Reshanau Lake (02-0009) *Rice Creek Watershed District*

Reshanau Lake is a 336-acre lake located within the City of Lino Lakes (Anoka County). The maximum depth is 4.7 m (15 ft). The entire lake is considered littoral area (area of aquatic plant dominance) and it does not maintain a thermocline (a density gradient created by changing water temperatures in the lakes water column).

In 2005, an aquatic plant survey was conducted on Reshanau Lake. It was found that the lake has a monotypic plant community made up of curlyleaf pondweed (RCWD 2005 Reshanau Lake Macrophyte report). The strength of the exotic curlyleaf pondweed helps to induce the algae abundance. During a typical growing season the curlyleaf pondweed will grow to the surface at nuisance levels throughout 75 % of the lake. During this time the lake has clear water as the curlyleaf pondweed is tying up the majority of the available total phosphorus (TP), typically by early July the curlyleaf will die-back and release its nutrients creating a percent growing scenario for blue-green algae. At this time the algae dominate the lake and the algae population can persist as late as fall depending on water temperatures and weather patterns. In 2005 the homeowners began utilizing chemical treatments to control the curlyleaf pondweed and hopefully break the cycle of curlyleaf to algae dominance. This program will be tried for 3 years and evaluated to determine success or failure. In 2005 15% of the littoral zone was treated with aquathol-k and after field inspections following the treatment it was determined that the treatment had a whole lake effect. Stem counts collected through SCUBA diving showed that the plants were not producing turions (the seed that produces new plants the following years). The heavy culryleaf growth in the lake has produced a bank of turions that we feel may be viable for 3-4 years. It is believed that a low dose whole treatment for 3 consecutive years may be enough to change the plant community from a curlyleaf dominated to a beneficial native plant community.

As part of the RCWD monitoring program, Reshanau Lake was sampled 6 times in 2005. Surface samples were collected for Chlorophyll-a (CLA), total Phosphorus (TP), and Total Kjeldahl Nitrogen (TKN). Surface Dissolved Oxygen, Temperature, Specifi Conductivity, pH, and Secchi Transparency (SD) were also recorded.

Historical monitoring of Reshanau Lake occurred in 1978, 1991, 1995, 1998, 1999, and 2001 with six samples being collected. The mean TP concentration in 2001 was 90 ug/L, the mean CLA concentration was 35.8 ug/L, and secchi transparency was 0.5 m.

The 2005 water quality data shows that the TP average was 174/L, CLA concentration was 48.44 ug/L, and the secchi transparency was 0.89 m. Lake water quality ranking is based on the lake water quality report card developed by the Metropolitan Council (Osgood 1989b). With this method a lake is ranked against other lakes in the metropolitan area following the same methodology. Lakes receiving an “A” can be deemed exceptional with no recreational impairments. A “B”-grade lake is considered to have good water quality and some recreational impairment, while lakes receiving a “C”-grade are considered to have average water quality are recreationally impaired. A “D”-grade lake has a very poor ranking (severely impaired), and an “F”-grade would mean extremely poor water quality with little to no recreational use. The lakes are ranked based on Secchi Depth, TP and CLA concentrations. For lakes greater than 10 feet deep the three parameters work fairly well to assess a lakes water quality.

Conclusion

Reshanau Lakes water chemistry and biological communities are in poor condition and will require some restoration. The lake has a plant community dominated by the exotic curlyleaf pondweed, the fish community is dominated by black bullheads and carp. Both of these are contributing to the deteriorated water quality and nuisance algal blooms. The lake is fully developed with the majority of homes having manicured lawns up to the water. The native restoration of some shoreline to provide buffering and fish and wildlife habitat would be beneficial to water quality. The control of curlyleaf pondweed and restoration of a native plant community would also be beneficial to water quality. A commercial fish harvester has been contacted about harvesting carp and black bullhead. A reduction of these bottom feeding fish could have a positive impact on water clarity. Maintain the

lake as a wildlife lake and do not allow for aeration or introduction of fish species. In shallow lake systems, fish are detrimental to the lakes water quality. They feed on aquatic plants and beneficial aquatic invertebrates which allows for sediment resuspension and release of nutrients. Placement of a fish barrier on the outlet should be investigated.

Figure 1 Mean growing season Chlorophyll-a and Secchi Transparency

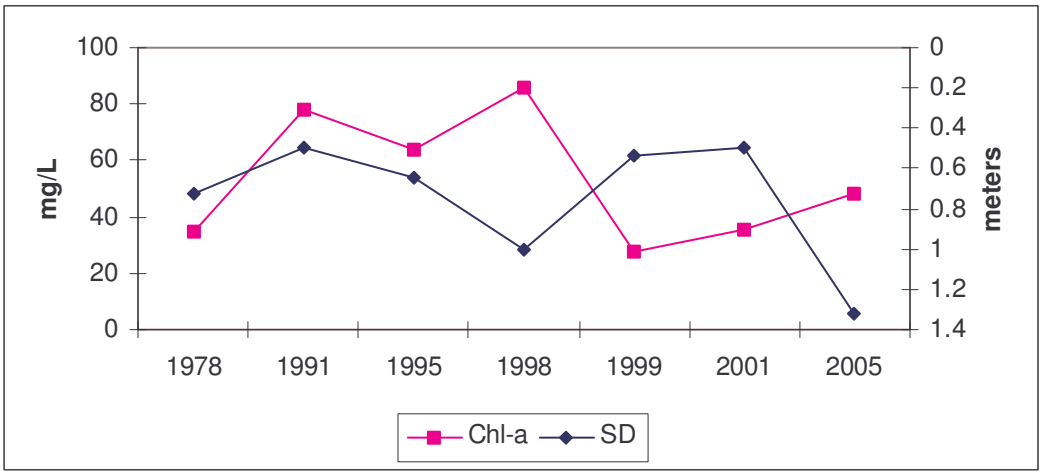

Figure 2 Mean growing season Total Phosphorus (TP)

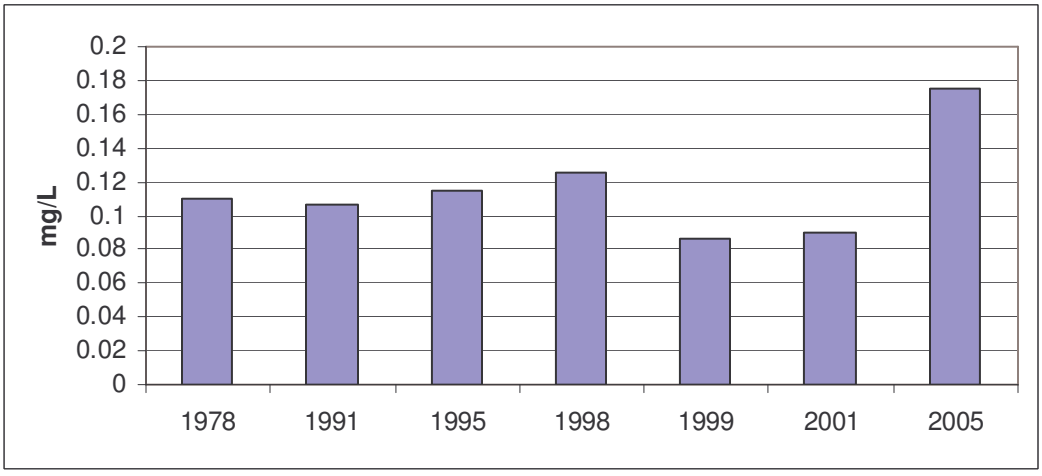

Table 1
Mean Water Quality Data

Year	Chl-a	TP	SD
1978	34.5	0.11	0.72
1991	78	0.106	0.5
1995	64	0.115	0.65
1998	86	0.126	1
1999	27.8	0.086	0.54
2001	35.8	0.09	0.5
2005	48.4	0.175	0.88

Lake Water Quality Grades Based on Averages

Year	1998	1999	2001	2005
Total Phosphorus	D	D	D	F
Chlorophyll a	F	C	C	D
Secchi Depth	D	F	F	D
Overall	D-	D	D	D-

NA= Not Applicable