

# Lake Luzerne Aquatic Plant Survey & Barrier Installation Report 2008

Prepared for  
Town of Lake Luzerne  
Eugene Merlino, Supervisor  
Prepared By  
Richard King, Ecologist

Richard King  
19 Wyman St. #3  
Worcester, MA 01610

## Background

### *Lake Description*

Lake Luzerne has a surface area of ca. 111 acres and sits within a steeply sloped watershed of ca. 14,000 acres. The watershed is primarily woodlands although several homes populate the immediate shore of Lake Luzerne. The drainage of this watershed roughly follows Route 9N West to the Town of Lake Luzerne. Lake Luzerne is a natural lake, though the level was raised slightly with the small dam at the outlet. Lake Luzerne is the last lake in this watershed before the waters enter the Hudson River just above its confluence with Sacandaga River. There is a small boat launch and public beach on the western side of the lake near the effluent. Lake Luzerne drains directly into the Hudson River through a very short stream (less than 0.5 miles in length). The lake is situated in the town of Luzerne at the southern edge of the Adirondak Park in Warren County, NY.

Lake Luzerne has a maximum depth of ca. 52 feet with an average depth of ca. 24 feet (Mikol & Polsinelli, 1985). It is a dimictic lake (i.e., thermally stratified on a seasonal cycle) and mesotrophic. Lake Luzerne currently supports a population of the invasive non-native nuisance aquatic plant Eurasian watermilfoil (*Myriophyllum spicatum*) with some locally dense beds at the two tributaries, the southern basin, and at the effluent as well as a healthy native aquatic plant community. Many of the areas that potentially could support dense *M. spicatum* growth currently do not (anything less than ca. 15 ft deep). Thus, an effort is underway to control the current population of *M. spicatum* before it has spread throughout the entire littoral area of the lake.

The abundance and distribution of *M. spicatum* in Lake Luzerne has varied annually. In 2007, individual colonies of *M. spicatum* were not as dense as in previous years (e.g., Eichler & Boylen, 2004), and no new areas of growth were identified. The cause of the reduced abundance of *M. spicatum* in 2007 is uncertain, but it may have been due at least in part to the possible presence of the milfoil weevil (*Euhrychiopsis lecontei*). Confirmation of the presence of this herbivore in Lake Luzerne is pending. However, dense *M. spicatum* beds do vary annually in other nearby lakes (e.g., Lake George) where no *E. lecontei* population exists. These beds can later return to actively growing beds and have even ‘migrated’ to other areas within the same bays. In short, a single season of reduced density within milfoil beds does not necessarily mean the population is likely to exhibit long-term decline in the absence of more active control strategies. In 2008, milfoil densities were the highest yet with the south basin particularly troubling.

In 2007, a pilot study was initiated with the installation of 4 panels of ‘lake bottom blanket’ which were each 400 s.f. in size. Subsequently, two additional batches of blankets were procured (ca. 25 panels per shipment) and Aquatic Control Taskforce (ACT) now has 53 blankets (or ca. ½ acre in total area).

In 2008, a ‘rolling installation’ approach was initiated whereby panels were deployed in June, July, August and again in September (ca. 30-day intervals). Bottom blankets require roughly 30 days in order to suppress covered beds. Therefore, panels can be pulled and redeployed up to four times a summer. In addition to deployment of panels in 2008, a detailed and current distribution map was created using a handheld GPS unit. This report is an update to the 2007 Survey and Tier III Report.

## 2008 Milfoil Coverage

In 2008 a detailed distribution map was produced using handheld gps. These raw data were used to create outline maps showing the distribution of moderate to dense beds within Lake Luzerne in September 2008. Maps were constructed prior to September management activities.

### Current Bed Distribution, Shape and Size (See also Figure 1).

#### *Main Basin: Inlet S.E*

There are two fairly well defined beds on the southeastern shore of the inlet. Together they comprise ca.  $\frac{1}{4}$  acre at ca. 7,283 & 4,730 s.f. each. It would require ca. 28 panels to cover these beds simultaneously.

#### *Main Basin: Inlet N.W.*

There are an additional two bed on the Northwest side of the inlet. One bed is small and well defined at ca. 1,142 s.f. The other bed is ca. 31,294 s.f. and has grown substantially since the 2007 survey. Together these are ca.  $\frac{3}{4}$  acre in size.

#### *Main Basin: 'Campbell's Cove'*

This cove is accessible through Bill Campbell's property. A small tributary drains a wetland into this cove. Prior to the September 2008 installation this bed was 45,959 s.f. (or just over 1 acre). Approximately 11,000 s.f. was covered leaving ~36,000 s.f. in this cove.

#### *Main Basin: Western Shore and Outlet*

This is the single largest bed, and although it is irregular in shape it will be treated as a single, very long, continuous bed for the purposes of this report. This bed consists of ca. 96,022 sf of dense milfoil growth. In 2008 ca. 44,000 s.f. (1 acre) were covered. Thus this bed was roughly 3 acres in size as of Spring 2008, approximately 2 acres remain.

#### *Main Basin: 'Middle Shoal' Beds*

There are two, similar-sized beds established on a shallow shoal just outside of the southern basin. These are ca. 4,731 s.f. and ca. 4,074 s.f. It would require ca. 24 panels to cover these two beds entirely.

#### *Southern Basin: 'Thumb Cove'*

In the shallow cove on the northeastern side of the southern basin there is a moderate-to-dense area of coverage totaling ca. 8,300 s.f.

#### *Southern Basin: 'Between the Swim Areas'*

There is a dense and well-defined bed in the narrow stretch between the two swim areas. This bed is nearly circular and comprises ca. 6,271 s.f. or ca. 18 panels.

#### *Southern Basin: Remaining Beds*

Although these three beds were distinct when mapped, for management purposes it's more reasonable to consider them a single bed as they are separated by only a few feet which will likely fill in with milfoil by the time management begins in this basin. Combined, these beds are 71,320 s.f. or ca. 1.6 acres.

However, currently only about ½ of this area is dense growth. The remaining 50% is moderate, though beyond reasonable hand harvesting techniques in scope. Further, it is expected that the moderate areas will soon become dense areas. Thus the perimeter of the moderate-to-dense areas are mapped. Beyond these mapped beds, on the far eastern cove of the south basin there are scattered areas of milfoil.

**Table 1. Bed locations and sizes.**

<b>Bed</b>	<b>Size (s.f.)</b>
<i>Main Basin: Inlet S.E</i>	12,013
<i>Main Basin: Inlet N.W.</i>	32,436
<i>Main Basin: 'Campbell's Cove'</i>	36,000
<i>Main Basin: Western Shore and Outlet</i>	96,022
<i>Main Basin: 'Middle Shoal' Beds</i>	8805
<i>Southern Basin: 'Thumb Cove'</i>	8300
<i>Southern Basin: 'Between the Swim Areas'</i>	6271
<i>Southern Basin: Remaining Beds</i>	71,320
<i>Total Coverage</i>	271,167 sf 6.225acres

### **Conclusions**

In total there are ~6.3 acres of milfoil beds in Lake Luzerne as of this report. Approximately 80% of that is densely populated beds. The remaining 20% is moderate, but dense enough that hand harvesting is not likely a feasible management approach. The beds in the main basin are generally well defined and contained; though growing. These beds are suitable for continued benthic barrier management. The south basin is more problematic. The south basin has rapidly filled in with milfoil. This change is made more dramatic by the fact that 2007 was a 'down' year and milfoil was not as prevalent in this area.

Any areas within Lake Luzerne with depths of 15 feet or less are possible invasion areas. There are approximately 55 acres of the total 111 acres in Lake Luzerne which are less than 15 feet in depth. Therefore half of the entire surface of the lake is potential Eurasian Watermilfoil habitat (approximated in Figure 1 as the area outside of red outline). Currently, only 6.3 acres of the possible 55 acres support dense or moderately dense stands of milfoil.

Moving forward, it's suggested to continue efforts where the majority of the panels are currently in place. If more material is purchased in 2009 it would be preferable to manage some of the smaller beds in the main basin before they grow any larger. Currently there are 5-6 distinct beds which could be covered entirely in a single day.

**Figure 1.** Aerial imagery of Lake Luzerne with dense milfoil beds outlined in white and the approximate 15-foot depth contour in red. Imagery captured with GoogleEarth, data overlay from September 2008.



Image © 2008 New York GIS  
Image © 2008 TerraMetrics

©2008 Google