

Lake Lucerne

Forest County, Wisconsin

NORTHERN LAKE SERVICE, INC

CRANDON, WI

May 2005

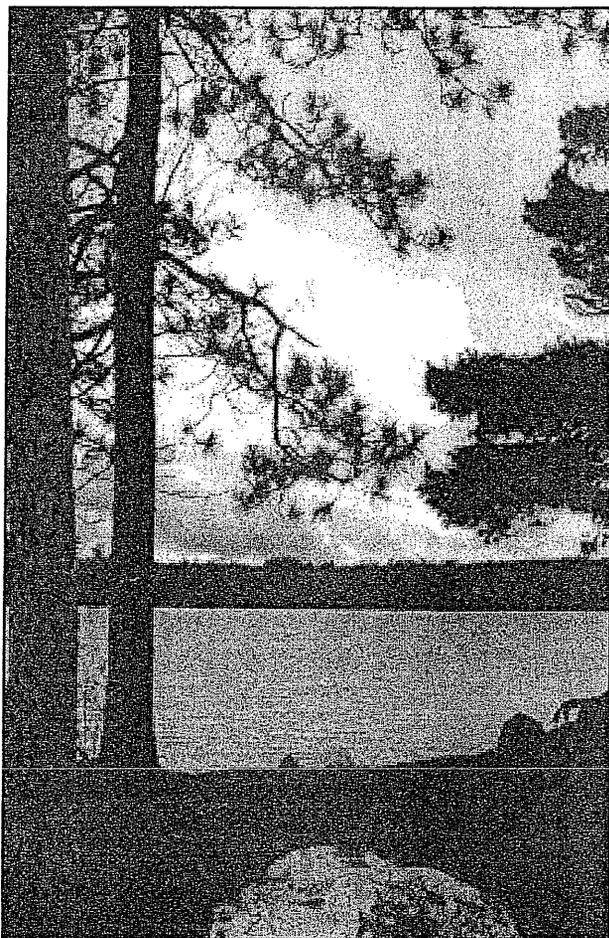
HOW IT ALL FITS TOGETHER

A lake is an extremely dynamic community. We tend to look at different aspects of that community separately. "The ice fishing was great last winter," or "the weeds are really bad this summer". What we need to realize is that all aspects of this community are connected. If we make mistakes developing our shoreline we can increase runoff. The runoff carries nutrients that feed the plants or algae and can destroy fish breeding grounds. It can also cloud the water making it difficult for aquatic plants to survive. If the plants aren't growing it further hurts the fishery by eliminating food and cover sources and allows algae to gain an upper hand, adversely affecting aesthetics. If the plants survive and are "overfed", their populations can explode, recreational opportunities can be lost, a stunted fish population can result, and winterkill may become more likely. Many potential problems stemming from one action.

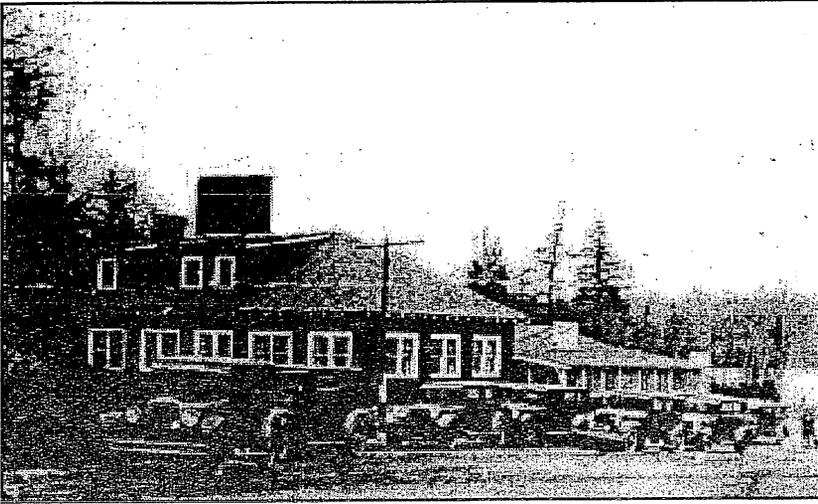
Our recreational activities can have a similar "domino effect". Improper, high-impact recreational activities pound the shoreline and destroy plant communities, both of which lead to sedimentation and water-quality problems which can result in the same set of problems as the "shoreline" example above.

It is the responsibility of every lake-property owner and lake user to understand the impact that his or her actions have on the overall health of the lake.

Each of the articles in this report looks at a separate study area, but you will notice that it is not possible to discuss any single issue without discussing its relationship to another.



Lake Lucerne



A BIT OF HISTORY

Lake Lucerne has been a valuable recreational resource for over a century. The north end was initially developed by the Uhlein family (of the Schlitz Brewing Company) around the turn of the century. The compound that they built served as a social gathering place for local residents and members of Milwaukee's elite.

THIS REPORT

Through the years, data and information on Lake Lucerne has been collected under a number of different projects. The purpose of this study, which was made possible through a grant from the DNR's Lake Planning Grant program, is to bring all the technical data together, interpret it and produce a single comprehensive report. The Association contracted Northern Lake Service of Crandon to generate this report.

The first component of the report is this section. It is designed to give an overview of general lake issues as they apply to Lake Lucerne. The technical and supporting data are referenced here and included as appendices of the report. The emphasis of this section is on giving a very general view of the data and providing residents with information on how they can preserve, protect and improve the lake.

THANKS

The directors of the Lake Lucerne Advancement Association would like to thank the following people for their help with this project:

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With a special thanks to Dick Lewis for his many hours completing the grant application process, writing the history and working on the resident survey.

In the 1920's and 30's, Planets Resort, also on the north end and pictured here, was an official post office, where residents and summer vacationers could conveniently receive their mail. The north end also had its own schoolhouse for a number of years.

Over the years, large tracts of land along the shores of Lucerne were divided and subdivided and by September of 1946, 45 lot owners were paid members of the newly-formed lake association.

The Association has been very active over the past couple decades. Page 12 highlights Association activities and Appendix A of this report is a more complete history of the association compiled by Dick Lewis. Appendix A also includes a history of early activities along the north shore. Both of these items can also be found on the Lake Lucerne Advancement Association website.

WATER QUALITY

A significant amount of water quality data has been collected on Lake Lucerne over the past several decades. The lake has been tested by the DNR as one of its long-term trend lakes and by dedicated members of the Association under the DNR's Self-help monitoring program. Additional samples have been as part of this and other studies.

Water quality data can be divided into three groups – macronutrients, micronutrients and buffering capacity parameters.

The macronutrients consist of nitrogen and phosphorus. These are the components that “drive” the entire living lake community. They are discussed on the next page.

The micronutrients are other elements found in the water in very low concentrations. They also “feed” the system, but their effects are usually subtle and often not very well understood. Appendix B contains some information on these elements, but they are not discussed in this report. The buffering capacity parameters are pH and alkalinity. They are indicators of the potential effects that acid rain can have on a lake. They are discussed next.

TEARING DOWN THE WALLS - THE MYTH OF SEAWALLS

It is often assumed that the best shoreline stabilizer is a sturdy concrete seawall. While this type of wall can lessen the effects of wave action on the zone directly behind the wall, it can often lead to more devastating effects on the shoreline adjacent to the wall. The wave force is actually magnified by the wall and applies that force to the areas of the end off the walls. Seawalls can also eliminate “microhabitats” important to small fish and amphibians (see page 10)

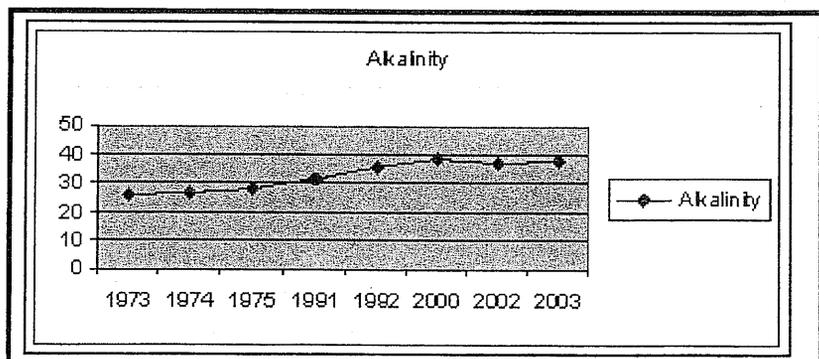
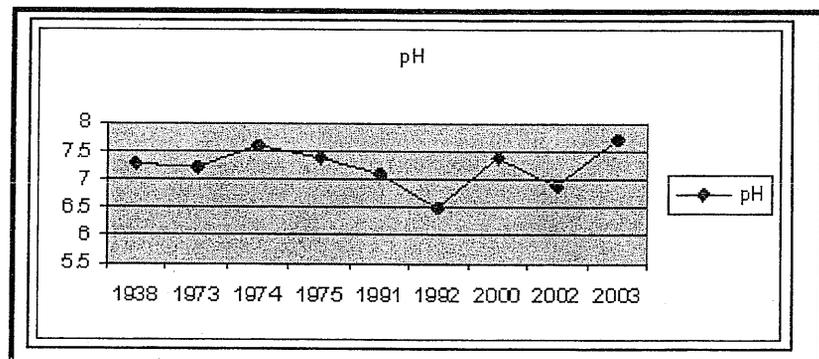
ACID RAIN AND LAKE LUCERNE

Acid rain is a product of airborne contaminants (mostly from vehicle emissions and industrial smokestacks) being trapped within raindrops and snowflakes and redeposited on earth. In certain lakes the effects of the acid deposition can be devastating. The measurement of alkalinity and pH are indicators of a lake's susceptibility to these effects or the current state of these effects. pH is the measurement of the acidity of a lake. The lower the number, the more acidic the water; the higher the number, the more basic. A value of 7.0 is neutral. Most of the lakes in our region are around the neutral area of this scale and most vary a bit seasonally, due to natural processes. The plants and animals in these lakes can withstand the natural fluctuation, but begin to suffer when the pH moves further toward one end or the other. A number of lakes in the re-

are naturally acidic – plants and animals in these lakes have evolved to require the lower pH.

Alkalinity is the measurement of certain dissolved materials that neutralize acid. The higher the alkalinity, the more acid can be deposited in a lake before the pH is changed. This is the same effect that many stomach remedies rely on. Research has indicated that lakes with alkalinity levels of greater than 31 mg/L are at very low risk of the adverse effects of acid rain.

The pH in Lake Lucerne has been relatively high since data collection began – ranging from 6.5 to 8. This means that the lake is in the expected range and has quite a bit of room on the scale for healthy plant and animal populations to flourish. The alkalinity however, keeps Lucerne in the range of susceptibility to the effects of acid rain. Alkalinity has ranged from 26 to 39 mg/L, with the higher values seen in the most recent tests.



PHOSPHORUS AND NITROGEN. . .THE MAIN PLAYERS

It may seem hard to believe, but nearly all of the reasons we enjoy our lake experience, and most of the reasons that the experience can sometimes be not so enjoyable, are related to these two elements. They supply the living system in our lake with its primary "food" supply and their presence can be greatly affected by our activities. Generally speaking, we use their levels as a measure of a lake's health.

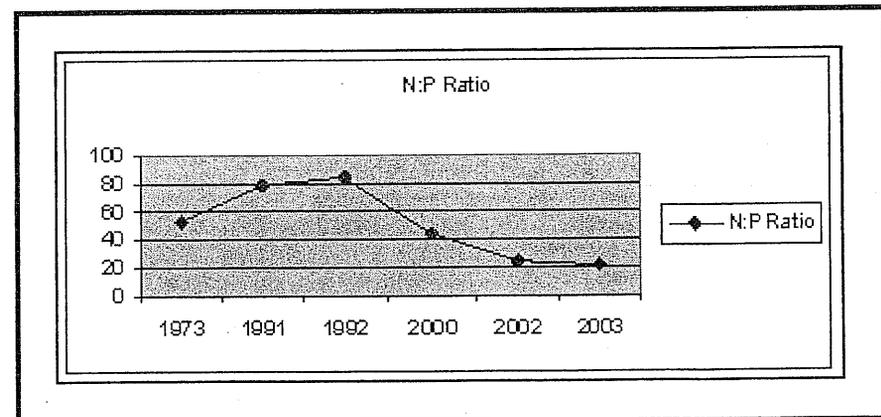
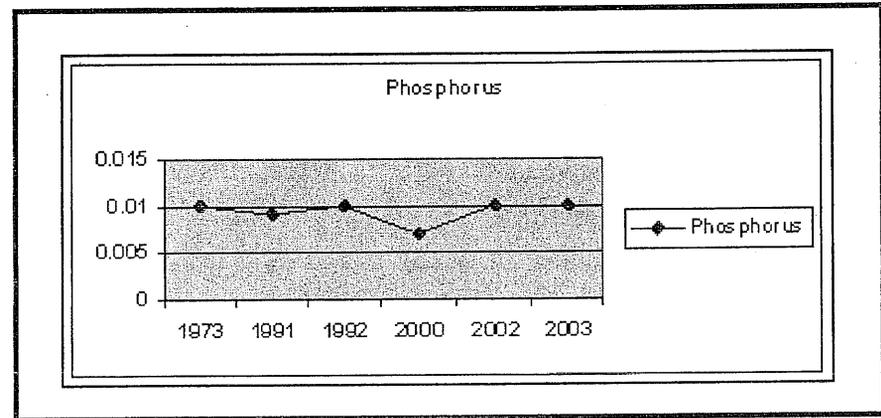
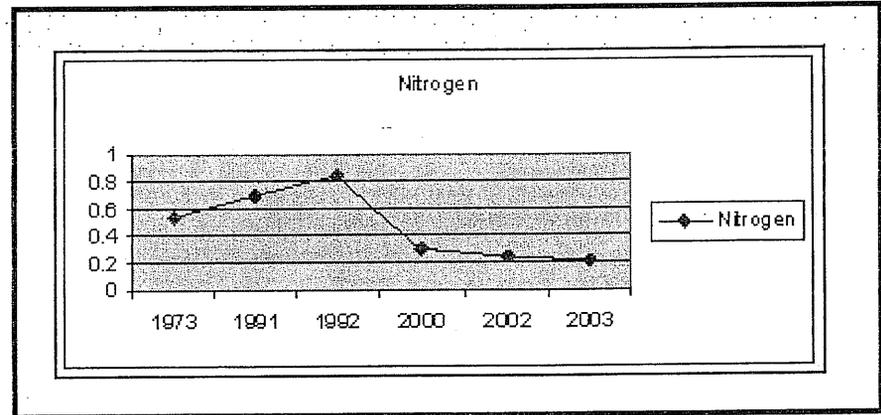
Phosphorus comes from the surrounding shoreline and from the sediments. Removal of shoreline vegetation, fertilization, and improper or insufficient waste treatment (septic systems) can all contribute enormously to the phosphorus loading from the shoreline. Off shore, weed removal and high-impact activities in shallow areas can lead to additional nutrient loading from the sediment. Generally, phosphorus levels of greater than .013 PPM can support nuisance levels of plants and algae. The accompanying graph shows that phosphorus levels have remained just slightly below that level over the past thirty years.

Nitrogen levels over that same period have fluctuated somewhat but remain within an expected range. Nitrogen levels tend to fluctuate seasonally due to natural processes.

In most lakes, Lucerne among them, nitrogen is present in excess. That means that the amount of phosphorus present determines the amount of plant and algae growth, which in turn affects the fishery, the aesthetics and our lake experience in general.

A ratio of nitrogen to phosphorus of 13 or greater indicates that this is the case.

The third graph on this page shows that ratio over the same period of time.



THE SIMPLE SOLUTION TO WATER QUALITY MONITORING

Phosphorus feeds algae, algae clouds the water – that’s the concept. Testing for phosphorus and algae (Chlorophyll A) requires complex chemical tests and many dollars. The alternative is a simple, inexpensive method that involves lowering a heavy disk (Secchi disk) into the water and reporting the lowest depth at which it is still visible. The shallower the visible depth the more algae and ultimately the more phosphorus in the system.

Thanks to a few dedicated Lake Lucerne residents, we have an extensive database of Secchi disk measurements, tracking water quality trends over the past 18 years.

The table below contains summer averages over the past 30 years. These averages run between 19 and 29 feet indicating very good to excellent water quality.

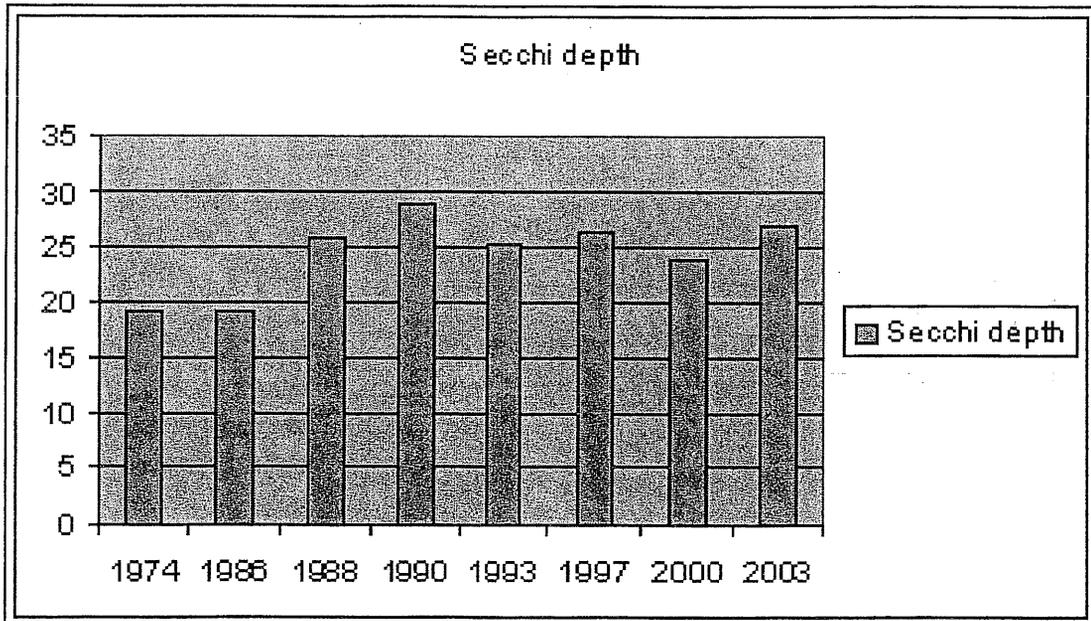
Lake Model Shows Water Quality Very Good

The Lillie and Mason water quality model was developed in 1983 and uses phosphorus and transparency (Secchi depth) to rate the water quality of a lake. The following table shows the water quality of Lake Lucerne according to this model at four points over the last three decades. You can use this table along with the graph below and the phosphorus graph on page 4 to create a more complete model of water quality. The columns labeled phos. and secchi show the ranges for each water quality category.

	Phos.	1974	1991	2000	2003	Secchi	1974	1991	2000	2003
Excellent	<.001					>19.7		26.8	24.0	27.1
Very Good	.001-.010	.010	.010	.007	.010	9.8-19.7	18.8			
Good	.010-.030					6.6-9.8				
Fair	.030-.050					4.9-6.6				
Poor	.050-.150					3.3-4.9				
Very Poor	>.150					<3.3				

“BLOWDOWNS” POLLUTION, EYESORE – MYTH NUMBER 2

Fallen trees or “blowdowns” in the lake are often removed immediately. There is usually the sense that the lake should be “cleansed” of this “mess”. But, blowdowns provide a number of benefits. They provide for a number of wildlife activities both above and below the water surface. They are shelter and feeding sources for fish and other aquatic animals, “basking” areas for turtles, and “hunting grounds” for raccoons and other small, carnivorous animals. They also act to disrupt wave action thus protecting the shoreline behind them. So, the next time Mother Nature provides you with a blowdown, consider leaving it where it is and enjoy the wildlife it supports.



Aquatic Plants

The aquatic plants in a lake can provide numerous benefits or endless headaches. A healthy diverse plant community supplies food and cover for fish and other wildlife, provides sediment and shoreline stabilization, utilizes nutrients that might otherwise lead to algae problems and even adds to the aesthetics in the eyes of many beholders.

Lake Lucerne supports a healthy and diverse plant community, with over 30 species present. Several distinctly different types of communities are present. Moderate to dense growth of several larger species, including *P. robbinsii*, characterize the areas near and to the south of the island.

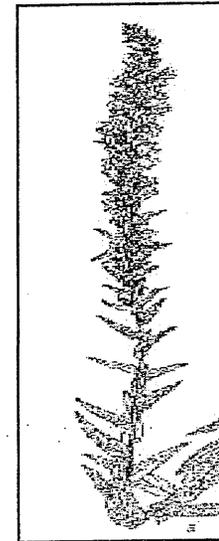
During the previous study in 1995 the east shore supported a community dominated by very low-growing sand-loving species with some scattered growth of pondweed (*P. gramineus*). The same species were encountered in 2003, however the growth of pondweed had increased

significantly. This may be simply a seasonal effect or may be an indicator of a change in water quality or increase in sedimentation due to increased development in that area. Residents in this area should be aware of the change and consider development practices that will decrease additional deposition of sediment and nutrients.

The second most commonly encountered plant during the 1995 survey was *Nitella*. This organism is not actually a green plant but a colonial algae that looks very similar to a green plant. It consists of lush green stems with long, forked branches and small orange reproductive structures. *Nitella* was found to depths of over 30 feet in 1995. It was much less common during the recent survey, but this may have been due to fewer deep-water sample sites.

Several of the other plants in the table below are the small sand-loving plants mentioned earlier.

Appendix C of the supplemental report contains all field data from both studies along with diagrams and descriptions of the species collected.



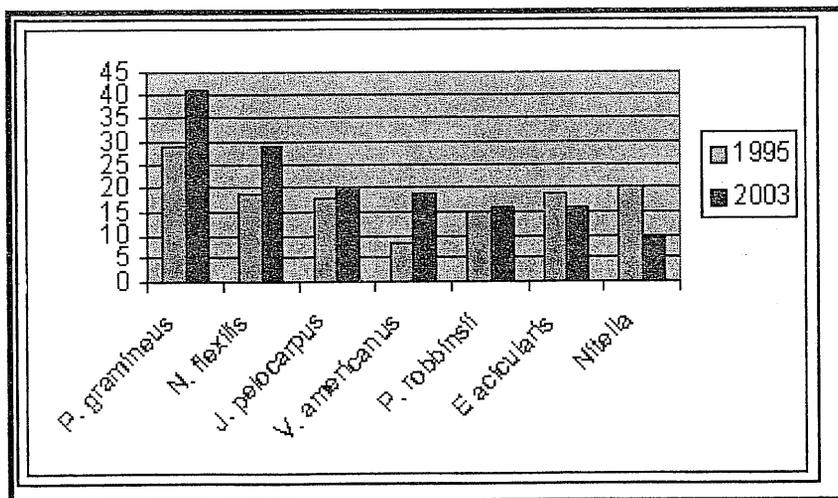
PURPLE LOOSESTRIFE

Purple loosestrife is an aggressive, semi-aquatic plant species that has escaped cultivation and damaged native habitat throughout the Midwest. This plant has been present on the north end of Lake Lucerne for several decades. Since it is an attractive plant, it is difficult to convince landowners to remove it.

The plant is a medium to large shrub, growing in shallow standing water or wet soil. It has a square stem and a spike of many pink-purple flowers.

Recently a local highschool science class has attempted biological control of the local population using a beetle shown to feed on the plant.

The section of this report on aquatic plants (appendix C) contains information on the proper identification and removal of this plant. Both are very important, since the plant has several native look-alikes and improper removal can spread the colony.



INVADERS!!

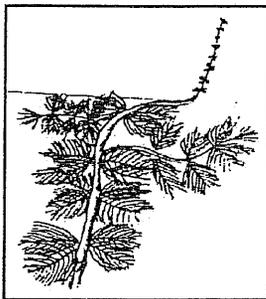
ZEBRA MUSSEL

The zebra mussel is a small, angular bivalve (clam), which reproduces very rapidly. These mussels filter particulate material from the water so the potential effect is a loss of food for other small animals near the bottom of the food chain. These animals support the larger fish and other organisms.

While zebra mussels have not yet been documented in Lake Lucerne, they have been present in Lake Metonga for the past several years.

EURASIAN WATER MILFOIL

Eurasian water milfoil is an aggressive aquatic plant which has made its way into many Wisconsin lakes, including nearby Lake Metonga. This plant possesses several biological advantages over native species and once in a lake may completely take over. It often forms dense floating mats, shading out native species and severely hindering recreational use. The macrophyte section of the supplemental report (appendix C) contains information on how to properly identify this nuisance plant.



Eurasian Water Milfoil

RECREATIONAL USE

Lake Lucerne has been a valuable recreational resource for the past century. As technology has advanced, usage has obviously changed. While the lake is still heavily fished, anglers and other low-impact users must now share the waters with a number of other activities.

During 2004, recreational usage was recorded by Association members. These records indicate that as many as ten different activities are vying for lake space at one time.

At one location an observer reported 6 fisherman, 6 water skiers and 2 personal water craft using one section of the lake. During another sampling event, 12 fisherman, 4 waterskiers and 6 pontoon boats were sharing the same area of the lake. This type of usage can very easily lead to user conflicts.

The table below is a summary of the activities recorded. The complete record of activities is included in the supplemental report as Appendix F.

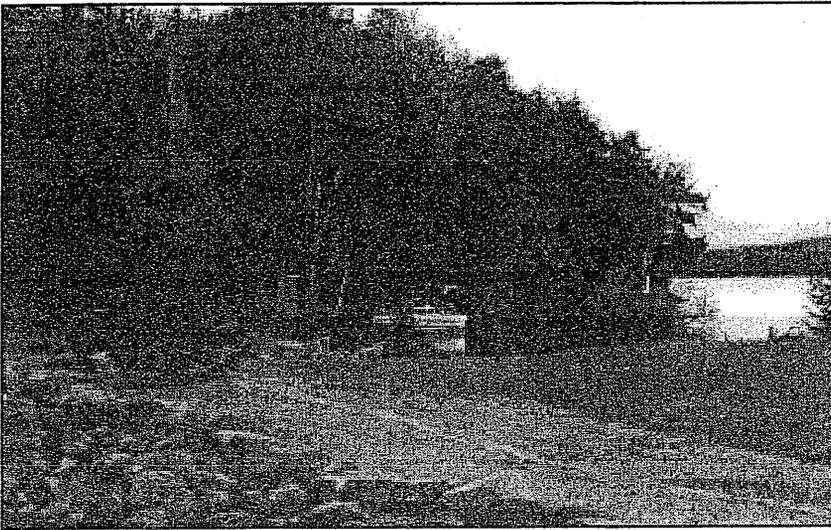
In 2004, a visual survey of boats and motors was made. Over 40% of the motors observed had horsepower of 75 or greater and nearly 20% were 150 or greater. While these boats can be enjoyable to use, it very important that they and other high impact water craft be used appropriately. Improper use can result in a number of water quality problems. High speeds in shallow areas can stir up the bottom sediments, clouding the water and releasing nutrients. High impact activities can also damage valuable plant species such as bulrushes, which benefit the fishery and protect the shoreline from erosion.

Although it may be unpopular to some residents and other lake users, the Association should consider protecting much of the south end of the lake (behind the islands) from any high-impact activity. This area supports important communities not found throughout most of the lake, including floating-leaf vegetation and bulrushes. It is also relatively shallow with many areas of loose sediment

Inappropriate use also poses a safety hazard. It is important that lake users understand the impacts their activities have on the lake and make wise recreational use of it.

	Fishing	Water skiing	Pontoons	PWC	Cruising
East - July	37	63	80	54	111
East - August	34	42	9	47	110
West - July	73	66	47	30	25
West - August	85	24	38	52	19

SHORELINE PRESERVATION - The Key to A Healthy Lake Lucerne



THE NATIVE SHORELINE

The primary goal of a “properly functioning” shoreline is to minimize nutrient load to the lake by:

1. Slowing runoff
2. Stabilizing the shoreline
3. Lessening the impact of precipitation

The best way to ensure these things are happening is to simply leave the native shoreline completely intact. The native vegetation has evolved to naturally provide these functions.

The layers of plant growth act to intercept precipitation and utilize nutrients before they can reach the water. Also, native plants have significantly deeper and more complex root systems that work to hold the soil tightly in place. For many of us though, some modification is necessary for us to be able to take advantage of the activities that we enjoy. When we consider these modifications we need to determine what effect they might have on this process and try to minimize that impact.

WHAT DO I DO?

So, you’ve decided to improve your shoreline but aren’t sure how to proceed. Consider following this checklist:

1. Address serious erosion problems as soon as possible. Attempt to divert water flow away from the lake. A “patch” of screen material with rigid support may be necessary to repair major gullies.
2. Redesign areas that may contribute to erosion problems. Divert runoff from eaves. Add some twists and turns to the path to the lake. Dig a shallow ditch near driveways, patios, and other flat surfaces to intercept runoff. **Be sure that these activities are reducing erosion and not contributing to it.**
3. If there are no obvious erosion problems, simply leave the shoreline alone for one season. The soil, even beneath lawn grass, contains a “bank” of native seeds. Often, native plants will re-grow in an area if left undisturbed and unmowed.

4. To take a more active approach to re-establishing shoreline vegetation, first determine what is appropriate. Visit with neighbors and review the shoreline project report (available through your board members) to see what kind of plants grow on adjacent properties. Consider similarities in slope, soil and shade when trying to decide on appropriate plants. You may also want to check out some of the many references currently available on shoreline restoration. Page 12 of this magazine contains a partial list.

5. At any point in this process, you may want to involve a consultant. But, certainly at the point when you have determined what you would like to plant, you should ask an expert to evaluate your plan. A consultant will be able to give you an idea of cost, availability, and expected success rate of specific vegetation.

6. You may wish to contact an Association board members to find out if funding assistance is available for your lake improvement project. Some major projects may require a permit or other regulatory consideration. Be sure to ask your board members or a DNR representative about this.

THE LIVING SHORELINE Wildlife and Our Lake

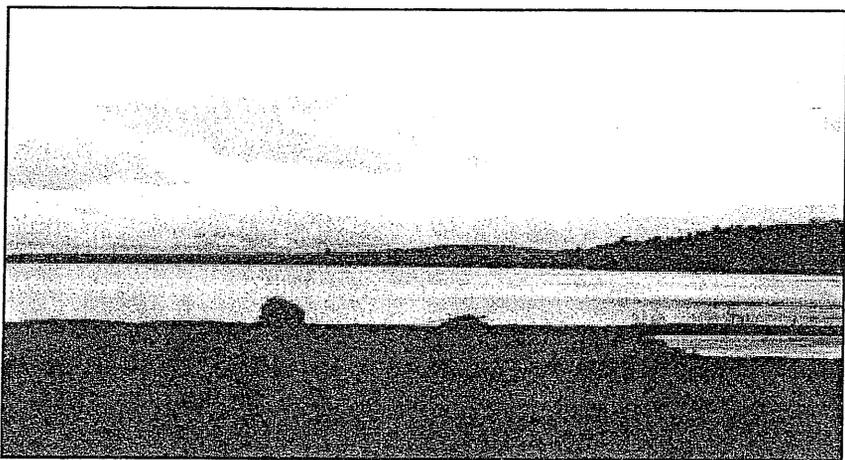
A natural shoreline provides countless advantages for wildlife. Some very obvious, others not so.

BIRDS – Studies by local ecologist Sandy Gillum, have shown that while total numbers of birds might not decline with removal of native shoreline vegetation, the types of birds change dramatically. Different bird species are very dependent on specific types of vegetation for food and shelter. A suburban-type lawn almost immediately leads to a loss of native woodland bird species and an influx of “urban, park” species.

INSECTS – Like birds, many insect species rely on very specific plant life for subsistence. And, while fewer of us appreciate our native insects than do our native birds, these smaller flying friends provide a number of benefits. The most important to most of us would be the dragonfly, which consumes an enormous amount of mosquitoes and other insect pests. Dragonflies require protected areas near shore where they can complete their metamorphosis into adults. Many species prefer tall, native vegetation.

FISH – Fish, like the other animal groups mentioned, are usually somewhat selective in their habitats. The most frequent loss of fish habitat is due to sedimentation of breeding grounds. For many lake users, there is nothing more exciting than landing a “monster” fish or even spotting one. But, it’s important to remember that the big ones rely on the little ones, which often rely on the even littler ones, which may require very shallow, clean breeding areas. These areas are the first to become sedimented and can be completely lost if seawalls and other man-made shoreline stabilization structures are installed.

AMPHIBIANS – Our native amphibians include several of the most threatened species of wildlife in our area. They require continuous cover from woods to waterline and beyond, along with access to the water. Lawns, landscaping, beaches, and seawalls can disrupt their breeding activities.



Septic Situation

Responses to the resident’s survey indicate that Lucerne probably does not have a large number of non-compliant private waste systems. Seventy-eight percent of the 211 respondents indicate that they have a septic system. An additional 13% reported having holding tanks. Approximately 80% of the systems are 20 years or less old and 71% are more than 75 feet from the shoreline.

While the responses are encouraging, it is important for the Association and lake residents to be aware of the potential damage that a sub-standard system does to the lake. Also, there are possibly many sub-standard systems belonging to residents who did not respond to the survey.

Residents should be encouraged to update systems and monitor their performance to ensure that heavy loads of nutrients and other pollutants are not reaching the lake.

Failing septic systems often contribute to the nutrient load of a lake. This is usually a problem when the system is very close to the water table - a situation very likely to occur along the north shore of the lake. Symptoms of septic pollution include pooling in the drain field and thick, localized algae blooms.

The data used in this section is presented in full with additional comments in Appendix E of the supplemental report.

If you have concerns about your septic situation, information is available through the local DNR office and the county UW- Extension office.

More information

For the past few years the Lake Lucerne Advancement Association has maintained website at

www.lucernewi.com

Along with some of the information found in this report, the site also contains Association and Town Board meeting minutes, Association announcements, an archive of photos and activity reports and links to several related websites.

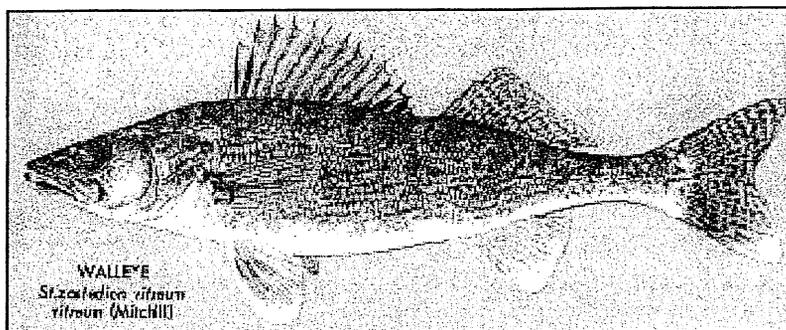
THE FISHERY

Lake Lucerne has been a prime fishing location for over a century. The residents survey of 2002 indicates that fishing is a very important lake management issue (second only to water quality). Fishing also received the second highest amount of votes as number one lake usage activity.

The lake is recognized for its cold water fishery and for the presence of smelt. The smelt were introduced to Lucerne and are considered a nuisance species to the native fishery. In a publication 30 years ago, the DNR listed to fishery as "walleye, northern pike, large and small mouth bass, whitefish, smelt, pumpkinseed, bluegill warmouth, yellow bullhead, splake and white sucker." Whitefish, now rarely encountered in northern Wisconsin, have not been reported in several years.

Tribal walleye spearing totals

1988	361
1989	244
1990	50
1991	65
1992	56
1993	102
1994	88
1995	59
1996	86
1997	64
1998	75
1999	60
2000	91
2001	60
2002	162
2003	120



Maynard Reece Iowa Fish and Fishing 1951

In 1985, a federal ruling allowed Chippewa Indian Tribes in Wisconsin to retain their rights to fish, hunt and gather food in the northern third of Wisconsin. Since this time, Lake Lucerne has received a relatively high amount of walleye spearing activity. Records indicate that a total of 1743 walleyes have been speared over the period from 1988 to 2003, with a season high of 361 in 1988. (The table below - left shows annual harvest totals)

Approximately 128 fish cribs were placed in the lake between 1989 and 1996. These artificial structures made of wood, provide shelter and food for small prey fish and hunting grounds for larger predator fish.

The native fish population of Lake Lucerne has been heavily augmented through stocking activities over the years. The majority of these activities have been the stocking of walleyes, but the cold-water fishery (trout) were also heavily stocked into the 1990's. The chart below shows a summary of stocking activities over the past 35 years.

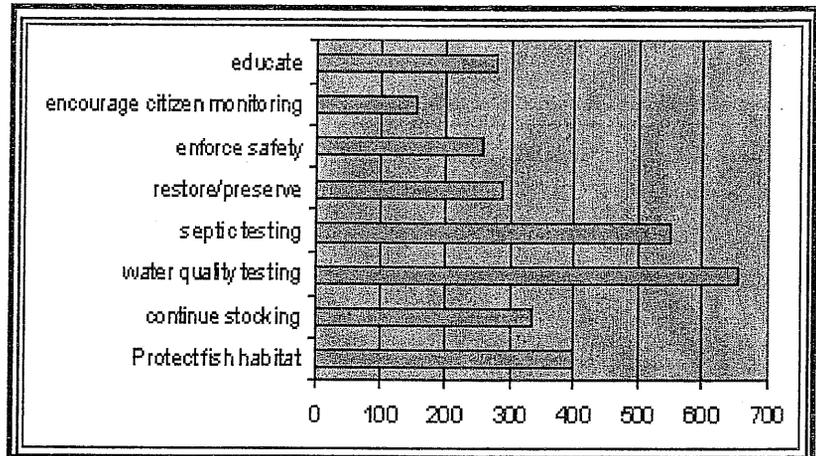
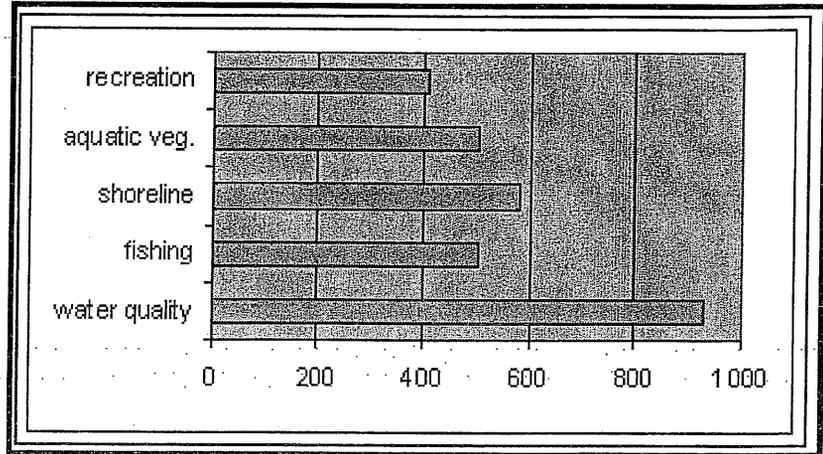
Stocking records have a history of inaccuracy and incompleteness and any data must be considered estimates.

This information comes from a larger document which was compiled by Association volunteers from DNR and tribal records. The full document is included in this report as appendix D.

	Walleye	Brown	Rainbow	Splake/Lake	Coho
1930's	0	0	0	352960	0
1940's	1,495,624	0	0	557,525	0
1950's	24,760	0	22,743	0	0
1960's	25,000	0	51,000	130731	0
1970's	25,000	0	10,000	103,946	28,500
1980's	245,850	96,100	0	25,000	0
1990's	483,074	132,600	0	0	0
2000's	310,920	0	0	0	0

RESIDENT SURVEY

In 2002, a survey was sent to all Lake Lucerne residents. The survey asked residents to rate their top concerns regarding lake management and how they felt these issues should be dealt with. Sixty-six responses were received. The tables on this page show some of the results of the survey. Each of the graphs is weighted - a number one vote receives a value of 5, a number two receives a value 4, so on. The graphs are a total of the weighted values for each item. The first graph summarizes the issues of concern. According to the respondents, water quality is the most pressing issue. As the previous articles in this document, water quality is tied to a number of other issues, including shoreline management, septic system maintenance, and recreational use.



The second graph summarized the ways in which the respondents feel these issues should be dealt with. Again water quality was at the top of the list. As has been stated throughout this report, Lucerne has an extensive database of water quality information. Efforts to expand the database should continue. However, because of Lucerne's relatively low nutrient levels, water quality data may not provide as much information as on some other lakes. Minor increases in nutrient loading due to increased sedimentation from the shoreline or disruption of the sediments may

show up as symptoms of decreasing water quality before they can be measured as increases of nutrients in the water column. Therefore, water quality information must be used in conjunction with other symptoms to paint a clearer picture. The Association should consider a program of specialized testing of these symptoms. These may include measuring water clarity in areas where the sediment may be disrupted due to recreational activities or monitoring sediment deposition rates in areas that may be impacted by poor land-use practices.

Septic testing was the second most recommended Association action. While this may yield valuable information, it is costly, difficult and almost always very controversial. In order to require testing, district status is required. The Association may want to use the approach of education and voluntary testing. This is especially important for residents with systems more likely to impact the lake.

Additional recommendation can be found on the following page.

RECOMMENDATIONS

1. Encourage, **however possible**, preservation and restoration of the native shoreline. Consider a matching funds program and/or a "compliance timeline." This is one of the most vital aspects to the preservation of Lake Lucerne. Make new residents aware of this issue "before it's too late." Consider low-tech monitoring of sediment deposition rates.
 2. Continue to collect water quality data and track trends. The more extensive and complete the data base, the more meaningful interpretations can be made. The Association should consider collecting an annual or semi-annual water quality sample. Also, continue to collect as much secchi disk data as possible and consider performing clarity tests in other, potentially impacted areas.
 3. Monitor activities in sensitive areas – near-shore, shallow water and bulrush beds. High impact activities in these areas will have an adverse effect on water quality and wildlife. Some lake users feel that restrictions are in place only to "take something" away from them. Educate them on how proper recreational use help the lake continue to "give" everything it's capable of giving.
 4. Continue to be involved in fish management decisions. Concerned District members should consider developing a **detailed, formal** request to be involved and submit it to the WDNR and GLIFWC.
 5. Consider implementing educational programs targeted at specific issues/areas. Specifically, stress wise land development to residents on the steep slopes and septic monitoring to those in lower areas. "Specialized" education will likely have a greater impact. Consider group "seminars" designed for residents with particular land use issues.
 6. Establish an aquatic-plant/nuisance species team to monitor the lake and especially the boatlandings for non-native species, such as Eurasian water milfoil and zebra mussels.
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Selected Association and lake management activities

- | | |
|---------|---|
| 1934 | The Forest County board officially changes the name of the lake from Stone Lake to Lake Lucerne |
| 1946 | The first Association of Lake Lucerne residents/land owners is formed |
| 1952 | The Association incorporates. |
| 1968 | Town action is taken to block the establishment of a mobile home court on the lake. |
| 1972 | Septic system testing is performed |
| 1973-75 | Water quality data is collected as part of the DNR's "Inland Lake water quality study" |
| 1985 | Spearing of walleyes by the Chippewa Tribe begins |
| 1988 | The first Association Fun Day is held |
| 1990 | Land is purchased by the Association for a permanent site for meetings and social activities. |
| 1995 | Publication of an Association newsletter begins |
| 1996 | Lake Lucerne is included in a study of Forest County lakes. (see Appendix G) |
| 2001 | The Association applies for and receives a grant through the Wisconsin Department of Natural Resources to prepare this report |
-

References / Resources

- Better Homes and Groundwater WDNR PUB # WR386-95
Landscaping for Wildlife and Water Quality call Minnesota Bookstore 1-651-297-3000
Life on the Edge...Owning Waterfront Property UWEX-Lakes Program College of Natural Resources, UWSP,
1900 Franklin St. Stevens Point, WI 54481
The Living Shore Video UWEX and UMEX call 1-800-542-LAKE
Shoreline Plants and Landscaping UWEX 1994 / WDNR PUB-WR-461-94
The Water's Edge WDNR PUB-FH-428 00

LAKE LUCERNE
PLANNING GRANT
SUPPLEMENTAL INFORMATION

JUNE 2005

COMPILED BY
THE LAKE LUCERNE ADVANCEMENT ASSOCIATION
AND
NORTHERN LAKE SERVICE, INC.

APPENDIX B

WATER QUALITY

WATER QUALITY

The following section contains water quality data gathered and/or generated by the Wisconsin Department of Natural Resources, Northern Lake Service, Inc and Lake Lucerne residents. The first pages are from the WDNR's Water Quality of Selected Wisconsin Inland Lakes.

The next pages are data reports for samples collected and analyzed by Northern Lake Service, Inc as part of this and previous studies.

The final section is information from the DNR's Self Help database, which contains all water quality data collected by Lake residents dating back to 1988.

Inner Conductions: 1-22-75 17 100, 2-3 500

Inlet(s): 1
2

DATE	1		2	
	8-21-74	INLET 1	INLET 1	INLET 2
DEPTH	0	35	68	2
NO2N	.003	.003	<.002	
NO3N	.10	.25	.24	
NH3N	.83	.83	.80	
ORGN	1.44	1.30	1.29	
TOTN	2.370	2.387	2.334	
PO4P	.023	.058	.037	
PTOT	.01	.03		
CA	9.	8.	8.	
MG	8.	8.	8.	
NA	2.	<1.0	<1.0	
K	1.7	1.6	1.6	
COND	65.	59.	62.	
SO4	6.	6.	6.	
CL	<1.0	1.	1.	
PH	7.7	7.5	7.2	
ALKA	27.	26.	29.	
TURB	1.6	1.3	1.7	

Secchi 19.0 feet

DATE	2	
	11-6-74	INLET 1
DEPTH	0	68
NO2N	.019	.028
NO3N	.15	.09
NH3N	.57	.44
ORGN	.50	.56
TOTN	1.234	1.117
PO4P	.097	.164
PTOT	.21	
CA	8.	6.
MG	9.	9.
NA	1.	2.
K	3.4	3.9
COND	69.	68.
SO4	4.	4.
CL	<1.0	<1.0
PH	7.7	7.7
ALKA	29.	27.
TURB	1.1	1.1

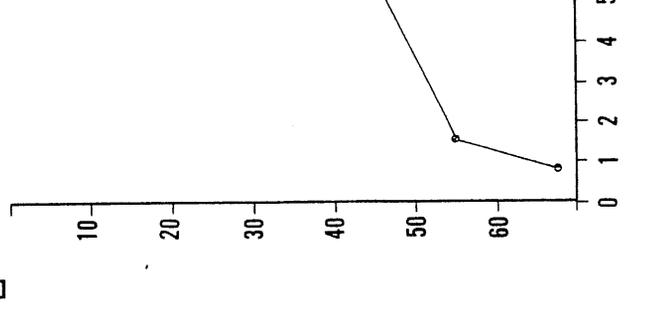
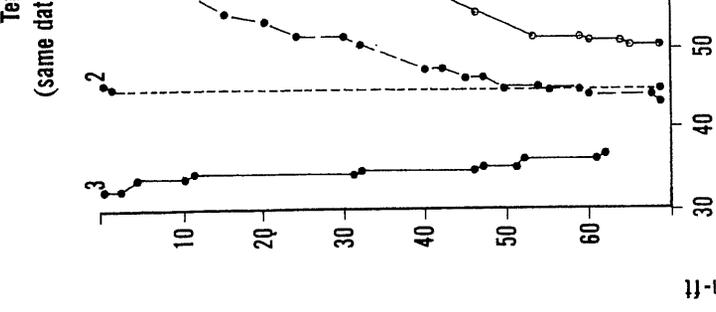
Secchi 22.5 feet

DATE	3		4	
	1-22-75	INLET 1	INLET 1	INLET 2
DEPTH	0	40	61	2
NO2N	.004	.003	.003	
NO3N	.05	.05	.04	
NH3N	<.03	<.03	.09	
ORGN	.21	.14	.18	
TOTN	.263	.214	.318	
PO4P	.015	.015	.006	
PTOT	.03	.01	<.01	
CA	9.	8.	6.	
MG	6.	5.	5.	
NA	2.	2.	2.	
K	.8	1.4	1.7	
COND	95.	62.	62.	
SO4	6.	5.	5.	
CL	2.	1.	1.	
PH	7.6	7.7	7.6	
ALKA	34.	28.	28.	
TURB	1.7	1.2	1.0	

Secchi 9.3 feet

DATE	4	
	5-21-75	INLET 2
DEPTH	0	35
NO2N	.012	.005
NO3N	.40	<.04
NH3N	.21	<.03
ORGN	.17	.15
TOTN	.79	.12
PO4P	<.005	<.005
PTOT	.07	.02
CA	12.	11.
MG	5.	4.
NA	1.	<1.0
K	1.8	1.6
COND	69.	69.
SO4	5.	4.
CL	<1.0	<1.0
PH	7.3	7.3
ALKA	26.	27.
TURB	1.0	.7

Secchi 16.5 feet



Max. Depth: 68 feet

Other Conditions: 8-30-73: No algae or macrophyte problems

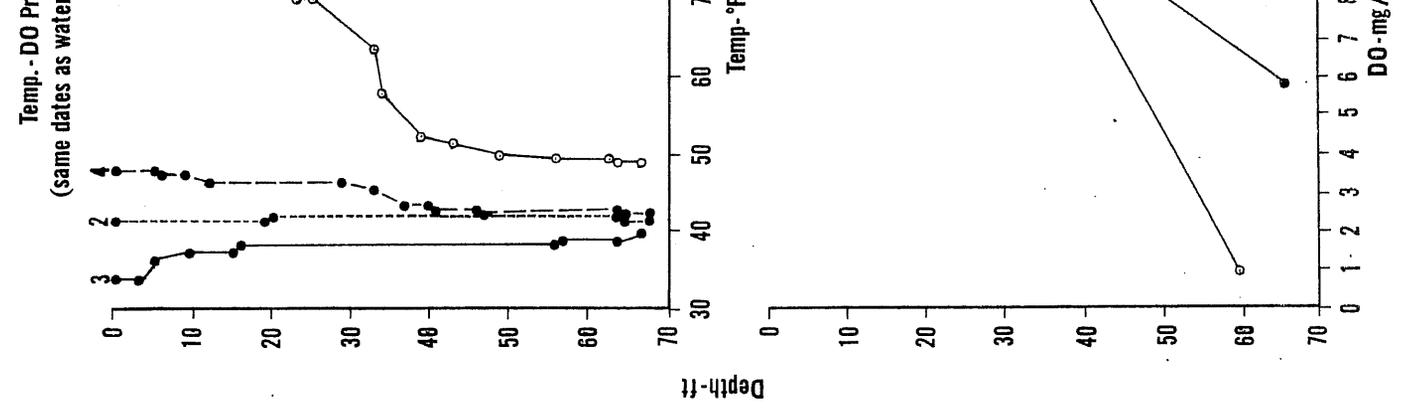
Inlet(s): 1
2

DATE	1			2		
	0	35	65	0	65	2
NO2N	.000	.000	.000	.006	.005	
NO3N	<0.04	<0.04	<0.04	.19	.18	
NH3N	.00	.00	.00	<0.03	<0.03	
ORGN	.53	.53	.46	.21	.27	
TOTN	.53	.53	.46	.41	.46	
P04P	<0.005	<0.005	<0.005	.122	.085	
PTOT	.01	.02	.02	.09	.06	
CA	6.7	6.0	6.9	5.0	3.1	
MG	4.3	3.8	5.2	6.8	6.5	
NA	<1.0	<1.0	<1.0	<1.0	<1.0	
K	.6	.9	1.1	<.5	<.5	
COND	59.	57.	60.	58.	58.	
S04	5.	5.	5.	2.	2.	
CL	<1.	1.	<1.	1.	1.	
PH	7.2	7.2	7.8	7.2	7.2	
ALKA	26.	25.	28.	25.	25.	
TURB	.90	.70	1.20	1.00	1.10	

Secchi 18.8 feet

DATE	3			4		
	0	30	66	0	67	2
NO2N	.010	.002	.005	.003	.003	
NO3N	.96	.07	.17	1.31	.13	
NH3N	.20	<0.03	<0.03	<.03	.07	
ORGN	.64	.16	.11	.36	.42	
TOTN	1.81	.23	.29	1.666	.615	
P04P	.009	.009	<0.005	.011	<.005	
PTOT	.03	.03	.02	<.01	.01	
CA	4.	6.	5.	15.	15.	
MG	8.	3.	4.	8.	8.	
NA	5.	<1.0	3.	2.	4.	
K	4.6	3.8	4.3	3.0	3.0	
COND	107.	66.	78.	64.	64.	
S04	11.	3.	3.	8.	9.	
CL	4.	2.	2.	2.	2.	
PH	7.6	7.2	7.1	7.5	7.5	
ALKA	36.	27.	32.	31.	26.	
TURB	1.75	.75	.81	1.0	1.1	

Secchi 15.8 feet



ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
 WDATCP Laboratory Certification No. 105-330
 EPA Laboratory ID No. WI00034

Printed: 05/19/04 Code: S Page 2 of 2

NLS Project: 56941
 NLS Customer: 90250

NORTHERN LAKE SERVICE, INC.
 Analytical Laboratory and Environmental Services
 400 North Lake Avenue - Crandon, WI 54520
 Ph: (715)-478-2777 Fax: (715)-478-3060

Client: Forest County Courthouse
 Attn: Cindy Grezinger
 Courthouse
 Crandon, WI 54520

Project: Forest County Extension

Lucerne NLS ID: 242456

Ref. Line COC Lucerne Matrix: SW

Collected: 10/11/00 14:36 Received: 10/12/00

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
field conductivity	88	umho@25C	1			10/11/00	EPA 120.1	721026460
field pH	7.41	s.u.	1			10/11/00	EPA 150.1	721026460
Alkalinity, tot. as CaCO3 (unfiltered)	39	mg/L	1	2.3	8.2	10/20/00	EPA 310.1	721026460
Chloride, as Cl (unfiltered)	ND	mg/L	10	5.0*		10/16/00	EPA 300.0	721026460
Nitrogen, ammonia as N (unfiltered)	ND	mg/L	1	0.024	0.084	10/19/00	EPA 350.1	721026460
Nitrogen, NO2 + NO3 as N (unfiltered)	ND	mg/L	1	0.042*	0.15	10/24/00	EPA 353.2	721026460
Nitrogen, Kjeldahl as N (unfiltered)	[0.31]	mg/L	1	0.10	0.33	10/24/00	EPA 351.2	721026460
Phosphorus, tot. as P	[0.0070]	mg/L	1	0.0070*		10/16/00	EPA 365.2	721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and/or LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected 1000 ug/L = 1 mg/L

DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000

MCL = Maximum Contaminant Levels for Drinking Water Samples

Reviewed by: _____
 Authorized by: R. T. Krueger
 President

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
 WDATCP Laboratory Certification No. 105-330
 EPA Laboratory ID No. WI00034
 Printed: 05/19/04 Code: S Page 1 of 1
 NLS Project: 1491
 NLS Customer: 17338

NORTHERN LAKE SERVICE, INC.
 Analytical Laboratory and Environmental Services
 400 North Lake Avenue - Crandon, WI 54520
 Ph: (715)-478-2777 Fax: (715)-478-3060
 Client: Lake Lucerne Association
 Attn: Jack Kloss
 Crandon, WI 54520

Project: Annual Monitoring - Fall Mix for Nutrients

Lake Lucerne at deepest location NLS ID: 18187

Ref. Line COC Lake Lucerne Matrix:
 Collected: 11/17/91 Received: 11/18/91

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Alkalinity, tot. as CaCO3 (filtered)	32	mg/l	1			11/15/91		721026460
Chloride, as Cl on solids	0	mg/l	1			11/27/91		721026460
Conductivity, lab	70	urnho@25C	1			11/18/91		721026460
Nitrogen, ammonia as N (filtered)	0	mg/l	1			11/19/91		721026460
Nitrogen, NO2 + NO3 as N	.0	mg/l	1			11/22/91		721026460
Nitrogen, Kjeldahl as N (filtered)	0.70	mg/l	1			12/02/91		721026460
pH, Lab	7.1	s.u.	1			11/18/91		721026460
Phosphorus, tot. as P	0.0090	mg/l	1			12/05/91		721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and/or LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected 1000 ug/L = 1 mg/L

DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000

MCL = Maximum Contaminant Levels for Drinking Water Samples

Reviewed by: _____
 Authorized by:
 R. T. Krueger
 President

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
 WDATCP Laboratory Certification No. 105-330
 EPA Laboratory ID No. WI00034
 Printed: 05/19/04 Code: S Page 1 of 1

NORTHERN LAKE SERVICE, INC.
 Analytical Laboratory and Environmental Services
 400 North Lake Avenue - Crandon, WI 54520
 Ph: (715)-478-2777 Fax: (715)-478-3060

Client: Lake Lucerne Association

Crandon, WI 54520

NLS Project: 4337
 NLS Customer: 17338

Project:

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Alkalinity, tot. as CaCO3 (filtered)	36	mg/l	1			11/04/92		721026460
Chloride, as Cl on solids	2.0	mg/l	1			11/12/92		721026460
Conductivity, lab	82	umho@25C	1			10/27/92		721026460
Nitrogen, ammonia as N (filtered)	0	mg/l	1			11/10/92		721026460
Nitrogen, NO2 + NO3 as N	0.080	mg/l	1			10/29/92		721026460
Nitrogen, Kjeldahl as N (filtered)	0.76	mg/l	1			10/28/92		721026460
pH, Lab		6.5 s.u.	1			10/27/92		721026460
Phosphorus, tot. as P	0.010	mg/l	1			11/03/92		721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and/or LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected 1000 ug/L = 1 mg/L

DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000

MCL = Maximum Contaminant Levels for Drinking Water Samples

Authorized by:
 R. T. Krueger
 President

Reviewed by: _____

ANALYTICAL REPORT

WI LAB CERTIFICATION NO. 721026460

NORTHERN LAKE SERVICE, INC.
 Analytical Laboratory and Environmental Services
 400 North Lake Avenue - Crandon, WI 54520
 Ph: (715)-478-2777 Fax: (715)-478-3060

Printed: 06/07/02 Code: S Page 1 of 1
 Client: Lake Lucerne Association
 NLS Project: 66811
 NLS Customer: 17338

Crandon, WI 54520
 Lake Samples

Lucerne Surf NLS ID: 282829

Ref. Line COC Lucerne Surf Matrix: SW
 Collected: 05/28/02 18:20 Received: 05/28/02

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Alkalinity, tot. as CaCO3 (unfiltered)	39	mg/L	1	1.1	3.9	06/03/02	EPA 310.1	721026460
Conductivity, lab	90	umho@25C	1					
Nitrogen, ammonia as N (unfiltered)	0.094	mg/L	1	0.025	0.075	05/31/02	EPA 120.1	721026460
Nitrogen, NO2 + NO3 as N (unfiltered)	ND	mg/L	1	0.075*	0.075*	06/04/02	EPA 353.2	721026460
Nitrogen, Kjeldahl as N (unfiltered)	[0.24]	mg/L	1	0.10	0.37	06/04/02	EPA 351.2	721026460
pH, Lab	6.8	s.u.	1					
Phosphorus, tot. as P	0.010	mg/L	1	0.0070*	0.0070*	05/31/02	EPA 150.1	721026460
Phosphorus, tot. react. as P	ND	mg/L	1	0.0070*	0.0070*	06/06/02	EPA 365.2	721026460
Phosphorus, tot. react. as P	ND	mg/L	1	0.0070*	0.0070*	05/29/02	EPA 365.2	721026460

Lucerne 20M NLS ID: 282830

Ref. Line COC Lucerne 20M Matrix: SW
 Collected: 05/28/02 18:25 Received: 05/28/02

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Alkalinity, tot. as CaCO3 (unfiltered)	38	mg/L	1	1.1	3.9	06/03/02	EPA 310.1	721026460
Conductivity, lab	160	umho@25C	1					
Nitrogen, ammonia as N (unfiltered)	[0.058]	mg/L	1	0.025	0.075	05/31/02	EPA 120.1	721026460
Nitrogen, NO2 + NO3 as N (unfiltered)	ND	mg/L	1	0.075*	0.075*	06/04/02	EPA 353.2	721026460
Nitrogen, Kjeldahl as N (unfiltered)	[0.25]	mg/L	1	0.10	0.37	06/04/02	EPA 351.2	721026460
pH, Lab	6.8	s.u.	1					
Phosphorus, tot. as P	0.0080	mg/L	1	0.0070*	0.0070*	05/31/02	EPA 150.1	721026460
Phosphorus, tot. react. as P	ND	mg/L	1	0.0070*	0.0070*	06/06/02	EPA 365.2	721026460
Phosphorus, tot. react. as P	ND	mg/L	1	0.0070*	0.0070*	05/29/02	EPA 365.2	721026460

Lucerne South NLS ID: 282831

Ref. Line COC Lucerne South Matrix: SW
 Collected: 05/28/02 18:45 Received: 05/28/02

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Alkalinity, tot. as CaCO3 (unfiltered)	38	mg/L	1	1.1	3.9	06/03/02	EPA 310.1	721026460
Conductivity, lab	82	umho@25C	1					
Nitrogen, ammonia as N (unfiltered)	[0.062]	mg/L	1	0.025	0.075	05/31/02	EPA 120.1	721026460
Nitrogen, NO2 + NO3 as N (unfiltered)	ND	mg/L	1	0.075*	0.075*	06/04/02	EPA 353.2	721026460
Nitrogen, Kjeldahl as N (unfiltered)	0.48	mg/L	1	0.10	0.37	06/04/02	EPA 351.2	721026460
pH, Lab	7.1	s.u.	1					
Phosphorus, tot. as P	0.010	mg/L	1	0.0070*	0.0070*	05/31/02	EPA 150.1	721026460
Phosphorus, tot. react. as P	ND	mg/L	1	0.0070*	0.0070*	06/06/02	EPA 365.2	721026460
Phosphorus, tot. react. as P	ND	mg/L	1	0.0070*	0.0070*	05/29/02	EPA 365.2	721026460

Values in brackets represent results greater than the LOD but less than or equal to the LOQ and are within a region of "Less-Certain Quantitation". Results greater than the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits.

LOD = Limit of Detection
 DWB = Dry Weight Basis
 LOQ = Limit of Quantitation
 %DWB = (mg/kg DWB) / 10000
 ND = Not Detected
 NA = Not Applicable
 1000 ug/L = 1 mg/L

Reviewed by: _____
 Authorized by: R. T. Krueger
 President

ANALYTICAL REPORT

NORTHERN LAKE SERVICE, INC.
 Analytical Laboratory and Environmental Services
 400 North Lake Avenue - Crandon, WI 54520
 Ph: (715)-478-2777 Fax: (715)-478-3060

WDNR Laboratory ID No. 721026460
 WDATCP Laboratory Certification No. 105 000330
 EPA Laboratory ID No. WI00034

Printed: 12/03/02 Code: S Page 1 of 1
 NLS Project: 70422
 NLS Customer: 17338

Client: Lake Lucerne Association
 Crandon, WI 54520
 Project: Lake Samples

Lucerne Surface NLS ID: 297591
 Ref. Line COC 59146 Lucerne Surface Matrix: SW
 Collected: 11/19/02 14:40 Received: 11/19/02

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Alkalinity, tot. as CaCO3 (unfiltered)	36	mg/L	1	1.1	3.9	12/02/02	EPA 310.1	721026460
Conductivity, lab	83	umho@25C	1			11/21/02	EPA 120.1	721026460
Nitrogen, ammonia as N (unfiltered)	0.12	mg/L	1	0.025	0.075	11/25/02	EPA 350.1	721026460
Nitrogen, NO2 + NO3 as N (unfiltered)	ND	mg/L	1	0.075*		11/20/02	EPA 353.2	721026460
Nitrogen, Kjeldahl as N (unfiltered)	[0.32]	mg/L	1	0.10	0.37	11/25/02	EPA 351.2	721026460
pH, Lab	7.8	s.u.	1			11/21/02	EPA 150.1	721026460
Phosphorus, tot. as P	0.013	mg/L	1	0.0070*		11/26/02	EPA 365.2	721026460
Phosphorus, tot. react. as P	ND	mg/L	1	0.0070*		11/20/02	EPA 365.2	721026460

Lucerne 20 M NLS ID: 297592
 Ref. Line COC 59146 Lucerne 20 M Matrix: SW
 Collected: 11/19/02 14:45 Received: 11/19/02

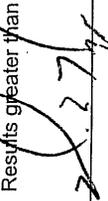
Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Alkalinity, tot. as CaCO3 (unfiltered)	38	mg/L	1	1.1	3.9	12/02/02	EPA 310.1	721026460
Conductivity, lab	75	umho@25C	1			11/21/02	EPA 120.1	721026460
Nitrogen, ammonia as N (unfiltered)	[0.034]	mg/L	1	0.025	0.075	11/25/02	EPA 350.1	721026460
Nitrogen, NO2 + NO3 as N (unfiltered)	ND	mg/L	1	0.075*		11/20/02	EPA 353.2	721026460
Nitrogen, Kjeldahl as N (unfiltered)	[0.22]	mg/L	1	0.10	0.37	11/25/02	EPA 351.2	721026460
pH, Lab	7.7	s.u.	1			11/21/02	EPA 150.1	721026460
Phosphorus, tot. as P	0.0090	mg/L	1	0.0070*		11/26/02	EPA 365.2	721026460
Phosphorus, tot. react. as P	ND	mg/L	1	0.0070*		11/20/02	EPA 365.2	721026460

Lucerne South NLS ID: 297593
 Ref. Line COC 59146 Lucerne South Matrix: SW
 Collected: 11/19/02 15:05 Received: 11/19/02

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Alkalinity, tot. as CaCO3 (unfiltered)	38	mg/L	1	1.1	3.9	12/02/02	EPA 310.1	721026460
Conductivity, lab	82	umho@25C	1			11/21/02	EPA 120.1	721026460
Nitrogen, ammonia as N (unfiltered)	[0.028]	mg/L	1	0.025	0.075	11/25/02	EPA 350.1	721026460
Nitrogen, NO2 + NO3 as N (unfiltered)	ND	mg/L	1	0.075*		11/20/02	EPA 353.2	721026460
Nitrogen, Kjeldahl as N (unfiltered)	[0.34]	mg/L	1	0.10	0.37	11/25/02	EPA 351.2	721026460
pH, Lab	7.6	s.u.	1			11/21/02	EPA 150.1	721026460
Phosphorus, tot. as P	0.012	mg/L	1	0.0070*		11/26/02	EPA 365.2	721026460
Phosphorus, tot. react. as P	ND	mg/L	1	0.0070*		11/20/02	EPA 365.2	721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected
 DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
 MCL = Maximum Contaminant Levels for Drinking Water Samples

Reviewed by:  Authorized by: R. T. Krueger, President

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
 WDATCP Laboratory Certification No. 105 000330
 EPA Laboratory ID No. WI00034
 Printed: 06/03/03 Code: S Page 1 of 1
 NLS Project: 73900
 NLS Customer: 17338

NORTHERN LAKE SERVICE, INC.
 Analytical Laboratory and Environmental Services
 400 North Lake Avenue - Grandon, WI 54520
 Ph: (715)-478-2777 Fax: (715)-478-3060
 Client: Lake Lucerne Association
 Grandon, WI 54520
 Project: Lake Samples

Lucerne Surface NLS ID: 310854
 Ref. Line COC Lucerne Surface Matrix: SW
 Collected: 05/26/03 07:00 Received: 05/26/03

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Alkalinity, tot. as CaCO3 (unfiltered)	39	mg/L	1	1.3*		05/30/03	EPA 310.1	721026460
Conductivity, lab	82	umho@25C	1			05/27/03	EPA 120.1	721026460
Nitrogen, ammonia as N (unfiltered)	ND	mg/L	1	0.024	0.084	05/29/03	EPA 350.1	721026460
Nitrogen, NO2 + NO3 as N (unfiltered)	ND	mg/L	1	0.075*		05/28/03	EPA 353.2	721026460
Nitrogen, Kjeldahl as N (unfiltered)	[0.22]	mg/L	1	0.085	0.30	06/03/03	EPA 351.2	721026460
pH, Lab	7.9	s.u.	1			05/27/03	EPA 150.1	721026460
Phosphorus, tot. as P	0.010	mg/L	1	0.0070*		05/27/03	EPA 365.2	721026460
Phosphorus, tot. react. as P	ND	mg/L	1	0.0070*		05/27/03	EPA 365.2	721026460

Lucerne 20M NLS ID: 310855
 Ref. Line COC Lucerne 20M Matrix: SW
 Collected: 05/26/03 07:05 Received: 05/26/03

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Alkalinity, tot. as CaCO3 (unfiltered)	38	mg/L	1	1.3*		05/30/03	EPA 310.1	721026460
Conductivity, lab	84	umho@25C	1			05/27/03	EPA 120.1	721026460
Nitrogen, ammonia as N (unfiltered)	ND	mg/L	1	0.024	0.084	05/29/03	EPA 350.1	721026460
Nitrogen, NO2 + NO3 as N (unfiltered)	ND	mg/L	1	0.075*		05/28/03	EPA 353.2	721026460
Nitrogen, Kjeldahl as N (unfiltered)	[0.17]	mg/L	1	0.085	0.30	06/03/03	EPA 351.2	721026460
pH, Lab	7.5	s.u.	1			05/27/03	EPA 150.1	721026460
Phosphorus, tot. as P	0.011	mg/L	1	0.0070*		05/29/03	EPA 365.2	721026460
Phosphorus, tot. react. as P	ND	mg/L	1	0.0070*		05/27/03	EPA 365.2	721026460

Lucerne South NLS ID: 310856
 Ref. Line COC Lucerne South Matrix: SW
 Collected: 05/26/03 07:20 Received: 05/26/03

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Alkalinity, tot. as CaCO3 (unfiltered)	38	mg/L	1	1.3*		05/30/03	EPA 310.1	721026460
Conductivity, lab	84	umho@25C	1			05/27/03	EPA 120.1	721026460
Nitrogen, ammonia as N (unfiltered)	ND	mg/L	1	0.024	0.084	05/29/03	EPA 350.1	721026460
Nitrogen, NO2 + NO3 as N (unfiltered)	ND	mg/L	1	0.075*		05/28/03	EPA 353.2	721026460
Nitrogen, Kjeldahl as N (unfiltered)	[0.20]	mg/L	1	0.085	0.30	06/03/03	EPA 351.2	721026460
pH, Lab	7.5	s.u.	1			05/27/03	EPA 150.1	721026460
Phosphorus, tot. as P	0.080	mg/L	1	0.0070*		05/29/03	EPA 365.2	721026460
Phosphorus, tot. react. as P	ND	mg/L	1	0.0070*		05/27/03	EPA 365.2	721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected 1000 ug/L = 1 mg/L
 DWB = Dry Weight Basis NA = Not Applicable
 MCL = Maximum Contaminant Levels for Drinking Water Samples %DWB = (mg/kg DWB) / 10000

Reviewed by: _____
 Authorized by: R. T. Krueger, President

Lake Monitoring 1986 Annual Report

LAKE LUCERNE

Lake Type:

Stratified Seepage

Forest County

DNR Region:

NO

Waterbody Number:

396500

GEO Region:

NE

Site Name	Storet #
DEEP HOLE	213123

Group	Date	SD(ft)	SD(m)	CHL	TP	TSI(SD)	TSI(CHL)	TSI(TP)	Lake Level	Clarity	Color	Perception
523	06/26/1986	21.5	6.55			33				Clear	Blue	
523	07/03/1986	21.25	6.48			33				Clear	Blue	
523	07/17/1986	22	6.71			33					Blue/Green	
523	07/24/1986	21.25	6.48			33				Clear		
523	07/31/1986	19.25	5.87			34					bluish green	
523	08/07/1986	19	5.79			35				Clear		
523	08/11/1986	17.5	5.33			36				Clear		
523	08/19/1986	19.5	5.94			34				Clear		
523	08/29/1986	16.75	5.11			36				Clear		
523	09/07/1986	16.25	4.95			37				Clear		
523	09/23/1986	16.5	5.03			37				Clear		
523	10/06/1986	16.75	5.11			36				Clear	Blue	

Date	Lab Comments
09/23/1986	Sent letter.

Date	Collector Comments
07/17/1986	2 days after rain, water temp at 3" depth is 74 F.
09/07/1986	Water temperature is 3" below surface 67 F.
10/06/1986	Last reading for the year.

Data Collectors (Source of Data):**523 - Kenneth Lehner (Self-Help Lake Monitoring)**

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total phosphorus in ug/l, surface sample only; TSI(SD), TSI(CHL), TSI(TP) = Trophic state index based on SD, CHL, TP respectively; Depth measured in feet; Temp = Temperature in degrees Fahrenheit; D.O. = Dissolved Oxygen in parts per million.

Wisconsin Department of Natural Resources Wisconsin Lakes Partnership Report generated on : 5/11/2005

Lake Monitoring 1987 Annual Report

LAKE LUCERNE

Lake Type:

Stratified Seepage

Forest County

DNR Region:

NO

Waterbody Number:

396500

GEO Region:

NE

Site Name		Storet #										
DEEP HOLE		213123										
Group	Date	SD(ft)	SD(m)	CHL	TP	TSI(SD)	TSI(CHL)	TSI(TP)	Lake Level	Clarity	Color	Perception
523	04/17/1987	22	6.71			33			Low	Clear	Blue	
523	04/30/1987	20.25	6.17			34				Clear	Blue	
523	05/07/1987	22.5	6.86			32				Clear	Blue	
523	05/15/1987	25.75	7.85			30				Clear	Blue	
40255	05/17/1987	29	8.84			29				Clear	Blue	
523	05/27/1987	22.5	6.86			32				Clear	Blue	
523	06/06/1987	22.5	6.86			32				Clear	Blue	
40255	06/07/1987	29.25	8.92			28				Clear	Blue	
40255	06/13/1987	33.25	10.13			27				Clear	Blue	
523	06/18/1987	27.5	8.38			29				Clear	Blue	
523	06/23/1987	31.5	9.6			27				Clear	Blue	
40255	06/28/1987	32	9.75			27				Clear	Blue	
523	07/03/1987	31	9.45			28				Clear	Blue	
40255	07/04/1987	32	9.75			27				Clear	Blue	
40255	07/18/1987	30.5	9.3			28				Clear	Blue	
523	07/20/1987	27.75	8.46			29				Clear	Blue	
40255	07/24/1987	33.25	10.13			27				Clear	Blue	
523	08/03/1987	25.25	7.7			31				Clear	Blue	
523	08/21/1987	22.25	6.78			32				Clear	Blue	
523	08/29/1987	22.25	6.78			32				Clear	Blue	
523	09/03/1987	24.25	7.39			31			-38"	Clear	Blue	
523	09/09/1987	22.25	6.78			32				Clear	Blue	
523	09/22/1987	20.25	6.17			34				Clear	Blue	
523	09/27/1987	21.25	6.48			33			-35"	Clear	Blue	
523	10/03/1987	17.25	5.26			36				Clear	Blue	
523	10/19/1987	21.25	6.48			33				Clear	Blue	

Date	Lab Comments
07/04/1987	Secchi disc hit bottom. Please disregard TSI(SD).

Date	Collector Comments
04/17/1987	Rope not long enough, reading over 22', letter explaining level reading in file. Lake level -9".
04/30/1987	Water temp. 52 F., reading greater than 22.5'.
05/07/1987	Rope is only 22.5' long. est. Secchi depth = 25'.
05/15/1987	Added rope to line.
05/17/1987	Perfectly calm water, no clouds.
05/27/1987	Reading greater than 22.5'.
06/13/1987	Partly sunny, light wind, reading is the consensus of three.
07/18/1987	Very choppy and hard to see the disk.
07/20/1987	Hot, humid, and sunny, and there is a slight algae bloom.
07/24/1987	Dead calm, thousands of things suspended in the water at 100-200 cubic ft.
08/03/1987	Hot, humid, sunny, slight algae bloom.
10/03/1987	Winds of 30 mph from the NW for previous two days, high waves.
10/19/1987	Last reading for 1987.

Data Collectors (Source of Data):**40255 - Paul And Deb Gustafson (Self-Help Lake Monitoring)****523 - Kenneth Lehner (Self-Help Lake Monitoring)**

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total

Lake Monitoring 1988 Annual Report

LAKE LUCERNE

Lake Type:

Stratified Seepage

Forest County

DNR Region:

NO

Waterbody Number:

396500

GEO Region:

NE

Site Name	Storet #
DEEP HOLE	213123

Group	Date	SD(ft)	SD(m)	CHL	TP	TSI(SD)	TSI(CHL)	TSI(TP)	Lake Level	Clarity	Color	Perception
523	05/15/1988	16.25	4.95			37						2
523	05/19/1988	19.5	5.94			34				Clear	Blue	
523	05/25/1988	22.5	6.86			32				Clear	Blue	
523	05/29/1988	25.25	7.7			31				Clear	Blue	
523	06/03/1988	28	8.53			29				Clear	Blue	
523	06/10/1988	31	9.45			28				Clear	Blue	1
523	06/27/1988	30.5	9.3			28				Clear	Blue	1
523	07/08/1988	24.25	7.39			31				Clear	Blue	
523	07/17/1988	25.75	7.85			30				Clear	Blue	
523	07/28/1988	23.25	7.09			32				Clear	Blue	
523	08/20/1988	29.75	9.07			28				Clear	Blue	1
523	08/30/1988	33.25	10.13			27				Clear	Blue	1
523	09/06/1988	28.25	8.61			29						
523	09/17/1988	24	7.32			31				Clear	Blue	
523	10/22/1988	25.5	7.77			30				Clear	Blue	

Date	Collector Comments
06/10/1988	Ran out of secchi disk line, estimate of true secchi depth to be 33 feet.
06/27/1988	Lake level has dropped 6" since the end of May, lake level 43.5" below "datum".
07/08/1988	Sunny past 3 weeks, no rain.
08/30/1988	Calm.
09/06/1988	Labor Day weekend, substantial rain, high north-northeast winds.

Data Collectors (Source of Data):

523 - Kenneth Lehner (Self-Help Lake Monitoring)

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total phosphorus in ug/l, surface sample only; TSI(SD), TSI(CHL), TSI(TP) = Trophic state index based on SD, CHL, TP respectively; Depth measured in feet; Temp = Temperature in degrees Fahrenheit; D.O. = Dissolved Oxygen in parts per million.

Wisconsin Department of Natural Resources Wisconsin Lakes Partnership Report generated on : 5/11/2005

Lake Monitoring 1989 Annual Report

LAKE LUCERNE

Lake Type:

Stratified Seepage

Forest County

DNR Region:

NO

Waterbody Number:

396500

GEO Region:

NE

Site Name	Storet #
DEEP HOLE	213123

Group	Date	SD(ft)	SD(m)	CHL	TP	TSI(SD)	TSI(CHL)	TSI(TP)	Lake Level	Clarity	Color	Perception
523	05/19/1989	16.25	4.95			37			-18 in.	Clear	Blue	2
523	06/01/1989	22.25	6.78			32			-18 in.	Clear	Blue	2
523	06/10/1989	31	9.45			28				Clear	Blue	1
523	06/18/1989	33.75	10.29			26						1
523	06/29/1989	24.25	7.39			31				Clear	Blue	2
523	07/05/1989	27	8.23			30				Clear	Blue	2
523	08/01/1989	24.75	7.54			31				Clear	Blue	2
523	08/08/1989	25.25	7.7			31						2
523	08/21/1989	30.75	9.37			28						2
523	08/27/1989	21.75	6.63			33				Clear	Blue	2
523	09/13/1989	29.5	8.99			28						2
523	09/20/1989	25.25	7.7			31						2
523	10/07/1989	24.5	7.47			31				Clear	Blue	2
523	10/14/1989	24.5	7.47			31						2

Date	Collector Comments
05/19/1989	Rain 1 in. before reading.
06/10/1989	Est. true reading at 35 ft., rope is too short.
06/18/1989	Added rope to secchi disk.
09/13/1989	Dull sun.

Data Collectors (Source of Data):**523 - Kenneth Lehner (Self-Help Lake Monitoring)**

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total phosphorus in ug/l, surface sample only; TSI(SD), TSI(CHL), TSI(TP) = Trophic state index based on SD, CHL, TP respectively; Depth measured in feet; Temp = Temperature in degrees Fahrenheit; D.O. = Dissolved Oxygen in parts per million.

Wisconsin Department of Natural Resources Wisconsin Lakes Partnership Report generated on : 5/11/2005

Lake Monitoring 1990 Annual Report

LAKE LUCERNE

Lake Type:

Stratified Seepage

Forest County

DNR Region:

NO

Waterbody Number:

396500

GEO Region:

NE

Site Name										Storet #		
DEEP HOLE										213123		
Group	Date	SD(ft)	SD(m)	CHL	TP	TSI(SD)	TSI(CHL)	TSI(TP)	Lake Level	Clarity	Color	Perception
523	05/07/1990	32.25	9.83			27						
523	05/30/1990	35.75	10.9			26				Clear	Blue	1
523	06/07/1990	35.75	10.9			26				Clear	Blue	
523	06/14/1990	31	9.45			28			High	Clear	Blue	
523	06/29/1990	28.5	8.69			29				Clear	Blue	
523	07/18/1990	24	7.32			31						
523	07/25/1990	22	6.71			33						
523	07/31/1990	27.5	8.38		20	29		51		Clear	Blue	
523	08/07/1990	29.5	8.99			28				Clear	Blue	1
523	08/16/1990	25.5	7.77			30				Clear	Blue	
523	08/22/1990	34.5	10.52			26						1
523	09/01/1990	31.5	9.6			27				Clear	Blue	1
523	09/17/1990	26.25	8			30				Clear	Blue	
523	10/02/1990	25	7.62		4	31		39		Clear	Blue	

07/31/1990		
Depth	Temp.	D.O.
3	72	8
9	71	8
15	70	8
20	70	8
25	70	8
30	69	8
35	64	8
40	61	7
45	59	7
68	58	6

09/01/1990		
Depth	Temp.	D.O.
3	70	8
9	69	8
15	68	8
20	68	9
25	68	8
30	68	8
35	68	8
40	63	7
45	59	4
69	55	5

10/02/1990		
Depth	Temp.	D.O.
3	58	8
9	57	8
15	57	8
20	57	8
25	57	8
30	57	9
35	57	8
40	57	9
45	57	9
69	56	3

Date	Lab Comments
07/31/1990	Oxygen precipitate takes a long time to dissolve after sulfamic acid is added. Should we be using H2SO4?

Date	Collector Comments
06/14/1990	Water level: Up 5" in past wk.
07/31/1990	0.3" of rain the last four days.
10/02/1990	0.7" of rain from 9/29-10/2.

Data Collectors (Source of Data):

523 - Kenneth Lehner (Self-Help Lake Monitoring)

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total phosphorus in ug/l, surface sample only; TSI(SD), TSI(CHL), TSI(TP) = Trophic state index based on SD, CHL, TP respectively; Depth measured in feet; Temp = Temperature in degrees Fahrenheit; D.O. = Dissolved Oxygen in parts per million.

Wisconsin Department of Natural Resources Wisconsin Lakes Partnership Report generated on : 5/11/2005

Lake Monitoring 1991 Annual Report

LAKE LUCERNE

Lake Type:

Stratified Seepage

Forest County

DNR Region:

NO

Waterbody Number:

396500

GEO Region:

NE

Site Name										Storet #		
DEEP HOLE										213123		
Group	Date	SD(ft)	SD(m)	CHL	TP	TSI(SD)	TSI(CHL)	TSI(TP)	Lake Level	Clarity	Color	Perception
523	05/20/1991	34.25	10.44			26				Clear	Blue	
523	05/28/1991	32.25	9.83			27						2
523	06/11/1991	30.75	9.37			28				Clear	Blue	
523	06/28/1991	27.25	8.31			29				Clear	Blue	1
523	07/04/1991	27	8.23			30				Clear	Blue	2
523	07/06/1991	16	4.88		4	37		39		Clear	Blue	
523	08/15/1991	24.5	7.47			31				Clear	Blue	1
523	08/20/1991	24	7.32		20	31		51		Clear	Blue	
523	09/02/1991	24.75	7.54			31				Clear	Blue	1
523	09/10/1991				4			39				

05/28/1991			07/06/1991			08/20/1991			09/10/1991		
Depth	Temp.	D.O.									
3	65		3	73	8	3	69	8	3	67	
9	63		9	72	8	9	69	8	9	67	
15	62		15	72	8	15	69	8	15	69	
20	56		20	70	8	20	68	8	20	69	
25	52		25	62	9	25	68	7	25	69	
30	49		30	56	9	30	62	9	30	69	
35	49		35	54	10	35	61	10	35	60	
40	47		40	51	9	40	54	9	40	56	
45	46		45	50	8	45	53	8	45	54	
67	46		61	48	8	69	50	5	69	50	

Date	Lab Comments
07/06/1991	D.O. samples take over one hour to dissolve after sulfamic acid addition.
09/10/1991	Leaking sampler.

Date	Collector Comments
05/28/1991	Level up 11" since ice out.
07/04/1991	Level rose 12" in 6 weeks.
07/06/1991	Slight algae bloom.
09/10/1991	No secchi reading given.

Data Collectors (Source of Data):

523 - Kenneth Lehner (Self-Help Lake Monitoring)

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total phosphorus in ug/l, surface sample only; TSI(SD), TSI(CHL), TSI(TP) = Trophic state index based on SD, CHL, TP respectively; Depth measured in feet; Temp = Temperature in degrees Fahrenheit; D.O. = Dissolved Oxygen in parts per million.

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Lake Monitoring 1992 Annual Report

LAKE LUCERNE

Lake Type:

Stratified Seepage

Forest County

DNR Region:

NO

Waterbody Number:

396500

GEO Region:

NE

Site Name										Storet #		
DEEP HOLE										213123		
Group	Date	SD(ft)	SD(m)	CHL	TP	TSI(SD)	TSI(CHL)	TSI(TP)	Lake Level	Clarity	Color	Perception
523	07/13/1992	22	6.71	1	4	33	35	39		Clear	Blue	2
523	07/31/1992	21.5	6.55			33				Clear	Blue	2
523	08/06/1992				5			41				
523	09/14/1992	28	8.53	2	7	29	40	43		Clear	Blue	2
523	10/06/1992	32.5	9.91	1		27	35			Clear	Blue	

07/13/1992			07/31/1992			08/06/1992			09/14/1992			10/06/1992		
Depth	Temp.	D.O												
3	65		3	68	9	3	70	9	3	66	9	3	57	9
6	64		9	68		9	69		9	65	9	9	58	9
9	64		15	68	8	15	69		15	64	8	15	58	9
15	64		20	68		20	67		20	64		25	57	
20	64		25	67		25	67		25	63	9	30	57	10
25	64		30	65	9	30	65		30	63	8	40	57	9
30	62		35	57		35	65		35	61	8	72	53	9
35	58		40	52	8	40	59	10	40	59	8			
40	56		45	51		45	55		45	53	3			
45	50		72	48	4	70	49	3	61	49	1			
72	47													

Date	Lab Comments
07/13/1992	Need instructions on how to take dissolved oxygen samples, the new sampler does not allow transfer of the sample to the small bottle.

Date	Collector Comments
07/13/1992	Rain gauge reading from 7/12-7/14 is 1.85 inches.
07/31/1992	No rain for 7 days.

Data Collectors (Source of Data):

523 - Kenneth Lehner (Self-Help Lake Monitoring)

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total phosphorus in ug/l, surface sample only; TSI(SD), TSI(CHL), TSI(TP) = Trophic state index based on SD, CHL, TP respectively; Depth measured in feet; Temp = Temperature in degrees Fahrenheit; D.O. = Dissolved Oxygen in parts per million.

Wisconsin Department of Natural Resources Wisconsin Lakes Partnership Report generated on : 5/11/2005

Lake Monitoring 1993 Annual Report

LAKE LUCERNE

Lake Type:

Stratified Seepage

Forest County

DNR Region:

NO

Waterbody Number:

396500

GEO Region:

NE

Site Name										Storet #		
DEEP HOLE										213123		
Group	Date	SD(ft)	SD(m)	CHL	TP	TSI(SD)	TSI(CHL)	TSI(TP)	Lake Level	Clarity	Color	Perception
523	05/25/1993	34.75	10.59	2		26	40			Clear	Blue	2
523	06/11/1993	32.5	9.91			27				Clear	Blue	2
523	06/25/1993	29.25	8.92			28			highest in three years	Clear	Blue	2
523	07/21/1993	24.5	7.47	1	4	31	35	39	High	Clear	Blue	2
523	08/02/1993	20.75	6.32			33				Clear	Blue	2
523	08/23/1993	24	7.32	1	4	31	35	39		Clear	Blue	2
523	09/07/1993	22.5	6.86			32						2
523	09/23/1993	21.25	6.48			33						2
523	10/04/1993	17.5	5.33	2	4	36	40	39		Clear	Blue	2

05/25/1993		
Depth	Temp.	D.O.
3	54	10
9	53	10
15	52	10
20	52	10
25	52	10
30	52	10
40	51	10
63	46	10

07/21/1993		
Depth	Temp.	D.O.
3	71	8
9	70	8
15	70	8
20	70	8
25	69	8
30	63	8
35	54	8
40	51	8
45	50	6
63	49	4

08/23/1993		
Depth	Temp.	D.O.
3	74	8
9	73	8
15	72	8
20	72	8
25	70	8
30	69	8
35	58	8
40	52	6
45	50	4
63	49	4

10/04/1993		
Depth	Temp.	D.O.
3	54	8
9	54	8
15	54	8
20	54	9
25	54	8
30	54	
35	54	8
40	53	8
65	53	2

Date	Lab Comments
07/21/1993	Chl approximate, low absorbance.
08/23/1993	Chl approximate, low absorbance.
10/04/1993	TP <4 ug/l. Chl approximate, low absorbance.

Date	Collector Comments
05/25/1993	Ice off May 1st.
07/21/1993	Scattered clouds, visibility unlimited, wind NW 5-10 mph, temp 75 F. Lake highest in 3 years

Data Collectors (Source of Data):

523 - Kenneth Lehner (Self-Help Lake Monitoring)

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total phosphorus in ug/l, surface sample only; TSI(SD), TSI(CHL), TSI(TP) = Trophic state index based on SD, CHL, TP respectively; Depth measured in feet; Temp = Temperature in degrees Fahrenheit; D.O. = Dissolved Oxygen in parts per million.

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Lake Monitoring 1994 Annual Report

LAKE LUCERNE

Lake Type:

Stratified Seepage

Forest County

DNR Region:

NO

Waterbody Number:

396500

GEO Region:

NE

Site Name										Storet #		
DEEP HOLE										213123		
Group	Date	SD(ft)	SD(m)	CHL	TP	TSI(SD)	TSI(CHL)	TSI(TP)	Lake Level	Clarity	Color	Perception
523	05/25/1994	45	13.72			22						1
523	06/01/1994	35	10.67			26						1
523	06/08/1994	34.75	10.59			26						1
523	06/22/1994	35.25	10.74	1	4	26	35	39		Clear	Blue	1
523	07/18/1994									Clear	Blue	2
523	07/23/1994	23.25	7.09			32					Blue/Green	2
523	08/09/1994	20.75	6.32			33					Blue/Green	2
523	08/15/1994	18.25	5.56			35						2
523	08/18/1994			1	5		35	41		Clear	Blue	2
523	09/19/1994	22.25	6.78	1	7	32	35	43		Clear	Blue	2
523	10/10/1994	22.75	6.93	2	8	32	40	44		Clear	Blue	2

06/22/1994			07/18/1994			08/18/1994			09/19/1994			10/10/1994		
Depth	Temp.	D.O.												
3	73	8	3	70	8	3	68	8	3	66	8	3	57	8
9	72	8	9	70	8	9	68	8	9	68	7	9	57	8
15	71	8	15	70	8	15	68	7	15	66	8	15	57	8
20	68	9	20	70	7	20	68	8	20	66	8	20	57	8
25	62	10	25	70	8	25	68	7	25	66	8	25	57	8
30	61	10	30	70	8	30	66	7	30	66	7	30	56	8
35	55	10	35	65	9	35	64	9	35	65	8	35	57	8
40	53	10	40	56	9	40	57	7	40	59	6	40	57	7
45	52	10	45	53	8	50	54	4	45	54	3	65	53	1
68	50	7	62	50	2	70	49	0	65	51	1			

Date	Lab Comments
06/22/1994	Chl approximate, low absorbance.
08/18/1994	Chl approximate, low absorbance. Holding time exceeded between 15 and 18 days.
09/19/1994	Chl approximate, low absorbance.
10/10/1994	Chl approximate, low absorbance.

Date	Collector Comments
08/18/1994	Very slight bloom.

Data Collectors (Source of Data):**523 - Kenneth Lehner (Self-Help Lake Monitoring)**

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total phosphorus in ug/l, surface sample only; TSI(SD), TSI(CHL), TSI(TP) = Trophic state index based on SD, CHL, TP respectively; Depth measured in feet; Temp = Temperature in degrees Fahrenheit; D.O. = Dissolved Oxygen in parts per million.

Wisconsin Department of Natural Resources Wisconsin Lakes Partnership Report generated on : 5/11/2005

Lake Monitoring 1995 Annual Report

LAKE LUCERNE

Lake Type:

Stratified Seepage

Forest County

DNR Region:

NO

Waterbody Number:

396500

GEO Region:

NE

Site Name								Storet #				
DEEP HOLE								213123				
Group	Date	SD(ft)	SD(m)	CHL	TP	TSI(SD)	TSI(CHL)	TSI(TP)	Lake Level	Clarity	Color	Perception
523	05/22/1995	22	6.71			33				Clear	Blue	1
523	06/16/1995	26.5	8.08			30						2
523	07/02/1995	23.5	7.16	0		32				Clear	Blue	1
523	07/10/1995	28.75	8.76			29				Clear	Blue	2
523	07/24/1995	25.5	7.77			30				Clear	Blue/Green	2
523	08/11/1995			1			35			Clear	Blue	2
523	08/14/1995	25.25	7.7			31			High		Blue/Green	2
523	08/28/1995	18.75	5.72			35			High			2
523	09/05/1995	20.75	6.32			33						2
523	09/10/1995	17.75	5.41			36			High	Clear	Blue	2
523	10/08/1995			2			40					2

07/02/1995		
Depth	Temp.	D.O
3	70	8
9	70	8
15	70	8
20	70	8
30	62	10
35	54	10
45	54	9
60	50	6

08/11/1995		
Depth	Temp.	D.O
3	77	6
9	77	8
15	76	8
20	75	7
30	70	7
35	58	11
40	55	8
45	55	7
62	50	2

09/10/1995		
Depth	Temp.	D.O
3	68	8
9	68	9
15	68	8
20	68	8
25	68	9
30	68	9
35	67	
40	57	9
45	54	4
60	50	1

Date	Lab Comments
07/02/1995	Chl approximate, low absorbance
08/11/1995	Chl approximate, low absorbance.
09/10/1995	No filter Received. Assumed noon for sample time.
10/08/1995	TP below level of detection (7 ug/l). Result should read "<7." Chl approximate, low absorbance.

Date	Collector Comments
07/02/1995	Air temp is 70 degrees.
08/11/1995	No secchi reading, too cloudy.
08/28/1995	Much rain in last 2 weeks.

Data Collectors (Source of Data):

523 - Kenneth Lehner (Self-Help Lake Monitoring)

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total phosphorus in ug/l, surface sample only; TSI(SD), TSI(CHL), TSI(TP) = Trophic state index based on SD, CHL, TP respectively; Depth measured in feet; Temp = Temperature in degrees Fahrenheit; D.O. = Dissolved Oxygen in parts per million.

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Lake Monitoring 1997 Annual Report

LAKE LUCERNE

Lake Type:

Stratified Seepage

Forest County

DNR Region:

NO

Waterbody Number:

396500

GEO Region:

NE

Site Name										Storet #		
DEEP HOLE										213123		
Group	Date	SD(ft)	SD(m)	CHL	TP	TSI(SD)	TSI(CHL)	TSI(TP)	Lake Level	Clarity	Color	Perception
523	05/21/1997	22	6.71			33				Clear	Green	2
523	06/09/1997	27.25	8.31			29				Clear	Green	2
523	07/01/1997	28.5	8.69			29					Blue	1
523	07/05/1997			1	10		35	46				
523	07/07/1997	27	8.23			30				Clear	Blue	2
523	07/15/1997	26	7.92			30						
523	07/28/1997	28.25	8.61			29					Blue	1
523	08/07/1997	25.75	7.85	1		30	35			Clear	Green	2
523	08/25/1997	25.75	7.85			30						2
523	09/13/1997	27.75	8.46			29				Clear	Blue	2
523	09/14/1997			1			35					
523	10/06/1997			2	7		40	43				

07/07/1997		
Depth	Temp.	D.O
3	68	9
9	67	10
15	68	9
20	68	9
25	63	
30	50	
35	50	
40	48	10
60	46	
70	46	7

08/25/1997		
Depth	Temp.	D.O
3	64	8
6	64	8
9	64	9
15	65	9
20	64	
30	53	11
50	48	6
60	47	4
70	45	0

Date	Lab Comments
07/05/1997	Chl-Low absorbance, result approximate
08/07/1997	Chl-Low absorbance, result approximate
09/14/1997	Chl-Low absorbency, result approximate
10/06/1997	Chl-Recommended holding time exceeded by 7 days

Data Collectors (Source of Data):

523 - Kenneth Lehner (Self-Help Lake Monitoring)

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total phosphorus in ug/l, surface sample only; TSI(SD), TSI(CHL), TSI(TP) = Trophic state index based on SD, CHL, TP respectively; Depth measured in feet; Temp = Temperature in degrees Fahrenheit; D.O. = Dissolved Oxygen in parts per million.

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Lake Monitoring 1998 Annual Report

LAKE LUCERNE

Lake Type:

Stratified Seepage

Forest County

DNR Region:

NO

Waterbody Number:

396500

GEO Region:

NE

Site Name	Storet #
DEEP HOLE	213123

Group	Date	SD(ft)	SD(m)	CHL	TP	TSI(SD)	TSI(CHL)	TSI(TP)	Lake Level	Clarity	Color	Perception
523	07/01/1998			1	5		35	41				
523	08/10/1998	25.25	7.7	1		31	35		Low	Clear	Green	2

08/10/1998		
Depth	Temp.	D.O
3	74	7
10	73	8
20	71	8
30	67	9
40	47	8
50	43	4
65	41	2

Date	Lab Comments
07/01/1998	Chl--Low absorbency, result approx. TP--Holding time exceeded by 9 days.
08/10/1998	Chl--Low absorbency, result approx.

Data Collectors (Source of Data):**523 - Kenneth Lehner (Self-Help Lake Monitoring)**

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total phosphorus in ug/l, surface sample only; TSI(SD), TSI(CHL), TSI(TP) = Trophic state index based on SD, CHL, TP respectively; Depth measured in feet; Temp = Temperature in degrees Fahrenheit; D.O. = Dissolved Oxygen in parts per million.

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Lake Monitoring 1999 Annual Report

LAKE LUCERNE

Lake Type:

Stratified Seepage

Forest County

DNR Region:

NO

Waterbody Number:

396500

GEO Region:

NE

Site Name										Storet #		
DEEP HOLE										213123		
Group	Date	SD(ft)	SD(m)	CHL	TP	TSI(SD)	TSI(CHL)	TSI(TP)	Lake Level	Clarity	Color	Perception
523	05/19/1999	23.25	7.09			32			Low	Clear	Blue	1
523	06/03/1999	33	10.06			27			Low	Clear		
523	06/15/1999	34.25	10.44			26			Low	Clear	Green	1
523	06/17/1999			1			35					
523	06/25/1999	32	9.75			27			Low	Clear	Green	2
523	06/29/1999								Low	Clear	Green	2
523	07/12/1999	26.25	8			30			Low	Clear	Green	2
523	07/17/1999	24.5	7.47			31			Low	Clear	Green	1
523	07/28/1999			1	9		35	45				
523	08/15/1999	20	6.1			34			No Change	Clear	Green	1
523	08/28/1999	24	7.32			31			Low	Clear	Blue	1
523	09/04/1999	21	6.4			33			Low	Clear	Blue	1
523	09/11/1999	21.5	6.55			33			Low	Clear	Blue	1
42048	09/18/1999	20	6.1			34			Low	Clear	Blue	1
42048	10/02/1999	20	6.1			34			Low	Clear	Blue	1
42048	10/16/1999	19	5.79	3	6	35	43	42	Low	Clear	Blue	1

10/16/1999		
Depth	Temp.	D.O
3	50	12
6	50	10
9	50	10
15	50	10
20	50	11
30	50	10
40	50	10
50	50	10
60	50	2
70	50	1

Date	Lab Comments
06/17/1999	TP-no data.
07/28/1999	Chl - Low absorbency, result approx.; TP-Holding time exceeded by 5 days.

Data Collectors (Source of Data):

42048 - Neal Klemme (Self-Help Lake Monitoring)

523 - Kenneth Lehner (Self-Help Lake Monitoring)

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total phosphorus in ug/l, surface sample only; TSI(SD), TSI(CHL), TSI(TP) = Trophic state index based on SD, CHL, TP respectively; Depth measured in feet; Temp = Temperature in degrees Fahrenheit; D.O. = Dissolved Oxygen in parts per million.

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Lake Monitoring 2000 Annual Report

LAKE LUCERNE

Lake Type:

Stratified Seepage

Forest County

DNR Region:

NO

Waterbody Number:

396500

GEO Region:

NE

Site Name								Storet #				
DEEP HOLE								213123				
Group	Date	SD(ft)	SD(m)	CHL	TP	TSI(SD)	TSI(CHL)	TSI(TP)	Lake Level	Clarity	Color	Perception
42048	04/23/2000	19	5.79		6	35		42	Low	Clear	Blue	1
42048	04/30/2000	23	7.01			32			Normal	Clear	Blue	1
42048	05/06/2000	22	6.71			33			Normal	Clear	Blue	1
42048	05/14/2000	20	6.1			34			Normal	Clear	Blue	1
42048	05/20/2000	22.75	6.93			32			Normal	Clear	Blue	1
42048	05/29/2000	21.5	6.55			33			Normal	Clear	Blue	1
42048	06/12/2000	33	10.06			27			Normal	Clear	Blue	1
42048	06/18/2000	26.5	8.08	1	7	30	35	43	Low	Clear	Blue	1
42048	06/25/2000	25.25	7.7			31			Normal	Clear	Blue	1
42048	07/09/2000	24	7.32			31			Normal	Clear	Blue	1
42048	07/16/2000	25	7.62	1	6	31	35	42	Low	Clear	Blue	1
42048	07/31/2000	24.75	7.54			31			Normal	Clear	Green	1
42048	08/07/2000	20.25	6.17			34			Normal	Clear	Green	1
42048	08/12/2000	22.75	6.93	2	8	32	40	44	Low	Clear	Green	1
42048	08/28/2000	21.25	6.48			33			Low	Clear	Green	1
42048	09/03/2000	22	6.71			33			Low	Murky	Blue	2
42048	09/09/2000	24	7.32			31			Low	Clear	Green	1
42048	09/30/2000	30.25	9.22			28			Low	Clear	Green	1
42048	10/06/2000	28	8.53	1	13	29	35	48	Low	Clear	Green	1

04/23/2000		
Depth	Temp.	D.O.
3	42	15
6	40	16
9	40	16
15	40	17
20	40	15
30	39	16
40	39	16
50	39	15
60	39	17
70	39	16

05/14/2000		
Depth	Temp.	D.O.
3	54	
6	54	
9	54	
15	54	
20	54	
30	46	
50	42	

05/20/2000		
Depth	Temp.	D.O.
3	56	
6	56	
9	55	
15	54	
20	54	
30	48	
40	44	
50	42	
60	42	
70	42	

05/29/2000		
Depth	Temp.	D.O.
3	59	
6	59	
9	59	
15	58	
20	56	
30	50	
40	44	
50	43	
60	42	
70	42	

06/12/2000		
Depth	Temp.	D.O.
3	69	
6	64	
9	64	
15	64	
20	61	
30	53	
40	47	
50	43	
60	43	
70	43	

06/18/2000		
Depth	Temp.	D.O.
3	68	13
6	68	13
9	64	14
15	64	13
20	63	11
30	55	12
40	44	17
50	44	13
60	43	13
70	43	

07/09/2000		
Depth	Temp.	D.O.
3	70	
6	68	
9	68	
15	67	
20	66	
30	64	
40	49	
50	46	
60	44	
70	44	

07/16/2000		
Depth	Temp.	D.O.
3	72	11
6	71	12
9	71	9
15	70	10
20	70	8
30	60	10
40	50	11
50	45	9
60	44	5
70	44	8

07/31/2000		
Depth	Temp.	D.O.
3	71	
6	70	
9	70	
15	70	
20	69	
30	64	
40	50	
50	46	
60	44	
70	44	

08/07/2000		
Depth	Temp.	D.O.
3	71	
6	71	
9	71	
15	71	
20	70	
30	66	
40	52	
50	46	
60	45	
70	44	

08/12/2000		
Depth	Temp.	D.O.
3	72	10
6	72	10

08/28/2000		
Depth	Temp.	D.O.
3	70	
6	70	

09/03/2000		
Depth	Temp.	D.O.
3	69	
6	69	

09/09/2000		
Depth	Temp.	D.O.
3	66	10
6	66	10

09/30/2000		
Depth	Temp.	D.O.
3	58	
6	58	

9	72	10
15	72	10
20	71	10
30	68	10
40	48	10
50	46	9
60	44	7
70	44	5

9	70
15	70
30	68
40	52
50	47
60	46
70	45

9	69
15	69
20	69
30	68
40	54
50	47
60	45
70	45

9	66	10
15	66	10
20	66	10
30	66	12
40	54	10
50	48	7
60	46	6
70	45	3

9	58
15	58
20	58
30	58
40	58
50	50
60	46
70	46

10/06/2000		
Depth	Temp.	D.O
3	55	
30	55	

Date	Lab Comments
06/18/2000	Chl- <1. Integrated Sampler (6 ft) - Chl = 1.3 ug/l.
07/16/2000	Chl-Low absorbency, result approximate. Integrated Sampler (6 ft) - Chl = 1 ug/l.
08/12/2000	Chl- <1. Integrated Sampler (6 ft) - Chl = 1.5 ug/l.
10/06/2000	Chl-Low absorbency, result approximate

Date	Collector Comments
04/23/2000	Sunny, windy. E wind, 55 degrees F.
06/18/2000	West winds, mostly cloudy, 64 degrees F. Anchor barely holding.
07/16/2000	Sunny, 78 degrees F. calm west wind. 1 week after big rain. 4" rain, lake up 6".
09/09/2000	70 degrees F., S wind 15 mph.
09/30/2000	Sunny, slight haze, 62 degrees F.
10/06/2000	Cold, 34 degrees F. Sudden snow squall came from no where. Can no longer see shore, must get off lake.

Data Collectors (Source of Data):**42048 - Neal Klemme (Self-Help Lake Monitoring)**

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total phosphorus in ug/l, surface sample only; TSI(SD), TSI(CHL), TSI(TP) = Trophic state index based on SD, CHL, TP respectively; Depth measured in feet; Temp = Temperature in degrees Fahrenheit; D.O. = Dissolved Oxygen in parts per million.

Wisconsin Department of Natural Resources Wisconsin Lakes Partnership Report generated on : 5/11/2005

Lake Monitoring 2001 Annual Report

LAKE LUCERNE

Lake Type:

Stratified Seepage

Forest County

DNR Region:

NO

Waterbody Number:

396500

GEO Region:

NE

Site Name								Storet #				
DEEP HOLE								213123				
Group	Date	SD(ft)	SD(m)	CHL	TP	TSI(SD)	TSI(CHL)	TSI(TP)	Lake Level	Clarity	Color	Perception
42048	05/20/2001	23	7.01			32			Low	Clear	Blue	1
42048	05/28/2001	27	8.23			30			Low	Clear	Blue	1
42048	06/11/2001	31	9.45			28			Low	Clear	Blue	1
42048	06/16/2001	26.75	8.15			30			Low	Clear	Blue	1
42048	06/24/2001	25	7.62	1	9	31	35	45	Low	Clear	Blue	1
42048	06/30/2001	23.5	7.16			32			Low	Clear	Blue	1
42048	07/08/2001	22.75	6.93			32			Low	Clear	Green	1
42048	07/15/2001	26	7.92			30			Low	Clear	Green	1
42048	08/04/2001	25.5	7.77	1	8	30	35	44	Low	Clear	Green	1
42048	08/20/2001	29	8.84			29			Low	Clear	Green	1
42048	08/26/2001	29	8.84	1	6	29	35	42	Low	Clear	Blue	1
42048	09/02/2001	27	8.23			30			Low	Clear	Blue	1
42048	09/15/2001	33	10.06			27			Low	Clear	Blue	1
42048	09/29/2001	27.5	8.38	1	8	29	35	44	Low	Clear	Blue	1

05/20/2001		
Depth	Temp.	D.O
3	61	
6	61	
9	61	
12	57	
15	57	
20	55	
25	54	
30	53	
40	50	
50	48	
60	47	
70	46	
72	46	

05/28/2001		
Depth	Temp.	D.O
3	57	12
6	57	12
9	57	12
12	56	
15	56	10
20	56	10
25	55	
30	54	10
40	50	10
50	48	9
60	47	9
70	47	9

06/11/2001		
Depth	Temp.	D.O
3	63	
6	62	
9	62	
12	62	
15	59	
20	57	
25	56	
30	56	
40	56	
50	49	
60	48	
70	47	
72	47	

06/16/2001		
Depth	Temp.	D.O
3	67	
6	66	
9	66	
12	66	
15	65	
20	62	
25	57	
30	56	
40	52	
50	49	
60	48	
70	48	
72	47	

06/24/2001		
Depth	Temp.	D.O
3	67	11
6	67	11
9	67	10
12	67	
15	66	11
20	65	11
25	60	
30	57	11
40	53	10
50	50	7
60	49	6
70	48	6

06/30/2001		
Depth	Temp.	D.O
3	75	
6	75	
9	75	
12	72	
15	70	
20	67	
25	62	
30	58	
40	52	
50	49	
60	49	
70	48	
72	48	

07/08/2001		
Depth	Temp.	D.O
3	71	
6	70	
9	70	
12	70	
15	69	
20	69	
25	67	
30	59	
40	54	
50	50	
60	49	
70	49	
73	48	

07/15/2001		
Depth	Temp.	D.O
3	73	
6	73	
9	72	
12	72	
15	71	
20	70	
25	67	
30	61	
40	53	
50	50	
60	49	
70	48	
73	48	

08/04/2001		
Depth	Temp.	D.O
3	76	3
6	76	10
9	75	9
12	74	
15	74	9
20	73	9
25	71	
30	63	10
40	54	9
50	51	5
60	50	4
70	49	2
71	48	

08/20/2001		
Depth	Temp.	D.O
3	71	
6	70	
9	70	
12	70	
15	70	
20	70	
25	70	
30	68	
40	55	
50	51	
60	50	
70	48	
71	48	

08/26/2001		
Depth	Temp.	D.O
3	72	11

09/02/2001		
Depth	Temp.	D.O
3	69	

09/15/2001		
Depth	Temp.	D.O
3	66	

09/29/2001		
Depth	Temp.	D.O
3	59	10

6	71	10
9	71	9
15	71	9
20	71	7
30	68	8
40	55	7
50	51	2
60	50	1
70	48	2
71	48	

6	69	
9	69	
12	69	
15	69	
20	69	
25	69	
30	68	
40	56	
50	51	
60	50	
70	49	
71	49	

6	66	
9	66	
12	66	
15	66	
20	65	
25	65	
30	65	
40	57	
50	51	
60	50	
69	49	

6	59	10
9	59	10
12	59	
15	59	10
20	59	10
30	58	9
40	58	9
50	53	4
60	51	5
68	49	4

Date	Lab Comments
05/28/2001	TP below level of detection.
07/15/2001	SD hit bottom; please ignore TSI(SD).
08/26/2001	Chl < 1 ug/l.

Date	Collector Comments
05/28/2001	Sunny, 65 deg F. Lake up 2" from last week due to rain.
06/24/2001	75 deg F and sunny. SW winds approx. 15 mph.
08/04/2001	Sunny, hazy, and calm. Hot, 80 deg F.
08/26/2001	Sunny and calm. 75 deg F.
09/29/2001	Sunny, 60 deg F.

Data Collectors (Source of Data):

42048 - Neal Klemme (Self-Help Lake Monitoring)

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total phosphorus in ug/l, surface sample only; TSI(SD), TSI(CHL), TSI(TP) = Trophic state index based on SD, CHL, TP respectively; Depth measured in feet; Temp = Temperature in degrees Fahrenheit; D.O. = Dissolved Oxygen in parts per million.

Wisconsin Department of Natural Resources Wisconsin Lakes Partnership Report generated on : 5/11/2005

Lake Monitoring 2002 Annual Report

LAKE LUCERNE

Lake Type:

Stratified Seepage

Forest County

DNR Region:

NO

Waterbody Number:

396500

GEO Region:

NE

Site Name										Storet #		
DEEP HOLE										213123		
Group	Date	SD(ft)	SD(m)	CHL	TP	TSI(SD)	TSI(CHL)	TSI(TP)	Lake Level	Clarity	Color	Perception
42048	06/02/2002	25.5	7.77			30			Low	Clear	Blue	1
42048	06/09/2002	30.25	9.22			28			Normal	Clear	Blue	1
42048	06/30/2002	23.5	7.16			32			Normal	Clear	Green	1
42048	07/01/2002	21.5	6.55			33			Normal	Clear	Green	1
42048	07/07/2002	18.5	5.64	1	6	35	35	42	Normal	Clear	Green	1
42048	07/14/2002	18.5	5.64			35			Normal	Clear	Green	1
42048	08/03/2002	21.5	6.55	2	5	33	40	41	Normal	Clear	Green	1
42048	08/25/2002	35.25	10.74	1	7	26	35	43	Normal	Clear	Green	1
42048	09/01/2002	32	9.75			27			High	Clear	Green	1
42048	09/21/2002	32.25	9.83			27			Normal	Clear	Blue	1
42048	09/28/2002	30.25	9.22	1	11	28	35	47	Normal	Clear	Blue	1

06/02/2002		
Depth	Temp.	D.O
3	54	
6	54	
9	54	
12	53	
15	52	
20	51	
25	50	
30	48	
40	46	
50	43	
60	43	
70	43	

06/09/2002		
Depth	Temp.	D.O
3	62	9
6	61	9
9	61	9
12	61	
15	60	10
20	59	9
25	56	
30	51	11
40	49	11
50	48	11
60	47	9
65	46	9
66	46	9

06/30/2002		
Depth	Temp.	D.O
3	68	
6	68	
9	67	
12	66	
15	66	
20	64	
25	62	
30	56	
40	50	
50	48	
60	48	
70	48	
72	47	

07/01/2002		
Depth	Temp.	D.O
3	79	
6	77	
9	76	
12	75	
15	73	
20	67	
25	64	
30	57	
40	51	
50	48	
60	48	
70	48	
72	48	

07/07/2002		
Depth	Temp.	D.O
3	78	8
6	77	8
9	77	8
12	77	
15	76	9
20	69	10
25	64	
30	58	10
40	51	10
50	49	8
60	48	8
70	48	7
72	48	

07/14/2002		
Depth	Temp.	D.O
3	78	
6	77	
9	77	
12	77	
15	76	
20	69	
25	64	
30	58	
40	51	
50	49	
60	48	
70	48	
72	48	

08/03/2002		
Depth	Temp.	D.O
3	75	9
6	74	9
9	74	9
15	73	8
20	73	10
30	54	11
40	48	10
50	46	8
60	45	
70	45	7

08/25/2002		
Depth	Temp.	D.O
3	67	8
6	67	9
9	66	9
15	66	9
20	66	10
30	65	10
40	49	9
50	46	6
60	45	4
70	44	3

09/28/2002		
Depth	Temp.	D.O
3	56	11
6	57	9
9	57	9
15	57	9
20	57	10
30	57	9
40	52	8
50	47	4
60	46	2
70	46	2

Date	Lab Comments
06/02/2002	Total Phosphorus- below level of detection.
07/07/2002	Temp at lab - iced.
08/03/2002	Temp at lab - iced.
08/25/2002	Temp at lab - iced.
09/28/2002	Temp at lab - iced.

Date	Collector Comments
06/02/2002	Lake level is up 4 inches from last year. Ice completel off on 4/27/02
06/09/2002	Lots of tree pollen at shore. Hazy sky 76 degrees and muggy.
06/30/2002	2 inches of rain the night before readings were taken.
08/03/2002	Digital thermometer malfunction. Reads a constant 32.0 degrees F. Using thermometer in Van Doren Sampler.
08/25/2002	alge floating on the surface at shore. This is unusal. Calm wind lake like a sheet of glass.

Data Collectors (Source of Data):**42048 - Neal Klemme (Self-Help Lake Monitoring)**

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total phosphorus in ug/l, surface sample only; TSI(SD), TSI(CHL), TSI(TP) = Trophic state index based on SD, CHL, TP respectively; Depth measured in feet; Temp = Temperature in degrees Fahrenheit; D.O. = Dissolved Oxygen in parts per million.

Wisconsin Department of Natural Resources Wisconsin Lakes Partnership Report generated on : 5/11/2005

Lake Monitoring 2003 Annual Report

LAKE LUCERNE

Lake Type:

Stratified Seepage

Forest County

DNR Region:

NO

Waterbody Number:

396500

GEO Region:

NE

Site Name										Storet #		
DEEP HOLE										213123		
Group	Date	SD(ft)	SD(m)	CHL	TP	TSI(SD)	TSI(CHL)	TSI(TP)	Lake Level	Clarity	Color	Perception
42048	06/01/2003	35.5	10.82		6	26		42	Normal	Clear	Blue	1
42048	06/14/2003	30	9.14			28			Normal	Clear	Blue	4
42048	06/22/2003	29.5	8.99	1	7	28	35	43	Normal	Clear	Blue	1
42048	06/30/2003	26.25	8			30			Normal	Clear	Blue	1
42048	07/07/2003	26	7.92			30			Normal	Clear	Blue	1
42048	07/12/2003	24.75	7.54			31			Normal	Clear	Blue	1
42048	07/27/2003	23.5	7.16	2	9	32	40	45	Normal	Clear	Blue	1
42048	08/02/2003	23.5	7.16			32			Normal	Clear	Blue	1
42048	08/09/2003	27.5	8.38			29			Normal	Clear	Green	1
42048	08/17/2003	28.25	8.61			29			Normal	Clear	Green	1
42048	08/23/2003	29.5	8.99	1.7	10	28	39	46	Normal	Clear	Green	1
42048	08/31/2003	24.5	7.47			31			Normal	Clear	Green	1
42048	09/07/2003	26.25	8			30			Normal	Clear	Green	1
42048	10/17/2003	24.5	7.47	1.7	11	31	39	47	Low	Clear	Blue	1

06/01/2003		
Depth	Temp.	D.O
3	57	10.5
6	56.2	10.8
9	56.1	10.4
12	55.9	
15	55.7	10
20	55.5	10.5
25	55.2	
30	52.5	10
40	48	10.5
50	45	9.9
60	44	9.1
70	44	9.5

06/22/2003		
Depth	Temp.	D.O
3	68	8.9
6	66	8.9
9	66	9.1
15	66	9.9
20	62	10.4
30	54	9.5
40	50	9
50	46	7.3
60	45	6.4
70	45	6.8

06/30/2003		
Depth	Temp.	D.O
3	68.7	
6	67.6	
9	67.4	
12	67.2	
15	67.1	
20	66.2	
25	61.7	
30	56.1	
40	53.4	
50	47.8	
60	47.4	

07/07/2003		
Depth	Temp.	D.O
3	74.4	
6	74.3	
9	74.1	
12	71.7	
15	69.2	
20	67.8	
25	61.8	
30	57.2	
35	53.2	
40	50	

07/12/2003		
Depth	Temp.	D.O
3	69.2	
6	69	
9	69	
12	68.7	
15	68.5	
20	68.1	
25	63.3	
30	57	
35	53	
40	51	
50	48.5	

07/27/2003		
Depth	Temp.	D.O
3	71.2	9.2
6	70.8	8.9
9	70.7	8.8
12	70.7	
15	70.5	8.8
20	70.5	8.8
25	70.3	
30	61.6	10.1
35	54.8	
40	51.8	8.7
50	48.9	6.6
60	47	5.2
70	46	4.1

08/02/2003		
Depth	Temp.	D.O
3	71.2	9.2
6	70.8	8.9
9	70.7	8.8
12	70.7	
15	70.5	8.8
20	70.5	8.8
25	70.3	
30	61.3	10.1
35	54.8	
40	51.8	8.7
50	48.9	6.6
60	47	5.2
70	46	4.1

08/17/2003		
Depth	Temp.	D.O
3	76.4	
6	75.9	
9	75.3	
12	74.1	
15	72.8	
20	71.9	
25	70.5	
30	64.2	
35	56.4	
40	51.8	

08/23/2003		
Depth	Temp.	D.O
3	74.4	9
6	74.4	8.8
9	74.4	9
12	74.4	
15	74.4	9.5
20	74.4	9.4
25	71.6	
30	67.8	10
35	56.4	
40	52.3	8
45	50.5	
50	49.1	4.1
60	48.8	3.6
70	48	2

08/31/2003		
Depth	Temp.	D.O
3	71.4	
6	71.4	
9	71.4	
12	71.4	
15	71.2	
20	71	
25	70.8	
30	69.2	
35	58.2	
40	52.8	
45	50	

10/17/2003		
Depth	Temp.	D.O
3	50	9.1

6	50.5	8.8
9	50.5	8.6
15	50.5	8.8
20	50.5	8.8
30	50.5	8.8
40	50	8.8
50	50	9.6
60	50	8.6
65	50	9.5

Date	Lab Comments
06/01/2003	Temp at lab - iced.
06/22/2003	Temp at lab - iced.
07/27/2003	Temp at lab - iced.
08/02/2003	Date estimated.

Date	Collector Comments
06/01/2003	Calm, light nw winds, 60 degrees F.
07/07/2003	clear 80 degrees west winds beautiful
08/02/2003	Doric meter was used down to 50 feet. 60 and 70 foot reading taken with the van dorn sampler. Doric meter fails below temp. of 48 degrees. temp readings 50ft and less was double checked with van dorn sampler.
08/17/2003	Electronic temp meter is only linear down to 48 degrees F.
08/23/2003	Fish jumping around boat. Electronic Temp meter was double checked against the thermometer in the Van Dorn sampler
10/17/2003	Last time on the water. Nice 70 degree day north winds.

Data Collectors (Source of Data):

42048 - Neal Klemme (Self-Help Lake Monitoring)

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total phosphorus in ug/l, surface sample only; TSI(SD), TSI(CHL), TSI(TP) = Trophic state index based on SD, CHL, TP respectively; Depth measured in feet; Temp = Temperature in degrees Fahrenheit; D.O. = Dissolved Oxygen in parts per million.

Wisconsin Department of Natural Resources Wisconsin Lakes Partnership Report generated on : 5/11/2005

Lake Monitoring 2004 Annual Report

LAKE LUCERNE

Lake Type:

Stratified Seepage

Forest County

DNR Region:

NO

Waterbody Number:

396500

GEO Region:

NE

Site Name										Storet #		
DEEP HOLE										213123		
Group	Date	SD(ft)	SD(m)	CHL	TP	TSI(SD)	TSI(CHL)	TSI(TP)	Lake Level	Clarity	Color	Perception
913	05/18/2004	18.6	5.67			35			High	Clear	Blue	1
42048	06/06/2004	45.5	13.87		8	22		44	Normal	Clear	Blue	1
913	06/14/2004	9.6	2.93			45			High	Murky	Brown	3
42048	06/19/2004	23	7.01			32			Normal	Clear	Blue	1
42048	06/27/2004	24	7.32			31			Normal	Clear	Green	1
42048	07/11/2004	24	7.32			31			Normal	Clear	Green	1
913	07/11/2004	13.6	4.15			39			High	Clear	Green	2
42048	07/19/2004	25	7.62	1.2	9	31	36	45	Normal	Clear	Green	1
913	07/30/2004	12	3.66			41			Normal	Clear	Green	2
42048	08/01/2004	32	9.75			27			Normal	Clear	Green	1
42048	08/21/2004	31.5	9.6	0.9	6	27	34	42	Normal	Clear	Green	1
42048	08/28/2004	26.25	8			30			Normal	Clear	Green	1
42048	09/04/2004	25	7.62			31			Normal	Clear	Green	1
913	09/09/2004	12	3.66			41			Normal	Clear	Green	2
42048	09/12/2004	32	9.75			27			Normal	Clear		1
42048	10/16/2004	18	5.49	1.2	9	35	36	45	Low	Clear	Blue	1

06/06/2004			07/19/2004			08/21/2004			09/12/2004			10/16/2004		
Depth	Temp.	D.O.												
3	59	9.9	3	69	8.3	3	63	10	3	65	9.1	3	53	8.9
6	57	10.1	6	68	7.2	6	64	9.1	6	65	9	6	53	8.5
9	56	9.9	9	68	8.6	9	64	9.5	9	65	9	20	53	8.7
15	54	9.8	15	67	8.8	15	64	9	15	65	9.8	40	53.5	8.5
20	53	10.5	20	66	8.4	20	64	8.8	20	65	10	50	53	9.4
30	52	10.8	30	61	9.5	30	63	8.9	30	65	9	60	53	3.1
40	51	10	40	58	8.5	40	55	6.2	40	61.5	9.2			
50	50	9.6	50	51	5.2	50	51	4	50	52.5	2.3			
60	48.5	9	60	50	4.1	60	49.5	2	60	51	3			
70	47.5	8.4				68	49	2.5	68	51	2.2			

Date	Lab Comments
06/06/2004	Temp at lab - iced.
07/19/2004	Temp at lab - iced.
08/21/2004	Temp at lab - iced.
10/16/2004	Temp at lab - iced.

Date	Collector Comments
10/16/2004	Cold, windy, snow and some sleet. Air temp. 35F. Not a nice day. But last day I will have boat in water.

Data Collectors (Source of Data):

42048 - Neal Klemme (Self-Help Lake Monitoring)

913 - Russ Tiedemann (Self-Help Lake Monitoring)

SD = Secchi depth measured in feet converted to meters; Chl = Chlorophyll a in micrograms per liter(ug/l); TP = Total phosphorus in ug/l, surface sample only; TSI(SD), TSI(CHL), TSI(TP) = Trophic state index based on SD, CHL, TP respectively; Depth measured in feet; Temp = Temperature in degrees Fahrenheit; D.O. = Dissolved Oxygen in parts per million.

Wisconsin Department of Natural Resources

Wisconsin Lakes Partnership

Report generated on : 5/11/2005

APPENDIX C

AQUATIC PLANTS

AQUATIC PLANTS

The following section contains all field data, maps, species descriptions and diagrams from macrophyte (aquatic plant) surveys performed in 1995 (for the FCAL grant) and 2003 for this grant project.

MACROPHYTE SURVEY

LAKE LUCERNE

FOREST COUNTY, WI

AUGUST, 2003

**PERFORMED BY NORTHERN LAKE SERVICE, INC.
400 NORTH LAKE AVENUE
CRANDON, WI**

MACROPHYTE SURVEY METHODOLOGY

A grid is drawn on a map of the lake so that intersection points give a good representation of the littoral zone (the area in which the bottom receives enough sunlight to support plant growth). These points will generally number between 30 and 80 depending on the size of the lake. Each point is numbered.

Once on the lake, a map, compass and visual estimations are used to locate the sampling stations. At each station an 8 to 10 foot circle is visualized and divided into 4 quadrants. Macrophytes are then collected, identified, and ranked as follows: 1 if present in 1 quadrant, 2 if present in 2 quadrants, etc... A ranking of 5 signifies complete or near complete dominance by one species, occupying a significant portion of the water column.

If a species is observed growing outside the circle, it is given a "p" for present. Species receiving only this designation are not considered when relative frequency, average density, and depth of growth are calculated, but are included on the species list. If a specimen cannot be identified to species it is referred to by the generic name followed by "sp" ("spp" indicates the presence of more than one unidentified species of the given genus.)

Water depth, depth to vegetation, percent open water, and bottom type (if depth permits) is also recorded at each station.

From the field sheets and notes a report is prepared. Along with a written section on the status of the aquatic plant population of the lake, the report contains all field sheets, a site map, a community map, a species list with percent frequency, average density and depth of growth for each species, a species glossary and species sketches.

Northern Lake Service, Inc
400 N. Lake Ave.
Crandon, WI 54520

LAKE LUCERNE MACROPHYTE SURVEY 2003

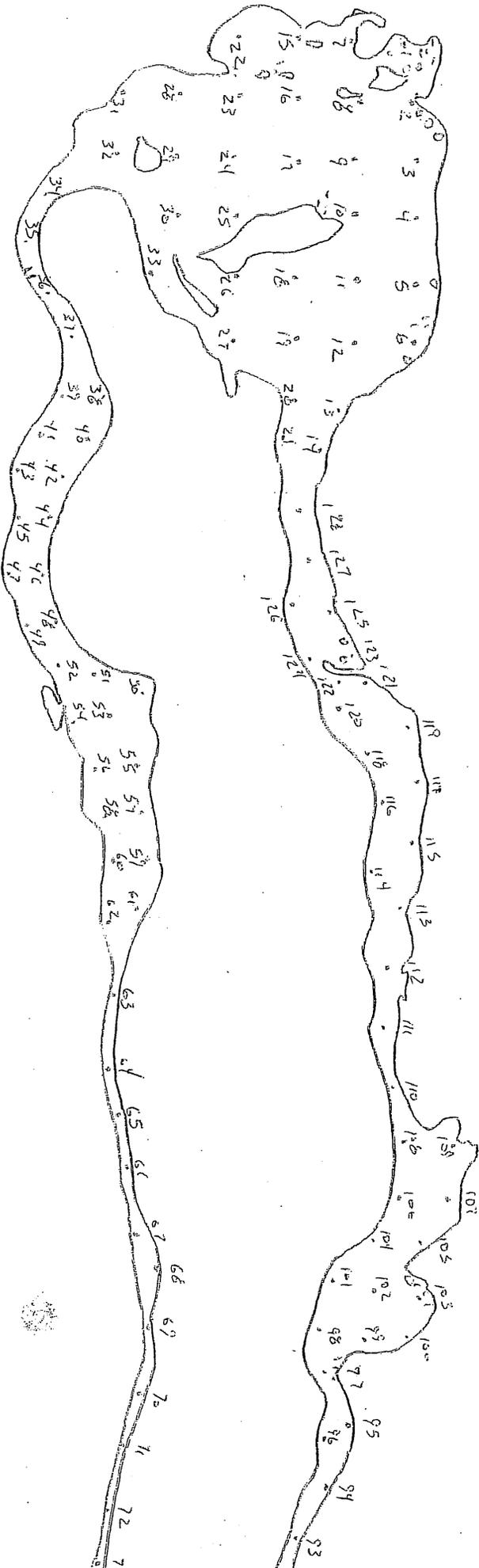
LUCERNE MACROPHYTE SPECIES LIST 2003

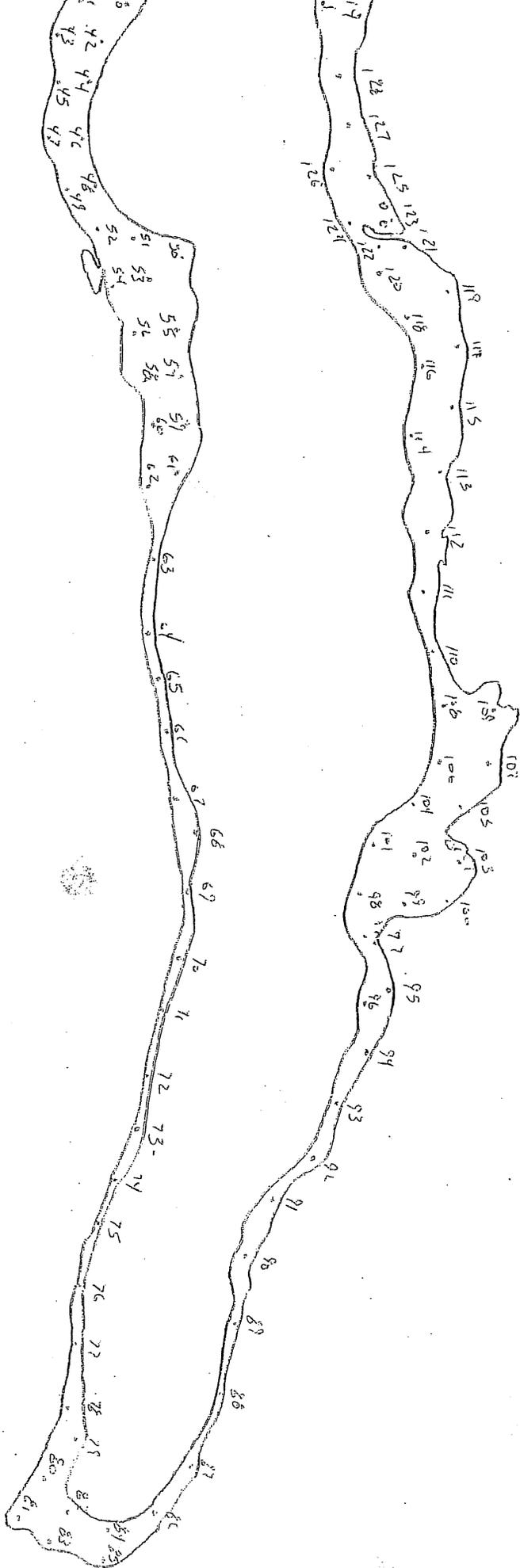
<u>Species (common name)</u>	<u>Relative Frequency(%)</u>	<u>Average Density</u>	<u>Depth of Growth(ft.)</u>
Brasenia shreberi (water shield)	2	2.0	3.0 - 4.0
Ceratophyllum demersum (coontail)	2	1.0	4.0
Chara vulgaris (muskwort)	15	1.5	2.0 - 22.0
Dulichium arundinaceum) (three-way sedge)	p		
Eleocharis acicularis (water needles)	16	1.8	2.5 - 7.0
Eleocharis sp (spike rush)	1	1.0	3.0
Elodea canadensis (American elodea)	1	1.0	4.0
Heteranthera dubia (water star-grass)	1	1.0	5.0
Isoetes sp. (quillwort)	2	1.0	5.0 - 13.0
Juncus pelocarpus (bayonet rush)	20	2.1	2.5 - 8.0
Lobelia dortmanna (water lobelia)	2	1.3	2.5 - 3.0
Myriophyllum exalbescens (Northern water milfoil)	3	2.0	3.0 - 7.0
M. tenellum (dwarf water milfoil)	9	2.1	3.0 - 7.0
Najas flexilis (slender najas)	29	1.9	2.5 - 12.0
Nitella flexilis (nitella)	9	2.1	9.0 - 20.0
N. hyaline (nitella)	9	1.4	7.0 - 15.0

LUCERNE MACROPHYTE SPECIES LIST 2003 (cont.)

<u>Species (common name)</u>	<u>Relative Frequency (%)</u>	<u>Average Density</u>	<u>Depth of Growth(ft.)</u>
Nuphar variagatum (yellow pond lily)	P		
Nymphaea odorata (white water lily)	2	1.0	3.0
Polygonum natans (water smartweed)	p		
Potamogeten amplifolius (large-leaf pondweed)	9	1.5	3.0 - 13.0
P. gramineus (variable pondweed)	41	2.2	2.0 - 14.0
P. illinoensis (Illinois pondweed)	1	3.0	3.0
P. natans (floating-leaf pondweed)	2	1.5	3.0 - 4.0
P. richardsonii (Richardson=s pondweed)	11	1.6	3.0 - 14.0
P. robbinsii (fern leaf pondweed)	16	2.4	3.0 - 17.0
P. sp.	3	1.2	3.0 - 12.0
Scirpus validus (Great bulrush)	1	1.0	4.0
Sparganium eurycarpum (burreed)	p		
Typha latifolia (cattail)	p		
Vallisneria americana (eelgrass, wild celery)	19	1.8	3.0 - 13.0
Zizania aquatica (wild rice)	1	1.0	3.0

NOTE: P = present, this species was present but did not occur within the circle at any given station





MACROPHYTE SURVEY OF:

BY:

ON:

TAXA	STATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<i>Brasenia Shreberi</i>		3					P	2								1
<i>Ceratophyllum demersum</i>																
<i>Chara</i>			1													
<i>Eleocharis acicularis</i>							2							3	3	
<i>Elodea canadensis</i>		1														
<i>Heteranthera dubia</i>						1										
<i>Juncus pelocarpus</i>						3	3									
<i>Lemna minor</i>																
<i>Lemna trisulca</i>																
<i>Megalodonta Beckii</i>																
<i>Myriophyllum exalbescens</i>																
M.																
M.																
Musci																
<i>Najas flexilis</i>		2	3			4	3	4	3	1			2			2
N.																
<i>Nitella</i>																
<i>Nuphar variegatum</i>																
<i>Nymphaea</i>		P	1			P		P								P
<i>Pontederia cordata</i>																
<i>Polygonum natans</i>																
<i>Potamogeton amplifolius</i>											3					
<i>P. gramineus</i>							2		1				1	2	2	
<i>P. praelongus</i>																
<i>P. zosteriformes</i>																
<i>P. rostratum</i>		3						1		4		4				4
<i>P. richardsonii</i>		2				3										1
P.																
<i>P. natans</i>		2	1					P								
<i>Scirpus</i>																
<i>Spartanum eurycarpum</i>						P	P									
<i>Spirodella polycarpum</i>																
<i>Typha latifolia</i>		P														
<i>Utricularia</i>																
<i>Vallisneria spiralis</i>		2	3			2	1	2		3						2
<i>Wolffia columbiana</i>																
Depth to vegetation		30	90							5						
% Open water @ 0.5' depth								90								95
Water depth (ft)		4	3	4 1/2	7	5	5	3	6	6 1/2	9	8	7	4	3	4
Bottom type		M	MSR	M	S	M	MR	M	M	M	S	S	S	SG	G	M

TAXA	STATION	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
<i>Brasenia Shreberi</i>																
<i>Ceratophyllum demersum</i>																
<i>Chara</i>				2												
<i>Eleocharis acicularis</i>																
<i>Flodea canadensis</i>																
<i>Heteranthera dubia</i>																
<i>Juncus belocarpus</i>																
<i>Lemna minor</i>																
<i>Lemna trisulca</i>																
<i>Megalodonta Beckii</i>																
<i>Myriophyllum exalbescens</i>																
M.																
M.																
Musci																
<i>Najas flexilis</i>								7			2					
N.																
<i>Nitella</i>				2												
<i>Najas variegatum</i>																
<i>Nymphaea</i>								P								
<i>Pontederia cordata</i>																
<i>Polygonum natans</i>																
<i>Potamogeton amplifolius</i>			P													
<i>P. gramineus</i>											3			1		
<i>P. praelongus</i>																
<i>P. rostriformis</i>																
<i>P. rub</i>						4	3									
<i>P. rub</i>																
P.																
P.																
<i>Scirpus</i>								P		i						P
<i>Sparganium eurycarpum</i>																
<i>Spirodella polycarpum</i>																
<i>Typha latifolia</i>																
<i>Utricularia</i>																
<i>Vallisneria americana</i>								3								
<i>Wolffia columbiana</i>																
Depth to vegetation																
% Open water @ 0.5' depth																
Water depth (ft)		5	6	9	13	14	14	4	5	6 1/2	4	7	7	8	4	5
Bottom type		M	M	S	S	S	S	M	M	M	R	R	RS	M	R	R

NORTHERN LAKE SERVICE, INC.

MACROPHYTE SURVEY OF:		BY:															ON:				
TAXA	STATION	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45					
<i>Brasenia Shreberi</i>																					
<i>Ceratophyllum demersum</i>										1		1									
<i>Chara</i>		2																			
<i>Eleocharis acicularis</i>		1					2					1			3						
<i>Elodea canadensis</i>																					
<i>Heteranthera dubia</i>																					
<i>Juncus pelocarpus</i>		3					2					2		2	2						
<i>Lemna minor</i>																					
<i>Lemna trisulca</i>																					
<i>Megalodonta Beckii</i>																					
<i>Myriophyllum exalbescens</i>																					
M. <i>lca</i>										1		3		3	2						
M.																					
Musci																					
<i>Najas flexilis</i>										1											
N.																					
<i>Nitella</i>																					
<i>Nuphar variegatum</i>																					
<i>Nymphaea</i>																					
<i>Pontederia cordata</i>																					
<i>Polygonum natans</i>																					
<i>Potamogeton amplifolius</i>																					
<i>P. gramineus</i>						4 ²	2	4	2			1	2		2 ⁺	P ^{sc}					
<i>P. praelongus</i>																					
<i>P. zosteriformes</i>																					
<i>P. vrb</i>			3		3	2															
<i>P. rch</i>						2															
P.																					
P.																					
<i>Scirpus</i>		P					P														
<i>Sparganium eurycarpum</i>																					
<i>Spirodella polycarpum</i>																					
<i>Typha latifolia</i>																					
<i>Utricularia</i>																					
<i>Vallisneria americana</i>												1			2						
<i>Wolffia columbiana</i>																					
<i>iso</i>		1																			
Depth to vegetation																					
% Open water @ 0.5' depth																					
Water depth (ft)		5	16	10	14	10	6	8	11	4	12	4	13	3	5	16					
Bottom type		S	S	R	S	S	S	SG	S	G	S	SG	S	S	S	S					

NORTHERN LAKE SERVICE, INC.

MACROPHYTE SURVEY OF:

BY:

ON:

TAXA	STATION	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
<i>Brasenia Shreberi</i>																
<i>Ceratophyllum demersum</i>																
<i>Chara</i>								1	X	1		1				
<i>Eleocharis acicularis</i>		2						1	X			1		4		3
<i>Elodea canadensis</i>																
<i>Heteranthera dubia</i>																
<i>Juncus pelocarpus</i>		2						3	3	1		3				
<i>Lemna minor</i>																
<i>Lemna trisulca</i>																
<i>Megalodonta Beckii</i>																
<i>Myriophyllum exalbescens</i>																
<i>M. L.</i>					3											3
<i>M.</i>																
<i>Musci</i>																
<i>Najas flexilis</i>							1					1		1		
<i>N.</i>																
<i>Nitella</i>																
<i>Nuphar variegatum</i>																
<i>Nymphaea</i>																
<i>Pontederia cordata</i>																
<i>Polygonum natans</i>																
<i>Potamogeton amplifolius</i>							1								2	
<i>P. gramineus</i>		1	2	X	2X	2	3			1	1	1	4	2		1
<i>P. praelongus</i>																
<i>P. zosteriformes</i>																
<i>P.</i>																
<i>P. riel</i>		2														
<i>P.</i>																
<i>P.</i>																
<i>Scirpus</i>																
<i>Sparqanium eurycarpum</i>																
<i>Spirodella polycarpum</i>																
<i>Typha latifolia</i>																
<i>Utricularia</i>																
<i>Vallisneria americana</i>		2				1									1	
<i>Wolffia columbiana</i>																
<i>Wolffia</i>				2			1									1
Depth to vegetation																
% Open water @ 0.5' depth																
Water depth (ft)		12	3	16	3	14	8	2 1/2	12	3	10	2 1/2	12	4	13	3
Bottom type		S	S	S	S	S	S	S	S	SG	S	S	S	S	S	S

MACROPHYTE SURVEY OF:

BY:

ON:

TAXA	STATION	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
<i>Brasenia Shreberi</i>																
<i>Ceratophyllum demersum</i>																
<i>Chara</i>			2								1			1		
<i>Eleocharis acicularis</i>																
<i>Eloдея canadensis</i>																
<i>Heteranthera dubia</i>																
<i>Juncus pelocarpus</i>																
<i>Lemna minor</i>																
<i>Lemna trisulca</i>																
<i>Megalodonta Beckii</i>																
<i>Myriophyllum exalbescens</i>				3	3	1										
M.																
M.																
Musci																
<i>Najas flexilis</i>				1			P				1					
N.																
<i>Nitella</i>																
<i>Nuphar variegatum</i>																
<i>Nymphaea</i>																
<i>Pontederia cordata</i>																
<i>Polygonum natans</i>																
<i>Potamogeton amplifolius</i>				1		1	P	P?								
<i>P. gramineus</i>			1	3		2	P				3		1			
<i>P. praelongus</i>																
<i>P. zosteriformes</i>																
<i>P. sub</i>						2										
<i>P. rich</i>				2	1	1										
P.																
P.																
<i>Scirpus</i>																
<i>Sparganium eurycarpum</i>																
<i>Spirodella polycarpum</i>																
<i>Typha latifolia</i>																
<i>Utricularia</i>																
<i>Vallisneria americana</i>				1		1	P									
<i>Wolffia columbiana</i>																
<i>Chara</i>												1				
Depth to vegetation																
% Open water @ 0.5' depth																
Water depth (ft)		14	2	6	6	7	8	10	E	8 1/2	8	11	9	12	16	14
Bottom type		S	SB	S	R	R	R	R	R	R	SR	G	SR	S	M	M

MACROPHYTE SURVEY OF:

BY:

ON:

TAXA	STATION	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
<i>Brasenia Shreberi</i>																
<i>Ceratophyllum demersum</i>																
<i>Chara</i>							1	1	1							
<i>Eleocharis acicularis</i>							1	3	1							
<i>Elodea canadensis</i>																
<i>Heteranthera dubia</i>																
<i>Juncus pelocarpus</i>							3	2								
<i>Lemna minor</i>																
<i>Lemna trisulca</i>																
<i>Megalodonta Beckii</i>																
<i>Myriophyllum exalbescens</i>																
<i>M. Ltn</i>							2	1								
<i>M.</i>																
<i>Musci</i>																
<i>Najas flexilis</i>		1	2	1				BL	3						2	
<i>N.</i>																
<i>Nitella</i>			1		3							1	4	1	4	
<i>Nuphar variegatum</i>																
<i>Nymphaea</i>																
<i>Pontederia cordata</i>																
<i>Polygonum natans</i>																
<i>Potamogeton amplifolius</i>							1									
<i>P. gramineus</i>						3	3		1	1	3	1				1
<i>P. praelongus</i>																
<i>P. zosteriformes</i>																
<i>P. roo</i>									1		1					
<i>P. rich</i>						1	1		3						1	
<i>P.</i>																
<i>P.</i>																
<i>Scirpus</i>																
<i>Sparganium eurycarpum</i>																
<i>Spirodella polycarpum</i>																
<i>Typha latifolia</i>																
<i>Utricularia</i>																
<i>Vallisneria americana</i>									1	2						
<i>Wolffia columbiana</i>																
<i>Chara</i>		1									1		1			1
<i>iso</i>																
Depth to vegetation									Pol	6	2					1
% Open water @ 0.5' depth																
Water depth (ft)		11	11	8	10	9	3	21	4	12	7	10	11	12	12	13
Bottom type		DR	SR	G	S	SG	S	S	S	S	S	SR	R	SG	S	S

NORTHERN LAKE SERVICE, INC.

MACROPHYTE SURVEY OF:

BY:

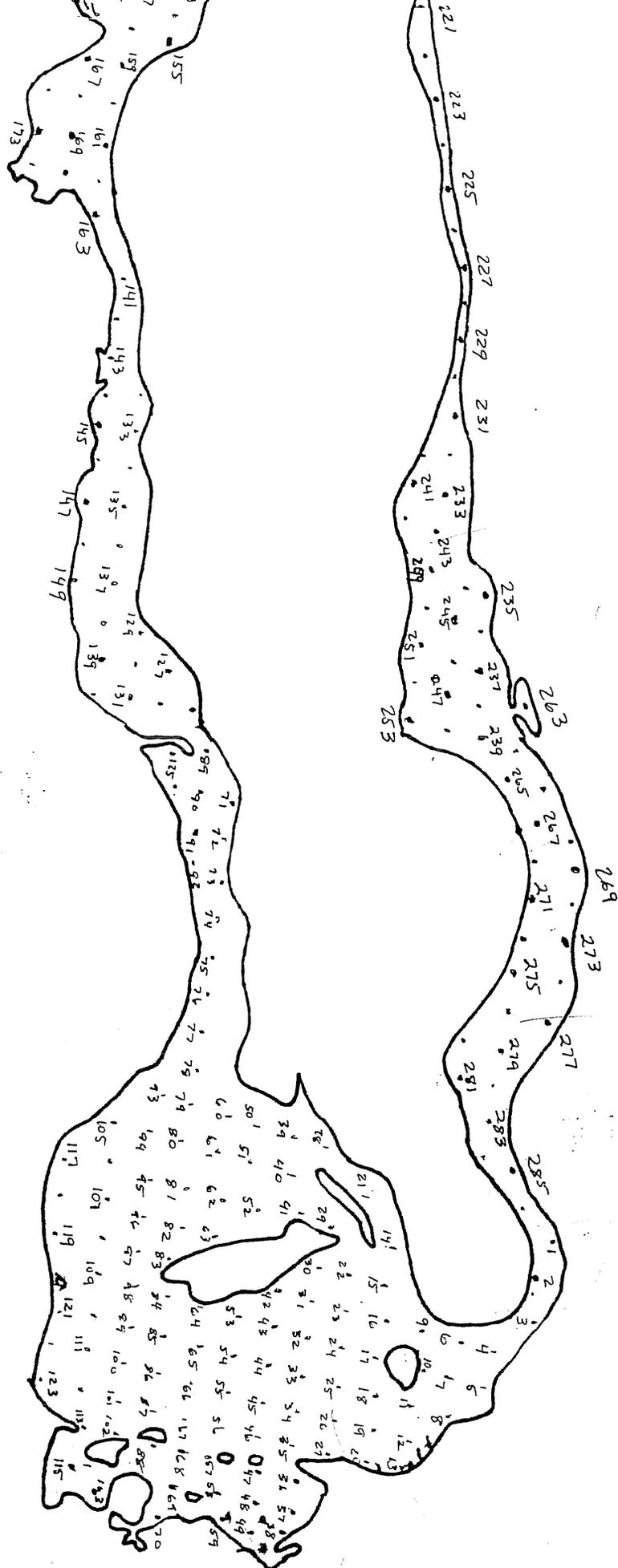
ON:

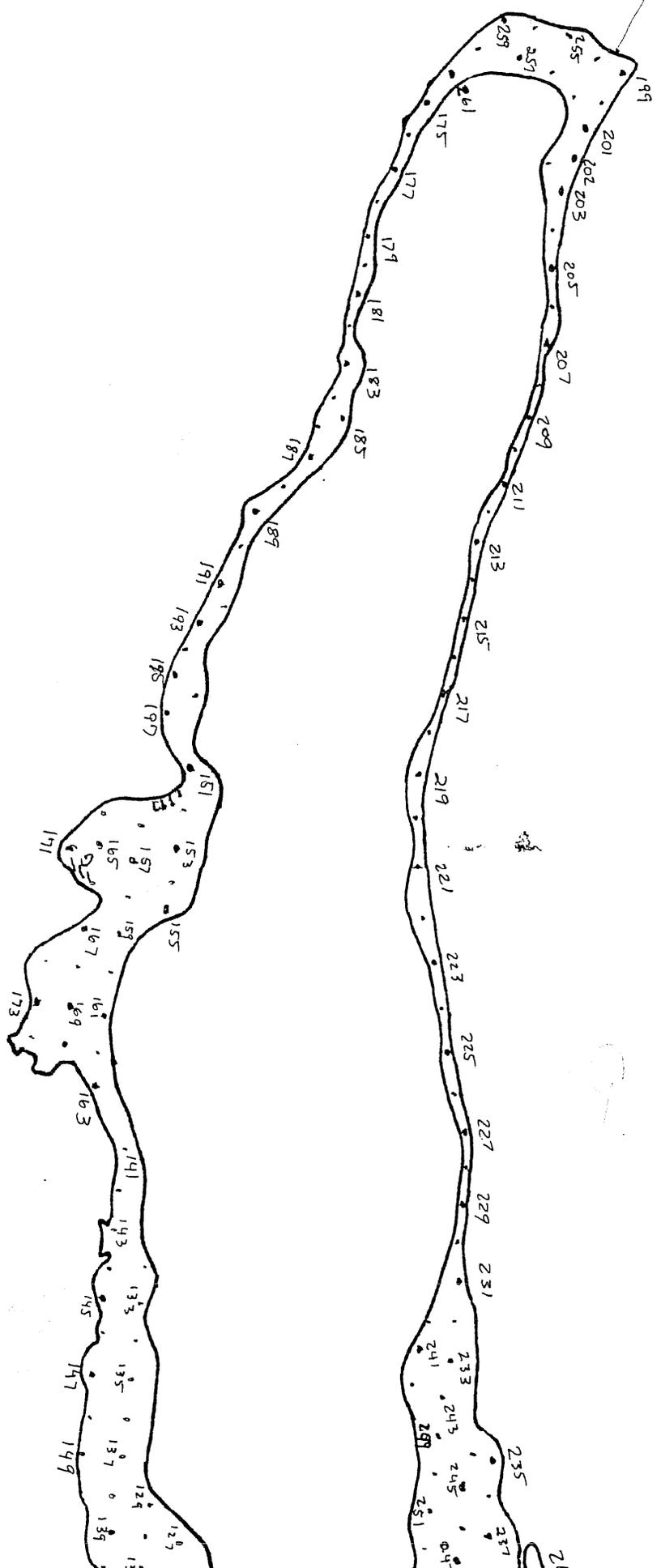
TAXA	STATION	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
<i>Brasenia Shreberi</i>																
<i>Ceratophyllum demersum</i>																
<i>Chara</i>							1							1	3	
<i>Eleocharis acicularis</i>													2		1	
<i>Elodea canadensis</i>																
<i>Heteranthera dubia</i>																
<i>Juncus pelocarpus</i>						1		1			2		2		1	
<i>Lemna minor</i>																
<i>Lemna trisulca</i>																
<i>Megalodonta Beckii</i>																
<i>Myriophyllum exalbescens</i>																
M.																
M.																
Musci																
<i>Najas flexilis</i>			3			2					1		3		4	
N.																
<i>Nitella</i>		1		2								1				
<i>Nuphar variegatum</i>																
<i>Nymphaea</i>														1		
<i>Pontederia cordata</i>																
<i>Polygonum natans</i>															P	
<i>Potamogeton amplifolius</i>													1	1		
<i>P. gramineus</i>		2	2			2				2	1		2	3		2
<i>P. praelongus</i>																
<i>P. zosteriformes</i>																
<i>P. rob</i>												1				
<i>P. rich</i>																
<i>P. ill</i>											3					
P.																
<i>Scirpus</i>									P							
<i>Sparganium eurycarpum</i>																
<i>Spirodella polycarpum</i>																
<i>Typha latifolia</i>																
<i>Utricularia</i>																
<i>Vallisneria americana</i>			2											2		
<i>Wolffia columbiana</i>																
<i>eleocharis</i>		Chara				Chara			P					1		
del														P		
zil						isoe								P		
Depth to vegetation																
% Open water @ 0.5' depth														90		
Water depth (ft)		9	8	12	13	6	22	3	16	6	30	16	10	3	17	5
Bottom type		S	S	S	S	SG	S	G	S	SE	SM	S	G.M	S	S	MC

NORTHERN LAKE SERVICE, INC.

MACROPHYTE SURVEY OF:		BY:												ON:					
TAXA	STATION	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120			
<i>Brasenia Shreberi</i>																			
<i>Ceratophyllum demersum</i>																			
<i>Chara</i>			1	1			3												
<i>Eleocharis acicularis</i>							1								1				
<i>Elodea canadensis</i>																			
<i>Heteranthera dubia</i>																			
<i>Juncus pelocarpus</i>			2								1				2				
<i>Lemna minor</i>																			
<i>Lemna trisulca</i>																			
<i>Megalodonta Beckii</i>																			
<i>Myriophyllum exalbescens</i>																			
<i>M. tan</i>							2		1										
<i>M.</i>																			
<i>Musci</i>																			
<i>Najas flexilis</i>			1		1				1		2		1		3	1			
<i>N.</i>																			
<i>Nitella</i>		2		3															
<i>Nuphar variegatum</i>																			
<i>Nymphaea</i>																			
<i>Pontederia cordata</i>																			
<i>Polygonum natans</i>																			
<i>Potamogeton amplifolius</i>					2					1		2							
<i>P. gramineus</i>			4		4				4		3		3		3	3			
<i>P. praelongus</i>																			
<i>P. zosteriformes</i>																			
<i>P. sp</i>		1								3		1	3	2					
<i>P. sp</i>											1			3		1			
<i>P.</i>																			
<i>P. sp</i>									1							2			
<i>Scirpus</i>																			
<i>Sparganium eurycarpum</i>																			
<i>Spirodella polycarpum</i>																			
<i>Typha latifolia</i>																			
<i>Utricularia</i>																			
<i>Vallisneria americana</i>			1						2		3		2		2				
<i>Wolffia columbiana</i>																			
<i>Chara like</i>		3							2		1				2				
Depth to vegetation																			
% Open water @ 0.5' depth																			
Water depth (ft)		15	5	18	9	16	7	8	7	17	3	15	10	14	7	12			
Bottom type		S	MS	S	M	S	SG	SG	MR	S	MR	S	RS	S	SM	S			

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LAKE LUCERNE MACROPHYTE SURVEY 1995

TAXA	STATION	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31
<i>Brasenia Shreberi</i>																	
<i>Ceratophyllum demersum</i>																	
<i>Chara</i>																	
<i>Eleocharis acicularis</i>									2	1							1
<i>Elodea canadensis</i>																	
<i>Heteranthera dubia</i>									1								
<i>Juncus pelocarpus</i>																	
<i>Lemna minor</i>																	
<i>Lemna trisulca</i>																	
<i>Megalodonta Beckii</i>																	
<i>Myriophyllum exalbescens</i>																	
M.																	
<i>Eleocharis</i>									2	1							
Musci																	
<i>Najas flexilis</i>									1								2
N.																	
<i>Nitella</i>																	
<i>Nuphar variegatum</i>																	
<i>Nymphaea round</i>									1								P
<i>Pontederia cordata</i>																	
<i>Polygonum natans</i>									P	P	P						
<i>Potamogeton amplifolius</i>		1															
<i>P. cramineus</i>																	3
<i>P. praelongus</i>																	
<i>P. rostriformis</i>																	
<i>P. robbinsii</i>		3		1											3		1
<i>P. richardsonii</i>														1	2		
P.																	
<i>Sagittaria</i>									P								
<i>Scirpus validus</i>									2	1							1
<i>Sparganium eurycarpum</i>																	
<i>Spirodella polycarpum</i>																	
<i>Typha latifolia</i>									1								
<i>Utricularia</i>																	P
<i>Vallisneria americana</i>																	
<i>Wolffia columbiana</i>																	
<i>Isoetes</i>			2														
<i>Carex</i>																	
<i>Lobelia dortmanna</i>										1							
Depth to vegetation		2.0	6.0	12.0	-	-	-	-	-	-	3.0	-	7.0	4.5	5.5	3.0	-
Open water @ 0.5' depth		100	100	100	100	100	100	60	90	100	100	100	100	100	100	100	99
Water depth (ft)		7.0	6.5	12.5	21.0	19.5	5.0	2.0	6.5	7.0	7.5	8.5	8.5	6.5	7.5	7.0	5.0
Bottom type		S	S	S	S	S	S+R	S	R	R	S	R	S	D	S	S	R

TAXA	STATION	45	38	35	39	39	41	43	47	49	51	53	55	57	59	61	63	65
<i>Brasenia Shreberi</i>					1										2			
<i>Ceratophyllum demersum</i>																		
<i>Chara</i>																		
<i>Eleocharis acicularis</i>																		
<i>Elodea canadensis</i>																		
<i>Heteranthera dubia</i>																		
<i>Juncus belocarpus</i>																		
<i>Lemna minor</i>																		
<i>Lemna trisulca</i>																		
<i>Megalodonta Beckii</i>																		
<i>Mvriophyllum exalbescens</i>																		
M.																		
M.																		
Musci																		
<i>Najas flexilis</i>					1				3		1							
N.																		
<i>Nitella</i>															1			
<i>Nuphar variegatum</i>															1			
<i>Nymphaea</i>					1				1						1			
<i>Pontederia cordata</i>															1			
<i>Polygonum natans</i>										P					1			
<i>Potamogeton amplifolius</i>																		
<i>P. gramineus</i>									1		1		3		4			
<i>P. praelongus</i>										P								
<i>P. rosteriformes</i>																		
<i>P. robbinsii</i>					1													
<i>P. richardsonii</i>									1		1							
<i>P. natans</i>															P			
<i>P. sp</i>																2		
<i>Scirpus validus</i>								1		P					P			
<i>Sparganium eurycarpum</i>															P			
<i>Spirodella polycarpum</i>																		
<i>Typha latifolia</i>											P							
<i>Utricularia</i>																		
<i>Vallisneria americana</i>										2								
<i>Wolffia columbiana</i>																		
<i>Sagittaria cristata</i>						3												
<i>Carex</i>										P					P			
<i>Filamentous algae</i>										P								
Depth to vegetation		-	-	-	-	-	-	-	-	-	-	4.5	-	4.0	-	11.0	-	-
% Open water @ 0.5' depth	100	100	100	80	100	100	99		95	100	100	100	100	100	80	100	100	100
Water depth (ft)	8.5	7.5	7.0	5.5	9.5	6.0	4.5		5.0	14.0	7.5	7.5	6.0	4.5	13.5	10.0	6.0	
Bottom type	S	S	S	M	R	R	R		M	S	S	M	R	M	S	S	M	

TAXA	STATION	67	69	71	73	75	77	79	81	83	85	87	89	91	93	95	97
<i>Brasenia Shreberi</i>			1														
<i>Ceratophyllum demersum</i>			1														
<i>Chara</i>										2							
<i>Eleocharis acicularis</i>											1						
<i>Flodea canadensis</i>																	
<i>Heteranthera dubia</i>																2	
<i>Juncus pelocarpus</i>																	
<i>Lemna minor</i>																	
<i>Lemna trisulca</i>																	
<i>Megalodonta Beckii</i>																	
<i>Myriophyllum exalbescens</i>																	
<i>M. tenellum</i>										2							
<i>M.</i>																	
Musci																	
<i>Najas flexilis</i>			1							1						2	
<i>N.</i>																	
<i>Nitella</i>				1	1								3			1?	
<i>Nuphar variegatum</i>																	
<i>Nymphaea</i>			P														
<i>Pontederia cordata</i>																	
<i>Polygonum natans</i>																	
<i>Potamogeton amplifolius</i>																	
<i>P. gramineus</i>									1								1
<i>P. praelongus</i>																	
<i>P. zosteriformes</i>																	
<i>P. robbinsii</i> 4'							2	1			4						3 3
<i>P. richardsonii</i>									1		2						
<i>P. sp</i>			1														
<i>P.</i>																	
<i>Scirpus</i>																	
<i>Sparganium eurycarpum</i>																	
<i>Spirodella polycarpum</i>																	
<i>Typha latifolia</i>																	
<i>Utricularia</i>																	
<i>Vallisneria americana</i>						1											
<i>Wolffia columbiana</i>																	
Depth to vegetation		-	-	19.5	20.5	11.5	11.0	8.5	9.5	5.0	2.0	-	31.0	-	4.5	6.0	7.0
% Open water @ 0.5' depth		100	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Water depth (ft)		7.0	3.5	20.0	21.0	12.0	15.0	12.5	12.5	6.0	7.5	7.5	32.0	12.0	5.0	9.0	10.0
Bottom type		M	M	S	R	R	S	M	M	R	S	S	R	S	R	M	M

TAXA	STATION	99	101	103	105	107	109	111	113	115	117	119	121	123	125	127	129	
<i>Brasenia Shreberi</i>				1						1	P			P				
<i>Ceratophyllum demersum</i>																	3	
<i>Chara</i>																	1	
<i>Eleocharis acicularis</i>																		
<i>Elodea canadensis</i>																		
<i>Heteranthera dubia</i>											1	1		2	3			
<i>Juncus pelocarpus</i>					1													
<i>Lemna minor</i>																		
<i>Lemna trisulca</i>																		
<i>Megalodonta Beckii</i>																		
<i>Myriophyllum exalbescens</i>							1						3					
<i>M. Tenellum</i>																		
<i>M.</i>																		
<i>Musci</i>																		
<i>Najas flexilis</i>				4	2					4	1							
<i>N.</i>																		
<i>Nitella</i>												1						
<i>Nuphar variegatum</i>				P													P	
<i>Nymphaea</i>				1					1	1	P						P	
<i>Pontederia cordata</i>																	1	
<i>Polygonum natans</i>										4								
<i>Potamogeton amplifolius</i>													1					
<i>P. gramineus</i>						1						3	1	3	1	P		
<i>P. praelongus</i>																		
<i>P. rosteriformes</i>																		
<i>P. richardsonii</i>				3										2				
<i>P. robbinsii</i>				4						3							1	
<i>P. natans</i>				4					1					2				
<i>P.</i>																		
<i>Scirpus validus</i>				P											P			
<i>Sparganium eurycarpum</i>																		
<i>Spirodella polycarpum</i>																		
<i>Typha latifolia</i>				P						P								
<i>Utricularia</i>																		
<i>Vallisneria americana</i>				2					2	2	1							
<i>Wolffia columbiana</i>																		
<i>Sagittaria cristata</i>										1								
<i>Eleocharis</i>											P						1	
<i>Eriocaulon</i>																	1	
Depth to vegetation		-	2.0	-	5.0	6.5	-	-	-	-	-	-	6.0	6.0	-	-	15.0	16.5
% Open water @ 0.5' depth		100	100	20	100	100	100	100	95	10	95	100	100	90	95	100	100	
Water depth (ft)		7.5	5.0	4.5	5.5	6.5	10.0	7.5	6.0	5.0	3.5	7.0	7.0	5.0	3.0	6.0	18.5	
Bottom type		S	S	M	R	M	M	M	M	M	R	M	M	M	R	S	S	

TAXA	STATION	131	133	135	137	139	141	143	145	147	149	151	153	155	157	159	161
<i>Trasenia Shreberi</i>																	
<i>Paratophyllum demersum</i>																	
<i>Chara</i>				1				2			1	2		4			
<i>Leocharis acicularis</i>								2				3					
<i>Podia canadensis</i>																	
<i>Peteranthera dubia</i>																	
<i>Puncus pelocarpus</i>								3									
<i>Pemna minor</i>																	
<i>Pemna trisulca</i>																	
<i>Pegalodonta Beckii</i>																	
<i>Pyriophyllum exalbescens</i>																	
<i>Pyrisia</i>																	
<i>Pyrisia flexilis</i>						1		1		1					1		
<i>Pyritella</i>		2				1?								1	2	3?	4
<i>Puphar variegatum</i>																	
<i>Pymphaea</i>																	
<i>Pontederia cordata</i>																	
<i>Polygonum natans</i>																	
<i>Potamogeton amplifolius</i>																	
<i>Potamogeton gramineus</i>						3		1	1	1							
<i>Potamogeton praelongus</i>																	
<i>Potamogeton rostriformes</i>																	
<i>Potamogeton richardsonii</i>										3							
<i>Potamogeton robbinsii</i>										2					1		
<i>Potamogeton sp</i>										1							
<i>Potamogeton</i>																	
<i>Potamogeton eurycarpum</i>																	
<i>Potamogeton polycarpum</i>																	
<i>Potamogeton latifolia</i>																	
<i>Potamogeton tricularia</i>																	
<i>Potamogeton americana</i>																	
<i>Potamogeton columbiana</i>																	
<i>Potamogeton Leocharis</i>												P					
<i>Potamogeton Lobelia dortmanna</i>												2					
Depth to vegetation		-	34.0	18.5	-	6.5	-	6.5	7.5	7.0	9.0	4.0	-	16.0	9.0	16.5	22.0
% Open water @ 0.5' depth		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Water depth (ft)		9.5	36.0	19.5	18.5	9.5	11.0	7.0	8.5	10.5	10.0	4.5	16.0	18.0	10.5	17.0	24.0
Bottom type		R	S	S	S	R	R	G	R	S	R	S	S	S	S	S	S

10
5
3
4
13
7
3
3
1
2

MACROPHYTE SURVEY OF: *Lucerne*

BY:

ON:

~~163 165 167 169 171 173 175 177 181 183 185 187 189 191 193~~

TAXA	STATION	177	163	165	167	169	171	173	175	177	181	183	185	187	189	191	193
<i>Brasenia Shreberi</i>																	
<i>Ceratophyllum demersum</i>																	
<i>Chara</i>					2												
<i>Eleocharis acicularis</i>							4										
<i>Elodea canadensis</i>																	
<i>Heteranthera dubia</i>																	
<i>Juncus pelocarpus</i>					3		3										
<i>Lemna minor</i>																	
<i>Lemna trisulca</i>																	
<i>Megalodonta Beckii</i>																	
<i>Myriophyllum exalbescens</i>																	
M.																	
M.																	
Musci																	
<i>Najas flexilis</i>					4	3		1									
N.																	
<i>Nitella</i>	1		2	1	2				1		2	4		2	1		
<i>Nuphar variegatum</i>																	
<i>Nymphaea</i>							P										
<i>Pontederia cordata</i>																	
<i>Polygonum natans</i>																	
<i>Potamogeton amplifolius</i>																	
<i>P. gramineus</i>			3	1		4	3				2						
<i>P. praelongus</i>																	
<i>P. zosteriformes</i>								1									
<i>P. richardsonii</i>									1								
<i>P. robbinsii</i>					2		1							2			
<i>P. sp</i>									1					2			
P.																	
<i>Scirpus</i>																	
<i>Sparganium eurycarpum</i>																	
<i>Spirodella polycarpum</i>																	
<i>Typha latifolia</i>																	
<i>Utricularia</i>																	
<i>Vallisneria americana</i>							P	2									
<i>Wolffia columbiana</i>																	
<i>Isoetes</i>				1		1											
<i>Eleocharis</i>						2											
Depth to vegetation	25.5	-	7.5	5.5	12.0	-	6.0	-	18.0	-	6.5	20.5	-	10.5	10.0	-	-
% Open water @ 0.5' depth	100	100	100	100	100	60	100	100	100	100	100	100	100	100	100	100	100
Water depth (ft)	27.0	12.5	8.5	6.0	14.0	3.0	8.5	16.0	19.5	14.0	8.5	22.0	8.5	12.5	11.0	12.5	12.0
Bottom type	R	R	S	S	S	S	S	R	R	R	S	S	S	S	R	S	S

MACROPHYTE SURVEY OF: *Lucerne*

BY: *NLS*

ON: *8/14/95 + 8/15*

TAXA	STATION	197	199	201	203	205	207	209	211	213	215	217	219	221	223	225	227
<i>Brasenia Shreberi</i>			P														
<i>Ceratophyllum demersum</i>																	
<i>Chara</i>																	
<i>Eleocharis acicularis</i>			2														
<i>Elodea canadensis</i>																	
<i>Heteranthera dubia</i>																	
<i>Juncus pelocarpus</i>																	
<i>Lemna minor</i>																	
<i>Lemna trisulca</i>																	
<i>Megalodonta Beckii</i>																	
<i>Myriophyllum exalbescens</i>																	
M.																	
M.																	
Musci																	
<i>Najas flexilis</i>																	
N.																	
<i>Nitella</i>																	
<i>Nuphar variegatum</i>																	
<i>Nymphaea</i>																	
<i>Pontederia cordata</i>																	
<i>Polygonum natans</i>			P														
<i>Potamogeton amplifolius</i>																	
<i>P. gramineus</i>		a	2														
<i>P. praelongus</i>																	
<i>P. zosteriformes</i>																	
<i>P. richardsonii</i>																	
<i>P. robbinsii</i>																	
P.																	
P.																	
<i>Scirpus</i>																	
<i>Sparganium eurycarpum</i>																	
<i>Spirodella polycarpum</i>																	
<i>Typha latifolia</i>																	
<i>Utricularia</i>																	
<i>Vallisneria americana</i>			P														
<i>Wolffia columbiana</i>																	
<i>Lythrum</i>			P														
Depth to vegetation		7.5	6.0														
% Open water @ 0.5' depth		100	100														
Water depth (ft)		9.0	2.0														
Bottom type		S	M														

TAXA	STATION	229	231	233	235	237	239	241	243	245	247	249	251	253	255	257	259
<i>Brasenia Shreberi</i>																	
<i>Ceratophyllum demersum</i>																	
<i>Chara</i>				3	1		3			1	1				1		
<i>Eleocharis acicularis</i>				3	3	1	2				2				3		1
<i>Flodea canadensis</i>																	
<i>Heteranthera dubia</i>																	
<i>Juncus pelocarpus</i>				1	3	1			3		3				2		1
<i>Lemna minor</i>																	
<i>Lemna trisulca</i>																	
<i>Megalodonta Beckii</i>																	
<i>Myriophyllum exalbescens</i>																2	
<i>M. Tenellum</i>								1									
<i>M.</i>																	
<i>Musci</i>																	2
<i>Najas flexilis</i>				2		2											
<i>N.</i>																	
<i>Nitella</i>				1?											2?		2?
<i>Nuphar variegatum</i>																	
<i>Nymphaea</i>																	
<i>Pontederia cordata</i>																	
<i>Polygonum natans</i>																	
<i>Potamogeton amplifolius</i>																	
<i>P. gramineus</i>						2	3	3		2	3		3	1	2		
<i>P. praelongus</i>																	
<i>P. rosteriformes</i>																	
<i>P. richardsonii</i>										1		1					
<i>P. robbinsii</i>																1	2
<i>P.</i>																	
<i>filamentous algae</i>					2												
<i>Scirpus</i>																	
<i>Sparganium eurycarpum</i>																	
<i>Spirodella polycarpum</i>																	
<i>Typha latifolia</i>																	
<i>Utricularia</i>																	
<i>Vallisneria americana</i>															1		2
<i>Wolffia columbiana</i>																	
<i>Lobelia dortmanna</i>					1		2										
<i>Isoetes</i>							1		1								
<i>Eleocharis</i>					2	P									P		
Depth to vegetation				4.0	-	1.0	5.0	-	7.5	10.0	4.5	17.5	13.5	-	5.5	14.0	4.5
% Open water @ 0.5' depth				100	85	100	100	100	100	100	100	100	100	100	100	100	100
Water depth (ft)				4.5	2.5	4.0	6.5	10.5	8.5	12.0	6.5	19.5	15.5	13.5	7.0	15.5	5.0
Bottom type				S	S	G	S	S	S	S	S	S	S	S	M	S	S

SPECIES GLOSSARY

- Brasenia shreberi*: Water shield(1); football-shaped floating leaves approximately 12 cm x 7 cm; thin, red stem attached to center of leaf; red waxy flower held about 1 cm above water surface; stem and underside of leaf extremely slimy.
- Ceratophyllum demersum*: Coontail (2); leaves 1 - 3.5 cm long, whorled on stems, palmately divided and serrated on one side; leaves crowded at tips of stems giving "coontail" effect.
- Chara* sp.: Muskwort(3); rigid, often brittle algae growing to 1 ft.; "leaves" simple, whorled around stems; plants reddish brown, yellow or green; strong musty smell when crushed.
- Dulichium arundinaceum*: Threeway sedge(4); distinctive grass-like emergent plant, see sketch).
- Eleocharis acicularis*: Needle rush(5); usually inconspicuous small grass-like plant; leaves linear ? 1 mm diameter to 10 cm long.
- Eleocharis* sp.: Spike rush(6); stems rigid, unbranched, extending out of the water; flowers tiny in a spike at the very tip of the stem; some species with floating string-like leaves.
- Elodea canadensis*: American elodea; leaves 1-2 cm long by 1.5-3 mm whorled on stems in groups of 3's or 4's; whorls about 0.5-1 cm apart; stem thin, light colored and brittle; flowers, with extremely thin white petiole, float on surface.
- Heteranthera dubia*: Mud plantain(8); leaves ? 10 cm long, 5 mm wide, sessile; stems slender with many branches; flowers small pale yellow; plant resembles a pondweed but leaves lack midvein.
- Isoetes* sp.: Quillwort(7); leaves 10-30 cm, grass-like, hollow, recurved pointed; leaf bases swollen clasping.
- Juncus pelocarpus*: Bayonet rush(9); cluster of long (3 to 20 mm), narrow, stiff leaves tapering to a sharp point. Clusters connected by narrow rootstock. Usually grows on sandy bottom.
- Lobelia dortmanna*: Water lobelia(10); leaves to 10 cm; consisting of two hollow tubes united length-wise in basal rosette; flowers pink to purple, lipped to 2 cm, 2-7 on solitary stem which may or may not extend out water.
- Lythrum* sp.: Purple loosestrife(18); tall nuisance exotic that grows from aquatic to terrestrial habitats; leaves opposite or alternate and thinly heart-shaped. flowers bright purple numerous in long spike.

- Myriophyllum exalbescens*: Northern water milfoil(11); submerged leaves to 3 cm long, in whorls of 3,4, or 5, dissected into 6-10 pairs of thin segments from a central axis; flower small on a spike held above the water; floral bracts very small.
- M. tenellum*: Dwarf water milfoil(12); inconspicuous plant consisting of a stiff upright stem ? 3 to 20 mm., leaves reduced to small scales long the stem; stems joined by slender rootstock; usually grows on sandy bottom.
- Najas flexilis*: Slender naiad(13); leaves 1-3.5 cm long, opposite on stems, tapering to a slender pointed tip; leaf bases clasping; stems slender, flexible; plant extremely limp out of water.
- Nitella* sp.: *Nitella*(14); large limp algae; dark green, almost transparent; "leaves" whorled on stems, with forked tips.
- Nuphar variegatum*: Yellow pond lily, spatterdock(16); leaves large (to 50 cm) oval, basal lobes rounded; stem stout, attached to leaf between basal lobes; flowers large (to 10 cm), yellow spherical.
- Nymphaea odorata*: White water lily(15); leaves large (to 40 cm) nearly circular; basal lobes pointed; stem stout attached to leaf between basal lobes; flower large (to 20 cm) with 25-50 waxy white petals surrounding yellow center.
- Polygonum natans*: Water smartweed(17); leaves to 10 cm, oval to elliptical, floating, glossy; petioles ? 3 cm; stipules unite forming papery tube; flowers small, pink, crowded into spike.
- Potamogeton amplifolius*: Large-leaf pondweed(18); leaves to 20 cm, folded along midrib and recurved (banana-shaped); plants often turning brown; flowers on dense spike (to 8 cm) held above the water; stipules rigid, persistent (to 4 cm); often with elliptical floating leaves.
- P. gramineus*: Variable pondweed(19); leaves variable usually to 7 cm x 8 mm somewhat bluntly tapered; veins 3-7, often several erect, branching stems on runner-like horizontal stem; stipules persistent ? 2 cm long; fruits dense on 1-3 cm spike.
- P. illinoensis*: Illinois pondweed(20); leaves lanceolate to 20 cm veins 9-19; stipules persistent, rigid to 8 cm; stem stout, branching; fruits dense on 6 cm spike.
- P. natans*: Floating leaf pondweed(21); submerged leaves linear 10-20 cm x 1-2 mm with 3-5 faint veins; floating leaves to 10 cm x 6 cm, oval, thick, 20-30 veins; stipules 4-10 cm with sharp tips; spike to 6 cm; stem with little branching.

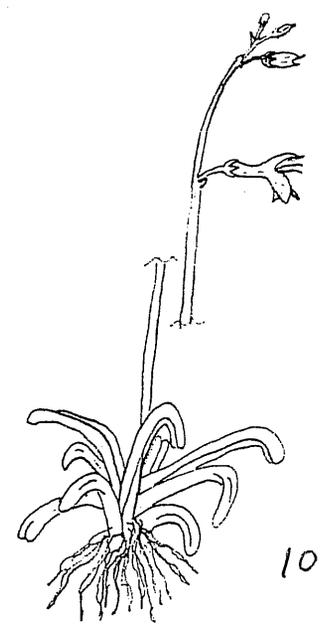
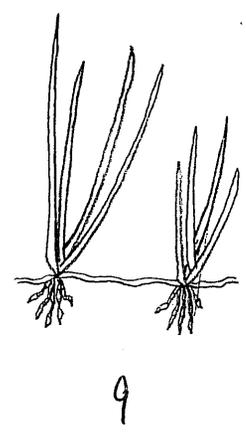
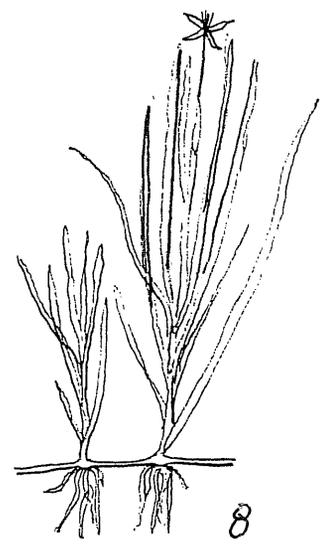
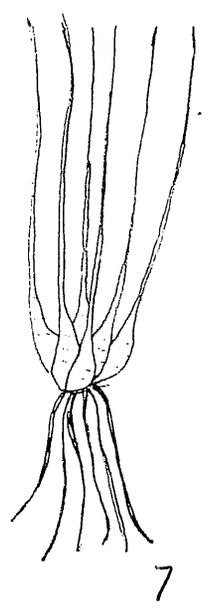
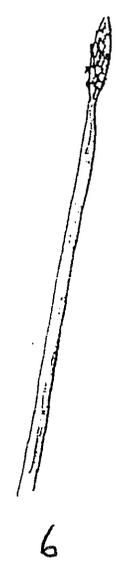
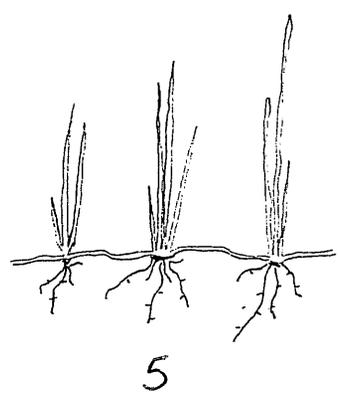
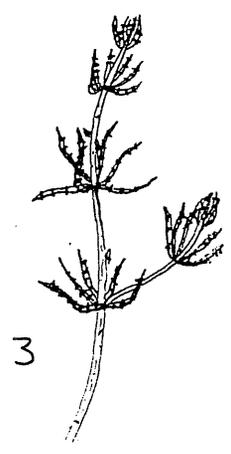
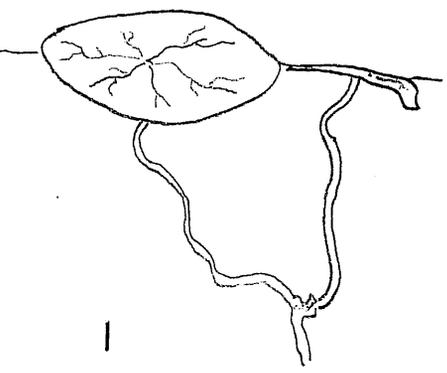
- P. richardsonii*: Richardson's pondweed(22); leaves to 10 cm, often with conspicuous white midvein, wavy leaf margins, clasping stems tapering to slender tip; stipules blunt, not persistent; stem usually white; floral spike to 3 cm.
- P. robbinsii*: Robbin's pondweed(23); leaves strongly two ranked(plant resembles a fern under water), stiff, ? 10 cm x 5 mm; stipules not persistent; stem slightly flattened usually un-branched.
- Scirpus* sp.: Bulrush(24); stems simple, rigid, linear, erect to 2m, round, mostly hollow; flowers spraying out from side of stem near the end (actually end of stem with bract).
- Typha latifolia*: Cattail; leaves sword-like to 2 m, stiff; to 3 m stiff, erect; flowers tiny crowded into large (to 20 x 5 cm) cigar-like spike.
- Vallisneria americana*: Eel grass, wild celery(25); leaves ribbon-like to 1 m x ? 1.5 cm wide; flowers, white ? 1 cm, floating on long, slender, spirally stem.
- Zizania aquatica*: Wild rice(26); large grass-like emergent, flower heads large (to 20 cm), florets hanging on long petioles, not densely packed.

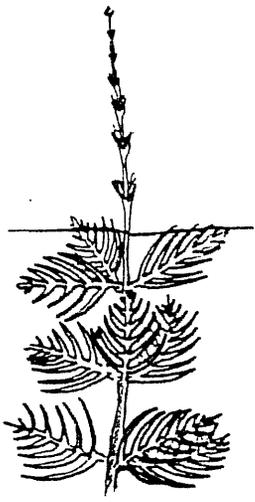
(These definitions have been written with regard to the species and variations of species found in Forest County. It should not be relied upon as a key, especially in other areas.)

REFERENCES

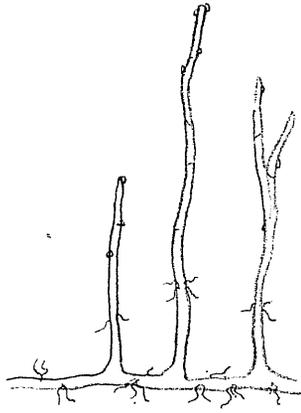
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Lopinot, Alvin C. and Glen S. Winterringer, Aquatic Plants of Illinois, 1966, pp. 140, Department of Registration and Education, Illinois State Museum Division and Department of Conservation, Division of Fisheries.

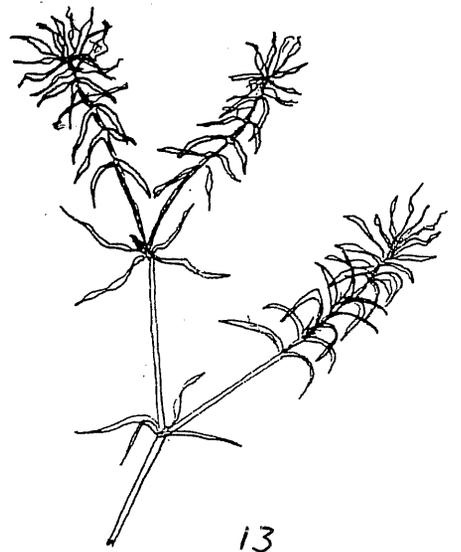




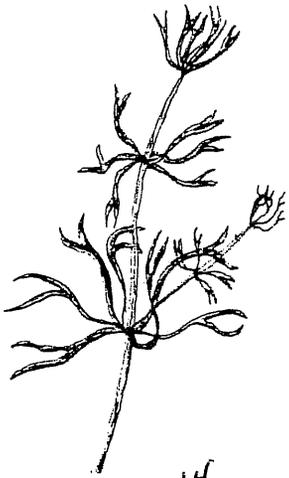
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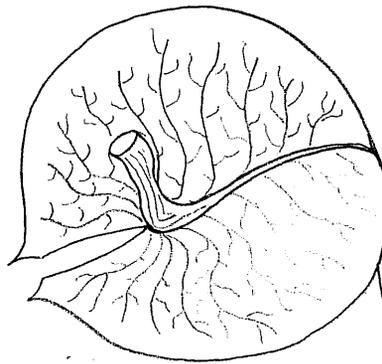
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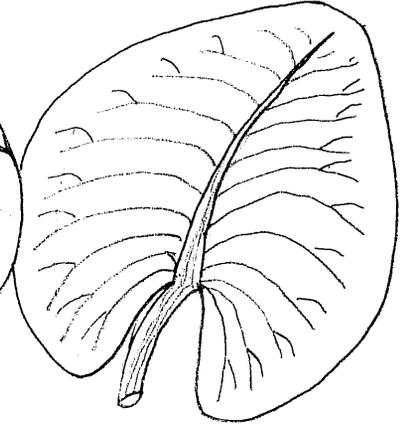
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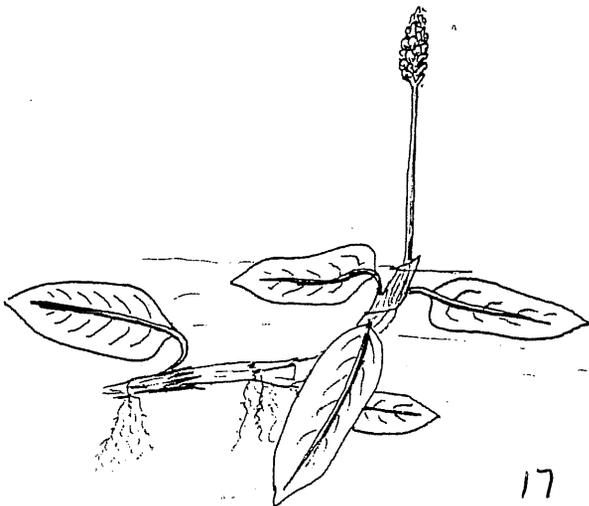
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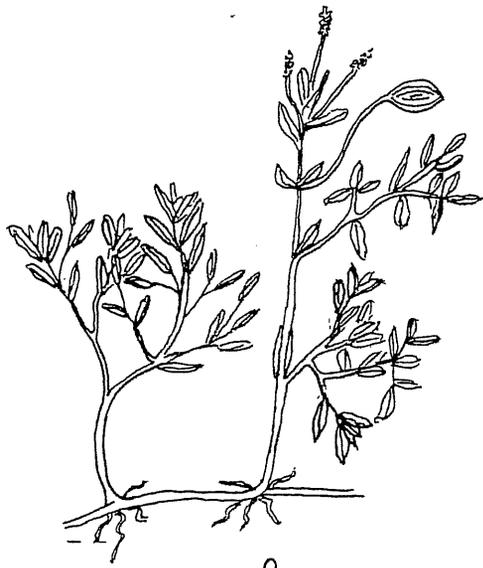
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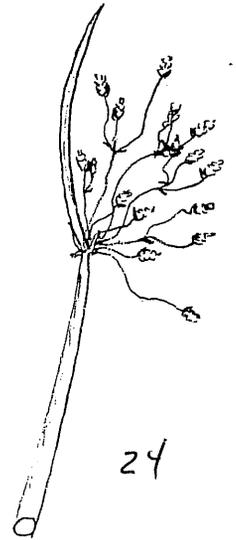
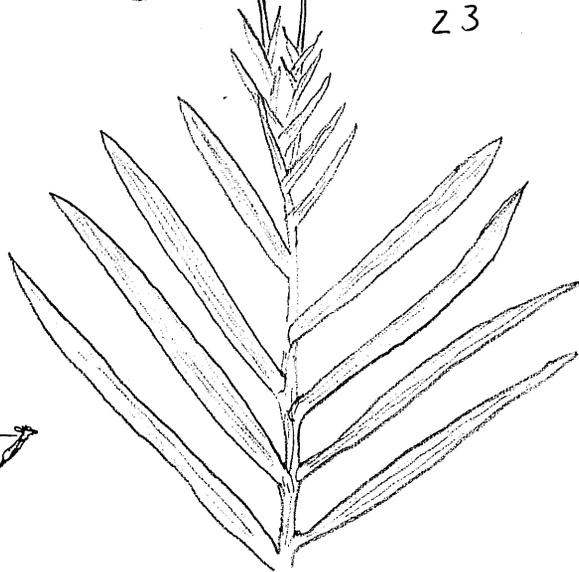
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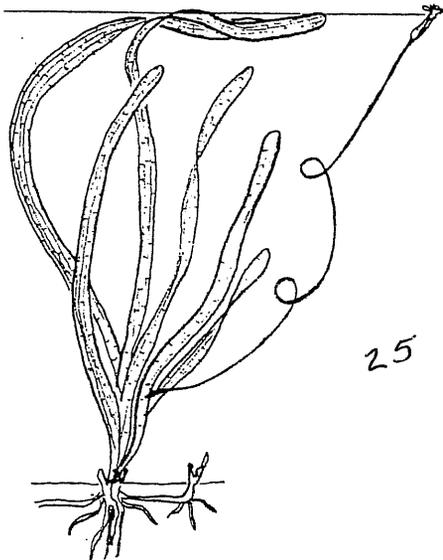
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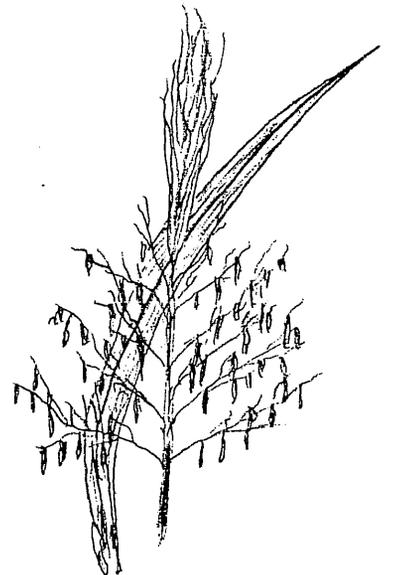
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26

APPENDIX D

FISHERY

FISHERY

The following information was compiled and presented by Association members. It was gathered from Wisconsin Department of Natural Resources and Great Lake Indian Fish and Wildlife Commission records along with Association data.

LAKE LUCERNE FISHERIES

Lake Lucerne has been a fishing lake for many years. The fish population has consisted of small and largemouth bass, northerns, whitefish, lake trout, splake, rainbow trout and brown trout. The panfish population consists of rock bass, bluegills, perch and some crappies. There are some bottom feeders such as bullheads and suckers.

This lake has always been a good fishing lake, but over the years the fishing has deteriorated due to the introduction of pollution caused by a greater density of homes, poorly maintained septic tanks and fields, increased fertilizers, and the introduction of smelt whose population has increased over the years.

It appears that the introduction of smelt may have been caused by anglers who put live smelt in buckets where the eggs and melt mixed, fertilized and then were stocked when the anglers dumped the contents into the lake. Such dumpings are considered illegal since the smelt are considered “rough fish” which cannot be transported within the state without a permit.

The reason the walleye are particularly susceptible to smelt are twofold. First, walleye hatch about the same time as the smelt. Secondly, the young walleye, hatched or planted, then move to the middle of the lake to eat zooplankton. Circumstantial evidence indicates

that the adult smelt feed on little walleye. In addition young walleye compete with the young smelt for the same zooplankton food supply. There isn't much left at the dinner table when the smelt are done.

Over the years, the Wisconsin Department of Natural resources (WDNR) has planted splake, coho and trout to try to reduce the population of smelt. It appears none of these efforts have been successful.

To give all lake residents and other fishing people a greater opportunity to catch fish, particularly walleye and trout, the WDNR has stocked Lake Lucerne over the years. Exhibit 1 shows the DNR stocking of various fish species from 1969 up to 2001.

The Forest County Walleye Association (FCWA), with support from the Lake Lucerne Association, has stocked walleye in Lake Lucerne since 1992. Exhibit 2 shows FCWA stocking numbers since 1992.

For the last 3 years, in addition to the stocking by FCWA, the LLA has been buying and planting extended growth walleye in the amounts shown in exhibit 3.

The WDNR fish for stocking are raised in hatcheries to protect them during their most vulnerable life stages then released into the lake to allow them to grow to adulthood. The FCWA raise fish from fry in ponds to extended growth, to give them an added advantage to survive.

Fish may be stocked when they are fry (newly hatched), fingerlings (up to one year old – 1 ½ - 2”), or yearlings (12 to 23 months old – 5 – 9”). Lake survey (fyke nets or electro shocking) and past experience determine if the lake should be stocked, what species to stock and what size the fish need to be to survive in the water. Fish biologists consider harvest regulations (bag limits), catch records and determine in calculating how many fish should be stocked. Exhibit 4 shows walleye stocking from 1994 to 2002. There have also been stocking of brown trout with 20,000 in 1998, 30,000 in 2001 and 30,000 in 2003.

In addition to WDNR stocking, the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) also stocked walleye as shown in exhibit 5.

It is estimated that 0.1% of the fry that are stocked reach maturity. Approximately 1% to 3% of fingerlings grow to adulthood.

Per the GLIFWC study of 2001 exhibit 6) there was an estimated male walleye population of 1229.9 for the lake of 1026 acres, which equates to 1.20 male walleyes per acre. There was an estimated female population of 319 for 1026 acres. This equates to 0.31 female walleyes per acre. For combined sexes and unknowns the estimated walleye population is 1912.9 for 1026 acres or 1.86 walleye per acre.

Per a 2002 fall recruitment survey of walleye (exhibit 7) of 0 and 1 year old made by boom shocking, the catch effort showed 2.1 walleye per mile. In a similar study made in 2003 (exhibit 8) catch effort showed 1.4 walleye per mile. This shows a decline per mile of 0 to 1 year olds even after the stockings that had taken place.

**DNR FISH STOCKING RECORDS
LAKE LUCERNE
FOREST COUNTY**

YEAR	SPECIES	NO. PLANTED	SIZE	REMARKS
1937	Lake trout	144,960	Fingerlings	None
1938	Lake trout	100,000	Fingerlings	None
1939	Lake trout	108,000	Fingerlings	None
1940	Lake trout	92,500	Fingerlings	None
1940	Blue Gill	1,950	Fingerlings	None
1941	Lake trout	101,400	Fingerlings	None
1941	Perch	16,948	Fingerlings	None
1941	S. M. Bass	3,000	Fingerlings	None
1942	Lake trout	100,000	Fingerlings	None
1942	S. M. Bass	7,000	Fingerlings	None
1942	No. Pike	46,000	Fry	None
1942	Walleye	400,000	Fry	None
1943	S. M. Bass	7,000	Fingerlings	None
1943	Walleye	375,000	Fry	None
1944	S. M. Bass	7,000	Fingerlings	None
1944	Walleye	700,000	Fry	None
1945	Lake trout	23,625	Fingerlings	None
1945	Walleye	8,000	Fingerlings	None
1946	Lake trout	240,000	Fry	None
1947	Walleye	12,624	Fingerlings	None
1950	Walleye	8,100	Fingerlings	None
1952	Walleye	5,570	Fingerlings	None
1953	Walleye	8,590	Fingerlings	None
1954	Walleye	2,500	Fingerlings	None
1955	Rainbow trout	33,395	Fingerlings	None
1956	Rainbow trout	30,000	Fingerlings	None
1957	Rainbow trout	9,000	Holdovers	None
1958	Rainbow trout	24,000	Fingerlings	None
1959	Rainbow trout	22,743	Fingerlings	None
1960	Rainbow trout	23,000	Fingerlings	None
1961	Rainbow trout	12,000	Fingerlings	None
1962	Rainbow trout	6,000	Fingerlings	None
1962	Splake	8,000	Yearlings	None
1963	Splake	27,640	Fingerlings	None
1964	Lake trout	26,300	Fingerlings	None
1965	No record			
1966	No record			
1967	Walleye	25,000	Fingerlings	None
1967	Rainbow trout	10,000	Fingerlings	None

YEAR	SPECIES	NO. PLANTED	SIZE	REMARKS
1967	Splake	8,175	Yearlings	None
1968	Lake trout	25,000	Fingerlings	None
1968	Splake	8,000	Yearlings	None
1969	Splake	27,616	Yearlings	6-7" average
1974	Lake trout	26,300	Yearlings	5-20-74
1974	Coho	8,500	Yearlings	4-11-74
1975	Coho	20,000	Yearlings	4-28-75
1977	Walleye	25,000	Fingerlings	9-20-77
1977	Rainbow trout	10,000	Fingerlings	4-13-77
1978	Lake trout	25,000	4"	9-19 & 20-78
1979	Lake trout	25,000	4"	10-09-79
1980	Lake trout	25,000	5" R.P. clip	10-16-80
1982	Walleye	50,000	3"	08-25 & 08-30
1983	Walleye	50,000	2"	07-28-83
1984	Walleye	42,750	3"	08-02-84
1985	Walleye	72,000	2-3"	06-25 & 08-15
1985	Brown trout	30,000	Fingerlings	09-10 & 11
1986	Walleye	50,000	Fingerlings	08-07, 19, 26
1986	Brown trout	30,000	Fingerlings	10-2, 3, 8, 21
1987	Brown trout	30,000	Fingerlings	10-20, 21
1988	Brown trout	30,000	Fingerlings	09-30 & 10-14
1989	Brown trout	30,100	Fingerlings	08-21 & 08-22
1989	Walleye	50,100	Fingerlings	07-25
1990	Brown trout	32,000	Fingerlings	10-01
1991	Walleye	50,042	Fingerlings	07-12
1991	Brown trout	20,000	Fingerlings	10-9, 10, 11
1992	Walleye	25,334	2"	07-14
1992	Walleye	(Private) 10,200	3"	11-09
1993	Brown trout	39,020	4-6"	07-13, 15
1993	Walleye	7,915	3-7"	09-21 & 10-27
1994	Walleye	73,265	Fingerlings	07-01 & 11-25
1994	Brown trout	30,608	6"	10-06
1995	Walleye	29,489	Fingerlings	09-28 10-11 11-01
1996	Walleye	4,804	Fingerlings	09-23 & 10-04
1997	Walleye	51,300	Fingerlings	07-01
1998	Walleye	200,000	Fry	None
1998	Brown trout	20,000	6-8"	None
1999	Walleye	2,000	5-8"	Private
1999	Walleye	92,174	1-2"	06-11
2000	Walleye	2,015	9"	Private
2001	Walleye	51,500	2"	None
2001	Walleye	17,500	2"	Co-op pond
2001	Walleye	1,560	7"	Private

Exhibit 4

Walleye stocking history
Lake Lucerne, Forest Co.

YEAR	STAGE	DATE	NUMBER	POUNDS	AVG LENGTH	#/POUND	MARKS	STOCKED BY/FISH SOURCE	SOURCE TYPE	AGENCY	DATA SOURCE
1994	EXG	11/28/94	1185		6				PRIVATE HATCHERY		B. Young 6/18/2002 data file
1994	FGL	7/1/94	52080	120	2.1	434		Art Oehmcke Hatchery - Woodruff	DNR HATCHERY	WDNR	B. Young 6/18/2002 data file
1995	EXG	10/11/95	509		7				DNR COOP PONDS	WDNR	B. Young 6/18/2002 data file
1995	EXG	11/1/95	2300	153	6	15			PRIVATE HATCHERY		B. Young 6/18/2002 data file
1995	FGL	9/28/95	19552	104	2.8	188		Winding Creek	DNR PONDS	WDNR	B. Young 6/18/2002 data file
1995	FGL	10/2/95	7128	36	2.9	198		Winding Creek	DNR PONDS	WDNR	B. Young 6/18/2002 data file
1996	FGL	9/23/96	564	5.1	3.1	110			DNR COOP PONDS	WDNR	B. Young 6/18/2002 data file
1996	FGL	10/4/96	4240	132	5.1	32			PRIVATE HATCHERY		B. Young 6/18/2002 data file
1997	FGL	7/1/97	51300	85	1.8	606		Gov. Thompson Hatchery - Spooner	DNR HATCHERY	WDNR	B. Young 6/18/2002 data file
1998	FRY	4/5/98	2000000	31.3		64000		Art Oehmcke Hatchery - Woodruff	DNR HATCHERY	WDNR	B. Young 6/18/2002 data file
1999	EXG	10/25/99	2000		7				PRIVATE HATCHERY		B. Young 6/18/2002 data file
1999	FGL	6/11/99	13024	9.8	1.5	1329		Art Oehmcke Hatchery - Woodruff	DNR COOP PONDS	WDNR	Woodruff Hatchery
1999	FGL	6/11/99	79150	49.5	1.3	1599		Art Oehmcke Hatchery - Woodruff	PRIVATE HATCHERY	WDNR	Woodruff Hatchery
2000	EXG	10/1/00	2015		9	4.6		AOH-Forest Co. Walleye Association Coop Pond	DNR COOP PONDS	WDNR	WDNR 7/23/01 data file
2001	EXG		1560	0	7		U	Taal Lake Hatchery	PRIVATE HATCHERY		11/22/2002 WDNR data file
2001	FGL	6/25/01	17500	22	1.5	800		AOH-Forest Co. Walleye Association Coop Pond	DNR COOP PONDS	WDNR	10/22/2001 WDNR data file
2001	FGL	7/9/01	12666	23.5	2	539		AOH-Presque Isle	DNR PONDS	WDNR	10/22/2001 WDNR data file
2001	FGL	7/10/01	21290	39.5	2	539		AOH-Presque Isle	DNR PONDS	WDNR	10/22/2001 WDNR data file
2001	FGL	7/12/01	17517	32.5	2	539		AOH-Presque Isle	DNR PONDS	WDNR	10/22/2001 WDNR data file
2002	FGL	6/20/02	17488	12.5	1.3		OTC	Art Oehmcke Hatchery - Woodruff	DNR HATCHERY	WDNR	11/22/2002 WDNR data file
2002	FGL	6/24/02	32745	37	1.6		U	Art Oehmcke Hatchery - Woodruff	DNR HATCHERY	WDNR	11/22/2002 WDNR data file
2002	FGL	6/24/02	85112	96.2	1.6		U	Art Oehmcke Hatchery - Woodruff	DNR HATCHERY	WDNR	11/22/2002 WDNR data file
2003	FGL		103,000	69				ART OEHMCKE HATCHERY - WOODRUFF	DNR HATCHERY	WDNR	2/23/2004 487/C DATA FILE

STOCKING YEAR	WATERBODY NAME	SPECIES	STRAIN	AGE CLASS	NUMBER FISH STOCKED	POUNDS FISH STOCKED	SOURCE
1998	L LUCERNE	BROWN TROUT	ST. CROIX	LARGE FINGERLING	20,000	1,923	BRULE RIVER
2001	L LUCERNE	BROWN TROUT	ST. CROIX	LARGE FINGERLING	30,000	4,285	LANGLADE
		SPECIES	STRAIN	AGE CLASS	NUMBER FISH STOCKED	POUNDS FISH STOCKED	SOURCE
2003	L LUCERNE	BROWN TROUT	ST. CROIX	LARGE FINGERLING	30,000	3,489	LAKEWOOD

STOCKING YEAR: 2002 | REGION: NORTHERN REGION | COUNTY: FOREST |
WATERBODY NAME: LAKE LUCERNE | WBIC: 396500 | REPORT CREATED: FEB 23, 2004 - 01:36 PM

	SPECIES	STRAIN	AGE CLASS	NUMBER FISH STOCKED	POUNDS FISH STOCKED	SOURCE
1	WALLEYE	LAKE MICHIGAN	SMALL FINGERLING	135,345	146	ART OEHMCKE

STOCKING YEAR: 2003 | REGION: NORTHERN REGION | COUNTY: FOREST |
WATERBODY NAME: LAKE LUCERNE | WBIC: 396500 | REPORT CREATED: FEB 23, 2004 - 01:36 PM

	SPECIES	STRAIN	AGE CLASS	NUMBER FISH STOCKED	POUNDS FISH STOCKED	SOURCE
1	BROWN TROUT	ST. CROIX	LARGE FINGERLING	30,000	3,489	LAKWOOD
2	WALLEYE	LAKE MICHIGAN	SMALL FINGERLING	103,000	69	ART OEHMCKE

SPAWNING POPULATION ESTIMATE

LAKE: L LUCERNE
SPEARING ADJUSTMENT?

YES

COUNTY: FOREST

YEAR: 2001
AGENCY: GLIFWC
RECRUIT CODE: C-ST

1/26/01

	LENGTH INTERVAL				NUMBER		TOTAL	VARIANCE
		M	C	R	N	SPEARED	N	
MALE	0 - 11.9	1	0	0	2.0	0	2.0	0.0
	12 - 14.9	21	37	1	418.0	6	424.0	55176.0
	15 - 19.9	95	158	22	663.7	42	705.7	15696.8
	20 +	16	27	4	95.2	3	98.2	1240.8
	TOTAL:	133	222	27	1178.9	51		
		POPULATION ESTIMATE:					1229.9	
		AREA IN ACRES:					1026	
		WALLEYE/ACRE:					1.20	
		TOTAL VARIANCE:						72113.6
		STANDARD DEVIATION:						268.5
		95% CONF. INTERVAL:						526.3
		COEFF. OF VARIATION:						21.84%

FEMALE	0 - 11.9	0	0	0	1.0	0	1.0	0.0
	12 - 14.9	0	0	0	1.0	0	1.0	0.0
	15 - 19.9	18	2	0	57.0	4	61.0	1083.0
	20 +	35	20	2	252.0	4	256.0	13608.0
	TOTAL:	53	22	2	311.0	8		
		POPULATION ESTIMATE:					319.0	
		AREA IN ACRES:					1026	
		WALLEYE/ACRE:					0.31	
		TOTAL VARIANCE:						14691.0
		STANDARD DEVIATION:						121.2
		95% CONF. INTERVAL:						237.6
		COEFF. OF VARIATION:						38.00%

COMBINED SEXES + UNKNOWN 15"+	0 - 11.9	1	0	0	2.0	0	2.0	0.0
	12 - 14.9	21	37	1	418.0	6	424.0	55176.0
	15 - 19.9	116	176	23	862.9	46	908.9	25743.9
	20 +	56	69	6	570.0	8	578.0	36551.3
	TOTAL:	194	282	30	1852.9	60		
		POPULATION ESTIMATE:					1912.9	
		AREA IN ACRES:					1026	
		WALLEYE/ACRE:					1.86	
		TOTAL VARIANCE:						117471.1
		STANDARD DEVIATION:						342.7
		95% CONF. INTERVAL:						671.8
		COEFF. OF VARIATION:						17.92%

EXHIBIT 6

2001

LAKE: L LUCERNE
COUNTY: FOREST

AREA: 1026
RECRUIT CODE: C-ST

LENGTH FREQUENCY FOR WALLEYE SPEARED BEFORE FIRST RECAP RUN:

DATES: April 26 (49 walleye), May 2 (11 walleye)

NUMBER OF WALLEYE:

60

LENGTH INTERVAL (INCHES)	SPEARING: UNMARKED			SPEARING: MARKED			SPEARING: TOTAL		
	MALE	FEMALE	UNKNOWN	MALE	FEMALE	UNKNOWN	MALE	FEMALE	UNKNOWN
5.0 - 5.99	0	0	0	0	0	0	0	0	0
6.0 - 6.99	0	0	0	0	0	0	0	0	0
7.0 - 7.99	0	0	0	0	0	0	0	0	0
8.0 - 8.99	0	0	0	0	0	0	0	0	0
9.0 - 9.99	0	0	0	0	0	0	0	0	0
10.0 - 10.99	0	0	0	0	0	0	0	0	0
11.0 - 11.99	0	0	0	0	0	0	0	0	0
12.0 - 12.99	0	0	0	0	0	0	0	0	0
13.0 - 13.99	1	0	0	0	0	0	0	0	0
14.0 - 14.99	5	0	0	0	0	0	1	0	0
15.0 - 15.99	6	0	0	0	0	0	5	0	0
16.0 - 16.99	12	0	0	0	0	0	6	0	0
17.0 - 17.99	8	3	0	1	0	0	13	0	0
18.0 - 18.99	10	1	0	0	0	0	8	3	0
19.0 - 19.99	4	0	0	1	0	0	11	1	0
20.0 - 20.99	2	0	1	0	0	0	4	0	0
21.0 - 21.99	0	0	0	0	0	0	2	0	1
22.0 - 22.99	0	1	0	0	0	0	0	0	0
23.0 - 23.99	0	0	0	0	0	0	0	1	0
24.0 - 24.99	1	2	0	0	0	0	0	0	0
25.0 - 25.99	0	1	0	0	0	0	1	2	0
26.0 - 26.99	0	0	0	0	0	0	0	1	0
27.0 - 27.99	0	0	0	0	0	0	0	0	0
28.0 - 28.99	0	0	0	0	0	0	0	0	0
29.0 - 29.99	0	0	0	0	0	0	0	0	0
30.0 - 30.99	0	0	0	0	0	0	0	0	0
31.0 - 31.99	0	0	0	0	0	0	0	0	0
TOTAL:	49	8	1	2	0	0	51	8	1

County Forest
Lake Lucerne
Acres 1026

<u>Year</u>	<u>Tribal Harvest</u>
1985	
1986	
1987	
1988	361
1989	244
1990	50
1991	65
1992	56
1993	102
1994	88
1995	59
1996	86
1997	64
1998	75
1999	60
2000	91
2001	60
2002	162
2003	120

EXHIBIT 9

Following the federal courts decision that the Chippewa Indian Tribes in Wisconsin retained property right to fish, hunt and gather food in the northern third of Wisconsin, which is known as ceded territory, the tribes began harvesting fish beginning in 1985. This ruling is in accord with treaties signed by the United States Government in 1837 and 1842 and reaffirmed in federal court cases in 1983, 1987, 1988, 1989 and 1990. Forest county and Lake Lucerne fall within this ceded territory. Reference the following map.

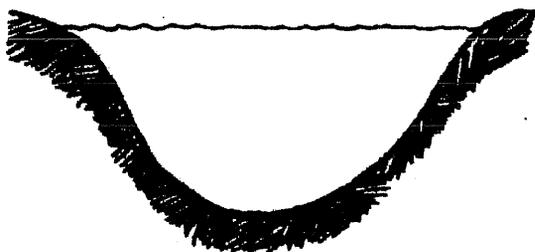
THE CEDED TERRITORY



The spear harvest of fish larger than 20 inches is regulated to limit the number of large fish taken to two per permit. *THE TRIBAL HARVEST FOR LAKE LUCERNE FROM 1985 THROUGH 2003 IS SHOWN IN FIGURE 9*

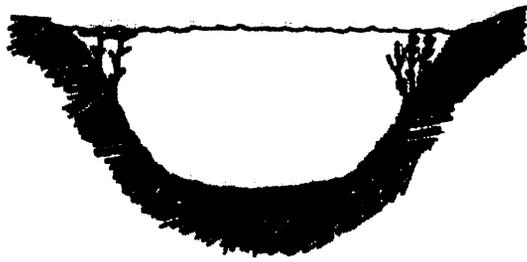
The WDNR and the tribes continue to diligently manage the fishery resource in the ceded territory.

Lakes can be classified into three trophic states which are an indicator of water quality



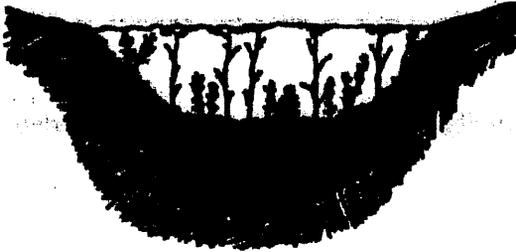
OLIGOTROPHIC

- Clear water, low productivity
- Very desirable fishery of large game fish



MESOTROPHIC

- Increased production
- Accumulated organic matter
- Occasional algal bloom
- Good fishery

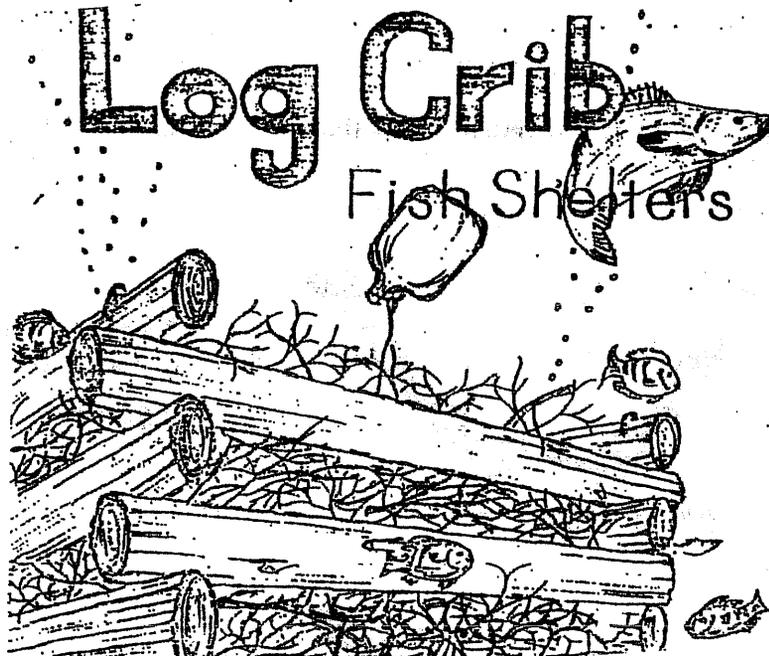


EUTROPHIC

- Very productive
- May experience oxygen depletion
- Rough fish common

Lake Lucerne is classified as an oligotrophic lake based on water clarity (Secchi Disk Readings) and satellite observation on the same day as secchi readings are taken. Since the Lake has a low productivity of aquatic cover for the fishery, cribs have been placed in the Lake. Fish cribs are designed to attract and concentrate fish for easier harvest for anglers. They also benefit small fish by providing protection from predators where natural cover is scarce.

Panfish and bass are most readily attracted to fish shelters. Walleye seek shelter underneath the structure or lie alongside the base logs during daylight hours



Fish cribs have been placed from 1989, 1990, 1991, 1992 and 1996. The cribs are constructed of 8 foot hard wood logs, 4 to 6 inches in diameter and stacked 4 feet high. The four corners are held together with rods. Slab wood is nailed across the bottom tier and the center is filled with brush. Slab wood is also nailed across the top to prevent the brush from floating out. Cribs are weighted down with concrete blocks and pulled out on the ice. At ice-out, the cribs sink in 12 to 15 feet of water. There are approximately 128 cribs in the lake. On some of the earlier cribs the corners were not held together with rods and they have deteriorated. The newer cribs are still intact, but much of the brush has deteriorated also. Volunteers scuba divers could be used to refill these cribs to again make them a good source for fish habitats.

In order to protect our fishery we must have a strong program by the county or WDNR to inspect and monitor the septic tanks and fields around the lake. There should be a way to test all septic tanks and fields on a regular basis with authority to have those that fail corrected. We also need a no-wake law on the south end of the lake by the town to eliminate the destroying of weed growth there which is our one source of habitat for fish. We need a program to monitor boats entering our lake to avoid the introduction of noxious weeds and Zebra mussels in our lake.