

# ROUND LAKE (MASON COUNTY, MICHIGAN): A SUCCESSFUL STORY OF EURASIAN WATERMILFOIL CONTROL

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## Introduction

Round Lake is a 571-acre, natural lake in Mason County, Michigan and possesses a shallow mean depth of under 6.0 feet (Figure 1). The lake has a marl and sand bottom and is primarily surrounded by vegetated and forested land, which supports approximately 77 lakefront riparians. In 2004, a lake management company was requested by a Round Lake riparian to conduct an aquatic vegetation survey of the lake due to concerns of a visible nuisance weed bed located near the central portion of the lake. The survey results found approximately 50 acres of the exotic, invasive species, Eurasian Watermilfoil (*Myriophyllum spicatum*) which was capable of infesting the entire lake surface area. The observed exotic milfoil infestation was so dense that boats could not get through that specific area.

Another year passed with no assessment district formed and the majority of the riparians remained unaware of the survey conducted the previous year. In 2006, a group of highly motivated riparians were able to obtain riparian signatures needed to facilitate the formation of the Round Lake Improvement Board and the lake board was formed in October of 2006. A Round Lake Improvement Feasibility Study was then conducted by a local engineering firm and determined that nearly half of the lake sur-

face area was covered by Eurasian Watermilfoil; Figures 2 and 3). Additional water quality analyses of the lake would demonstrate that the lake contained high nutrient levels (approximately 0.071 µg L<sup>-1</sup> of total phosphorus at the lake bottom, mean Secchi transparency of 6.0 feet, low conductivity, and a total alkalinity of 130 mg L<sup>-1</sup> as CaCO<sub>3</sub>).

It was evident that a rigorous management protocol was necessary to prevent the exotic weed from colonization of the entire lake surface area which was essentially an entire littoral zone. The amount of light available to submersed aquatic plants was high enough to allow for abundant growth of even the lowest-growing species. However, as a result of the dense infestation of exotic milfoil, the native aquatic plants that had slower growth rates and grew closer to the lake bottom (i.e., did not canopy) had major limitations for successful growth with reduced space and light resources.

## Round Lake Management Methods

Prior to the implementation of any aquatic plant management strategies, a rigorous GPS Point-Intercept survey was conducted on Round Lake to assess the presence and relative abundance of all aquatic plant species present. The protocol was developed by the U.S. Army Corps of Engi-

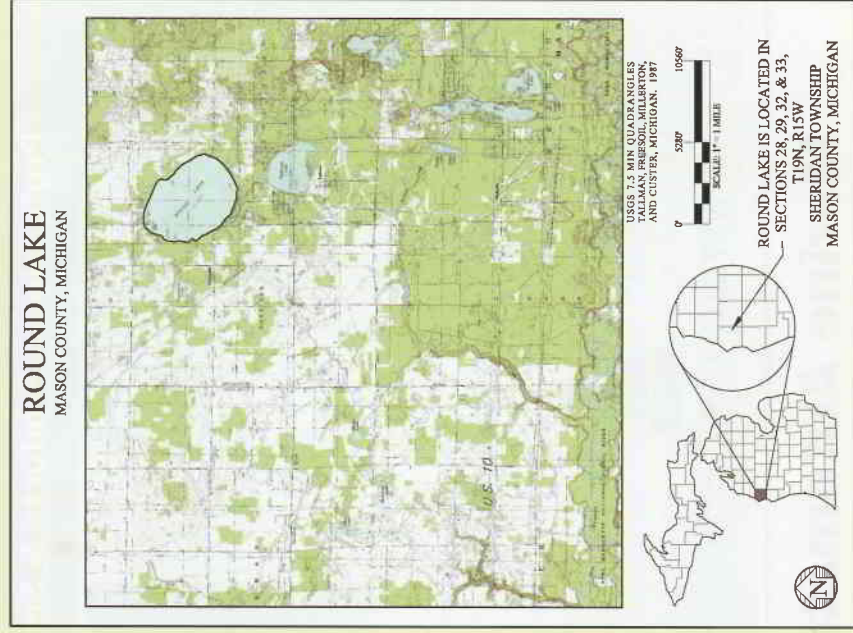


Figure 1

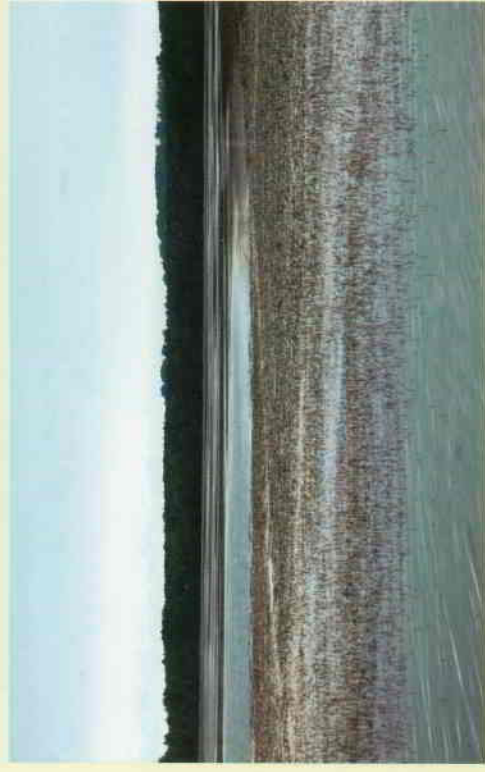


Figure 2

evaluated the potential impacts of fish predation on 5,000 aquatic weevils (*Euhrychiopsis lecontei*) that were placed in two areas of the lake during July of 2007. Since aquatic herbicide treatments were not possible at that time and the infestation of exotic milfoil severely impeded navigability and recreational activities, mechanical harvesting was used to provide temporary access to infested lake areas and increase removal of excessive plant biomass.

Data for the weevil predation study and efficacy of the weevil on the exotic milfoil population is being analyzed for a professional journal article submission. After the temporary methods for 2007 were executed, a whole-lake fluridone treatment occurred during May of 2008. The following year, approximately 130 acres of exotic milfoil returned and were treated with the systemic aquatic herbicide, 2,4-D. Three lake vegetation surveys have been conducted during



Figure 5

2010 and the recent August survey demonstrated that exotic milfoil eradication was possible as no milfoil fragments or mature plants were found (Figure 4). It should be cautioned, however, that eradications are usually temporary and the milfoil may re-emerge from the seed bank and new plants can grow. Thus, continuous monitoring of the lake via the GPS Point Intercept surveys is critical for effective long-term management of this exotic species.

## Importance of a Viable Lake Association

When Round Lake was initially surveyed in 2004, a viable Lake Association or Lake Improvement Board did not exist and thus an

Figure 3

important vehicle for establishing a Special Assessment District (SAD) for funding the necessary improvements to the lake was absent. Furthermore, a group with common goals and the ability to review the available (2004) survey data was also absent and this allowed the existing 50 acres of exotic milfoil to rapidly expand throughout Round Lake. If such an Association had existed at that time, the 50 acres of exotic milfoil could have been treated at a significant reduction in cost. This particular case emphasizes the necessity of strong community and interactions among riparians, even if there exists substantially different philosophies in regards to potential treatment strategies.

## Round Lake Today

The ecological status of Round Lake is currently demonstrative of a well-balanced aquatic ecosystem with a healthy abundance of native emergent, floating-leaved, and submersed aquatic vegetation. Pondweeds such as Illinois Pondweed (*Potamogeton illinoensis*), White-stem Pondweed (*Potamogeton praelongus*), Variable-leaf Pondweed (*Potamogeton gramineus*), and Thinleaf Pondweed (*Potamogeton pectinatus*) now occupy the areas of the open water that were once densely covered with Eurasian Watermilfoil. Low-growing,

submersed aquatic plants such as Southern Naiad (*Najas guadalupensis*), Slender Naiad (*Najas flexilis*), and Muskgrass (*Chara vulgaris*), now occupy the shallow areas and act as suitable habitat for growing fish. Along the perimeter of the lake, the majority of the riparians understand the importance of shoreline vegetation and communities of Bulrushes (*Scirpus acutus*), Native Blue flag Iris (*Iris versicolor*), Native Swamp Loosestrife (*Decodon verticillatus*), Cattails (*Typha sp.*), and Water Smartweed (*Polygonum amphibium*) reduce shoreline erosion and serve as valuable fisheries spawning habitat. Fishing in Round Lake continues to be strong once again and the pike, bass, and pan fish populations create great fun for fishing recreation (Figure 5).

## Acknowledgements:

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Figure 4