

We Energies
2009 Annual Report - Nuisance Plant Control Survey
Big Quinnesec Falls Reservoir
FERC Project #1980

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 Big Quinnesec 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 1BQ. 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.

Twenty-four stands of Eurasian water milfoil were observed to occur in 2009 at the Big Quinnesec project area (attached map), an increase of 8 stands from 2007. Although Eurasian water milfoil is distributed throughout the project area, it is primarily located in the lower basin just above the dam. Eurasian water milfoil stands range in size from <0.01-acre up to 2.26-acres.

Eurasian water milfoil is present in 8.88-acres in the Big Quinnesec Falls Reservoir project area, an increase of nearly 3-acres from 2007. Cumulatively, the average stand size is 0.37-acres with an average density rating of 1.25 per stand. In 2007, the average stand size was 0.38-acres and had an average density rating of 1.06 per stand. The average stand size remained

nearly constant, while a slight increase in stand density was observed since 2007. Increases in stand densities were observed in 3 stands between 2007 and 2009 (stands 1, 2, and 8).

All stands observed in 2007 were observed in 2009. However, stand 6 was combined with stand 5 due to a decrease in the density of 6, as it became the same as stand 5 (sparse). Although the changes were minor on average, 7 stands changed in spatial coverage. The total gross change observed is 1.04-acres with an average gross change of 0.15-acre per stand.

Out of the 24 observed stands, none have a high density (>75% cover). This remained constant from 2007 observations. Conversely, 22 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*). These low density stands account for approximately 91% (8.12-acres) of the total area observed to have Eurasian water milfoil present.

Conclusions

In conclusion, there was a substantial increase in the number of Eurasian water milfoil stands in the Big Quinnesec Falls project area. There was also an approximate 50% increase in the total acreage of milfoil. Although, the average stand size and spatial coverage remained relatively constant. Some slight increases in average stand density were observed in stands 1, 2, and 8. There was also an increased presence of Eurasian water milfoil in the upper reaches of the project area. These are relatively negative results with respect to whether the conditions are improving. However, Big Quinnesec Falls continues to have no high density stands of Eurasian water milfoil.

Relative to the other reservoirs where Eurasian water milfoil is abundant, it occurs in a few small and sparse stands. Approximately two-thirds of the stands occur in the downstream segment of Big Quinnesec in sheltered bays along the south and southeast shorelines. The relative low Eurasian water milfoil presence can be attributed to steep slopes, deep water, and swift currents occurring within this reservoir. Relatively few slack water alluvial deposits, typical of where Eurasian water milfoil tends occur, are present.

The observed 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 1BQ. 2009 Big Quinnesec Reservoir
Eurasian Water Milfoil Stand Data.**

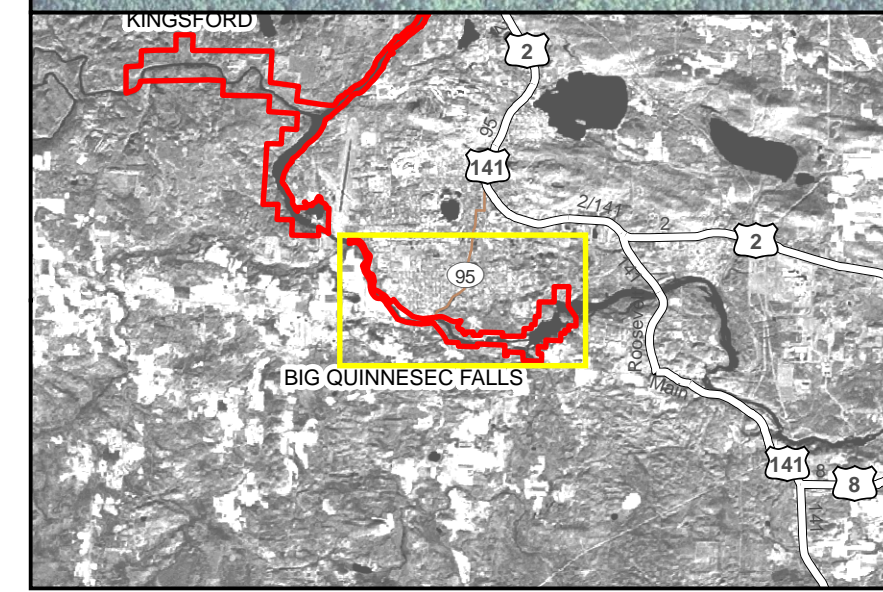
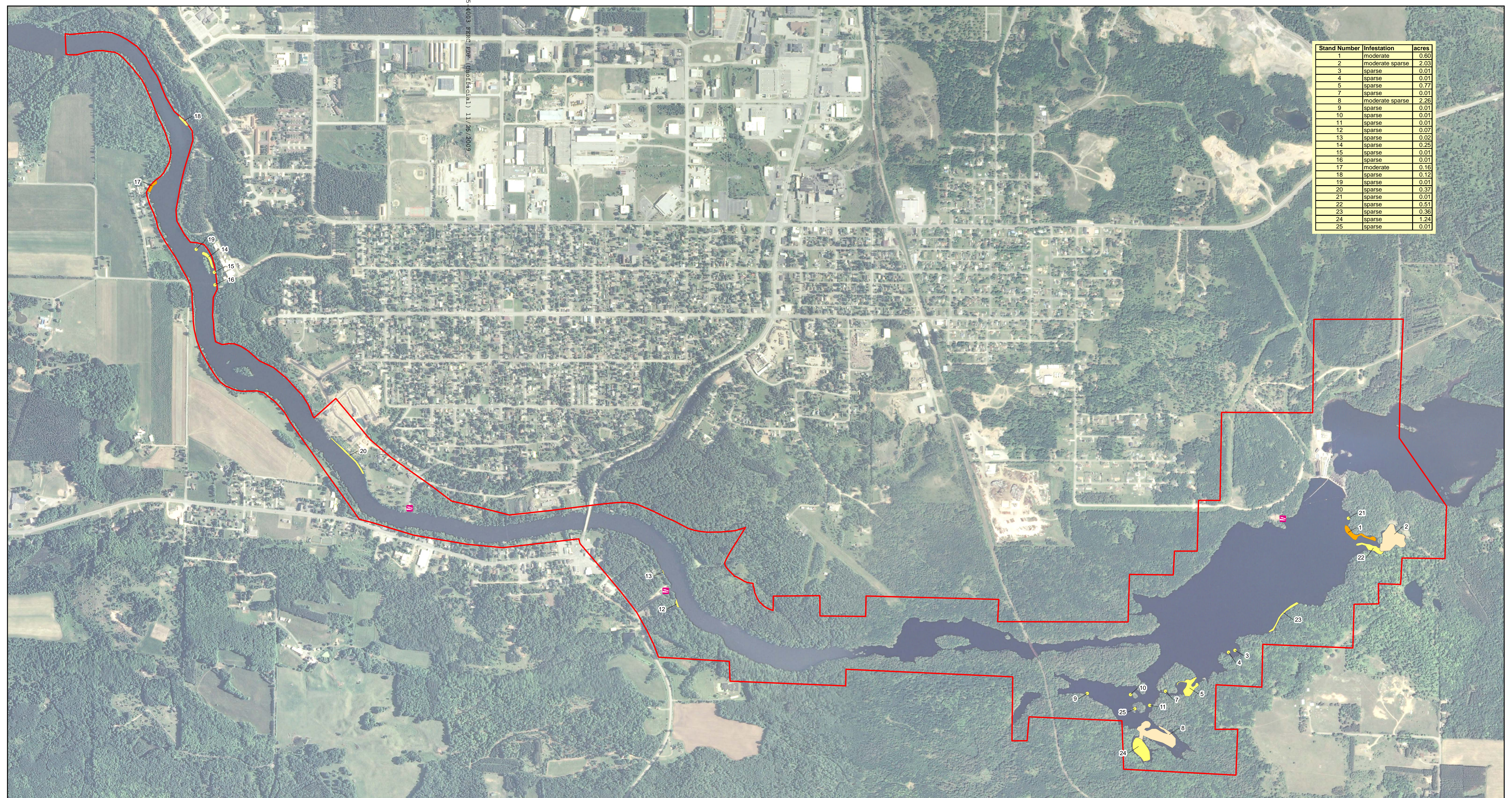
Stand Number	Density¹	Mat Thickness	Stand Size²
1	3 (+1)	None	0.6 (+0.2)
2	2 (+1)	None	2.03 (-0.37)
3	1	None	0.01
4	1	None	0.01
5	1	None	0.77 (+0.07)
6	combined with 5	NA	NA
7	1	None	0.01
8	2 (+1)	None	2.26 (-0.04)
9	1	None	0.01
10	1	None	0.01
11	1	None	0.01
12	1	None	0.07 (-0.03)
13	1	None	0.02 (-0.08)
14	1	None	0.25 (+0.24)
15	1	None	0.01
16	1	None	0.01
17	3	None	0.16
18	1	None	0.12
19	1	None	0.01
20	1	None	0.37
21	1	None	0.01
22	1	None	0.51
23	1	None	0.36
24	1	None	1.24
25	1	None	0.01

1 – change in density rating from 2007 to 2009

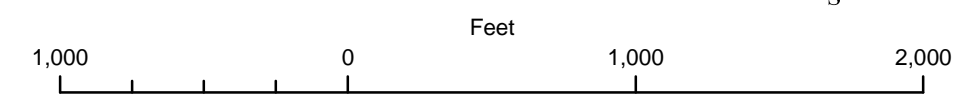
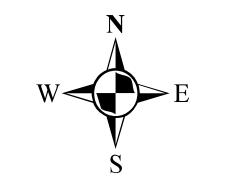
2 – change in stand size from 2007 to 2009

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Stand Number	Infestation	acres
1	moderate	0.60
2	moderate sparse	2.03
3	sparse	0.01
4	sparse	0.01
5	sparse	0.77
7	sparse	0.01
8	moderate sparse	2.26
9	sparse	0.01
10	sparse	0.01
11	sparse	0.01
12	sparse	0.07
13	sparse	0.02
14	sparse	0.25
15	sparse	0.01
16	sparse	0.01
17	moderate	0.16
18	sparse	0.12
19	sparse	0.01
20	sparse	0.37
21	sparse	0.01
22	sparse	0.51
23	sparse	0.36
24	sparse	1.24
25	sparse	0.01



Public Boat Launch
 FERC Hydro Project Boundary
Year 2009 Field Work
 sparse
 moderate sparse
 moderate
 moderate dense
 dense



**Big Quinnesec Falls Hydro Project - Year 2009
Eurasian Water Milfoil and Purple Loosestrife Survey**

Source: USDA-NAIP Imagery, 2008
GPS field data collected 7/29/2009 and 8/5/2009