We Energies
2009 Annual Report - Nuisance Plant Control Survey
Peavy Falls Reservoir
FERC Project #11830

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 Peavy Falls Reservoir project on July 30 and 31, 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 1PV. 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:

Estimated Density Rating	% Cover
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 Peavy Falls Reservoir project area.

Thirty-five stands of Eurasian water milfoil were observed at the Peavy Falls Reservoir project area (attached map), a reduction of 86 stands since 2007. The identified stands are distributed throughout the project area and range in size from <0.01-acre up to 2.08-acres. The largest stand in 2007 was 57.59-acres.

Eurasian water milfoil is present in approximately 7.07-acres in the Peavy Falls Reservoir project area, which is 200-acres less than what was observed in 2007. Cumulatively, the average stand size is 0.20-acres and has an average density rating of 1.34 per stand. In 2007, the average stand size was 1.71-acres (nearly 8x that of 2009) and had an average density rating of 1.59 per stand. The decrease in stand size is attributable to the overall reduction of Eurasian water milfoil coverage and 8 new stands having an average size of 0.11-acre.

The decrease observed in average density rating is attributable to the rating decreases observed in stands 10, 77, 90, and 109, while an increase was observed in only 2 (stands 92 and 112). Additionally, the average density rating of the 8 new stands is 1.25, which is about a 21% reduction from 2007 values.

Additionally, 18 stands decreased in spatial coverage, while only two stands increased. The total gross change observed is 69.10-acres with an average gross change of 3.84-acres per stand. The majority of the difference in stand size is due to stand 8 accounting for the decrease of approximately 58 acres.

Out of the 35 observed stands, only stand 90 has a high density (>75% cover), 14 fewer than in 2007. This stand accounts for about 8% (0.59-acre) of the total area observed to have Eurasian water milfoil present.

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 (*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*). 30 of the 35 stands have low densities (<25% cover) and account for 80% (5.66-acres) of the total area observed to have Eurasian water milfoil present.

Conclusions

In conclusion, Peavy Falls Reservoir experienced the most significant changes from a year to year monitoring basis. The total number of stands significantly decreased by more than 70% from those observed in 2007. Additionally, the total acreage, average stand size, average stand density, the number of stands with high densities, and total acreage of high density stands all decreased. The most extreme change occurred in the loss of total acreage, from approximately 207-acres down to just over 7-acres observed in total for the entire reservoir. Additionally, stand 90 is the only high density stand remaining of 15 observed in 2007.

All of these changes indicate a vastly improved condition of Eurasian water milfoil at Peavy Falls. In summary, there is much less Eurasian water milfoil observed at lower densities than what was present in 2007.

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

Table 1PV. 2009 Peavy Reservoir Eurasian Water Milfoil Stand Data.

Stand Number	Density[1]	Mat Thickness	Stand Size[2]
1	Not Present	NA	NA
2	Not Present	NA	NA
3	Not Present	NA	NA
4	Not Present	NA	NA
5	Not Present	NA	NA
6	1	None	0.01 (-2.42)
7	1	None	0.4 (-4.34)
8	1	None	0.01 (-57.58)
9	Not Present	NA	NA
10	1 (-4)	None	0.01 (-0.12)
11	Not Present	NA	NA
12	Not Present	NA	NA
13	Not Present	NA	NA
14	Not Present	NA	NA
15	Not Present	NA	NA
16	Not Present	NA	NA
17	Not Present	NA	NA
18	1	None	0.01 (-0.72)
19	Not Present	NA	NA
20	Not Present	NA	NA
21	Not Present	NA	NA
22	Not Present	NA	NA
23	Not Present	NA	NA
24	Not Present	NA	NA
25	Not Present	NA	NA
26	Not Present	NA	NA
27	Not Present	NA	NA
28	Not Present	NA	NA
29	Not Present	NA	NA
30	Not Present	NA	NA
31	Not Present	NA	NA
32	Not Present	NA	NA
33	Not Present	NA	NA
34	Not Present	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	Not Present	NA	NA
41	Not Present	NA	NA
42	Not Present	NA	NA
43	Not Present	NA	NA
44	Not Present	NA	NA
45	Not Present	NA	NA
46	Not Present	NA	NA
47	Not Present	NA	NA

Table 1PV. 2009 Peavy Reservoir Eurasian Water Milfoil Stand Data.

Stand Number	Density[1]	Mat Thickness	Stand Size[2]
48	Not Present	NA	NA
49	Not Present	NA	NA
50	Not Present	NA	NA
51	Not Present	NA	NA
52	3	None	0.15 (-0.24)
53	Not Present	NA	NA
54	Not Present	NA	NA
55	Not Present	NA	NA
56	Not Present	NA	NA
57	Not Present	NA	NA
58	Not Present	NA	NA
59	Not Present	NA	NA
60	Not Present	NA	NA
61	Not Present	NA	NA
62	Not Present	NA	NA
63	Not Present	NA	NA
64	Not Present	NA	NA
65	Not Present	NA	NA
66	Not Present	NA	NA
67	Not Present	NA	NA
68	Not Present	NA	NA
69	1	None	0.01 (-0.23)
70	Not Present	NA	NA
71	Not Present	NA	NA
72	Not Present	NA	NA
73	Not Present	NA	NA
74	Not Present	NA	NA
75	Not Present	NA	NA
76	Not Present	NA	NA
77	1 (-2)	None	0.01 (-0.26)
78	Not Present	NA	NA
79	Not Present	NA	NA
80	Not Present	NA	NA
81	Not Present	NA	NA
82	1	None	0.09 (-0.13)
83	Not Present	NA	NA
84	Not Present	NA	NA
85	Not Present	NA	NA
86	Not Present	NA	NA
87	Not Present	NA	NA
88	Not Present	NA	NA
89	Not Present	NA	NA
90	4 (-1)	None	0.59 (-0.09)
91	1	None	0.01
92	3 (+2)	None	0.14 (-0.2)
93	Not Present	NA	NA
94	combined with 98	NA	NA

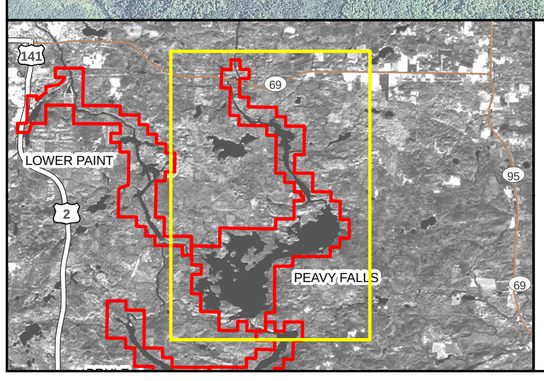
Table 1PV. 2009 Peavy Reservoir Eurasian Water Milfoil Stand Data.

Stand Number	Density[1]	Mat Thickness	Stand Size[2]
95	Not Present	NA	NA
96	Not Present	NA	NA
97	2	None	0.46
98	1	None	2.08 (-1.7)
99	1	None	0.94 (0.23)
100	1	None	0.01
101	1	None	0.01 (-0.01)
102	Not Present	NA	NA
103	1	None	0.01
104	1	None	0.01 (-0.13)
105	Not Present	NA	NA
106	Not Present	NA	NA
107	Not Present	NA	NA
108	Not Present	NA	NA
109	1 (-3)	None	0.38 (-0.46)
110	1	None	0.16
111	1	None	0.01
112	3 (+2)	None	0.39
113	1	None	0.17
114	1	None	0.09 (0.08)
115	Not Present	NA	NA
116	1	None	0.01 (-0.17)
117	Not Present	NA	NA
118	Not Present	NA	NA
119	Not Present	NA	NA
120	Not Present	NA	NA
121	1	None	0.01
122	1	None	0.01
123	3	None	0.14
124	1	None	0.01
125	1	None	0.01
126	1	None	0.01
127	1	None	0.01
128	1	None	0.01
129	1	None	0.69

1 – change in density rating from 2007 to 2009

2 – change in stand size from 2007 to 2009

Stand Number	Infestation	acres
6	sparse	0.01
7	sparse	0.40
8	sparse	0.01
10	sparse	0.01
18	sparse	0.01
52	moderate	0.15
69	sparse	0.01
77	sparse	0.01
82	sparse	0.09
90	moderate dense	0.59
91	sparse	0.01
92	moderate	0.14
97	moderate sparse	0.46
98	sparse	2.08
99	sparse	0.94
100	sparse	0.01
101	sparse	0.01
103	sparse	0.01
104	sparse	0.01
109	sparse	0.38
110	sparse	0.16
111	sparse	0.01
112	moderate	0.39
113	sparse	0.17
114	sparse	0.09
116	sparse	0.01
121	sparse	0.01
122	sparse	0.01
123	moderate	0.14
124	sparse	0.01
125	sparse	0.01
126	sparse	0.01
127	sparse	0.01
128	sparse	0.01
129	sparse	0.69



Public Boat Launch

FERC Hydro Project Boundary

Year 2009 Field Work

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

Feet

1,000 0 1,000 2,000

N

W E

S

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

Source: USDA -NAIP Imagery, 2005
GPS field data collected 7/30/2009 and 7/31/2009

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