MIRROR LAKE
FINDINGS AND EXECUTIVE SUMMARY

Mirror Lake was sampled as part of the New York Citizens Statewide Lake Assessment Program in 2003. For all program waters, water quality conditions and public perception of the lake each year and historically have been evaluated within annual reports issued after each sampling season. This report attempts to summarize both the 2003 CSLAP data and an historical comparison of the data collected within the 2003 sampling season and data collected at Mirror Lake prior to 2003.

The majority of the short- and long-term analyses of the water quality conditions in Mirror Lake are summarized in Table 2, divided into assessments of eutrophication indicators, other water quality indicators, and lake perception indicators. The 2003 data indicate that the lake could be classified as oligotrophic, or unproductive, as in previous years. Water quality conditions in 2003 were about as productive (slightly higher water clarity and lower algae levels, but similar phosphorus levels) as those measured in the typical CSLAP sampling season, and these small changes were probably within the normal variability for this lake. CSLAP data suggest that water clarity is probably closely influenced by both algae and nutrients (based on the similar trophic classification generated from each of the trophic indicators), and the nitrogen to phosphorus ratios indicate that algae levels in Mirror Lake are probably controlled by phosphorus. Lake productivity varies little (and inconsistently) over the course of a typical sampling season, despite deepwater nutrient levels that are higher than those at the lake surface (thus they do not "enrich" the surface waters during destratification). Phosphorus levels in the lake fall well below the state phosphorus guidance value, resulting in water transparency readings that significantly exceed the minimum recommended water clarity for swimming beaches. In short, water quality conditions in 2003 were probably similar to those measured in most previous sampling seasons.

The lake is weakly colored (low levels of dissolved organic matter) and it is likely that these readings reflect the characteristics of the watershed (i.e. "natural" conditions at the lake). Color readings are not high enough to exert limits on the water transparency, even when algae levels are low. Mirror Lake has slightly hardwater, slightly alkaline (above neutral) pH readings, and mostly undetectable nitrate readings. Conductivity readings have increased slightly since 1998, but it is not suspected that this has otherwise impacted the lake.. pH readings consistently fall between the NYS water quality standards (=6.5 to 8.5), and should be adequate to support most organisms found in the lake. Neither nitrate nor ammonia levels are high enough to represent a threat to the lake. Calcium levels may be high enough to support zebra mussels, although these exotic animals have not been found in the lake.

The recreational suitability of Mirror Lake has been fairly stable the last several years, with slightly poorer assessments (such as in 2003) most often attributed to variations in weather. Recreational conditions are most often described as "could not be nicer" to "excellent" for most uses, and the lake is usually described as "crystal clear" to "not quite crystal clear"; the latter is about as expected given the water quality conditions in the lake. The recreational assessments are about as favorable as in other lakes with similar water quality and plant densities (aquatic plants regularly grow to, but not densely at, the lake surface, according to the sampling volunteers, and grew more abundantly in 2003). Recreational assessments tend to be seasonally stable, consistent with seasonally stable water quality conditions and despite some seasonal increases in aquatic plant densities and coverage.

The 1996 NYSDEC Priority Waterbody Listings (PWL) for the Lake Champlain drainage basin do not include Mirror Lake. The CSLAP datasets suggest that no listings appear to be warranted. The next PWL cycle for the Lake Champlain drainage basin will occur in 2005.

General Comments and Questions:

What is the condition of Mirror Lake?

Water quality conditions in Mirror Lake are usually adequate to support most recreational uses of the lake during the summer, and can be best described as oligotrophic, or unproductive, with nutrient levels low enough to indicate that water quality changes are unlikely in at least the near future. The favorable recreational assessments of the lake continue to be most strongly influenced by poor weather or other non-water quality factors, rather than water quality or rooted aquatic plants.

What about the dark and murky bottom waters of the lake?

Deepwater nutrient (phosphorus and nitrogen, particularly ammonia) levels are higher than those measured at the lake surface, and although this suggests that deepwater oxygen levels may become depleted during the summer, the lack of any seasonal eutrophication patterns (particularly the lack of any significant seasonal phosphorus trend) suggests that these nutrient-enriched bottom waters do not impart a large nutrient loading to the surface waters during and after lake destratification.

How does this condition change from spring showers thru the changing** of the **leaves?

The productivity of Mirror Lake (clarity, nutrient and algae levels) does not vary significantly during the summer, and recreational assessments are fairly stable and favorable throughout the sampling season. Aquatic plant densities increase during the summer (decreasing by fall), but this appears to have limited impacts on recreational assessments of the lake.

How has the condition changed since CSLAP sampling began on the lake and/or relative to historical values?

Conductivity has increased slightly since 1998; however, none of the other measured water quality indicators have exhibited significant change over this period, and the small changes in each of these indicators are probably within the normal and expected range of variability for this lake.

How does Mirror Lake compare to other similar lakes (nearby lakes, same lake use, etc.)?

Mirror Lake is usually less productive than other nearby (Lake Champlain basin) lakes, other lakes classified for bathing and contact recreation (Class B(T)), and other NYS lakes. As a result, recreational assessments are usually more favorable than in these other lakes.

Based on these data, what should be done to improve or maintain Mirror Lake?

Given the low lake productivity, and little evidence of water quality threats, management of water quality conditions in Mirror Lake should focus on reducing nutrient loading to the lake, through maintaining septic systems, shoreline buffer zones, limited use of lawn fertilizers, minimizing land disturbances in the near-lake watershed, and localized stormwater management. The lake association is also advised to minimize introductions of exotic plants and animals from public and private launch areas into the lake, given the increasing threat within the Adirondacks from these invasive organisms.