

**We Energies
2012 Annual Report - Nuisance Plant Control Survey
Lower Paint
Project #2072-008**

Background and Methods

We Energies' Environmental department staff, Mr. Mike Grisar and Mr. Bill Braunschweig, conducted a survey from a boat of the entire shoreline at the Lower Paint Reservoir project on July 28, 2012. 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 2012 surveys, the stand location and perimeter were compared and verified with the 2010 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 1LP. 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

A single purple loosestrife plant was observed along the far upper shores of the Lower Paint Reservoir project area in 2010. This was the first time since invasive species monitoring began at Lower Paint that purple loosestrife was observed. The single plant was removed and was not observed to be present in 2012, nor was it observed anywhere else in Lower Paint.

Thirty-one stands of Eurasian water milfoil were observed to occur in 2012 at the Lower Paint Reservoir project area (attached map), a decrease of 3 stands from 2010. The identified stands are distributed throughout the project area and range in size from 0.01-acre up to 35.65-acres.

Eurasian water milfoil is present in approximately 124-acres in the Lower Paint Reservoir project area; a decrease of approximately 30-acres from 2010. There was a consistent trend of an increase in the number of stands and spatial coverage between 2006 and 2010; however, decreases were observed between 2010 and 2012. Cumulatively, the average stand size is 4.00-acres and has an average density rating of 1.55 per stand. In 2010, the average stand size was 4.52-acres and had an average density rating of 1.71 per stand.

Seven new stands were identified in 2012 accounting for approximately 17.76-acres, 14% of the total acres of Eurasian water milfoil. These new stands have an average density rating per stand of 1.86, which is relatively high for most new stands observed throughout the system. However, some of these stands were simply part of previous less dense stands that were mapped as unique stands due to their higher densities. Four stands combined with other stands from when they were previously observed.

Thirty-five stands changed in spatial coverage. The total gross change observed is nearly 100-acres with an average gross change of 2.85-acres per stand. Of these, 8 stands accounted for over 65-acres that either increased or decreased in size (approximate 8.21-acre average change).

Out of the 31 observed stands, only stand 42 has a high density rating (>75% cover), a decrease of three stands since 2010. It covers only 0.34-acre, less than 0.01% of the total acreage.

The majority of the stands have very low densities (<25% cover) of Eurasian water milfoil with single stems growing sporadically among a lot of native species. The most common native species included northern water milfoil (*Myriophyllum sibiricum*), two-leaf water milfoil (*Myriophyllum heterophyllum*), a variety of pondweeds (*Potamogeton* 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*). 24 of the 31 stands have low densities and account for only 90% (111.50-acres) of the total area observed to have Eurasian water milfoil present

Conclusions

Generally, a decrease in observed purple loosestrife presence was documented at the We Energies reservoirs monitored in 2012. It was discouraging that a new location of purple loosestrife was observed in the Lower Paint Reservoir for the first time in 2010. The entire plant was removed including the flowering heads, stems, and root mass. No purple loosestrife was found at Lower Paint in 2012.

Substantial decreases in the number Eurasian water milfoil stands (-9%), the spatial distribution (-19%), average stand density (-9%), and the number of high density stands (-75%) was observed between 2010 & 2012. The percent acres of low density stands increased by 16% while the percent acres of high density stands was near zero (0.003%). Over ¾ of all stands observed were very low densities with only one the one, very small stand being documented as high density. These are all positive trends from the perspective that the Eurasian water milfoil improved or were stable between 2011 and 2012.

The only negative trend observed was that five stands were observed to increase in density between 2010 and 2012. These stands accounted for only about 8% (10.01-acres) of the total. However, this increase was offset by 7 stands that decreased in density and accounted for about 9% (11.20-acres).

The Eurasian water milfoil infestation in Lower Paint improved in most calculated values, while having minimal negative trends between 2010 and 2012. Overall the milfoil population observations trended very positively. Consistently, changes in the number of stands, overall coverage, spatial distribution of individual stands, and stand densities continue to be observed on an annual basis in Lower Paint and all of the We Energies reservoirs where Eurasian water milfoil is present throughout the Menominee River system. Conditions exhibit a majority of negative trends some years, remain relatively constant in others, and also dramatically improve

as observed at Lower Paint in 2012. Refer to the attached annual Eurasian water milfoil monitoring summary tables for a complete summary of data results since detailed observations were first recorded in 2006.

These trends indicate the Eurasian water milfoil population is in flux from year to year. 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, and others.

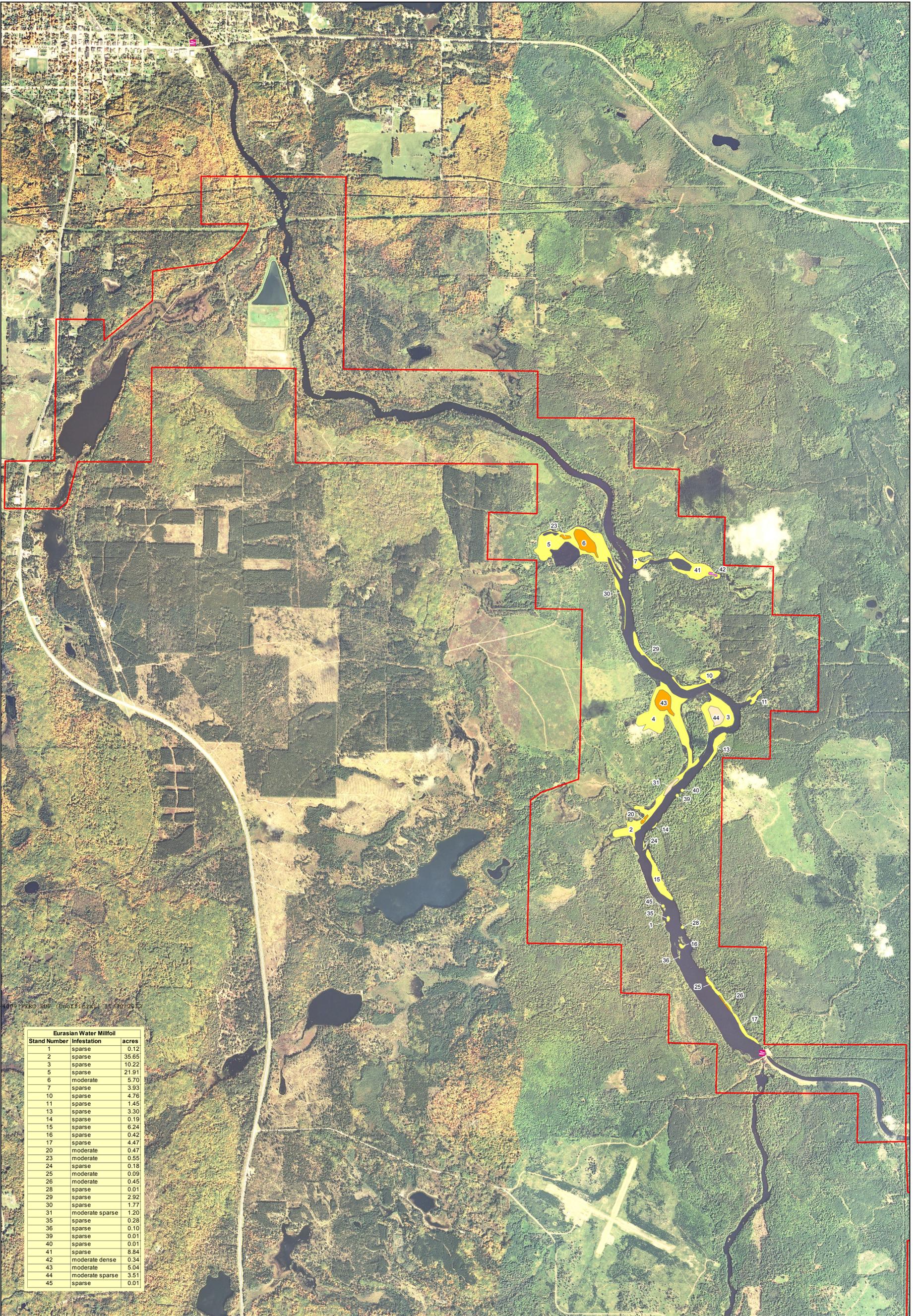
Annual fluctuations in the extent and density of Eurasian water milfoil appear to be due, in large part, to the presence of an indigenous weevil population occurring in the system. After four years of monitoring the weevil population, positive trends are being observed between weevil population and Eurasian water milfoil population fluctuations. These trends indicate the indigenous weevil population tends to increase as the Eurasian water milfoil population increases. Evidence shows the milfoil populations ultimately spike before declining. The weevil populations tend to lag behind the milfoil population spike, and it spikes as the milfoil population begins declining and crashes as observed in some reservoirs. The weevil population spikes are followed by substantial decreases in the respective populations. It appears a cycle occurs between these two populations. See the attached results and discussion regarding the Eurasian water milfoil summary report prepared by EnviroScience for further information about milfoil management activities that occurred in 2012.

**Table 1LP. 2012 Lower Paint Reservoir
Eurasian Water Milfoil Stand Data**

Stand Number	Density ¹	Mat Thickness	Stand Size ²
1	1	None	0.12 (-1.01)
2	Combined with 19	NA	NA
3	1	None	10.22 (-3.82)
4	1	None	35.65 (+1.95)
5	1	None	21.91 (+15.1)
6	3 (+1)	None	5.7 (-16.54)
7	1	None	3.93 (-0.54)
8	Not Present	NA	NA
9	Not Present	NA	NA
10	1	None	4.76 (-4.32)
11	1	None	1.45 (-5.68)
12	Not Present	NA	NA
13	1 (+1)	None	3.3 (+3.3)
14	1	None	0.19 (-0.68)
15	1	None	6.24 (-2.34)
16	1	None	0.42 (-2.23)
17	1 (-2)	None	4.47 (-2.00)
18	Not Present	NA	NA
19	Combined with 2	NA	NA
20	3 (+3)	None	0.47 (+0.47)
21	Combined with 2	NA	NA
22	Not Present	NA	NA
23	3 (-1)	None	0.55 (-10.51)
24	1	None	0.18
25	3 (+2)	None	0.09 (-0.52)
26	3 (+2)	None	0.45 (-4.85)
27	Not Present	NA	NA
28	1 (-3)	None	0.01 (-0.46)
29	1 (-3)	None	2.92 (+2.79)
30	1 (-2)	None	1.77 (+1.54)
31	2 (-1)	None	1.2
32	Combined with 2	NA	NA
33	Not Present	NA	NA
34	Not Present	NA	NA
35	1 (-3)	None	0.28 (-0.91)
36	1	None	0.1 (-0.34)
37	Not Present	NA	NA
38	Not Present	NA	NA
39	1	None	0.01
40	1	None	0.01
41	1	None	8.84
42	4	None	0.34
43	3	None	5.04
44	2	None	3.51
45	1	None	0.01

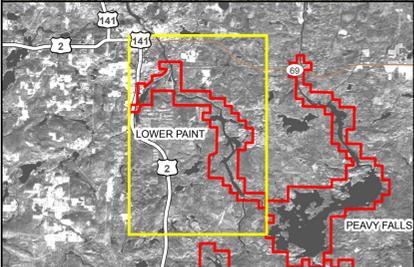
1 – (+/-) change in density rating from 2010 to 2012

2 – (+/-) change in stand size in acres from 2010 to 2012



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Stand Number	Infestation	acres
1	sparse	0.12
2	sparse	35.65
3	sparse	10.22
5	sparse	21.91
6	moderate	5.70
7	sparse	3.93
10	sparse	4.76
11	sparse	1.45
13	sparse	3.30
14	sparse	0.19
15	sparse	6.24
16	sparse	0.42
17	sparse	4.47
20	moderate	0.47
23	moderate	0.55
24	sparse	0.18
25	moderate	0.09
26	moderate	0.45
28	sparse	0.01
29	sparse	2.92
30	sparse	1.77
31	moderate sparse	1.20
35	sparse	0.28
38	sparse	0.10
39	sparse	0.01
40	sparse	0.01
41	sparse	8.84
42	moderate dense	0.34
43	moderate	5.04
44	moderate sparse	3.51
45	sparse	0.01



Year 2012 Field Work

- sparse
- moderate sparse
- moderate
- moderate dense
- dense

FERC Hydro Project Boundary
 Public Boat Launch

1,000 0 Feet 1,000 2,000

Lower Paint Hydro Project - Year 2012
Eurasian Water Milfoil and Purple Loosestrife Survey

Source: USDA - NAIP Imagery, 2010
 GPS field data collected 7/28/2012