

We Energies
2010 Annual Report - Nuisance Plant Control Survey
Chalk Hill Reservoir
FERC Project #2394

Background and Methods

We Energies' Environmental department staff, Mr. Mike Grisar and Mr. Scott Horzen, conducted a survey from a boat of the entire shoreline at the Chalk Hill Reservoir project on August 2, 2010. 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 2010 surveys, the stand location and perimeter were compared and verified with the 2009 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 1CH. 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 at a new location along the shores of the Chalk Hill Reservoir project area. This single plant was located at the south end of the reservoir in the back of a secluded bay along the west side of the reservoir. The plant was found immediately adjacent to a wood duck house that was installed by a third party a few years ago. The entire plant was removed including the flowering heads, stems, and root mass. The loosestrife plant observed at the south end of Miscauno Island in 2008 continues to be effectively removed.

Forty-five stands of Eurasian water milfoil were observed at the Chalk Hill Reservoir project area in 2010 (attached map), an increase of four stands from 2009. While there were 9 new stands documented, 1 previously identified stand was not present in 2010. An additional 4 stands merged into other stands. The identified stands are distributed throughout the project area and range in size from <0.01-acre up to 37.63-acres.

Eurasian water milfoil is present in approximately 137-acres in the Chalk Hill Reservoir project area, an increase of approximately 17-acres from 2010. This is the same acreage that disappeared between 2008 and 2009. Cumulatively, the average stand size is 3.05-acres with an average density rating of 1.51 per stand. In 2009, the average stand size was 2.94-acres with an average density rating of 1.85 per stand. The increase in average stand size is attributable to the overall increase of Eurasian water milfoil coverage in the reservoir.

The decrease observed in the average density rating is attributable to the decrease in stand densities observed in 12 stands as well as the new stands having an average rating of 1.67. Only two stands increased in stand density between 2009 and 2010.

Thirteen stands changed in spatial coverage. The total gross change observed exceeded 27-acres with an average gross change of 2.11-acres per stand. Of these, 7 stands accounted for over 26-acres that either increased or decreased in size (approximate 3.7-acre average change). The largest changes were observed in stands 5, 6, 23, & 26.

Out of the 45 observed, only stands 3 and 63 have a high density (>75% cover). Cumulatively, these stands cover only 0.19-acres (0.14%) of the total area observed to have Eurasian water milfoil present.

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*). 37 of the 45 stands have low densities and account for approximately 86% (117.79-acres) of the total area observed to have Eurasian water milfoil present, an increase of over 40-acres since 2009.

Conclusions

In conclusion, the number Eurasian water milfoil stands increased slightly in the Chalk Hill project area. There were notable increases in the total acreage and average stand size. A decrease was observed in the average stand density while a sharp decrease in the total acreage of dense stands occurred. Each of these changes in spatial distribution, stand size, average stand density, and acreage of dense stands are nearly exact opposite results observed between 2008 and 2009. With the exception of the increase in overall distribution, positive trends were observed at Chalk Hill in 2010.

The most notable improvement between 2009 and 2010 is the total acreage of dense stands being just 0.19-acre across the entire project area. While the spatial coverage continues to be widespread having nearly 140-acres of Eurasian water milfoil present, less than one-fifth of 1% is dominated by the milfoil.

Changes in spatial distribution continue to be observed with having over 27-acres change in 13 stands (approximately ¼ of all stands). Of those stands occurring in 2009 and still present in 2010, significant changes in the average stand size further indicate annual changes in the extent of milfoil populations.

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.

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 summary report prepared by EnviroScience for further information about milfoil management activities that occurred in 2010.

The new location of purple loosestrife observed in 2010 is discouraging. Generally, a trend in increased purple loosestrife presence was observed in 4 of the 8 reservoirs monitored in 2010. There continues to be an influx of purple loosestrife occurring along public roadways leading to many of the reservoirs. In this instance, loosestrife appears to be increasing exponentially along CTH K leading easterly toward the Menominee River between the Chalk Hills and White Rapids project areas.

**Table 1CH. 2010 Chalk Hill Reservoir
Eurasian Water Milfoil Stand Data.**

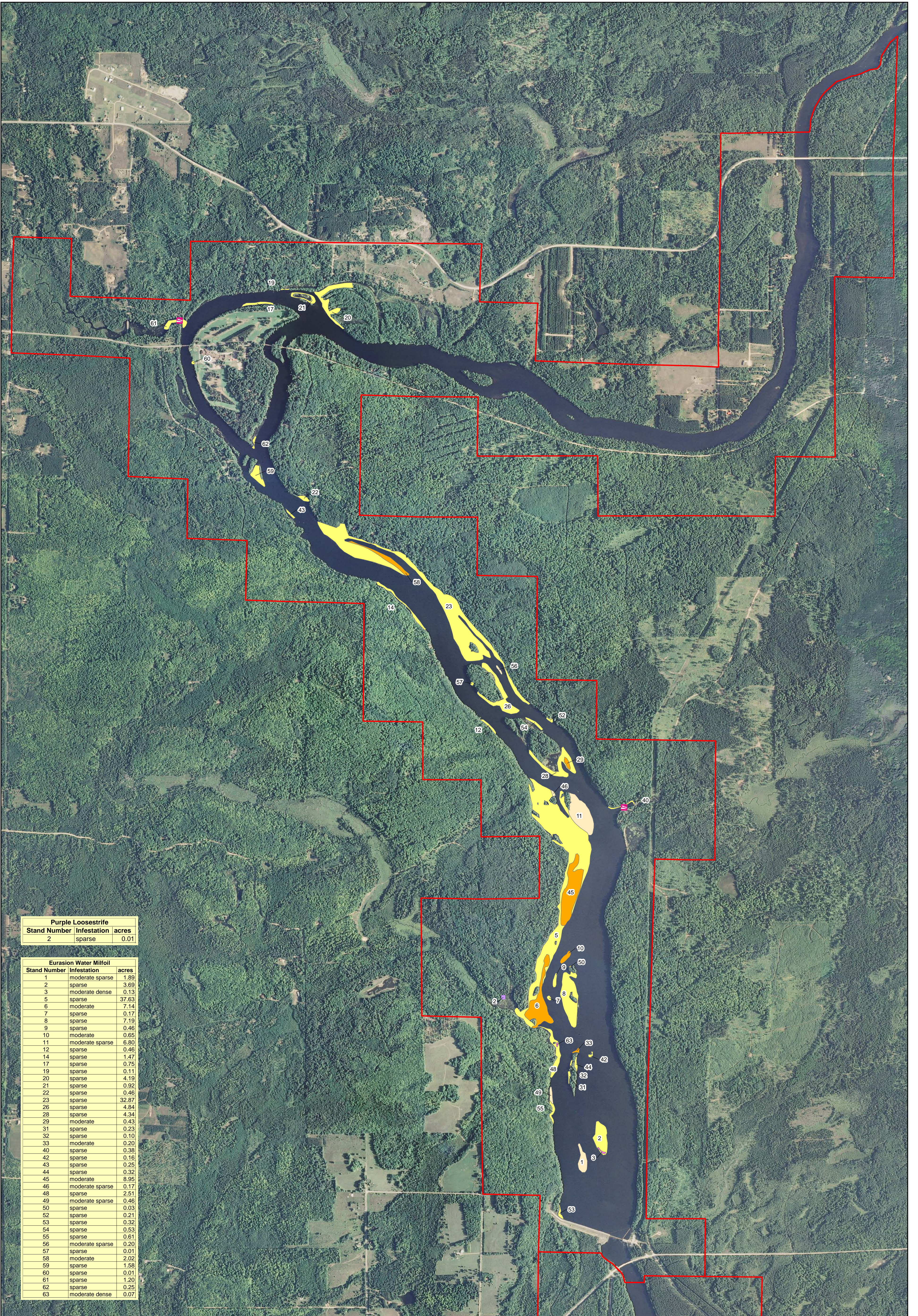
Stand Number	Density¹	Mat Thickness	Stand Size²
1	2	None	1.89
2	1	None	3.69
3	4 (+2)	None	0.13
4	Not Present	NA	NA
5	1	None	37.63 (+11.81)
6	3	None	7.14 (-3.25)
7	1	None	0.17
8	1 (-2)	None	7.19
9	1 (-3)	None	0.46
10	3 (-1)	None	0.65
11	2 (-2)	None	6.80
12	1	None	0.46
13	Not Present	NA	NA
14	1	None	1.47 (+0.58)
15	Not Present	NA	NA
16	Not Present	NA	NA
17	1	None	0.75
18	Not Present	NA	NA
19	1 (-1)	None	0.11
20	1	None	4.19
21	1	None	0.92
22	1	None	0.46
23	1	None	32.87 (+3.53)
24	Not Present	NA	NA
25	Not Present	NA	NA
26	1	None	4.84 (+2.73)
27	Combined with 23	NA	NA
28	1	None	4.34 (+1.54)
29	3	None	0.43
30	Not Present	NA	NA
31	1	None	0.23
32	1	None	0.10
33	3 (+2)	None	0.20 (+0.16)
34	Combined with 5 and 45	NA	NA
35	Not Present	NA	NA
36	Not Present	NA	NA
37	Not Present	NA	NA
38	Not Present	NA	NA
39	Not Present	NA	NA
40	1	None	0.38 (+0.09)
41	Not Present	NA	NA
42	1 (-1)	None	0.16
43	1	None	0.25
44	1 (-1)	None	0.32
45	3 (-1)	None	8.95 (+1.69)
46	2 (-1)	None	0.17
47	Combined with 6	NA	NA

**Table 1CH. 2010 Chalk Hill Reservoir
Eurasian Water Milfoil Stand Data.**

Stand Number	Density¹	Mat Thickness	Stand Size²
48	1 (-2)	None	2.51 (1.55)
49	2 (-2)	None	0.46 (0.29)
50	1 (-1)	None	0.03
51	Within 61	NA	NA
52	1	None	0.21 (0.2)
53	1	None	0.32 (0.08)
54	1	None	0.53
55	1	None	0.61
56	2	None	0.20
57	1	None	0.01
58	3	None	2.02
59	1	None	1.58
60	1	None	0.01
61	1	None	1.20
62	1	None	0.25
63	4	None	0.07

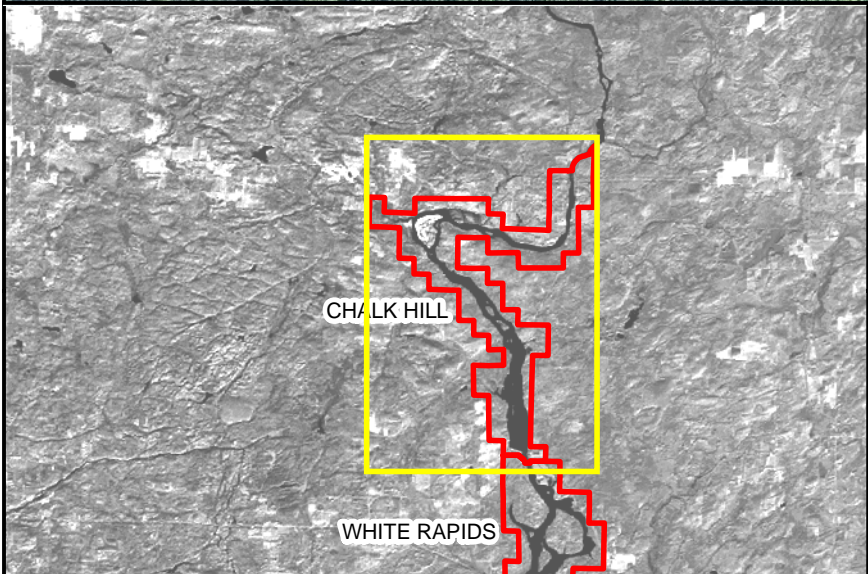
1 – change in density rating from 2009 to 2010

2 – change in stand size from 2009 to 2010



Purple Loosestrife		
Stand Number	Infestation	acres
2	sparse	0.01

Eurasian Water Milfoil		
Stand Number	Infestation	acres
1	moderate sparse	1.89
2	sparse	3.69
3	moderate dense	0.13
5	sparse	37.63
6	moderate	7.14
7	sparse	0.17
8	sparse	7.19
9	sparse	0.46
10	moderate	0.65
11	moderate sparse	6.80
12	sparse	0.46
14	sparse	1.47
17	sparse	0.75
19	sparse	0.11
20	sparse	4.19
21	sparse	0.92
22	sparse	0.46
23	sparse	32.87
26	sparse	4.84
28	sparse	4.34
29	moderate	0.43
31	sparse	0.23
32	sparse	0.10
33	moderate	0.20
40	sparse	0.38
42	sparse	0.16
43	sparse	0.25
44	sparse	0.32
45	moderate	8.95
46	moderate sparse	0.17
48	sparse	2.51
49	moderate sparse	0.46
50	sparse	0.03
52	sparse	0.21
53	sparse	0.32
54	sparse	0.53
55	sparse	0.61
56	moderate sparse	0.20
57	sparse	0.01
58	moderate	2.02
59	sparse	1.58
60	sparse	0.01
61	sparse	1.20
62	sparse	0.25
63	moderate dense	0.07



■ Public Boat Launch
 FERC Hydro Project Boundary
■ Purple Loosestrife

Year 2010 Field Work
 sparse
 moderate sparse
 moderate
 moderate dense
 dense

1,000 0 Feet 1,000 2,000

Chalk Hill Hydro Project - Year 2010
Eurasian Water Milfoil and Purple Loosestrife Survey

Source: USDA - NAIP Imagery, 2009
 GPS field data collected 8/02/2010