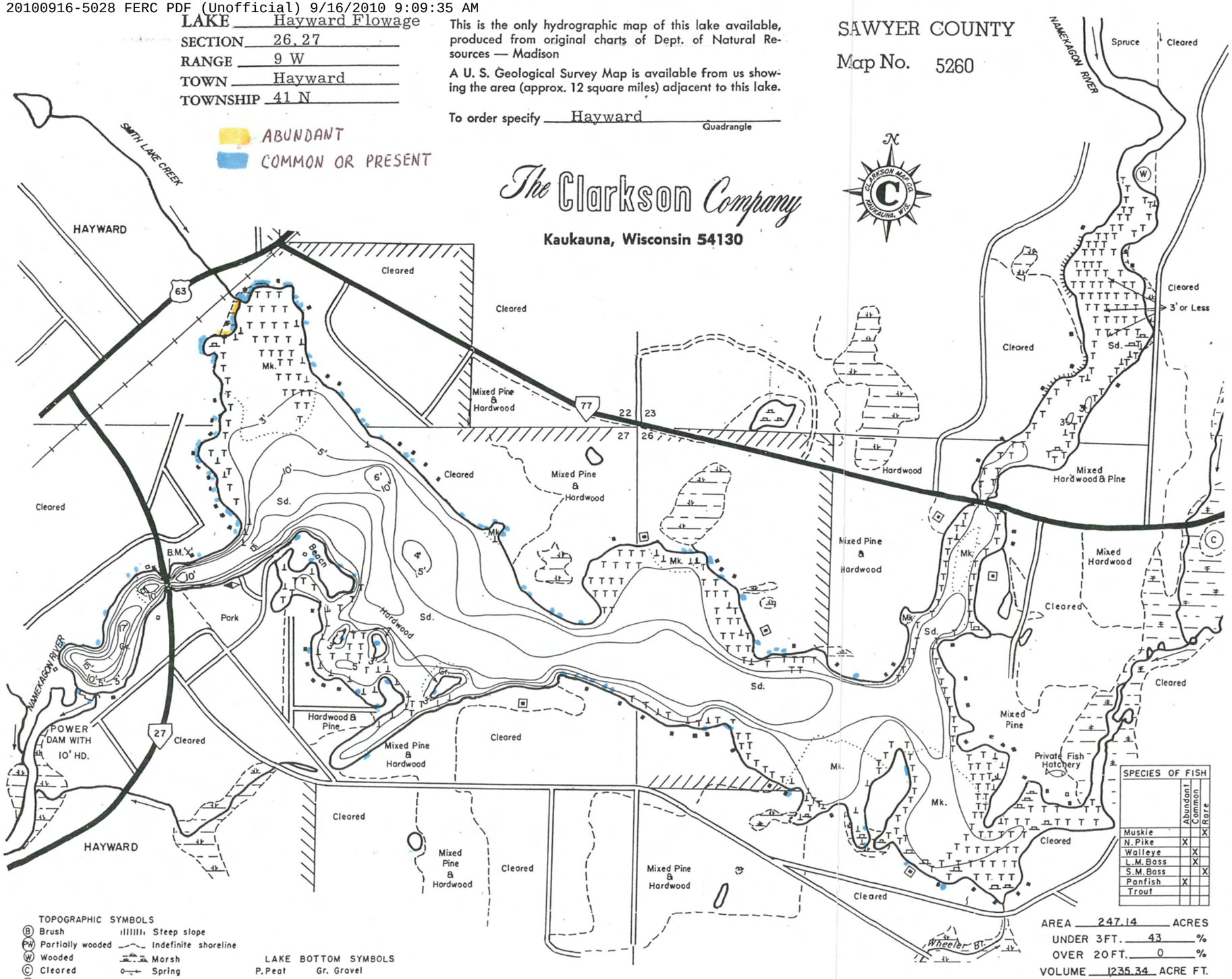
A U. S. Geological Survey Map is available from us showing the area (approx. 12 square miles) adjacent to this lake.

To order specify Hayward Quadrangle

ABUNDANT
COMMON OR PRESENT

The Clarkson Company
Kaukauna, Wisconsin 54130

SAWYER COUNTY
Map No. 5260




| SPECIES OF FISH | Abundant | Common | Rare |
|---|---|---|---|
| Muskie | | | X |
| N. Pike | X | | |
| Walleye | | X | |
| L.M. Boss | | X | |
| S.M. Boss | | | X |
| Panfish | X | | |
| Trout | | | |

TOPOGRAPHIC SYMBOLS
(B) Brush
(PW) Partially wooded
(W) Wooded
(C) Cleared
(P) Pastured
(A) Agricultural
B.M. Bench Mark
Dwelling
Resort
Steep slope
Indefinite shoreline
Marsh
Spring
Intermittent stream
Permanent inlet
Permanent outlet
Dam

LAKE BOTTOM SYMBOLS
P. Peat
Mk. Muck
C. Clay
M. Marl
Sd. Sand
St. Silt
Gr. Gravel
R. Rubble
Br. Bedrock
T Submergent vegetation
Emergent vegetation
Floating vegetation

◇ Access
◆ Access with Parking
◆ Boat Livery

AREA 247.14 ACRES
UNDER 3FT. 43 %
OVER 20FT. 0 %
VOLUME 1235.34 ACRE FT.
TOTAL ALK. 69 P.P.M.
SHORELINE 8.64 MILES
MAX. DEPTH 17 FEET

PURPLE LOOSESTRIFE MONITORING

AUGUST 12, 2010

AREAS OF PURPLE LOOSESTRIFE PRESENT OR COMMON

7.2 CLICKS / 1 MILE = 4.1 / X MILES

X = 0.57 MILES = 3010 FT
OR 6.6% OF SHORELINE

AREAS OF PURPLE LOOSESTRIFE ABUNDANT

7.2 CLICKS / 1 MILE = 0.4 CLICKS / X MILES

X = 0.06 MILES = 317 FT
OR 0.69% OF SHORELINE

PURPLE LOOSESTRIFE MONITORING

AUGUST 26, 2010

ABUNDANT

COMMON OR PRESENT

AREAS OF PURPLE LOOSESTRIFE COMMON OR PRESENT

2.5 CLICKS / 4000 FT. = 2.6 CLICKS / X

X = 4160 FT = 0.79 MILES

OR 10.4% OF SHORELINE

AREAS OF PURPLE LOOSESTRIFE ABUNDANT

2.5 CLICKS / 4000 FT. = 0 CLICKS / X

X = 0 FT... = 0 MILES

LAKE Thornapple Flow
SECTION 18, 19, 22, 23, 24
RANGE 6, 7 W
TOWN Thornapple
TOWNSHIP 34 N

This is the only hydrographic map of this lake available, produced from original charts of Dept. of Natural Resources — Madison

A U. S. Geological Survey Map is available from us showing the area (approx. 12 square miles) adjacent to this lake.

To order specify Thornapple Quadrangle

RUSK COUNTY

**MAP NO.**

5129

**LEGEND**

TOPOGRAPHIC SYMBOLS

- BRUSH REFUGE
- SAPLING TANGLE
- SPAWNING BOX
- MINNOW SPAWNER
- WEED BED
- ROCKY SHOAL
- DWELLING
- ABANDONED DWELLING
- RESORT
- STEEP SLOPE
- SPRING
- INTERMITTENT INLET
- BRUSH
- WOODED (W)
- PASTURED (P)
- CULTIVATED (C)
- ENCROACH. SHORE
- PERMANENT INLET
- PERMANENT OUTLET
- MARSH
- PARTIALLY WOODED (PW)
- CLEARED (C)
- BENCH MARK B.M.

LAKE BOTTOM SYMBOLS

- PULPY PEAT P
- MUCK K
- CLAY C
- SAND S
- RUBBLE R
- EMERGENT VEGET. ⊥
- FIBROUS PEAT F
- DETRITUS D
- MARL M
- GRAVEL G
- BEDROCK Br.
- SUBMERGENT VEGET. T





AREA 268.2 ACRES
TOTAL SHORELINE 7.6 MILES
MAX. DEPTH 19 FEET
UNDER 3' 19.4% OVER 20' 0%

**CLARKSON MAP CO.**

724 DESNOYER STREET
**Kaukauna, Wisconsin 54130**

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