

**We Energies
2013 Annual Report - Nuisance Plant Control Survey
Brule Reservoir
FERC Project #2431**

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 Brule Reservoir project on August 21, 2013. 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.

Visual observations for Eurasian water milfoil were made and compared to 2012 survey results. Relative changes in the extent and distribution of Eurasian water milfoil were noted. Specific locations of purple loosestrife were mapped using a Trimble XH GPS unit. Each location was identified as a stand and the number of plants, stems per plant, and relative age of the plants were recorded.

Results & Discussion

No purple loosestrife plants were observed along the shores of the Brule Reservoir project area. The removal of the plant observed in 2009 was successful with no reoccurrence of this plant in 2013.

Specific mapping of Eurasian water milfoil stand extents and densities were not conducted in 2013, but rather visual observations comparing the 2012 results to observed conditions in 2013. Generally, the distribution and density of Eurasian water milfoil appeared to have increased in some stands and decreased in others when compared to 2012 observations. Example stands where reductions in distribution, density, or both were observed in 2013 include stands 4, 5, 6, and portions of 65. Stands 64 and 80 were not present. Stands where increases in Eurasian water milfoil distribution, density, or both were observed include stands 1, 3, and portions of 65.

Conclusions

It was discouraging that a new location of purple loosestrife was observed in the Brule 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 Brule in 2013.

Overall, the Eurasian water milfoil infestation in Brule appeared to have improved in some areas and become worse in others from 2012 to 2013. Consistently, changes in the number of stands, overall coverage, spatial distribution of individual stands, and stand densities have been well documented from 2006 through 2012 on all of the We Energies reservoirs where Eurasian water milfoil is present throughout the Menominee River system. Conditions exhibit a majority of positive trends some years, remain relatively constant in others, become much worse, or have mixed results as observed at Brule in 2013. 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 were 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.