

**We Energies
2008 Annual Report - Nuisance Plant Control Survey
Brule Reservoir
FERC Project #2431**

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 Brule Reservoir project on August 4, 2008. 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 2008 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 1. 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 & Discussion

No purple loosestrife plants were observed along the shores of the Brule Reservoir project area.

Forty-four stands of Eurasian water milfoil were observed at the Brule Reservoir project area in 2008 (Table 1), an increase of 16 stands from 2007. While there were 20 new stands recorded, Stand 12 was observed to be absent in 2008 and 3 stands were merged with other stands. The identified stands are distributed throughout the project area and range in size from <0.01-acre up to 8.20-acres.

Table 1. 2008 Brule Reservoir Eurasian Water Milfoil Stand Data.

Stand #	Stand/Mat Density ¹	Mat Thickness	Stand Size (acres) ²
1	3	none	0.22
2	1	none	2.31 (+1.36)
3	3	none	0.92
4	1	none	7.70 (-1.28)

Stand #	Stand/Mat Density ¹	Mat Thickness	Stand Size (acres) ²
5	4 (+2)	none	0.43
6	2 (+1)	none	4.42 (+0.28)
7	2 (+1)	none	8.10
8	1	none	0.39 (+0.10)
9	1	none	1.12 (+0.94)
10	3 (-1)	none	8.20 (-0.28)
11	1	none	7.58 (+0.92)
12	Not Present		
13	2 (+1)	none	0.09
14	1	none	0.06
15	1	none	0.92 (+0.18)
16	2	none	0.13
17	1 (-1)	none	0.33
18	2	none	0.05
19	1	none	0.01
20	combined w/ #21		
21	1	none	6.76 (+1.86)
22	1 (-1)	none	0.96 (+0.24)
23	1	none	0.15
24	2 (+1)	none	5.33
25	1	none	0.66 (+0.65)
26	combined w/ #25		
27	skip in # sequence		
28	combined with 40		
29	1	none	0.01
30	1	none	0.54
31	3	none	5.83
32	1	none	0.01
33	1	none	0.15
34	1	none	0.01
35	1	none	0.01
36	1	none	2.08
37	1	none	0.01
38	1	none	0.01
39	1	none	0.01
40	1	none	2.03
41	1	none	0.24
42	1	none	0.30
43	1	none	0.01
44	1	none	0.01
45	1	none	0.01
46	1	none	0.01
47	1	none	0.01
48	1	none	0.09

1 – change in density rating from 2007 to 2008

2 – change in stand size from 2007 to 2008

Eurasian water milfoil is present in approximately 68-acres in the Brule Reservoir project area, an increase of 10.62-acres from 2007. Cumulatively, the average stand size is 1.55-acres and has an average density rating of 1.36 per stand. In 2007, the average stand size was 2.17-

acres and had an average density rating of 1.56 per stand. The decreases in both average stand size and average stand density is attributable to the number of new stands encountered that were both small in size and had sparse cover. The data shows that there were numerous changes in stand size and densities between the 2007 and 2008 data. For example, 9 stands increased in size (an average increase of 0.72-acre) and 6 stands decreased in size (an average decrease of 1.21-acre). Similarly, slight changes in stand densities were observed in 8 stands, 5 increased while 3 decreased.

Out of the 44 observed stands, only stand 5 has a high density (>75% cover), one less than in 2007. Stands 1, 3, 10, & 31 have moderate ratings with +/- 50% milfoil coverage. Cumulatively, these five stands comprise approximately 23% (15.60-acres) of the total area observed to have Eurasian water milfoil present. These stands occur are generally located near the two boat launches occurring in the northern and central portions of the reservoir.

The majority of the stands have very low densities 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*). 23 of the 27 stands have low densities (<25% cover) and account for 80% (47.26-acres) of the total area observed to have Eurasian water milfoil present.

Conclusions

In conclusion, there was an increase in the number Eurasian water milfoil stands observed in the Brule project area. While the number of stands increased by approximately 36-percent, most were very small and observed at very low densities.

The region continues to experience a drought (over 2 years) resulting in lower flows and improved water clarity. Drought conditions have led to slower current in the impoundments. Less current and better light penetration appears to have promoted the establishment of the new stands. Additionally, better clarity also allowed for clearer visibility of Eurasian water milfoil.

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.