2012 **Eurasian Water-Milfoil Management Report**

Upper Saranac Lake, NY

Submitted By:

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Introduction

Milfoil management on Upper Saranac in 2012 was a true stress test for our two-diver system working in tandem with Guy Middleton's surface spotting. It was a test that we passed, despite a time in August when all of us were a little worried that we would need to re-visit the drawing board. It was a test because of the runoff from storms in 2011, putting high nutrient loads into the water column, the notably weak winter in terms of ice cover and temperature and the phenomenally good growing season for aquatic plants, thanks to abundant sunlight and warmth. Our team began the season by hitting the key areas that produce consistent growth and removed many plants as they were just starting to grow in the spring. As the season progressed, the visibility allowed Guy to start surface spotting. When he located plants, our team would respond to them first and then resume their standard removal work throughout the lake.

In August, we got a shock when Little Square Bay suddenly had 10 foot tall, multi-stem plants scattered throughout the Tongue area of the bay. We doubled our crews for one week and hit the bay hard, and, once it was cleared out, we took a look at how it happened. Little Square was left alone for three weeks and, in such a short time, was able to produce large plants. Normally, we would have hit the bay after one week or so and would have found the same number of plants but in much smaller sizes, adding up to far fewer bags. August was the peak of ideal plant growth conditions this season, and, as a result, Little Square produced some tall, healthy plants in very little time. We gave our crew leaders a spreadsheet that was maintained day to day, to keep track of the frequency with which specific areas of the lake were being harvested. The areas were prioritized by how much growth they usually produce. With this easy to use record of our harvesting operations, the crew leaders could make sure that no top priority areas (such as Little Square) were left alone for too long.

Methods

With a small crew capable of moving quickly from location to location, we knew they could be very flexible, meaning they could switch from one objective to another easily. We decided to prioritize their work in order of importance.

1. Rapid response calls verified as milfoil by Guy Middleton
2. Buoys dropped by Guy Middleton
3. Key areas known to produce consistent milfoil growth

By prioritizing this way, we knew that rapid response calls would get the necessary "rapid" response. We also knew that any growth, easily seen from the surface, is therefore a concern for fragmentation and for the possibility of much more low lying growth in its vicinity. Therefore, Guy's surface spots received the next level of importance to ensure that nothing was getting ahead of us. Finally, we always know where to find the milfoil, and, once all other priorities were met, the crew could commit to coverage swimming key areas.

We have decided to adjust our harvest priorities going into 2013 to reflect the need for repeat harvests of critical areas. When a crew leader sees the need to clear an area, such as Little Square, they will prioritize that above clearing Guy's buoys. However, the buoys will not be ignored for more than one week. The use of a spreadsheet to keep track of what has been cleared, and when, will help make these decisions easy.

As our crew found milfoil, the surface tender would collect GPS waypoints that would characterize the overall spread of the growth and its density. In other words, a dense area of growth would receive a dense cluster of GPS waypoints, and a sparse area would receive sparse waypoints over the exact locations where plants were being picked.

This data was then converted into maps that could both represent the work completed by our crew and provide us with real time data on where the most growth was occurring and recurring.

Results

Fig I: Total GPS harvest points from 2011 and 2012. Maps include all collected points over the entirety of each year.

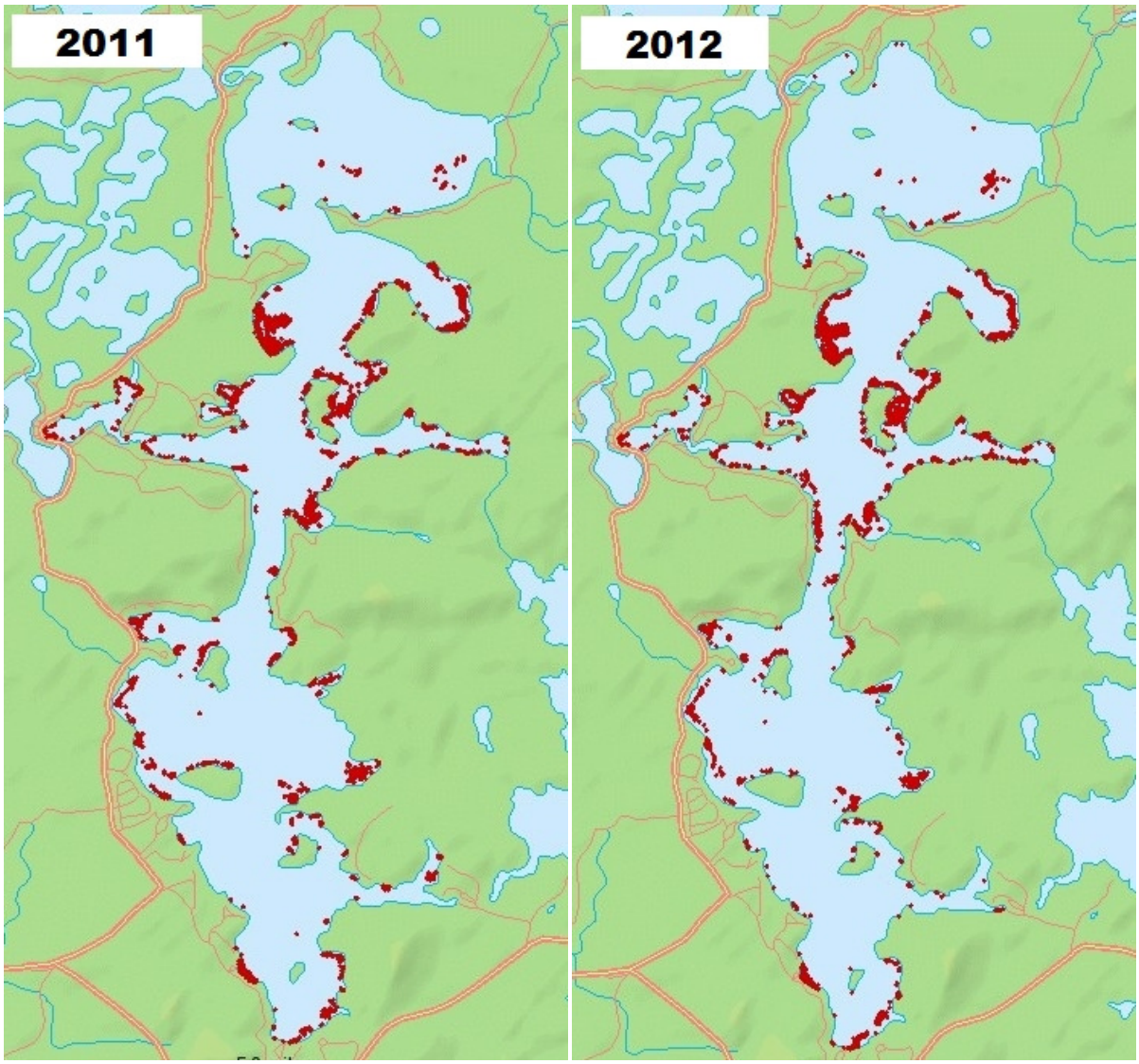


Fig II: Total bag harvests by week (weeks 1-20) and month for 2011 and 2012.

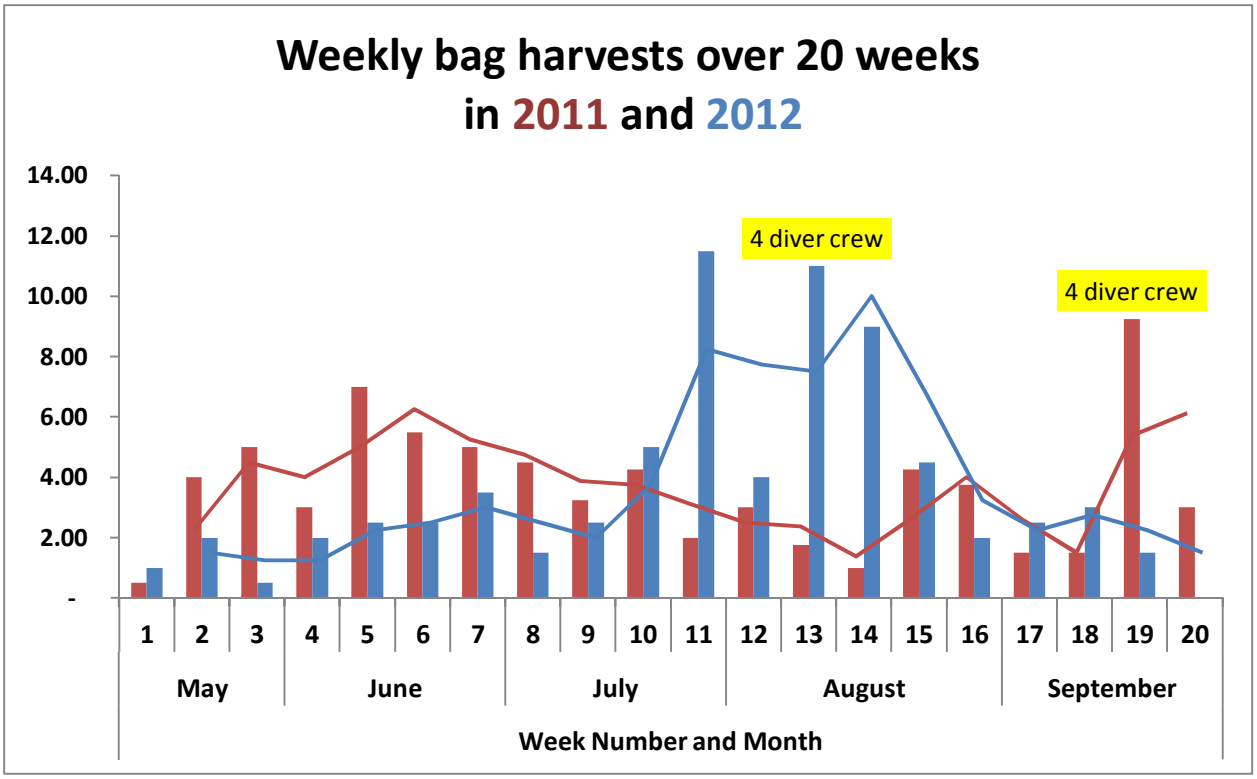


Fig III: Bag harvest totals for 2010, 2011 and 2012

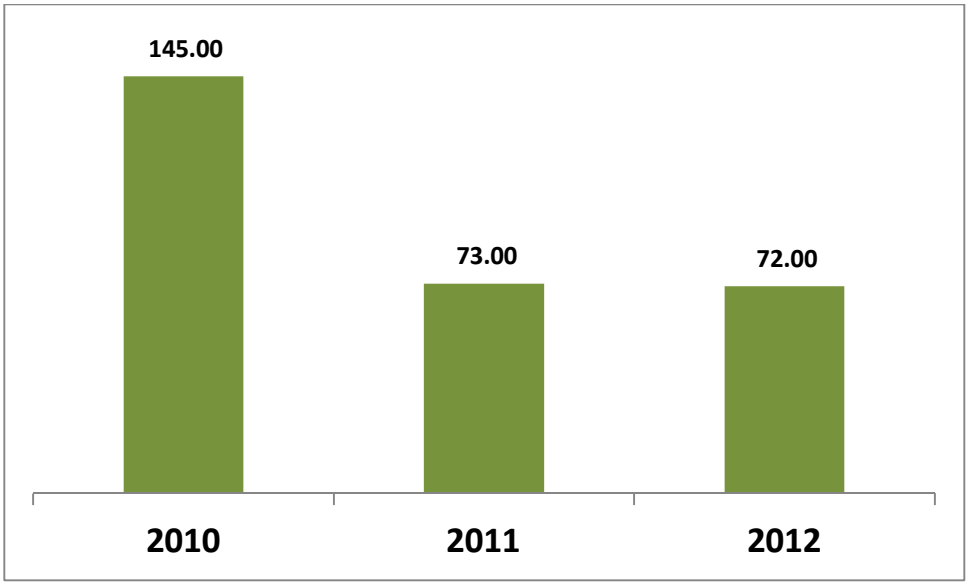
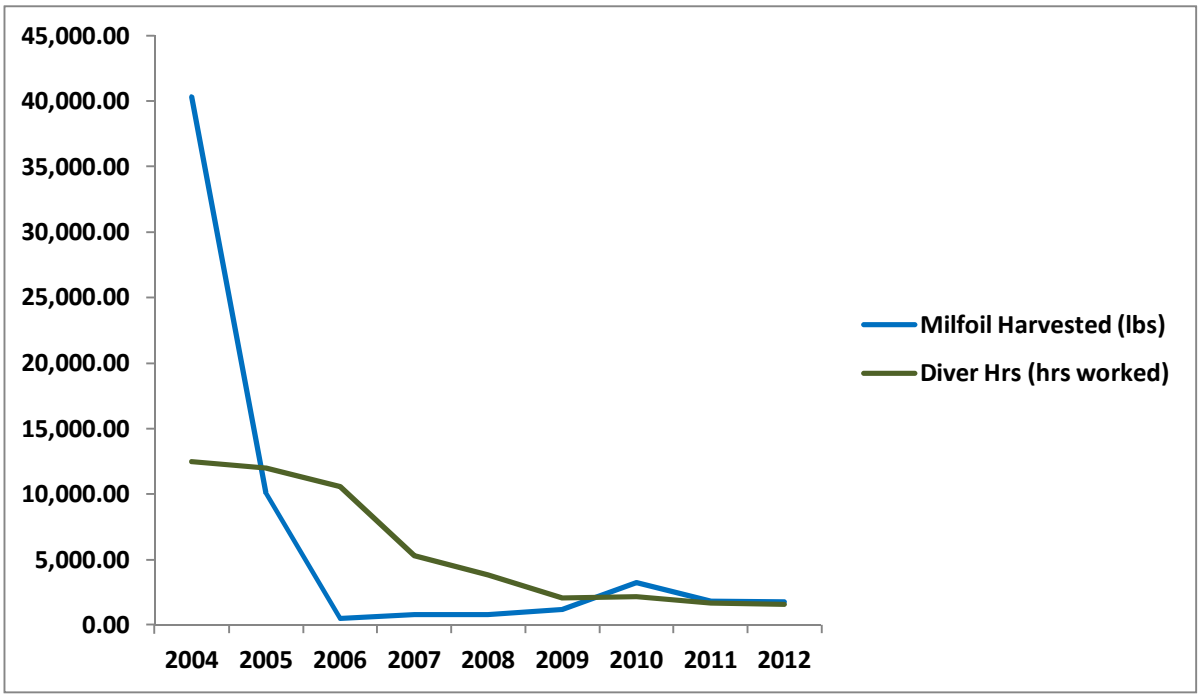


Fig IV: Milfoil harvested in pounds versus diver hours worked from 2004 to 2012



Discussion of Trends

In Fig I, the comparison is shown between 2011 and 2012 in total GPS points collected and mapped. Each year shows the same key, dense areas, such as Little Square Bay, Pork Bay, Square Bay, East side of Buck Island, etc. In 2012, there is a notable increase in point density in Little Square Bay, the East Side of Buck Island and the West side of the Narrows. As mentioned in the introduction, this was an exceptional growing season, and it was seen across the board in the form of fast growing plants. We also found a lot more growth pushing into deeper water (sometimes as much as 18 feet), thanks to good sunlight and high water temperatures. The area on the West side of the Narrows was a surprise discovery during normal coverage swimming. The plants were past the normal depth drop-off where a "hump" rises up again, providing shallow enough water for good plant growth.

In Fig II, the bag count trend for 2011 and 2012 is shown over the course of the 20 week season. In 2012, there is clear increase in bag harvests in late July and August. This was when the Little Square plant growth spiked, and we doubled our crews for a week. During that week, one crew focused on Little Square, while the other continued harvesting Guy's buoys and key areas. This is a strategy we can use every season as needed. By September, growth was back to low levels

Fig III, shows the bag totals from 2010 to 2012. Despite our concerns during the increased growth in August, we removed one less bag in 2012 than in 2011. The fact that our bag counts are so close between the two years indicates a successful strategy. If the number had increased in 2012, we would

be examining the possibility that we were losing ground. The reports from our crews indicated that our system was working well. Now we can see that the data supports our field observations.

Fig IV shows our milfoil harvested versus diver hours worked graph from 2004 to 2012 on Upper Saranac Lake. In 2010, we saw the diver hours trend continue downward, yet saw an increase in milfoil harvested. The immediate concern was the possibility that milfoil growth was increasing with our reduction in diver time. While it may have appeared this way on the graph, we felt strongly that in 2010 we were simply picking more milfoil in more areas because our new methods allowed us to. In other words, the diver time was being invested more on harvesting than searching. In addition, we felt that in 2010 we were catching up on growth that had not been completely controlled in previous years, when we were trying to develop an ideal lake-wide management strategy for the maintenance phase.

The 2011 data, when added to the long term graph, showed a trend in the right direction. In addition to the continued downward trend in diver time, the milfoil harvested trend dips significantly. Now, with 2012 on the graph, we see a slight decrease in both diver hours and milfoil harvested. The two actually form a near perfect 1:1 ratio. We have begun to rely on this ratio as an indicator of a successful maintenance phase and are seeing the same results on Minerva and Brant Lake.

Future Plans

2012 cemented our faith in the two-diver system. The season was a full spectrum stress test for our work, and the result was a slight reduction in overall harvest totals, and a slight reduction in overall diver hours. We will proceed with the same 20 week schedule in 2013. As with the past two years, if the need arises, we will double crews to deal with a spike in growth. If 2013 proves to be a milder growing season, we may start to push the growth down to much lower levels. However, if we face another warm and sunny summer, our system has been proven to work. Ideally, over the next two seasons, we will be able to reduce growth levels to the point where a reduction in diver time may be possible.

Thanks

We would like to thank the Upper Saranac Lake Foundation for working with us since 2008 and allowing us the leeway to make changes as needed. Thanks to you, we have a business born from the successes of early milfoil work on the lake. Thanks to you, we have been able to hone in on the best ways to manage a maintenance-phase milfoil problem. In all of our projects statewide, we refer to our lessons learned on Upper Saranac.

We would like to thank Guy Middleton for being a huge asset in the hunt for milfoil lake-wide. He keeps a constant flow of buoys and maps coming to our dive leaders and makes it possible for us to suppress growth all over the lake, without losing track of any problem areas. Without his diligence, many areas would not have received the attention they needed, when they needed it.