STEWART LAKE, DANE COUNTY

2006 WATER QUALITY MONITORING REPORT

Dane County Dept. of Land and Water Resources

October, 2006

SUMMARY

The Dane County Department of Land and Water Resources initiated a study of Stewart Lake in the spring of 2006 to assess the water quality conditions in Stewart Lake and determine if lake management recommendations in the 1995 plan were still viable. Results indicated that excessive lake fertility continued to undermine ecological and recreational potential in the lake. The data suggest that most of the fertility problems were linked to sediment deposits, although sediment depths had not changed significantly over the past decade. These results indicate that the best management practices installed after 1995 had been effective at reducing additional sedimentation in the lake. Consistent with the 1995 lake management plan, dredging is recommended to prevent internal phosphorus loading from the lake sediments.

The 1992-93 lake study concluded that stormwater runoff was a major source of nutrients in the lake as well as internal phosphorus loading from bottom sediments. The combined nutrient sources resulted in heavy algal growths in the lake. In this study it was concluded that lake fertility was also linked to sediment nutrients. However, in 2006 the fertility produced excessive rooted aquatic plants instead of algae. Whereas chlorophyll-a concentrations were relatively high in 1992-93 and reflect typical eutrophic conditions, in 2006 dense growths of non-native curly-leaf pondweed (*Potamogeton crispus*), common waterweed (*Elodea canadensis*) and coontail (*Ceratophyllum demersum*) had apparently suppressed phytoplankton growth. As a result, chlorophyll-a concentrations were lower and water clarity was generally better in 2006 than in 1992 or 1993.

During both study periods, low dissolved oxygen near the bottom of the lake was prevalent, indicating poor habitat for trout and other sportfish. However, in 2006 low dissolved oxygen levels were more pronounced than in 1992 or 1993. Following the seasonal decline of very dense common waterweed, August and September dissolved oxygen levels were lower than the minimum water quality criteria concentration of 5 mg/l throughout the entire water column. The data suggest that the suppression of algal photosynthesis continued even as the rooted plants were decaying. The decomposition of the aquatic plants also contributed dissolved oxygen deficits. When the aquatic plants were growing in early June 2006, supersaturated dissolved oxygen levels were evident and reflected photosynthesis. Coinciding with low dissolved oxygen in late summer, Stewart Lake had unusually high conductivity readings. The high conductivity readings can be an indicator of high fertility, including nutrients that were likely released from the decaying plants and ultimately from the sediment.

The ecological effects of the dense rooted aquatic plants found in 2006 include undermining fish predator-prey relationships. Abundant very small bluegills were easily observed near the surface during the 2006 study, particularly when dissolved oxygen levels were low. The dense plant canopy likely created a refuge, resulting in large numbers of stunted panfish.

2006 lake cross sectional data indicated that the water depths had not decreased since 1993 and that the watershed best management strategies were working. No significant

change in water depths indicated that there were no additional sediment sources. Sediment chemical analysis revealed that the material is relatively clean and will not pose an environmental problem for drawdown, dredging and disposal.

Water quality and thermal impacts of the lake were minimal below the dam. Groundwater flow to the stream rapidly increased below the dam and data loggers indicated water temperatures were typical of Driftless Area trout streams. The aquatic insect community reflected a healthy stream and fish populations were dominated by mottled sculpin (*Cottus bairdii*) and brown trout (*Salmo trutta*). Therefore, a restored lake is also compatible with a healthy trout stream below the dam. Opportunities for improving the Moen Creek trout stream would involve in-stream habitat improvement.

Recommendations

1. Conduct a lake drawdown in an effort to better assess sediment deposits and other potential sources of nutrients. A drawdown would have to be completed prior to October 1st, in any given year to prevent hibernating turtle and amphibian mortalities.
2. Following a lake drawdown, dredging is recommended to remove sediment sources of phosphorus and ammonia.
3. Restore lake fisheries of primarily bluegill and largemouth bass populations. Stocking trout should be discontinued due to warm water temperatures typical of shallow lakes.
4. Protect important woody debris habitat around the perimeter of the lake.
5. Consider establishing high value floating-leaf plants in shallow areas.
6. Consider habitat improvement efforts to enhance coldwater fisheries in Moen Creek.

Study Site

Stewart Lake is a seven acre impoundment located at the headwaters of Moen Creek and within the northern limits of the Village of Mt. Horeb. The dam, now owned by Dane County, was originally built in 1912. In 1915 the Civilian Conservation Corps and World War I veterans rebuilt the dam after it had washed out. In 1935, Dane County purchased the surrounding land and the impoundment became the centerpiece for the first Dane County Park. For decades the lake had been a popular destination for swimmers and anglers but these uses declined significantly due to sedimentation and excessive macrophytes and algae. The lake watershed is relatively small at 476 acres. Parkland, farmland and woods comprise over 60% of the land uses.

Methods

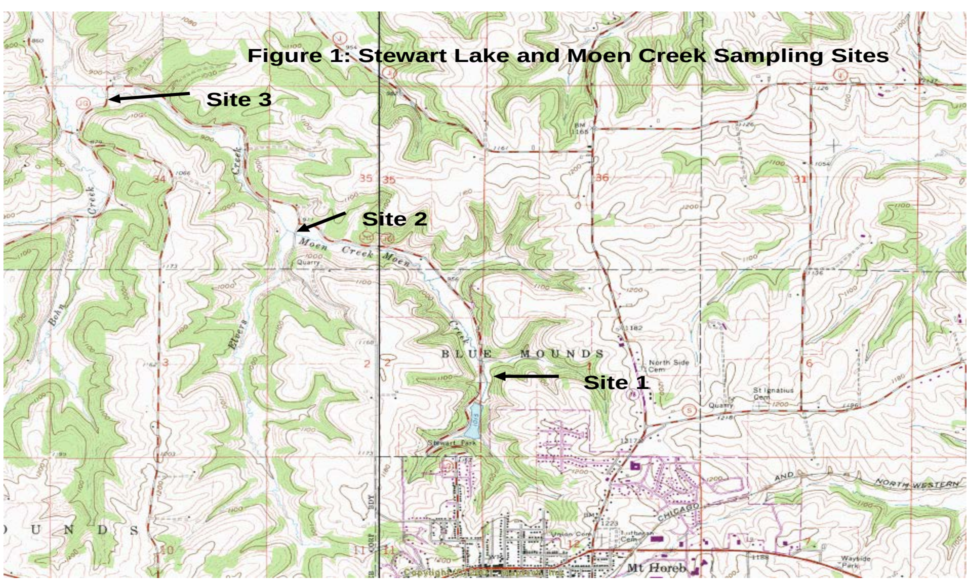
Lake sampling was designed to collect water quality and habitat information as an update to the 1995 lake management plan. Stewart Lake was sampled near the dam on a biweekly basis to include Secchi measurements, dissolved oxygen, temperature, pH and conductivity profiles. Water chemical laboratory sampling included total phosphorus, chlorophyll and ammonia, analyzed at the Wisconsin State Lab of Hygiene (SLOH). A Yellow Springs Instrument meter Model 52 was used for dissolved oxygen and temperature and a Model 63 meter was used for pH and conductivity. A Kemmerer sampling bottle was used to collect lab samples.

The depth profiles were measured to determine if additional sediment had reduced storage capacity since the 1993 study. No change in lake volume would indicate that the sedimentation basins are functioning while a decrease would indicate additional sedimentation. A standard Secchi disc was used to measure water depths along eight transects. Sonar proved ineffective due to the dense rooted plant growth. A piston sediment corer was used to collect three sediment samples from Stewart Lake. Each core was homogenized and tested for metals and nutrients at the SLOH.

In addition to deep-hole chemical sampling and sediment sampling, a survey was performed on September 13, 2006 to measure conductivity levels (YSI 63) around the lake in an effort to determine if unknown sources of nutrients were present.

Below the dam, aquatic macroinvertebrates were collected from three locations (Figure 1) in Moen Creek during April 2006. Specimens were sorted and identified to the family-level. The Family-level Biotic Index (Hilsenhoff 1988) and Ephemeroptera-Plecoptera-Tricoptera families (EPTF) were calculated from each sample. A DC pulse backpack stream shocker was used to collect fish from Moen Creek in July 2006 and calculate the coldwater Index of Biotic Integrity (IBI – Lyons et al. 1996). Routine stream sampling included biweekly flow (G. O. Environmental mechanical flow meter), dissolved oxygen and temperature (YSI Model 52 meter). Long term summer water temperature data were collected at sites 1 and 2 with Onset Tidbit data loggers.

Biological inventories were recorded during the scheduled lake and stream surveys as well as surveys focusing on amphibians and Odonata.



RESULTS AND DISCUSSION

Lake Water Quality

Biweekly lake water quality monitoring began on June 5, 2006. Throughout the sampling period from June 5 through July 30, submersed rooted aquatic plants grew at high densities and covered the entire basin. The dominant species were Elodea, curly-leaf pondweed and coontail. The high densities of plants had a significant effect on the lake water quality and ecology. On June 5, supersaturated levels of dissolved oxygen exceeded the meter scale (> 20 mg/l) and reflected photosynthesis of the abundant vegetation. By early July, a large percentage of the plant biomass was dying and floated to the surface, creating a surface scum over much of the lake area. The combination of decaying plants and sediment oxygen demand created a trend of declining dissolved oxygen levels throughout the water column. By July 30, dissolved oxygen levels were below water quality criteria just one meter (3.3 feet) below the surface (Figure 2). The abundant small panfish were observed swimming just below the surface where dissolved oxygen levels were adequate Figure (7). By mid-August, dissolved oxygen levels dropped below water quality criteria (5 mg/l) throughout the entire water column.

Conductivity and pH patterns (Fig. 3, 4) were typical for the observed dissolved oxygen levels and trends. Low dissolved oxygen, low pH and high conductivity reflected decomposition and biochemical oxygen demand below the surface while high pH and moderate conductivity occurred near the surface where photosynthesis exceeded decomposition. A trend of lower pH and higher conductivity values occurred as the summer progressed and reflected less primary productivity, greater respiration and release of nutrients in the water column. The trend of increasing specific conductance throughout the summer likely reflected decomposing rooted plants, primarily common waterweed. However, measurements exceeding 800 *u*S/cm are uncommonly high and apparently reflect high nutrients and minerals in the water column. On August 31 2006, levels in Stewart Lake (810 uS/cm) were significantly higher than levels found in Birch Lake (547 uS/cm), an eleven acre eutrophic impoundment located in Iowa County.

Temperature data (Fig. 5) indicated that cold water trout habitat was lacking near the bottom of the shallow lake. Warm water and anoxia near the lake bottom created unsustainable conditions for trout. Stewart Lake also lacks sufficient depth necessary to establish thermal stratification, an important habitat requirement for trout management in lakes. By September 13th, profiles of temperature, dissolved oxygen, pH and conductivity were nearly uniform from top to bottom, indicating fall water column mixing.

Secchi water clarity measurements were favorable during each survey except for early June 2006, when macrophyte growths were relatively modest. Clear water conditions typically reflect oligotrophic conditions in stratified lakes, but instead the favorable Secchi Trophic State Index (TSI) numbers (43 – 44) reflected the effects of the dense rooted aquatic plants, apparently suppressing the phytoplankton.

Surface phosphorus concentrations generally indicated moderate eutrophic conditions in 2006 with the exception of June 5th. On that date, the highest surface phosphorus concentration (46 *u*g/l) coincided with the lowest Secchi measurement (5'). This combination suggests a phytoplankton bloom, however relatively low chlorophyll-a indicated otherwise. Translated into TSI values (phosphorus = 58, Secchi = 54, chlorophyll-a = 43), the disparity was obvious in typically linked parameters.

Bottom concentrations of phosphorus were typically higher than surface concentrations and likely reflect decomposition, however levels were relatively low compared with stratified lakes, where hypolimnetic reduction is significant. Consistent with phosphorus concentrations, moderate ammonia levels were present near the bottom as well.

On September 13, 2006, conductivity and temperature measurements were collected around the lake. No significant variations in either parameter were found (sp. cond. range = 796 – 807 uS/cm, temp. range = 17.2 – 17.9 C). The results suggest that locating either springs or possible nutrient sources within the lake will require a drawdown. While the conductivity readings are atypically high, the measurements may reflect decomposition of common waterweed and other rooted plants.

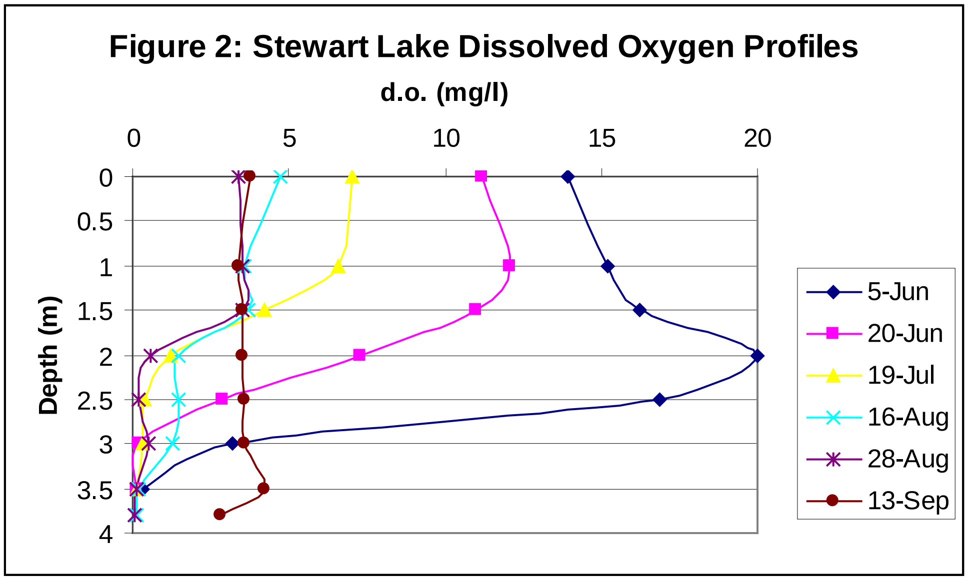
Data Comparisons, 1992-93 and 2006

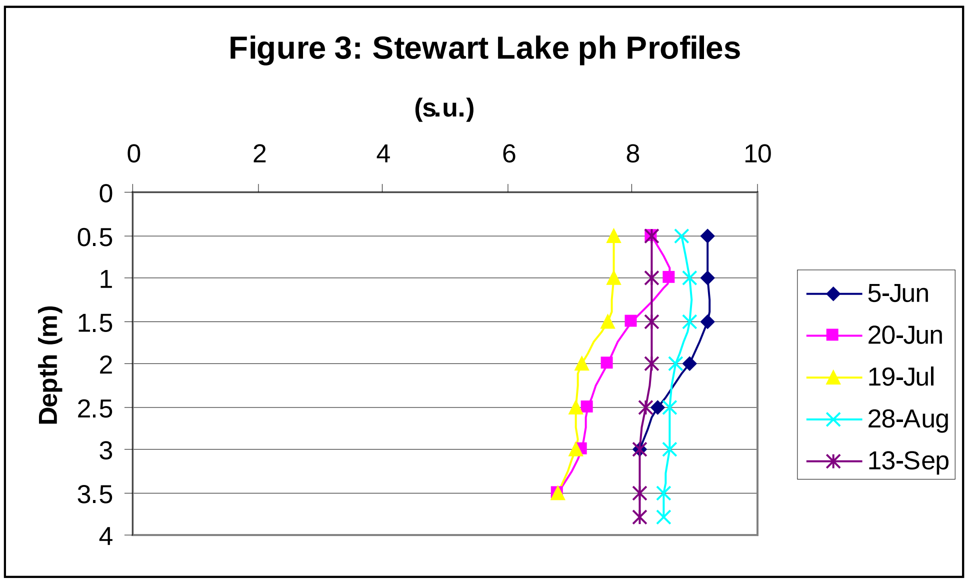
Water clarity was generally lower in 1992-93 (Figure 6), reflecting higher chlorophyll-a concentrations (Figure 7) linked to algal growths. The two study periods reflected extremes in lake conditions, algae dominated in the early 1990's and aquatic plants dominated in 2006. TSI values were not useful for comparing dramatic shifting plant communities, however both conditions reflected a nutrient rich eutrophic lake. The favorable Secchi TSI values certainly didn't indicate oligotrophic conditions in 2006, but rather reflected excessive aquatic plants and apparent suppression of algae. As the macrophytes died, phytoplankton did not increase significantly (based on clear water and low chlorophyll-a) and the lack of photosynthesis resulted in low dissolved oxygen levels. Mean phosphorus concentrations at the surface appear in Figure 6. Highest phosphorus concentrations occurred in 1992, however none of the phosphorus trends were consistent with the other TSI parameters (Secchi and chlorophyll-a).

Lake Sediment Survey

Lake depths were measured along eight transects on May 22, 2006 (Figure 8). Dense aquatic plant cover prevented the use of sonar so a Secchi disc was used to measure numerous depths across the lake. Results indicated that the depth profiles had not changed significantly since 1993 and reflected effectiveness of the upland soil stabilization efforts and detention basins. Figures 10 & 11 demonstrate how the lake basin was created within a steep valley and how the water depths have not changed significantly.

Sediment cores were collected on June 27, 2006. Table 1 contains chemical analysis and the soil characteristics appear in Figure 12. The test results indicated that the sediment is relatively clean and reflected the relatively small benign watershed. Levels do not pose significant threats to aquatic life and disposal should be routine.





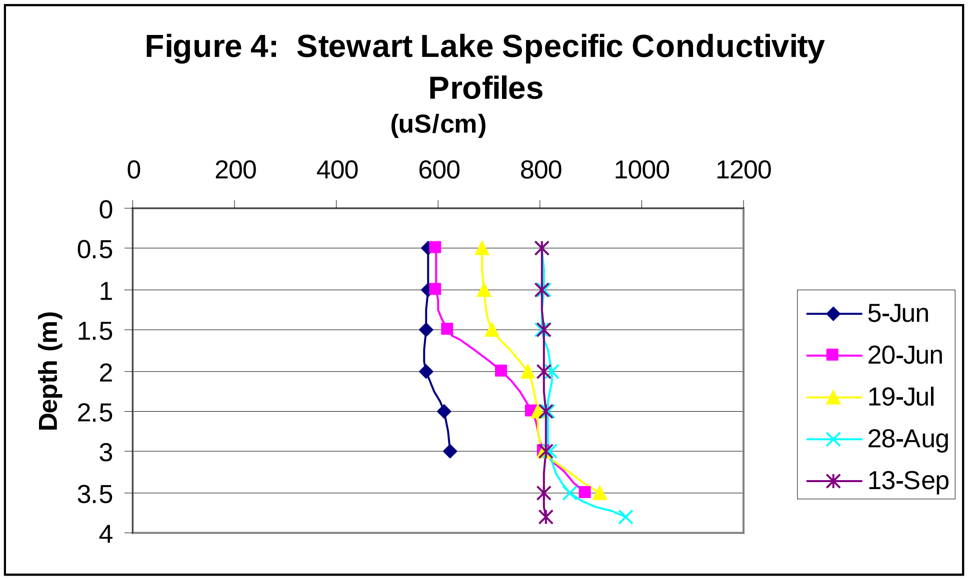


Figure 4: Stewart Lake Specific Conductivity Profiles
(uS/cm)
0
200
400
600
800
1000
1200
Depth (m)
0
0.5
1
1.5
2
2.5
3
3.5
4
5-Jun
20-Jun
19-Jul
28-Aug
13-Sep

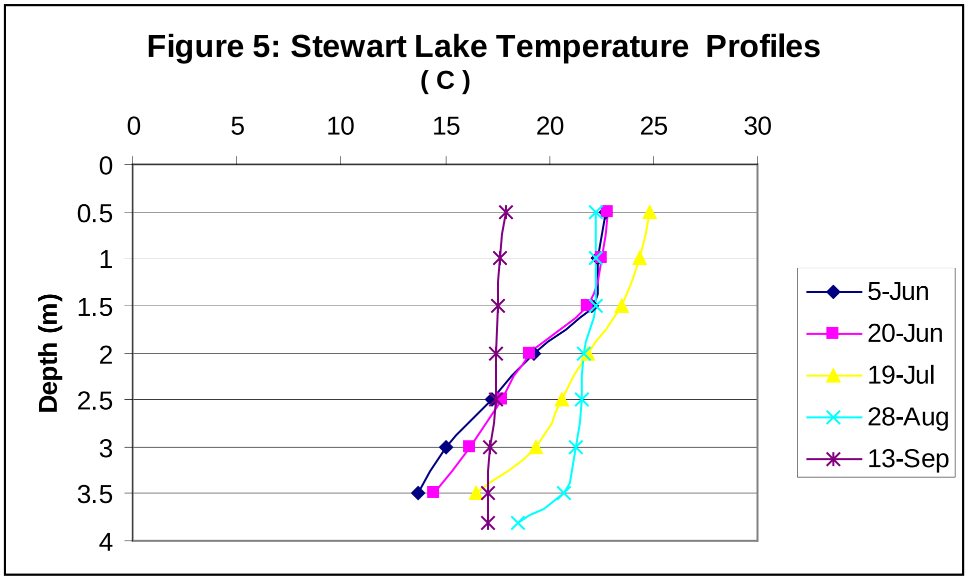


Figure 5: Stewart Lake Temperature Profiles
(C)
0
5
10
15
20
25
30
Depth (m)
0
0.5
1
1.5
2
2.5
3
3.5
4
5-Jun
20-Jun
19-Jul
28-Aug
13-Sep

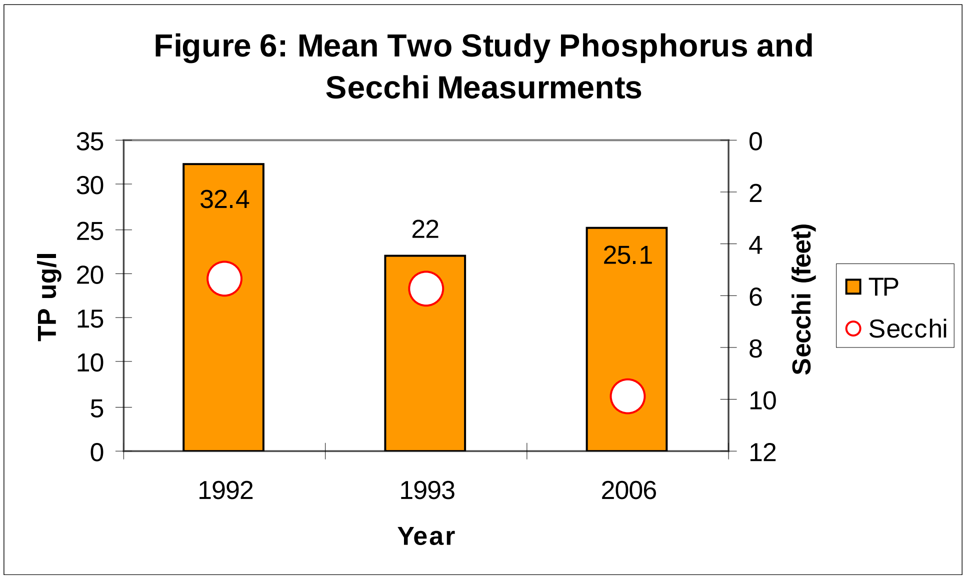


Figure 6: Mean Two Study Phosphorus and Secchi Measurments
35
30
25
20
15
10
5
0
TP ug/l
32.4
22
25.1
0
2
4
6
8
10
12
Secchi (feet)
TP
Secchi
1992
1993
2006
Year

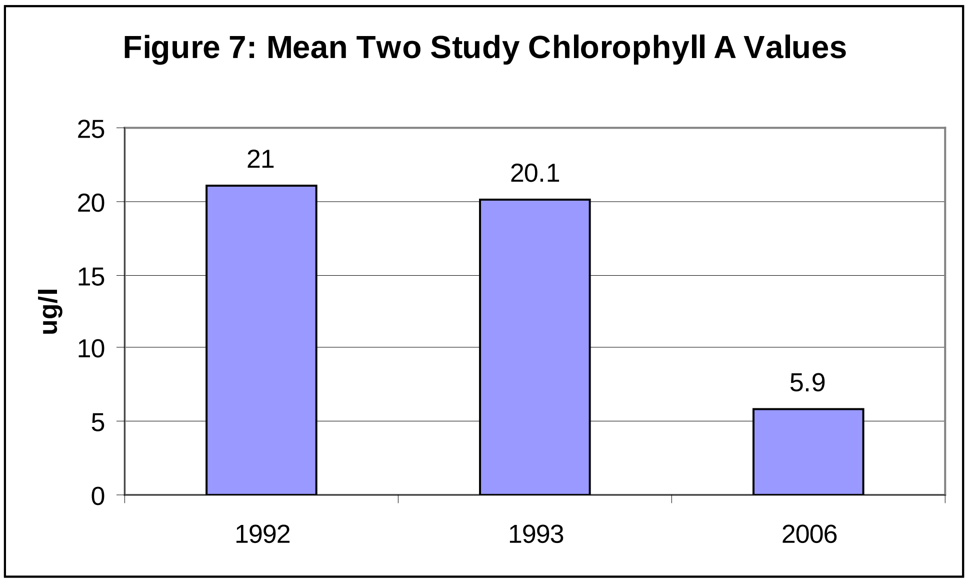


Figure 7: Mean Two Study Chlorophyll A Values
25
20
15
10
5
0
ug/l
21
20.1
5.9
1992
1993
2006

Fig. 8: 2006 Depth Contour Transects

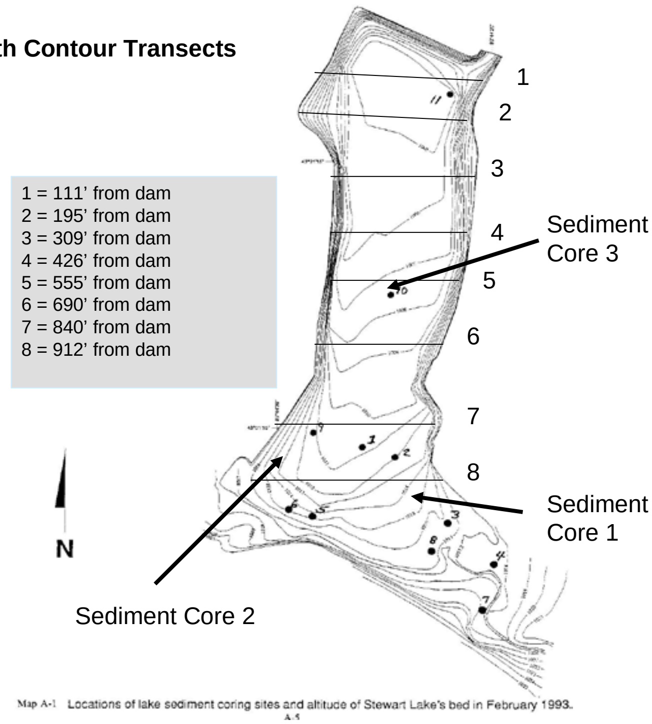
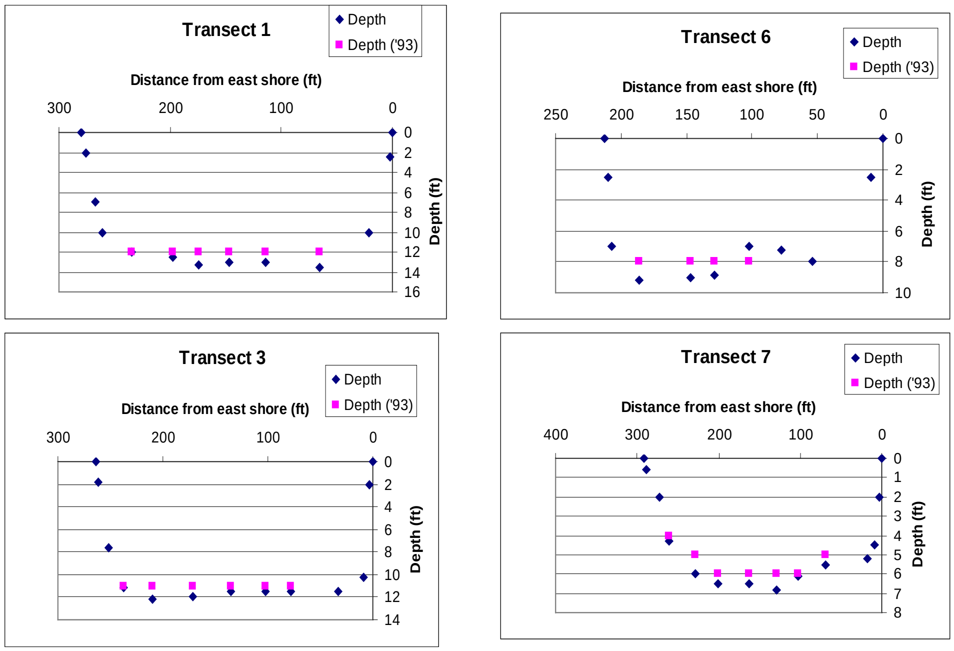


Figure 9: Submersed photo of Stewart Lake.

Figure 10



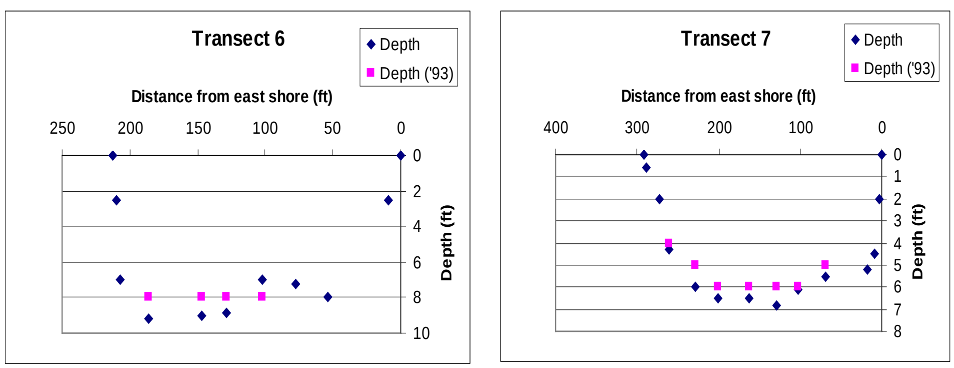


Figure 11

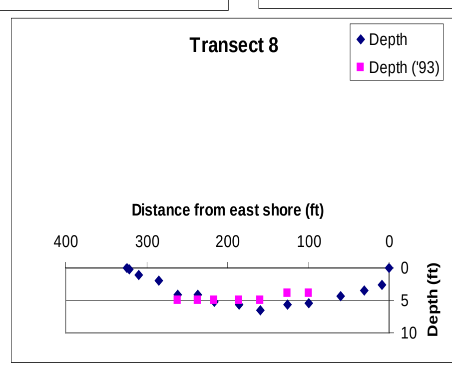
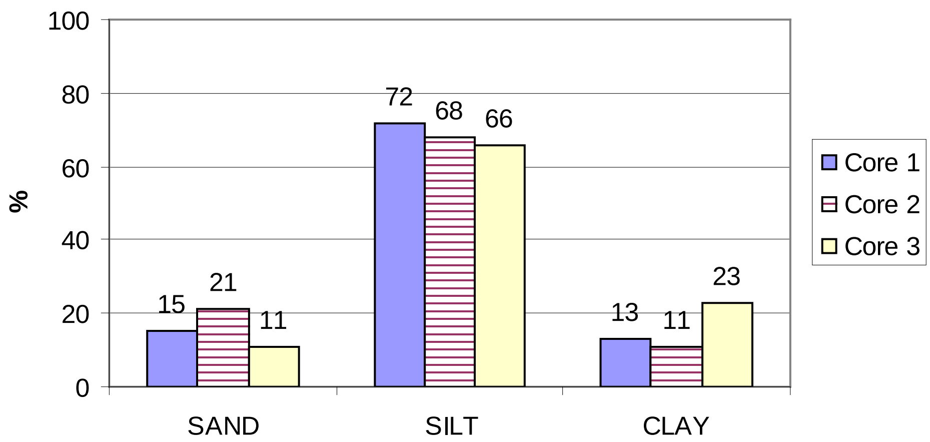


Table 1: Stewart Lake Sediment Core Results (sample locations in Figure 6)

Core	As	Cd	Cr	Cu	Pb	Hg	Ni	K	Zn
1	8	0.6	17.6	11.8	25	0.061	11	1430	111
2	11	0.5	24.5	14.1	26	0.043	19	2050	83
3	7	0.3	17.6	9.8	18	0.035	15	1360	58

All results presented as mg/kg.

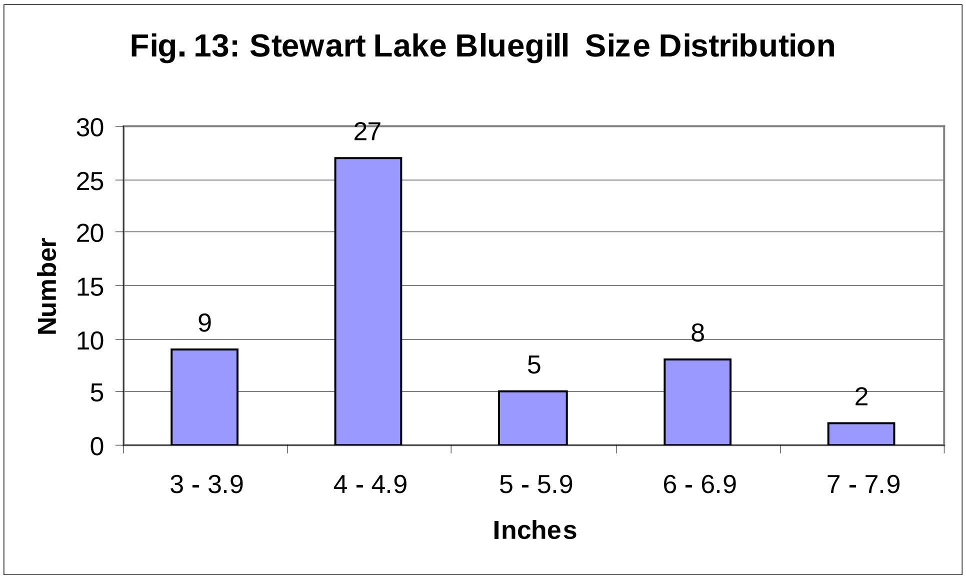
Figure 12: Stewart Lake Soil Types



Stewart Lake Biological Survey Results

Fish

The Wisconsin Department of Natural Resources SWISS Tabular Database contains fish species collected in 1945, including northern pike, golden shiner, bullheads, sunfishes, bluegill and walleye. More recently, fish species identified in the lake include rainbow trout, panfish, largemouth bass and forage species (WDNR 1985). In 2006, undersized bluegills were very abundant (Figure 9) and modest sized largemouth bass were occasionally observed as well. In July 2006, WDNR (Welke) set fyke nets in the lake and also found numerous small bluegills (Figure 13) and low largemouth bass numbers. Rainbow trout are typically stocked each spring, including 800 in 2006, but water chemistry data suggest that survival is probably brief due to warm water column temperatures and insufficient dissolved oxygen.



Herptiles

Frogs and toads were identified by listening to calls, including bullfrog (*Rana catesbeinana*), northern spring peeper (*Hyla crucifer crucifer*), western chorus frog (*Pseudacris triseriata triseriata*), green frog (*Rana clamitans melanota*) and eastern American toad (*Bufo americanus americanus*). Sightings included either a juvenile pickerel frog or leopard frog and either a Cope's gray treefrog or eastern gray treefrog. Turtle sightings included a Blanding's turtle (*Emydoidea blandingi*) – State Threatened, painted turtle (*Chrysemys picta*), and snapping turtle (*Chelydra serpentine*).

Aquatic Insects

In July 2006, WDNR (Sims) identified dragonflies and damselflies in flight around Stewart Lake. No threatened or endangered species were identified. Table 2 lists the Odonata inventory on July 27, 2006.

Table 2: Stewart Lake Area Odonata

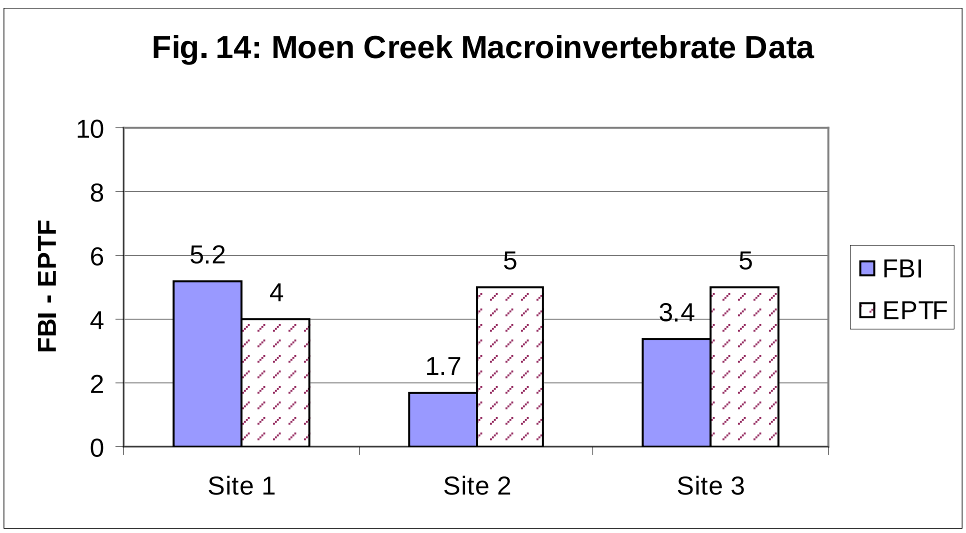
Genus - species	Common name
Enallagma signatum	Orange bluet
Enallagma antennatum	Rainbow bluet
Lestes rectangularis	Slender spreadwing
Libelllula luctuosa	Widow
Libellula pulchella	Twelve spotted skimmer
Pachydiplax longipennis	Blue dasher
Erythemis simplicicollis	Eastern saddlebags
Tramea lacerate	Black saddlebags
Anax junius	Common green darner

Aquatic Plants

Stewart Lake is dominated by three species, *Elodea canadensis* (common waterweed), *Potamogeton crispus* (curly-lead pondweed – exotic) and *Ceratophyllum demersum* (coontail). Curly-leaf pondweed is a cool water species that dies back when summer water temperatures increase. In Stewart Lake, common waterweed was the most abundant submersed plant and caused most of the habitat and recreational problems in 2006. Other species observed in lower densities include *Struckenia pectinatus* (sago pondweed), *Nymphaea odorata* (white water lily) and *Ranunculus* sp (buttercup). Within the alluvial depositional area at the two inlets, cattails *(Typha)* and exotic reed canary grass (*Phalaris arundinacea)* dominated and marsh marigold (*Caltha palustris*) was evident in the spring.

Stream Water Quality

Macroinvertebrates were collected from Moen Creek on April 21, 2006 at three locations (Figure 1). Family-level Biotic Index (FBI) values ranged from 5.2 (Good) near the dam to 1.7 (Excellent) at site 2. The higher FBI value near the dam reflected high numbers of the freshwater sowbug (*Asellus intermedius*), however the most intolerant family of insects (Plecoptera) was also found near the dam and indicated good water quality. All three sites had healthy EPT representation as well (Figure 14).



Biweekly stream flow and temperature monitoring indicated that the stream receives considerable groundwater discharge below the dam. Cold water temperatures just a short distance below the dam indicate that groundwater minimizes any thermal and water quality effects of the dam on Moen Creek (Figure 15, 16). Increased flow measurements below the dam reflect significant groundwater sources (Figure 17) and sustainable cold temperatures at Site 2 (Figure 15, 16). All instantaneous dissolved oxygen measurements were above minimum water quality criteria.

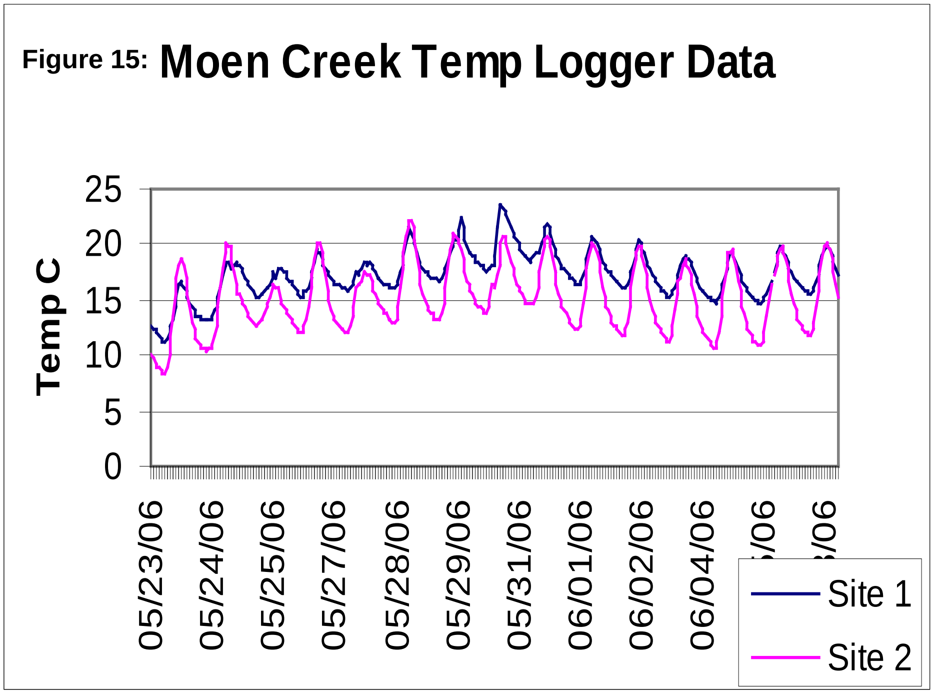


Figure 15: Moen Creek Temp Logger Data
Temp C
25
20
15
10
5
0
05/23/06
05/24/06
05/25/06
05/27/06
05/28/06
05/29/06
05/31/06
06/01/06
06/02/06
06/04/06
Site 1
Site 2

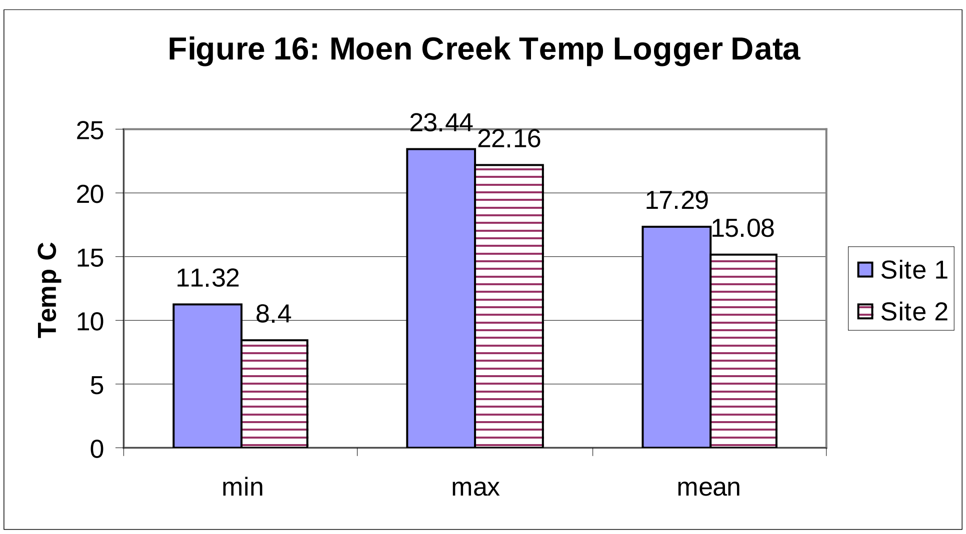
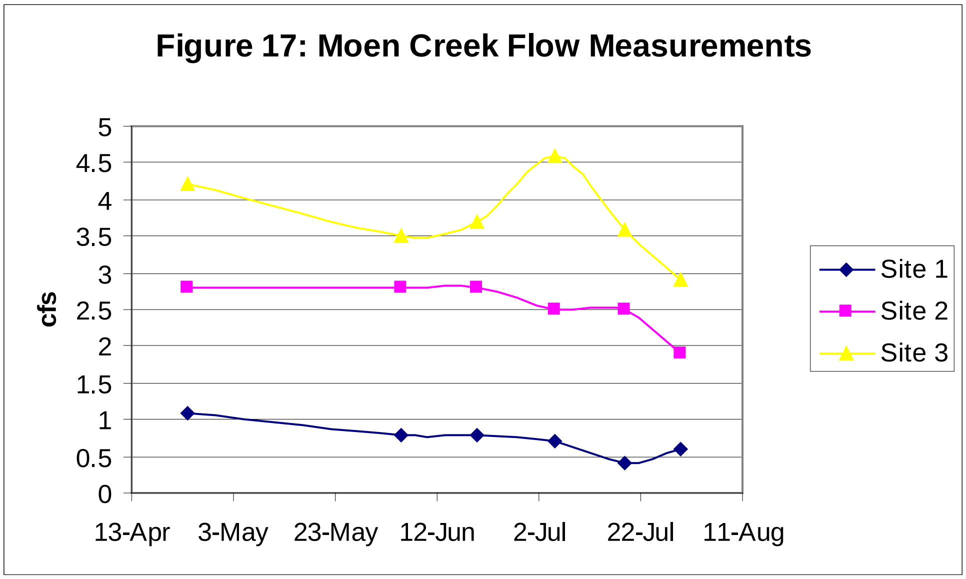
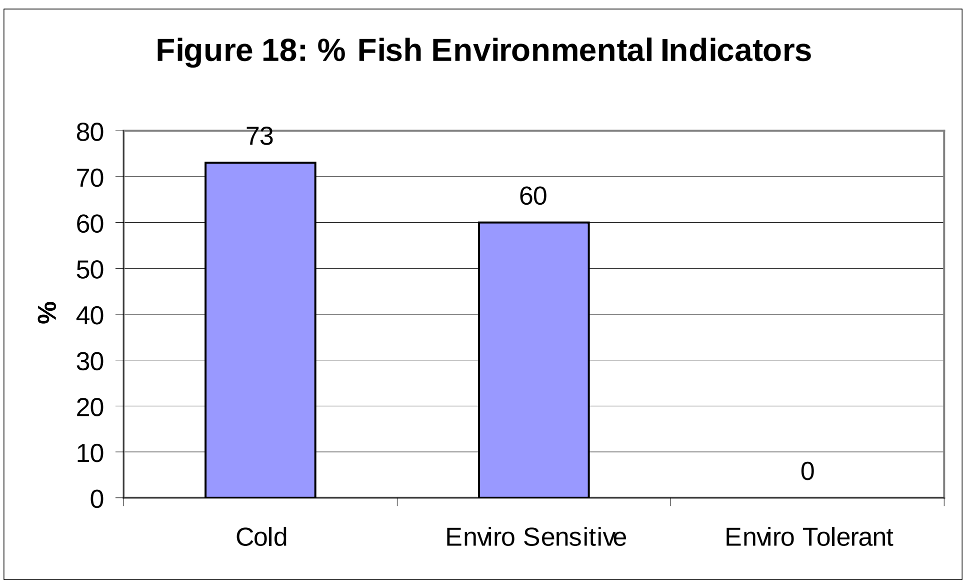


Figure 16: Moen Creek Temp Logger Data
Temp C
25
20
15
10
5
0
11.32
8.4
23.44
22.16
17.29
15.08
min
max
mean
Site 1
Site 2



A stream shocking survey was performed on July 27, 2006 using a battery powered backpack stream shocker. The small stream was choked with dense overhanging reed canary grass, undermining effective sampling. Regardless, fish species collected were typical of high quality cold water streams, with mottled sculpin (*Cottus bairdii*) dominant and juvenile brown trout (*Salmo trutta*) also common. Eurythermal fantail darters (*Etheostoma flabellare*) were relatively abundant at site 3 but no environmental tolerant species were found. Figure 18 represents the composite fish community data from sites 1-3.



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Appendix A: Lake Monitoring Data

Table 3: 2006 Stewart Lake Water Chemistry Lab Analysis

Date	Chl	TP	Bottom TP	Bottom NH3
20-Jun	3.4	0.046		
5-Jul	2.4	0.021		
19-Jul	3.97	0.019		
30-Jul	11.9	0.027		
16-Aug	3.12	0.018	0.1	0.237
28-Aug	12.3	0.02	0.05	0.039
13-Sep	3.86	0.025	0.027	0.108

Table 4: 2006 Stewart Lake Dissolved Oxygen Data mg/l

Depth (m)	5-Jun	20-Jun	5-Jul	19-Jul	30-Jul	16-Aug	28-Aug	13-Sep
0	13.9	11.2	8.9	7	6.3	4.7	3.4	3.8
1	15.2	12.1	9	6.6	5.3	3.6	3.5	3.4
1.5	16.2	11	11.2	4.2	2.4	3.7	3.5	3.5
2	20	7.3	6	1.2	0.3	1.5	0.6	3.5
2.5	16.9	2.9	1.3	0.4	0.2	1.5	0.2	3.6
3	3.2	0.2	0.1	0.3	0.1	1.3	0.5	3.6
3.5	0.3	0.1	0.1	0.1	0	0.2	0.1	4.2
3.8						0.1	0.09	2.8

Table 5: 2006 Stewart Lake Temperature Data C

Depth (m)	5-Jun	20-Jun	5-Jul	19-Jul	30-Jul	16-Aug	28-Aug	13-Sep
0.5	22.7	22.8	22.5	24.8	26.5	24.1	22.2	17.9
1	22.3	22.5	22.5	24.3	25.4	23.4	22.2	17.6
1.5	22	21.9	21.5	23.5	24.1	23	22.2	17.5
2	19.3	19.1	20.2	21.9	22.5	22.8	21.7	17.4
2.5	17.3	17.7	19.1	20.6	21.3	22.7	21.6	17.4
3	15	16.2	17.8	19.4	20.3	22.2	21.3	17.2
3.5	13.7	14.5	15.7	16.5	18.3	19.8	20.7	17.1
3.8						17.2	18.5	17.1

Table 6: 2006 Stewart Lake pH Data

Depth (m)	5-Jun	20-Jun	5-Jul	19-Jul	30-Jul	16-Aug	28-Aug	13-Sep
0.5	9.2	8.3	8.8	7.7	8.1	8.5	8.8	8.3
1	9.2	8.6	8.9	7.7	7.7	8.5	8.9	8.3

1.5	9.2	8	8.3	7.6	7.6	8.5	8.9	8.3
2	8.9	7.6	7.8	7.2	7.4	8.4	8.7	8.3
2.5	8.4	7.3	7.6	7.1	7.4	8.4	8.6	8.2
3	8.1	7.2	7.5	7.1	7.3	8.3	8.6	8.1
3.5		6.8	7.3	6.8	6.9	7.9	8.5	8.1
3.8						7.8	8.5	8.1

Table 7: 2006 Stewart Lake Specific Conductivity Data (uS/cm)

Depth (m)	5-Jun	20-Jun	5-Jul	19-Jul	30-Jul	16-Aug	28-Aug	13-Sep
0.5	582	595	657	686	717	771	805	802
1	582	596	659	691	744	784	806	805
1.5	575	620	733	706	750	783	805	806
2	575	725	751	778	775	788	823	806
2.5	613	786	766	797	800	829	817	810
3	624	808	800	807	825	853	820	810
3.5		889	831	916	957	933	860	809
3.8						979	967	810

Table 8: 2006 Stewart Lake Secchi Data

Secchi	Feet
5-Jun	5
20-Jun	10
5-Jul	11
19-Jul	11
30-Jul	10.5
16-Aug	10
28-Aug	10.5
13-Sep	11

Table 9: Comparative Depth Profiles (1993 – 2006)

Transect 1

Distance	Depth	Depth ('93)
280	0	
276	2	
267	7	
261	10	
234	12	12
198	12.5	12
174	13.3	12
147	13	12
114	13	12
66	13.5	12
21	10	

2	2.5
0	0

Transect 2

Distance	Depth	Depth ('93)
345	0	
342	0.7	
330	2.1	
321	4.8	
300	7.5	
267	10	
240	12.5	12
192	12.5	12
126	12.8	12
96	13	12
84	11.4	
15	4.2	
6	2	
0	0	

Transect 3

Distance	Depth	Depth ('93)
264	0	
261	1.8	
252	7.6	
237	11.1	11
210	12.2	11
171	12	11
135	11.5	11
102	11.5	11
78	11.5	11
33	11.5	
9	10.3	
3	2	
0	0	

Transect 4

Distance	Depth	Depth ('93)
243	0	
240	2	
222	6	
210	11.8	11
174	11.2	11
147	11.4	11
129	11.2	10
102	11.2	10
60	10.5	10
21	10.5	

9	10.3	
3	2	
0	0	

Transect 5

Distance	Depth	Depth ('93)
250	0	
246	1.5	
243	6.4	
225	11.2	9
183	10.2	9
144	10.1	9
99	9.5	9
69	9.3	9
27	9.5	
15	8.3	
9	2.5	
0	0	

Transect 7

Distance	Depth	Depth ('93)
292	0	
288	0.6	
273	2	
261	4.3	4
228	6	5
201	6.5	6
162	6.5	6
129	6.8	6
102	6.1	6
69	5.5	5
18	5.2	
9	4.5	
3	2	
0	0	

Transect 8

Distance	Depth	Depth ('93)
324	0	
321	0.3	
309	1	
285	2	
261	4.2	5
237	4.2	5
216	5.2	5
186	5.6	5
159	6.5	5
126	5.7	4
99	5.4	4
60	4.4	

30	3.4
9	2.5
0	0

Figure 19: Comparative Conductivity Measurements

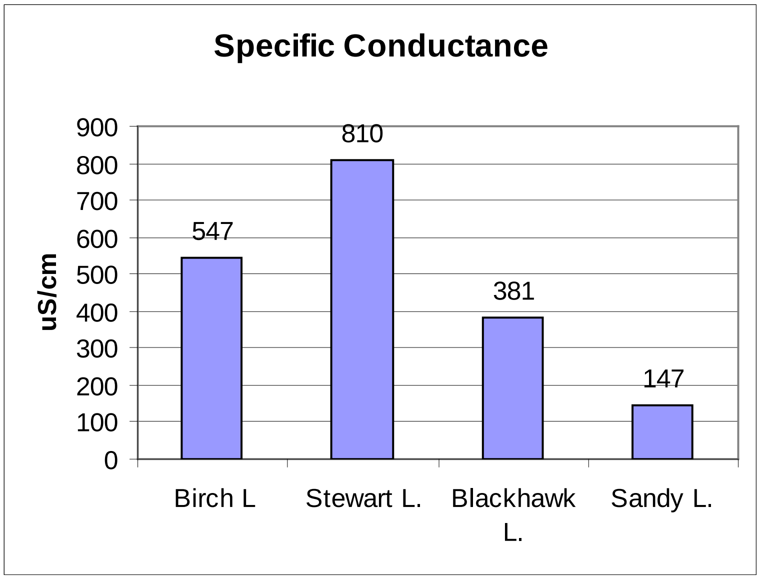
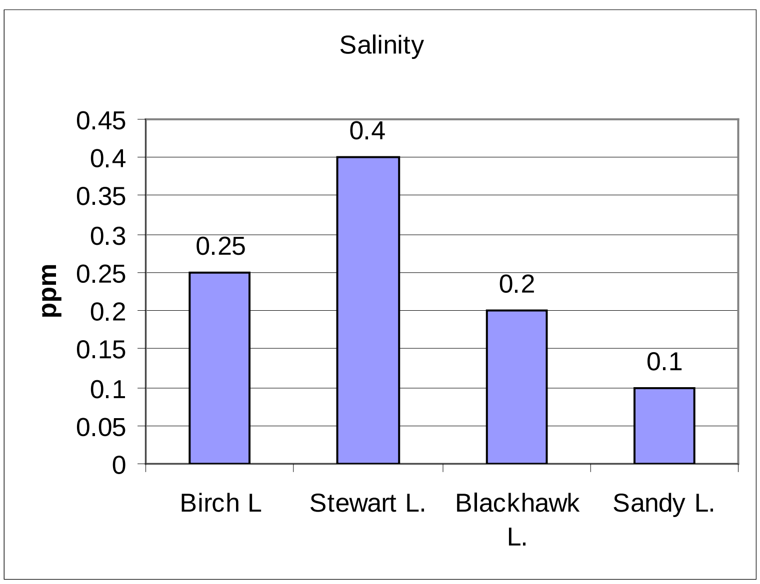


Figure 20: Comparative Salinity Measurements



Birch Lake: 11 acre eutrophic impoundment in Iowa County
Blackhawk Lake: 220 acre mesotrophic impoundment in Iowa County
Sandy Lake: 9 acre softwater seepage lake in Marquette County

Appendix B: Stream Monitoring Data

Table 10: Moen Creek Flow Data

	24-Apr	5-Jun	20-Jun	5-Jul	19-Jul	30-Jul	16-Aug	28-Aug
Site 1	1.1	0.8	0.8	0.7	0.4	0.6	0.5	0.7
Site 2	2.8	2.8	2.8	2.5	2.5	1.9	1.7	2.7
Site 3	4.2	3.5	3.7	4.6	3.6	2.9	2.5	3.4

Table 11: Moen Creek Dissolved Oxygen Grab Data

	24-Apr	5-Jun	20-Jun	5-Jul	19-Jul	30-Jul	16-Aug	28-Aug
Site 1	9.4	7.7	8.2	8.6	8.4	8.1	8.4	7.8
Site 2	10.3	9.3	9.5	10.2	9.6	9.4	9.1	9.2
Site 3	10.6	9.6	9.6	9.7	9.3	9.1	9.6	9

Table 12: Moen Creek Temperature Grab Data

	24-Apr	5-Jun	20-Jun	5-Jul	19-Jul	30-Jul	16-Aug	28-Aug
Site 1	10.6	17.2	16.8	15.9	17.8	19.4	18.6	16.7
Site 2	10.2	17.3	15	13.6	15.9	17	17.1	14.3
Site 3	10.3	15.7	14.9	13.9	16.8	19	18.6	15.8