Preliminary Report on the Water Quality of Damariscotta Lake

December 2009

The water quality of the three basins of Damariscotta Lake was monitored by Lake & Watershed Resource Management Associates (LWRMA) staff and DLWA volunteers trained and certified by the Maine Volunteer Lake Monitoring Program from May through September, 2009. This report is based on limited review of the data, and should be considered preliminary. A final report for the lake will be available in spring, 2010, following a complete review of the data, and a comparison of the findings for Damariscotta Lake with regional and statewide lake data for 2009.

The 2009 lake monitoring season will long be remembered for the extreme period of nearly continuous rainfall from spring through mid-summer. With watershed soils almost continuously saturated with water for several months, it is likely that Damariscotta Lake received higher than normal amounts of stormwater runoff from the rain. Watershed runoff from developed areas typically carries relatively high concentrations of the nutrient phosphorus, which stimulates the growth of algae in lake water, resulting in reduced water clarity and causing oxygen levels in the water to decline over time. Heavy runoff may also carry high concentrations of sediment from soil erosion, and it causes wetlands in the lake watershed to flush, resulting in relatively high levels of natural water color, as was noted in measurements taken in late August.

Given the unusual weather during the monitoring period, it is not surprising that some of the water clarity readings taken in the lake in 2009 were somewhat lower than average. However, dry conditions during the late summer may have offset the effects of the rain somewhat. Water clarity readings taken during baseline sampling of the lake on August 28 were close to the seasonal historical average for each of the three basins. The south arm of the lake was the least clear of the three sample stations, and was somewhat lower than the historical average for that area of the lake. However, this comparison does not take into account the many readings that were taken prior to, and following August 28.

Total phosphorus samples taken on August 28 were very close to the historical average for the three basins. Chlorophyll-a samples (a measure of the concentration of algae in the water) were consistently high for all three sampling stations in the lake, indicating moderate algae growth throughout the lake during late August.

Dissolved oxygen levels in each of the basins of the lake were similar to historical levels during late summer. Oxygen was depressed in the Great Bay area, and severely depleted in both Muscongus Bay and the South Arm of the lake. Phosphorus samples taken near the bottom of the lake at the Muscongus and South Arm monitoring stations were significantly elevated over surface levels, indicating that phosphorus was likely being released from the bottom sediments as a result of the low levels of dissolved oxygen in the deepest areas.

All factors taken into account, Damariscotta Lake appears to have withstood the effects of the severe spring and summer weather well. During the past two decades, DLWA has undertaken a great deal of work to stabilize areas of soil erosion in the watershed. Such efforts help to protect the lake from the effects of extreme weather on water quality.

Respectfully submitted,
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