PRAIRIE CROSSING: LAKE LEOPOLD

WATER QUALITY SUMMARY 2006

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INTRODUCTION:

Integrated Lakes Management (ILM) has performed water quality testing at Lake Leopold since 1995, before most of the site had been developed. We have seen the lake change dramatically over the years and have collected a significant amount of data. Due to the extensive database and the costs associated with collection and analysis, the community decided that for 2006 only minimal sampling would be performed. The samples collected were based on problems observed at the lake, such as heavy plant growth and high salt levels. Seven site visits were made to test for total phosphorous, chloride, chlorophyll *a*, algae and zooplankton. Diagnostic field testing for dissolved oxygen/temperature profiles, conductivity, pH, secchi, alkalinity, and chloride were also performed. This letter report also deviates from past reports since it includes only a short summary of our findings with recommendations.

SUMMARY

1. Aquatic Plants:

In 2005 Eurasian water milfoil (EWM) and curly leaf pondweed (CLP) were very dominant in the lake. ILM had recommended that for 2006, several spot herbicide treatments should be performed. The areas chosen included the north bay (1.3 acres), the semicircular stone area (0.28 acres), and around the swimming beach (~ 2 acres). The north bay and semicircular area were sectioned off with the use of a sediment curtain and Sonar (fluoridone) was applied in the early spring (April 11). An herbicide bump up was done on May 2nd. The sediment curtain acts as a barrier to prevent the herbicide from spreading to other parts of the lake. Sonar is a systemic herbicide and needs to be in the water for at least a month to be effective. Due to the larger area of beach out to the swim float, a contact herbicide was used in pellet form (Aquathol Super K) on May 31st. A sediment curtain was not used in this area.

Overall the herbicide treatments appeared to be quite effective. The herbicide treatment around the beach prevented most aquatic plants from reappearing in the swimming area for the majority of the summer. An area east of the beach was also relatively plant free, probably due to the water flow pattern in the lake. The Sonar treatments in the north bay and semicircular areas were effective for a few months, but then the EWM came back later in the summer. The north bay also developed a heavy growth of waterstar grass in a thick mat along the shoreline. This species was not one of the target species during the spring herbicide treatments and did not appear until summer.

According to the comments received by Donna Sefton, independent Lake Consultant, she recommends that herbiciding be done for three years in the same location in order to have a long term effect. This year was the second year for the north bay and the first for the other two areas. These areas should be herbicided again in 2007 to determine if multiple years of treatments are effective.

EWM weevils were released in the lake on June 21st. Over 6,000 weevils were released in 4 primary locations in the lake (see map in appendix).

This year the aquatic plant density appeared to be much less dense than in 2005. This may have been due to multiple factors, one of which may have been the herbicide treatments. During the May visit the aquatic plant growth for EWM appeared to be quite dense, but in late June, the plant density appeared to be less dense on the date of the milfoil weevil installation. Throughout the rest of the summer the plant density appeared to be significantly less than in 2005. These observations appear to be supported by the sediment chemistry samples that were collected in August (discussed in a separate section of this report).

2. Algae:

Although minor blue green algal blooms have been observed in past years, none were observed in 2006. This was probably due to the increased rainfall and flushing effect in the lake. Some blue green algae (*Aphanizomenon sp.)* was found in September, but it was not dense enough to cause a surface scum.

Chlorophyll *a* concentrations at Lake Leopold averaged 8.3 ug/l this year, which was the same as in 2005. Chlorophyll *a* is a way to measure the amount of algae in the lake. Algal blooms occur above 20 ug/l of chlorophyll *a*. Lake Leopold did not have any samples that were above 20 ug/ this year.

3. Water Movement:

A staff gage was installed at the outlet for Lake Leopold a few years ago. Although this year had significantly more rainfall than in 2005, the average during the seven site visits was 0.07 feet above normal water level. No flow occurred during the June, July and August site visits. A volunteer should read the gage on a more frequent basis, or a continuous water level monitor could be installed to determine water levels on a daily basis.

4. Water Quality:

Total phosphorous, chloride, chlorophyll a, algae and zooplankton were tested in Lake Leopold along with the field diagnostic tests. Surprisingly the chloride concentration was only slightly lower than in 2005 (341 mg/l vs. 346 mg/l in 2005). Previous data had ranged from 200 – 300 mg/l from 2001 to 2004. Before 2001 the surrounding roads did not receive road salt and chloride levels were usually less than 50 mg/l. Since the lake is accumulating salt and is approaching the IL state standard of 500 mg/l, it is recommended that road salt be restricted in the Prairie Crossing subdivision in order to maintain good water quality in the lake..

Total phosphorus concentrations were similar to previous year's data. The average total phosphorus was 0.047 mg/l at site 1. Site 2 in the north bay and the deep samples had very similar concentrations to the surface samples. Deep samples were collected approximately 2 feet off the lake bottom, where phosphorus levels would have been higher if the lake bottom was anoxic. Although anoxic lake bottom conditions occurred, they did not occur for a long enough period to create significant changes in the phosphorus concentrations. Total phosphorus concentrations were below the IL State Standard of 0.05 mg/l for general use water quality.

Water clarity was again significantly reduced in the north bay after the herbicide treatments. This difference in turbidity lasted throughout the summer months, even after the sediment curtain had been removed. Although some changes in turbidity between the two sites naturally occur due to wave action, there seemed to be more of a difference this year due to fewer plants in the north bay.

5. Energy Relationships:

Trophic state indices or TSIs are an indirect method of measuring the amount of organic material (i.e. algae) generated during key stages in the growing season. While Lake Leopold's TSI's have not changed dramatically from year to year it is clear that the size of the rooted aquatic plant community has. Both submergent and emergent rooted aquatic plant communities have increased in spatial extent, density, and biomass. In future years more efforts should be put into mapping and assessment of the relative biomass of the plant communities.

Carlson's Trophic State Index (TSI) is a quick way to determine the health of a pond or lake using water clarity, total phosphorus, and chlorophyll *a* concentrations. The index indirectly measures the relative planktonic algae productivity across the growing season. It does not measure the productivity of rooted aquatic plants which will clearly be increasingly important in Lake Leopold.

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
TSI	54	53	54	52	53	50	51	58	49	56	55
Class	Eutrophic	Meso / Eutrophic	Eutrophic	Meso.	Meso / Eutrophic	Meso.	Meso.	Eutrophic	Mesotrophic	Eutrophic	Eutrophic

6 Sediment Sampling:

In 2005 Donna Sefton, a locally well known limnologist, visited lake Leopold and reviewed the historic water quality data. One of her recommendations was to study the nutrients in the sediment and to also look at other parameters in relation to their contribution to nuisance aquatic plant growth, specifically EWM and CLP. ILM contacted Steve McComas of Blue Water Science, who has been studying the sediment chemistries required for CLP and EWM and their capacity to form dense populations. This year ILM collected shallow sediment samples from 4 main sites, each of which consisted of composite sediment samples. The results are shown in the appendix. Bases on these results it appears that conditions are more favorable for EWM growth than for CLP, and that overall, the nutrient concentration of the sediment is fairly low. This was a bit surprising due to the heavy aquatic plant growth that has been observed the last few years. According to the research performed by Steve McComas, CLP and EWM may grow excessively for a few years but if the sediment conditions are not right, they will die back naturally. This may be what is happening with CLP, since there appeared to be much less in 2006 than in 2005.

Steve McComas has also developed a density characterization for EWM and CLP which is included in the appendix of this report. According to his determinations EWM would fit have been in the light nuisance control in 2006, but in the heavy nuisance conditions in 2005. The same would probably apply to CLP.

RECOMMENDATIONS:

PLANTS

- Spot herbicide treatments for EWM and CLP should be done in the same areas in 2007 as in 2006. There has been some evidence that herbicide treatments at the same locations for several years in a row may help control the nuisance species in the long term. Between the herbicide treatments and the EWM weevils control of the EWM should occur in the next few years.

- Back planting areas that have been herbicided with other species may be helpful in controlling the nuisance species. It is critical that the plants chosen occupy the same water depth and are aggressive. Since EWM, CLP and coontail all occupy about the same depth (~ 2 ft – 6 ft depths), sago pondweed, chara, and V*allisneria* may be successful. Pickerel weed may be successful in shallow areas.

- Yearly aquatic plant surveys should occur to determine changes in the aquatic plant community.

- EWM weevil stem counts are recommended to determine the survivorship of the weevils.

ALGAE

- Due to the potential for toxic blue green algal blooms to occur in the lake, especially in the swimming area, ILM recommends that frequent testing occur during the late summer and early fall when algal populations have periodically reached bloom proportions. Biweekly plankton tows should be made at the beach and if a bloom is occurring a sample should have an ELISA test and confirmation by a laboratory if needed. A quick response is needed if signs need to be posted warning people of this hazard for dogs or children drinking the water.

WATER QUALITY

- Although nutrients are fairly low in the lake, they are concentrating due to the long retention time in the lake. We recommend that phosphorus levels continue to be monitored on a monthly basis.

- A hydrologic budget should be performed to determine water inflows and outflows. This information is required before a nutrient budget can be created. Since the chloride concentration is not decreasing in the lake and it is approaching the IL State Standard, a hydrologic budget is strongly recommended, as is alternatives to road salt applications.

- A volunteer should read the staff gage at the outlet on a weekly basis and more frequently after heavy rain events. Possibly a continuous water level recorder should be purchased so that more frequent water level elevation is collected.

- Road salt applications in areas that drain to the lake should be restricted or minimized.

OTHER

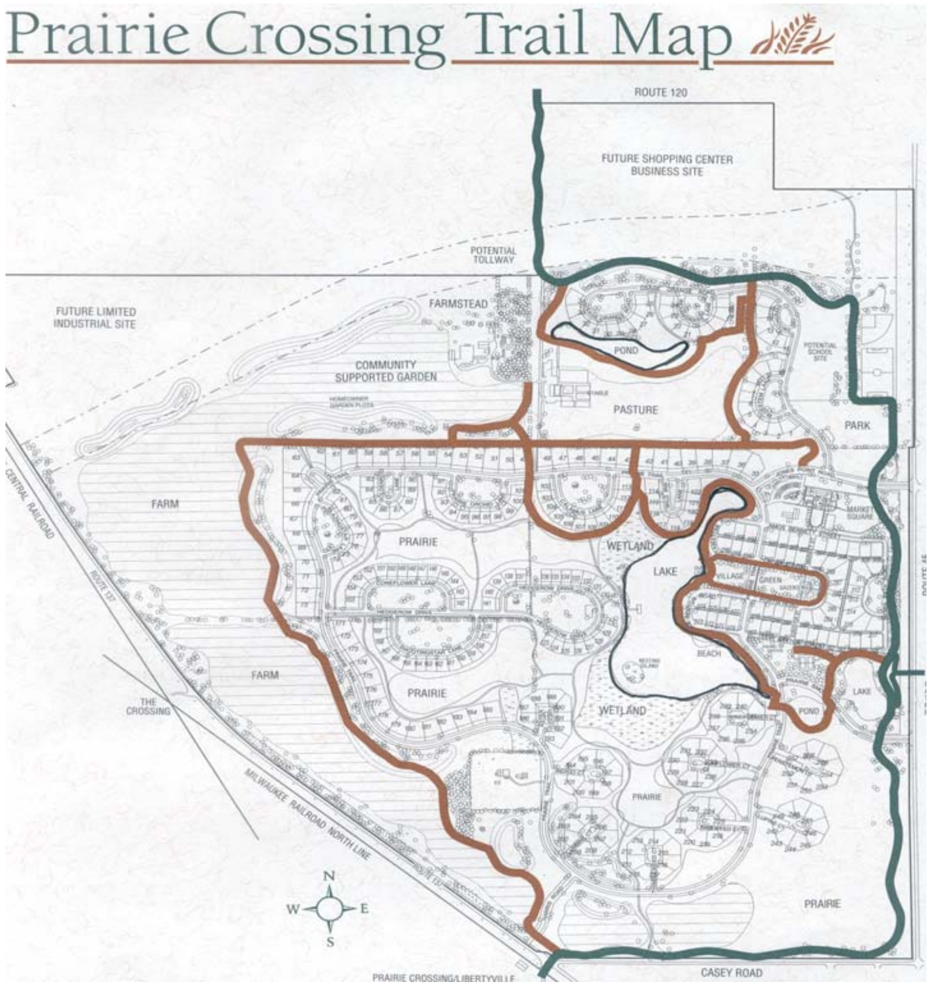
- Goose populations and gull populations have continued to remain high despite some efforts at control. ILM recommends that goose depredation activities continue in 2007.

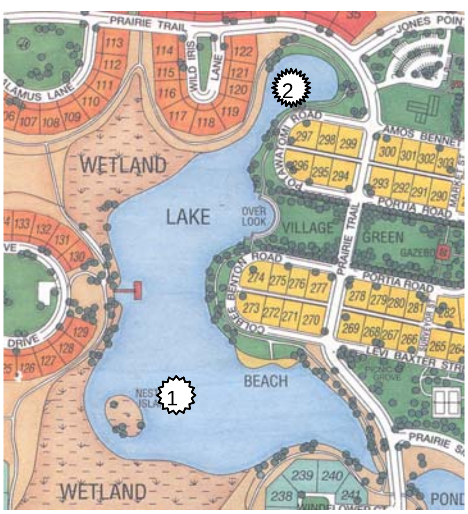
- We believe that community seminars should be held concerning the performance of the lake.

- Additional monitoring could be done by or getting a resident to be a Volunteer Lake Monitor (VLMP), which involves monthly testing collected by the Illinois Environmental Protection Agency.

MEETING

- Early in 2007, ILM hopes to meet with you to discuss our findings and plan a proposal for 2007.





Prairie Crossing Site Map and Lake Leopold Monitoring Stations

Figure 1

Prairie Crossing Site Map and Lake Leopold Monitoring Stations.

APPENDICES

DESCRIPTION OF MONITORING PARAMETERS

Field Monitoring

Dissolved oxygen (D.O.) *is needed for aquatic life to survive. A healthy environment for fish has D.O. concentration above 5 mg/L. Below 5 mg/L, fish become stressed. When the D.O. reaches 3 mg/L, fish may begin to die. Dissolved oxygen varies depending day/night cycles, the amount of direct sunlight, and the temperature. D.O. drops at night and is highest on sunny days. D.O. is also much higher in cool water in the spring and fall, than during the summer. The Illinois State standard for D.O. is 5 mg/L at all times, and should not fall below 6 mg/L during at least 16 hours out of any 24 hour period (IEPA Title 35: Environmental Protection, Subtitle C: Water Pollution, Chapter 1: Pollution Control Board, State of Illinois Rules and Regulations, 1993).*

pH *Some changes in pH occurs naturally and is related to the amount of algal growth in the lake. Most lakes in this area have a pH of greater than 7 and often in the 8 range. pH measures the acidity and alkalinity of the water. A pH of 7.0 is neutral, below 7 is acidic and above 7 is alkaline. The pH scale is logarithmic, so a pH change of 1 unit is very significant.*

Alkalinity *measures the buffering capacity of the lake. Normal alkalinity for this region is about 90-250 mg/L.*

Secchi *indicates the clarity of the lake water. A high secchi depth indicates that the water is quite clear and free of algae and/or suspended sediments. A low secchi depth of less than 3 feet indicates that the water is very turbid. Turbidity could be due to either planktonic algae or suspended sediments.*

Chemical Analysis

Chloride *is usually tested in lake waters as an indicator of human activity. Natural waters away from human influence usually have chloride measurements below 20 mg/L. Sources of chloride include agricultural chemicals, human and animal wastes, and road salt.*

Conductivity *measures the water's ability to conduct an electrical current, and is influenced by the amount of dissolved ions in the water. Conductivity levels vary dramatically from site to site. Distilled water has essentially no conductivity, while seawater is about 50,000 μmhos/l. Typical streams have a conductivity ranging from 150 to 3000 μmhos/l.*

Total phosphorus (P) *has been the nutrient most often measured in lakes. Phosphorus is the nutrient that stimulates plant growth in most lakes. Total phosphorus represents a sum of all of the different forms of phosphorus in the water column, both dissolved and particulate. Total P includes orthophosphorus, phosphorus contained within organisms and, phosphorus attached to sediments. Orthophosphorus is the dissolved inorganic form of phosphorus that can be used easily by plants. Organisms such as algae contain small amounts of phosphorus that are released when the organism dies. Only very small amounts of phosphorus are needed to stimulate aquatic plant growth.*

The standard for total P is 0.05 mg/L, which is a guideline for natural waters. Urban and rural lakes usually have a much higher total phosphorus level than 0.05 mg/L. Although the state exceedence standard is 0.05 mg/L for natural water (IEPA Title 35: Environmental Protection, Subtitle C: Water Pollution, Chapter 1: Pollution Control Board, State of Illinois Rules and Regulations, 1993), many lakes are well above that level because of nutrient loading in stormwater runoff.

Chlorophyll *a*, *which is present in plants and algae, is the primary green pigment necessary for photosynthesis to occur. Measuring the amount of chlorophyll a in the water gives a rough indication of the amount of algae present in the lake. The pheophytin a, and trichromomatic chlorophyll a, b, and c represent different pigments that occur in algae. Pheophytin a, in particular, is a degradation product of chlorophyll a that interferes with its analysis. Therefore, corrected chlorophyll a represents the amount of algae present in the lake after adjusting for the presence of pheophytin a.*

FIELD METHODS FOR WATER QUALITY TESTING

FIELD MONITORING:

Water clarity is measured using a 20-cm secchi disk, a black-and-white painted metal disk attached to a cord which is marked at one-foot intervals. The disk is lowered into the water to the point at which the painted divisions are no longer visible. This depth is recorded as the secchi depth, which is an indicator of the amount of water clarity. At least two readings are taken at every sample site.

Dissolved oxygen (DO) is measured using a Hydrolab Quanta Water Quality Monitoring System, a digital multiprobe meter which gives readouts of temperature, dissolved oxygen, pH, and conductivity concentrations. The meter is calibrated at ILM against a solubility table for oxygen in water at various temperatures. The meter is calibrated based on temperature and barometric pressure. Calibrated is typically only needed once per day. To operate the meter, Quanta Transmitter is lowered into the water at one-foot depth intervals and measurements recorded. The Quanta is routinely compared with DO analyses using a HACH kit (model OX-2P). If the differential is greater than 1 mg/l, the readings are regarded as invalid and both the meter and HACH tests are redone.

Water temperature is recorded using the Hydrolab Quanta Water Quality Monitoring System, as well as with a backup non-mercury thermometer.

pH measurements are taken using the Hydrolab Quanta Water Quality Monitoring System and a back up test is done with a LaMotte model HA analog pH meter. Both meters are standardized before use in the field by inserting the probe into buffer solutions of pH 7.0 and 10.0, and calibrating the meter to the appropriate pH. PH buffers are chosen to be slightly above and below the expected pH encountered in the field. The meter is set to the appropriate water temperature for each site, the probe inserted into the water column, and the pH reading then recorded for each foot of depth.

Conductivity measurements are taken in the field using the Hydrolab Quanta Water Quality Monitoring System. The meter uses a two-point calibration, distilled water and 500 umhos/cm. Conductivity is read per foot of water depth.

Chloride measures the amount of salt in the water. A Hach Model 8-P, 5-400 mg/l test kit is used for field analysis. Frequently laboratory backup is also employed. Both high range 0 – 400 mg/l and low range 0-100 mg/l can be used. The method utilized involves titrating silver nitrate into the mixing bottle until a color change is noted. The amount of chloride is then calculated from the number of drops added.

Alkalinity is measured using a HACH model AL-DT with digital titrator. A sulfuric acid titration cartridge is attached to the titrator body. A 100-ml water sample is collected and placed in a glass flask. Phenolphthalein indicator is added to the sample and swirled to mix. Bromcresol green-methyl red indicator is then added to the sample and mixed. Using the digital titrator, the sample is titrated with the sulfuric acid standard solution to a light pink color, and the concentration of alkalinity recorded from the digital reading. Periodically the kit results are graded against a known standard solution provided by the manufacturer.

A **plankton tow** from Wildlife Supply Company, Wildco 48 C60, is used for specimen collection. The plankton tow is comprised of mesh netting with a weighted chamber and rope attachment. The plankton tow is thrown several feet from the boat and pulled through the water at a depth of one to two feet. The clamp attachment on the outlet hose is released and the water poured from the collection chamber into the specimen bottle, which is then reviewed under a microscope back at ILM. The tow is cleaned between sampling sites with a solution of Chlorox. Chlorox residual is rinsed off with distilled water.

CHEMICAL TESTING:

Water samples for laboratory analysis are collected using Wildlife Supply Company's Wildco model 1930-G62 beta bottle. The bottle is lowered into the water column to the appropriate depth (2 feet for all sites except the deep sample taken at 10 feet). When the weighted metal attachment is dropped along the rope from the surface, the collection chamber's doors are released and the water sample is thus captured and retrieved. To avoid contamination, the beta bottle is periodically cleaned with a solution of liquid Alconox and rinsed with tap water. Prior to specimen collection, the bottle is rinsed with lake water at the site.

All samples are placed on ice in the field immediately after collection. Several tests can be conducted from each sample bottle. Bottles used for collection are clean bottles provided by Northern Lakes Service. A 1-liter unpreserved bottle is collected and tested for chloride, total suspended solids, and conductivity. A 250-ml bottle preserved with sulfuric acid is collected from the lake and tested for the nitrogen series and total phosphorus. A separate 1-liter unpreserved bottle is collected for chlorophyll *a* testing. Following any additional preparation required for each sample, the samples are placed on ice and shipped overnight to Northern Lakes Service in Crandon, Wisconsin for laboratory analysis.

Chloride samples are placed in 250-ml plastic containers with no preservative.

Chlorophyll *a* samples are composites taken from 2, 4, and 6-foot depths when the lake is stratified. When the lake is well mixed, chlorophyll *a* samples are collected only at a 2-foot depth. The samples are placed in 1-liter plastic bottles with no preservatives. The samples are maintained at a temperature of approximately 4 ° C upon collection and during shipment.

Total phosphorus samples are placed into 250-ml plastic containers with sulfuric acid preservative. The samples are maintained at a temperature of approximately 4 deg. C upon collection and during shipment.

Algae samples are collected using a 250-ml plastic bottle that contains 1% Lugols iodine. Sample depth is at 2-ft when the lake is well mixed, and is a composite sample a 2, 4, and 6-ft when the lake is stratified. Samples are sent to Water's Edge for analysis.

Zooplankton samples are also collected at 2-ft when the lake is mixed and 2, 4, and 6-ft when the lake is stratified. A total of 2 liters of water are collected and sieved through the bottom portion of a plankton tow. The resulting 20 – 40 mls represent a concentrated sample. Samples are preserved in 70% ethyl alcohol and are sent to Water's Edge for analysis.

Water Quality Results

Lake Leopold at Prairie Crossing

2006 Trophic State Index

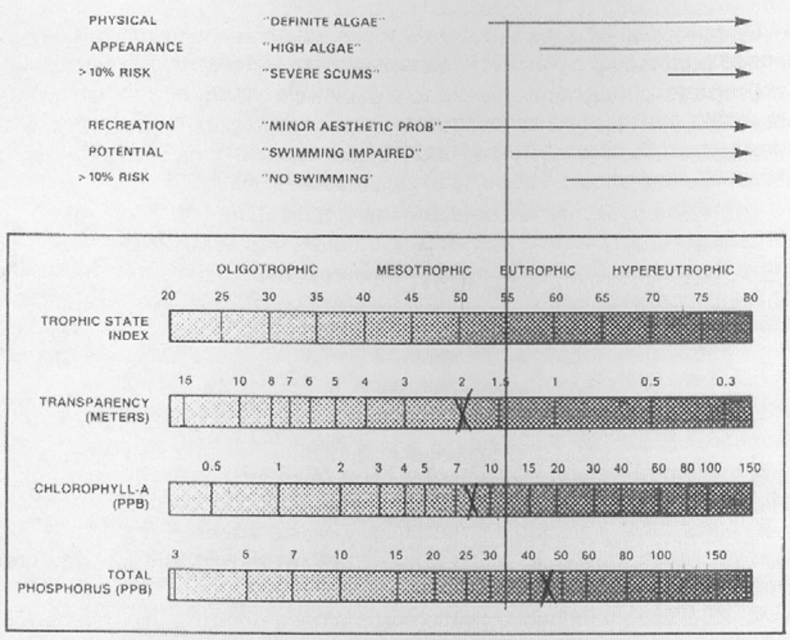


Figure 4-5.—Carlson's Trophic State Index related to perceived nuisance conditions (Heiskary and Walker, 1987). Length of arrows indicate range over which a greater than 10 percent probability exists that users will perceive a problem.

From: The Lake and Reservoir Restoration Guidance Manual, Second Edition, U. S. Environmental Protection Agency, August 1990.

Chemical analysis of Lake Leopold

Site 1 Location: About 200 feet southwest of Beach

Samples collected at a 2 foot depth — **The values are mg/l**

	BOD 5-Day	C.O.D	Chloride as CL	Conduct. umhos	Nitrogen Ammonia as N	Nitrogen Nitrate/ Nitrite	Nitrogen Kjeldahl	Phos. Dis. as P	Phos. Total	Tot. Susp. Solids	Total Susp. Volatile Solids	Turbidity NTU	Total Solids
Standard*	***5***	***30***	500	NA	15/0.01**	NA	NA	***0.01***	0.05	***15***	NA	NA	NA
Avg. for 1995	ND	17	25	465	0.17	0.66	0.79	0.005	0.034	12	ND	NA	NA
Avg. for 1996	ND	19	40	462	0.25	0.34	0.91	0.008	0.044	8	ND	NA	332
Avg for 1997	ND	19	99	607	0.17	0.26	0.95	0.004	0.026	3	ND	NA	423
Avg for 1998	ND	21	49	475	0.06	0.23	0.60	0.007	0.042	6	34	NA	396
Avg. for 1999	ND	21	30	420	0.16	0.11	0.67	ND	0.041	ND	ND	NA	278
Avg. for 2000	1	23	34	403	0.03	0.16	0.78	0.005	0.034	6	5	NA	280
Avg. for 2001	2	21	294	1150	0.03	ND	0.92	0.007	0.031	1	ND	NA	823
Avg. for 2002	1	22	230	1065	0.09	0.11	0.76	ND	0.029	3	2	5.8	725
Avg. for 2003	NA	NA	250	1075	ND	0.01	1.00	0.0018	0.042	4.2	1	5.3	678
Avg. for 2004	< 3	21	200	NA	< 0.2	< 0.05 / < 0.4	0.87	< 0.010	0.025	< 3	< 3	2.6	633
Avg. for 2005	NA	NA	346	NA	NA	NA	NA	NA	0.048	NA	NA	NA	NA
4/13/06	NA	NA	340	NA	NA	NA	NA	NA	0.037	NA	NA	NA	NA
5/17/06	NA	NA	320	NA	NA	NA	NA	NA	0.089	NA	NA	NA	NA
6/21/06	NA	NA	330	NA	NA	NA	NA	NA	0.033	NA	NA	NA	NA
7/25/06	NA	NA	350	1,320	NA	NA	NA	NA	0.048	NA	NA	NA	NA
8/25/06	NA	NA	390	NA	NA	NA	NA	NA	0.038	NA	NA	NA	NA
9/27/06	NA	NA	350	NA	NA	NA	NA	NA	0.037	NA	NA	NA	NA
10/26/06	NA	NA	310	NA	NA	NA	NA	NA	0.050	NA	NA	NA	NA
Avg. for 2006	NA	NA	341	NA	NA	NA	NA	NA	0.047	NA	NA	NA	NA

*IL State Standards (Title 35, Subtitle C Water Pollution, IEPA 1998) or **typical limnological recommended concentrations**

** Ammonia nitrogen is dependent on pH and temperature. At pH 9 & temp 80 ^{o}C, std = 0.1 mg/l. At pH 7 and 65^{o} temp and below std = 15 mg/l

*** Dredging standard for return water

represent concentrations above State Standards or Recommended Maximum Concentration

Site 2 Location: North Bay

Samples are mg/l

	Chloride	Cond. umhos	Nitrogen Ammonia N	Nitrogen Nitrate/N	Nitrogen Kjeldahl	Phos. Dis. as P	Phos. Total	Tot. Susp. Solids
Avg. for 1996	NA	NA	0.18	N/A	N/A	0.020	0.038	5.0
Avg. for 1997	134	605	0.13	0.21	0.84	ND	0.037	10.0
Avg. for 1998	48	544	0.06	0.13	0.56	0.003	0.047	4.4
Avg. for 1999	32	430	0.16	0.17	0.74	0.003	0.044	ND
Avg. for 2000	35	440	0.02	0.16	0.87	0.004	0.029	3.8
Avg. for 2001	273	1125	0.04	ND	1.10	0.004	0.039	3.5
Avg. for 2002	233	1050	0.08	0.10	0.86	ND	0.031	3.3
Avg. for 2003	254	NA	0.08	ND	1.274	ND	0.041	3.4
Avg. for 2004	NA	NA	< 0.05	NA	0.83	< 0.01	0.024	2.6
Avg. for 2005	NA	NA	NA	NA	NA	NA	0.057	NA
4/13/06	NA	NA	NA	NA	NA	NA	NA	NA
5/17/06	NA	NA	NA	NA	NA	NA	0.059	NA
6/21/06	NA	NA	NA	NA	NA	NA	0.032	NA
7/25/06	NA	NA	NA	NA	NA	NA	0.057	NA
8/25/06	NA	NA	NA	NA	NA	NA	0.047	NA
9/27/06	NA	NA	NA	NA	NA	NA	0.032	NA
10/26/06	NA	NA	NA	NA	NA	NA	NA	NA
Avg. for 2006	NA	NA	NA	NA	NA	NA	0.045	NA

Deep Total Phosphorus Results

Date	Site 1	Site 2	Site 3	Average
8/11/06	0.035	0.048	0.040	0.041
8/25/06	0.040	0.041	0.038	0.040
9/27/06	0.038	0.035	0.041	0.038

SITE 1 Chlorophyll Results				The values are ug/l	
	Corrected Chlor. *a*	**Pheoph.** *a*	**Trichro. Chlor.** *a*	**Trichro. Chlor.** *b*	**Trichro. Chlor.** *c*
Standard*	***20***				
Avg for 1995	trace				
Avg. for 1996	3.19				
Avg. for 1997	2.64				
Avg. for 1998	3.03	1.81	4.17	3.50	1.13
Avg. for 1999	4.90	1.77	5.40	0.36	0.61
Avg. for 2000	8.75	0.54	9.18	0.15	1.40
Avg. for 2001	4.85	0.39	4.73	0.30	0.86
Avg. for 2002	4.35	0.32	4.55	0.03	0.38
Avg. for 2003	16.30	0.08	16.36	0.06	1.14
Avg. for 2004	1.90	NA			
Avg. for 2005	8.33	0.85			
4/13/06	16.0	0.00	16.00	0.00	1.40
5/17/06	2.6	0.13	2.80	0.05	0.53
6/21/06	7.0	0.00	6.60	0.10	0.38
7/25/06	7.4	0.00	7.60	0.23	0.29
8/25/06	3.8	0.78	4.40	0.06	0.06
9/27/06	9.1	0.00	9.00	0.00	0.48
10/26/06	12	0.00	11.00	0.00	0.64
Avg. for 2006	8.3	0.13			

Deep Samples	**Nitrogen Ammonia as N**	**Nitrogen Nitrate/ Nitrite**	**Nitrogen Kjeldahl**	**Phos. Total**	**BOD 5-Day**	**COD**
Standard*	15/0.01**	NA	NA	0.05	***5***	***30***
Site 1						
Avg.1995	0.12	0.67	NA	NA	ND	NA
Avg.1996	0.30	0.67	NA	0.027	ND	19
Avg.1997	0.22	0.06	0.77	0.017	ND	20
Avg.1998	ND	0.03	NA	0.050	ND	20
Avg.1999	0.14	ND	0.73	0.135	ND	20
Avg. 2000	0.06	ND	NA	0.030	NA	NA
Avg. 2001	ND	ND	0.79	0.035	2.0	21
Avg. 2002	0.04	ND	0.76	0.028	1.0	24
Avg. 2003	0.24	ND	2.00	0.055	ND	32
Avg. 2004	< 0.19	NA	0.71	0.03	2	18.4
4/5/05	Chloride N. Bay = 568 mg/l		Remainder of 2005 no deep samples collected			
Sites 1 - 3						
4/13/06	Deep samples not collected					
5/17/06	Deep samples not collected					
6/21/06	Deep samples not collected					
8/11/06	Only phosphorus collected			0.041		
8/25/06	Only phosphorus collected			0.040		
9/27/06	Only phosphorus collected			0.038		
10/26/06	Deep samples not collected					
	*Phosphorus in 2006 is an average of 3 sites.					

Field testing of Lake Leopold

Site 1 Location: Southwest of Beach	DO (surface)	DO (bottom)	Depth (ft)	pH	Secchi (ft)	PAR* (ft)	Temp oC (surface)	Temp oC (bottom)	Alkalinity (mg/l)	Conduct. umhos	Chloride	IEPA Color	Suspended Sediment	Algae	Weeds	Odor
Avg. for 1995	9.1	7.1	11.6	8.5	4.2	7.6	20.8	18.1	92	NA	NA					
Avg. for 1996	9.5	5.7	11.5	8.1	2.5	4.5	16.8	13.8	107	NA	NA					
Avg. for 1997	8.8	5.8	12.5	8.2	3.1	5.6	17.3	14.9	107	NA	NA					
Avg. for 1998	9.3	4.6	13.6	8.4	5.4	9.7	20.2	17.0	124	487	NA					
Avg. for 1999	8.9	5.7	12.5	8.3	5.2	9.3	19.0	17.4	127	272	NA					
Avg. for 2000	8.6	3.7	12.4	8.3	5.1	9.1	19.2	17.3	120	342	NA					
Avg. for 2001	9.6	6.9	13.8	8.5	6.3	11.3	18.4	15.9	111	1,250	NA					
Avg. fpr 2002	9.7	7.3	11.3	8.5	5.6	10.0	18.5	15.7	129	1,125	267					
Avg. for 2003	9.4	5.4	12.6	8.4	4.5	8.1	18.6	16.5	111	1,180	300					
Avg. for 2004	8.8	6.4	12.4	8.0	5.5	9.9	17.9	16.5	137	1,016	220					
Avg. for 2005	8.7	7.4	12.2	8.5	6.3	11.4	19.6	17.8	81	1,418	523					
4/13/06	10.5	9.2	13.0	8.3	4.2	7.6	13.3	12.3	115	1,590	310	Light yellow	none	none	none	none
5/17/06	10.5	6.6	12.8	8.3	8.1	14.6	14.4	12.4	NA	1,510	320	Light yellow	none	none	slight	none
6/21/06	7.7	2.6	12.5	8.4	8.5	15.3	23.1	19.5	75	1,485	340	Light yellow	none	none	slight	none
7/25/06	7.6	0.3	15.8	8.1	8.4	15.1	25.7	21.9	70	1,273	280	Light green	none	none	slight	none
8/25/06	5.8	0.7	12.9	7.7	7.8	14.0	23.8	23.0	140	1,500	320	Light yellow	none	none	slight	none
9/27/06	8.6	7.7	12.8	8.1	5.0	9.0	16.9	16.7	120	1,445	320	Lt greenish/brn	none	none	none	none
10/26/06	11.2	9.2	10.5	8.3	3.8	6.8	7.4	7.3	130	1,376	320	Light green	slight	none	slight	none
Avg. for 2006	8.8	5.2	12.9	8.2	6.5	11.8	17.8	16.2	108	1,454	316					

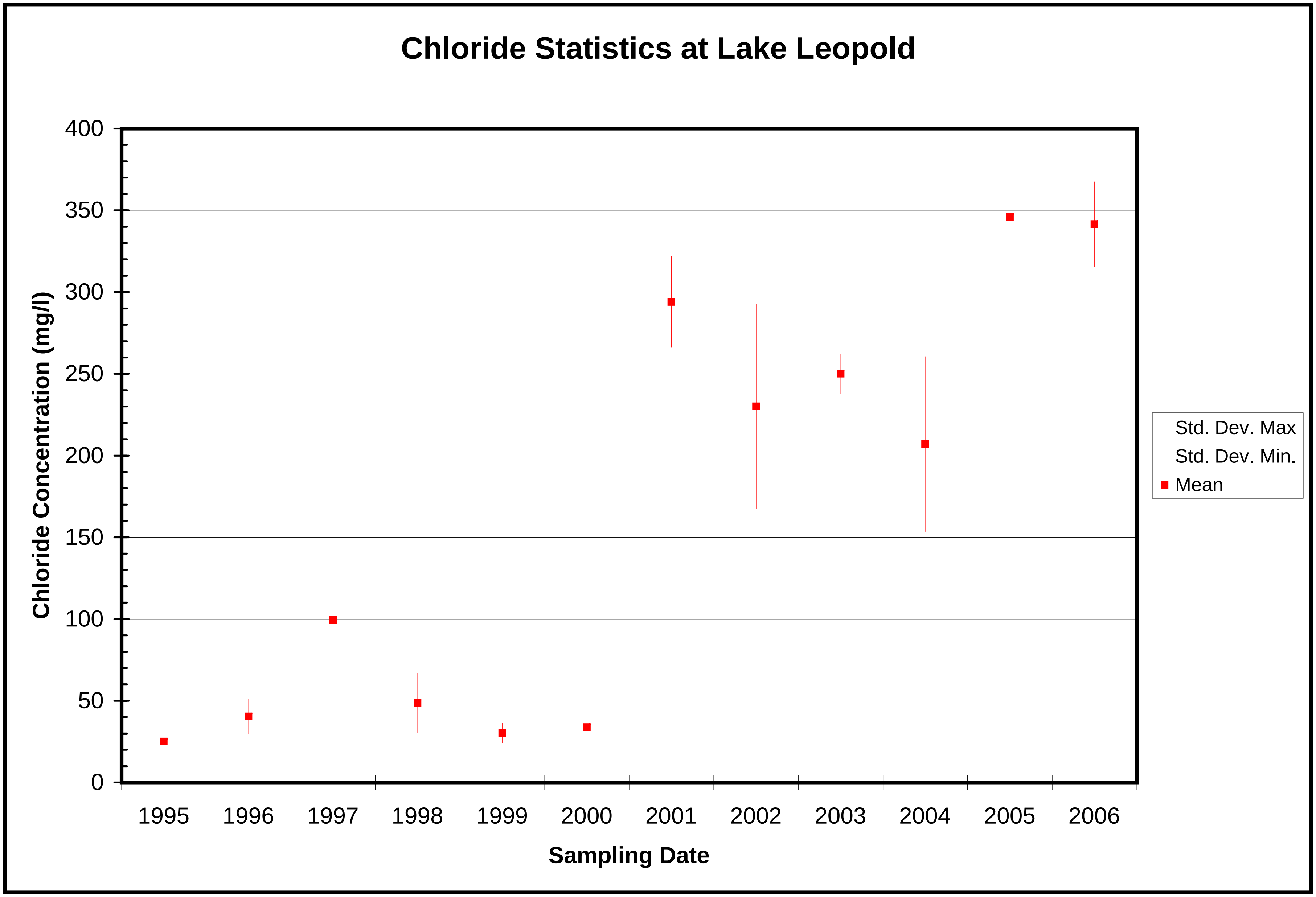
* PAR Photosynthetic Active Radiation = roughly 1.8 X secchi depth based on Lake County Health Dept. data for light transmission.

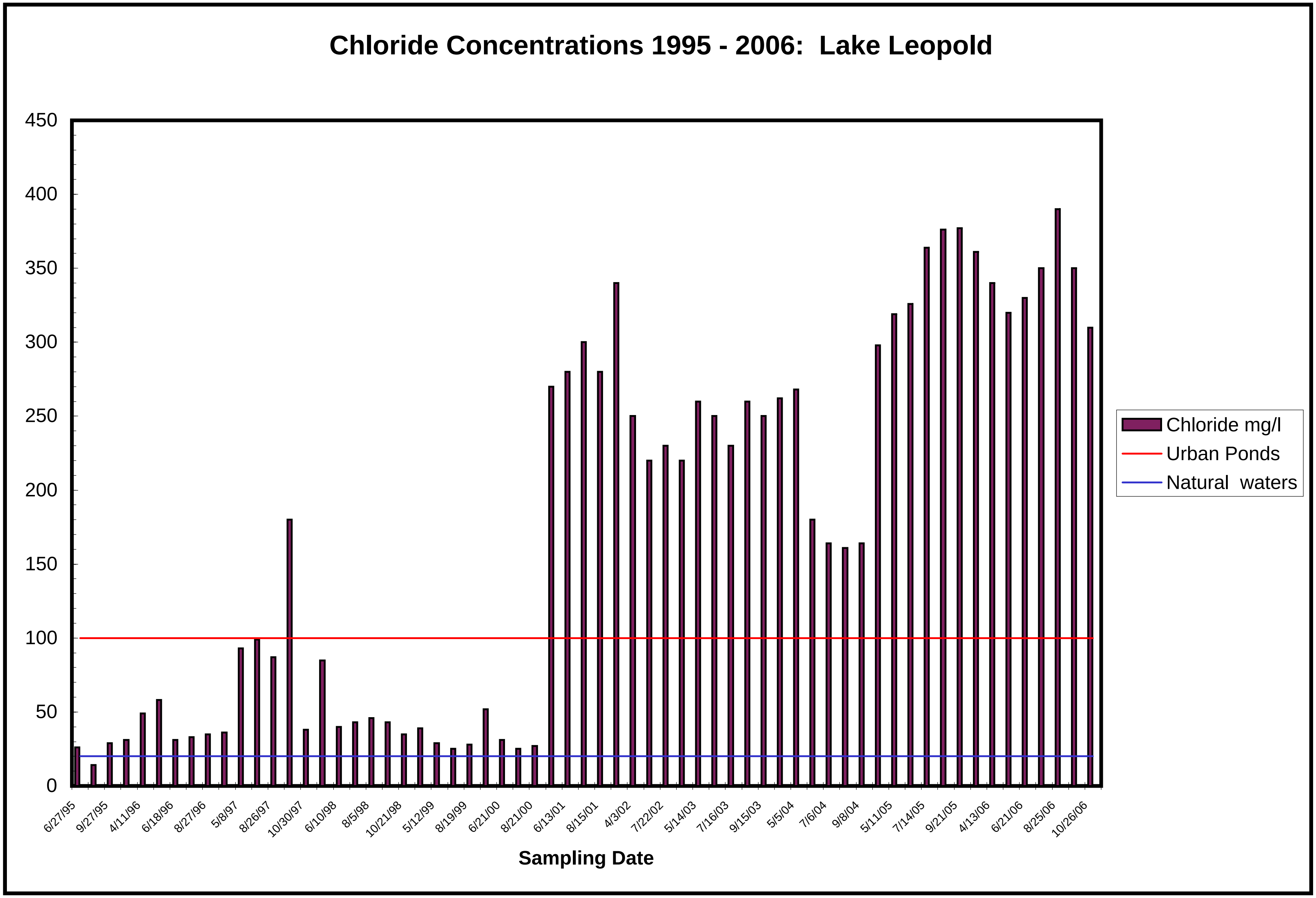
SITE 2 Location: North Bay	DO (surf.)	DO (bottom)	Depth (ft)	pH	Secchi (ft)	Conduct. umhos (field)	Temp oC (surface)	Temp oC (bottom)
Avg. for 1996	8.1	4.1	10.1	8.3	2.1	NA	21.4	13.4
Avg. for 1997	9.1	5.3	10.3	8.4	2.7	NA	18.5	14.5
Avg. for 1998	8.9	2.9	9.5	8.4	3.8	464	19.9	17.3
Avg. for 1999	8.6	5.4	10.2	8.4	4.2	296	19.3	17.2
Avg.for 2000	9.2	5.4	10.6	8.3	5.2	349	19.5	16.3
Avg.for 2001	9.8	5.8	10.2	8.4	4.2	1,245	18.9	16.3
Avg.for 2002	9.7	6.2	10.1	8.5	4.8	1,145	20.6	16.1
Avg. for 2003	9.5	3.7	9.8	8.5	3.9	1,179	18.9	16.3
Avg. for 2004	8.5	5.6	10.6	8.0	4.8	1,012	17.9	16.2
Avg. for 2005	8.6	6.5	10.5	8.3	4.5	1,462	20.0	18.1
4/13/06	11.0	7.2	10.5	8.3	4.6	1,630	14.4	11.4
5/17/06	10.4	4.1	9.4	8.0	5.0	1,474	15.2	12.0
6/21/06	7.3	6.9	6.1	8.1	5.0	1,540	23.5	23.3
7/25/06	8.0	1.4	9.7	8.6	5.0	1,273	26.2	24.2
8/25/06	6.0	2.3	11.2	8.2	3.5	1,437	23.8	23.1
9/27/06	9.5	7.7	9.5	8.2	6.3	1,450	17.6	17.0
10/26/06	11.4	8.5	9.5	8.7	3.8	1,361	7.5	8.3
Avg. for 2006	9.1	5.4	9.4	8.3	4.7	1,452	18.3	17.0

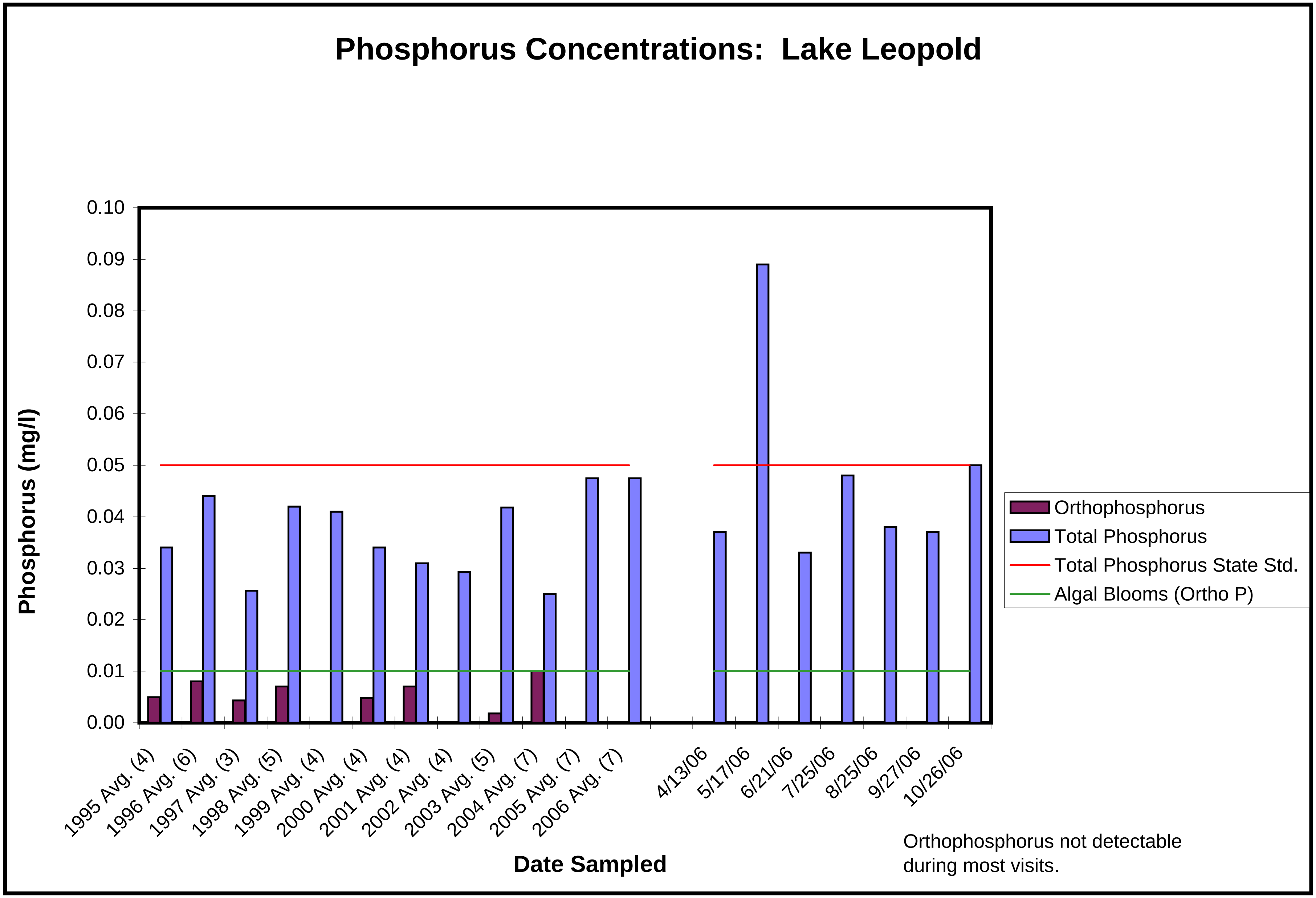
Water level - measured at the outlet

NWL = 0.92 ft

	Gage	Compared to NWL	
Avg. for 1998		+ 1.7	inches
Avg. for 1999		-0.13	inches
Avg. for 2000		+ 1.4	inches
Avg. for 2001		+ 0.6	inches
Avg. for 2002		+ 0.9	inches
Avg. for 2003		+ 0.4	inches
Avg. for 2004		+ 0.8	inches
Avg. for 2005		-0.21	inches
4/13/06	1.09	0.17	ft.
5/17/06	1.16	0.24	ft.
6/21/06	0.90	-0.02	ft.
7/25/06	0.80	-0.12	ft.
8/25/06	0.86	-0.06	ft.
9/27/06	1.02	0.1	ft.
10/26/06	1.1	0.18	ft.
Avg. for 2006		0.07	ft.

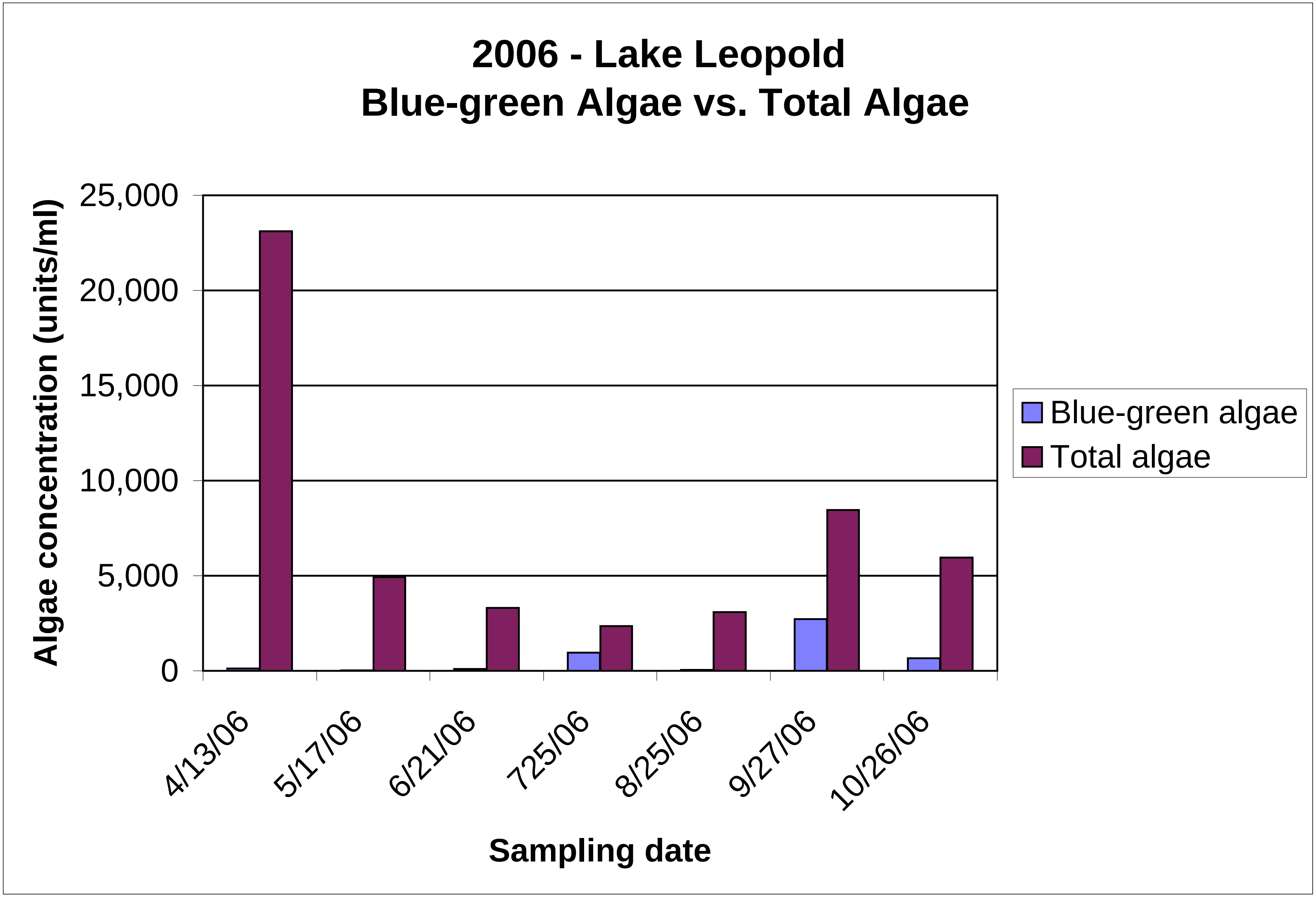

Chloride Statistics at Lake Leopold
Chloride Concentration (mg/l)
400
350
300
250
200
150
100
50
0
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Sampling Date
Std. Dev. Max
Std. Dev. Min.
Mean

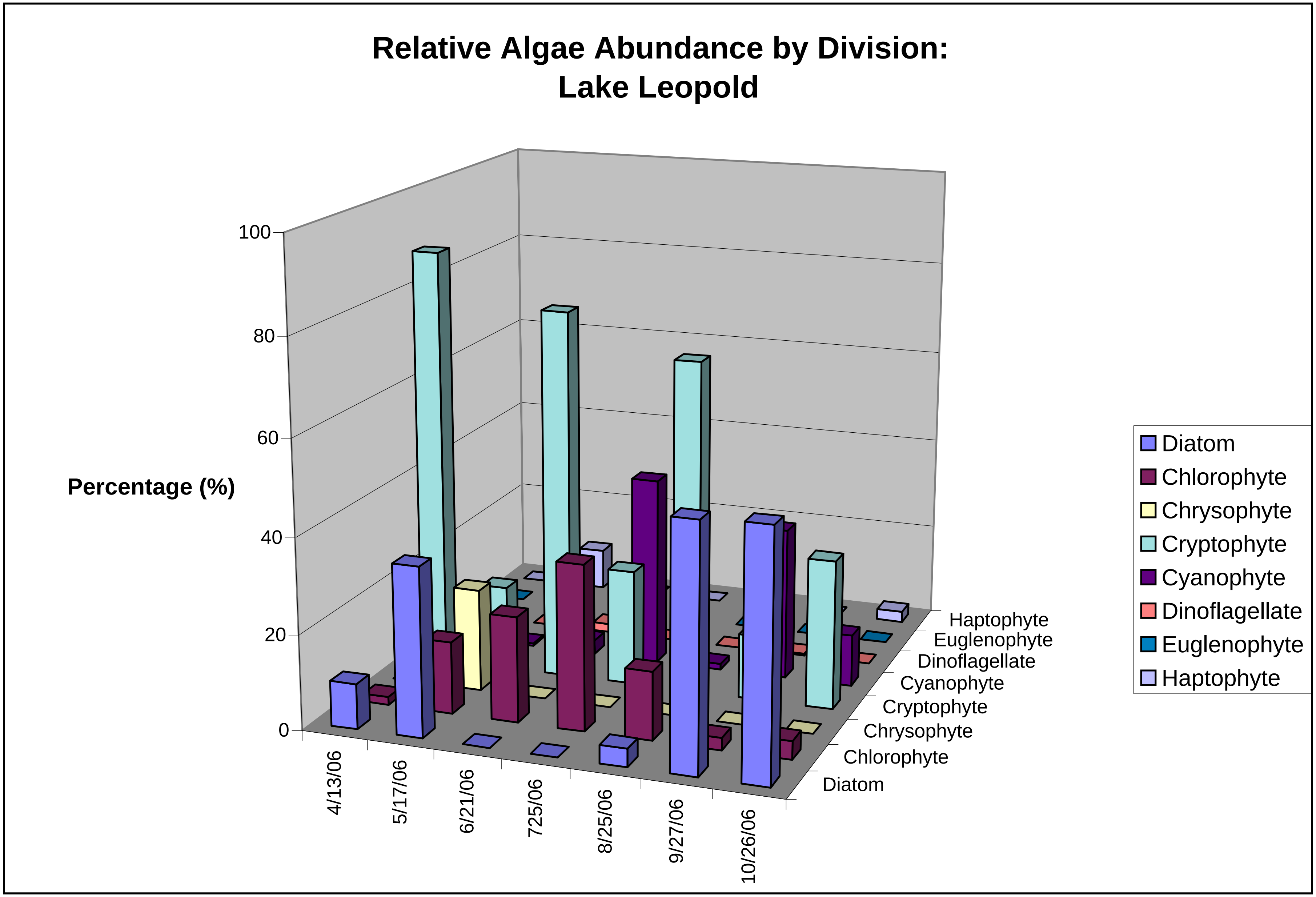

Chloride Concentrations 1995 - 2006: Lake Leopold
450
400
350
300
250
200
150
100
50
0
6/27/95
9/27/95
4/11/96
6/18/96
8/27/96
5/8/97
8/26/97
10/30/97
6/10/98
8/5/98
10/21/98
5/12/99
8/19/99
6/21/00
8/21/00
6/13/01
8/15/01
4/3/02
7/22/02
5/14/03
7/16/03
9/15/03
5/5/04
7/6/04
9/8/04
5/11/05
7/14/05
9/21/05
4/13/06
6/21/06
8/25/06
10/26/06
Sampling Date
Chloride mg/l
Urban Ponds
Natural waters



Phosphorus Concentrations: Lake Leopold
Phosphorus (mg/l)
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
1995 Avg. (4)
1996 Avg. (6)
1997 Avg. (3)
1998 Avg. (5)
1999 Avg. (4)
2000 Avg. (4)
2001 Avg. (4)
2002 Avg. (4)
2003 Avg. (5)
2004 Avg. (7)
2005 Avg. (7)
2006 Avg. (7)
4/13/06
5/17/06
6/21/06
7/25/06
8/25/06
9/27/06
10/26/06
Date Sampled
Orthophosphorus
Total Phosphorus
Total Phosphorus State Std.
Algal Blooms (Ortho P)
Orthophosphorus not detectable
during most visits.

Biological Sampling Results


2006 - Lake Leopold
Blue-green Algae vs. Total Algae
Algae concentration (units/ml)
25,000
20,000
15,000
10,000
5,000
0
4/13/06
5/17/06
6/21/06
7/25/06
8/25/06
9/27/06
10/26/06
Sampling date
Blue-green algae
Total algae



Lake Leopold algae 2006
.xls

Lake Leopold - Algae Analysis Summary, 2006

		4/13/06			5/17/06			6/21/06			7/25/06			8/25/06			9/27/06			10/26/06		
Taxa	Division	Rel. Abund. (%)	Rel. Biovol. %	Conc. (units/mL)	Rel. Abund. (%)	Rel. Biovol. %	Conc. (units/mL)	Rel. Abund. (%)	Rel. Biovol. %	Conc. (units/mL)	Rel. Abund. (%)	Rel. Biovol. %	Conc. (units/mL)	Rel. Abund. (%)	Rel. Biovol. %	Conc. (units/mL)	Rel. Abund. (%)	Rel. Biovol. %	Conc. (units/mL)	Rel. Abund. (%)	Rel. Biovol. %	Conc. (units/mL)
Achnathes sp.	Diatom																					
Asterionella sp.	Diatom																					
Aulacoseira sp.	Diatom																					
Cocconeis sp.	Diatom																					
Cyclotella sp.	Diatom				*34.2*	*33.4*	1682.6							1.3	12.7	38.7	*50.0*	1.2	4222.6	*51.4*	3.9	3066.0
Cyclostephanos	Diatom																					
Denticulla sp.	Diatom																					
Diatoma sp.	Diatom																					
Fragilaria sp.	Diatom																					
Gomphonema sp.	Diatom																					
Navicula	Diatom													1.9	1.6	58.1						
Nitzschia sp	Diatom	6.1	3.4	1405.3													0.9	1.4	74.7			
Rhizosolenia	Diatom																					
Rhopalodia sp.	Diatom																					
Stephanodiscus sp.	Diatom																					
Synedra sp.	Diatom	0.6	4.1	127.8	1.3	1.2	62.3							0.6	1.4	19.4						
Tabellaria sp.	Diatom	2.8	12.2	638.8																		
Diatom 2005 Totals		**9.5**	**19.7**	**2171.9**	**35.5**	**34.6**	**1744.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**3.8**	**15.7**	**116.2**	**50.9**	**2.6**	**4297.3**	**51.4**	**3.9**	**3,066.0**
Actinastrum sp.	Chlorophyte				2.6	0.0	124.6															
Ankistrodesmus sp.	Chlorophyte																					
Botryococcus sp.	Chlorophyte																					
Carteria sp.	Chlorophyte																					
Chlamydomonas sp.	Chlorophyte				0.6	0.6	31.2				*21.5*	4.5	507.5				0.9	0.7	74.7	0.5	0.3	28.4
Closteriopsis sp.	Chlorophyte																					
Closterium sp.	Chlorophyte																			2.9	1.5	170.3
Coelastrum sp.	Chlorophyte																					
Cosmarium	Chlorophyte																					
Crucigenia sp.	Chlorophyte																					
Dictyosphaerium so.	Chlorophyte																					
Dysmorphococcus sp.	Chlorophyte				0.6	0.6	31.2															
Gloecystis sp.	Chlorophyte							1.2	0.2	39.3												
Elakatothrix sp.	Chlorophyte													0.6	1.8	19.4						
Kirchneriella sp.	Chlorophyte				0.6	0.1	31.2															
Monoraphidium sp.	Chlorophyte	1.7	0.2	383.3	10.8	1.3	529.7	2.4	0.0	78.6	0.7	0.0	17.5	12.5	3.8	387.1	1.3	0.1	112.1	0.5	0.0	28.4
Mougeotia sp.	Chlorophyte																					
Oedogonium sp.	Chlorophyte										0.7	1.5	17.5									
Oocystis sp.	Chlorophyte							1.8	0.2	59.0	7.4	0.9	175.0									
Pandorina sp.	Chlorophyte																					
Pediastrum sp.	Chlorophyte							6.0	0.0	19.7												
Pyramichlamys sp.	Chlorophyte																					
Quadrigula sp.	Chlorophyte																					
Scenedesmus sp.	Chlorophyte							0.6	0.1	19.7	1.5	0.1	35.0	1.3	0.7	38.7	0.4	0.2	37.4			
Schizochlamys sp.	Chlorophyte																					
Schroederia sp.	Chlorophyte							4.8	0.0	157.2	2.2	0.0	52.5									
Selenastrum sp.	Chlorophyte																					
Spaerellopsis sp.	Chlorophyte																					
Sphaerocystis sp.	Chlorophyte																					
Staurastrum sp.	Chlorophyte							0.6	2.6	19.7												
Tetraedron sp.	Chlorophyte							4.8	0.8	157.2	0.7	0.9	17.5									
Tetrastrum sp.	Chlorophyte																					
Non-motile Chlorophyte coccoids	Chlorophyte																					
Chlorophyte 2005 Totals		**1.7**	**0.2**	**383.3**	**15.2**	**2.6**	**747.9**	**22.2**	**3.9**	**550.4**	**34.7**	**7.9**	**822.5**	**14.4**	**6.3**	**0.0**	**2.6**	**1.0**	**224.2**	**3.9**	**1.8**	**227.1**
Chrysococcus sp.	Chrysophyte																					
Desmarella sp.	Chrysophyte																					
Dinobryon sp.	Chrysophyte																					
Ellipsoidion	Chrysophyte																					
Erkenia sp.	Chrysophyte																					
Kephyrion sp.	Chrysophyte				1.3	0.2	62.3															
Mallomonas sp.	Chrysophyte																					
Chrysophyte, flagellated	Chrysophyte																					
Chrysophyte, cyst	Chrysophyte																					
Non-motile Chrysophytes	Chrysophyte																					
Ochromonas sp.	Chrysophyte				*20.3*	7.5	997.1															
Synura sp.	Chrysophyte																					
Uroglena sp.	Chrysophyte																					
Chrysophyte 2005 Totals		**0.0**	**0.0**	**0.0**	**21.6**	**7.7**	**1,059.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Chroomonas sp.	Cryptophyte	2.8	*31.6*	638.8																		
Cryptomonas sp.	Cryptophyte				2.5	10.5	124.6	*50.6*	*27.2*	1670.6	5.9	4.6	140.0	6.9	*26.9*	212.9	1.3	2.4	112.1	17.6	*62.8*	1050.4
Rhodomonas sp.	Cryptophyte	*85.6*	*22.4*	19801.3	15.2	3.4	747.8	*27.4*	0.4	904.1	18.5	0.3	437.5	*63.1*	*28.5*	1955.0	12.4	0.8	1,046.3	13.8	0.9	823.3
Cryptophyte 2005 Totals		**88.4**	**54.0**	**20440.1**	**17.7**	**13.9**	**872.4**	**78.0**	**27.6**	**2574.7**	**24.4**	**4.9**	**577.5**	**70.0**	**55.4**	**2167.9**	**13.7**	**3.2**	**1,158.4**	**31.4**	**63.7**	**1873.7**

Lake Leopold - Algae Analysis Summary, 2006

(continued)

Taxa	Division	4/5/04 Rel. Abund. (%)	Rel. Biovol. %	Conc. (units/mL)	5/10/04 Rel. Abund. (%)	Rel. Biovol. %	Conc. (units/mL)	6/7/05 Rel. Abund. (%)	Rel. Biovol. %	Conc. (units/mL)	Rel. Abund. (%)	Rel. Biovol. %	Conc. (units/mL)	Rel. Abund. (%)	Rel. Biovol. %	Conc. (units/mL)	Rel. Abund. (%)	Rel. Biovol. %	Conc. (units/mL)	Rel. Abund. (%)	Rel. Biovol. %	Conc. (units/mL)
Anabaena sp.	Cyanophyte							1.2	1.1	39.3							0.4	4.8	37.4			
Aphanizomenon sp.	Cyanophyte							1.2	1.0	39.3	40.0	86.7	945.0				26.1	70.0	2,204.7	1.0	1.1	56.6
Aphanocapsa sp.	Cyanophyte																					
Aphanothece sp. (colony)	Cyanophyte																					
Chroococcus sp.	Cyanophyte																					
Coelosphaerium sp.	Cyanophyte																					
Dactylococcopsis sp.	Cyanophyte																					
Gomphosphaeria sp.	Cyanophyte																					
Lyngbya sp.	Cyanophyte							0.6	19.9	19.7				0.6	13.5	19.4						
Merismopedia sp.	Cyanophyte																					
Microcystis sp.	Cyanophyte																0.4	1.3	37.4			
Non-motile blue-greens	Cyanophyte																					
Oscillatoria sp.	Cyanophyte	0.6	26.0	127.8	0.6	20.8	31.2							0.6	3.4	19.4	5.3	7.8	448.4	10.0	29.3	596.2
Pseudanabaena sp.	Cyanophyte																					
Raphidiopsis sp.	Cyanophyte																					
Synechococcus sp.	Cyanophyte																					
Cyanophyte 2005 Totals		**0.6**	**26.0**	**127.8**	**0.6**	**20.8**	**31.2**	**3.0**	**22.0**	**98.3**	**40.0**	**86.7**	**945.0**	**1.2**	**16.9**	**38.8**	**32.2**	**83.9**	**2,727.9**	**11.0**	**30.4**	**652.8**
Amphidinium sp.	Dinoflagellate																					
Ceratium sp.	Dinoflagellate							1.8	46.1	59.0							0.4	9.4	37.4			
Dinoflagellate cyst	Dinoflagellate																					
Glenodinium sp.	Dinoflagellate																					
Gymnodinium sp.	Dinoflagellate																					
Misc. Dinoflagellates	Dinoflagellate																					
Peridinium sp.	Dinoflagellate																					
Dinoflagellate 2005 Totals		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.8**	**46.1**	**59.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.4**	**9.4**	**37.4**	**0.0**	**0.0**	**0.0**
Chrysochromulina sp.	Haptophyte				8.9	1.5	436.2							10.6	5.8	329.1				2.4	0.1	141.9
Haptophyte 2005 Totals		**0.0**	**0.0**	**0.0**	**8.9**	**1.5**	**436.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**10.6**	**5.8**	**329.1**	**0.0**	**0.0**	**0.0**	**2.4**	**0.1**	**141.9**
Euglena sp.	Euglenophyte				0.6	18.9	31.2															
Lepocinclis sp.	Euglenophyte																					
Phacus sp.	Euglenophyte																					
Trachelomonas sp.	Euglenophyte							0.6	0.4	19.7	0.7	0.6	17.5									
Euglenophyte 2005 Totals		**0.0**	**0.0**	**0.0**	**0.6**	**18.9**	**31.2**	**0.6**	**0.4**	**19.7**	**0.7**	**0.6**	**17.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
2005 Totals	Misc.	100.2	99.9	23,123.1	100.1	100.0	4,923.2	105.0	100.0	3302.1	99.8	100.1	2,362.5	100.0	100.1	3,097.2	99.8	100.1	8,445.2	100.1	99.9	5,961.5

Lake Leopold Zooplankton Analysis, 2006

	4/1320/06 Concentration (#/L)	Total Biomass (ug/l)	Relative Biomass %	6/21/2006 Concentration (#/L)	Total Biomass (ug/l)	Relative Biomass %	7/25/2006 Concentration (#/L)	Total Biomass (ug/l)	Relative Biomass %	8/25/2006 Concentration (#/L)	Total Biomass (ug/l)	Relative Biomass %	9/27/2006 Concentration (#/L)	Total Biomass (ug/l)	Relative Biomass %
CLADOCERANS															
Daphnia				11	25.9	6.9				1	1	2.3	0.5	0.3	0.2
Bosmina	4.50	4.70	1.40	40.50	35.30	9.50	31.50	23.20	11.20	23.50	10.20	***22.00***	78.00	58.60	***36.90***
Ceriodaphnia				109.50	159.80	***43.00***	63.00	40.90	19.80	16.00	10.40	***22.50***	8.00	10.80	6.80
Diaphanosoma				8.00	27.90	7.50	0.50	1.20	0.60	2.00	4.00	8.70	0.50	0.80	0.50
Acroperus sp.															
Chydorus	5.50	3.60	1.10												
Alona	1.00	0.40	0.10												
Immature clad.															
TOTAL CLADS	11.00	8.70	2.60	169.00	248.90	66.90	63.50	65.30	31.60	42.50	25.60	55.50	87.00	70.50	44.40
COPEPODS															
Acanthocyclops															
Leptodiaptomus															
Calanoid copepodid				1.00	1.70	0.50	1.00	1.30	0.60	1.00	1.90	4.2			
Chydorus															
Cyclopoid copepodid	3.00	11.30	3.30	6.00	4.50	1.20				2.50	0.50	1.00	2.50	1.20	0.80
Diacyclops															
Mesocyclops	0.50	2.30	0.70	17.50	41.70	11.20				0.5	2.5	5.4			
Nauplii				72.50	74.60	20.10	72.50	74.60	***36.10***				72.5	53.9	***33.9***
Skistodiaptomus	0.50	2.00	0.60							1	4.8	10.4	2.00	4.40	2.70
TOTAL COPES	4.00	15.60	4.60	97.00	122.50	33.00	73.50	75.90	36.70	5.00	9.70	21.00	77.00	59.50	37.40
ROTIFERS															
Asplanchna							217.50	43.50	***21.10***						
Bdelloid															
Brachionus															
Euchlanis															
Filinia	145.00	18.90	5.50												
Gastropus															
Conochilus															
Kellicotia															
Keratella	1450.00	210.30	***61.80***										72.50	7.30	4.60
Lecane															
Polyarthra	580.00	87.00	***25.60***				145.00	21.80	10.50	72.50	10.90	***23.6***	145.00	21.80	13.7
Synchaeta															
Tetramastix															
Trichocerca															
TOTAL ROTIFERS	2175.00	316.20	92.90	0.00	0.00	0.00	362.50	65.30	31.60	72.50	10.90	23.60	217.50	29.10	18.30
Ostracods															
TOTAL ZOOPS	2190.00	340.50	100.10	266.00	371.40	99.90	531.00	206.50	99.90	120.00	46.20	100.10	381.50	159.10	100.10

Sediment Sampling Results

Lake Leopold at Prairie Crossing Sediment Samples

Collected 8/11/06

	Low	Normal	Elevated	Highly Elevated	Site 1 Outlet	Site 2 Island	Site 3 Center	Site 4 N. Bay
pH	< 7	7 - 8.5	8.5 - 9.5	> 9.5	7.58	6.98	7.29	7.22
Organic Carbon (% dry)	< 20%**	20 - 59%	>'50% - 75%	> 75%	12.4	10.9	13.6	10.5
Bulk density					NA	NA	NA	NA
Percent Moisture					74.5	64.7	76.1	69.4
Total phosphorus (mg/kg)	< 394*	394 < 1,115*	1,115 < 2,179*	> 2,179*	272	408	279	347
Iron (mg/kg dry)	< 16,000*	16,000 - 37,000*	37,000 < 56,000*	> 56,000*	29,900	17,300	23,900	21,900
Manganese (mg/kg dry)]	< 500*	500 - 1,700*	1,700 < 5,500*	> 5,500*	429	219	390	407
Fe:Mn ratio	< 6**	6 - 10	> 10		70	79	61	54
Nitrate N (ppm)***	< 9	10 - 19	20 - 39	> 40	2	2	2	2
Bray 1 Phosphorus (ppm)***	< 19	20 - 29	30 - 49	> 50	2	1	1	2
exchangeable ammonia N***					NA	NA	NA	NA

** IEPA (1996) Sediment Classification for Illinois Inland Lakes*

**Steve McComas - Blue Water Science study:

Factors favoring EWM
- High Fe:Mn ratio
- exchangeable ammonia N > 10 ppm
- organic matter < 20%

Factors favoring CLP
- Low Fe:Mn ratio
- pH > 7.7
- organic matter > 20%

Dense matt forming colonies require these conditions more than open canopy colonies

Usually EWM and CLP are not dominant for a long term in the same area in water > 6 feet. EWM or CLP may be dominant for a few years but if nitrogen is low the EWM will dieback. If the organic matter is low the CLP may dieback after a few years.

If get 30 - 40 sunfish/trap - then too high of a density to maintain EWM weevils - may get too much predation.
*** Soil test ratings (A & L Great Lakes Laboratories)
***Have lab use a KCl extract - standard soil test

Sediment Sampling Locations
August 11, 2006

600 0 600 1200 Feet

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● Sediment locations.shp

Eurasian Watermilfoil Growth Characteristics

(source: Steve McComas, Blue Water Science, unpublished)

Non-Nuisance Conditions

Plants rarely reach the surface.

Navigation and recreational activities generally are not hindered.

Stem density: 0 - 40 stems/m^2
Biomass: 0 - 51 g-dry wt/m^2

Light Nuisance Conditions

Broken surface canopy conditions. However, stems are usually unbranched.

Navigation and recreational activities may be hindered.

Lake users may opt for control.

Stem density: 35 - 100 stems/m^2
Biomass: 30 - 90 g-dry wt/m^2

Heavy Nuisance Conditions

Solid or near solid surface canopy conditions. Stems typically are branched near the surface.

Navigation and recreational activities are severely limited.

Control is necessary for navigation and/or recreation.

Stem density: 250\+ stems/m^2
Biomass: >285 g-dry wt/m^2

Curlyleaf Pondweed Growth Characteristics
(source: Steve McComas, Blue Water Science, unpublished)

Non-Nuisance Conditions

Plants rarely reach the surface.

Navigation and recreational activities are not generally hindered.

Stem density: 0 - 160 stems/m^2
Biomass: 0 - 50 g-dry wt/m^2
Estimated TP loading: <1.7 lbs/ac

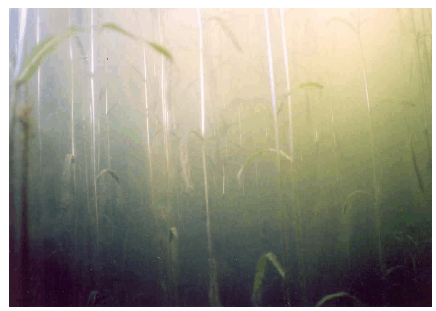
Light Nuisance Conditions

Broken surface canopy conditions.

Navigation and recreational activities may be hindered.

Lake users may opt for control.

Stem density: 100 - 280 stems/m^2
Biomass: 50 - 85 g-dry wt/m^2
Estimated TP loading: 2.2 - 3.8 lbs/ac



Heavy Nuisance Conditions

Solid or near solid surface canopy conditions.

Navigation and recreational activities are severely limited.

Control is necessary for navigation and/or recreation.

Stem density: 400+ stems/m^2
Biomass: >300 g-dry wt/m^2
Estimated TP loading: >6.7 lbs/ac

Eurasian Watermilfoil Weevils

Lake Leopold
Eurasian Watermilfoil installation locations
June 21, 2006

600 0 600 1200 Feet

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● Weevil loc.shp

PHOTOS

Photo 1: Eurasian Watermilfoil becoming very dense early in the season (5/17/06).

Photo 2: Later in the season EWM did not look healthy and was less dense (8/25/06)

Photo 3: Aquatic plant material dominating the outlet bay (7/25/06)

Photo 4: After EWM was herbicided in the north bay waterstar grass became dominant in the shallow areas. (7/25/06).

Photo 5: Pickerel weed and black eyed Susans dominate parts of the shoreline (7/25/06).

Photo 6: Sediment sample collected on 8/11/06.