

**We Energies**  
**2009 Annual Report - Nuisance Plant Control Survey**  
**Kingsford Reservoir**  
**FERC Project #2131**

Background and Methods

We Energies' Environmental department staff, Mr. Mike Grisar and Mr. John Hrobar, conducted a survey from a boat of the entire shoreline at the Kingsford Reservoir project on August 5, 2009. All waters and appropriate wetlands accessible from the boat were evaluated. Those species targeted for the survey included purple loosestrife (*Lythrum salicaria*) and Eurasian water milfoil (*Myriophyllum spicatum*). The visual meander survey included areas of shallow water adjacent to the shorelines. Shallow water was surveyed to a point where the water depth and clarity excluded visibility conducive to observing submerged vegetation. On average, this depth was at approximately 7-feet.

For each stand of Eurasian water milfoil encountered during the 2009 surveys, the stand location and perimeter were compared and verified with the 2007 monitoring data using a Trimble Geo XH GPS unit. Where the stand size was negligible, a single point in the center of the stand was located with the GPS. When significant changes in the stand perimeter were observed, these changes were marked with the GPS and reflected in the attached map. Changes in stand density were updated and are shown in Table 1KF. New stands not previously observed were mapped and recorded.

Various data were collected at each stand including stand/mat density and mat thickness (when present). The stand size was subsequently calculated from the collected GPS boundaries. A percent cover scale from 1-5 (sparse – dense) was used to accurately and consistently estimate stand densities:

<u>Estimated Density Rating</u>	<u>% Cover</u>
1 (sparse)	0 - 5%
2 (moderately sparse)	>5 - 25%
3 (moderate)	>25 - 75%
4 (moderately dense)	>75 - 95%
5 (dense)	>95%

Results and Discussion

No purple loosestrife plants were observed along the shores of the Big Quinnesec Falls Reservoir project area.

Thirty-four stands of Eurasian water milfoil were observed to occur in 2009 at the Kingsford project area (attached map), which is a decrease of 8 stands from 2007. The identified stands are distributed throughout the project area and range in size from <0.01-acre up to 22.33-acres. While the total stands decreased by 8, 10 stands merged with other stands, 1 (stand 5) split into two stands, and 2 other stands (stands 24 & 25) were no longer present in 2009. These changes are attributed to changes in stand densities between 2007 and 2009.

Eurasian water milfoil is present in approximately 132-acres in the Kingsford Reservoir project area, a decrease of nearly 28-acres from 2007. Cumulatively, the average stand size is 3.87-acres with an average density rating of 1.88 per stand. In 2007, the average stand size was 3.82-acres and had an average density rating of 1.69 per stand. Both average stand size and

average stand density increased slightly since 2007. Increases in stand densities were observed in 7 stands between 2007 and 2009 (stands 8, 10, 16, 18, 28, 31, and 34). Conversely, only 4 stands decreased in density from 2007.

Out of the 34 observed stands, only stands 8, 30, 34, and 47 have a high density (>75% cover), and they are scattered throughout the reservoir. These stands combined cover 2.89-acres (approximately 2% of the total), or 1/10 of the total area covered by dense stands in 2007. However, 41% of the total area covered by Eurasian water milfoil is comprised of stands with moderate density.

Additionally, 27 stands changed in spatial coverage. The total gross change observed is 31.08-acres with an average gross change of 1.15-acres per stand. Of these, 6 stands accounted for over 17-acres that either increased or decreased in size (approximate 3-acre average change).

22 of the 34 stands have very low densities of Eurasian water milfoil with single stems growing sporadically among native species. The most common native species included northern water milfoil (*Myriophyllum sibiricum*), two-leaf water milfoil (*Myriophyllum heterophyllum*), a variety of pondweeds (*Potamogetan* sp.), common waterweed (*Elodea canadensis*), bladderwort (*Utricularia* sp.), coon's tail (*Ceratophyllum demersum*), water celery (*Vallisneria americana*), yellow pond lilies (*Nuphar* sp.), and white pond lily (*Nymphaea odorata*). These low density stands account for approximately 57% (74.73-acres) of the total area observed to have Eurasian water milfoil present.

### Conclusions

In conclusion, the number Eurasian water milfoil stands dropped by nearly 20% from 2007. Correspondingly, the total acreage of Eurasian water milfoil decreased by about 18% over the past 2 years. Although, this was in part due to combining a number of stands as the more dense portions of them decreased to the same density of the larger beds.

While the average stand size remained relatively constant, substantial changes in the area of the stands were observed in individual stands that remained present from 2007. Additionally, the total acreage of high density stands observed in 2009 decreased to 10% of that observed in 2007. However, 41% of the total area covered by Eurasian water milfoil is comprised of stands with moderate density. This includes a large proportion of Cowboy Lake, which was observed as having high density in 2007. Unlike the general trend of new stands being first observed with low densities, the new stands observed in 2009 have a relatively high average density (2.4). These are mixed results with respect to whether the conditions are improving or on a negative trend.

These trends of changing spatial distribution, overall coverage, and stand densities indicate the Eurasian water milfoil population is in flux from year to year within the Menominee River system. Contributing factors include influences of local and annual climate variances (i.e. precipitation and temperature), the presence of the indigenous milfoil weevil population, extent of milfoil hybridization, fish predation, and others.

Eurasian water milfoil is prominent in Cowboy Lake and along portions of the Kingsford shoreline. Based on anecdotal evidence, the causes for this abundance in Eurasian water milfoil appear to be related to eutrophication, intense public use, and developed shorelines.

Annual fluctuations in the extent and density of Eurasian water milfoil may be due, in part, to the presence of an indigenous weevil population occurring in the system. See the attached

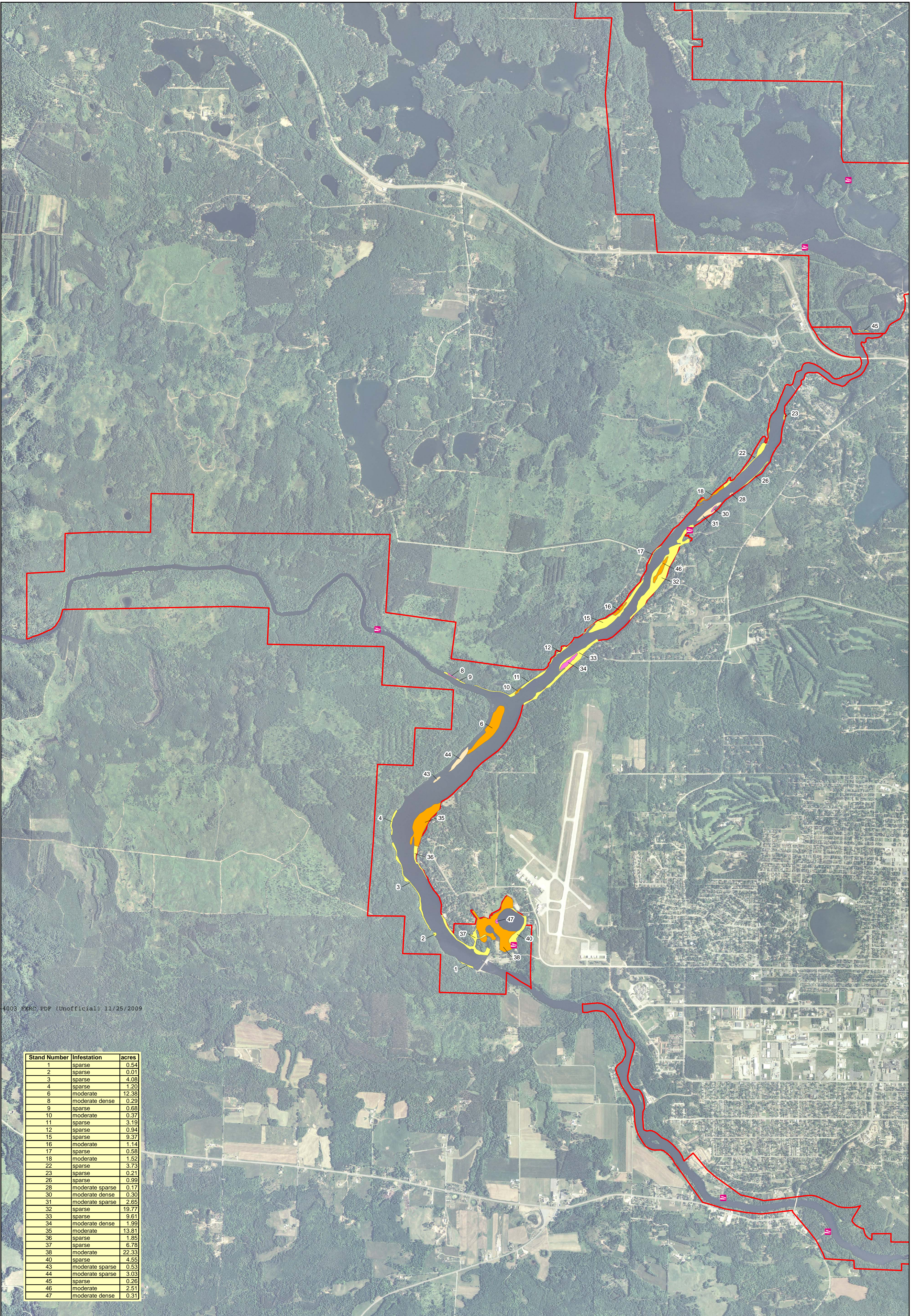
discussion regarding the Eurasian water milfoil management plan and the summary report prepared by EnviroScience for further information about milfoil management activities.

**Table 1KF. 2009 Kingsford Reservoir  
Eurasian Water Milfoil Stand Data.**

Stand Number	Density <sup>1</sup>	Mat Thickness	Stand Size <sup>2</sup>
1	1	None	0.54 (+0.04)
2	1	None	0.01
3	1	None	4.08 (-0.02)
4	1	None	1.2 (+0.2)
5	seperated into 43 and 44	NA	NA
6	3	None	12.38 (+4.48)
8	4 (+3)	None	0.29 (+0.28)
9	1 (-2)	None	0.68 (+0.67)
9b	combined into 9	NA	NA
10	3 (+2)	None	0.37 (-3.23)
11	1 (-2)	None	3.19 (+2.79)
12	1	None	0.94 (+0.04)
13	combined into 15	NA	NA
14	combined into 16	NA	NA
15	1	None	9.37 (+4.27)
16	3 (+1)	None	1.14 (-0.36)
17	1	None	0.58 (+0.18)
18	3 (+2)	None	1.52 (-0.68)
19	combined into 22	NA	NA
20	combined into 22	NA	NA
21	combined into 22	NA	NA
22	1	None	3.73 (+3.63)
23	1	None	0.21 (+0.2)
24	Not Present	NA	NA
25	Not Present	NA	NA
26	1	None	0.99 (+0.59)
27	1	None	0.01
28	2 (+1)	None	0.17 (-0.03)
29	combined into 31	NA	NA
30	4	None	0.3 (+0.2)
31	2 (+1)	None	2.65 (+0.85)
32	1	None	19.77 (-0.93)
33	1	None	9.61 (-1.99)
34	4 (+1)	None	1.99 (+0.39)
35	3	None	13.81 (+0.01)
36	1	None	1.85 (+0.05)
37	1	None	6.78 (+1.18)
38	3 (-1)	None	22.33 (+0.33)
39	combined into 40	NA	NA
40	1 (-2)	None	4.55 (+3.45)
41	combined into 40	NA	NA
42	combined into 38	NA	NA
43	2	None	0.53
44	2	None	3.03
45	1	None	0.26
46	3	None	2.51
47	4	None	0.31

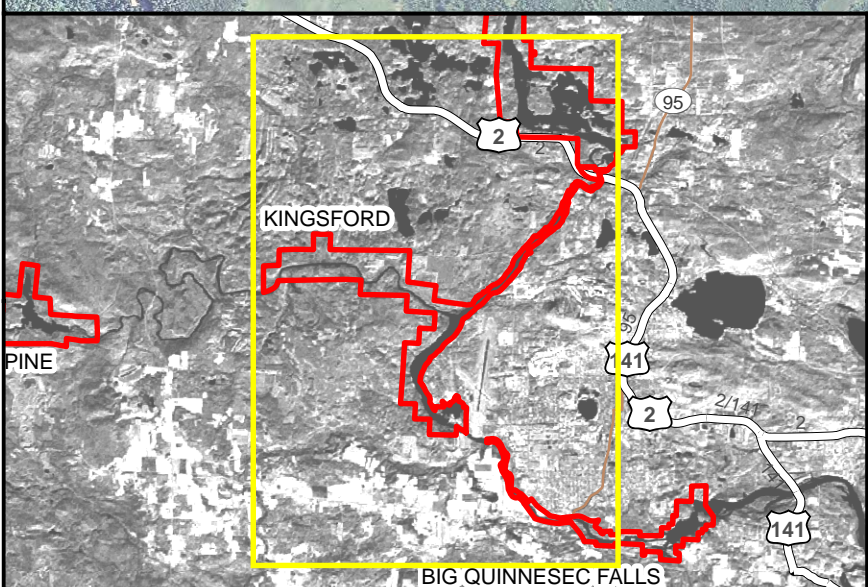
1 – change in density rating from 2007 to 2009

2 – change in stand size from 2007 to 2009



20091125-4003 FERC PDF (Unofficial) 11/25/2009

Stand Number	Infestation	acres
1	sparse	0.54
2	sparse	0.01
3	sparse	4.05
4	sparse	1.20
6	moderate	12.38
8	moderate dense	0.29
9	sparse	0.68
10	moderate	0.37
11	sparse	3.19
12	sparse	0.94
15	sparse	9.37
16	moderate	1.14
17	sparse	0.58
18	moderate	1.52
22	sparse	3.73
23	sparse	0.21
26	sparse	0.99
28	moderate sparse	0.17
30	moderate dense	0.30
31	moderate sparse	2.65
32	sparse	19.77
33	sparse	9.61
34	moderate dense	1.99
35	moderate	13.81
36	sparse	1.85
37	sparse	6.78
38	moderate	22.33
40	sparse	4.55
43	moderate sparse	0.53
44	moderate sparse	3.03
45	sparse	0.26
46	moderate	2.51
47	moderate dense	0.31



■ Public Boat Launch  
 FERC Hydro Project Boundary

**Year 2009 Field Work**  
 sparse  
 moderate sparse  
 moderate  
 moderate dense  
 dense

1,000 0 Feet 1,000 2,000

**Kingsford Hydro Project - Year 2009**  
**Eurasian Water Milfoil and Purple Loosestrife Survey**

Source: USDA - NAIP Imagery, 2008  
 GPS field data collected 8/3/2009