Land Use and Resource
Management Department

Amended June 29, 2011

Walworth County
Land Conservation Committee Meeting and Public Hearing
Monday, July 18 2011 at 1:30 p.m.

Walworth County Government Center
County Board Room 114
Elkhorn, WI 53121

Dan Kilkenny – Chair, Jerry Grant - Vice Chair
Randy Hawkins - Supervisor
Sue Bellman – USDA/FSA Representative, *Dorothy C. Burwell* – Citizen Member

(Posted in Compliance with Sec. 19.84 Wis. Stats.)

It is possible that a quorum of the County Board or a committee of the County Board could be in attendance.

AGENDA

1. Call to order

2. Roll call

3. Approval of the Agenda

4. Approval of Minutes from June 20, 2011 LCC Meeting

5. Public Comment

6. Public Hearing Pursuant to Section 33.26 of the Wisconsin Statutes – Petition to Attach Property to the Lake Beulah Management District – Michael Cotter (enclosure, pages 1-71)

   The petition seeks to attach land to the Lake Beulah Management District consisting of those lands:

   Within Township 4North, Range 18 East
   Section 7, SE 1/4 west of East Shore Road, north of Beulah Lane Road and east of Beulah Park Road
   Including lots 6, 7, 8, 10, 11, 12, outlot 1 and outlot 2 of Beulah Lake Park Subdivision
   Section 7, SE 1/4 west of East Shore Road, north of Beulah Lane Road and east of Beulah Park Road
   Including lots 10, 11, 12, 13, 14, 15, 16 and an alley way of the re-subdivision of Lot 10 of Lake Beulah Park

   A map of the above-listed property and full legal description is available in the Walworth County Clerk's Office and will be published by way of official notice in the *Elkhorn Independent.*

7. Discussion/Possible Action – Petition to Attach Property to the Lake Beulah Management District – Michael Cotter (enclosure, pages 72-73.

8. Discussion/Possible Action – State Budget Impact regarding Farmland Preservation Conversion Fee – Michael Cotter (enclosure, pages 74-76)

9. Discussion/Possible Action – Honey Lake Management District County Representative Possible Appointment – Michael Cotter (enclosure, pages 77-78)

10. Southeastern Association of Land Conservation Committees Summer Tour - Waukesha Tentatively September 12-16 – Louise Olson

11. WLWCA Annual Conference December 8-9, 2011, Volunteers Needed – Louise Olson (enclosure, pages 79-81)

12. Adjournment

Submitted by: Michael P. Cotter, Director, Land Use and Resource Management Department, Louise Olson, Deputy Director, Land Conservation Committee Designee

Posted: June 28, 2011
Amendment Posted: June 29, 2011

DRAFT

Walworth County Land Conservation Committee

MINUTES
Monday, June 20, 2011 at 1:00 p.m.

Walworth County Board Room 114
Elkhorn, WI 53121

The meeting was called to order by LCC Chair Kilkenny at 1:00 p.m.

Roll call - Committee members present included: Supervisors Kilkenny, Hawkins, Grant, and Citizen Member Burwell. USDA/FSA Representative Sue Bellman was absent. A quorum was declared.

County staff present – David Bretl, County Administrator; Michael Cotter, Director of Land Use & Resource Management (LURM); Louise Olson, Deputy Director, LURM; Fay Amerson, Urban Manager, LURM; Neal Frauenfelder, Sr. Planner, LURM; and Joeann Douglas, Recording Secretary.

Also in attendance –. Nancy Russell, Walworth County Board Chair; Carl Redenius, Supervisor; and Maggie Zoellner, Kettle Moraine Land Trust

Approval of Agenda –**Supervisors Hawkins and Grant moved and seconded approval of the agenda. Motion carried 4-0.**

Approval of Minutes from May 16, 2011 LCC Meeting – **Citizen Member Burwell and Supervisor Grant moved and seconded approval of the minutes. Motion carried 4-0**

Public Comment – none

Farmland Preservation Town of Bloomfield Plan Map Amendments Request - Neal Frauenfelder reiterated that the LCC had directed them to only honor removal of Bloomfield parcels that correlate and are consistent with the Walworth County Comprehensive Land Use Plan (Comp Plan) and the Bloomfield Comprehensive Land Use Plan, which comprised about 90% of the town's request. The balance of the request included small parcels where the 50% rule could apply and one of two parcels owned by Fairwind Farms. On June 6 a rezone petition from Fairwind Farms was received on the parcel which is 95% in the floodplain. **Supervisor Hawkins and Grant moved and seconded to adopt the modified map which removes the small parcels that have more than 50% in a non-farmland category and the Fairwind Farms parcel that has a rezone petition pending and incorporate the modified map in the Farmland Preservation Plan Revision. Motion carried 4-0.**

Farmland Preservation Plan Revision Plan Adoption –**Supervisors Grant and Hawkins moved and seconded to tentatively adopt the Farmland Preservation Plan Revision with the above modifications, and directed Louise Olson to mail it to DATCP with a certification of application for review after sending to Corporation Council for signature. Motion carried 4-0.**

Langlade County Resolution #36-211 – Oppose the Provisions of AB 40 that call for elimination of PACE and Farmland Protection Conversion Fees - **Citizen Member Burwell and Supervisor Hawkins moved and seconded placing the resolution on file. Motion carried 4-0.**

Resignation of Roy Lightfield as county representative to the Honey Lake Management District – Michael Cotter said neither the LCC members nor the County Board of Supervisors expressed interest in becoming a representative. It will now be opened up to the public and will be brought back to the LCC in July for informational purposes.

Next Meeting Date – Monday, July 18, 2011 at 1:30 p.m.

Adjournment – **On motion and second by Supervisor Hawkins and Citizen Member Burwell, Chair Kilkenny adjourned the meeting at 1:15 p.m. Motion carried 4-0.**

Submitted by Joeann Douglas, Recording Secretary. Minutes are not considered final until approved by the committee at the next regularly scheduled meeting.

HNH ATTORNEYS

HOPP NEUMANN HUMKE LLP

COPY

June 7, 2011

Ms. Kimberly S. Bushey, Clerk
Walworth County
100 West Walworth St.
P. O. Box 1001
Elkhorn, WI 53121

Re: Resolution to Expand the Lake Beulah Management District Boundary

Dear Ms. Bushey:

Enclosed please find the Resolution to Expand the Lake Beulah Management District Boundary, District Resolution No. 2010-1, which includes Exhibits A through C.

Should you or Mr. Cotter have any questions, please contact me. Thank you.

Very truly yours,

Paul A. Dirkse
e-mail: paul.dirkse@hopplaw.com

PAD/ck
Enclosures

c: Michael P. Cotter, Deputy Corporation Counsel/Director LURM
David Bitter (w/o encl.)

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RECEIVED
JUN 8 2011
CORPORATION COUNSEL
WALWORTH COUNTY

LAKE BEULAH MANAGEMENT DISTRICT

Resolution No. 2010 - 1

RESOLUTION TO EXPAND THE LAKE BEULAH MANAGEMENT DISTRICT BOUNDARY

WHEREAS, Lake Beulah is an 834-acre flow-through lake located in Walworth County, Wisconsin; and

WHEREAS, the Lake Beulah Management District ("LBMD") is a public inland lake protection and rehabilitation district organized under Chapter 33 of the Wisconsin Statutes; and

WHEREAS, the LBMD has regulatory authority over all areas within the LBMD territory and the watershed to provide for the protection and rehabilitation of the lake and its environments; and

WHEREAS, pursuant to its regulatory authority the LBMD has contracted for the development of a Lake Management Plan (the "Plan") to identify management goals and areas of concern. A full copy of the Plan is attached hereto as Exhibit A; and

WHEREAS, the Plan identifies specific management goals as the restoration and maintenance of the environmental integrity of the lake ecosystem, protection of the aesthetic value of the lake, and maintenance of recreational opportunities; and

WHEREAS, the Plan identifies several areas of concern including the impact of high-capacity well on the lake, nutrient loading, water quality, shoreline erosion, weed management, and endangered species protection, among others; and

WHEREAS, the commissioners of the LBMD have identified certain properties listed on Exhibit B as properties that benefit from the achievement of the goals and the exploration of the areas of concern listed in the Plan; and

WHEREAS, the properties shown on Exhibit B, attached hereto have right and access to Lake Beulah by way of the private driveway and alley way, as shown and described on Exhibit C; and

WHEREAS, pursuant to Wis. Stat. §§ 33. 26(3) and 33.33(2) , the commissioners of a lake management district may by motion initiate proceedings to include in the district properties contiguous to the district when such properties benefit from the district; and

WHEREAS, the commissioners of the LBMD believe the properties listed on Exhibit B receive benefit from the LBMD and their inclusion will further promote the public health, comfort, convenience, necessity or public welfare of all property owners within the district.

NOW, THEREFORE, BE IT RESOLVED, the Commissioners of the Lake Beulah Management District hereby move to initiate attachment proceedings for the properties shown on Exhibit B.

LAKE BEULAH MANAGEMENT DISTRICT

David Bitter

DAVID BITTER, Chairperson

Date: November 30, 2010

ATTEST:

Valerie Johnson

Valerie Johnson, Secretary

R:\CLIENT\09109\00003\00036912.DOC

EXHIBIT A

LAKE BEULAH MANAGEMENT PLAN

April 1, 2010

RJN Project Number 09-201

Submitted to:

Lake Beulah Management District

Submitted by:

RJN Environmental Services, LLC
4631 County Road A
Oregon, Wisconsin 53575
608.576.3001

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1 INTRODUCTION

Lake Beulah is an 834-acre drainage (flow-through) lake, situated within U.S. Public Land Survey Sections 4, 5, 8, 9, 17, and 18, Township 4 North, Range 18 East, Town of East Troy, Walworth County, Wisconsin. The Lake Beulah Outlet Channel drains the lake into the middle reaches of the Mukwonago River, a Wisconsin Administrative Code Chapter (Wis. Admin. Code Ch.) NR 102 Exceptional Resource Water of the State. Figure 1 shows the lake, and its watershed.

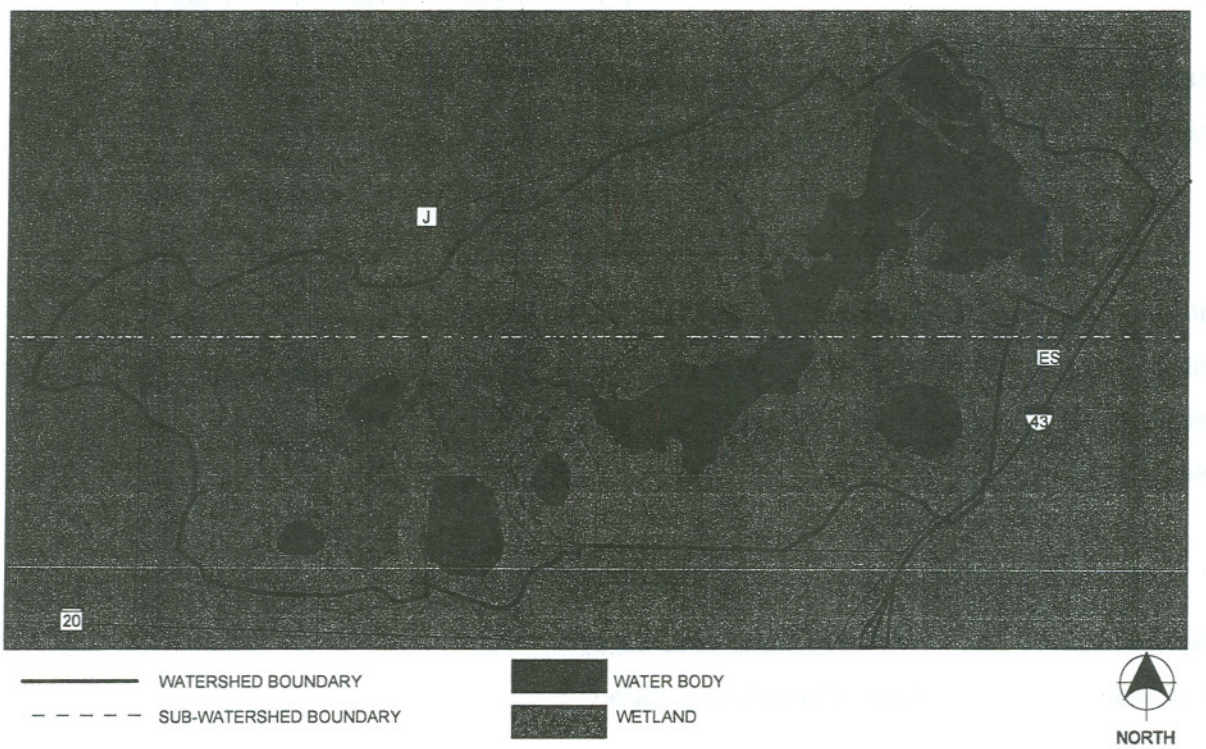

Figure 1. Lake Beulah watershed.

The Lake Beulah Management District (LBMD) was formed by the conversion of a town sanitary district, as a special purpose governmental unit to conduct studies and undertake other lake management activities with respect to Lake Beulah. Although the LBMD territory includes only properties near Lake Beulah, the LBMD is charged with the protection of the lake and its environments, and therefore assumes certain regulatory authority for all areas within the watershed.

The LBMD has undertaken a program of study that has included watershed, water quality, and lake management planning investigations, funded in part under the Wis. Admin. Code Ch. NR 190 Lake Management Planning Grant Program. The Wisconsin Department of Natural Resources (WDNR) awarded the LBMD's first Planning Grant in 2004. The grant funded a water balance study of the lake, which demonstrated the strong reliance of the lake's ecosystem on the flow of groundwater into the lake, particularly in the southern half of the lake.

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Significant work is currently being conducted to develop an understanding of the complex environments of the Lake Beulah watershed. Some of this work is being funded in part by an earlier Lake Management Planning grant; some is being entirely funded by the LBMD, and lake residents. This work includes:

- Lake water quality monitoring
- Citizen lake monitoring
- Groundwater elevation monitoring
- Stream flow monitoring below the Highway J dam
- Aquatic plant survey

Water quality monitoring conducted in 2007 and 2008 by the USGS has identified Lake Beulah as a high-quality, hard-water lake. Because Lake Beulah has adequate public recreational boating access as defined in Wis. Admin. Code Ch. NR 1, there are also opportunities for non-residents to enjoy recreational activities on the Lake, adding to the economic base that the lake sustains.

The development of this management plan is being funded in part by a Lake Management Planning Grant and will provide protection of Lake Beulah and its watershed, which will in turn contribute to the management and protection of downstream water resources, in light of the combined stressors of pumpage and development. Existing geochemical and groundwater elevation data, and supplemental trophic state index data will be utilized to assess possible long-term response of the lake to development in the watershed and pumpage from the well. Additionally, an aquatic plant survey and surrounding wetlands survey are proposed to assess the health and quality of current lake ecology, and to determine the appropriate care and protection practices. The results of the studies will be incorporated into this lake management plan, the preparation of which was recommended in the Southeast Wisconsin Regional Planning Commission (SEWRPC) Regional Water Quality Management Plan.

2 MANAGEMENT GOALS

The ultimate goal of the lake management plan is to preserve Lake Beulah and its watershed as an environmental and recreational resource for lake residents and anyone wishing to enjoy its scenic natural beauty, as well as to protect the integrity of the lake's ecosystem.

Specific goals include:

- Restoration and maintenance of the environmental integrity of the lake ecosystem,
- Protection of the aesthetic value of the lake and
- Maintenance of recreational opportunities.

3 IDENTIFICATION OF NEEDS AND PROBLEMS

Discussions with local residents and lake users identified several areas of concern, including:

- Impact of high-capacity well on lake
- Nutrient loading
- Water quality
- Area development and growth
- Shoreline erosion
- Invasive species management
- Weed management
- Fisheries management
- Endangered resources protection
- Sensitive area protection

3.1 IMPACT OF HIGH-CAPACITY WELL ON LAKE

To meet the increasing water supply needs of the growing surrounding population, the Village of East Troy installed a high-capacity water supply well near the southwestern shoreline of the lake. Previous studies have indicated that this is the primary area for groundwater discharge into the lake. Removal of water through the new well in the shallow aquifer reduces the amount of groundwater entering the lake and also reduces the amount of water in streams entering the lake, which will alter the lake's water budget. Subsequently, the lake's flushing rate will be reduced and seasonally low water levels, especially during drought periods, may be aggravated.

Additionally, groundwater discharge to the lake increases the hardness of the water and results in the lake being classified as a hard-water lake. In 2007, autumnal turnover concentrations of calcium and magnesium were 55.2 mg/L and 33.6 mg/L, respectively, with a water hardness of about 276 mg/L. A reduction in groundwater inputs to the lake over time could result in a reduction of water hardness in the lake, which, in turn, could degrade water quality. Recent studies by the USGS on nearby Nagawicka Lake have demonstrated that hard-water lakes often have better water quality than would be expected based upon phosphorus loadings because of the co-precipitation of phosphorus with calcium and magnesium that limits the availability of phosphorus for algal production. Combined with the likelihood of increased loading of phosphorus to the lake from increased development in the watershed, a decreased ability of the lake to assimilate phosphorus through co-precipitation could result in significant reduction in lake quality. Consequently, lake-area residents and property owners are concerned that operation of the well could have an adverse influence on the lake and downstream reaches of the Mukwonago River.

3.2 NUTRIENT LOADING

Nutrient loading is a major concern for many of Wisconsin's surface water bodies, and Lake Beulah is no exception. Nitrogen and phosphorus entering the lake from soil erosion and fertilizer applications within the watershed lead to growth of excess vegetation and a degradation of water clarity. There is currently a phosphorus ordinance prohibiting the use of phosphorus-containing fertilizers within the Lake Beulah Management District.

3.3 WATER QUALITY

Water quality in the lake is dependent on the level of nutrients such as nitrogen and phosphorus, hardness, concentration of dissolved oxygen, lake temperature, vegetation and sedimentation. Studies by the USGS and lake volunteers have shown the lake to have very good water quality.

3.4 AREA DEVELOPMENT AND GROWTH

Lake Beulah is located in a rapidly developing area in Walworth County. Between 1990 and 2000, the Village of East Troy experienced a population growth of 33.8% (Village of East Troy, 2008). Residential development within the Lake Beulah watershed is subject to the Village of East Troy Comprehensive Plan, adopted in June 2008. Under the plan, areas along the southern and eastern shores of Lake Beulah are identified for planned residential development and expansion of City sewer utilities. As discussed in Section 3.1 above, increased development coupled with a change in water chemistry in the Lake caused by pumpage of the high-capacity municipal well near the lake could significantly degrade water quality in the lake.

3.5 SHORELINE EROSION

Shoreline erosion leads to excess sedimentation and a degradation of the water quality in the lake. Shoreline erosion is exacerbated by wave action caused by boats wakes, as well as removal of natural vegetation from the lake shore.

3.6 INVASIVE SPECIES MANAGEMENT

Lake Beulah has been impacted by invasive species such as the rusty crayfish, zebra mussels and Eurasian milfoil. Invasive species are aggressive non-native species that disrupt the lake ecosystem by displacing native species.

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3.7 WEED MANAGEMENT

Excess vegetation in the lake caused by nutrient loading from poor land management practices can make boating difficult and affect other recreational opportunities, such as fishing. Additionally, different fish thrive in a variety of habitats, and some may be displaced by an overabundance of vegetation.

3.8 FISHERY MANAGEMENT

Lake Beulah provides year-round enjoyment for anglers in Wisconsin. Sport fish present in the lake include bluegill, brown trout, largemouth bass, northern pike and rainbow trout. The parking lot on the south side of the lake is frequently full during the peak fishing season, and protection and maintenance of the Lake Beulah fishery is essential to ensure the future of this recreation opportunity on the lake.

3.9 ENDANGERED RESOURCES PROTECTION

The WDNR defines a threatened species as "any species which appears likely, within the foreseeable future, on the basis of scientific evidence to become endangered." An endangered species is defined as "any species whose continued existence as a viable component of this state's wild animals or wild plants is determined by the Department to be in jeopardy on the basis of scientific evidence."

RSV Engineering, Inc. requested a WDNR review of threatened/endangered species within the Lake Beulah watershed area. The review was conducted in December 2008 and identified 25 rare species and communities that exist within and in close proximity to the Lake Beulah watershed boundary. The rare communities include oak opening, bog relict, calcareous fen, emergent marsh, southern sedge meadow, southern tamarack swamp and northern wet forest. The rare plant species include common bog arrow-grass, kitten tails, beaked spikerush, lesser fringed gentian, tufted club-rush, Ohio goldenrod, showy lady's slipper, pale green orchid and sycamore tree. The rare animal species include mulberry wing, double-striped bluet, lake chubsucker, banded killfish, least darter, starhead topminnow, pugnose shiner, bullfrog and blanding's turtle. Additionally, 48 rare species and communities were identified within the one-mile buffer zone surrounding the watershed, which may be present within the watershed if suitable habitat is present. Many of the rare species (mussels, dragonfly, fish, butterfly and plants) are dependent on lake and wetland habitat for their survival.

Three State Natural Areas (SNAs) are also located within the watershed or one-mile buffer zone. SNAs protect outstanding examples of Wisconsin's native landscape of natural communities and are valuable for research and educational use, the preservation of genetic and biological diversity and for use as benchmarks for determining the impact of use on managed lands.

To summarize, the Lake Beulah watershed area contains a variety of rare ecological communities providing habitat for several species of plants and animals rare in Wisconsin. If land disturbing projects are proposed in any of the ecological communities previously discussed, it is important that endangered resource surveys be conducted to determine the presence/absence of such species.

3.10 SENSITIVE AREA PROTECTION

The WDNR also completed an assessment of sensitive areas within Lake Beulah in 1994. These areas support a diverse community of native plants with limited areas of Eurasian milfoil and offer spawning and nursery areas for several fish species, nesting habitat for animals, act as sediment and nutrient traps and help protect the shoreline from erosion. Eight such areas are located within the lake, and specific recommendations were made by the WDNR for their protection (Appendix A).

The sensitive areas are as follows:

- Area 1 – along the eastern shore of Jesuit Island in the northeastern part of the lake.
- Area 2 – a small cove located across from Jesuit Island.
- Area 3 – around a small island along the northeastern shore of the lake.
- Area 4 – along the southern shore of the lake in the area also known as Mueller's Cove.
- Area 5 – in the south shore cove area, located on the southern shore of the eastern end of the lake.
- Area 6 – in the narrows between the two basins of the lake.
- Area 7 – in the bay near the inlet from Pickerel Lake in the southwestern part of the lake.
- Area 8 – just southeast of the East Troy boat launch on the southwestern shore of the lake.

4 CURRENT UNDERSTANDING

The physical characteristics of a lake and its watershed are important factors in any evaluation of existing and likely future water quality conditions and lake uses, including recreational uses. Characteristics such as watershed topography, lake morphometry and local hydrology, ultimately influence water quality conditions and the composition of plant and fish communities within the lake. This section provides pertinent information on the physical characteristics of Lake Beulah, its watershed, and on the climate and hydrology of the Lake Beulah drainage area.

4.1 WATERBODY CHARACTERISTICS

The Lake Beulah watershed is situated in the Towns of Troy and East Troy. Due to recent annexation, a portion of the Village of East Troy is also within the watershed. The lake occupies a central position within the Mukwonago River Basin. The Mukwonago River is a tributary stream to the Fox River, which ultimately drains into the Mississippi River. Lake Beulah is 834 acres with a mean depth of 17 feet and a maximum depth of 58 feet. A drainage lake is a lake that is fed by streams, groundwater, precipitation and runoff and drained by a stream. According to *A Comprehensive Plan for the Fox River Watershed – Volume 2* prepared by SEWRPC, the lake has approximately 15.3 miles of shoreline and a volume of 14,489 acre-feet. Approximately 13 percent of the lake area is less than 3 feet deep, 53 percent has a water depth between 3 and 20 feet, and about 34 percent of the lake has a water depth of more than 20 feet.

The level of the lake is maintained by a fixed berm, which includes a concrete spillway. The spillway was reportedly constructed in the 1840's and was initially used to power a flour mill. The berm forms the northernmost boundary of Lake Beulah and serves as the road bed for CTH J. The Lake discharges through this control structure to the Lake Beulah outlet, which in turn drains in a northerly direction to the Mukwonago River.

The lake has two public access points. One public access with two boat ramps is located on the southern portion of the lake, off Wilmers Landing Road. The second access point is a public beach located on the northeastern portion of the lake, off East Shore Road.

The shoreline of Lake Beulah is mostly developed for residential uses, with a few scattered commercial facilities comprised primarily of restaurants and businesses catering to lake users. Additionally, several camps are present for young people and families, such as Camp Edwards (YMCA) and Camp Charles Allis. Three significant wetland areas are present along the lake's shoreline: a large emergent wetland complex between Lake Beulah and Army Lake along the east central shoreline, a large forest/shrub/emergent wetland complex between Beulah Heights Road and Lake Beulah along the west central shoreline, and a variety of wetland types along the southern portion of the lake, north of Booth and Swan Lakes. In addition, numerous other smaller, yet valuable, wetland communities also exist along the shore of the lake.

4.2 WATERSHED CHARACTERISTICS

The drainage area tributary to Lake Beulah which drains directly into the lake totals approximately 10.2 square miles. Lake Beulah is fed by surface water flow, mainly from the southwestern portion of the watershed, and by groundwater. The watershed is an area of rolling hills on the southeastern edge of the southern Kettle Moraine, with numerous short surface water and groundwater flow systems draining into Lake Beulah and on to the Mukwonago River.

Much of the watershed is underlain by the Troy Bedrock Valley, a southwest-to-northeasterly-trending buried valley. The valley is filled with glacial outwash consisting of clay, silt, sand and gravel, and is a valuable aquifer.

4.3 WATERSHED LAND USE AND POPULATION

Human activity within the drainage area of a waterbody can deteriorate the natural environments within and ultimately impact water quality. This is especially true with respect to lakes, which are highly susceptible to deterioration from human activities and because of the variety of conflicting uses to which lakes are subjected. Development pressure is often concentrated in watershed areas, around the shorelines of lakes, where there are no intermediate stream segments to attenuate pollutant runoff and loadings. Land uses and population levels within the watershed of a lake must be important considerations in lake management planning effort. This section discusses land usage and population distributions within the Lake Beulah watershed, including their relevance to water quality and lake management.

4.3.1 Population

According to the SEWRPC Community Assistance Planning Report No. 288, the Town of Troy's population based on a 1980 census was 1,794. The Department of Administration estimated the 2006 population at 2,409, an approximate 42 percent increase between 1980 and 2006. SEWRPC's trend based population estimate for the year 2035 is 3,419, a potential 42 percent increase between 2006 and 2035. As for the Town of East Troy, the population based on the 1980 census was 3,583. The Department of Administration estimated the 2006 population at 3,915, an approximate 9 percent increase between 1980 and 2006. SEWRPC's trend based population estimate for the year 2035 is 5,378, a 37 percent increase between 2006 and 2035.

SEWRPC's regional land use plan recommends that much of the future increase in population and households within the County be accommodated in urban service areas that provide sanitary sewer and other urban services. Therefore, the 2035 trend based population estimates for the Town's of Troy and East Troy may be slightly on the high end. Regardless of the predicted percent population increase for the future, it can be assumed that the population within the Lake Beulah watershed will significantly increase over the next 25+ years.

4.3.2 Current and Future Land Use

Current Land Use

The various land use types within the Lake Beulah watershed play an integral role in the overall water quality and recreational use demands. Current and planned land use patterns should be important considerations in any lake management planning effort for Lake Beulah. Table 1 displays the different land use types within the Towns of Troy and East Troy and the overall percentage of each land use.

Urban				
Single-Family	1,472	7.8	915	4.0
Multi-Family	7	0.03	-	-
Commercial	16	0.1	12	0.1
Industrial	17	0.1	30	0.1
Streets and Highways	712	3.8	498	2.2
Railroads	82	0.4	-	-
Other Transportation/Utilities	16	0.1	7	0.03
Governmental/Institutional	68	0.4	13	0.1
Recreational	271	1.4	135	0.6
Unused Urban	71	0.4	10	0.04
Urban Subtotal	2,732	14.5	1,620	7.1
Non-Urban				
Surface Water	1,193	6.3	475	2.1
Wetlands	2,275	12	2,474	10.9
Woodlands	1,916	10.1	2,364	10.4
Extractive/Landfill	180	1.0	-	-
Agricultural	9,945	52.5	14,860	65.4
Unused Rural	689	3.6	934	4.1
Non-Urban Subtotal	16,198	85.5	21,107	92.9
Total	**18,930**	**100**	**22,727**	**100**

Source: SEWRPC Community Assistance Planning Report No. 288

Table 1. Land use in the Towns of Troy and East Troy.

The percentage of land within the watershed that is developed as impermeable surface, whether for buildings, roads, parking lots, etc., directly affects the amount of water that recharges the lake and associated wetlands through infiltration and groundwater flow. Additionally, it has become increasingly apparent that non-point sources such as stormwater flow and runoff from agricultural fields have a significant effect on the quality of water in surface water bodies, and can contribute heavy loads of nutrients from fertilizers, sodium and

other salts from road salt, which are particularly harmful to wetlands, as well as contaminants such as heavy metals and volatile organic compounds.

Future Land Use

The Village of East Troy initially adopted a "Smart Growth" plan, the 2030 Comprehensive Community Plan, on July 14, 2008. The plan addresses future land use in the areas surrounding Lake Beulah, including a significant portion of the Lake's watershed.

The plan was promulgated pursuant to the State of Wisconsin's "Smart Growth" legislation, and the primary objective of the legislation is the incorporation of community input into local land use planning. Due to widespread public dissatisfaction with the plan, the Village has agreed to reconsider the plan.

The Lake Beulah Protective and Improvement Association (LBPIA) raised several objections regarding the plan, including:

- Plans for extensive residential development in areas that are currently agricultural lands south of the lake;
- Plans for additional high-capacity municipal wells in areas adjacent to the lake;
- Preference for high-density development along lakeshores;
- Plans for the Divine Word Seminary property along the southern shore of Lake Beulah;
- Statement within the plan that only the Swan Lake Wetland Complex within the planning area "contains rare, threatened or endangered species..." and
- Lack of adequate study of the potential impacts of Well #7 on public rights, surface and ground water, wetlands or the ecosystem in general.

The Village of East Troy was invited to take part in the creation of the Lake Management Plan for Lake Beulah and asked to address the above comments in the final "Smart Growth" plan.

4.4 WATER BUDGET

A water budget study was completed by RSV Engineering, Inc. in 2006. This study was conducted utilizing data collected on site, published information, and a three-dimensional groundwater flow model. This study showed that the lake relied a great deal on groundwater. A summary of the water budget conclusions is summarized in Table 2.

COMPONENT	ACRE-FEET/YEAR[1]	
	INFLOW	OUTFLOW
Evaporation		2,208
Precipitation	2,295	
Surface flow	3,941	5,683
Groundwater	1,699	44
Totals	7,935	7,935

1 One acre-ft/year is equal to approximately 325,830 gallons per year.

Table 2. Summary of water budget calculations for Lake Beulah.

Although Table 2 shows that groundwater accounts for only 21 percent of the total inflow, most of the surface flow comes from the upgradient lakes, including Booth, Swan and Pickerel. Groundwater is a major component to inflow for those lakes. Together, surface flow and direct groundwater discharge provide approximately 71 percent of the lake's water budget.

Additionally, the groundwater flow model showed that the southern portion of the lake provides most of the groundwater flowing into it.

4.5 SOIL TYPES AND CONDITIONS

Soil type, topography, and land use are among the most important factors determining lake water quality conditions. Soil type, topography, and vegetative cover are also important factors affecting the rate, amount, and quality of stormwater runoff. Soil texture and land slope influence the permeability and infiltration rate of stormwater runoff and erosion potential of soils. The potential for erosion can be reduced with vegetative growth.

According to the Walworth County Soil Survey, the soils within the Lake Beulah watershed consist primarily of the Casco-Rodman and Casco-Fox soil associations. The Casco-Rodman association consists of loam and silt loam soils that are well-drained and somewhat excessively drained that have a subsoil of clay loam and gravelly sandy loam. The Casco-Fox association consists of loam and silt loam soils that are well-drained and have a subsoil of clay loam.

Casco soils have a water erosion hazard on sloping areas. They have a low available moisture capacity making them droughty during dry periods. The nearly level to sloping Casco soils are good to fair for cropland. Rodman soils are very droughty and sloping areas have a water erosion hazard. They are very poor cropland soils. Fox soils also have a water erosion hazard on sloping areas as well as being droughty during prolonged dry periods. The nearly level to moderately steep soils are suitable for cropland.

Utilizing the NRCS Web Soil Survey, an approximate Lake Beulah watershed boundary was delineated to determine an estimate of non-hydric vs. hydric soils within the watershed. Approximately 73 percent of the soils within the watershed boundary consist of upland soils and 27 percent consist of water or hydric soils.

4.6 WETLANDS

A wetland defined by the State of Wisconsin is: "an area where water is at, near, or above the land surface long enough to be capable of supporting aquatic or hydrophytic (water-loving) vegetation and which has soils indicative of wet conditions."

Wetlands cover a wide variety of landscapes and provide habitat for more species of plants and animals than any other landscape type in Wisconsin. In addition, wetlands also store water to prevent flooding, purify water, protect lakes and stream shores from eroding and provide recreational opportunities for wildlife viewers, anglers, hunters and boaters. Unfortunately, Wisconsin only has about half of the 10 million acres of wetlands that were present in 1848 due to farm drainage and filling for development and roads. Wetland regulations have slowed their loss; however, wetlands continue to be destroyed and degraded from human activities. Invasive plants such as purple loosestrife and reed canary grass are invading wetland habitats and crowding out native plants. Overuse of groundwater and increasing stormwater runoff from development either starves or drowns wetland plants.

Three significant wetland areas are present along the lake's shoreline; a large emergent wetland complex between Lake Beulah and Army Lake along the east central shoreline, a large forested/shrub/emergent wetland complex between Beulah Heights Road and Lake Beulah along the west central shoreline, and a variety of wetland types along the southern portion of the lake, north of Booth and Swan Lakes. In addition, numerous other smaller, yet valuable, wetland communities also exist along the shore of the lake.

Beulah Bog, owned by the WDNR and dedicated as a State Natural Area in 1975, is located approximately 1,200 feet north of Lake Beulah (within the lake watershed boundary) and is considered a rare southern bog community. Beulah Bog lies in a series of four kettle holes and features an undisturbed bog with many unusual plants more typical of northern bogs. Undisturbed bogs in southeastern Wisconsin are rare and support a number of regionally rare plants including dense cotton grass, large and small cranberry, and small bladderwort. The site harbors at least six species of insectivorous plants and the state-threatened plant, kitten tails, is also found there. The bog also provides habitat for several dragonfly species and other invertebrates. Beulah Bog is located within the lake watershed boundary and is considered a valuable resource to the lake.

Pickerel Lake Fen, owned by the Wisconsin Chapter of The Nature Conservancy, and dedicated as a State Natural Area in 1986, is located just west of Booth Lake (within the lake watershed boundary). Pickerel Lake Fen is a diverse alkaline fen that originates at the base of a glacial

ridge from seeps and springs. The fen has a rich flora including these common species; shrubby cinquefoil, pitcher plant, sedges, bulrushes, blue-joint grass, marsh blue violet, swamp milkweed, Joe-Pye weed, boneset and several goldenrods.

4.7 LAKE CHEMISTRY

Judging the water quality of a lake can be difficult because lakes display problems in many different ways. One indicator of water quality is a lake's trophic status. Lakes can be divided into three categories based on their trophic status; oligotrophic, eutrophic, and mesotrophic, defined below:

- **Oligotrophic** lakes are generally clear, deep and free of weeds or large algal blooms. Though beautiful, they are low in nutrients and do not support large fish populations; however, oligotrophic lakes often develop a food chain capable of sustaining a very desirable fishery of large game fish.

- **Eutrophic** lakes are high in nutrients and support a large biomass (all the plants and animals living in a lake). They are usually either weedy or subject to frequent algal blooms, or both. Eutrophic lakes often support large fish populations, but are also susceptible to oxygen depletion. Small, shallow, eutrophic lakes are especially vulnerable to winterkill which can reduce the number and variety of fish. Rough fish are commonly found in eutrophic lakes.

- **Mesotrophic** lakes lie between the oligotrophic and eutrophic stages. Devoid of oxygen in late summer, their hypolimnions limit cold water fish and cause phosphorus cycling from sediments.

Lakes naturally change over time and shift from oligotrophic to eutrophic status. Human beings accelerate the eutrophication process by allowing nutrients from agricultural fields, lawn fertilizers, streets, septic systems and urban storm drains to enter lakes.

There are three water quality parameters that have traditionally been used to determine a lake's trophic status in Wisconsin. These include total phosphorus, chlorophyll-a, and secchi disk transparency.

- **Phosphorus** is a nutrient that controls the growth of plants in the vast majority of Wisconsin lakes. In more than 80 percent of Wisconsin's lakes, phosphorus is the key nutrient affecting the amount of algae and weed growth.
- **Chlorophyll-a** is the green pigment present in all plant life that is necessary for photosynthesis. The amount present in lake water depends on the amount of algae, and is therefore used as a common indicator of water quality.
- **Secchi disk transparency** is a measurement of water clarity, and of all limnological parameters is the easiest for non-professionals to understand. Secchi disc readings are

taken using an 8-inch diameter weighted disc painted black and white. The disc is lowered into the water until it disappears from sight, then raised until it is visible. The average of the two depths is recorded.

The water quality parameters described above are all interrelated. Phosphorus controls algae abundance, which is measured by chlorophyll-a levels. Water clarity, as measured by secchi disk transparency, is directly affected by algal abundance.

4.7.1 Citizen Lake Monitoring Program

Lake Beulah water quality data (secchi disk clarity, chlorophyll-a, total phosphorus) was obtained from the WDNR's Citizen Lake Monitoring Program (formerly Self-Help Lake Monitoring) database. This database contained water quality data dating back to 1973 and was reportedly collected from Station 1 (deep hole) of the lake. Other stations on the lake have been monitored by citizen volunteers since 1991; however, for discussion purposes, only water quality data collected from Station 1 was evaluated. The Citizen Lake Monitoring began in 1986, so any data prior to 1986 was reportedly collected by WDNR staff.

A technical bulletin titled *Limnological Characteristics of Wisconsin Lakes* (Lillie and Mason, 1983) was used to compare water quality from Lake Beulah with water quality data collected from other Wisconsin Lakes. This document provides a source for comparing lakes within specific regions of the state. Lillie and Mason divided the state's lakes into five regions, each having lakes of similar nature or apparent characteristics. These regions include northwest, northeast, central, southwest and southeast. Walworth County lakes were included within the study's southeast region and were among 61 lakes randomly picked from the region that were analyzed for water clarity (Secchi disk), chlorophyll-a, and total phosphorus.

<u>Secchi Disk Clarity</u>
Secchi disk clarities in Lake Beulah have generally been very good and higher than mean values for other natural lakes in the state and for lakes in the southeast region of Wisconsin. The overall average secchi disk clarity based on the Citizen Lake Monitoring database was 11.8 feet. This value was based on sampling events during the growing season, May through October.

<u>Chlorophyll-a</u>
Chlorophyll-a levels in Lake Beulah have generally been very good and significantly lower than mean values for other natural lakes in the state and for lakes in the southeast region of Wisconsin. The low chlorophyll-a levels are related to the high secchi disk clarities. The overall average chlorophyll-a value based on the Citizen Lake Monitoring database was 5.45 µg/L. This value was based on sampling events during the growing season, June through October.

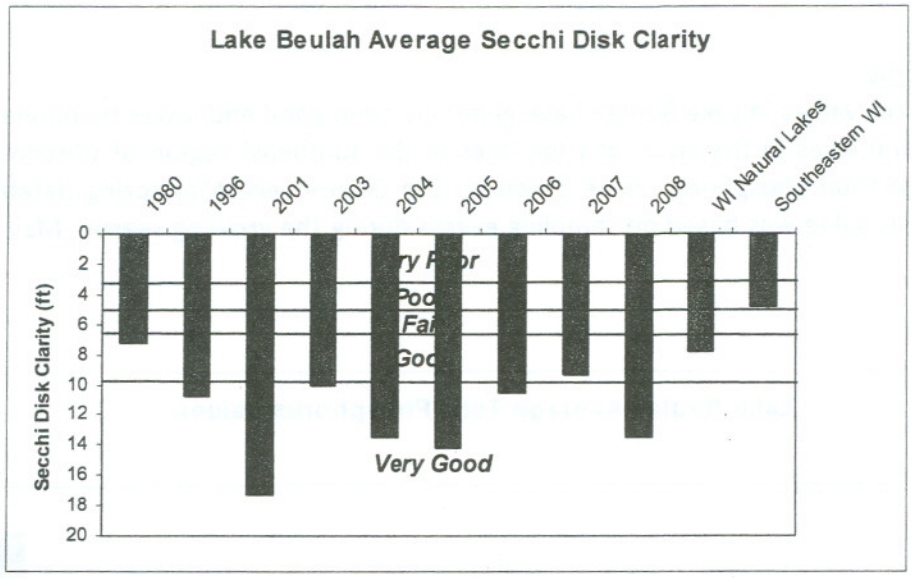

Figure 2. Lake Beulah Average Secchi Disk Clarity Values. *The mean secchi values from random natural lakes in Wisconsin and lakes in Southeastern Wisconsin were derived from Lillie & Mason (1983).*

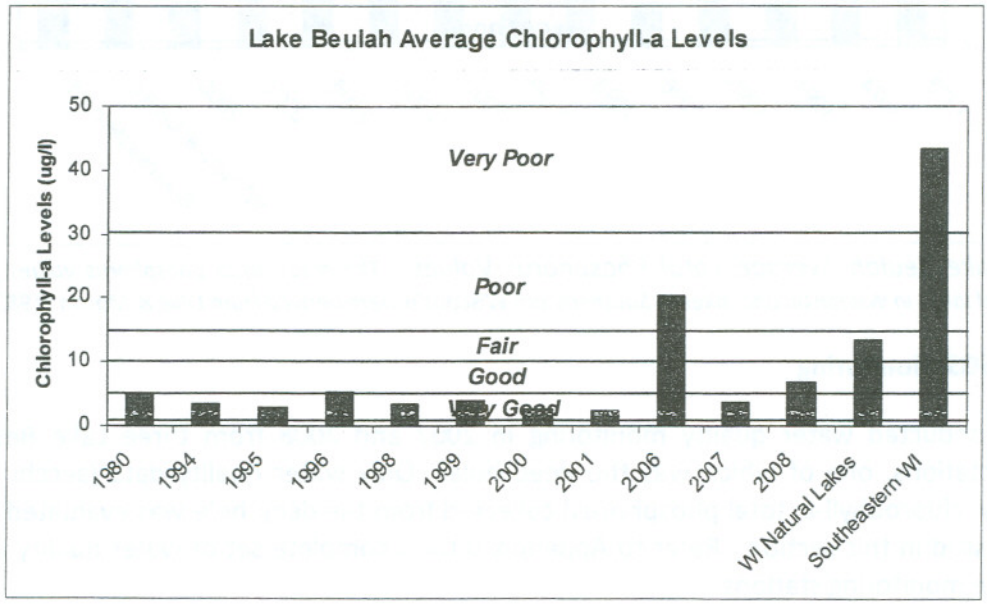

Figure 3. Lake Beulah Average Chlorophyll-a Levels. *The mean chlorophyll-a values from random natural lakes in Wisconsin and lakes in Southeastern Wisconsin were derived from Lillie & Mason (1983).*

Total Phosphorus

Total phosphorus values in Lake Beulah have generally been good and lower than mean values for other natural lakes in the state and for lakes in the southeast region of Wisconsin. The overall average total phosphorus value based on the Citizen Lake Monitoring database was 14.54 µg/L. This value was based on sampling events during the growing season, May through October.

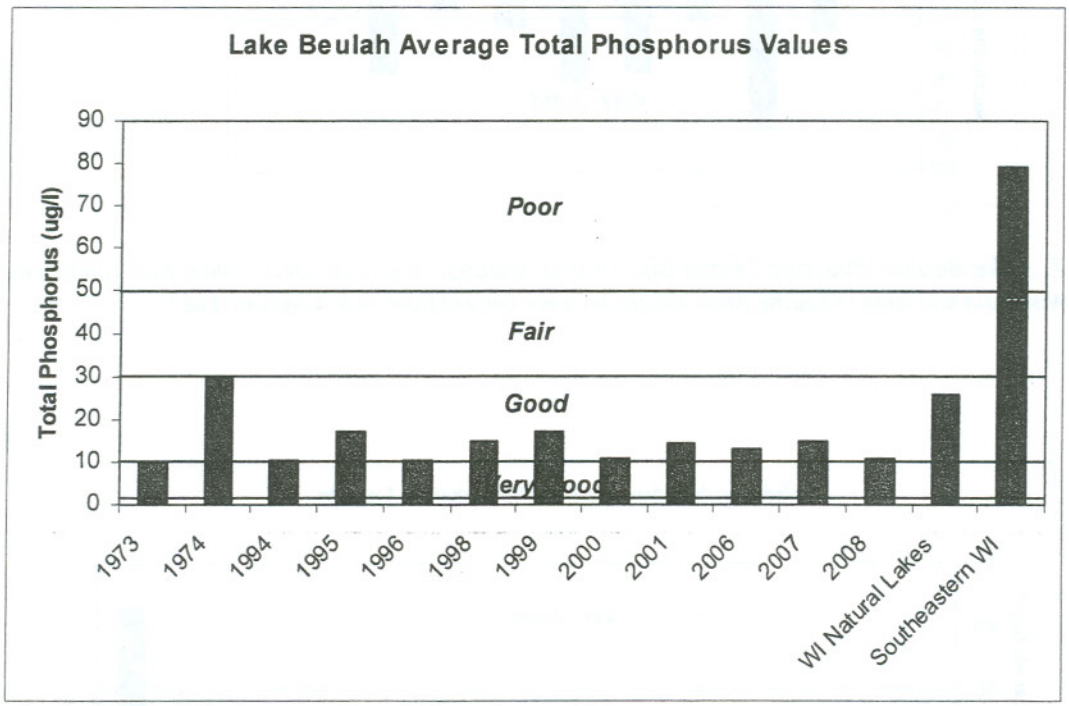

Figure 3. Lake Beulah Average Total Phosphorus Values. The mean total phosphorus values from random natural lakes in Wisconsin and lakes in Southeastern Wisconsin were derived from Lillie & Mason (1983).

4.7.2 USGS Monitoring

The USGS conducted water quality monitoring in 2007 and 2008 from three Lake Beulah monitoring stations, one of which was the deep hole. Only water quality data (secchi disk transparency, chlorophyll-a, total phosphorus) collected from the deep hole was evaluated and will be discussed in this section. Refer to Appendix B for a complete set of water quality data from all three monitoring stations.

The 2007 monitoring was conducted during the months of August and December. The 2008 monitoring was conducted in March, April, and August. In 2007, the average secchi disk clarity was 16 feet, compared to 10.6 feet in 2008. The two-year secchi disk average is 13.3 feet, slightly higher than the 11.8 feet average for the Citizen Lake Monitoring. According to Lillie and Mason (1983), a secchi disk clarity of 13.3 indicates very good water quality.

In 2007, the average chlorophyll-a value was 2.73 µg/L, compared to 6.23 µg/L in 2008. The two-year chlorophyll-a value average is 4.48 µg/L, slightly lower than the 5.45 µg/L average for the Citizen Lake Monitoring. According to Lillie and Mason (1983), a chlorophyll-a value of 4.48 ug/l indicates very good water quality.

In 2007, the average total phosphorus value was 18.3 µg/L, compared to 18.2 µg/L in 2008. The two-year total phosphorus average is 18.25 µg/L, slightly higher than the 14.54 µg/L average for the Citizen Lake Monitoring. According to Lillie and Mason (1983), a total phosphorus value of 18.25 indicates good water quality.

In addition the USGS analyzed for other water quality values including, but not limited to, turbidity, pH, specific conductance, calcium, magnesium, silica, sulfate, and iron. These parameters were all below any caution levels. The hardness concentration averaged 281 mg/L for 2007 and 2008 monitoring, indicating Lake Beulah is a very hard lake. According to limnology experts at the USGS, this hardness is a result of the strong groundwater component of the lake's water budget, and a reduction in groundwater flow could be detrimental to the lake's water quality.

4.7.3 Wisconsin Trophic Status Index

The Wisconsin Trophic Status Index (WTSI) is based upon the widely used Carlson Trophic Status Index (TSI), but is specific to Wisconsin. Secchi disk transparency, chlorophyll-a levels, and total phosphorus values can determine the trophic status or level of nutrient enrichment of a lake. Trophic state index is a continuum scale of 0 to 100, with 0 corresponding to the clearest and most nutrient poor lake possible, and being 100 the least clear and presumably most nutrient rich lake possible. As previously discussed, lakes can be divided into three main levels of nutrient enrichment categories: oligotrophic, eutrophic, and mesotrophic. Refer to Table 3 for a description of the TSI breakdown.

Figure 4 displays the WTSI (Lillie, et al. 1993) values calculated from average chlorophyll-a concentrations, total phosphorus concentrations, and Secchi disk transparencies measured during the growing season, May through October. Based on the WTSI, Lake Beulah is characterized as a mesotrophic lake. Mesotrophic lakes fall in the middle of the continuum from nutrient-poor to nutrient-rich. They have moderately clear water, and may experience low to now oxygen concentrations in bottom waters. Based on dissolved oxygen profiles conducted by the USGS while water quality sampling the deep hole of the lake in 2007 and 2008, the lake does stratify during the summer months and is essentially depleted of oxygen at approximately 20 feet in depth (Figure 5).

TSI	TSI Description
TSI < 30	Classical oligotrophy: clear water, many algal species, oxygen throughout the year in the bottom water, cold water, oxygen-sensitive fish species in deep lakes. Excellent water quality.
TSI 30-40	Deeper lakes still oligotrophic, but bottom water of some shallower lakes will become oxygen-depleted during the summer.
TSI 40-50	Water moderately clear, but increasing chance of low dissolved oxygen in deep water during the summer.
TSI 50-60	Lakes becoming eutrophic: decreased clarity, fewer algal species, oxygen-depleted bottom waters during the summer, plant overgrowth evident, warm-water fisheries only.
TSI 60-70	Blue-green algae become dominant and algal scums are possible, extensive plant overgrowth problems possible.
TSI 70-80	Becoming very eutrophic. Heavy algal blooms possible throughout summer, dense plant beds, but extent limited by light penetration (blue-green algae block sunlight).
TSI > 80	Algal scums, summer fish kills, few plants, rough fish dominant.

Table 3. Trophic Status Index Scale.

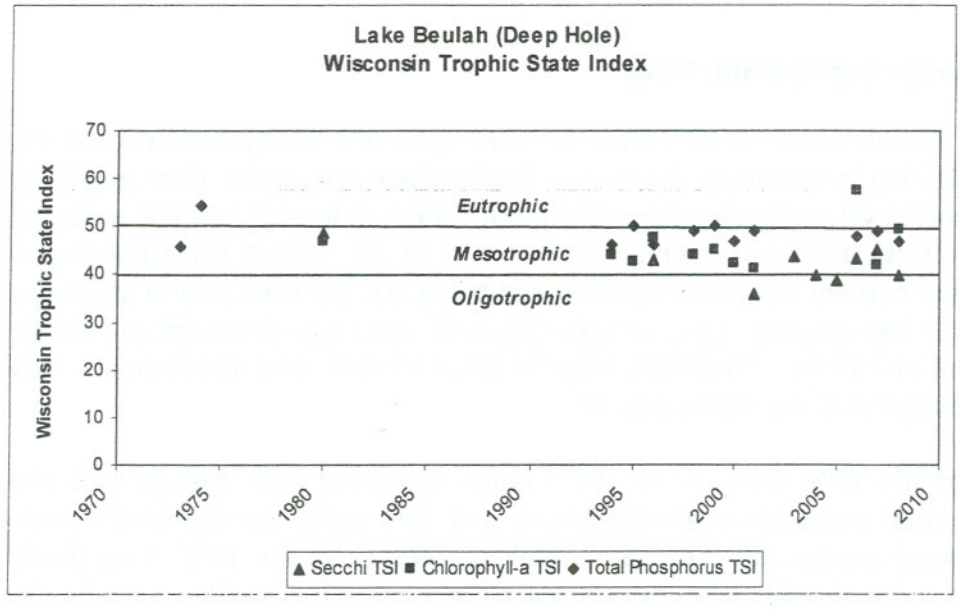

Figure 4. Lake Beulah Wisconsin Trophic State Index. Calculations based upon Lillie, et al. (1993).

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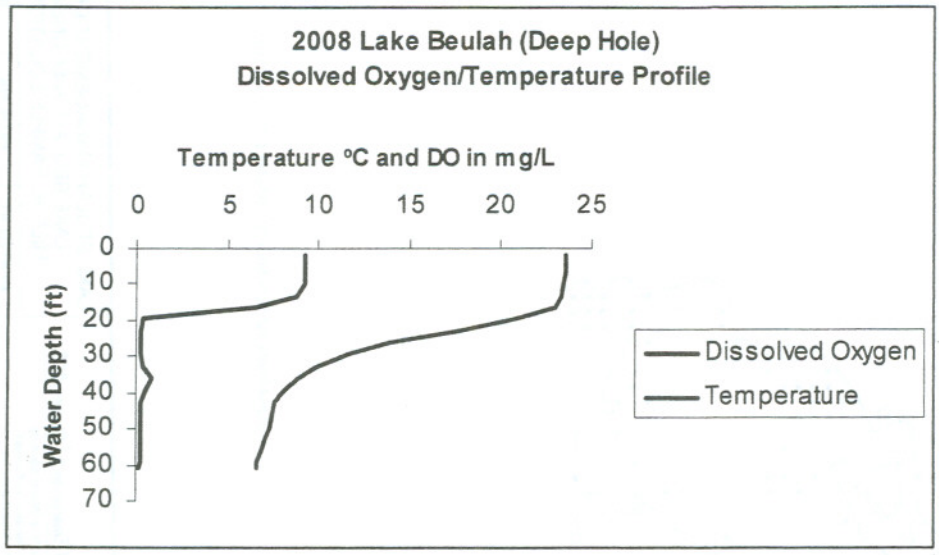
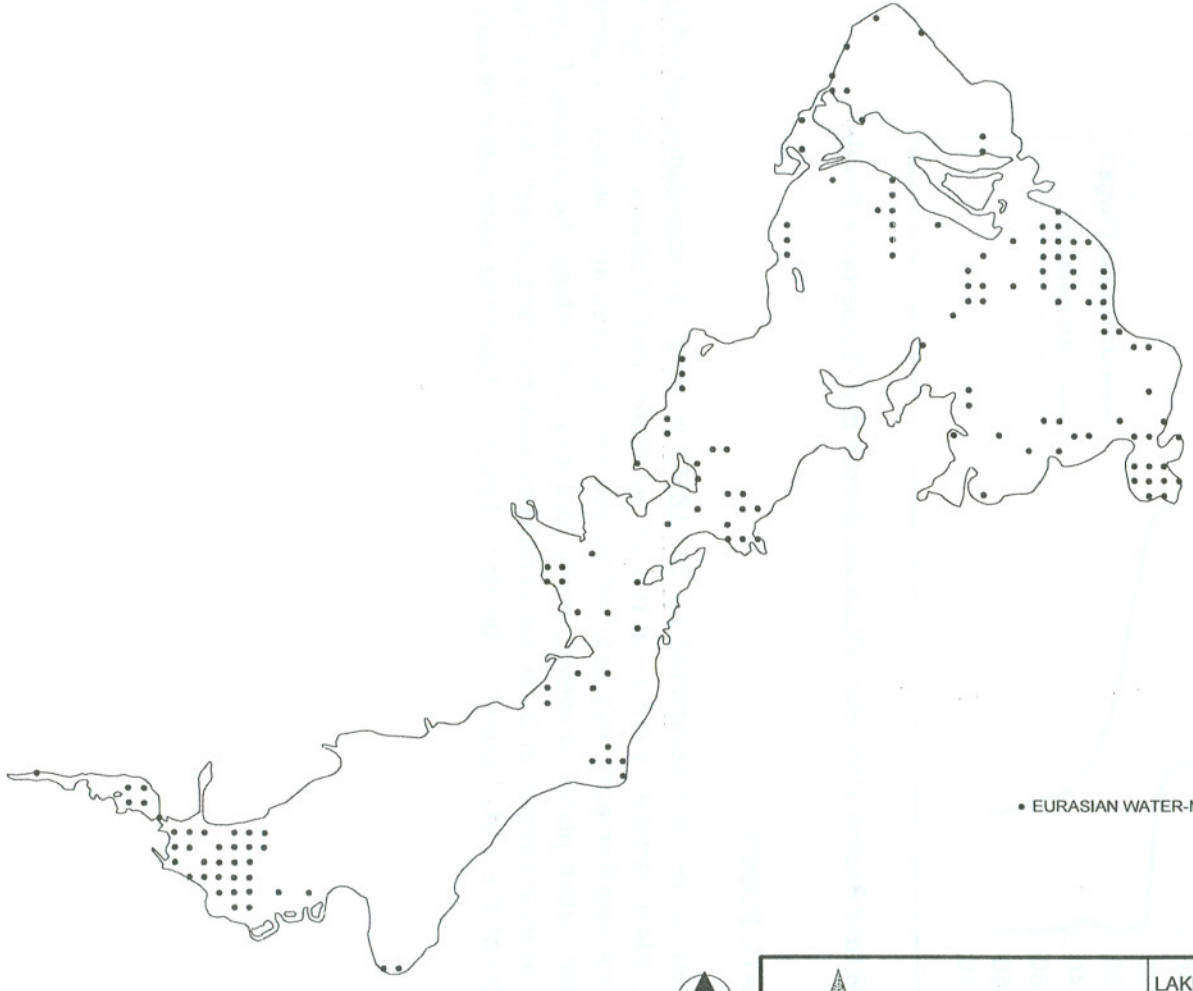


Figure 5. 2008 Lake Beulah (Deep Hole) Dissolved Oxygen and Temperature Profile.

4.8 AQUATIC PLANTS

An aquatic plant survey was completed for the LBMD in 2009. In accordance with WDNR requirements, plant samples were collected at pre-determined locations. Based on the WDNR's spacing requirements, this resulted in 996 sample locations. Numerous samples yielded healthy, native plants; however, many locations also yielded the invasive Eurasion water-milfoil. Several samples of Curly-leaf pondweed were collected, as well. Figure 6 shows the distribution of the milfoil sample collection. Figure 7 shows the distribution relative to water depth.



• EURASIAN WATER-MILFOIL SAMPLE COLLECTED

NORTH

RJN Environmental Services, LLC
Surface Water Studies
Groundwater Studies
Site Investigations
4631 COUNTY ROAD A OREGON, WISCONSIN 53575 (608) 576-3001

LAKE BEULAH MANAGEMENT DISTRICT
LAKE BEULAH, WISCONSIN
MILFOIL SAMPLE LOCATIONS

FIGURE 6

DRAWN BY	PROJ. No.	DATE	FILE
RN	09-201	24 MAR 10	SAMP LOC

(27)

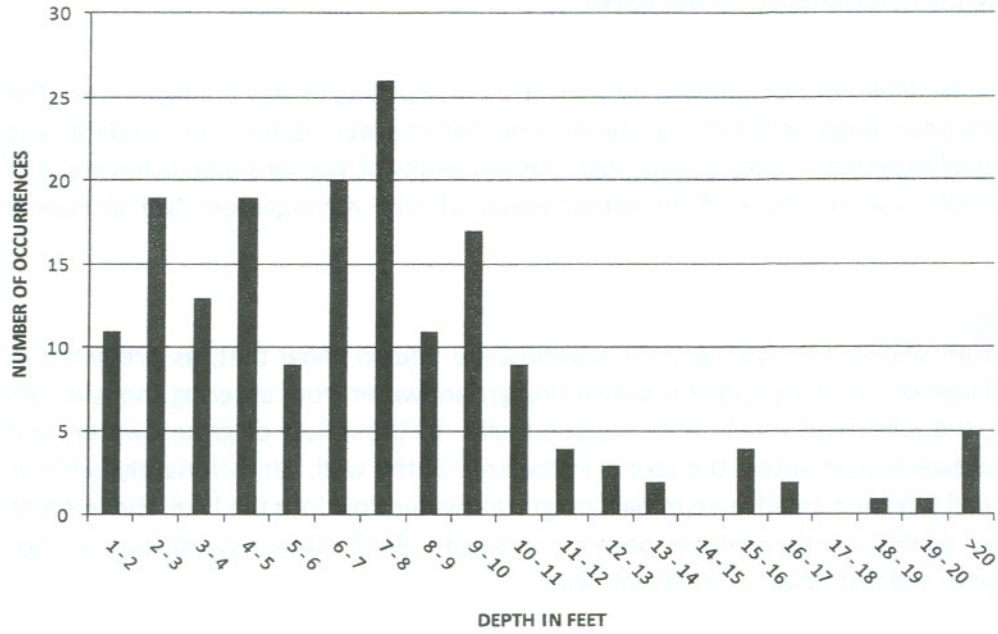


Figure 7. Occurrence of milfoil samples versus depth.

4.9 FISHERY

A fishery study was not included in the scope of this plan.

4.10 SHORELINE USE

A shoreline study was not included in the scope of this plan; however, with the exception of a few areas, most of the lake shore has been developed, either with single-family dwellings or by organizations (e.g., B'Nai Brith). Additionally, much of the lake is surrounded by steep slopes, giving the potential for erosional degradation of the shoreline.

5 MANAGEMENT RECOMMENDATIONS

Many experts are available for consultation on specific issues relating to lake management. The Southeastern Wisconsin Regional Planning Commission has available experts on wetland and aquatics. Additional expertise is available through the University of Wisconsin and University of Wisconsin Extension system. Several important areas of lake management are discussed below.

High Capacity Well

Data collected from several monitoring wells around Lake Beulah show that, as predicted in 2003, that the Village of East Troy well 7 is preventing groundwater from entering the lake. As discussed above, the lake owes much of its aquatic health to the inflow of groundwater, and most of the groundwater that enters the lake is in the area of the well. Unfortunately, while it is clear that the well is having an adverse impact on groundwater flow into the lake, the impacts to the lake's water quality will take time to become apparent. By that time, significant damage will have been done, and remediation will be difficult.

The continued monitoring of the water levels in the monitoring wells will serve to provide a database, documenting the groundwater flow conditions. Additionally, the continued monitoring of critical aspects of the lake water (e.g., hardness parameters) will provide documentation of the gradual changes. It is possible, that along with positive changes to Wisconsin's groundwater use regulations and the establishment of a mitigation fund in the State's high capacity fee program, early detection of adverse impacts can be addressed with minimal cost to the LBMD.

Nutrient Loading

The LBMD has wisely restricted the use of fertilizers containing phosphorus. Although, to a great extent, the success of this ban relies on compliance by the residents of the Lake Beulah watershed, public education can be helpful in encouraging compliance.

Shoreline Erosion

It is often natural for riparian owners to desire a beautifully landscaped lawn extending to the shoreline. However, shoreline buffers are important for the prevention of shoreline erosion. They serve the important purposes of taking the energy out of water flowing over the ground surface, and can also intercept debris that can cause erosion. As with nutrient loading, education is an important aspect of keeping riparian owners in compliance with buffer requirements.

Invasive Aquatic Animal Species

As indicated in section 3.6, Lake Beulah has been infested with rusty crayfish and zebra mussels. Once aquatic animal species have invaded a lake, and become a self-sustaining population, their eradication is very difficult. However, efforts should be taken to enforce the requirements to properly clean and flush watercraft before entering the lake. Various options are available,

from having staff monitoring the activities at public boat landings to specialized cameras that are positioned such that they monitor both the activities and boat identifications (e.g., registrations and license plates).

Management of Invasive Aquatic Plants

The most pervasive invasive aquatic plant is Eurasian milfoil. Various options are available for addressing this problem, based on water depth, equipment availability and water use. Clearly, efforts should be concentrated on the areas where significant milfoil was found (see Figure 6). Most harvesters can go to 5 feet of depth and the larger ones to 7 feet.

In lake management plans developed by SEWRPC, they typically recommend "top chopping" in deeper waters such that the harvester cuts to a depth that they are pulling up mostly milfoil. By removing the vegetative canopy of the plant, this allows sunlight to penetrate and native plants, which tend to be lower growing, to germinate and grow. We have found, however, that the harvesting/top chopping has to be repeated at about 3 to 4 week intervals through the summer to limit re-growth of the milfoil. In waters shallower than 3 feet depth, SEWRPC generally recommends that the individual homeowners manage milfoil by raking, although there will be some who prefer to use herbicide (granular 2,4-D is typically the herbicide of choice).

Habitat Protection

As discussed earlier, the WDNR has identified several areas around the lake as being environmentally sensitive. The LBMD should follow the recommendations provided in the WDNR's report on this issue.

Public Information and Education

The LBMD has traditionally been strong supporters of providing information and education to the public with respect to various issues pertaining to the lake. It is recommended that these efforts be focused on the issues discussed in this document, such as nutrient control, shoreline erosion and habitat protection.

APPENDIX A

WDNR SENSITIVE AREA REPORT

Lake Beulah
Sensitive Area Assessment

Final Report
May 1994

Prepared By
Kathi Dionne
Water Resources Specialist
Dan Helsel
Water Resources Management Specialist
Southeast District
Wisconsin Department of Natural Resources

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Acknowledgements

A number of individuals participated in the designation of the sensitive areas on Lake Beulah. Doug Welch (Fish Management) provided information concerning fish use and Mark Anderson (Wildlife Management) provided information concerning wildlife use. Liesa Nesta (Water Regulation and Zoning) evaluated these areas with respect to potential impacts of projects regulated by Chapter 30, such as piers and boardwalks.

Public Meetings

The information included in this report was presented at the Lake Beulah Protective and Improvement Association spring meeting on May 21, 1994. Reports were distributed to riparian property owners abutting the sensitive areas.

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LAKE BEULAH SENSITIVE AREA STUDY

DNR WATER RESOURCES
MAY, 1994

INTRODUCTION

Lake Beulah is a valuable resource of the state of Wisconsin held in trust for the general public. The lake provides recreation, aesthetic enjoyment, opportunities for fishing and wildlife observation, boating and swimming. Lake Beulah has offered enjoyable conditions such as good water quality, abundant fisheries of good sized game fish and areas of aesthetic beauty.

The aquatic plants in this lake are a diverse community which has served the lake well, keeping nutrients and sediments to a minimum and providing valuable food and habitat for many desirable animals such as game fish and waterfowl.

In July of 1993, Department of Natural Resources staff visited Lake Beulah for the purpose of identifying areas which are sensitive and therefor in need of extra protection. Areas are considered sensitive if they fall under the following definition:

> "... areas of aquatic vegetation identified by the department as offering critical or unique fish and wildlife habitat, including seasonal or lifestage requirements, or offering water quality or erosion control benefits to the body of water." (NR 107, 1989)

These might include:

- Diverse stands of high quality native aquatic plants which help provide a buffer against invasion of Eurasian water milfoil, a very aggressive non native aquatic plant which is increasingly becoming a nuisance in Wisconsin's lakes.
- Areas of vegetation which trap sediments and nutrients flowing into the lake thereby improving water clarity and reducing available nutrients for undesirable plant growth.
- Areas of vegetation which offer spawning nesting or feeding habitat for fish or wildlife.
- Areas of vegetation whose species composition or hydrology make it an ecologically unique community.

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Lake Beulah is an 834 acre drainage lake, with a maximum depth of 58 feet and an average depth of 17 feet. The water clarity at Lake Beulah typically ranges between 6 and 11 feet during the summer. There are eight areas in Lake Beulah identified as sensitive. Each of these areas possesses characteristics which are beneficial to the lake as a whole. Their protection will help to preserve the quality of the water in Lake Beulah. A brief description of the eight identified sensitive areas follows:

- Sensitive Area 1 is located along the eastern shore of Jesuit island in the northeastern part of the lake.
- Sensitive area 2 is a small cove located across from Jesuit island.
- Sensitive area 3 is located around a small island along the northeastern shore of the lake.
- Sensitive area 4 is located along the southern shore of the lake in the area also know as Mueller's Cove.
- Sensitive area 5 is in the south shore cove area, located on the southern shore of the eastern end of the lake.
- Sensitive area 6 is located in the narrows between the two basins of the lake.
- Sensitive area 7 is located in the bay near the inlet form Pickerel Lake in the southwestern part of the lake.
- Sensitive area 8 is located just southeast of the East Troy boat launch on the southwestern shore of the lake.

In general, these areas support a diverse community of native aquatic plants with limited areas of Eurasian water milfoil. They offer spawning and nursery areas for several fish species, nesting habitat for animals, act as a sediment and nutrient trap, as well as helping protect the shoreline from erosion.

Sensitive areas are determined by assessment of a team of scientists from the Wisconsin Department of Natural Resources, including fisheries, wildlife, water resources and water regulation and zoning staff. Each team member has expertise in areas relating to water quality and fish or wildlife biology and the ecological value of the area being assessed. The members of the team which investigated this area are:

Doug Welch (Fish Management)	Mark Anderson (Wildlife Management)
Dan Helsel (Water Resources)	Liesa Nesta (Water Regulation and Zoning)

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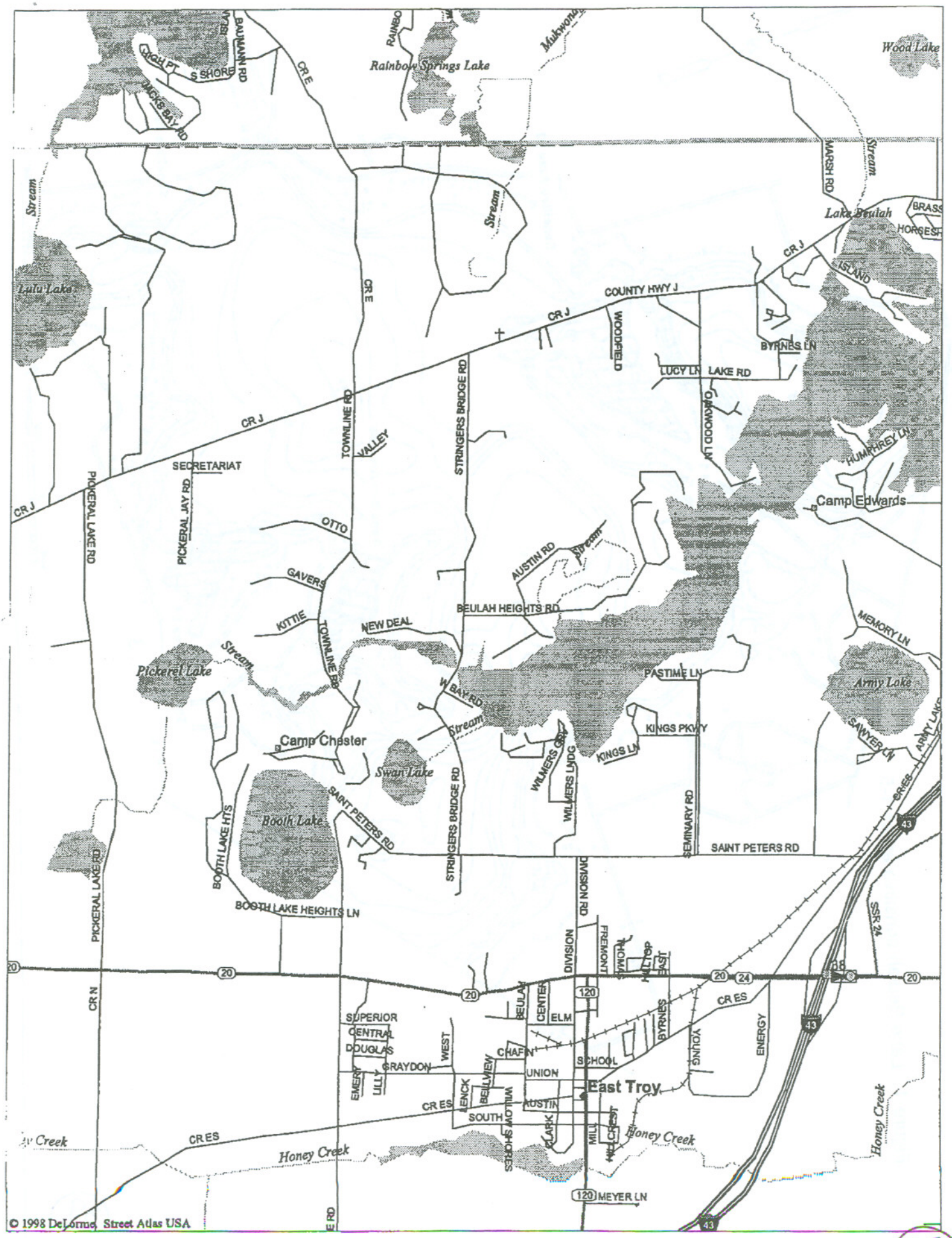
Rainbow Springs Lake
Wood Lake
Lake Beulah
Lulu Lake
Pickerel Lake
Swan Lake
Booth Lake
Army Lake
Camp Chester
Camp Edwards
Stream
Honey Creek
East Troy
COUNTY HWY J
CR J
CR E
CR N
CR ES
SAINT PETERS RD
BEULAH HEIGHTS RD
STRINGERS BRIDGE RD
TOWNLINE RD
PICKERAL LAKE RD
PICKERAL JAY RD
SECRETARIAT
OTTO
GAVERS
KITTIE
NEW DEAL
VALLEY
AUSTIN RD
W BAY RD
BOOTH LAKE HTS
BOOTH LAKE HEIGHTS LN
WOODFIELD
LUCY LN
LAKE RD
BYRNES LN
OAKWOOD LN
HUMPHREY LN
MEMORY LN
PASTIME LN
KINGS PKWY
KINGS LN
WILMERS GRV
WILMERS LNDG
SEMINARY RD
SAWYER LN
ARMY LAKE
MARSH RD
ISLAND
BRASS
HORSESH
DIVISION RD
DIVISION
FREMONT
THOMAS
HILLTOP
EAST
BEULAH
CENTER
ELM
SCHOOL
BYRNES
YOUNG
ENERGY
SUPERIOR
CENTRAL
DOUGLAS
GRAYDON
WEST
CHAPIN
UNION
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ULLY
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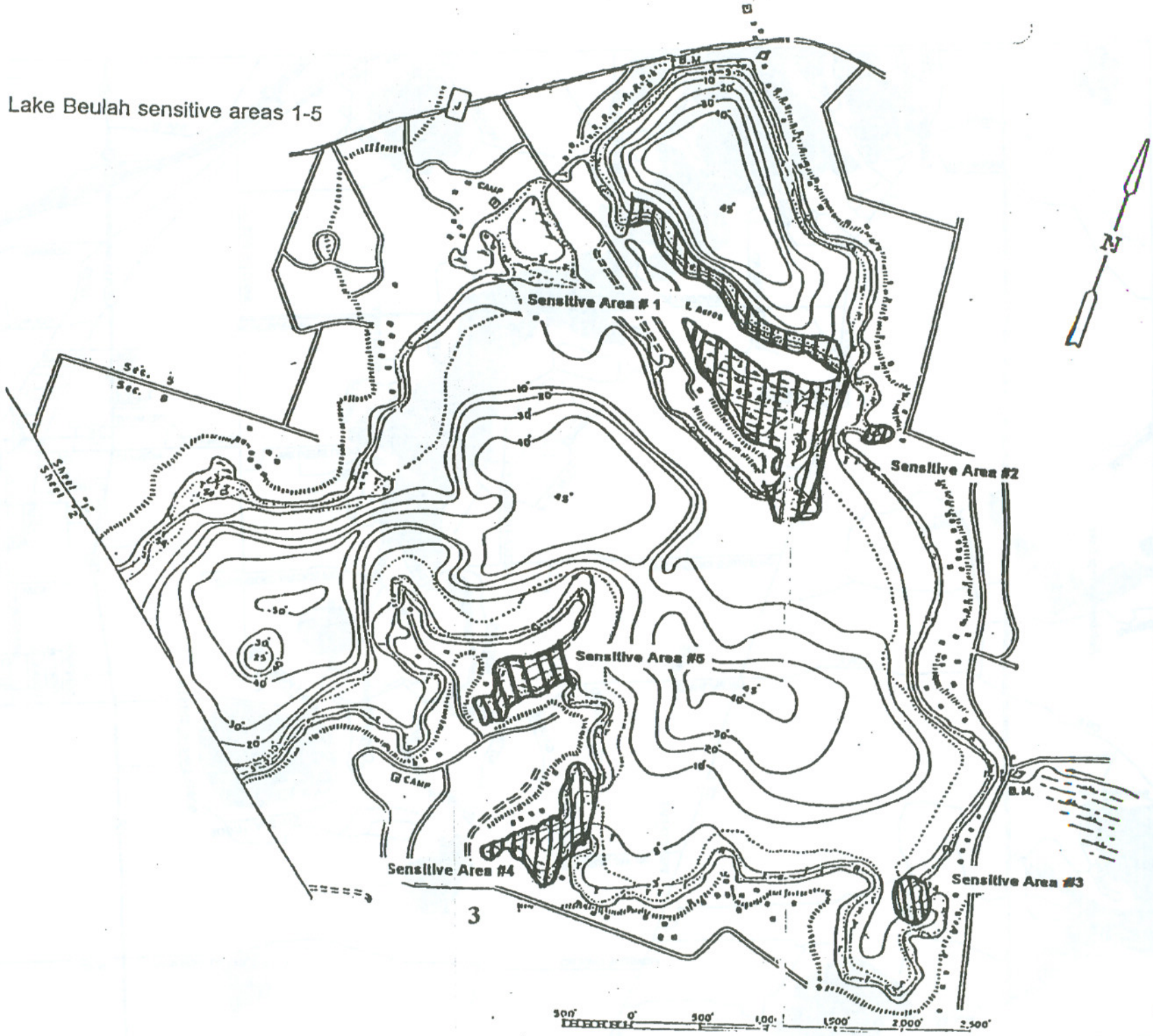
Figure 1. Lake Beulah sensitive areas 1-5



39

Figure 2. Lake Beulah sensitive areas 6-8

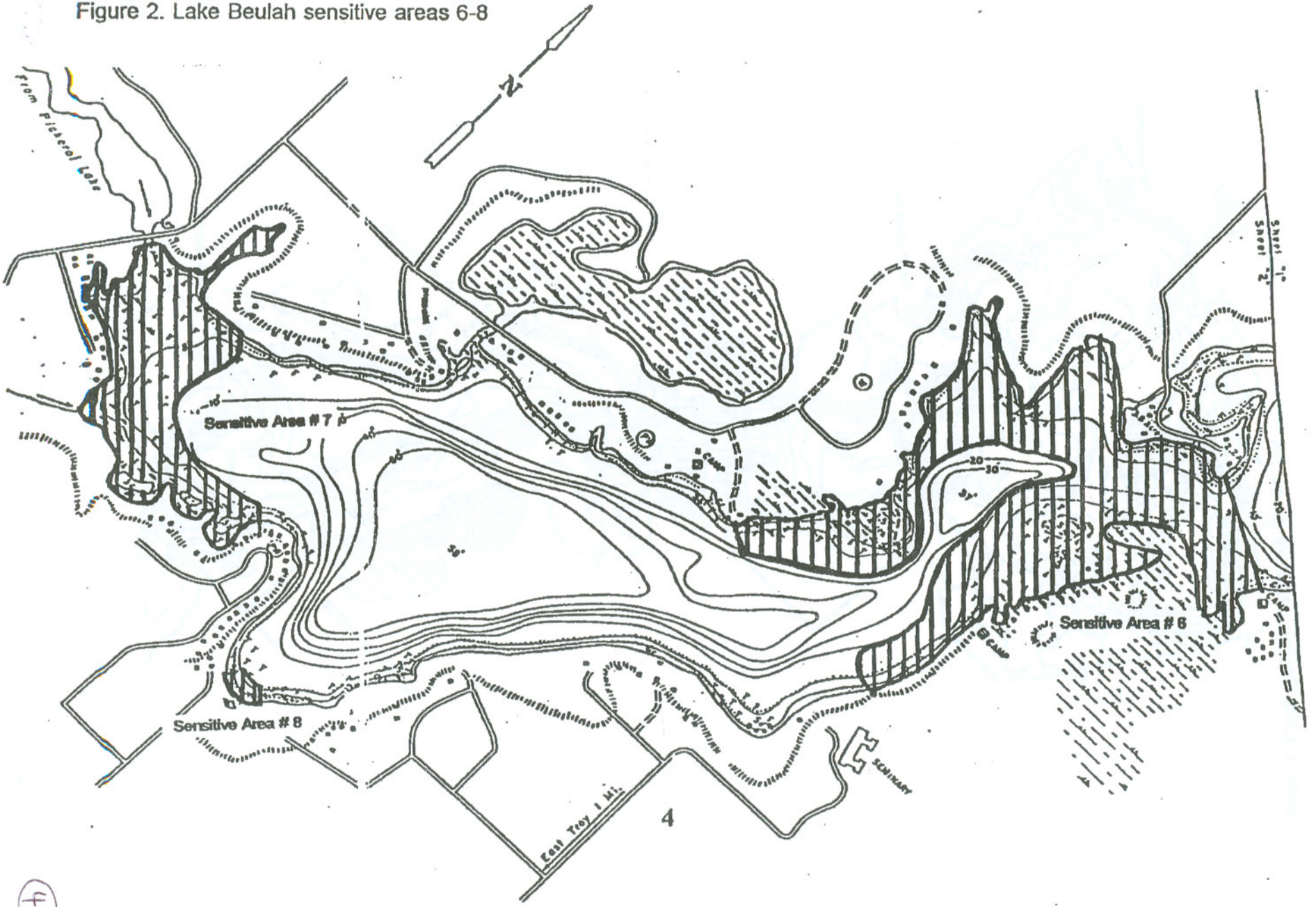


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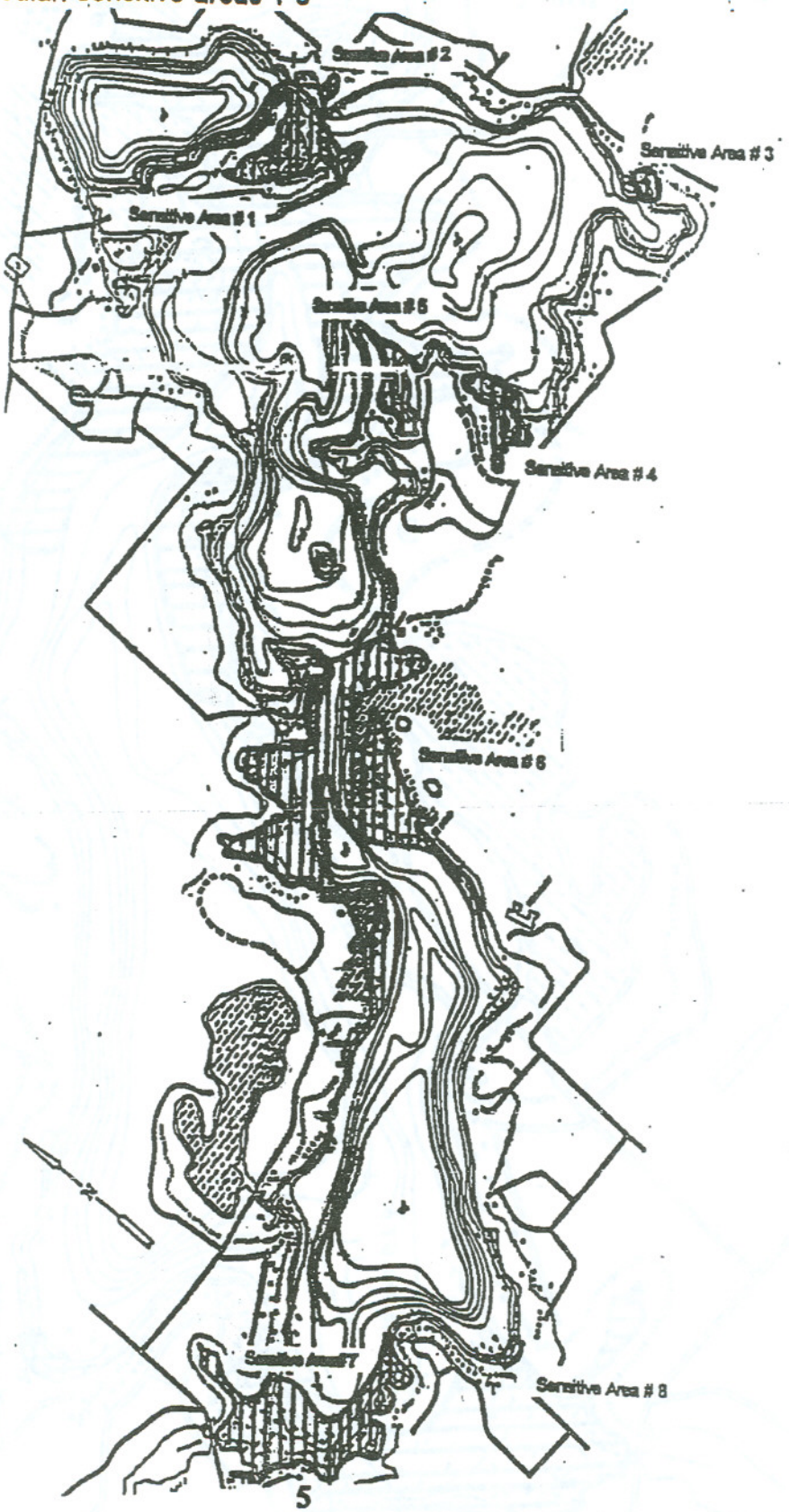
Figure 3. Lake Beulah sensitive areas 1-8



Sensitive area # 1

SENSITIVE AREA SITE DESCRIPTION

Sensitive area #1 is located along the eastern shore of Jesuit Island, in the northeastern part of Lake Beulah. (Figure 1 and 3) It contains approximately 2500 feet of shoreline and extends approximately 150 feet into the lake. The maximum depth in this area is 5 feet. The substrate in the shallow section of sensitive area #1 is 75% muck, 10% sand and silt, and 5% clay. In the areas over 2 feet deep, the substrate is 50% muck, 40% sand and 5% sand and clay.

RESOURCE ASSETS OF SENSITIVE AREA #1

Sensitive area #1 supports a diverse reservoir of native aquatic plants, both submergent and emergent, and only limited areas of Eurasian water milfoil (*Myriophyllum spicatum*). (Table 1) The emergent and floating leaved community includes swamp loosestrife (*Decodon verticillatus*), white water lily (*Nymphaea tuberosa*) and yellow water lily (*Nuphar variegatum*). The submergent community includes native water milfoil, (*Myriophyllum heterophyllum*), sago pondweed (*Potamogeton pectinatus*), clasping leaved pondweed (*P. richardsonii*), floating leaved pondweed (*P. natans*), large leaved pondweed (*P. amplifolius*), chara (*Chara spp.*), bladderwort (*Utricularia sp.*), and eel grass (*Vallisneria americana*).

Fish utilize this community in a variety of ways. The excellent variety of emergent and submerged aquatic plants provides ideal spawning habitat for northern pike, and very good spawning habitat for largemouth bass and bluegills. The less heavily vegetated areas provide spawning areas for crappie and walleye. The vegetated areas also provide high quality nursery areas for northern pike, largemouth bass, walleye, crappie and bluegill. All these species will also find excellent feeding habitat in these areas.

Wildlife also depends on the resources provided by sensitive area #1. This area offers high quality habitat for a variety of wetland species. Ducks such as mallards and wood ducks will nest, feed, and rear their young here. Wading birds such as the great blue heron, smaller herons and bitterns feed here, and stop here during migration. Shorebirds such as sandpipers will be found feeding here, and songbirds will find nesting habitat, and will feed and rear their young in the trees and shrubs along the wetlands. Muskrats, opossum and raccoons can be found here year round, feeding, nesting and raising their young.

The plant community in sensitive area #1 acts as a sediment and nutrient trap, as well as protecting the shoreline from erosion. It also stabilizes the bottom sediments. These functions benefit the entire lake in that they reduce nutrients available in the water to support the growth of nuisance aquatic plants, and improve the clarity of the water. (Table 2)

Sensitive area #1 is ecologically important to the lake for several reasons. The excellent native species reservoir will act as a buffer against invasion by exotic plant species, as well as a refuge where native species have established and can continue to spread. The emergent, floating leaved and submergent plant community and the spawning grounds they provide for fish are unique to the lake. (Table 2)

MANAGEMENT RECOMMENDATIONS FOR SENSITIVE AREA #1 (Table 3)

In-lake activities:

Aquatic plant control:

1. Chemical: chemical treatment of aquatic plants will be permitted in this area, but is limited to control of Eurasian Water Milfoil. These chemical applications should be as selective as possible to reduce impacts on the native aquatic plant community, and be part of a lake wide Eurasian water milfoil control plan.

2. Mechanical: mechanical control of any type is not recommended. Hand pulling or manual raking are recommended as an alternative.

Water Regulation and Zoning:

1. Dredging will not be allowed in the area of the wetland complex at the southern part of the designated area. In order to reduce disturbance to the wetland area, other dredging activities will be restricted to navigational purposes only, and will be allowed only if the permit review determines no harm will be done to native plant communities. In addition, native species plantings will be required after any dredging projects in order to reduce the potential for Eurasian water milfoil to become established.

2. Filling will not be permitted.

3. Pea gravel/sand blanket will not be allowed in the wetland area, and is not necessary in the other shoreline areas. Sand will not be allowed.

4. Aquatic plant screens will be considered on a case by case basis, but hand pulling or raking is recommended instead.

5. Special permitted piers/boardwalks will be considered on a case by case basis, and will be allowed only if the permit review determines that no harm will be done to the sensitive area and if the appropriate DNR and local permits are received.

6. Seawall construction or substantial repair generally will not be allowed, but will be considered on a case by case basis in areas with a steep slope and a significant erosion problem.

Riparian Activities:

1. Wetland alterations of any type will not be allowed without the proper DNR and Army Corp. of Engineers permits.

2. Boardwalks will be considered on a case by case basis for the purposes of limited riparian access and public education.

3. Shoreland zoning standards do not allow new homes or other structures such as gazebo's and decks to be built in wetlands. All other construction must comply with all Walworth County requirements, especially the 75 foot setback from the shoreline.

4. Shoreline protection will be limited to riprap and will be allowed only in places where erosion is occurring. It will not be permitted in the wetland areas, and should be minimal in its intrusion into the lake.

Sensitive Area # 2

SENSITIVE AREA SITE DESCRIPTION

Sensitive area #2 is a small cove area located on the northeast side of the channel across from Jesuit Island in the northeastern part of Lake Beulah.(Figure 1 and 3) It contains approximately 200 feet of shoreline and extends approximately 100 feet into the lake. The maximum depth in this area is 3 feet. The substrate in the shallow section of sensitive area #2 is 75% muck, 10% clay and silt, and 5% sand. In the areas over 2 feet deep, the substrate is 30% sand, 20% silt and 10% gravel clay and muck.

RESOURCE ASSETS OF SENSITIVE AREA #2

Sensitive area #2 supports an diverse reservoir of native aquatic plants, both submergent and emergent, and only limited areas of Eurasian water milfoil (*Myriophyllum spicatum*). (Table 1) The emergent and floating leaved community includes white water lily (*Nymphaea tuberosa*) and yellow water lily (*Nuphar variegatum*). The submergent community includes native water milfoil, (*Myriophyllum heterophyllum*), large leaved pondweed (*Potamogeton amplifolius*), narrow leaved pondweed , curly leaved pondweed (*P. crispus*) chara (*Chara spp.*), bladderwort (*Utricularia sp.*), and eel grass (*Vallisneria americana*).

Fish utilize this community in a variety of ways. The excellent variety of emergent and submerged aquatic plants provide high quality spawning habitat for northern pike, and very good spawning habitat for largemouth bass and bluegills. The less heavily vegetated areas provide spawning areas for crappie and walleye. The vegetated areas also provide ideal nursery areas for northern pike, largemouth bass, walleye, crappie and bluegill. All these species will also find prime feeding habitat in these areas. In addition, the cove area provides exceptional cover and habitat for minnows such as common shiners and brook silversides, on which the larger fish may feed.

Wildlife also depends on the resources provided by sensitive area #2. This area offers limited wildlife habitat due to its small size and its extensive human development. It does, however, provide some habitat for wading and shore birds such as the great blue heron, smaller herons, sandpipers and bitterns. Ducks and geese will make limited use of this area for feeding and rearing young, and will use the area during migration. Songbirds and kingfishers will find nesting habitat, and will feed and rear their young in the trees and shrubs. Muskrats, opossum and raccoons can be found here year round, feeding, nesting and raising their young.

The plant community in sensitive area #2 acts as a sediment and nutrient trap, as well as protecting the shoreline from erosion. These functions benefit the entire lake in that they reduce nutrients available in the water to support the growth of nuisance

aquatic plants, and improve the clarity of the water.(Table 2)

Sensitive area #2 is ecologically important to the lake for several reasons. The excellent native species reservoir will act as a buffer against invasion by exotic plant species, as well as a refuge where native species have established and can continue to spread. The emergent, floating leaved and submergent plant community and the spawning grounds they provide for fish are unique to the lake. The minnows which are found here are important to the trophic structure of the fish community.(Table 2)

MANAGEMENT RECOMMENDATIONS FOR SENSITIVE AREA #2 (Table 3)

In-lake activities:

Aquatic plant control:

1. Chemical: chemical treatment of aquatic plants will be permitted in this area, but is limited to control of Eurasian Water Milfoil. These chemical applications should be as selective as possible to reduce impacts on the native aquatic plant community, and be part of a lake wide Eurasian water milfoil control plan.

2. Mechanical: mechanical control of any type is not recommended. Hand pulling or manual raking is recommended as an alternative.

Water Regulation and Zoning:

1. Dredging will be allowed only if the permit review determines no harm will be done to native plant communities. In addition, native species plantings will be required after any dredging projects in order to reduce the potential for Eurasian water milfoil to become established.

2. Filling will not be permitted.

3. Pea gravel/sand blanket will not be allowed as they are not considered necessary

4. Aquatic plant screens will be considered on a case by case basis, but do not appear to be necessary.

5. Special permitted piers/boardwalks will be allowed if they meet DNR and town permitting requirements.

6. Seawall construction or substantial repair generally will not be allowed, but will be considered on a case by case basis in areas with a steep slope and a significant erosion problem.

Riparian Activities:

1. Shoreline zoning regulations of Walworth county must be followed in all new structures.

2. Shoreline protection will be allowed if a DNR permit is obtained.

Sensitive Area # 3

SENSITIVE AREA SITE DESCRIPTION

Sensitive area #3 is located around a small island along the northeastern shore of Lake Beulah.(Figure 1 and 3) It contains approximately 100 feet of shoreline and extends approximately 50 feet into the lake. The maximum depth in this area is 5 feet.

RESOURCE ASSETS OF SENSITIVE AREA #3

Sensitive area #3 supports a fairly diverse reservoir of native aquatic plants, both submergent and emergent, and only limited areas of Eurasian water milfoil (*Myriophyllum spicatum*).(Table 1) The emergent and floating leaved community includes white water lily (*Nymphaea tuberosa*) and yellow water lily (*Nuphar variegatum*).

This small area provides a stand of lily pads, which provide excellent cover for bluegills and minnows.

Wildlife depends on the resources provided by sensitive area #3. This area offers limited wildlife habitat die to its small size and its extensive human development. It does, however, provide some habitat for wading and shorebirds such as the great blue heron, smaller herons, bitterns and sandpipers. Ducks and geese will make limited use of this area for feeding and rearing young, and will use the area during migration. Songbirds and kingfishers will find nesting habitat and rear their young in the trees and shrubs along the shoreline. Muskrats, opossum and raccoons can be found here year round, feeding, nesting and raising their young.

The plant community in sensitive area #3 acts as a sediment and nutrient trap, as well as protecting the shoreline from erosion. It also stabilizes the bottom sediments. These functions benefit the entire lake in that they reduce nutrients available in the water to support the growth of nuisance aquatic plants, and improve the clarity of the water. (Table 2)

Sensitive area #3 is ecologically important to the lake for several reasons. The good native species reservoir will act as a buffer against invasion by exotic plant species, as well as a refuge where native species have established and can continue to spread. The floating leaved and submergent plant community and the habitat they provide for minnows are unique to the lake. (Table 2)

MANAGEMENT RECOMMENDATIONS FOR SENSITIVE AREA #3 (Table 3)

In-lake activities:

Aquatic plant control:

1. Chemical: chemical treatment of aquatic plants will be permitted in this area, but is limited to control of Eurasian water milfoil. These chemical applications should be as selective as possible to reduce impacts on the native aquatic plant community and be a part of a lake wide Eurasian water milfoil control plan.

2. Mechanical: mechanical control of any type is not recommended. Hand pulling or manual raking is recommended to control vegetation in swimming and boating areas.

Water Regulation and Zoning:

1. Dredging activities will be allowed only if the permit review determines no harm will be done to native plant communities. In addition, native species plantings will be required after any dredging projects in order to reduce the potential for Eurasian water milfoil to become established.

2. Filling will not be permitted.

3. Pea gravel/sand blanket are not necessary, but applications will be reviewed on a case by case basis.

Riparian Activities:

1. Shoreland zoning regulations of Walworth county must be followed in all new structures.

2. Shoreline protection will be permitted if a DNR permit is obtained.

Sensitive Area # 4

SENSITIVE AREA SITE DESCRIPTION

Sensitive area #4 is located along the southern shore of Lake Beulah, in an area also known as Mueller's Cove.(Figure 1 and 3) It contains approximately 2500 feet of shoreline and extends across the width of the cove approximately 1000 feet from the shore. The maximum depth in this area is 10 feet.

RESOURCE ASSETS OF SENSITIVE AREA #4

Sensitive area #4 supports a diverse reservoir of native aquatic plants, both submergent and emergent, and only limited areas of Eurasian water milfoil (*Myriophyllum spicatum*).(Table 1) The emergent and floating leaved community includes soft stem bulrush (*Scirpus validus*), white water lily (*Nymphaea tuberosa*) and yellow water lily (*Nuphar variegatum*). The submergent community includes native water milfoil, (*Myriophyllum heterophyllum*), clasping leaved pondweed (*Potamogeton richardsonii*), white stemmed pondweed (*P. praelongus*) and chara (*Chara spp.*).

Fish utilize this community in a variety of ways. The diverse community of emergent and submerged aquatic plants provide excellent spawning habitat for northern pike, and very good spawning habitat for largemouth bass and bluegills. The less heavily vegetated areas provide spawning areas for crappie and walleye. The vegetated areas also provide high quality nursery areas for northern pike, largemouth bass, walleye, crappie and bluegill. This area also provides excellent habitat for minnows. All these species will also find ideal feeding habitat in these areas.

Wildlife also depends on the resources provided by sensitive area #4. This area offers habitat for a variety of species. Ducks such as mallards and wood ducks will make limited use of this area for feeding and rearing young. Wading birds such as the great blue heron, smaller herons and bitterns will find good foraging here, and will stop here during migration. Shorebirds such as sandpipers will be found feeding here, and songbirds will find nesting habitat, and will feed and rear their young in the water willows. Muskrats, opossum and raccoons can be found here year round, feeding, nesting and raising their young.

The plant community in sensitive area #4 acts as a sediment and nutrient trap, as well as protecting the shoreline from erosion. These functions benefit the entire lake in that they reduce nutrients available in the water to support the growth of nuisance aquatic plants, and improve the clarity of the water.(Table 2)

Sensitive area #4 is ecologically important to the lake for several reasons. The excellent native species reservoir will act as a buffer against invasion by exotic plant species, as well as a refuge where native species have established and can continue

to spread. The emergent, floating leaved and submergent plant community and the spawning grounds they provide for fish are unique to the lake. (Table 2)

MANAGEMENT RECOMMENDATIONS FOR SENSITIVE AREA #4 (Table 3)

In-lake activities:

Aquatic plant control:

1. Chemical: chemical treatment of aquatic plants will be permitted in this area, but is limited to control of Eurasian water milfoil. These chemical applications should be as selective as possible to reduce impacts on the native aquatic plant community and be part of a lake wide Eurasian water milfoil control plan.

2. Mechanical: mechanical control is recommended only for control of Eurasian water milfoil. Hand pulling or manual raking is recommended to control vegetation in swimming and boating areas.

Water Regulation and Zoning:

1. Dredging will not be allowed in the area of bulrushes and Water Willow along the shoreline. Dredging in other areas would be considered on a case by case basis. In addition, native species plantings will be required after any dredging projects in order to reduce the potential for Eurasian water milfoil to become established.

2. Filling will be considered on a case by case basis.

3. Pea gravel/sand blanket will be considered on a case by case basis.

4. Aquatic plant screens will be considered on a case by case basis.

5. Special permitted piers/boardwalks will be considered on a case by case basis, and will be allowed only if the permit review determines that no harm will be done to the sensitive area and if the appropriate DNR and local permits are received.

6. Seawall construction or substantial repair generally will not be allowed, but will be considered on a case by case basis in areas with a steep slope and a significant erosion problem.

Riparian Activities:

1. Shoreline zoning regulations of Walworth county must be followed in all new structures.

2. Shoreline protection will reviewed on a case by case basis.

Sensitive Area # 5

SENSITIVE AREA SITE DESCRIPTION

Sensitive area #5 is the south shore cove area, located on the southern shore of the eastern end of Lake Beulah.(Figure 1 and 5) It contains approximately 1500 feet of shoreline and extends across the width of the cove approximately 1000 feet into the lake. The maximum depth in this area is 10 feet. The substrate in sensitive area #5 is mostly muck.

RESOURCE ASSETS OF SENSITIVE AREA #5

Sensitive area #5 supports an diverse reservoir of native aquatic plants, both submergent and emergent; the populated areas of the shoreline have extensive stands of Eurasian water milfoil (*Myriophyllum spicatum*), but in the less disturbed areas it is scattered within the native plant community. (Table 1) The emergent and floating leaved community includes swamp loosestrife (*Decodon verticillatus*), white water lily (*Nymphaea tuberosa*), yellow water lily (*Nuphar variegatum*) and duckweed (*Lemna sp.*). The submergent community includes native water milfoil, (*Myriophyllum heterophyllum*), sago pondweed (*Potamogeton pectinatus*), large leaved pondweed (*P. amplifolius*), chara (*Chara spp.*), and eel grass (*Vallisneria americana*).

Fish utilize this community in a variety of ways. The good variety of emergent and submerged aquatic plants provides spawning habitat for northern pike, largemouth bass, crappie and bluegills. The vegetated areas also provide excellent nursery areas for northern pike, largemouth bass, crappie and bluegill. This area is also prime cover and spawning habitat for minnows. All these species will also find high quality feeding habitat in these areas.

Wildlife also depends on the resources provided by sensitive area #5. Ducks such as mallards and wood ducks will nest, feed, and rear their young here. Wading birds such as the great blue heron, smaller herons, rails and bitterns feed here, and stop here during migration. Songbirds and kingfishers will find nesting habitat, and will feed and rear their young in the trees and shrubs along the shoreline. Muskrats, opossum and raccoons can be found here year round, feeding, nesting and raising their young.

The plant community in sensitive area #5 acts as a sediment and nutrient trap, as well as protecting the shoreline from erosion. These functions benefit the entire lake in that they reduce nutrients available in the water to support the growth of nuisance aquatic plants, and improve the clarity of the water. (Table 2)

Sensitive area #5 is ecologically important to the lake for several reasons. The excellent native species reservoir will act as a buffer against invasion by exotic plant

species, as well as a refuge where native species have established and can continue to spread. The emergent, floating leaved and submergent plant community and the spawning grounds they provide for fish are unique to the lake. The minnows which spawn here are important to the trophic structure of the lake. (Table 2)

MANAGEMENT RECOMMENDATIONS FOR SENSITIVE AREA #5 (Table 4)

In-lake activities:

Aquatic plant control:

1. Chemical: chemical treatment of aquatic plants will be permitted in this area, but is limited to control of Eurasian water milfoil. These chemical applications should be as selective as possible to reduce impacts on the native aquatic plant community and be part of a lake wide Eurasian water milfoil control plan.

2. Mechanical: mechanical control of any type is not recommended. Hand pulling or manual raking is recommended to control vegetation in swimming and boating areas.

Water Regulation and Zoning:

1. Dredging will not be allowed in the area of the water willow stands in the western part of the designated area. On the side which is heavily developed, some limited dredging will be permitted, however, native species plantings will be required after any dredging projects since Eurasian water milfoil became heavily populated in the area after their last dredging project.

2. Filling will not be permitted.

3. Pea gravel/sand blanket will not be permitted, as it appears unnecessary, and would be ineffective.

4. Aquatic plant screens will be considered on a case by case basis.

Riparian Activities:

3. Shoreland zoning regulations of Walworth County must be followed in all new structures built.

4. Shoreline protection will be limited to riprap and will be allowed only in places where erosion is occurring.

Sensitive Area # 6

SENSITIVE AREA SITE DESCRIPTION

Sensitive area #6 is located in the narrows between the two lake basins of Lake Beulah. (Figure 2 and 3) It contains approximately 4500 feet of shoreline and extends across the width of the channel along the 10 foot contour line. The maximum depth in this area is 10 feet.

RESOURCE ASSETS OF SENSITIVE AREA #6

Sensitive area #6 supports a very diverse reservoir of native aquatic plants, both submergent and emergent, and only limited areas of Eurasian water milfoil (*Myriophyllum spicatum*). (Table 1) The emergent and floating leaved community includes swamp loosestrife (*Decodon verticillatus*), narrow-leaved cattail (*Typha angustifolia*), bulrushes (*Scirpus sp.*), white water lily (*Nymphaea tuberosa*) and yellow water lily (*Nuphar variegatum*). The submergent community includes native water milfoil, (*Myriophyllum heterophyllum*), sago pondweed (*Potamogeton pectinatus*), clasping leaved pondweed (*P. richardsonii*), floating leaved pondweed (*P. natans*), large leaved pondweed (*P. amplifolius*), chara (*Chara spp.*), bladderwort (*Utricularia sp.*), large leaved elodea (*Elodea canadensis*) and eel Grass (*Vallisneria americana*).

Fish utilize this community in a variety of ways. The diverse community of emergent and submerged aquatic plants provide excellent spawning habitat for northern pike, and very good spawning habitat for largemouth bass and bluegills. The less heavily vegetated areas provide spawning areas for crappie and walleye. The vegetated areas also provide high quality nursery areas for northern pike, largemouth bass, walleye, crappie and bluegill. All these species will also find ideal feeding habitat in these areas.

Wildlife also depends on the resources provided by sensitive area #6. This area offers high quality habitat for a variety of wetland species. Ducks such as mallards and wood ducks will nest, feed, and rear their young here. Wading birds such as the great blue heron, smaller herons and bitterns feed here, and stop here during migration. Songbirds will find nesting habitat, and will feed and rear their young in the trees and shrubs along the wetlands. Muskrats, opossum and raccoons can be found here year round, feeding, nesting and raising their young.

The plant community in sensitive area #6 acts as a sediment and nutrient trap, as well as protecting the shoreline from erosion. It also stabilizes the bottom sediments. These functions benefit the entire lake in that they reduce nutrients available in the water to support the growth of nuisance aquatic plants, and improve the clarity of the water. (Table 2)

Sensitive area #6 is ecologically important to the lake for several reasons. The excellent native species reservoir will act as a buffer against invasion by exotic plant species, as well as a refuge where native species have established and can continue to spread. The emergent, floating leaved and submergent plant community and the spawning grounds they provide for fish are unique to the lake.(Table 2)

MANAGEMENT RECOMMENDATIONS FOR SENSITIVE AREA #6 (Table 4)

In-lake activities:

Aquatic plant control:

1. Chemical: chemical treatment of aquatic plants will be permitted in this area, but is limited to control of Eurasian water milfoil. These chemical applications should be as selective as possible to reduce impacts on the native aquatic plant community and be part of a lake wide Eurasian water milfoil control plan.

2. Mechanical: it is recommended that mechanical cutting be used only for navigational channels. Hand pulling and manual raking are the preferred method for controlling aquatic plants in swimming and boating areas.

Water Regulation and Zoning:

1. Dredging will not be permitted.

2. Filling will not be permitted.

3. Pea gravel/sand blanket will be considered on a case by case basis but does not appear to be necessary. Sand will not be permitted.

4. Aquatic plant screens will be considered on a case by case basis.

5. Special permitted piers/boardwalks will be considered on a case by case basis, and will be allowed only if the permit review determines that no harm will be done to the sensitive area and if the appropriate DNR and local permits are received.

6. It is recommended that this area remain a slow/no wake zone for boating in order to reduce disturbance to the plant community and bottom sediments.

Riparian Activities:

1. Wetland alterations of any type will not be allowed without the proper DNR and Army Corp of Engineers permits.

2. Boardwalks will be considered on a case by case basis for the purposes of limited riparian access and public education.

3. Shoreland zoning standards do not allow new homes or other structures such as gazebos and decks to be built in wetlands. All other construction must comply with all Walworth County requirements, especially the 75 foot setback from the shoreline.

4. Additional shoreline stabilization is not required and would be for aesthetic purposes only; therefore rip rap or seawalls will not be permitted.

Sensitive Area # 7

SENSITIVE AREA SITE DESCRIPTION

Sensitive area #7 is located in the bay near the inlet from Pickerel Lake in the southwestern part of Lake Beulah. (Figure 2 and 3) It contains approximately 4000 feet of shoreline and extends across the bay approximately 1500 feet into the lake. The maximum depth in this area is 7 feet.

RESOURCE ASSETS OF SENSITIVE AREA #7

Sensitive area #7 supports an diverse reservoir of native aquatic plants, both submergent and emergent, with no Eurasian water milfoil (*Myriophyllum spicatum*). (Table 1) The emergent and floating leaved community includes swamp loosestrife (*Decodon verticillatus*), bulrushes (*Scirpus sp.*), white water lily (*Nymphaea tuberosa*) and yellow water lily (*Nuphar variegatum*). The submergent community includes native water milfoil, (*Myriophyllum heterophyllum*), sago pondweed (*Potamogeton pectinatus*), clasping leaved pondweed (*P. richardsonii*), floating leaved pondweed (*P. natans*), large leaved pondweed (*P. amplifolius*), chara (*Chara spp.*), and eel grass (*Vallisneria americana*).

Fish utilize this community in a variety of ways. The excellent variety of emergent and submerged aquatic plants provide high quality spawning habitat for northern pike, and very good spawning habitat for largemouth bass and bluegills. The less heavily vegetated areas provide spawning areas for crappie and native perch. The vegetated areas also provide ideal nursery areas for northern pike, largemouth bass, walleye, crappie and bluegill. All these species will also find good feeding habitat in these areas. Minnows also find cover, feed and spawn here.

Wildlife also depends on the resources provided by sensitive area #7. This area offers high quality habitat for a variety of wetland species. Ducks such as mallards and wood ducks will nest, feed, and rear their young here. Wading birds such as the great blue heron, smaller herons and bitterns feed here, and stop here during migration. Shorebirds such as sandpipers will be found feeding here, and songbirds will find nesting habitat, and will feed and rear their young in the trees and shrubs along the wetlands. Muskrats, opossum and raccoons can be found here year round, feeding, nesting and raising their young.

The plant community in sensitive area #7 traps sediments and nutrients coming in from Pickerel Lake, as well as protecting the shoreline from erosion. It also stabilizes the bottom sediments. These functions benefit the entire lake in that they reduce nutrients available in the water to support the growth of nuisance aquatic plants, and improve the clarity of the water. (Table 2)

Sensitive area #7 is ecologically important to the lake for several reasons. The excellent native species reservoir will act as a buffer against invasion by exotic plant species, as well as a refuge where native species have established and can continue to spread. The absence of exotic milfoil in this area makes it an especially good buffer against invasion. The emergent, floating leaved and submergent plant community and the spawning grounds they provide for fish are unique to the lake. The Minnows which spawn here are important to the trophic structure of the lake. (Table 2)

MANAGEMENT RECOMMENDATIONS FOR SENSITIVE AREA #7 (Table 4)

In-lake activities:

Aquatic plant control:

1. Chemical treatment of aquatic plants in this area will not be permitted. There is no Eurasian water milfoil in this area, and it supports a diverse community of native plants. The diversity of this community is essential to its effectiveness as a buffer against milfoil invasion. Chemical treatment would have a detrimental effect on the diversity here.

2. Mechanical: it is recommended that mechanical cutting be used for navigational channels only. Hand pulling or manual raking are the preferred method for control of aquatic plants in swimming and boating areas.

Water Regulation and Zoning:

1. Dredging will not be permitted.

2. Filling will not be permitted.

3. Pea gravel/sand blanket will not be permitted.

4. Aquatic plant screens will not be permitted.

5. Special permitted piers/boardwalks will be considered on a case by case basis, for limited water access only.

6. Seawall construction or substantial repair generally will not be allowed, but will be considered on a case by case basis in areas with a steep slope and a significant erosion problem.

Riparian Activities:

1. Wetland alterations of any type will not be allowed without the proper DNR and Army Corp of Engineers permits.

2. Boardwalks will be considered on a case by case basis for the purposes of limited riparian access and public education.

3. Shoreland zoning standards do not allow new homes or other structures such as gazebo's and decks to be built in wetlands. All other construction must comply with all Walworth County requirements, especially the 75 foot setback from the shoreline.

4. Shoreline protection will be limited to riprap and will be allowed only in places where erosion is occurring. It will not be permitted in the wetland areas, and should be minimal in its intrusion into the lake.

Sensitive Area # 8

SENSITIVE AREA SITE DESCRIPTION

Sensitive area #8 is located just southeast of the East Troy boat launch on the southwestern shore of Lake Beulah. (Figure 2 and 3)

RESOURCE ASSETS OF SENSITIVE AREA #8

Sensitive area #8 supports an diverse reservoir of native aquatic plants, both submergent and emergent, and only limited areas of Eurasian water milfoil (*Myriophyllum spicatum*). (Table 1) The emergent and floating leaved community includes swamp loosestrife (*Decodon verticillatus*), bulrushes (*Scirpus sp.*), white water lily (*Nymphaea tuberosa*) and yellow water lily (*Nuphar variegatum*). The submergent community includes native water milfoil, (*Myriophyllum heterophyllum*), and a variety of pondweed species (*Potamogeton spp.*).

Fish utilize this community in a variety of ways. The diverse community of emergent and submerged aquatic plants provide excellent spawning habitat for northern pike, and very good spawning habitat for largemouth bass and bluegills. The less heavily vegetated areas provide spawning areas for crappie and walleye. The vegetated areas also provide high quality nursery areas for northern pike, largemouth bass, walleye, crappie and bluegill. All these species will also find ideal feeding habitat in these areas.

Wildlife also depends on the resources provided by sensitive area #8. This area offers high quality habitat for a variety of wetland species. Ducks such as mallards and wood ducks will nest, feed, and rear their young here. Wading birds such as the great blue heron, smaller herons and bitterns feed here, and stop here during migration. Shorebirds such as sandpipers will be found feeding here, and songbirds will find nesting habitat, and will feed and rear their young in the trees and shrubs along the wetlands. Muskrats, opossum and raccoons can be found here year round, feeding, nesting and raising their young.

The plant community in sensitive area #8 acts as a sediment and nutrient trap, as well as protecting the shoreline from erosion. It also stabilizes the bottom sediments. These functions benefit the entire lake in that they reduce nutrients available in the water to support the growth of nuisance aquatic plants, and improve the clarity of the water. (Table 2)

Sensitive area #8 is ecologically important to the lake for several reasons. The excellent native species reservoir will act as a buffer against invasion by exotic plant species, as well as a refuge where native species have established and can continue to spread. The emergent, floating leaved and submergent plant community and the

spawning grounds they provide for fish are unique to the lake. (Table 2)

MANAGEMENT RECOMMENDATIONS FOR SENSITIVE AREA #8 (Table 4)

In-lake activities:

Aquatic plant control:

1. Chemical: chemical treatment of aquatic plants will be permitted in this area, but is limited to control of Eurasian Water Milfoil. These chemical applications should be as selective as possible to reduce impacts on the native aquatic plant community and be part of a lake wide Eurasian water milfoil control plan.

2. Mechanical: mechanical control of any type is not recommended.

Water Regulation and Zoning:

1. Dredging will not be permitted.

2. Filling will not be permitted.

3. Pea gravel/sand blanket will not be permitted.

4. Aquatic plant screens will not be permitted.

5. Special permitted piers/boardwalks for water access will be considered on a case by case basis.

Riparian Activities:

1. Wetland alterations of any type will not be allowed without the proper DNR and Army Corp of Engineers permits.

2. Boardwalks will be considered on a case by case basis for the purposes of limited riparian access and public education.

3. Shoreland zoning standards do not allow new homes or other structures such as gazebo's and decks to be built in wetlands. All other construction must comply with all Walworth County requirements, especially the 75 foot setback from the shoreline.

4. Shoreline protection will not be permitted as it is unnecessary in this area.

Common Name	Scientific Name	Sensitive Area Occurrence
Eurasian water milfoil	*Myriophyllum spicatum*	1,2,3,4,5,6,8
Swamp loosestrife	*Decodon verticillatus*	1,5,6,7,8
White water lily	*Nymphaea tuberosa*	1,2,3,4,5,6,7,8
Yellow water lily	*Nuphar variegatum*	1,2,3,4,5,6,7,8
Variable leaved water milfoil (native)	*Myriophyllum heterophyllum*	1,2,4,5,6,7,8
Sago pondweed	*Potamogeton pectinatus*	1,5,6,7
Clasping leaved pondweed	*P. richardsonii*	1,4,6,7
Floating leaved pondweed	*P. natans*	1,6,7
Large leaved pondweed	*P. amplifolius*	1,5,6,7
Narrow leaved pondweed	*P. spp.*	2
White stemmed pondweed	*P. praelongus*	4
Curly leaved pondweed	*P. crispus*	2
Bladderwort	*Utricularia sp.*	1,2,6
Wild celery	*Valisneria americana*	1,2,5,6,7
Musk grass	*Chara sp.*	1,2,4,5,6,7
Duckweed	*Lemna sp.*	5
Narrow leaved cattail	*Typha angustifolia*	6
Large leaved elodea	*Elodea canadensis*	6
Bulrushes	*Scirpus spp.*	4,6,7,8

Table 1. Aquatic plant species found in Lake Beulah sensitive areas and their locations

Resource Value	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8
Diverse Native Plant Community	X	X	X	X	X	X	X	X
Sediment & Nutrient Trap- protects water quality	X	X	X	X	X	X	X	X
Wildlife & Fishery Value- spawning, nursery, feeding, etc.	X	X	limited by size	X	X	X	X	
Shoreline Erosion Protection	X	X	X	X	X		X	
Stabilization of Bottom Sediments- protects water quality	X		X			X	X	X
Ecological/ hydrological/other	spawning	buffer / refuge	fish cover		very diverse	traps incoming nutrients from Pickerel lake	buffer / refuge	

Table 2. Resource values of sensitive areas in Lake Beulah.

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	Activity	Sensitive Area 1	Sensitive Area 2	Sensitive Area 3	Sensitive Area 4
In Lake Activities	Chemical control of aquatic plants	Allowed only as part of a Eurasian water milfoil control plan	Allowed only as part of Eurasian water milfoil control plan	Allowed only as part of Eurasian water milfoil control plan	Allowed only as part of Eurasian water milfoil control plan
	Mechanical harvesting of aquatic plants	Not recommended	Not recommended	Not recommended	Recommended only for Eurasian water milfoil
	Dredging	Navigational purposes only- native plantings required. Southern part only	May be permittable on a case by case basis - native planting required	Permit required - native planting required	Permit required - native planting required - not in shoreline area of bulrushes and willow
	Filling	Not permitted	Not permitted	Not permitted	Permit required
	Pea gravel / sand blanket	Not permitted	Not permitted	Permittable on a case by case basis	Permittable on a case by case basis
	Aquatic plant screens	Permittable	Permit required	NA	Permittable on a case by case basis
	Boardwalks and special permitted piers	Permittable on a case by case basis	Permittable - must meet local and DNR standards	NA	Permittable on a case by case basis
	Other - Seawall construction	Generally not permitted but possible if conditions warrant	Generally not permitted but possible if conditions warrant	NA	Generally not permitted but possible if conditions warrant
Riparian Activities	Wetland alterations	Permit required	NA	NA	NA
	Boardwalks	Permittable for limited riparian and educational uses	NA	NA	NA
	Shoreline protection	Riprap only- not in wetland- only in cases where erosion is occurring	Permit required	Permit required	Permit required
	Shoreline zoning	Must comply with local standards, 75 foot setback	Must comply with local standards	Must comply with local standards	Must comply with local standards

Table 3. Management recommendations and restrictions for Lake Beulah sensitive areas 1-4.

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	Activity	Sensitive Area 5	Sensitive Area 6	Sensitive Area 7	Sensitive Area 8
In Lake Activities	Chemical control of aquatic plants	Allowed only as part of Eurasian water milfoil control plan	Allowed only as part of Eurasian water milfoil control plan	Not permitted	Allowed only as part of Eurasian water milfoil control plan
	Mechanical harvesting of aquatic plants	Not recommended	Recommended for navigational channels only	Recommended for navigational channels only	Not recommended
	Dredging	Permittable but limited - native planting required	Not permitted	Not permitted	Not permitted
	Filling	Not permitted	Not permitted	Not permitted	Not permitted
	Pea gravel / sand blanket	Not permitted	Pea gravel possible- sand not permitted	Not permitted	Not permitted
	Aquatic plant screens	Permit required	Permit required	Not permitted	Not permitted
	Boardwalks and special permitted piers	NA	Permittable on a case by case basis	Permittable for limited water access only	Permittable on a case by case basis
	Other - Boating regulations	NA	Recommended to remain slow / no wake	NA	NA
	Other - Seawall construction	NA	NA	Generally not permitted but possible if conditions warrant	NA
Riparian Activities	Wetland alterations	NA	Not permitted	Permit required	Permit required
	Boardwalks	NA	Permittable for education and riparian access	Permittable for education and riparian access	Permittable for education and riparian access
	Shoreline protection	Riprap permittable - only in cases where erosion is occurring	Not permitted	Riprap permittable - only in cases where erosion is occurring	Not permitted
	Shoreline zoning	Must comply with local standards	Must comply with local and shoreline wetland zoning standards	Must comply with local and shoreline wetland zoning standards	Must comply with local and shoreline wetlands zoning standards

Table 4. Management recommendations and restrictions for Lake Beulah sensitive areas 5-8.

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References

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Nichols, Stanley A. and James G. Vennie 1991 Attributes of Wisconsin Lake Plants. Wisconsin Geological & Natural History Survey Information Circular #73

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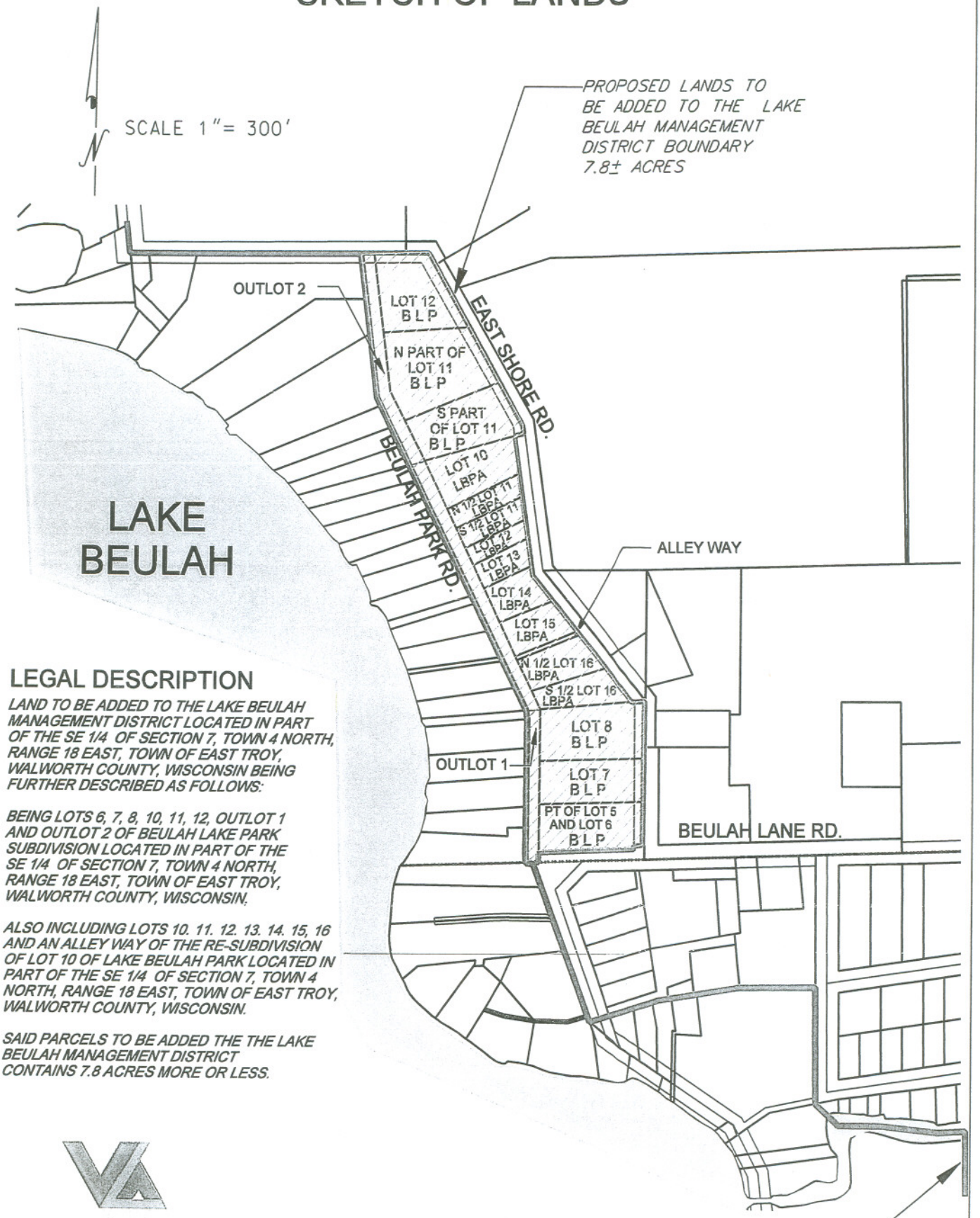
APPENDIX B

USGS WATER QUALITY DATA

EXHIBIT B

SKETCH OF LANDS



LEGAL DESCRIPTION

LAND TO BE ADDED TO THE LAKE BEULAH MANAGEMENT DISTRICT LOCATED IN PART OF THE SE 1/4 OF SECTION 7, TOWN 4 NORTH, RANGE 18 EAST, TOWN OF EAST TROY, WALWORTH COUNTY, WISCONSIN BEING FURTHER DESCRIBED AS FOLLOWS:

BEING LOTS 6, 7, 8, 10, 11, 12, OUTLOT 1 AND OUTLOT 2 OF BEULAH LAKE PARK SUBDIVISION LOCATED IN PART OF THE SE 1/4 OF SECTION 7, TOWN 4 NORTH, RANGE 18 EAST, TOWN OF EAST TROY, WALWORTH COUNTY, WISCONSIN.

ALSO INCLUDING LOTS 10. 11. 12. 13. 14. 15, 16 AND AN ALLEY WAY OF THE RE-SUBDIVISION OF LOT 10 OF LAKE BEULAH PARK LOCATED IN PART OF THE SE 1/4 OF SECTION 7, TOWN 4 NORTH, RANGE 18 EAST, TOWN OF EAST TROY, WALWORTH COUNTY, WISCONSIN.

SAID PARCELS TO BE ADDED THE THE LAKE BEULAH MANAGEMENT DISTRICT CONTAINS 7.8 ACRES MORE OR LESS.

VANHENKELUM LYNCH
& ASSOCIATES LLC
BIG BEND, WISCONSIN
262-662-4292

EXHIBIT C

P201459
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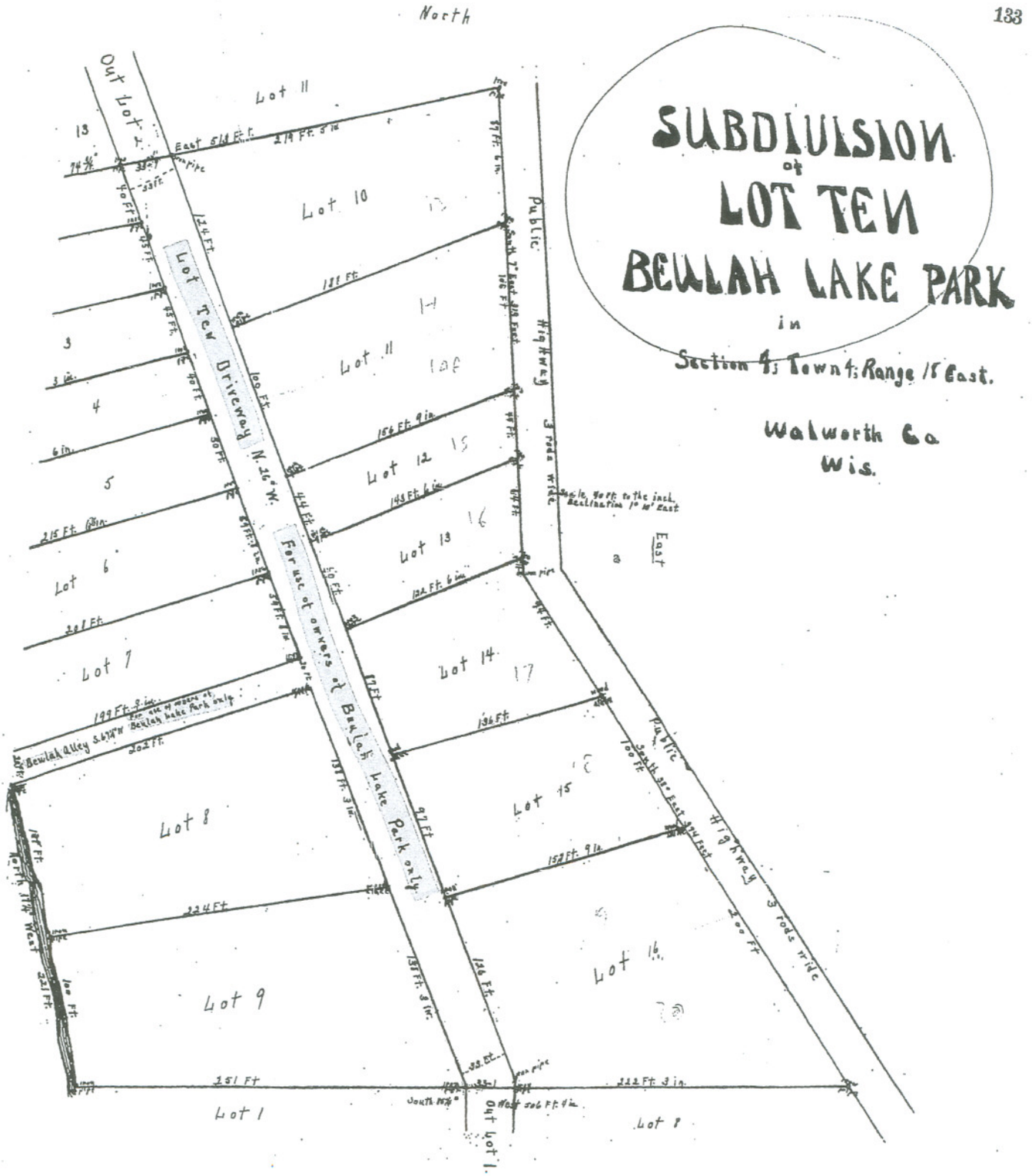

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No. 201459

P201459
Page 1 of 2

I, T. F. Bayley, Surveyor, do hereby certify that I have this day completed a survey of a parcel of land in the South East quarter of Section four (4); Town four (4) North; Range eighteen (18) East, known as lot 10 of the Plat of Beulah Lake Park, in order that the same may be known as a Subdivision of lot Ten, Beulah Lake Park. I have subdivided the same into lots, alleys and driveways of which the within map is a correct representation of the same. The distances are given in feet and inches; 2 inch wooden stakes and 1 and 2 inch iron pipes are placed at corners of lots and on lot lines as indicated on the within map.

That the survey and map was made under the order and direction of Martha J. Flamm, Charles H. Leuck, Hugo Westhofen, Henry J. Leuck, J. M. Mertz, Fred W. Harrison and Amelia Harrison his wife, and May Learned the owners of said lot Ten (10); and that I have fully complied with the provisions of Chapter 101 Revised Statutes of 1898 and the amendments thereto.

Survey completed Sept 5th 1914

T. F. Bayley, Surveyor.

We Martha J. Flamm, Charles H. Leuck, Hugo Westhofen, Henry J. Leuck, J. M. Mertz, Fred W. Harrison and Amelia Harrison, his wife and May Learned do hereby certify that we caused the land described in the foregoing certificate of T. F. Bayley, Surveyor, to be surveyed and mapped as represented on the within Plat.

Lot Ten Driveway, designated on said Plat is described as follows: Beginning at the Northeast corner of lot one (1) of the said Beulah Lake Park and thence running north 55¼° East Thirty three (33) feet and one (1) inch; thence north four (4) feet and six (6) inches; thence north 26° West six hundred and thirty eight (638) feet to the north line of said lot Ten (10); thence south 74¾° West thirty three (33) feet and seven (7) inches; thence south 26° east six hundred and thirty five (635) feet and ten (10) inches to the place of beginning and represents the same land intended to be conveyed by deed recorded in Volume 135 of Deeds on page 156 of Walworth Co., Wis. records, and is to be for the use of the owners of Beulah Lake Park only, in making a driveway from Out Lot No. 1 to Out Lot No. 2 in the said Beulah Lake Park.

Beulah Alley, designated on said Plat is described as follows: beginning at a point on the south west side of said lot Ten driveway two hundred and seventy six (276) feet and six (6) inches north 26° West from the north east corner of lot one (1) in said Beulah Lake Park; and thence running north 26° West twenty (20) feet; thence south 67¼° west one hundred and ninety nine (199) feet and nine (9) inches to the Lake shore; thence south 17¼° east twenty (20) feet; thence north 67¼° east two hundred and two (202) feet to the place of beginning; and represents the same land intended to be conveyed by deed recorded in Volume 135 of Deeds on page 144 of Walworth Co., Wis. records, and is to be for the use of the owners of Beulah Lake Park only, in travelling from said Lot Ten Driveway to the shore of Beulah Lake.

The several lots designated on said Subdivision of Lot Ten (10) belong to the several owners thereof as follows: Lot No. 1 to Martha J. Flamm; Lots No. 2-6-7-8-9-10-12-14-15 and 16 to May Learned; Lot No. 3 to Charles H. Leuck; Lot No. 4 to Hugo Westhofen; Lot No. 5 to Henry J. Leuck; Lot No. 11 to J. M. Mertz; Lot No. 13 to Fred W. Harrison and Amelia Harrison, his wife.

In Witness Whereof We have hereunto set our hands and seals this 5th day of September 1914.

In the presence of

Thomas F. Bayley	Mrs. Martha Flamm	Hugo Westhofen	
Chas. Buerseister	Fred W. Harrison	Henry J. Leuck	
	Amelia Harrison	J. M. Mertz	
	Charles H. Leuck	May Learned	

State of Wisconsin } ss.
Walworth County }

Personally came before me on the 5th day of Sept 1914 the above named Martha J. Flamm; Charles H. Leuck; Hugo Westhofen; Henry J. Leuck; J. M. Mertz; Fred W. Harrison and Amelia Harrison, his wife; May Learned to me known to be the persons who executed the foregoing certificate and acknowledged that they executed it for the uses and purposes as therein set forth.

Thomas F. Bailey,
Notary Public
May Com. Expires Nov. 15th 1914

Recorded Sept. 15th 1914 at 9 o'clock A.M.

See page Vol. 226 page 122.

Land Use and Resource
Management Department

June 28, 2011

Dear Landowner:

Attached is information brought to our attention by the Lake Beulah Management District regarding their intention to request a boundary expansion which includes land that you may own. The attached notice has a map and legal description that shows the proposed 7.8 acres of land to be added to the Lake Beulah Management District. Also included is the July 18, 2011 Walworth County Land Conservation Committee Meeting and Public Hearing when it will be discussed.

Public comments can be sent to Chair Dan Kilkenny, Walworth County Land Conservation Committee, 100 W. Walworth Street, P. O. Box 1001, Elkhorn, WI 53121. If you are not planning on speaking at the public hearing, your comments, to be included, must be mailed by Friday, July 15, 2011 4:00 p.m.

Sincerely,

Louise A. Olson

Louise A. Olson, Walworth County Conservationist/Deputy Director
Walworth County Land Use and Resource Management Department

jd

Enclosures (2)

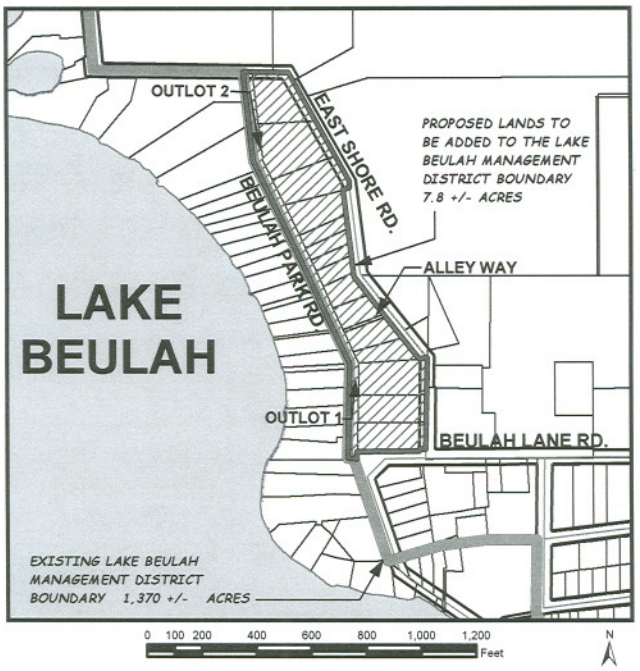
100 West Walworth Street
P. O. Box 1001
Elkhorn, WI 53121
Conservation Division
262-741-4972 tel
262-741-4973 fax

NOTICE

Lake Beulah Management District to Request Boundary Expansion in the coming months, the Lake Beulah Management District will formally submit a request to Walworth County to expand its boundary.

Lake Beulah is an 834-acre flow-through lake located in Walworth County, Wisconsin. The Lake Beulah Management District (LBMD) is a public inland lake protection and rehabilitation district organized under Chapter 33 of the Wisconsin Statutes. The LBMD has regulatory authority over all areas within the LBMD territory and the watershed to provide for the protection and rehabilitation of the lake and its environments. Pursuant to its regulatory authority the LBMD has contracted for the development of a Lake Management Plan (the Plan) to identify management goals and areas of concern. A full copy of the Plan is available for viewing at the Walworth County Land Use and Resource Management Department. The Plan identifies specific management goals as the restoration and maintenance of the environmental integrity of the lake ecosystem, protection of the aesthetic value of the lake, and maintenance of recreational opportunities. The Plan identifies several areas of concern including the impact of high-capacity well on the lake, nutrient loading, water quality, shoreline erosion, weed management, and endangered species protection among others.

The commissioners of the LBMD have identified certain properties listed on the map below as properties that benefit from the achievement of the goals and the exploration of the areas of concern listed in the Plan. The properties shown on the map below have right and access to Lake Beulah by way of the private driveway and alley way, as show on the map below. Pursuant to Wis. Stat. 33.26(3) and 33.33(2), the commissioners of the lake management district may by motion initiate proceedings to include in the district properties contiguous to the district when such properties benefit from the district. The commissioners of the LBMD believe the properties listed on the map receive benefit from the LBMD and their inclusion will further promote the public health, comfort, convenience, necessity or public welfare of all property owners within the district. The Commissioners of the Lake Beulah Management District move to initiate attachment proceedings for the properties shown on the map below.



LEGAL DESCRIPTION

Land to be added to the Lake Beulah Management District located in part of the SE ¼ of Section 7, Town 4 North, Range 18 East, Town of East Troy, Walworth County, Wisconsin being further described as follows:

Being lots 6, 7, 8, 10, 11, 12, Outlot 1 and Outlot 2 of Beulah Lake Park Subdivision located in Part of the SE ¼ of Section 7, Town 4 North, Range 18 East, Town of East Troy, Walworth County, Wisconsin,

Also including lots 10, 11, 12, 13, 14, 15, 16 and an alley way of the re-subdivision of lot 10 of Lake Beulah Park located in part of the SE ¼ of Section 7, Town 4 North, Range 18 East, Town of East Troy, Walworth County, Wisconsin.

Said parcels to be added to the Lake Beulah Management District contains 7.8 acres more or less.

86.30 **(2)** (dr) *Aid reduction related to outdoor advertising sign condemnation.* The department may reduce aids paid to a county or municipality under par. (e) as provided in s. 84.30 (5r) (c).

SECTION 2272. 86.30 (9) (b) of the statutes is amended to read:

86.30 **(9)** (b) For the purpose of calculating and distributing aids under sub. (2), the amounts for aids to counties are ~~$96,492,900 in calendar year 2008, $99,387,700 in calendar year 2009,~~ $101,375,500 in calendar year 2010, ~~and~~ $104,416,800 in calendar year 2011, and $94,615,600 in calendar year 2012 and thereafter. These amounts, to the extent practicable, shall be used to determine the statewide county average cost–sharing percentage in the particular calendar year.

SECTION 2273. 86.30 (9) (c) of the statutes is amended to read:

86.30 **(9)** (c) For the purpose of calculating and distributing aids under sub. (2), the amounts for aids to municipalities are ~~$303,578,100 in calendar year 2008, $312,685,400 in calendar year 2009,~~ $318,939,100 in calendar year 2010, ~~and~~ $328,507,300 in calendar year 2011, and $308,904,300 in calendar year 2012 and thereafter. These amounts, to the extent practicable, shall be used to determine the statewide municipal average cost–sharing percentage in the particular calendar year.

SECTION 2278d. 86.31 (2) (a) of the statutes is amended to read:

86.31 **(2)** (a) The department shall administer a local roads improvement program to accelerate the improvement of seriously deteriorating local roads by reimbursing political subdivisions for improvements. The selection of improvements that may be funded under the program shall be performed by officials of each political subdivision, consistent with par. (h) and the requirements of subs. (3), (3g), (3m), and (3r). The department shall notify each county highway commissioner of any deadline that affects eligibility for reimbursement under the program no later than 15 days before such deadline.

SECTION 2278em. 86.31 (2) (b) of the statutes is amended to read:

86.31 **(2)** (b) Except as provided in par. (d), improvements for highway construction projects funded under the program shall be under contracts. Such contracts shall be awarded on the basis of competitive bids and shall be awarded to the lowest responsible bidder. If a city or village does not receive a responsible bid for an improvement, the city or village may contract with a county for the improvement. ~~A~~ Subject to s. 59.52 (30), a town may contract with a county for the improvement subject to the criteria and procedures promulgated as rules under sub. (6) (h).

SECTION 2278j. 86.31 (2) (h) of the statutes is created to read:

86.31 **(2)** (h) A double seal coat project on a town road may be funded under the program if it has a projected life of at least 10 years, similar projects in the same geographic area have performed satisfactorily, and the county highway commissioner of the county in which the project is located approves the project's eligibility for funding.

SECTION 2278m. 86.31 (3m) of the statutes is amended to read:

86.31 **(3m)** TOWN ROAD IMPROVEMENTS — DISCRETIONARY GRANTS. From the appropriation under s. 20.395 (2) (ft), the department shall allocate ~~$765,000 in fiscal year 2007–08, $780,300 in fiscal year 2008–09, and~~ $732,500 in fiscal year 2009–10 and in fiscal year 2010–11, and $5,732,500 in fiscal year 2011–12 and each fiscal year thereafter, to fund town road improvements with eligible costs totaling $100,000 or more. The funding of improvements under this subsection is in addition to the allocation of funds for entitlements under sub. (3).

SECTION 2278o. 86.31 (6) (h) (intro.) of the statutes is amended to read:

86.31 **(6)** (h) ~~Criteria~~ Subject to s. 59.52 (30), criteria and procedures for contracting with a county for a town road improvement that includes at least all of the following:

SECTION 2279. 91.04 (2) (j) of the statutes is amended to read:

91.04 **(2)** (j) Rezoning of land out of farmland preservation zoning districts under s. 91.48~~, including the amounts of conversion fees paid to political subdivisions under s. 91.48 (1) (b)~~.

SECTION 2280. 91.48 (1) (intro.) of the statutes is amended to read:

91.48 **(1)** (intro.) A political subdivision with a certified farmland preservation zoning ordinance may rezone land out of a farmland preservation zoning district without having the rezoning certified under s. 91.36, if ~~all of the following apply~~ the political subdivision finds all of the following, after public hearing:

SECTION 2281. 91.48 (1) (a) (intro.) of the statutes is repealed.

SECTION 2282. 91.48 (1) (a) 1. to 4. of the statutes are renumbered 91.48 (1) (a) to (d).

SECTION 2283. 91.48 (1) (b) of the statutes is repealed.

SECTION 2284. 91.48 (2) (intro.) and (a) of the statutes are consolidated, renumbered 91.48 (2) and amended to read:

91.48 **(2)** A political subdivision shall by March ~~of~~ 1 of each year provide ~~all of the following~~ to the department~~: (a) A~~ a report of the number of acres that the political subdivision has rezoned out of a farmland preservation zoning district under sub. (1) during the previous year and a map that clearly shows the location of those acres.

SECTION 2285. 91.48 (2) (b) and (c) of the statutes are repealed.

SECTION 2286. 91.48 (3) of the statutes is amended to read:

91.48 **(3)** A political subdivision that is not a county shall by March 1 of each year submit a copy of the information that it reports to the department under sub. (2) ~~(a) and (b)~~ to the county in which the political subdivision is located.

SECTION 2287. 91.49 of the statutes is repealed.

SECTION 2292. 92.07 (15) of the statutes is amended to read:

92.07 **(15)** ADMINISTRATION AND ENFORCEMENT OF ORDINANCES. A land conservation committee may, if authorized by the county board, administer and enforce those provisions of an ordinance enacted under s. 101.65 (1) (a) related to construction site erosion, a zoning ordinance enacted under s. 59.693 or an ordinance enacted under authority granted under s. ~~281.33 (3m)~~ 101.1206.

SECTION 2293. 93.07 (3) of the statutes is amended to read:

93.07 **(3)** PROMOTION OF AGRICULTURE. To promote the interests of agriculture, dairying, horticulture, manufacturing, commercial fishing and the domestic arts and to advertise Wisconsin and its dairy, food, and agricultural products by conducting campaigns of education throughout the United States and in foreign markets. Such campaigns shall include the distribution of educational and advertising material concerning Wisconsin and its plant, animal, food, and dairy products. The department shall coordinate efforts by the state to advertise and promote agricultural products of this state, with the ~~department of commerce~~ Wisconsin Economic Development Corporation where appropriate. The department shall submit its request and plan for market development program expenditures for each biennium with its biennial budget request. The plan shall include the identification and priority of expenditures for each market development program activity.

SECTION 2294. 93.07 (18) (b) (intro.) of the statutes is amended to read:

93.07 **(18)** (b) (intro.) In consultation with the ~~department of commerce~~ Wisconsin Economic Development Corporation, to do all of the following for each economic development program administered by the department of agriculture, trade and consumer protection:

SECTION 2295. 93.07 (20) (title) of the statutes is amended to read:

93.07 **(20)** (title) ECONOMIC DEVELOPMENT ASSISTANCE COORDINATION AND REPORTING.

SECTION 2296. 93.07 (20) of the statutes is renumbered 93.07 (20) (b) and amended to read:

93.07 **(20)** (b) Annually, no later than October 1, to submit to the joint legislative audit committee and to the appropriate standing committees of the legislature under s. 13.172 (3) a comprehensive report assessing economic development programs, as defined in sub. (18) (a), administered by the department. The report shall include all of the information required under s. ~~560.01 (2) (am)~~ 238.07 (2). The department shall collaborate with the ~~department of commerce~~ Wisconsin Economic Development Corporation to make readily accessible to the public on an Internet–based system the information required under this subsection.

SECTION 2297. 93.07 (20) (a) of the statutes is created to read:

93.07 **(20)** (a) The department shall coordinate any economic development assistance with the Wisconsin Economic Development Corporation.

SECTION 2298. 93.07 (26) of the statutes is amended to read:

93.07 **(26)** ALTERNATIVE FUEL REFUELING FACILITIES. To pursue ~~in cooperation with the office of energy independence,~~ the establishment and maintenance of sufficient alternative fuel refueling facilities at public retail outlets to meet the traveling needs of the public.

SECTION 2299. 93.33 (5) (intro.) of the statutes is amended to read:

93.33 **(5)** ANNUAL REPORT. (intro.) In September of each year, the council shall submit a report to the appropriate standing committees of the legislature as determined by the speaker of the assembly and the president of the senate, under s. 13.172 (3), the governor, the secretary of agriculture, trade and consumer protection, the state superintendent of public instruction, the secretary of workforce development, the secretary of natural resources, the ~~secretary of commerce~~ chief executive officer of the Wisconsin Economic Development Corporation, the president of the University of Wisconsin System, the director of the technical college system, the chancellor of the University of Wisconsin–Extension, the chancellor of the University of Wisconsin–Madison, the chancellor of the University of Wisconsin–Platteville, the chancellor of the University of Wisconsin–River Falls, and the chancellor of the University of Wisconsin–Stevens Point. The council shall include all of the following in the report:

SECTION 2299r. 93.40 (1) (g) of the statutes is amended to read:

93.40 **(1)** (g) Promote the growth of the dairy industry through research, planning, and assistance, including grants and loans to dairy producers.

SECTION 2300. 93.42 (1) (e) of the statutes is amended to read:

93.42 **(1)** (e) Cooperating with the ~~department of commerce~~ Wisconsin Economic Development Corporation in promoting the state's products through the state's foreign trade offices.

SECTION 2301. 93.42 (3) of the statutes is repealed.

SECTION 2303. 93.46 (1) (am) of the statutes is repealed.

SECTION 2305. 93.46 (2) (d) of the statutes is repealed.

Scholars Program is transferred to the higher educational aids board.

(c) *Contracts.* All contracts entered into by the office of the Wisconsin Covenant Scholars Program in effect on the effective date of this paragraph remain in effect and are transferred to the higher educational aids board. The higher educational aids board shall carry out any obligations under such a contract until the contract is modified or rescinded by the higher educational aids board to the extent allowed under the contract.

(d) *Rules and orders.* All rules promulgated by the office of the Wisconsin Covenant Scholars Program that are in effect on the effective date of this paragraph remain in effect until their specified expiration dates or until amended or repealed by the higher educational aids board. All orders issued by the office of the Wisconsin Covenant Scholars Program that are in effect on the effective date of this paragraph remain in effect until their specified expiration dates or until modified or rescinded by the higher educational aids board.

(e) *Pending matters.* Any matter pending with the office of the Wisconsin Covenant Scholars Program on the effective date of this paragraph is transferred to the higher educational aids board and all materials submitted to or actions taken by the office of the Wisconsin Covenant Scholars Program with respect to the pending matter are considered as having been submitted to or taken by the higher educational aids board.

(3i) COMMUNITY PARTNERSHIPS. By January 10, 2012, the department of administration shall submit to the joint committee on finance for the approval of that committee under section 13.10 of the statutes a plan that includes all of the following:

(a) A plan prepared by the department of public instruction for providing funding to community–based nongovernmental organizations for the establishment of partnerships with local school districts that center on those organizations providing advocacy for students and serving as liaison between families and staff of those school districts with the goal of improving educational outcomes and promoting and teaching greater self–sufficiency.

(b) A plan prepared by the department of children and families for providing funding to community–based nongovernmental organizations for the establishment of partnerships with agencies that license foster homes that center on those organizations providing advocacy for children and serving as liaison between families and staff of those agencies with the goal of improving educational outcomes and promoting and teaching greater self–sufficiency.

Vetoed In Part

(4j) DRUG OFFENDER DIVERSION SURCHARGE FUND. The department of administration shall submit a plan to the joint committee on finance as to how the department will reduce state appropriations by $1,917,900 over the 2011–2013 fiscal biennium and lapse the associated funding to the general fund to eliminate the deficit in the drug offender diversion surcharge fund.

Vetoed In Part

(4q) TRANSFER OF HUMAN RESOURCES POSITIONS.

(a) The secretary of administration shall identify 2.0 FTE PR positions in the department of administration having responsibility for human resources functions. On the effective date of this subsection, one of the positions so identified, as determined by the secretary, is transferred to the state fair park board and the other of the positions so identified is transferred to the department of regulation and licensing and the incumbent employees in those positions are transferred to the state fair park board and the department of regulation and licensing, respectively.

(b) Employees transferred under paragraph (a) have all of the rights and the same status under subchapter V of chapter 111 and chapter 230 of the statutes in the state fair park board and the department of regulation and licensing that they enjoyed in the department of administration immediately before the transfer. Notwithstanding section 230.28 (4) of the statutes, no employee so transferred who has attained permanent status in class is required to serve a probationary period.

Vetoed In Part

(5q) STATE BUILDING AND LEASE BACK STUDY. The department of administration shall study the feasibility of instituting a program for private construction of buildings for the purpose of leasing those buildings to the state. The department shall report its findings and recommendations to the members of the joint committee on finance no later than December 1, 2011.

SECTION 9103. Nonstatutory provisions; Agriculture, Trade and Consumer Protection.

(1i) EVALUATION OF PURCHASE OF AGRICULTURAL CONSERVATION EASEMENT PROGRAM. The department of agriculture, trade and consumer protection shall evaluate the program for the purchase of agricultural conservation easements under section 93.73 of the statutes, including the administration of the program, the source of funding for the program, state financial participation, and the amount of local matching funds required. The department shall include in its evaluation options for a replacement program that would be less costly and more efficient in preserving farmland. The department shall report its findings from the evaluation no later than June 30, 2012, to the joint committee on finance and to the standing committees in each house of the legislature with responsibility for agricultural matters.

(2i) FARMLAND PRESERVATION CONVERSION FEES. If a political subdivision collected conversion fees under section 91.48 (1) (b), 2009 stats., for land rezoned in 2011, the political subdivision shall retain the fees and use them for farmland preservation planning, zoning, and compliance monitoring.

(2u) CONDITION OF SEGREGATED FUNDS. The department of agriculture, trade and consumer protection shall study and evaluate the condition of the agricultural

PRESS RELEASE

For Immediate
Release: June 30, 2011

For more information contact
Louise Olson, Deputy Director, Land Use
And Resource Management Department
262-741-7912

NOTICE OF CITIZEN APPOINTMENT

The Walworth County Land Conservation Committee will be considering one (1) citizen appointment as county representative to the Honey Lake Management District. Said term will commence upon appointment. The representative serves as a link between the Land Conservation Committee and Walworth County Board of Supervisors. Interested conservation minded residents of Walworth County must complete and return a notice of interest form no later than Thursday, July 12, 2011 – 5:00 p.m. Application forms may be obtained from the Land Use and Resource Management Department, Walworth County Government Center, 100 West Walworth Street, Elkhorn, WI 53121, telephone: (262) 741-7912. Completed forms should be mailed or delivered to Louise Olson, County Conservationist/Deputy Director, Land Use and Resource Management Department, Walworth County Government Center, 100 W. Walworth Street, P.O. Box 1001, Elkhorn, WI 53121.

WALWORTH COUNTY
NOTICE OF INTEREST TO SERVE AS A CITIZEN REPRESENTATIVE

Name:_____ **Date:**_____

Mailing Address: _____ **Phone:**_____

_____

E-Mail:_____

I reside in:

☐ **the Town of** _____

☐ **the Village of** _____

☐ **the City of** _____

Please consider me for appointment to:_____

_____

I am interested in serving as a citizen representative because:_____

_____

_____

_____

Special skills, experience or qualifications I possess related to this appointment are:

_____

_____

Check one of the following:

☐ **I am a resident of Walworth County and reside in the appropriate jurisdiction to serve on the board or commission for which I am applying.**

☐ **I am not a resident of Walworth County.**

I certify that the information I have provided is truthful to the best of my knowledge.

_____

Signature of Applicant **Date**

Feel free to attach any additional documentation to this form.

Fw: [Lcds] 2011 WLWCA Annual Conference Call for Volunteers

Louise A Olson to: Michael P Cotter, Joeann Douglas 06/23/2011 07:46 AM

I think we should have this on the LCC Agenda. I know Dorothy would appreciate it.

Louise Olson, Deputy Director/ LURM Dept.
100 W. Walworth Street
PO Box 1001
Elkhorn, WI 53121

Telephone # 262/741-7912
Fax # 262/741-4973

----- Forwarded by Louise A Olson/WALCO on 06/23/2011 07:46 AM -----

From: "Kirsten Moore" <kirsten@wlwca.org>
To: <lcds@danenet.org>
Date: 06/22/2011 02:36 PM
Subject: [Lcds] 2011 WLWCA Annual Conference Call for Volunteers
Sent by: lcds-bounces@lists.danenet.org

Good afternoon!

The 2011 WLWCA Annual Conference is December 8-9 at the Chula Vista Resort in Wisconsin Dells.

WLWCA is beginning its annual conference planning process. If you are interested in volunteering, please fill out the attached PDF, sign, and return to WLWCA. Volunteers are eligible for discounts on WLWCA annual conference registrations.

If you are interested in volunteering for the planning committee, we will be starting meetings very soon. Planning Committee volunteers are encouraged to sign up with the attached form right away, then visit http://www.doodle.com/mwm45cmyp4hwk847 to provide input regarding availability for two conference calls in July and August. Planning Committee volunteers are eligible for $20 off each day of conference registration.

County Cons: please pass this information along to your LCC members and staff. We plan to send follow-up solicitations via *Thursday Note* as well.

Thank you for your time! We hope to see you at the 2011 WLWCA Annual Conference!

Sincerely,
Kirsten Moore, Office Manager
Wisconsin Land and Water Conservation Association, Inc.
702 E. Johnson St.
Madison, WI 53703-1533
Phone: 608-441-2677
Fax: 608-441-2676
kirsten [at] wlwca.org
www.wlwca.org

2011 WLWCA Annual Conference Volunteer Application

Wisconsin Land and Water Conservation Association is currently seeking volunteers for the 2011 WLWCA Annual Conference December 8-9 at Chula Vista Resort in Wisconsin Dells.

All volunteers may take advantage of conference discounts!

Space is limited! Sign-up today!

Planning Committee	Auction Coordinator	Spouse Tour Leader	Auction Assistants
8 volunteers, pre-conference only Deadline to apply July 5	1 volunteer both days plus pre-conference consultation Deadline to apply August 1	1 volunteer Thursday plus pre-conference consultation Deadline to apply August 1	6 volunteers Thursday 1 volunteer Friday 3 to 5½ hour shifts Deadline to Apply Oct 1
WLWCA meets with land conservation supervisors, staff and agencies via conference call two to three times between June and August to plan the conference agenda. Planning Committee members help create sessions and recruit speakers, working behind the scenes before the conference to craft a successful event.	WLWCA plans the Youth Education Silent and Live Auctions with a land conservation staff or agency volunteer that will schedule volunteers for the auctions and attend the entire conference to manage the auctions. Ideal candidates, are detail oriented, outgoing, willing to volunteer Thursday evening, and have experience with Microsoft Access.	Work with WLWCA and the Wisconsin Dells Visitor and Convention Bureau to set the spouse tour itinerary and spend the day as the spouse tour guide. Ideal candidates are punctual, friendly, flexible, comfortable handling cash and enjoy event planning.	Assist the Auction Leader with auction setup, maintenance, tallying bids and distribution. Ideal candidates are punctual, energetic, and are comfortable with people, digital cameras and data entry.
$20 off each day of registration.	Waived registration and meals, free lodging, mileage reimbursed.* 2-day attendance required.	Waived registration and meals Thursday, free lodging Wednesday, mileage reimbursed.*	$30 off registration for each day of volunteering.

AV Assistants	Registration Assistants	Moderators
5 volunteers both days Deadline to Apply Oct 1	1 volunteer Thursday 2 volunteers Friday 90 to 180 minute shifts Deadline to Apply Oct 1	8 volunteers Thursday 4 volunteers Friday 75-90 minute shifts Deadline to Apply Oct 1
WLWCA relies on land conservation departments and agencies to loan and set up laptops and data projectors for the conference. Ideal candidates are punctual, reliable, have permission to loan equipment to WLWCA, have equipment savvy and are comfortable leaving equipment locked in conference rooms overnight.	Help WLWCA staff register attendees, help LCC Chairs register to vote at the annual business meeting or help attendees pay for silent auction items on Friday. Ideal candidates are punctual, efficient, friendly and comfortable handling cash or voter registration forms.	Want to take advantage of all the conference has to offer, but still attend all the events? Consider moderating a session! Moderators check in with speakers before their assigned session to make sure they have everything they need to make their presentation. Moderators also introduce the speaker and help keep the presentations running on time. Ideal candidates are punctual and assertive.
$40 off 2-day registration. 2-day registration only.	$20 off registration for each day of volunteering.	$10 off registration for each day of volunteering.

**For these volunteers, WLWCA will pay for meals provided at the conference or at the spouse tour and lodging at the single room rate in the WLWCA room block Wednesday and/or Thursday if needed. Mileage is reimbursed at current State of Wisconsin reimbursement rates determined by the Office of State Employment Relations.*

Yes! I want to volunteer for the 2011 WLWCA Annual Conference!

Name:_____

County:_____

Organization/Affiliation:_____

Position:_____

Address:_____ City/State/Zip:_____

Phone:_____ Email:_____

Mobile Phone (for during the conference only):_____

I plan to attend the conference:

- ◯ Both Days
- ◯ Thursday Only
- ◯ Friday Only

Please rank your TOP 3 volunteering interests:

- ____ Planning Committee
- ____ Auction Leader
- ____ Spouse Tour Leader
- ____ AV Assistant
- ____ Auction Assistant
- ____ Registration Assistant
- ____ Moderator

I would be willing to volunteer both days:

◯ **Yes** ◯ **No**

I understand that there are a limited number of volunteer positions available and that I may not be called on to volunteer if all the positions have been filled. If selected, I understand that WLWCA will send me a confirmation detailing my volunteer assignment and discount via Email and that discounts will be applied when I register for the WLWCA Annual Conference. I also understand that volunteers are still subject to the registration and cancellation deadlines outlined in the 2011 WLWCA Annual Conference Registration Form and that I need to fill out a registration as an attendee in order to receive my discount.

SIGNATURE:_____

SUBMIT FORM

Questions? Contact kirsten@wlwca.org

Thank you for volunteering your support for WLWCA!

Wisconsin Land and Water Conservation Association, Inc.
702 East Johnson Street · Madison, Wisconsin 53703-1533
Phone: (608) 441-2677 · Fax: (608) 441-2676 · Web site: www.wlwca.org