

EURASIAN WATER-MILFOIL (*Myriophyllum spicatum* L.)

EURASIAN WATER-MILFOIL was introduced into eastern North America in the 1950s and from that site it quickly spread to the Midwest. Its spread was facilitated, perhaps as it is now, as living fragments remaining in or attached to boating equipment that is moved between various lakes where living plant fragments are somehow released into the new lake environment.

Eurasian water-milfoil was found in Kangaroo Lake by Paul Mahlberg in early 1995 when several colonies were detected in the center of the lake south of the island. These areas of Eurasian water-milfoil (EWM) occurred in somewhat shallow areas of the middle of the lake where native species of pondweeds were beginning to disappear. EWM has migrated elsewhere in the lake: it occurs on both sides of the causeway, it occurs in the bayou and along some shore areas, it has populated the reef in the center of the lake, and now occurs in all of the fish cribs. Eurasian water-milfoil has a distinctive appearance as noted in Figure 1.

This figure also shows a comparison of Eurasian water-milfoil with a native species in our lake, the Northern water-milfoil (*M. sibiricum*), which is infrequent in the lake compared to invasive Eurasian water-milfoil. Both types of water-milfoil have 4 leaves at each node on the stem as shown in cross-section in the smaller inserts on Figure 1. But they differ in the number of filamentous leaflets on a leaf. Eurasian water-milfoil has more than 12 filamentous leaflets on a leaf, whereas Northern water-milfoil has fewer than 12 such leaflets on a leaf.

EWM begins to grow in the cool water of spring before other aquatic plants, and subsequently grows more rapidly than native aquatic plants. Thus, EWM out-grows native plants. These plants possess a robust root system that enables them to colonize disturbed lake bottom, such as caused by motorcraft, whereas the shallow-rooted native aquatic plants are easily up-rooted by motorcraft.

EWM grows as a dense population of plants. Leaves on a stem occur most commonly in feathery whorls of four, sometimes as 3 or 5, leaves at each node location on the stems. Each of the typically four leaves is divided into 12 or more thread-like green leaflets (Figure 1). In contrast, Northern water-milfoil has fewer than 12 leaflets.

By mid-summer their growing tips can reach the lake surface and form a floral stalk. Flowers and seeds are inconspicuous, but floral stalks are quite recognizable. Seeds are dispersed during the fall and can float to new locations around the lake to establish new plants.

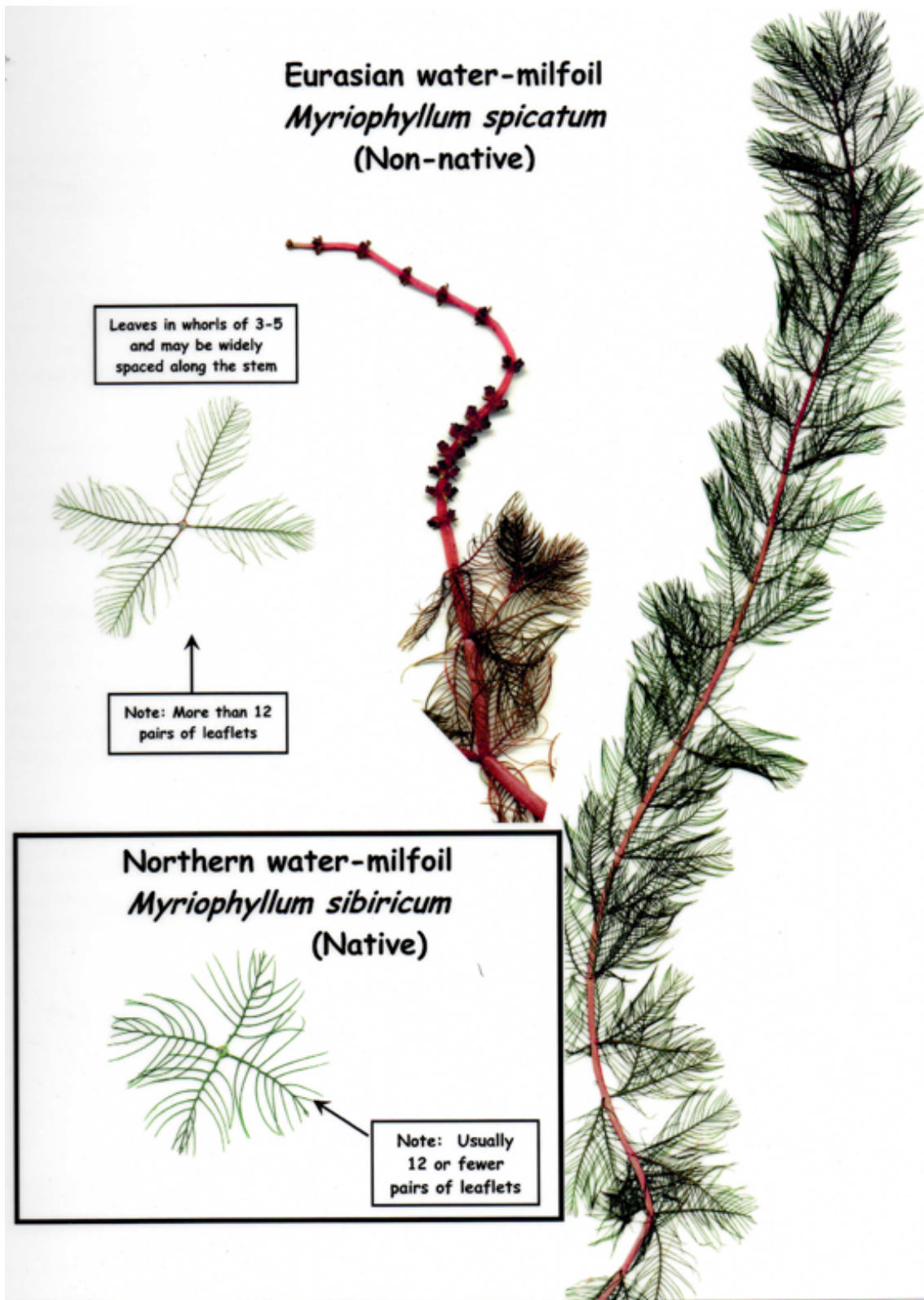


Figure 1. Invasive Eurasian water-milfoil compared with native Northern water-milfoil.

EWM also spreads notably by fragmentation. Stem fragments from the plant, broken off the plant by motors or waves and wind, will drift throughout the lake. These fragments readily produce roots, often present before they are separated from the parent plant. Such fragments can form new EWM colonies when they settle to the lake bottom somewhere, or tangle on a submerged log or among rocks on the bottom.

In 2006 we initiated an on-going program to study the progression of EWM growth in the lake. The objective of this study is to learn the precise distribution, density, relationship with other aquatic plants and lake bottom type associated with EWM. By repeating this survey biennially, and repeating the sampling of the same GPS site biennially, we will be able to ascertain the pace of EWM spreading in the lake, the potential changes in its density and its effect upon native aquatic plants.

This procedure is called a point-intercept survey (Figure 2). In 2006 we examined 530 GPS sites on a grid-map overlay of the lake for the presence and density of this milfoil. This procedure was repeated in 2008 and 2010 to provide three data sets from our study. This sampling procedure will be done again soon, and continued into the future.

In this study we examined EWM density at each of the 530 GPS sites, along with presence or absence of other aquatic plants and lake bottom type. Data are being analyzed currently. Results from these studies will be reported separately.

Control. Biological Control. Our first effort to attempt control of Eurasian Water-milfoil was with biological control. In 1997-99 KLA joined UW-Stevens Point and DNR in a study of several lakes to determine whether a milfoil weevil, which showed promise in controlling EWM in small lakes, would reduce the EWM colonies in Kangaroo Lake. There was no success in our lake. See the report on this study on our website, under The Geographic distribution of the aquatic milfoil weevil (*Euhrychiopsis Lecontei*) and factors influencing its density in Wisconsin lakes, by Laura Jester, 1998.

Chemical control. The purpose of this program to kill EWM along both sides of the causeway before this plant invades other portions of this nearly pristine northern region of the lake. We currently have recorded EWM to be present along both sides of the causeway. The Town of Baileys Harbor is funding this program. Chemicals are being used to control EWM along both sides of the causeway. They are used to treat EWM plants in an area 40-feet wide from the road edge out into the water, and along the length of the causeway on both sides. The chemicals are applied by a licensed applicator.

Physical control. An obvious way to control small numbers of EWM along our shoreline is for each of us to pull out any EWM that we see along our shoreline. We encourage you to become familiar with EWM and remove them along the shoreline in front of your property.

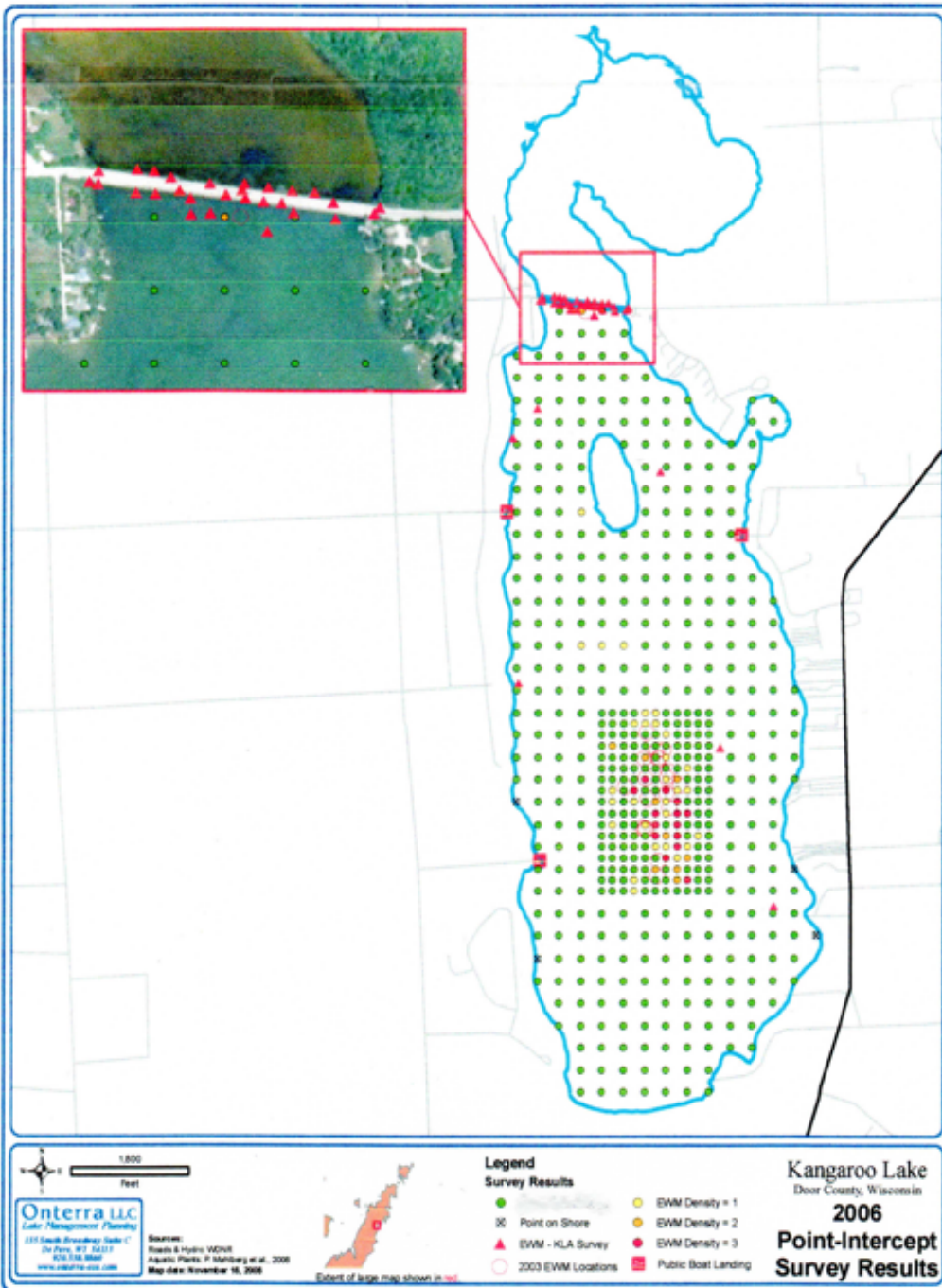


Figure 2. Point intercept survey of 530 GPS sites formatted as a grid over the south lobe of Kangaroo Lake. Dots (blue) represent the 530 GPS sites. Other dots depict location and relative density of EWM at specific locations. Survey from 2006.

Disposal. Remove the EWM plant material from the lake. Dispose of it in your garden or other acceptable location so that it does not get back into the lake.

Future work. If you would like to participate in activities related to EWM, kindly contact President Tom Schneider at trschneider@att.net

EURASIAN WATER-MILFOIL NORTH OF THE CAUSEWAY

Another phase of the Water-milfoil program is related to preventing the movement of this invasive plant from the large south lobe to the north lobe of Kangaroo Lake. There it may spread out of control and adversely affect the biology of the nearly pristine area. Currently it is present along the north-side shoreline of the causeway (Figure 2, causeway map insert). It is visible at various locations along the length of the causeway. Fragments can move from the south lobe to the north lobe through the culverts--they have been observed to do so--and subsequently become established along that shoreline