

11 John Road  
Sutton, MA 01590

Phone: (508) 865-1000  
FAX: (508) 865-1220  
e-mail: info@aquaticcontroltech.com  
Internet: www.aquaticcontroltech.com



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MAR 10 2008

CONSERVATION COMMISSION

**Date:** March 9, 2008

**To:** Dan Doherty; President, NLP

**From:** Gerry Smith; President/Aquatic Biologist

**Re:** Project Completion Report & Water Quality Test Results – Nabnasset Lake (2007)

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This report summarizes our management activities performed at Nabnasset Lake this past year. In 2005 and 2006 we had chemically treated approximately 5-7 acres of invasive, variable watermilfoil (*M. heterophyllum*) weed during each year. In 2007, the total treatment area was only approximately 3 acres and was located in a small portion of Shipley Swamp and the lake's northern shoreline in the vicinity of Lawson Rd., and Pollyanna Lane.

The determination of areas for chemical treatment of watermilfoil, in 2008 was made jointly between scientists from ESS, the Lake Association and Aquatic Control. It was also noted and reported that curlyleaf (*P. crispus*) pondweed was substantially more widely distributed throughout the lake during late spring 2007 than had been seen in the past, thereby warranting an aggressive management/chemical treatment program for 2008 and beyond to address the continuing spread of this other invasive submersed weed.

After filing and receiving an approved License to Apply Chemicals permit from MA DEP and following the thorough notification process to lake residents, the public at large and the Westford Conservation Commission, the designated areas of milfoil were first confirmed and "buoyed-off" in the field and then "spot" chemically treated on June 25<sup>th</sup>. Once again, I performed this application from our Panther Airboat with assistance from one of our Field Technicians. We again applied the USEPA/MA registered aquatic herbicide Reward (Diquat) to each designated area of milfoil. That treatment proceeded smoothly and we understand that a later inspection had confirmed it worked quite well.

The test results for the two water samples that were also collected on June 25<sup>th</sup> (just prior to treatment) are attached for your review. Two samples were again collected – one station at mid-lake and the second sample near the lake outlet. The samples were delivered to Microbac Laboratories in Marlborough, for analyses of selected chemical, nutrient and bacteria parameters. These test results are compared to previous years results.

- **pH & Alkalinity:** The pH at mid-lake and the outlet was 7.48 and 7.55, respectively. A pH range of generally 6.0 - 8.5 is desired to maintain a healthy fish population. The pH readings from the lake in 2007 are slightly higher than in the past but still close to neutral (pH of 7.0) and well suited for supporting a healthy fish population and other aquatic life. The alkalinity content measured this year of 22 and 23 mg/l is almost identical to the values obtained in prior recent years. This alkalinity level indicates a moderate buffering capacity of the lake water to prevent substantial changes in pH, due to factors such as acid rain.
- **Ammonia N & Nitrate Nitrogen as N:** The ammonia level this year was desirably somewhat lower than has been seen in recent years. Ammonia was actually reported at <0.05 mg/l or below the laboratories limit of detection. Nitrate levels of 0.52 and 0.71 mg/l are also a bit

lower than have been seen in most recent years. These nitrate values are still somewhat higher than are optimal to avoid potential "algal blooms". A nitrate level of <0.30 mg/l is desired to avoid the potential for supporting algal blooms, however, the concentration of phosphorus is a more important test parameter and potential "trigger" for nuisance algal blooms.

- **Total Phosphorus as P:** Total phosphorus is typically the "limiting nutrient" in most fresh water systems or the nutrient found in least supply relative to the growth requirements of algae. The values in 2007 were desirably low at <0.01mg/l. In ponds/lakes where total phosphorus is approximately 0.03 mg/l or greater, such waterbodies are more prone to potential algal blooms.
- **E. Coli Bacteria:** The E.Coli content was again low at < 10/ml. This is the same low content found in prior years. The maximum permissible limit for E. coli in waters used for swimming is not to exceed 230 per ml.

The overall water test results this year, were again favorable for Nabnasset Lake. Secchi Disk water clarity was again very good at about 11 feet towards mid-lake and 10.8 feet in the lake's outlet basin.

While the annual inspections and "spot treatment" of invasive watermilfoil has served the lake well to contain the spread of milfoil and avoid a potentially much larger milfoil infestation, the observance and spread of curlyleaf pondweed over the past two years is of concern. We recommend the Association plan to aggressively manage this invasive species of pondweed in 2008.

Upon reviewing this report, please be sure to forward a copy to the Conservation Commission.

Thank you.