

2003 GPS Survey of Eagle Lake Essex County New York

Baseline study documenting the location and
size of the largest and densest beds of
Eurasian Water Milfoil in Eagle Lake

Prepared for
the Eagle Lake Property Owners, Inc. (ELPOI)
11 Deepwood Drive
Ticonderoga, NY 12883

Prepared by
Michael Tiedemann
358 Electric Ave.
Rochester, NY 14613
camptouchstone@yahoo.com

A Study of Milfoil in Eagle Lake (Summer of 2003)

Back Ground:

Eagle Lake is a 412-acre lake in Essex County, New York. It is at the top of the Schroon River watershed, and has had a continuing problem with Eurasian Water Milfoil in the lake. Eurasian Water Milfoil, is an invasive aquatic plant species, which grows in extremely dense stands, that provide a navigational hazard, as well as out competing the native plant species already in the lake. Since it's discovery in the lake in the late 1970's, people have debated whether the milfoil patches in the lake are getting larger or smaller. This study hopes to lay the groundwork to conclude these arguments, by providing the first study to determine the current size of the milfoil patches in Eagle Lake.

Purpose:

The purpose of this project is to provide a starting point for the future tracking of the size of milfoil patches in Eagle Lake. This was undertaken after years of debating about the size of the patches, using only the physical appearance of the patches as a guide line, as well as to be able to present to the APA, DEC and other state agencies that we have a problem that is getting worse, should we apply for a permit to remove the milfoil in whatever way is practical.

In order to gain an accurate picture of the size of the milfoil beds present and established in Eagle Lake, it was necessary to find a method of obtaining accurate location data. The only practical technology, which was within the budget constraints, was a handheld global positioning receiver (GPS) being used by a person in a boat to plot the outline of the bed using the GPS's waypoints. (The use of this technology was determined as appropriate, after temporary use of Lloyd Burroughs GPS unit) (The ELPOI selected a Garmin "GPS 76," that was sold to the organization at a discounted price by one of the lake members business). These waypoint, were then transferred to a computer using a free download of the software "G7twin," which was the only software, that we found that did not include a street map of the area, but gave a list of the latitude, and longitude coordinates.

Sample Collection:

Through trial and error, it was determined that the most effective time to map the perimeter of the patches, was between 1 and 4 in the afternoon, on days that were either clear and sunny (for shallow water); or overcast and gray (for deeper water, limiting the glare on the surface). These conditions allowed for the uniform light distribution on the lake, allowing you to see through the water more clearly, the time frame, also reduced the amount of light reflection off the surface of the water. It is best to plot the patches, when the lake is calm, or has a chop of less than 2 inches, so that the bottom picture is not broken up past usefulness.

It was also determined through trial and error, that the best way to follow the outline of the patch is to use the boat in reverse. With a person standing in the back of the boat, following the outline of the bed with the boat, using the GPS to record his position every few feet around the patch where practicable and to the shore line when not.

This was the most effective method, because it not only made it possible for the mapping to be done by one person, but it also reduce the chance of spreading the Milfoil by keeping the prop from getting tangled in the Milfoil.

Data Management:

After searching online, we discovered the program called “g7towin” which allowed, through a link cable, the GPS unit to talk to the computer and vice versa. After more searching online, and in discussion with Larry Eichler, it was determined that the most effective software for plotting the milfoil beds, was the program “MapInfo.” This was determine to be the best program because of its ability to not only plot the GPS points, but also to overlay them on Arial photography of Eagle Lake, as well as topographic maps provide for free download at the NYSGIS website <http://www.nygis.state.ny.us>.

Each red point on the maps represents a point taken along the edge of a milfoil bed, and multiple red points indicate the outline of the patch. Yellow points, indicate a landmark, such as a boathouse, the bridge or the boat launch. And blue points, indicate a milfoil patch that in my opinion is small enough, and lacking sufficient density, so that it is possible to hand-harvest it with a mask, snorkel and dive fins (figures 1-7). It is my suggestion that these patches be addressed as quickly as possible, so as to remove one more breeding ground for milfoil from Eagle Lake.

Results:

With this information, we were able to determine, using a built in area calculator and an Excel spreadsheet, that the surface area of Eagle Lake is approximately 412 acres, being composed of approximately 336 acres on the west end (after taking out the surface area of the 3 islands) and 76 acres on the east end. It was also determined that Eagle Lake is approximately 2.7 miles long, and at it’s widest point, is approximately 0.45 miles across. Using the same area calculator, we were able to calculate the surface area of the patches, and then using an Excel spreadsheet to sort the patches based on size, it was possible to determine that Eagle Lake has approximately 8.0 acres of milfoil located in 49 separate locations. This means that the 8.0 acres of Milfoil occupy just under 2% of the total surface area of Eagle Lake (Figures 1 and 2).

It was also determined, through the use of a Microsoft Excel spreadsheet and the area calculator, the locations of the milfoil beds with a surface area of greater than half an acre. Of the 6 that met this limit, only 1 of them has a surface area greater than 1 acre. These 6 patches however contain 63% of the milfoil in Eagle Lake. Of the 38 other patches, all but 3 of these were smaller than ¼ of an acre. However, it is interesting to note that of the 23 patches that were large than 100 square feet, 10 of them are located around Fox Island and the causeway, where milfoil was originally found in Eagle Lake (Figure 3). This means that the concentration of milfoil in the area between Fox Island, Route 74, and the Causeway is 6 times greater than it is in Eagle Lake as a whole. The percentage of Eagle Lake being covered by Milfoil in this portion of the Lake is just under 13% of the surface area. It is also interesting to note that this is also the location of 2 of the patches that are larger than 1/2 half an acre in size. An explanation for this may

be that the milfoil, since it was first identified in this area, may be better established than in the other parts of Eagle Lake, as well as it being a relatively wind sheltered area, that allows milfoil fragments to collect, and become established plants.

Another section on the Eagle Lake that has a high concentration of milfoil, is Crown Point Beach. This area actually has three patches that are separated by about 10 feet, and stretch from the south side of Crown Point Bay to past Janie Stevens's boathouse (figure 4). However these three separate patches contain 2.11 acres of milfoil, or nearly $\frac{1}{4}$ of the milfoil in Eagle Lake. The other two remaining patches, are the one in the bay between Bob Steven's and Bill Knaus's boathouse and the patch around Sunken Island, with surface area's of 0.70 and 0.59 acres respectively (Figures 4 & 5 respectively). There were no major milfoil patches on the West End of the lake, with the total surface area between the 5 patches, being just over $\frac{4}{5}$ of an acre, as well as the percentage of surface coverage being half the east end of the lake at just over 1%.

It is interesting to note that of all of the milfoil in the East End of Eagle Lake, 53% of it is located around the Beach and Around Fox Island. I therefore suggest the continued survey of these two sections of Eagle Lake so that they include depth measurements, sediment analysis, and plant density studies at these sites, to determine if possible why the milfoil grows so well in these two locations. It is also suggested that due to the fact that there were, in past years, patches of milfoil on Eagle Lake, that no longer exist (ex. in front of the Tiedemann residence), that similar measurements also be taken there to determine if possible why milfoil no longer grows there. Also I suggest that those sites that are marked on the map as being hand-harvestable be hand-harvested so that they are no longer potential places for milfoil to spread from. It is also suggested that Eagle Lake be surveyed on a yearly basis for new areas of milfoil growth so that they can be acted on before they become a major problem, with a resurvey of the already identified patches every few years so as to be able to track the growth or decline of these patches.

Special thanks to: International Paper for providing the grant which allowed us to purchase the GPS unit, Larry Eichler at the Darien Freshwater Institute for providing technical assistance in the selection of a GPS unit and on the operation of MapInfo, Scott Davis for his time spent out on Eagle Lake with me surveying the patches, Hydes Boat & RV for providing us with a GPS unit at cost, to Rolf Tiedemann for the use of his boat in the survey process, and to anyone else who I may have missed that contributed to the project.

Figure 1

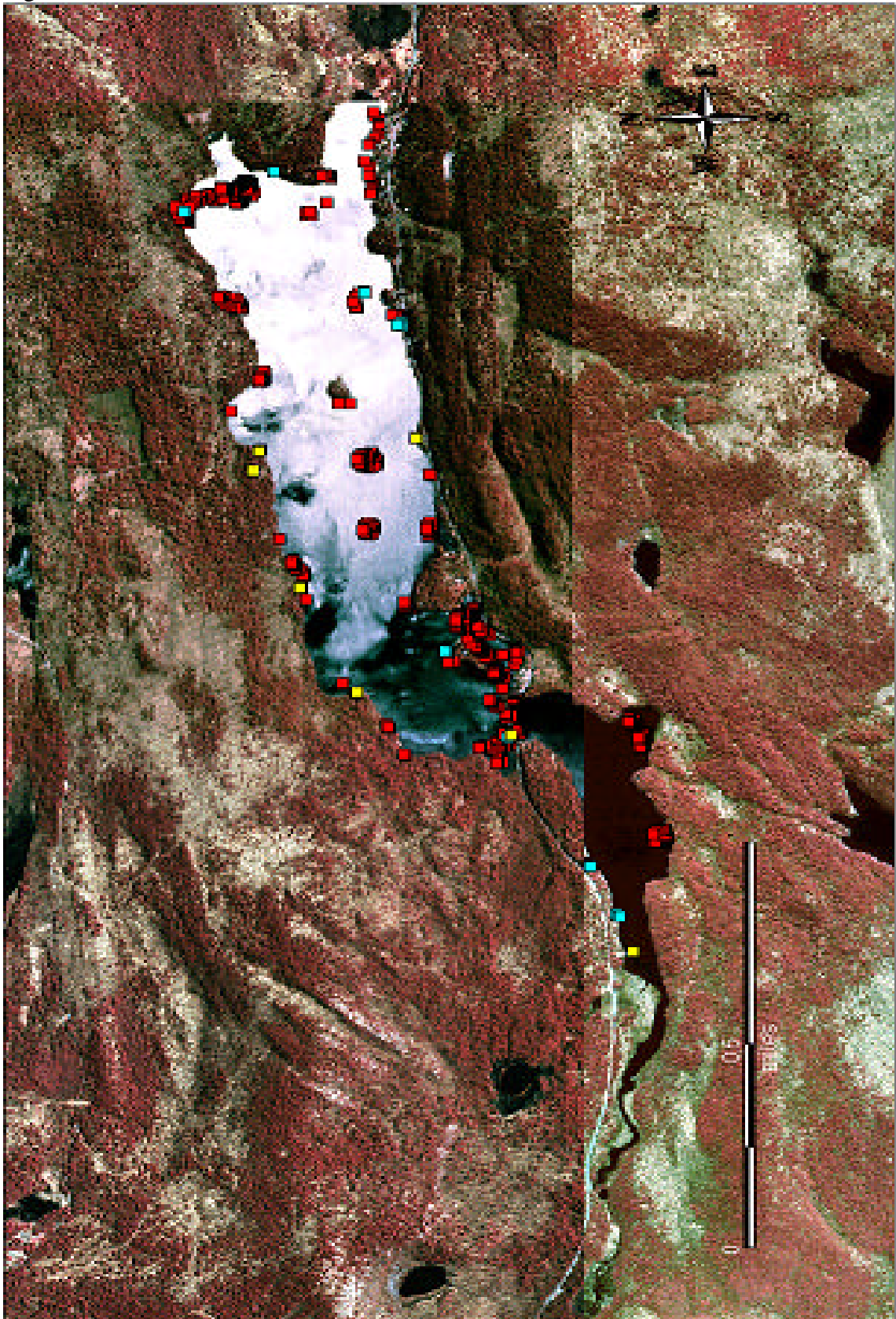


Figure 2

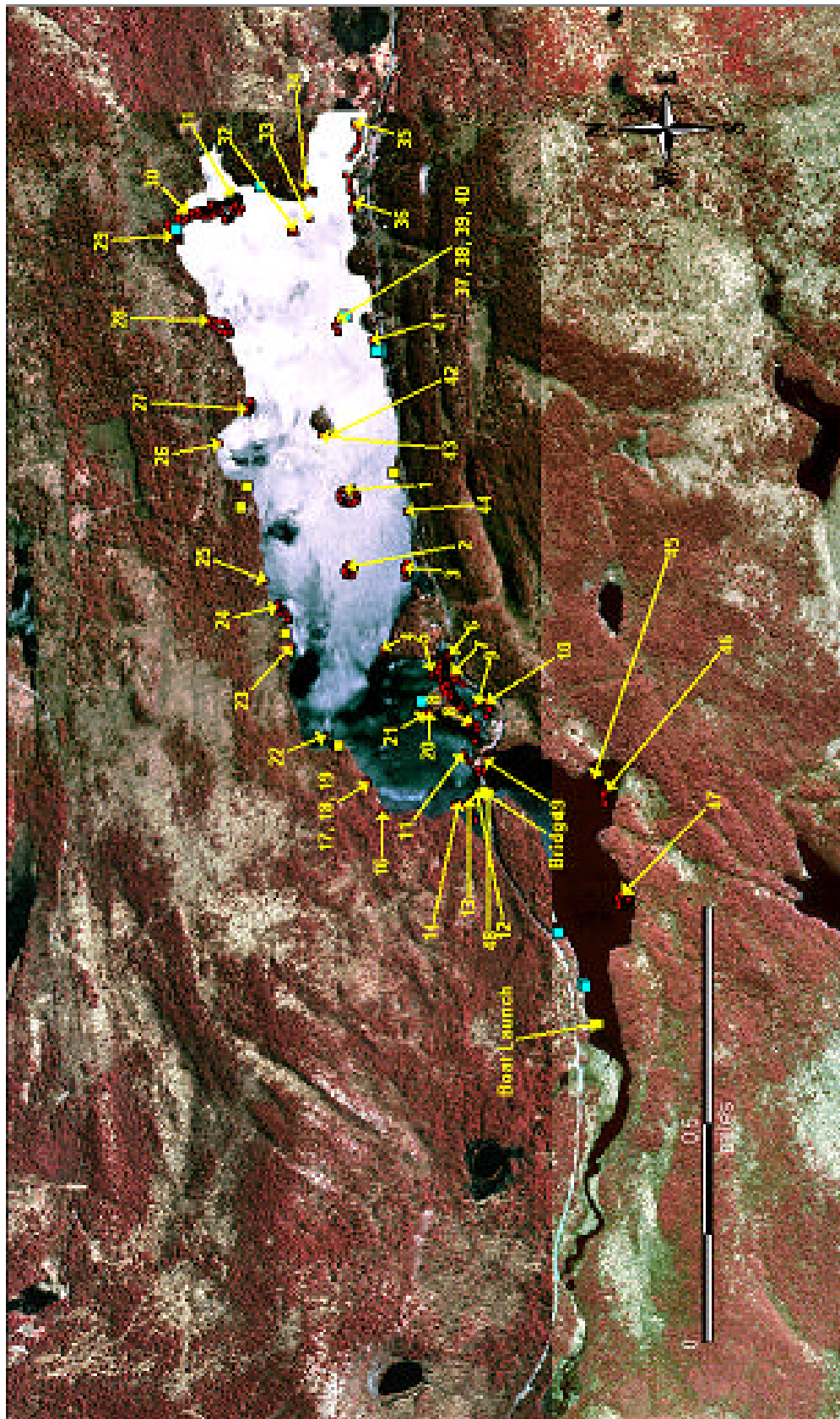


Figure 3



Figure 4

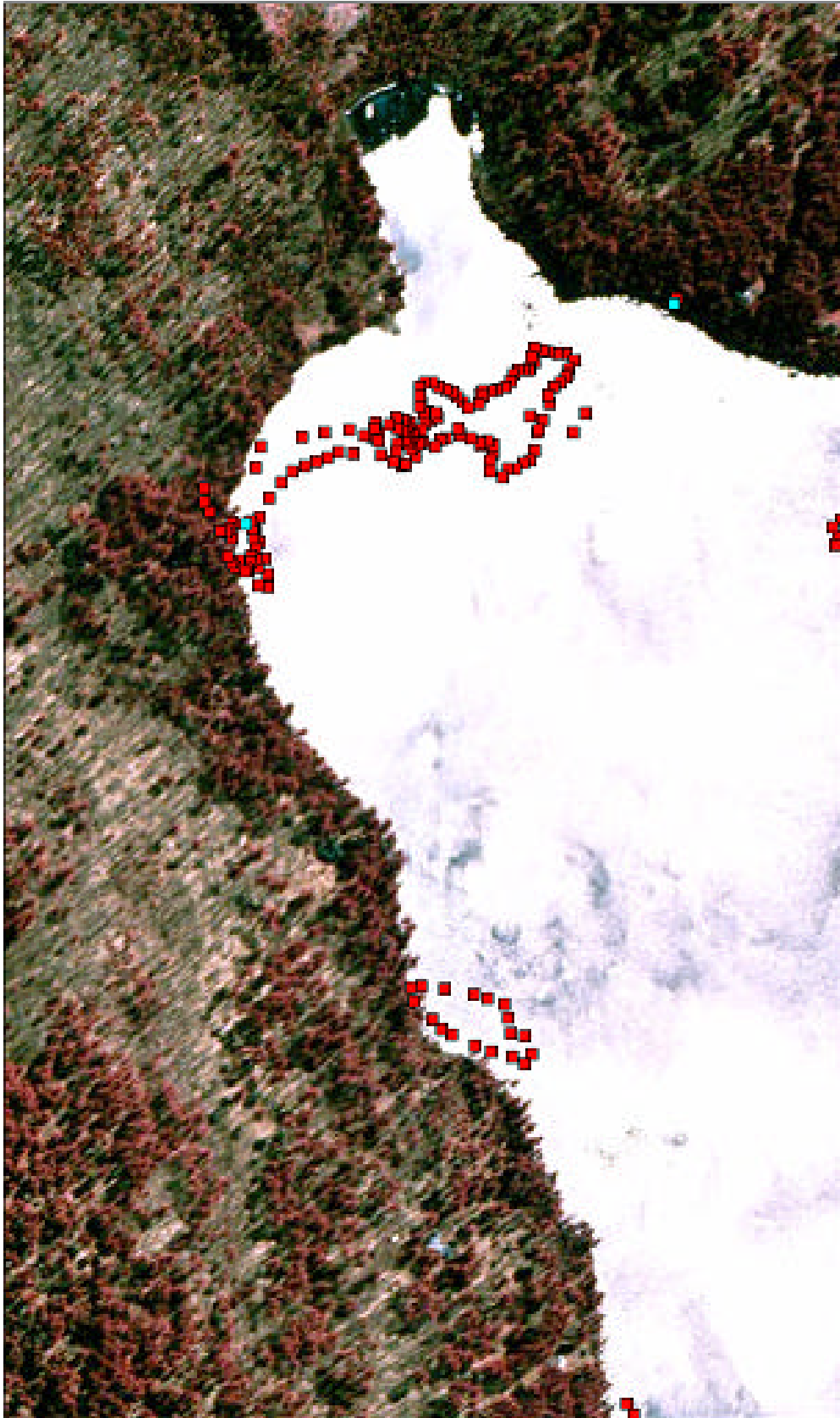


Figure 5

