

## Memorandum

**To:** Pam Anderson, MPCA  
**From:** John Hanson  
**Subject:** VBWD WRAPS, Eagle Point Lake – Shallow Lake vs. Wetland Classification  
**Date:** 6/17/2013  
**Project:** 23/82-1061  
**c:** Chris Klucas, MPCA; Jen Koehler, Barr Engineering

Eagle Point Lake is on the draft 2012 Minnesota 303(d) Impaired Waters List for aquatic recreation due to excessive nutrients. However, Eagle Point Lake is very shallow and the Valley Branch Watershed District would like you to review the lake's data to determine whether the MPCA considers it a shallow lake or a wetland.

This memorandum compiles the following available information for the lake to aid in your review:

- Eagle Point Lake's individual management plan from the Valley Branch Watershed District 2005-2015 Watershed Management Plan
- Photographs
- 2007 Bathymetric Map
- Historic macrophyte survey information
- Historic water quality data

### Background

Eagle Point Lake (DNR designation 82-109P) is located within the Lake Elmo Park Reserve. At an elevation of 893.83 feet, the lake has a surface area of 114.4 acres. The watershed is large (11,861 acres) with the majority of external flow entering the lake via Raleigh Creek at the north end of the lake. The lake outlet is a control structure (overflow elevation 894 feet) that flows to Horseshoe Lake and overflows to Lake Elmo during high flow events.

Eagle Point Lake is considered a medium priority water body by the Valley Branch Watershed District (VBWD). Local residents and the general public (via the Lake Elmo Park Reserve) are the primary users of the lake. The main uses of the lake include canoeing, wildlife habitat, and aesthetic viewing.

Even though Eagle Point Lake is listed as a lake (P designation) in the DNR public waters inventory, VBWD considers it a wetland due to its shallow depth and 100% vegetation coverage. The following

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table summarizes the lake's features and compares them to the factors listed in Appendix A of the MPCA's December 2011 Guidance Manual for Assessing the Quality of Minnesota Surface Waters.

<b>Factor</b>	<b>Shallow Lakes</b>	<b>Wetlands</b>	<b>Eagle Point Lake</b>
<b>Protected Waters Inventory Code</b>	May be coded as "L, LP or LW"	Typically coded as "LW"	P
<b>Maximum Depth</b>	Typically <15 feet	Typically <7 feet	5 feet
<b>Littoral Area</b>	Typically >80%	Typically 100%	100%
<b>Area (minimum)</b>	>10 acres (Bulletin 25)	No minimum	115 acres
<b>Thermal stratification (summer)</b>	Typically do not thermally stratify	Typically do not thermally stratify	Does not thermally stratify
<b>Fetch</b>	Fetch is variable depending on size and shape	Rarely has a significant fetch	GIS distances: <ul style="list-style-type: none"> <li>• NW: 3500'</li> <li>• W: 1500'</li> <li>• SW: 1500'</li> </ul>
<b>Substrate</b>	Consolidated to mucky	Mucky to unconsolidated	Unknown
<b>Shoreline features</b>	Generally wave formed, often sand, gravel or rock	Generally dominated by emergent	Dominated by emergent vegetation, no beaches or formal public access
<b>Emergent vegetation and relative amount of open water</b>	Emergents common, may cover much of fringe of lake; basin has high percentage of open water	Emergents often dominate much of basin; often minimal open water	The perimeter of the lake is dominated by emergent vegetation. Although there is often open water in the central portion of the lake, it is typically dominated by submergent vegetation.
<b>Submergent vegetation</b>	Abundant in clear lakes; however, may be lacking in algal-dominated turbid lakes	Common unless dominated by an emergent like cattail	Typically dominated by submergent vegetation
<b>Dissolved oxygen</b>	Aerobic epilimnion but wide diurnal flux possible	Diurnal flux & anaerobic conditions common	Anaerobic at the bottom
<b>Fishery</b>	May or may not be managed for sport fishery. If so, fishery assessment should be available. Winter aeration often used to	Typically not managed for a sport fishery. Little or no MDNR fishery information. Seldom aerated. May be managed to remove	Winterkills regularly. The DNR indicates that no fish management is planned for this lake and the lake is best suited as a waterfowl resting and production

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Factor	Shallow Lakes	Wetlands	Eagle Point Lake
	minimize winterkill potential.	fish and promote waterfowl.	<p>area.</p> <p>The DNR classified Eagle Point Lake as a waterfowl lake in 1951. At one time, large numbers of carp and bullheads were the predominant fish species in the lake, but there has not been a recent fishery assessment. Prior to the VBWD construction of the bypass pipe in 1987, the carp migrated from Lake Elmo and spawned in Eagle Point Lake. (The bypass pipe prevents this migration.) The DNR applied rotenone to Eagle Point Lake in November 1988 to kill the large carp population. This was done in conjunction with a temporary lowering of the lake. The DNR then stocked the lake with tiger muskie in an attempt to use the lake for rearing fish hatchery stock. The presence of rough fish in the lake (despite the rotenone treatment) caused the attempt to be unsuccessful. The DNR indicates it will not use the lake for rearing fish hatchery stock in the future. The DNR has not conducted any recent fish surveys of Eagle Point Lake (but it indicates that only smaller than average bullheads are present in</p>

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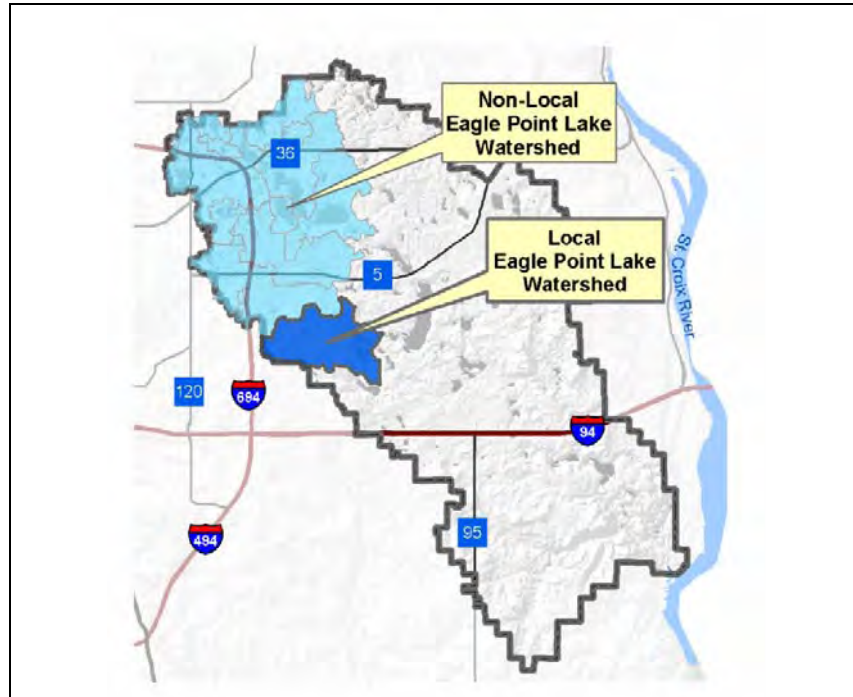
Factor	Shallow Lakes	Wetlands	Eagle Point Lake
			the lake), and the DNR will manage Eagle Point Lake as a wildlife wetland. The DNR indicates that fishing at this lake would take considerable effort.
<b>Uses</b>	Boating, fishing, waterfowl production, hunting, aesthetics; limited swimming; may have boat ramp, beaches uncommon	Waterfowl & wildlife production, hunting, aesthetics. Unimproved boat ramp, if any. No beaches.	Washington County indicates that the lake is used for canoeing, wildlife habitat, and aesthetic viewing; there is no official public access except for a small carry-in canoe launch developed by the county. Note that the DNR indicates that fishing in Eagle Point Lake will require considerable effort. (Note: VBWD plan indicates the lake is used for fishing, but the park manager says people don't fish on the lake)



**Appendix A**  
**Eagle Point Lake Watershed Plan from the**  
**VBWD 2005-2015 Watershed Management Plan**

## 5.12 Eagle Point Lake Watershed Management Plan

### 5.12.1 General Information



Eagle Point Lake is located in the south-central area of the City of Lake Elmo. The lake is shallow with a maximum depth of about six feet and an average depth of three feet. The local watershed of Eagle Point Lake includes Farney Creek, an intermittent stream that enters the lake's west side, and several small, isolated wetlands. The local watershed is within the cities of Oakdale and Lake Elmo, and is shown on Figure 5.12-1.

The overall watershed of Eagle Point Lake is much larger than its local watershed. Because Raleigh Creek enters the lake from the northwest side, the total watershed to Eagle Point Lake includes portions of eight communities.

All of Eagle Point Lake and a large portion of its local watershed are located within the Lake Elmo Park Reserve. Since 1995, residential housing has been developed in the western portions of the lake's local watershed. Figure 5.12-2 shows the existing and future land use of the Eagle Point Lake watershed.

Because the lake is located within the Lake Elmo Park

Eagle Point Lake Local Watershed Information	
Tributary Area (acres)	2,180 (11,502 with upstream areas)
DNR-Designated Basins within Watershed	82-410W, 82-411W (Brown's Pond, 82-419W, 82-413W, 82-416W, 82-412W, 82-109P (Eagle Point Lake)
Downstream Watershed	Horseshoe Lake (and Lake Elmo infrequently)
Eagle Point Lake Information	
DNR Designation	82-109P
Surface Area (acres)	119.6 at El. 893.5
Mean Depth (feet)	3
Maximum Depth (feet)	6
Volume Below Discharge Elevation (acre-feet)	Not determined
Discharge Elevation	894.0
Outlet Type	Staged: Primary is Stoplog Weir to Horseshoe Lake, Overflow is Concrete Weir to Lake Elmo
DNR Ordinary High Water Level (OHW)	896.5
100-Year Flood Level	901.0
VBWD "Allowable Fill" (cubic yards/lineal foot of shoreline - See Section 4.5.)	1.2
VBWD Water Quality Priority Category	Medium

Reserve, it is open to the public. The primary uses of Eagle Point Lake are passive viewing and habitat for waterfowl and wildlife. There is a canoe launch in the park and the lake is used for canoeing.

## **5.12.2 Water Quality Management Plan**

Because there is public access to the lake, the VBWD classified and will manage Eagle Point Lake as a Medium Priority water body even though its water quality is generally poor and the lake is shallow. The VBWD classified Eagle Point Lake as a Category V (wetland) in its 1995 VBWD Water Management Plan. Water quality guidelines of primary importance to water bodies with poor water quality are related to aesthetic enjoyment and wildlife habitat and the need to maintain or improve desired uses. (See Table 5 in Appendix B-4.2 for a listing of habitat indicators.)

### **5.12.2.1 Water Quality Implementation Plan**

Specific water quality implementation tasks for Eagle Point Lake include the following:

1. The VBWD will monitor the water quality of Eagle Point Lake and perform the actions discussed in Section 4.2 – Water Quality for Medium Priority water bodies.
2. The VBWD will work with others to manage the macrophytes (lake plants) and reed canary grass in Eagle Point Lake.
  - A. Although expensive, management of curlyleaf pondweed is recommended to protect the lake's water quality and native plant community. New technologies might become available, but currently two management options are recommended for consideration.
    1. Option 1: Treatment of all areas of the lake with low concentrations of the aquatic herbicide endothall as the formulation Aquathol® K (around 2 parts per million) for up to four consecutive years is recommended (Skogerboe, 2002). The low concentrations will kill curlyleaf pondweed and not harm native plants. Treatment should occur annually in May to kill this plant before it produces turions (similar to seeds). Turions may lie dormant for up to four years, sprout more than one time, or sprout at other times of the year if conditions allow. If this plant is prevented from reproducing with annual Aquathol® K treatments, it should eventually be eliminated from the lake. The necessary permit must be obtained from the Minnesota Department of Natural Resources (DNR). Use of large quantities of herbicide within a regional park would be unacceptable to the Washington County Parks (Polehna, 2004, Personal Communication). Assuming a treatment cost of \$560 per acre, the estimated cost of treating the 120 acre lake is \$67,200 annually or a total cost of \$268,800 for four annual treatments.
    2. Option 2: Treatment of all areas of the lake with lime slurry (calcium hydroxide mixed with water to form a slurry). A concentration of approximately 300 grams

calcium hydroxide per square meter is expected to kill curlyleaf pondweed and reduce native vegetation density to a desirable moderate level (Rattei, 2004). Because regrowth of this plant from turions in the lake's sediments is expected, annual treatment for at least 4 consecutive years may be necessary to effectively manage the plant. If this plant is prevented from reproducing by annual lime slurry treatments, it should eventually be eliminated from the lake. The necessary permit must be obtained from the DNR. This treatment is less toxic to non-target plants than the herbicide treatments. Assuming a treatment cost of \$625 per acre, the estimated cost of treating the 120 acre lake is \$75,000 annually or a total cost of \$300,000 for four annual treatments.

- B. Several wetlands within the Lake Elmo Regional Park and the Eagle Point watershed have become infested with reed canary grass. Reed canary is a major threat to natural wetlands. This Eurasian species has been planted throughout the U.S. since the 1800s for forage and erosion control. It is still being planted and it out competes most native species. Invasion is associated with disturbances, such as ditch building, stream channeling sedimentation and intentional planting. Reed canary grass presents a major challenge in wetland mitigation efforts as it forms large, single-species stands, with which other species cannot compete.

Although difficult to eradicate, the VBWD will work with Washington County Parks (WCP) and others to eliminate it from priority areas. No single control method is universally applicable. In natural communities, mechanical control practices are recommended. In buffer areas and in severely disturbed sites, chemical and mechanical controls may be used. If herbicide is used, care will be taken to prevent contact with non-target species. Any control technique to reduce or eliminate reed canary grass will be followed by planting native species adapted to the site.

3. The VBWD will work with WCP to protect oak forest buffer areas from impacts caused by excessive water level bounce. The VBWD will also work with WCP to improve the upland buffer areas by control of non-native invasive species and restoring prairie to surrounding grasslands.
4. The VBWD will work with WCP to address vegetation management issues at the Eagle Point Lake Dam. The current herbaceous plant community will be treated with herbicides and replaced with a native mixture, and the willows will be cut and stump-treated. Silt fence will be installed at the water line on both sides of the dam prior to implementation, and be maintained until the new vegetation has been established. Details of the conceptual process for addressing this issue are discussed in Section 5.12.2.4.

### **5.12.2.2 Water Quality Issues**

In 1999, the VBWD completed the report, *Hydrologic and Phosphorus Budgets for Eagle Point Lake, Lake Elmo, Minnesota* (December 1999). Through the report, the VBWD found that water quality of

Eagle Point Lake will likely degrade as a result of development in the watershed. The total phosphorus loading to the lake is expected to increase significantly, which will cause the in-lake phosphorus concentrations to increase and the potential for internal loading to increase. The actual conditions observed would be dependent on the flushing ability of the lake. The current observed conditions are highly variable and the expected future conditions are not expected to change significantly.

### 5.12.2.3 Water Chemistry Data

<b>Water Quality Ranking</b>	Poor
<b>Sampling Dates</b>	1972, 1979, 1984, 1986, 1990, 1993, 1998, 2003, 2005
<b>Secchi Disc Transparency Ranges (meters &amp; feet)</b>	0.2 – 1.9 meters or 0.7 – 6.2 feet

As listed in the table to the left, water quality data were collected from Eagle Point Lake several seasons during the period 1972 through 2003. The VBWD collected all of the samples, except in 1993 and 2005. The 1993 samples were collected by a volunteer (Mike Polhena of WCP) through the Metropolitan Council's Citizen-Assisted (lake) Monitoring Program (CAMP),

which was partially funded by the VBWD. A single Secchi disc depth was measured by a volunteer (Bob Schumacher) in 2005, on August 30. The samples were typically analyzed for total phosphorus and chlorophyll a, and Secchi disc transparency depths (measurements of the depths seen into the water) were typically collected at the time the samples were collected. The importance of this data is described in Appendix A-4.2 (Water Quality Background Information). The Secchi disc transparency data are summarized in Figure 5.12-3. Detailed water quality data are shown in Appendix A-5.12.

The water quality of Eagle Point Lake varies, but in general, it is poor. The historic water quality has not usually met the VBWD guidelines for fair water quality water bodies. The lake's average summertime Secchi disc transparencies are usually less than 0.7 meters (2.3 feet), and the average summertime total phosphorus and chlorophyll a concentrations are typically quite high.

There is insufficient data to perform a statistical analysis of the Eagle Point Lake Secchi disc transparency depths. To perform a statistical analysis of the summer average Secchi transparency data, at least four samples need to be used to calculate a summer average and at least five seasons need to be sampled. While sampling has been done on Eagle Point Lake for more than five seasons, only in three seasons were at least four samples collected.

### 5.12.2.4 Habitat Assessment

In 2003, the VBWD conducted a wetland habitat assessment and management project on Eagle Point Lake and several wetlands within the Lake Elmo Regional Park. The assessment evaluated the current wetland and riparian plant communities, water quality and hydrology issues as they relate to wildlife habitat in Eagle Point Lake and other wetlands in Lake Elmo Park Reserve, and developed a work plan for habitat improvement projects. The VBWD completed a *Minnesota Routine Assessment Method for Evaluating Wetland Functions* (MnRAM) evaluation of the presence and abundance of hydrophytic and invasive vegetation to identify and appraise the plant community and habitat quality as part of this assessment. Eagle Point Lake was rated as predominantly low-moderate quality for

wildlife habitat and aesthetics/recreation, and has been utilized for flood control and stormwater management. The MnRAM management classification is Manage 1, meaning that impacts to this wetland should be avoided and preservation should be the top priority when prudent and feasible.

The surrounding upland areas are predominantly oak forest and grasslands, including some areas of restored prairie grasses. Restoration of a native plant ecosystem is recommended for those areas that are currently dominated by non-natives, including grasslands (now dominated by smooth brome), wetland areas dominated by reed canary grass, and non-native deciduous forest (buckthorn). When ecosystem restoration is implemented, it should address the complete basin, both wetland and surrounding upland, preserving the desirable elements.

The Eagle Point Lake dam has a number of vegetation management issues that should be addressed in the very near future – including exotic and weedy species, and concern for dam integrity due to trees. The plant community of the dam is composed of exotic species such as crown vetch, spotted knapweed, cool-season grasses and thistles. These plant species are being moved by park users and normal plant dispersal methods into the prairie community to the south. The willows that have colonized the dam have the potential to threaten the structural integrity of the dam over time.

The current herbaceous plant community should be treated with herbicides and replaced with a native mixture, and the willows should be cut and stump-treated. Silt fence should be installed at the water line on both sides of the dam prior to implementation, and be maintained until the new vegetation has been established. The following lays out a conceptual procedure for managing the area. After the site is replaced with native plants, the site should be inspected annually, herbaceous weeds should be controlled, and willows should be prevented from re-colonizing the site.

<b>Timing</b>	<b>Activity</b>
4 weeks before planting	Remove and treat stumps with glyphosate (Roundup or Rodeo as appropriate); 20%-25% active ingredient
2 weeks before seeding	Herbicide Application 1: Broadcast spray Herbicide all areas
5-7 days after herbicide application	Mow or prescribed burn: Mow all areas to height 4-6".
2 weeks after beginning of site preparation	Begin seeding if no unacceptable/weed species are present within 10 days of herbicide application, otherwise apply herbicide again

Notes and application rates per acre for broadcast herbicide:

1. If vegetation is greater than 6" in height, site must be mowed to 4-6" prior to spraying.
2. 5-quart 41% concentrate "Round UP" or generic equivalent (Use "Rodeo" or generic equivalent only within 20' of water bodies.)
3. ½ pint 2-4-D in first application only (Do not use 2-4-D within 20" of water bodies.)
4. Surfactant in all applications.

The seeding process includes the following steps:

1. All seeding should be performed between May 1 and July 15 or between September 1 and October 1.
2. Immediately prior to seeding operations, all seeding equipment should be calibrated and adjusted to sow seeds at the proper seeding rate. The drill should be calibrated at  $\frac{1}{2}$  the appropriate seeding rate and each area should be drilled twice at opposite directions to help insure an even distribution. Seed should be sown at approximately  $\frac{1}{8}$ " to  $\frac{1}{4}$ " deep and no deeper than  $\frac{1}{2}$ " deep.
3. Cover crop should be sown separately from forbs and grasses unless drill meters out forbs and grasses separately from cover crop.
4. If a broadcast method of seeding is used, the following requirements should be followed:
  - A. The broadcast method will use broadcast seeding equipped with an agitator that effectively prevents seed from bridging or plugging. Seed should be broadcast twice over each area to help insure even distribution. The seeded area should be hand-raked or dragged with an implement to the extent necessary to cover a majority of the seed with  $\frac{1}{8}$ " to  $\frac{1}{4}$ " of soil.
5. Within 12 hours, if conditions permit or as soon thereafter as practical, all seeded areas should be rolled at right angles to the line of run-off with an approval type roller or cultipacker to compact the seedbed to place the seed in contact with the soil.
6. Mulch - Straw mulch should be seed-free threshed straw mulch of oats or wheat, or prairie mulch.
  - A. Straw mulch should be applied immediately to all seeded areas.
  - B. Upon application of straw mulch, crimp immediately with an industry wide approved crimper, or with hand tools on slopes where machinery cannot be used.
  - C. Application rates:
    - a. Mulch should be installed at a rate of 46 pounds per 1000 square feet in areas seed with prairie seed.
    - b. No machinery should be run across seeded area after seeding operations have been completed.

### **5.12.2.5 Biological Data**

Several types of biological data have been compiled and evaluated for Eagle Point Lake, in addition to physical and chemical parameters. Macrophyte (large aquatic plant), phytoplankton (non-rooted floating plants – algae), zooplankton (microscopic aquatic animals), and fisheries data provide insight into the health of the aquatic ecosystem of each water body. Aquatic communities interact with each other and influence both short- and long-term variations in observed water quality.

#### **5.12.2.5.1 Fisheries**

Eagle Point Lake is not managed by the DNR for fishing. The DNR classified Eagle Point Lake as a waterfowl lake in 1951. Large numbers of carp and bullheads are the predominant fish species in the lake. Prior to the VBWD construction of the bypass pipe as part of Project 1007, the carp migrated from Lake Elmo and spawned in Eagle Point Lake. The DNR applied rotenone to Eagle Point Lake in November 1988 to kill the large carp population. This was done in conjunction with a temporary lowering of the lake. The DNR then stocked the lake with tiger muskie in an attempt to use the lake for rearing fish hatchery stock. The presence of rough fish in the lake (despite the rotenone treatment) caused the attempt to be unsuccessful. The DNR will not use the lake for rearing fish hatchery stock in the future. The DNR has not conducted any recent fish surveys of Eagle Point Lake, and the DNR will manage Eagle Point Lake as a wildlife wetland.

#### **5.12.2.5.2 Macrophytes (Large Aquatic Plants)**

Macrophyte surveys were conducted in 1998 and 2003 at Eagle Point Lake. The VBWD collected this macrophyte data to identify the conditions of plant growth throughout the lake. Macrophytes are the primary producers in the aquatic food chain, converting the basic chemical nutrients in water and soil into plant matter through photosynthesis, which becomes food for all other aquatic life. While macrophytes can negatively impact the recreational use of a water body, they are critical to the ecosystem as fish and wildlife habitat.

Appendix B-5.12 includes the June 17, 1998, August 18, 1998, June 12, 2003 and August 15, 2003 macrophyte survey information.

Macrophytes were found throughout the entire water body in 2003 and in most of the water body in 1998. The 13 to 15 individual species observed during each plant survey are common to Minnesota lakes.

The growth of the exotic (non-native) species, curlyleaf pondweed (*Potamogeton crispus*), in Eagle Point Lake is of concern. Although densities of this plant were light to moderate during 1998, density increases over time resulted in very heavy densities throughout the lake during 2003. Once a lake becomes infested with curlyleaf pondweed, this plant typically replaces native vegetation, thereby increasing its coverage and density. Curlyleaf pondweed begins growing in late August, grows throughout the winter at a slow rate, grows rapidly in the spring, and dies in early summer. Native plants that grow from seed in the spring are unable to grow in areas already occupied by curlyleaf



pondweed, and are displaced by this plant. Curlyleaf pondweed dieoff in early summer releases phosphorus to the lake, causing increased algal growth for the remainder of the summer.

Although expensive, management of curlyleaf pondweed is recommended to protect the lake's water quality and native plant community. This plant's turions (like seeds) can flow downstream and infest downstream lakes. Thus, management should begin in the most upstream lake and continue to the most downstream lake. Curlyleaf pondweed management in Eagle Point Lake should precede management in downstream Horseshoe Lake. One of two management options is recommended for consideration. The options are discussed in Section 5.12.2.1.

#### **5.12.2.5.3 *Phytoplankton (Non-Rooted, Floating Plants - Algae) and Zooplankton (Microscopic Aquatic Animals)***

The VBWD has collected phytoplankton and zooplankton samples from Eagle Point Lake in 1998 and 2003. Appendix C-5.12 and Appendix D-5.12 show the information from the 1998 samples (June 16, July 14, August 11, August 25, and September 9) and 2003 samples (June 9, July 19, August 5, August 18, and September 8).

Phytoplankton derive energy from sunlight and use nutrients dissolved in lake water. They provide food for several types of animals, including zooplankton, which in turn are eaten by fish. A phytoplankton population in balance with the lake's zooplankton population is ideal for fish production. An inadequate phytoplankton population reduces the lake's zooplankton population and adversely impacts the growth of the lake's fishery. However, excess phytoplankton, especially blue-green algae, can interfere with recreational use of a lake and is considered problematic.

Although diverse, Eagle Point Lake's phytoplankton community is dominated by blue-green algae during much of the summer. In 1998, blue-green algae comprised 87 to 97 percent of the algal community during July and August and 38 percent during September. In 2003, blue-green algae comprised 32 to 51 percent of the algal community during the July through September period. Dominance by blue-green algae is undesirable because they are often inedible to zooplankton due to their large size. Furthermore, blue-green algae generally float on the waters' surface where they are particularly objectionable to lake users. Blue-green algae are best managed by reducing the lake's phosphorus concentration. Increases in the lake's phosphorus concentration could likely cause increased growth of blue-green algae. However, blue-green algae limit their own growth by shading when their growth levels are very high. High growth levels may adversely impact the lake's plant community by limiting growth through shading. Judicious management of the lake's phosphorus concentration is recommended to reduce objectionable algal blooms and to prevent adverse impacts to the lake's plant community.

Although nutrient levels in Eagle Point Lake were similar during 1998 and 2003, reduced algal growth was observed during 2003. The maximum number of algae observed in 1998 and 2003 were 77,611 units per milliliter and 34,312 units per milliliter, respectively. The decrease in algal numbers corresponds to the reduction in average summer chlorophyll concentration observed during 2003. The average summer chlorophyll concentrations during 1998 and 2003 were 90 µg/L and 38 µg/L,

respectively. Nonetheless, the algal numbers and chlorophyll concentrations confirm that nuisance algal blooms occurred during both years.

The lake's zooplankton community is dominated by small-bodied forms. While these animals provide food for the lake's panfish community, they are unable to control the lake's phytoplankton community due to their small size. Because fish predation generally determines the numbers of large- and small-bodied zooplankters in a lake, increasing the numbers of large-bodied zooplankters is unrealistic. Because zooplankton grazing will not control the lake's phytoplankton community, phosphorus loading to the lake solely determines Eagle Point Lake's algae community. Hence, phosphorus management will provide the best management measures for the lake's phytoplankton community.

### **5.12.3 Water Quantity Management Plan**

1. The VBWD will continue to inspect and maintain the Eagle Point outlet structures. According to the VBWD DNR-approved operation, inspection and maintenance plan for the Eagle Point Lake dam and control structures, no operation of the dam or control structures is anticipated under normal conditions. Only the bypass control structure can be operated to alter water levels. The stop logs in the bypass control structure can be removed to temporarily raise and lower the water level of Eagle Point Lake. The water level may be raised to Elevation 896.0 and lowered to Elevation 893.0. At the time of construction of the Eagle Point Lake Dam and control structures, the DNR planned to use Eagle Point Lake for fish rearing. VBWD installed the stop logs to allow DNR staff to operate the bypass control structure to aid in fish rearing efforts. However, as discussed previously, the DNR no longer plans to use Eagle Point Lake for fish rearing purposes. According to VBWD's operation plan (See Appendix E-5.12), the DNR must notify VBWD five days in advance of any proposed water level alteration.
2. The VBWD will continue to conduct annual inspections of the Eagle Point Lake dam, in accordance with the operation, inspection and maintenance plan. Only minor maintenance, such as tree removal, has been required to date. VBWD also inspects the Eagle Point Lake control structures as part of the Project 1007 annual inspection. The VBWD inspects more frequently during times of extended high water levels. A vegetation management plan for the dam is discussed in Section 5.12.2.4.
3. The VBWD will continue to measure Eagle Point Lake water levels on a monthly basis and supply the information to the DNR for their records. The VBWD will include the water level measurements in its annual report, which is posted to the VBWD website.

#### **5.12.3.1 Water Levels, Drainage Patterns, and Outlet Information**

The VBWD currently monitors Eagle Point Lake water levels on a monthly basis. VBWD's lake monitoring began in 1969. Figure 5.12-4 shows the historical water levels, beginning in 1969.

The highest water level in the lake was reported on June 30, 1976, when a major storm caused the lake to rise to Elevation 901. In May of 1986, the water level reached Elevation 899.4. Since the shoreline of the lake is undeveloped, the lake has historically been used as a water storage area. In 1980, an earthen dam was placed across the outlet stream, which raised the lake as high as Elevation 898 on a temporary basis. As part of VBWD's Project 1007, a dam was constructed in 1986 across the outlet stream from Eagle Point Lake, just upstream from Lake Elmo. The temporary dam was subsequently removed. Two control structures and outlet pipes were installed as part of the Project 1007 dam construction. One structure contains a stop-log weir which controls the Eagle Point Lake water level at Elevation 894.0; above this elevation, water flows over the weir and into a 22-inch diameter pipe which carries water from Eagle Point Lake along the bottom of Lake Elmo (bypass pipe). This structure is shown in Figure 5.12-5. The second structure is an overflow structure with a 20-foot long weir at Elevation 896.5. When the water level in Eagle Point Lake rises above Elevation 896.5, water flows into the overflow structure and into a 42-inch diameter pipe, which discharges directly to Lake Elmo. Figure 5.12-6 shows this overflow structure. Ninety percent of the water from Eagle Point Lake is designed to be diverted through the bypass pipe. Since completion of Project 1007, water flowed into the overflow structure four times: (1) in July 1987, following a large rainfall event, (2) in August until October of 1993, following a period of above-average precipitation, (3) in the spring of 2001, following a spring melt and rainstorms, and (4) in early September 2002 after a period of above-average precipitation.

As a result of the Project 1007 construction, the 100-year flood elevation of Eagle Point Lake was raised 0.5 foot, to Elevation 901.0. In 2004, the VBWD re-analyzed the 100-year flood elevation of Eagle Point Lake as part of re-mapping the Raleigh Creek floodplain on Federal Emergency Management Agency (FEMA) floodplain maps. The 2004 FEMA study used existing land use conditions, instead of ultimate development conditions, and determined a 100-year flood level of Eagle Point Lake of Elevation 899.2. The VBWD will continue to manage Eagle Point Lake's 100-year flood level at Elevation 901.0.

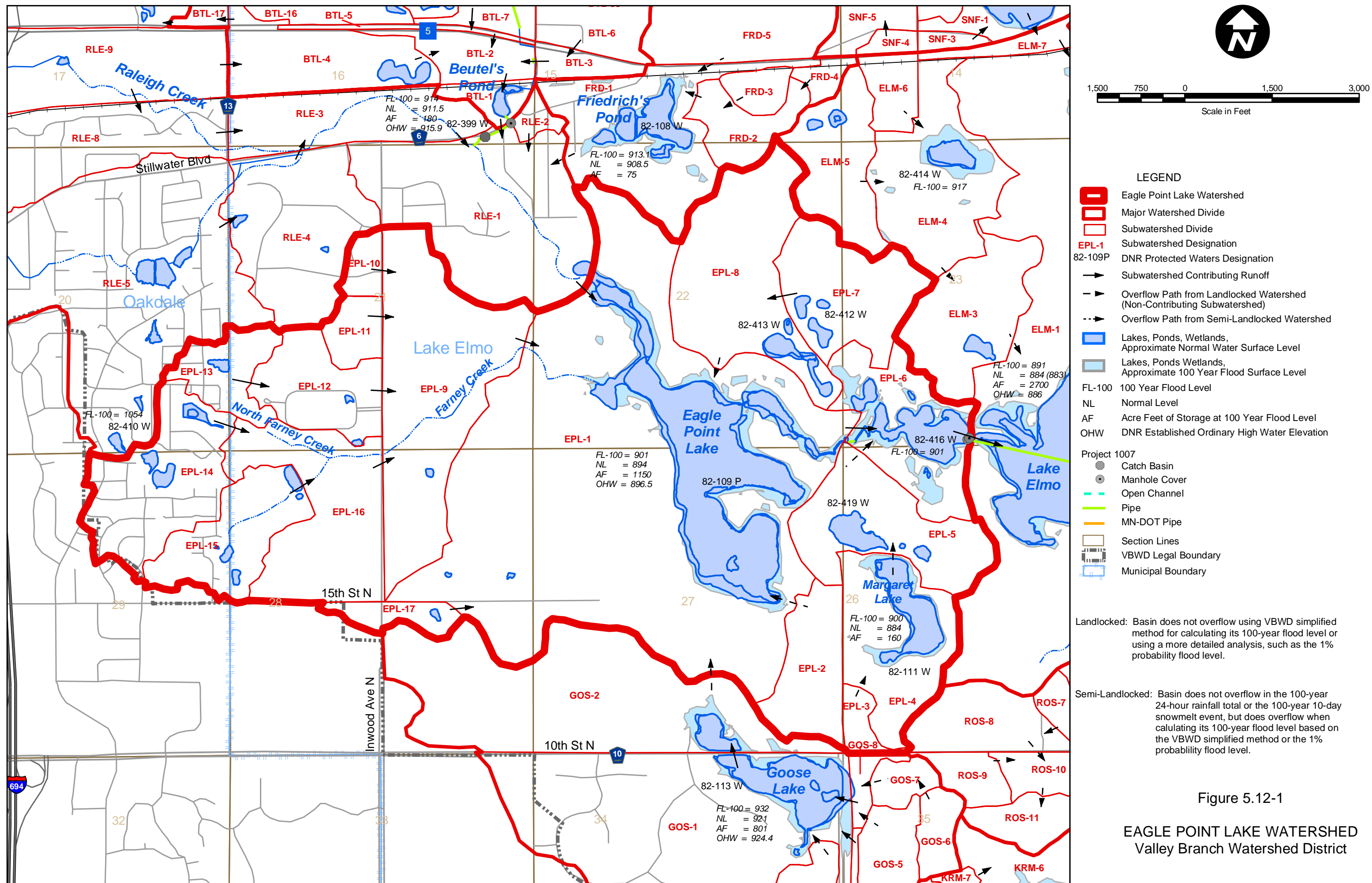
During low-water conditions, a ditch upstream of a culvert under Kelvin Avenue (the park entrance road) controls the water levels of Eagle Point Lake. The invert of the ditch is Elevation 893.0 and the invert of the Kelvin Avenue culvert is Elevation 892.0. If the DNR were to allow, the stop-log weir structure, located downstream of this culvert, could be lowered to a minimum level of Elevation 890.0.

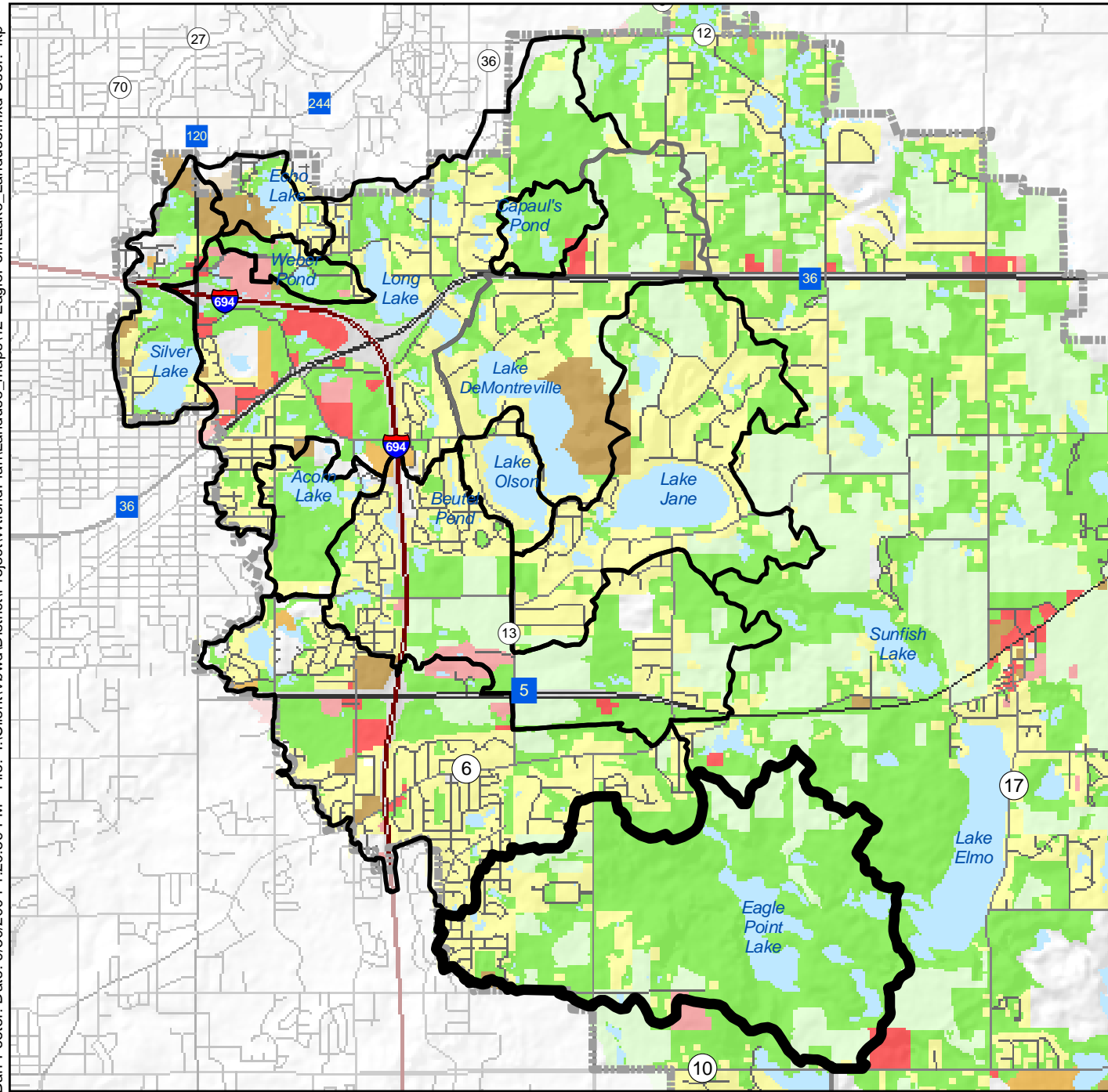
#### **5.12.4 Groundwater**

Water that seeps from Eagle Point Lake could contribute to the groundwater feeding Valley Creek. More information groundwater flow patterns will likely be determined through two groundwater studies, in which the VBWD is a partner. The studies are expected to be complete by July 2005. More details regarding the studies are discussed in Section 4.6.

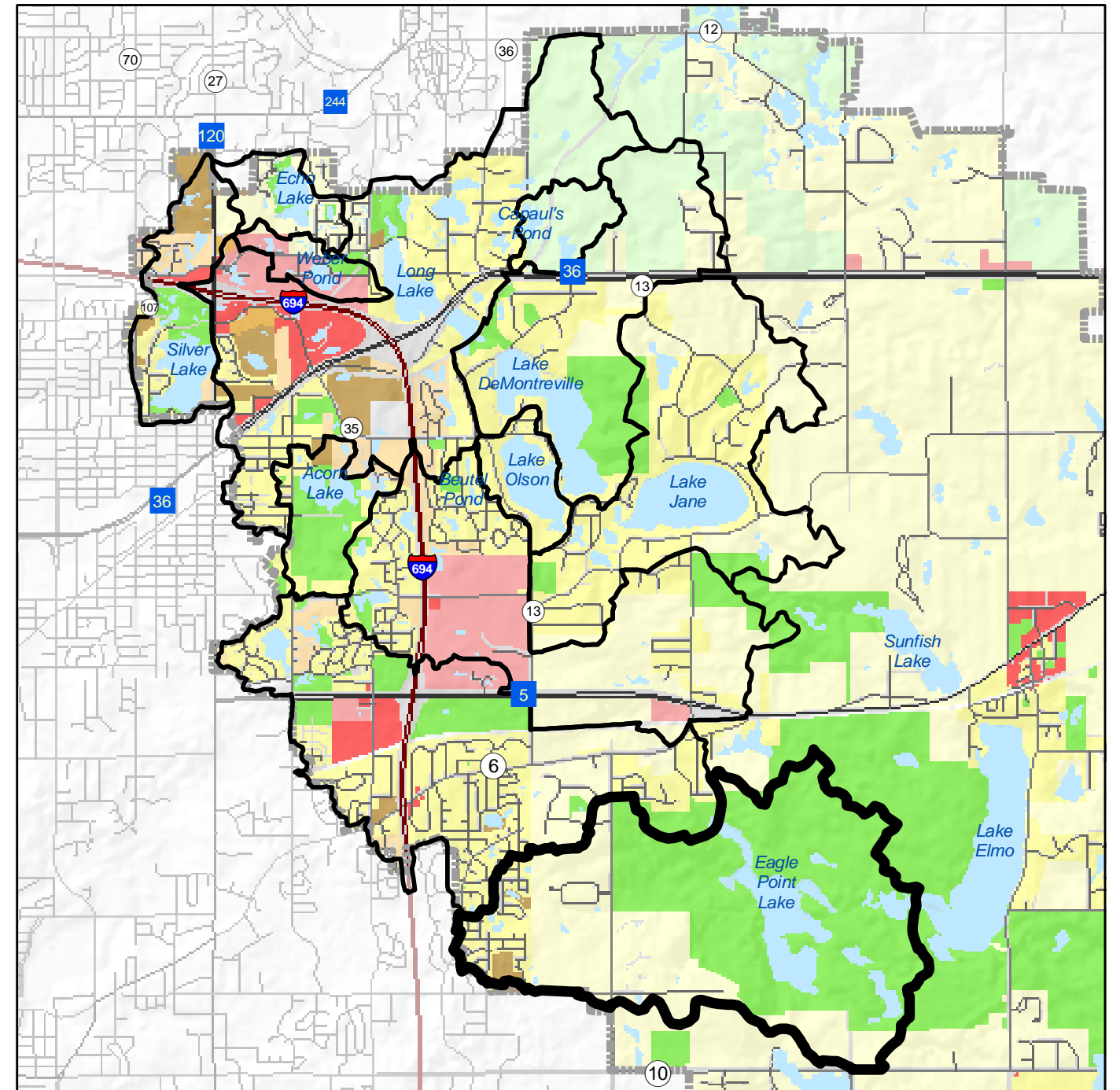
### 5.12.5 References

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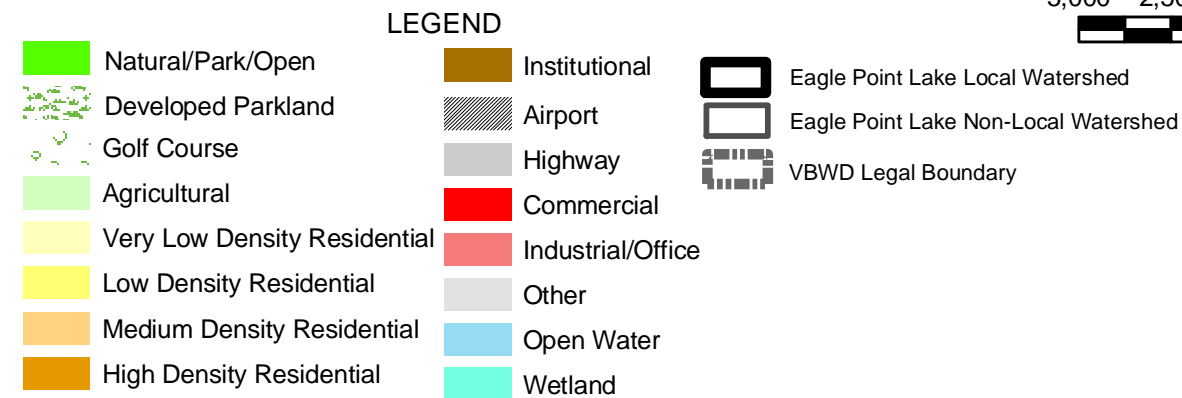




2000 LAND USE FROM METROPOLITAN COUNCIL



FUTURE (2020) LAND USE FROM METROPOLITAN COUNCIL



Scale in Feet

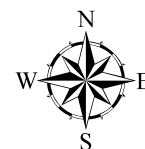


Figure 5.12-2

CURRENT AND FUTURE LAND USE  
EAGLE POINT LAKE LOCAL AND NON-LOCAL WATERSHEDS  
Valley Branch Watershed District

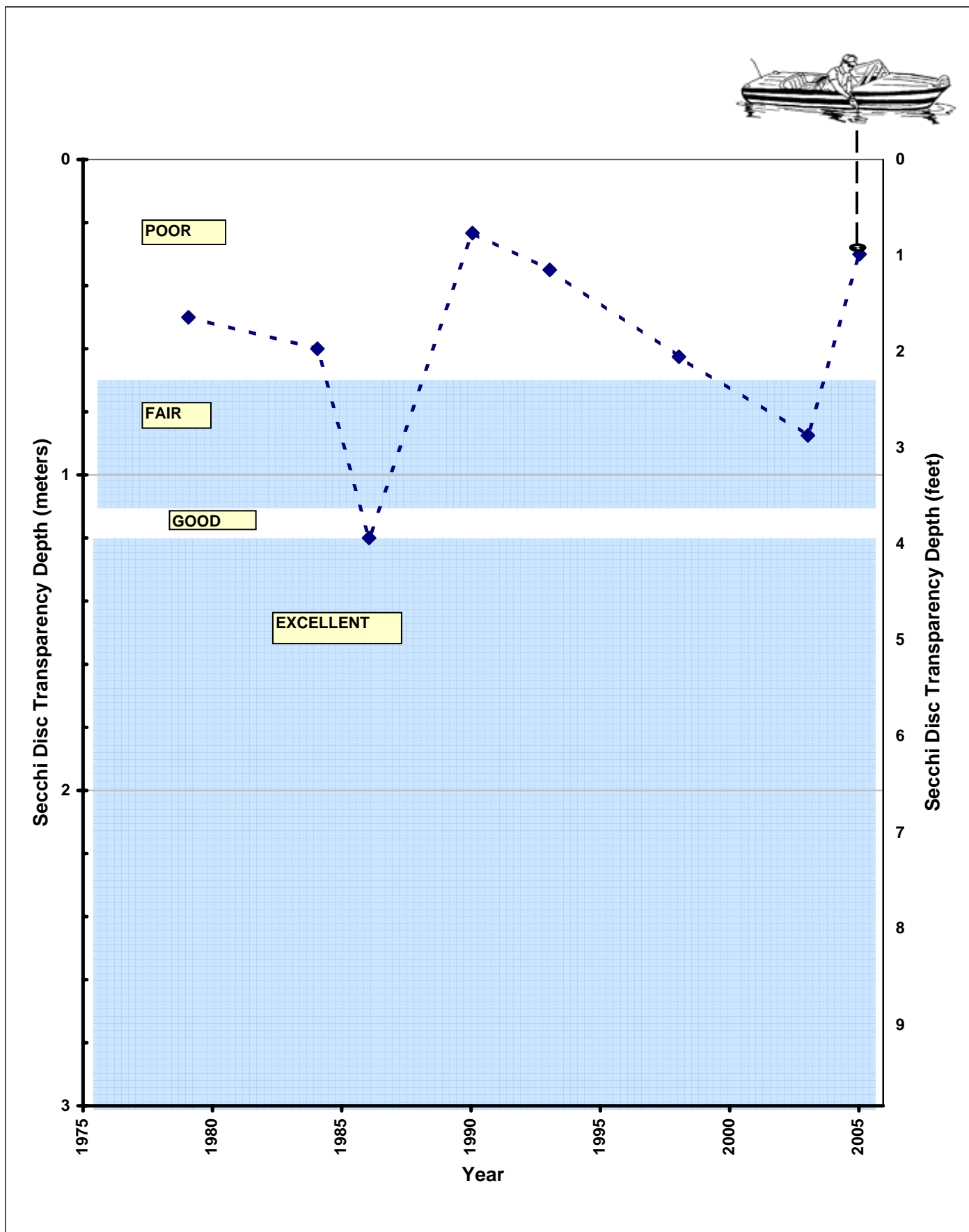


Figure 5.12-3

EAGLE POINT LAKE  
SUMMER AVERAGE WATER CLARITY  
Valley Branch Watershed District



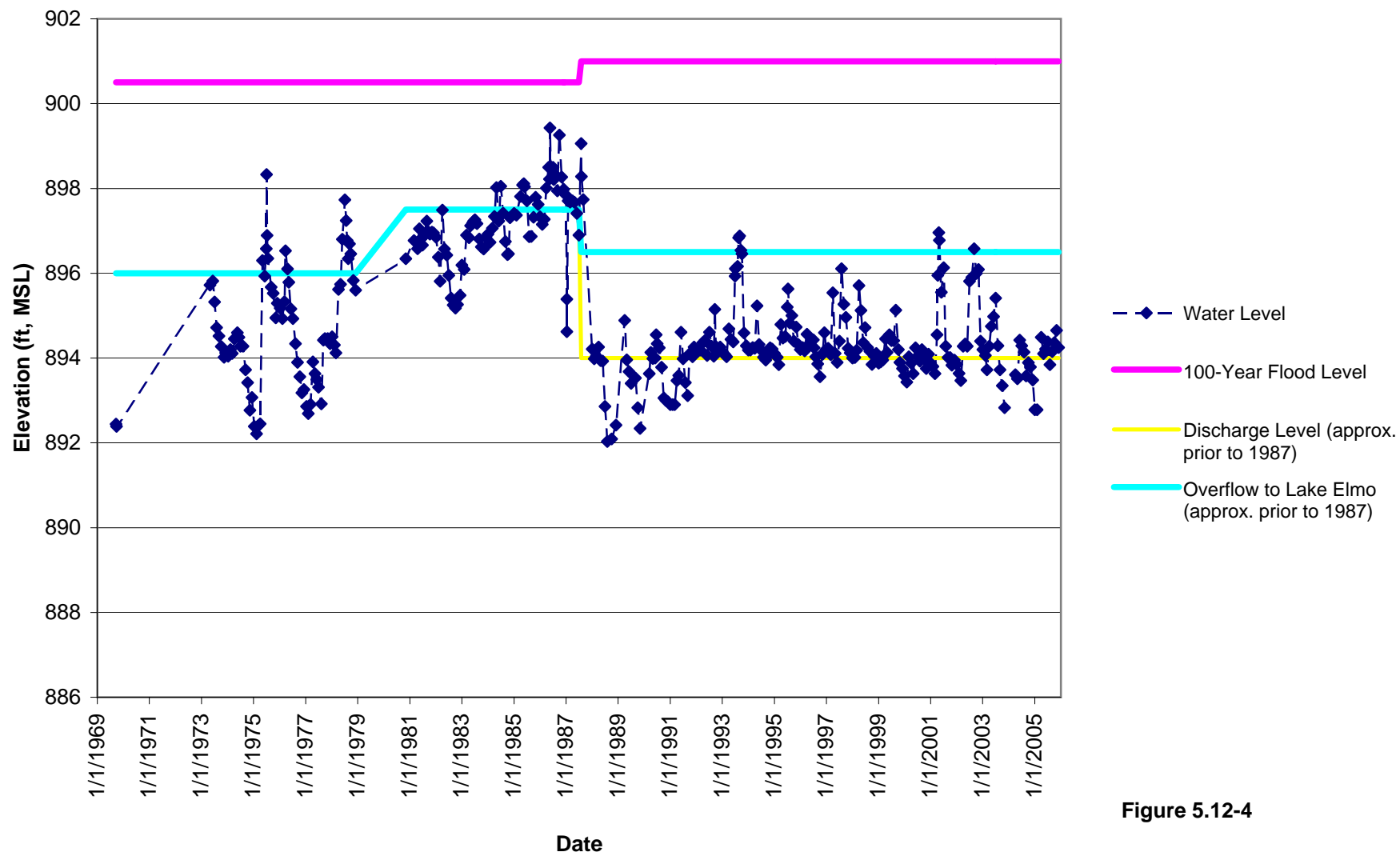


Figure 5.12-4

**EAGLE POINT LAKE WATER LEVELS**  
**Valley Branch Watershed District**



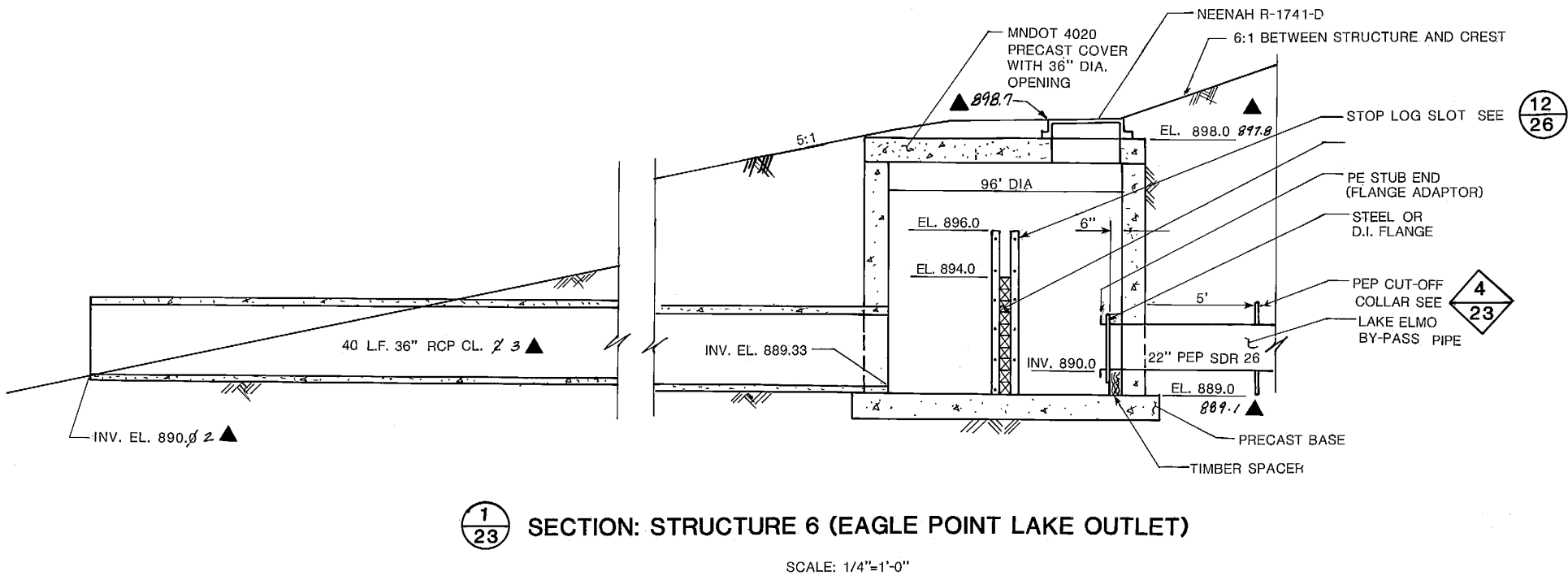


Figure 5.12-5  
EAGLE POINT LAKE OUTLET  
Valley Branch Watershed District

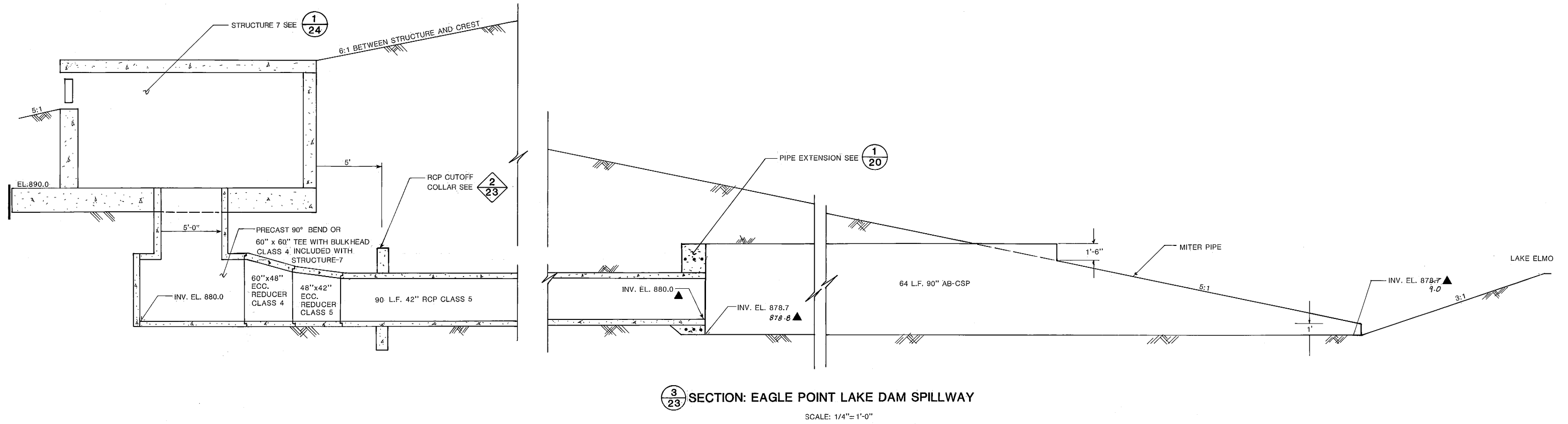
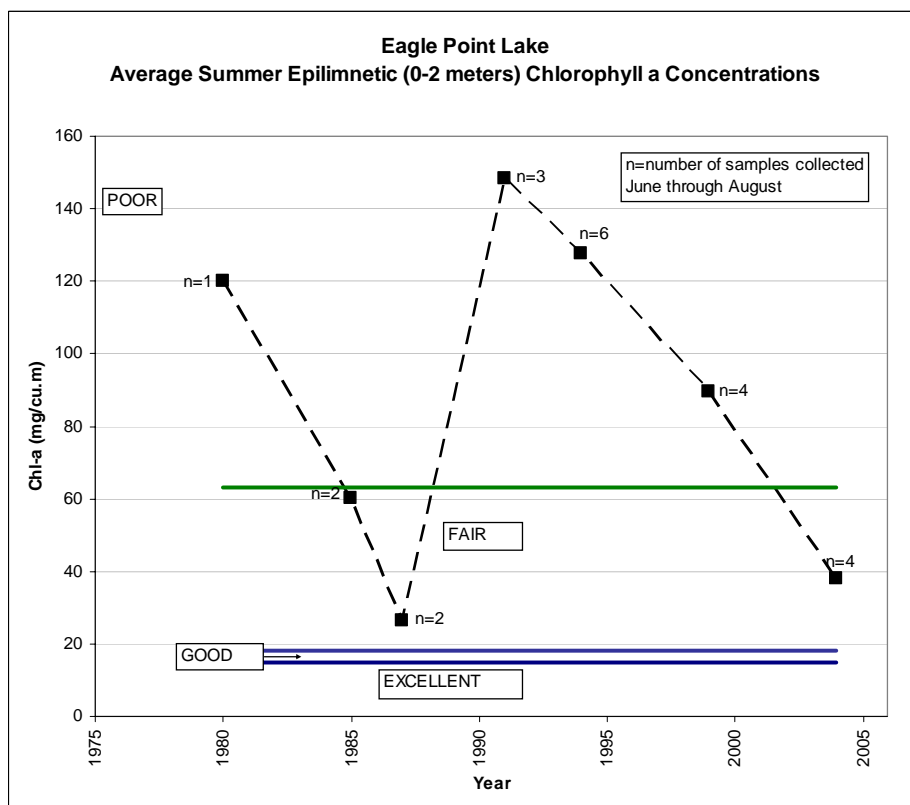
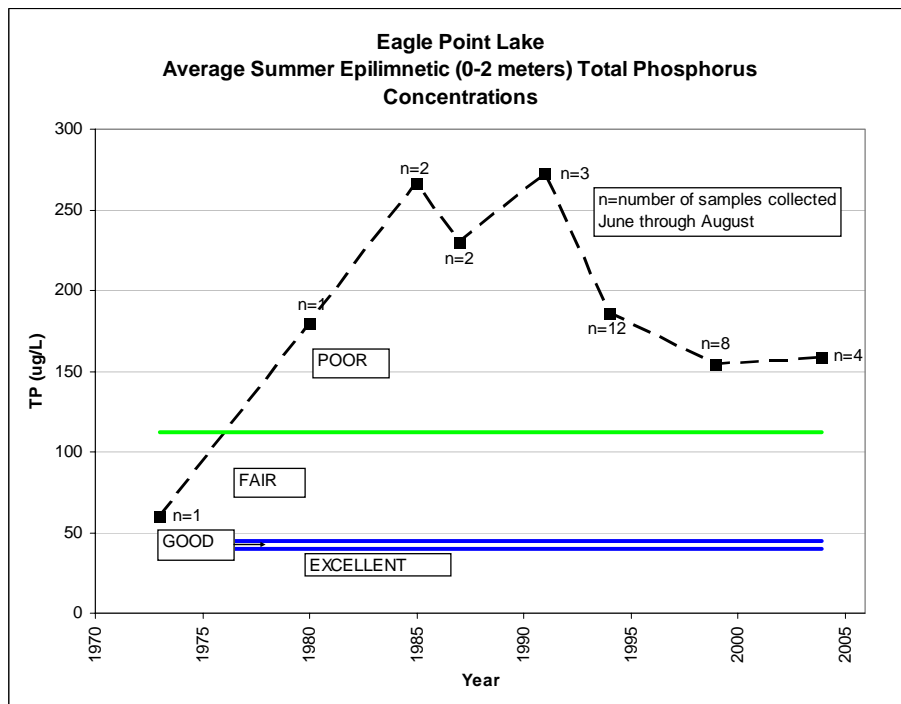


Figure 5.12-6

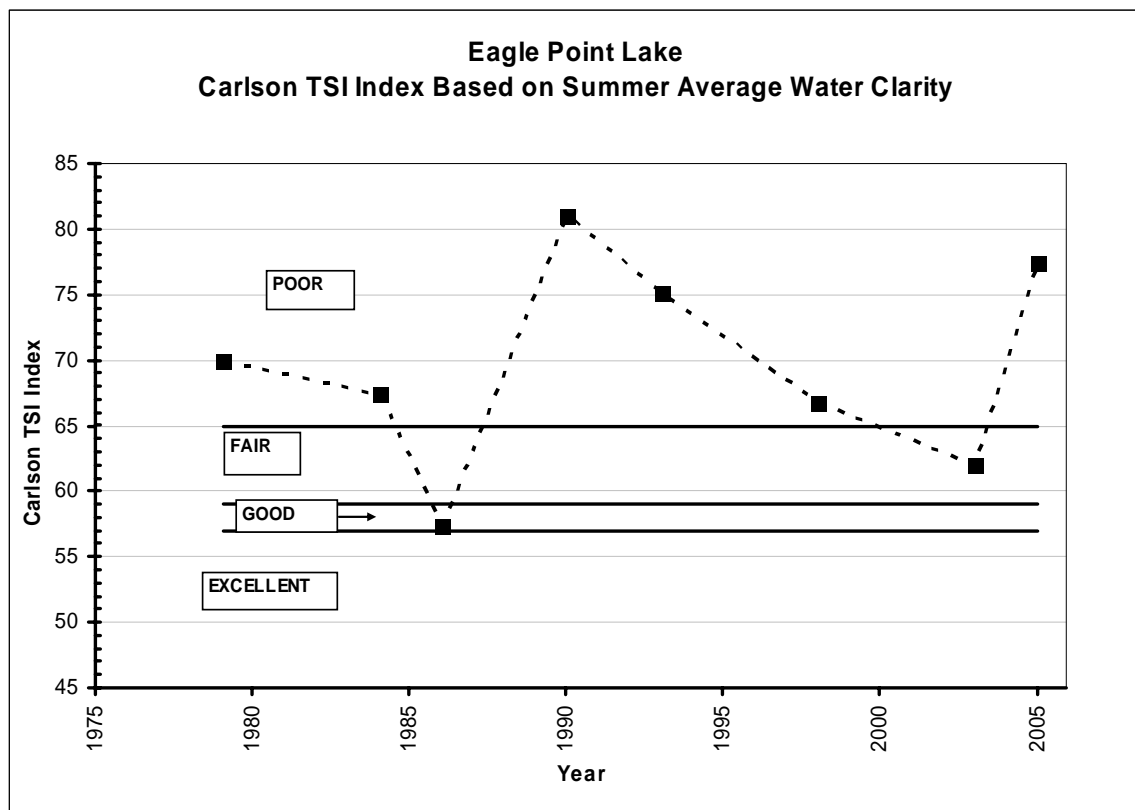
EAGLE POINT LAKE OVERFLOW  
Valley Branch Watershed District

## **Appendix A-5.12 Additional Water Quality Information**



**Appendix A-5.12**  
**Figure 1**

**EAGLE POINT LAKE**  
**HISTORIC WATER QUALITY DATA**  
**Valley Branch Watershed District**



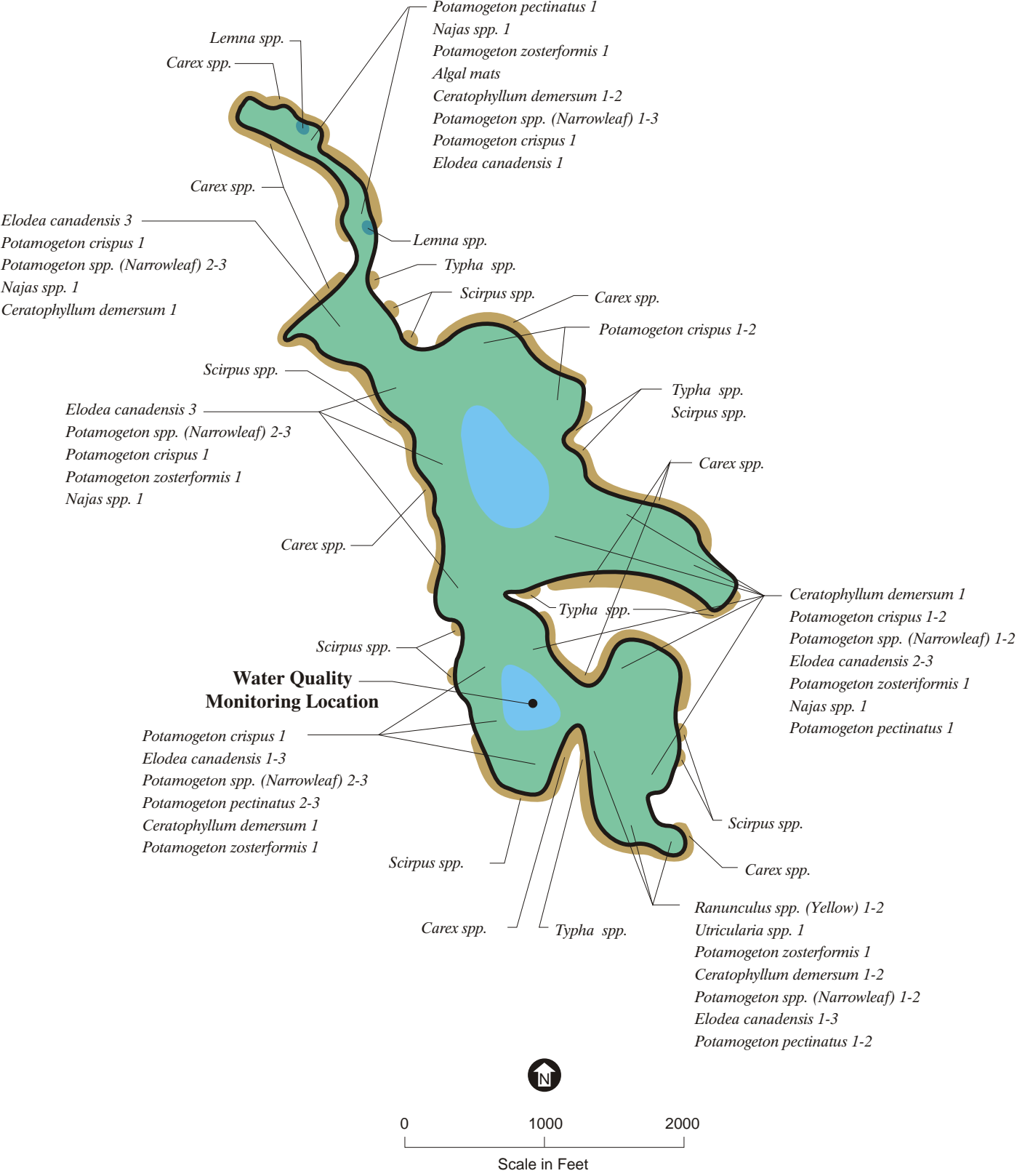
**Appendix A-5.12**  
**Figure 2**

**EAGLE POINT LAKE**  
**HISTORIC WATER QUALITY DATA**  
**Valley Branch Watershed District**

## **Appendix B-5.12 Additional Macrophyte Information**

- No macrophytes found in water > 5-6.5 feet
- Macrophyte growth is heaviest along shoreline
- Macrophyte densities estimated as follows: 1 = light; 2 = moderate; 3 = heavy

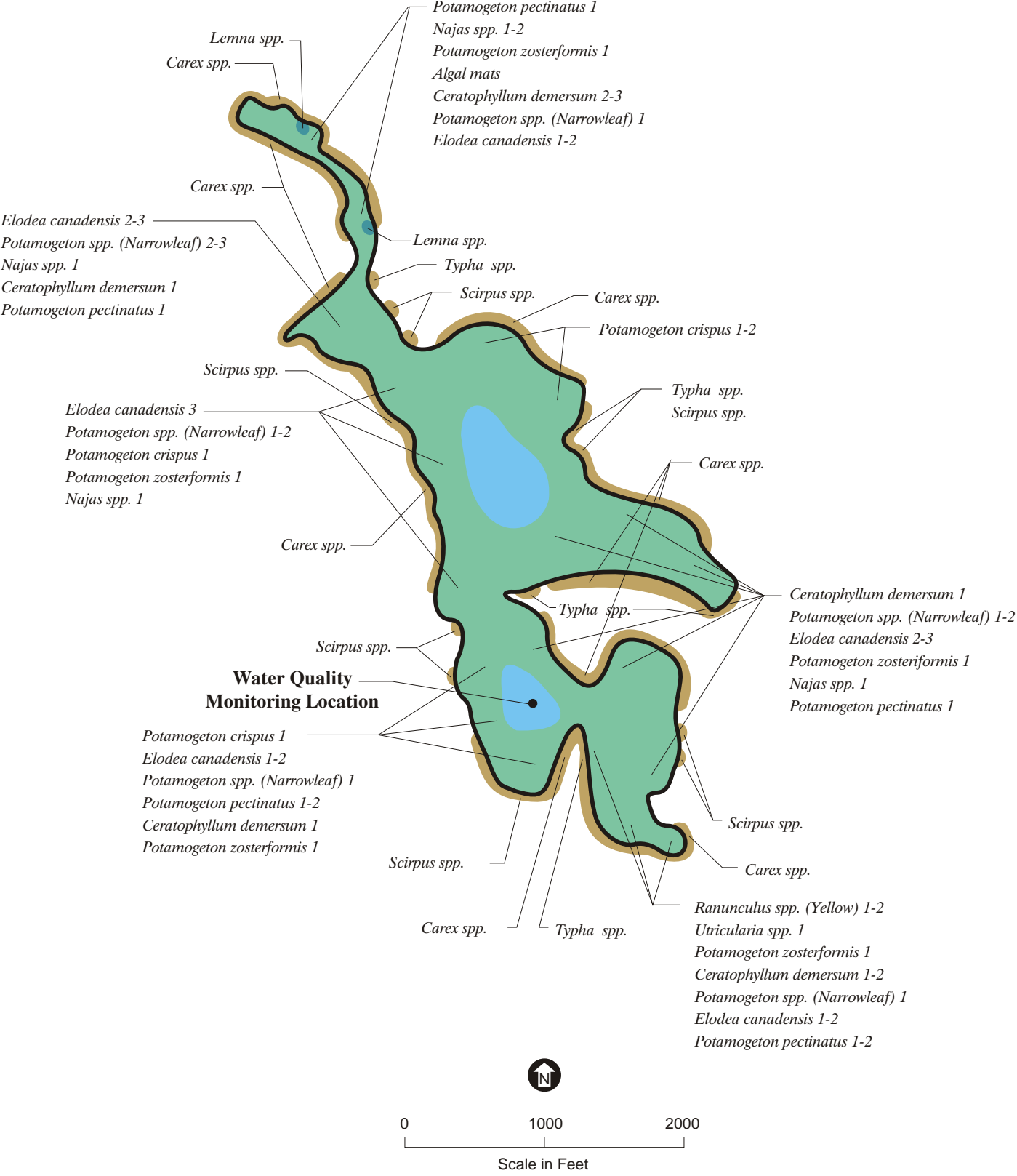
		Common Name	Scientific Name
Submerged Aquatic Plants:		Curlyleaf pondweed	<i>Potamogeton crispus</i>
		Flatstem pondweed	<i>Potamogeton zosteriformis</i>
		Sago Pondweed	<i>Potamogeton pectinatus</i>
		Leafy/Narrowleaf pondweed	<i>Potamogeton spp.</i>
		Coontail	<i>Ceratophyllum demersum</i>
		Bushy pondweed and naiad	<i>Najas spp.</i>
		Yellow water buttercup	<i>Ranunculus spp.</i>
		Bladderwort	<i>Utricularia spp.</i>
		Elodea	<i>Elodea canadensis</i>
Floating Leaf:		Duckweed	<i>Lemna spp.</i>
		(may include Lemna major, Lemna minor, Greater duckweed and Watermeal)	
Emergent:		Cattail	<i>Typha spp.</i>
		Sedge	<i>Carex spp.</i>
		Bulrush	<i>Scirpus spp.</i>
No Aquatic Vegetation Found:			



EAGLE POINT LAKE  
MACROPHYTE SURVEY  
JUNE 17, 1998

- No macrophytes found in water > 3-4 feet
- Macrophyte growth is heaviest along shoreline
- Macrophyte densities estimated as follows: 1 = light; 2 = moderate; 3 = heavy



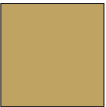

		Common Name	Scientific Name
Submerged Aquatic Plants:		Curlyleaf pondweed	<i>Potamogeton crispus</i>
		Flatstem pondweed	<i>Potamogeton zosteriformis</i>
		Sago Pondweed	<i>Potamogeton pectinatus</i>
		Leafy/Narrowleaf pondweed	<i>Potamogeton spp.</i>
		Coontail	<i>Ceratophyllum demersum</i>
		Bushy pondweed and naiad	<i>Najas spp.</i>
		Yellow water buttercup	<i>Ranunculus spp.</i>
		Bladderwort	<i>Utricularia spp.</i>
		Elodea	<i>Elodea canadensis</i>
Floating Leaf:		Duckweed	<i>Lemna spp.</i>
		(may include Lemna major, Lemna minor, Greater duckweed and Watermeal)	
Emergent:		Cattail	<i>Typha spp.</i>
		Sedge	<i>Carex spp.</i>
		Bulrush	<i>Scirpus spp.</i>
No Aquatic Vegetation Found:			

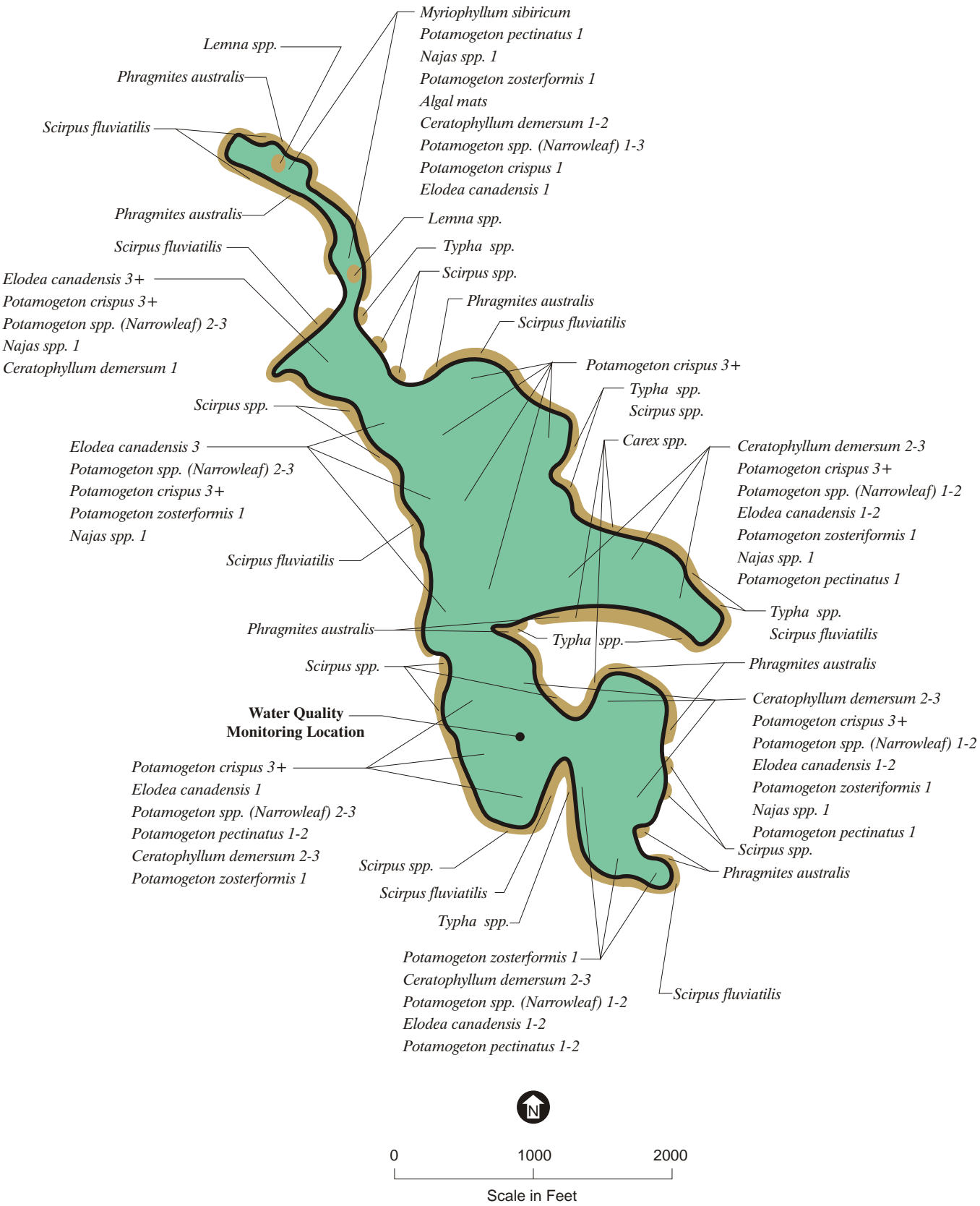


EAGLE POINT LAKE  
MACROPHYTE SURVEY  
AUGUST 18, 1998



- Macrophytes found in throughout entire water body
- Macrophyte growth is heaviest along shoreline
- Macrophyte densities estimated as follows: 1 = light; 2 = moderate; 3 = heavy

		Common Name	Scientific Name
Submerged Aquatic Plants:		Curlyleaf pondweed	<i>Potamogeton crispus</i>
		Flatstem pondweed	<i>Potamogeton zosteriformis</i>
		Sago Pondweed	<i>Potamogeton pectinatus</i>
		Leafy/Narrowleaf pondweed	<i>Potamogeton spp.</i>
		Coontail	<i>Ceratophyllum demersum</i>
		Bushy pondweed and naiad	<i>Najas spp.</i>
		Elodea	<i>Elodea canadensis</i>
Floating Leaf:		Northern milfoil	<i>Myriophyllum sibiricum</i>
		Water meal	<i>Wolffia columbiana</i>
		Lesser duckweed	<i>Lemna minor</i>
		Greater duckweed	<i>Spirodela polyrhiza</i>
Emergent:		Duckweed	<i>Lemna spp.</i>
		(May include Lemna major, Lemna minor, Greater duckweed and Watermeal)	
		Cattail	<i>Typha spp.</i>
		River bulrush	<i>Scirpus fluviatilis</i>
		Bulrush	<i>Scirpus spp.</i>
No Aquatic Vegetation Found:		Giant reed grass	<i>Phragmites australis</i>





## **Appendix C-5.12 Additional Phytoplankton Information**

# EAGLE POINT LAKE

## PHYTOPLANKTON SUMMARY

SAMPLE: 0-2 METERS

STANDARD INVERTED MICROSCOPE ANALYSIS METHOD

DIVISION	TAXON	06/16/98 units/mL	07/14/98 units/mL	08/11/98 units/mL	08/25/98 units/mL	09/09/98 units/mL
CHLOROPHYTA (GREEN ALGAE)	<i>Actinastrum Hantzschii</i>	0	137	0	92	42
	<i>Ankistrodesmus falcatus</i>	42	410	137	646	0
	<i>Ankistrodesmus Brauni</i>	0	0	0	92	0
	<i>Chlamydomonas globosa</i>	5,878	1,093	1,093	1,200	1,517
	<i>Coelastrum microporum</i>	0	46	273	92	632
	<i>Dictyosphaerium Ehrenbergianum</i>	0	46	0	0	0
	<i>Elakatothrix gelatinosa</i>	0	91	0	92	0
	<i>Golenkinia radiata</i>	0	0	0	0	42
	<i>Lagerheimia sp.</i>	0	0	0	0	169
	<i>Oocystis parva</i>	105	319	0	185	169
	<i>Pediastrum Boryanum</i>	0	0	0	92	84
	<i>Pediastrum duplex</i>	0	0	0	0	126
	<i>Pediastrum simplex</i>	0	0	0	0	42
	<i>Scenedesmus dimorphus</i>	0	91	0	0	0
	<i>Scenedesmus quadricauda</i>	21	319	0	277	253
	<i>Scenedesmus sp.</i>	21	0	0	0	0
	<i>Schroederia Judayi</i>	337	91	0	0	0
	<i>Selenastrum minutum</i>	885	46	0	92	42
	<i>Sphaerocystis Schroeteri (Colony)</i>	0	0	0	0	211
	<i>Selenastrum minutum</i>	0	0	0	185	126
	<i>Staurostrum sp.</i>	21	0	137	185	211
	<i>Tetraedron muticum</i>	0	0	0	0	42
	<i>Tetraedron sp.</i>	0	0	0	92	42
	<i>Treubaria setigerum</i>	0	0	0	0	42
CHLOROPHYTA TOTAL		7,311	2,687	1,640	3,322	3,793
CHRYSTOPHYTA ( GOLDEN BROWN ALGAE)	CHRYSTOPHYTA TOTAL	0	0	0	0	0
CYANOPHYTA (BLUE-GREEN ALGAE)	<i>Anabaena affinis</i>	0	1,731	2,186	0	126
	<i>Anabaena flos-aquae</i>	21	3,826	1,230	0	84
	<i>Anabaena spiroides v. crassa</i>	42	137	0	0	0
	<i>Anabaenopsis raciborski</i>	21	2,505	48,644	27,406	1,601
	<i>Aphanizomenon flos-aquae</i>	990	9,701	11,614	2,584	590
	<i>Aphanocapsa delicatissima</i>	0	46	0	0	0
	<i>Coelosphaerium Naegelianum</i>	0	0	137	554	0
	<i>Merismopedia tenuissima</i>	21	319	0	0	0
	<i>Merismopedia sp.</i>	0	0	137	0	0
	<i>Microcystis aeruginosa</i>	253	4,099	1,913	1,476	2,908
	<i>Microcystis incerta</i>	0	547	410	92	126
	<i>Oscillatoria Agardhii</i>	0	0	9,155	13,565	126
	<i>Oscillatoria limnetica</i>	21	501	137	277	295
	<i>Rhabdoderma lineare</i>	42	0	0	0	0
CYANOPHYTA TOTAL		1,412	23,411	75,562	45,954	5,857
BACILLARIOPHYTA (DIATOMS)	<i>Cocconeis placentula</i>	21	0	0	0	0
	<i>Fragilaria crotonensis</i>	0	0	0	0	42
	<i>Gomphonema sp.</i>	21	0	0	0	0
	<i>Melosira granulata</i>	274	364	137	277	2,402
	<i>Melosira granulata v. angustissima</i>	0	0	0	185	1,096
	<i>Navicula sp.</i>	0	46	0	0	42
	<i>Stephanodiscus Hantzschii</i>	84	182	0	92	506
BACILLARIOPHYTA TOTAL		400	592	137	554	4,088
CRYPTOPHYTA (CRYPTOMONADS)	<i>Cryptomonas erosa</i>	1,096	137	273	2,768	1,686
	CRYPTOPHYTA TOTAL	1,096	137	273	2,768	1,686
EUGLENOPHYTA (EUGLENOIDS)	EUGLENOPHYTA TOTAL	0	0	0	0	0
PYRRHOPHYTA (DINOFLAGELLATES)	<i>Ceratium hirundinella</i>	21	0	0	0	42
	PYRRHOPHYTA TOTAL	21	0	0	0	42
TOTALS		10,240	26,827	77,611	52,597	15,465

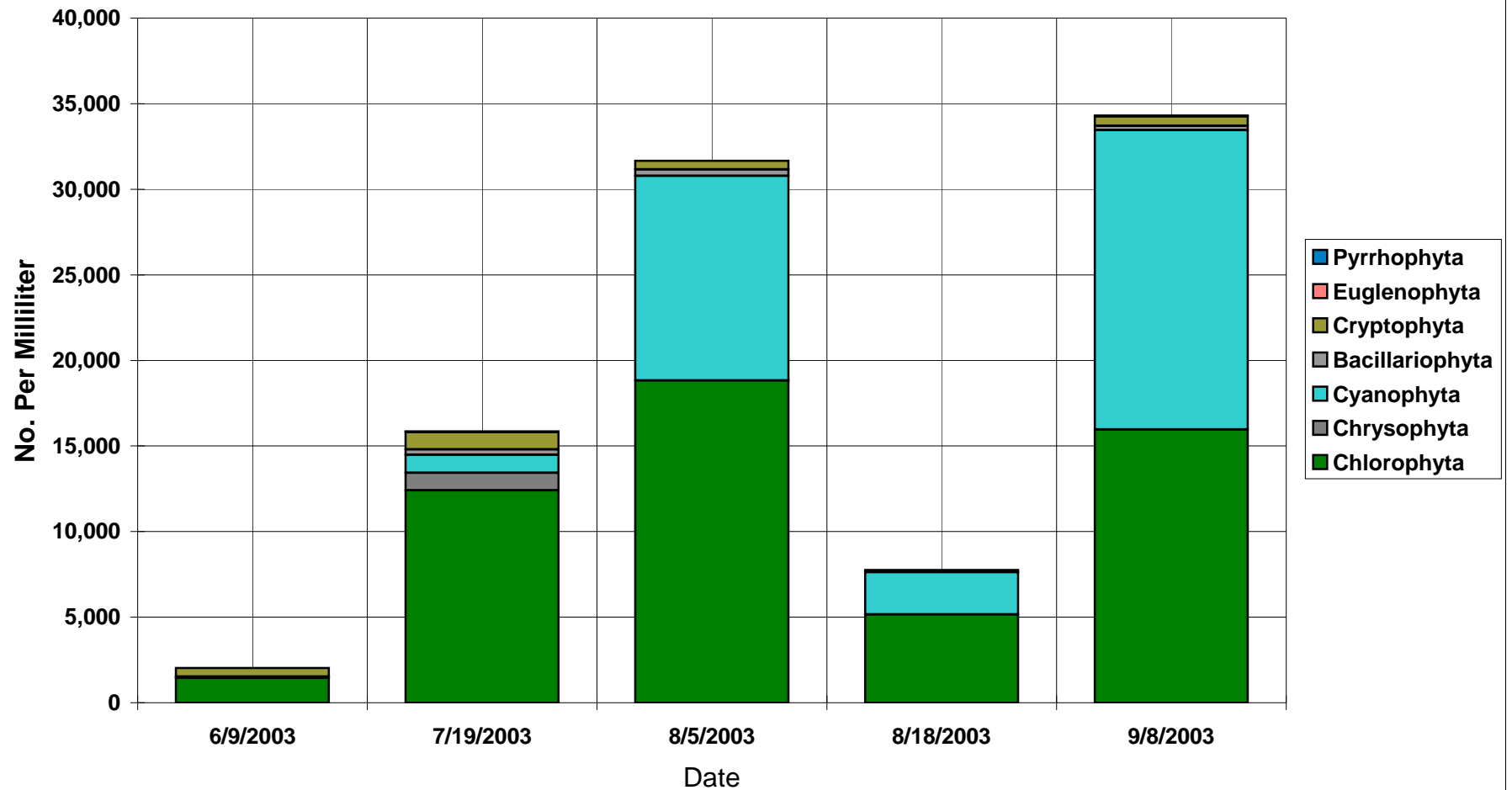
# EAGLE POINT LAKE

SAMPLE: 0-2 METERS (INT. TUBE)

STANDARD PHYTOPLANKTON CLUMP COUNT

DIVISION	TAXON	6/9/2003 units/mL	7/19/2003 units/mL	8/5/2003 units/mL	8/18/2003 units/mL	9/8/2003 units/mL
CHLOROPHYTA (GREEN ALGAE)	<i>Actinastrum Hantzschii</i>	0	0	0	59	182
	<i>Ankistrodesmus falcatus</i>	0	78	62	0	61
	<i>Ankistrodesmus Brauni</i>	0	78	187	0	182
	<i>Botryococcus sudeticus</i>	0	0	0	0	61
	<i>Chlamydomonas globosa</i>	1,288	6,520	11,717	2,420	8,016
	<i>Closterium sp.</i>	0	0	0	39	182
	<i>Coelastrum microporum</i>	0	0	810	625	486
	<i>Cosmarium sp.</i>	0	78	125	59	0
	<i>Dictyosphaerium sp.</i>	0	0	0	0	61
	<i>Elakatorhrix gelatinosa</i>	78	0	0	0	0
	<i>Elakotothrix sp.</i>	0	39	0	0	0
	<i>Golenkenia sp.</i>	0	39	0	0	0
	<i>Kirchneriella sp.</i>	0	0	0	0	61
	<i>Lagerheimia sp.</i>	0	78	0	20	911
	<i>Oocystis parva</i>	0	4,099	3,303	1,425	2,126
	<i>Pediastrum Boryanum</i>	0	0	125	59	121
	<i>Pediastrum duplex v. clathratum</i>	0	0	62	0	0
	<i>Quadrigula sp.</i>	0	0	125	0	0
	<i>Rhizoclonium hieroglyphicum</i>	0	0	187	0	0
	<i>Schroederia Judayi</i>	0	468	187	0	1,154
	<i>Scenedesmus dimorphus</i>	0	0	62	0	0
	<i>Scenedesmus quadricauda</i>	39	234	623	371	1,215
	<i>Scenedesmus sp.</i>	0	39	125	0	243
	<i>Selenastrum minutum</i>	39	0	312	0	0
	<i>Selenastrum sp..</i>	0	0	0	20	61
	<i>Sphaerocystis Schroeteri (Colony)</i>	0	312	499	0	547
	<i>Staurostrum sp.</i>	0	39	0	20	0
	<i>Tetraedron muticum</i>	0	156	249	20	0
	<i>Tetraedron sp.</i>	0	78	62	20	304
	<i>Treubaria setigerum</i>	0	78	0	0	0
<b>CHLOROPHYTA TOTAL</b>		<b>1,444</b>	<b>12,415</b>	<b>18,823</b>	<b>5,153</b>	<b>15,972</b>
CHRYSTOPHYTA (YELLOW-BROWN ALGAE)	<i>Dinobryon sociale</i>	0	1,015	0	0	0
	<b>CHRYSTOPHYTA TOTAL</b>	<b>0</b>	<b>1,015</b>	<b>0</b>	<b>0</b>	<b>0</b>
CYANOPHYTA (BLUE-GREEN ALGAE)	<i>Anabaena affinis</i>	0	39	312	0	1,154
	<i>Anabaena flos-aquae</i>	0	0	62	0	0
	<i>Anabaena spiroides v. crassa</i>	0	0	436	0	0
	<i>Anabaena sp.</i>	0	0	0	0	61
	<i>Anabaenopsis raciborski</i>	0	0	3,553	234	11,417
	<i>Aphanizomenon flos-aquae</i>	0	0	0	0	2,429
	<i>Aphanocapsa delicatissima</i>	0	78	125	0	0
	<i>Coelosphaerium Naegelianum</i>	0	0	0	0	304
	<i>Merismopedia tenuissima</i>	0	0	187	20	0
	<i>Merismopedia sp.</i>	0	0	0	78	121
	<i>Microcystis aeruginosa</i>	0	859	6,046	2,050	1,761
	<i>Microcystis incerta</i>	0	39	1,184	59	182
	<i>Oscillatoria limnetica</i>	0	0	62	39	61
	<i>Oscillatoria Agardhii</i>	0	39	0	0	0
	<b>CYANOPHYTA TOTAL</b>	<b>0</b>	<b>1,054</b>	<b>11,967</b>	<b>2,479</b>	<b>17,490</b>
BACILLARIOPHYTA (DIATOMS)	<i>Cymbella sp.</i>	0	39	0	0	0
	<i>Fragilaria capucina</i>	0	39	0	0	0
	<i>Fragilaria crotonensis</i>	39	39	0	0	0
	<i>Melosira granulata</i>	0	0	125	0	0
	<i>Melosira granulata v. angustissima fo spiralis</i>	0	0	187	0	61
	<i>Navicula sp.</i>	0	0	0	0	61
	<i>Stephanodiscus Hantzschii</i>	0	156	0	0	0
	<i>Stephanodiscus sp.</i>	0	0	0	0	61
	<i>Synedra ulna</i>	39	39	62	0	61
<b>BACILLARIOPHYTA TOTAL</b>		<b>78</b>	<b>312</b>	<b>374</b>	<b>0</b>	<b>243</b>
CRYPTOPHYTA (CRYPTOMONADS)	<i>Cryptomonas erosa</i>	508	1,015	499	117	547
	<b>CRYPTOPHYTA TOTAL</b>	<b>508</b>	<b>1,015</b>	<b>499</b>	<b>117</b>	<b>547</b>
EUGLENOPHYTA (EUGLENOIDS)	<i>Euglena sp.</i>	0	39	0	0	0
	<i>Phacus sp.</i>	0	78	0	0	0
<b>EUGLENOPHYTA TOTAL</b>		<b>0</b>	<b>39</b>	<b>0</b>	<b>0</b>	<b>0</b>
PYRRHOPHYTA (DINOFLAGELLATES)	<i>Peridinium cinctum</i>	0	0	0	0	61
	<b>PYRRHOPHYTA TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>61</b>
<b>TOTALS</b>		<b>2,030</b>	<b>15,850</b>	<b>31,662</b>	<b>7,749</b>	<b>34,312</b>

# 2003 Eagle Point Lake Phytoplankton Data Summary



## **Appendix D-5.12 Additional Zooplankton Information**

# ZOOPLANKTON IDENTIFICATION SUMMARY (#/sq. m)

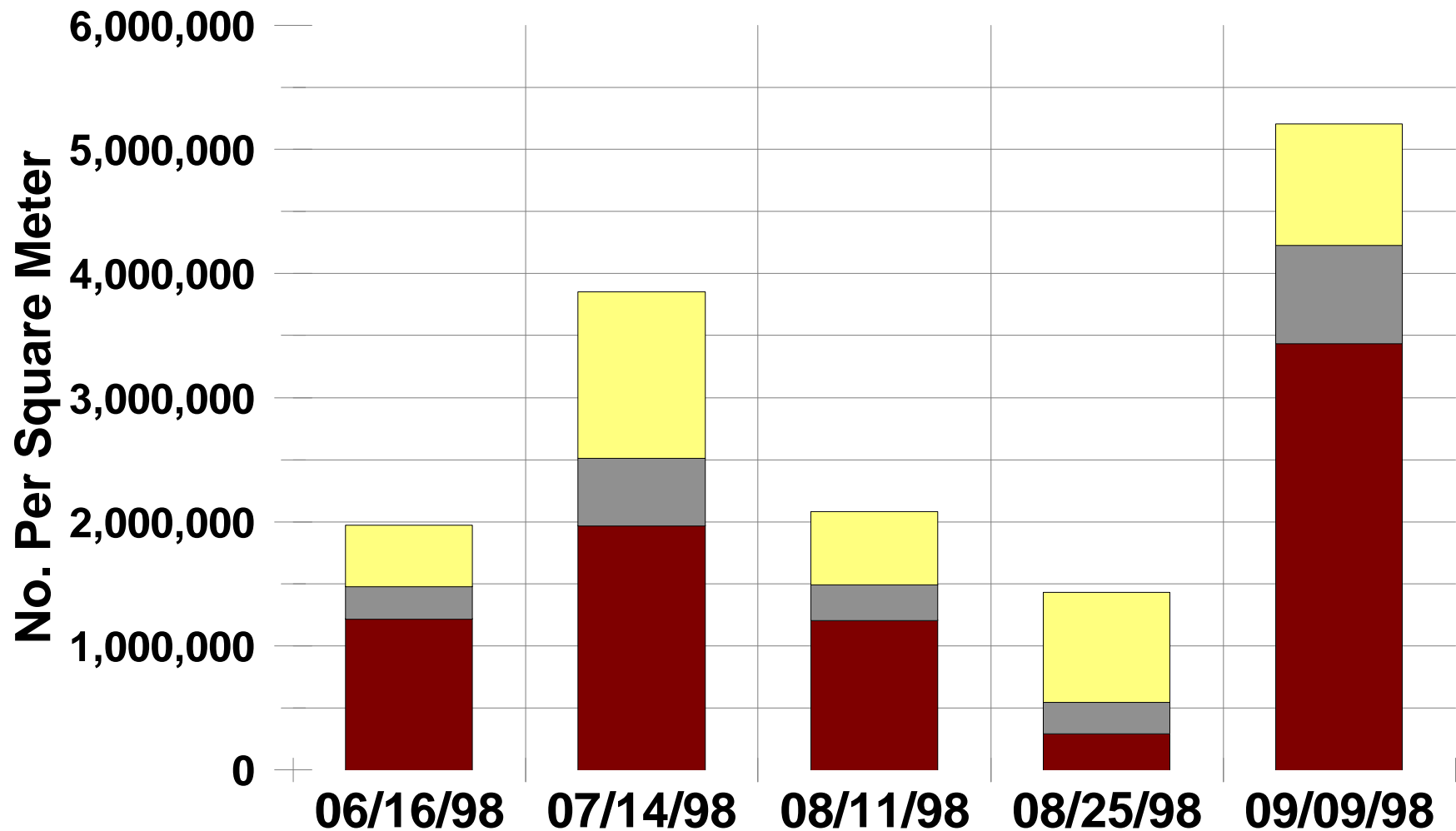
VALLEY BRANCH WATERSHED DISTRICT  
23/83 207 V98 030

LAKE: **Eagle Point**

		SAMPLE DATE				
DIVISION	TAXON	06/16/98	07/14/98	08/11/98	08/25/98	09/09/98
CLADOCERA	<i>Bosmina sp.</i>	1,165,842	1,940,633	1,167,840	270,251	3,342,811
	<i>Chydorus sp.</i>	36,035	4,386	8,966	6,871	59,693
	<i>Diaphanosoma sp.</i>	0	19,735	29,140	13,742	14,326
	<i>Ceriodaphnia sp.</i>	21,197	6,578	4,483	0	26,265
	Total Cladocera	1,223,074	1,971,332	1,210,429	290,864	3,443,095
	COPEPODA	Nauplii	175,936	456,104	248,810	116,803
<i>Cyclops sp.</i>		2,120	35,085	20,174	11,451	162,365
<i>Mesocyclops sp.</i>		14,838	52,627	20,174	36,644	33,428
<i>Diaptomus sp.</i>		69,951	0	0	93,901	4,775
Total Copepoda		262,844	543,816	289,158	258,800	792,724
ROTIFERA		<i>Keratella cochlearis</i>	154,739	1,078,860	412,442	421,409
	<i>Asplanchna sp.</i>	40,275	2,193	2,242	2,290	2,388
	<i>Kellicottia sp.</i>	25,437	0	0	2,290	2,388
	<i>Polyarthra vulgaris</i>	161,098	52,627	49,314	11,451	152,814
	<i>Conochilus sp.</i>	80,549	28,506	13,449	70,998	21,489
	<i>Trichocerca sp.</i>	12,718	28,506	17,932	4,581	11,939
	<i>Filinia sp.</i>	0	43,856	65,005	98,481	9,551
	<i>Brachionus sp.</i>	12,718	105,255	20,174	272,541	0
	<i>Lecane sp.</i>	0	0	0	0	2,388
	<i>Playtias sp.</i>	0	0	0	0	2,388
	<i>Monostyla sp.</i>	0	0	2,242	0	0
	Total Rotifera	487,534	1,339,804	582,799	884,042	974,191
	TOTAL ZOOPLANKTON		1,973,452	3,854,953	2,082,386	1,433,705



# 1998 Eagle Point Lake Zooplankton Data Summary



**Total Cladocera**



**Total Copepoda**



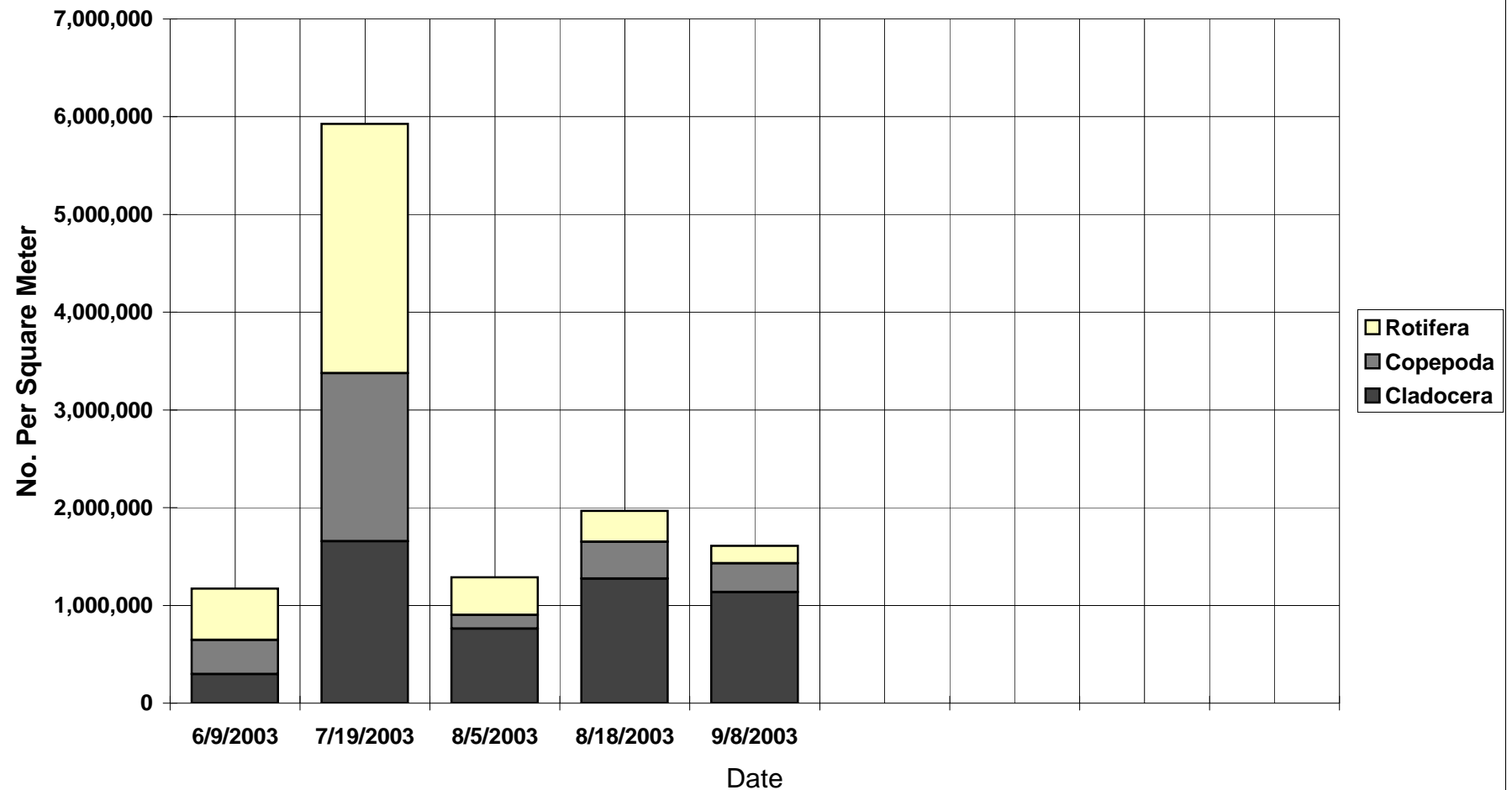
**Total Rotifera**

# EAGLE POINT LAKE

SAMPLE: BOTTOM TO SURFACE TOW  
ZOOPLANKTON ANALYSIS

DIVISION	TAXON	Vertical Tow (m)	6/9/2003	7/19/2003	8/5/2003	8/18/2003	9/8/2003
			#/m2	#/m2	#/m2	#/m2	#/m2
CLADOCERA	<i>Bosmina longirostris</i>		15,208	1,169,347	584,275	968,016	972,614
	<i>Ceriodaphnia sp.</i>		15,208	366,056	49,515	231,482	124,495
	<i>Chydorus sp.</i>		258,538	71,178	59,418	21,044	23,343
	<i>Daphnia galeata mendotae</i>		0	0	0	0	0
	<i>Daphnia retrocurva</i>		0	0	0	0	0
	<i>Diaphanosoma leuchtenbergianum</i>		7,604	50,841	49,515	21,044	15,562
	Immature Cladocera		0	0	19,806	31,566	0
	<b>CLADOCERA TOTAL</b>		<b>296,559</b>	<b>1,657,422</b>	<b>762,529</b>	<b>1,273,151</b>	<b>1,136,013</b>
COPEPODA	<i>Cyclops sp.</i>		212,914	427,066	138,642	157,829	77,809
	<i>Diaptomus sp.</i>		0	20,336	0	0	7,781
	Nauplii		129,269	1,271,029	0	220,960	210,085
	Cyclopoid Copepodid		7,604	0	0	0	0
	<b>COPEPODA TOTAL</b>		<b>349,787</b>	<b>1,718,431</b>	<b>138,642</b>	<b>378,789</b>	<b>295,675</b>
ROTIFERA	<i>Asplanchna priodonta</i>		0	0	19,806	52,610	0
	<i>Brachionus havanaensis</i>		0	30,505	29,709	0	0
	<i>Filinia longiseta</i>		7,604	0	0	0	7,781
	<i>Lecane sp.</i>		0	20,336	19,806	10,522	7,781
	<i>Keratella cochlearis</i>		243,330	1,586,244	168,351	115,741	93,371
	<i>Keratella quadrata</i>		0	20,336	0	0	0
	<i>Kellicottia sp.</i>		0	0	9,903	10,522	0
	<i>Polyarthra vulgaris</i>		258,538	823,627	108,933	84,175	15,562
	<i>Polyarthra eurypta</i>		7,604	71,178	9,903	42,088	31,124
	<i>Trichocerca cylindrica</i>		7,604	0	0	0	0
	<i>Trichocerca multicrinis</i>		0	0	19,806	0	23,343
	<b>ROTIFERA TOTAL</b>		<b>524,681</b>	<b>2,552,226</b>	<b>386,216</b>	<b>315,657</b>	<b>178,961</b>
<b>TOTALS</b>			<b>1,171,027</b>	<b>5,928,080</b>	<b>1,287,387</b>	<b>1,967,597</b>	<b>1,610,648</b>

# 2003 Eagle Point Lake Zooplankton Data Summary



## **Appendix E-5.12 Operation Plan**

VALLEY BRANCH WATERSHED DISTRICT  
OPERATION, INSPECTION AND MAINTENANCE PLAN FOR EAGLE POINT LAKE DAM

INTRODUCTION

This plan is submitted by Valley Branch Watershed District (Watershed District) to fulfill Special Provision 8 of Protected Waters Permit 86-6264, issued July 7, 1986 by the Minnesota Department of Natural Resources (MnDNR). It describes the operation, inspection and maintenance plan for the Eagle Point Lake Dam.

PROCEDURE

This Operation, Inspection and Maintenance Plan will be adopted tentatively for a period of one year after which it will be reviewed before permanent adoption. It will be reviewed thereafter on a two-year basis.

OPERATION PLAN

1. Under normal conditions, no operation of the dam or control structures is anticipated.
2. The water level of Eagle Point Lake is controlled by a stoplog weir which is set at Elevation 894.0 feet. The stoplog design was chosen so that MnDNR staff could temporarily raise and lower the water level of Eagle Point Lake to aid in fish rearing. Additional stoplogs may be added to raise the water level to Elevation 896.0 feet and stoplogs may be removed to lower the water level to Elevation 893.0 feet. The MnDNR shall notify the Watershed District five working days in advance of any proposed water level changes. Otherwise, stoplogs are not to be added or removed.

INSPECTION PLAN

The dam and control structures shall be inspected annually by a registered engineer. A report of the inspection shall be submitted to the Dam Safety Unit of the Division of Waters of the MnDNR.

1. The outlet structures and outlet works shall be inspected annually for evidence of:
  - o accumulated debris
  - o cracking or spalling of concrete and opening of joints
  - o deterioration of concrete
  - o abnormal leakage through concrete surfaces or along pipe outlet
  - o unusual or inadequate operational behavior
2. Upstream embankment slopes shall be inspected annually for evidence of:
  - o wave erosion
  - o cracks
  - o slides
  - o sloughs
  - o subsidences
  - o damages to slope protection
  - o other signs of serious erosion
  - o failure of vegetation
  - o growth of trees, brush or other unsuitable vegetation
  - o animal burrows
3. Downstream slopes shall be inspected annually for evidence of:
  - o wave erosion
  - o cracks
  - o slides
  - o sloughs
  - o subsidences
  - o damages to slope protection
  - o other signs of serious erosion
  - o springs
  - o seeps
  - o boggy areas
  - o failure of vegetation cover
  - o establishment of brush or trees
  - o animal burrows
4. During periods of low reservoir levels, the exposed portions of the abutments and lake bottom shall be examined annually for sinks or seepage holes, and cracking.
5. During periods of sustained high water (above Elevation 898.0 feet), a weekly inspection shall be made of the embankment for evidence of abnormal development, with particular attention being given to:

- o the crest of the dam
- o the visible portions of the upstream slope protection
- o downstream slope protection
- o areas downstream from the dam

The Watershed District shall promptly notify the MnDNR of any abnormal developments.

#### MAINTENANCE PLAN

The Watershed District shall be responsible for and promptly perform all necessary dam maintenance. Possible maintenance activities include the following:

1. Vegetative cover shall be maintained on the dam.
  - o Lost or destroyed vegetative cover shall be reseeded or resodded. The reshaping, fertilizing, reseeding and resodding shall follow the original construction specifications.
  - o Vegetation shall be fertilized as necessary to maintain the desired vegetative stand.
  - o Vegetation shall be mowed at regular intervals to a minimum height of 3 to 4 inches. Trees and deep rooting plants shall be removed.
2. The structural integrity and function of the earth dam and outlet structures shall be maintained.
  - o Soil removed by burrowing animals shall be replaced.
  - o The outlet piping system and the toe drains shall be cleaned or replaced as necessary.
  - o Any slides on the embankment areas shall be stabilized as soon as practical.
  - o Any settled portions of the dam shall be restored to their proper elevation.
  - o Eroded material shall be replaced and the eroded areas revegetated.
  - o Unusual seepages, boils, subsidences or settlements in fill areas shall be investigated and repaired.

- o Eroded materials around pipe outlets and inlets shall be restored.
- o Deteriorated or damaged concrete shall be restored.
- o The outlet structures shall be maintained in proper working order. Ice and debris that may hamper its function shall be removed. Damaged protective coatings shall be restored.



## **Appendix B**

### **Photographs**



6.8.2007





6. 8. 2007





6. 8. 2007





6.8.2007





6.8.2007





6. 8. 2007





6. 8. 2007





6. 8. 2007





6.8.2007





6. 8. 2007





6. 5. 2009



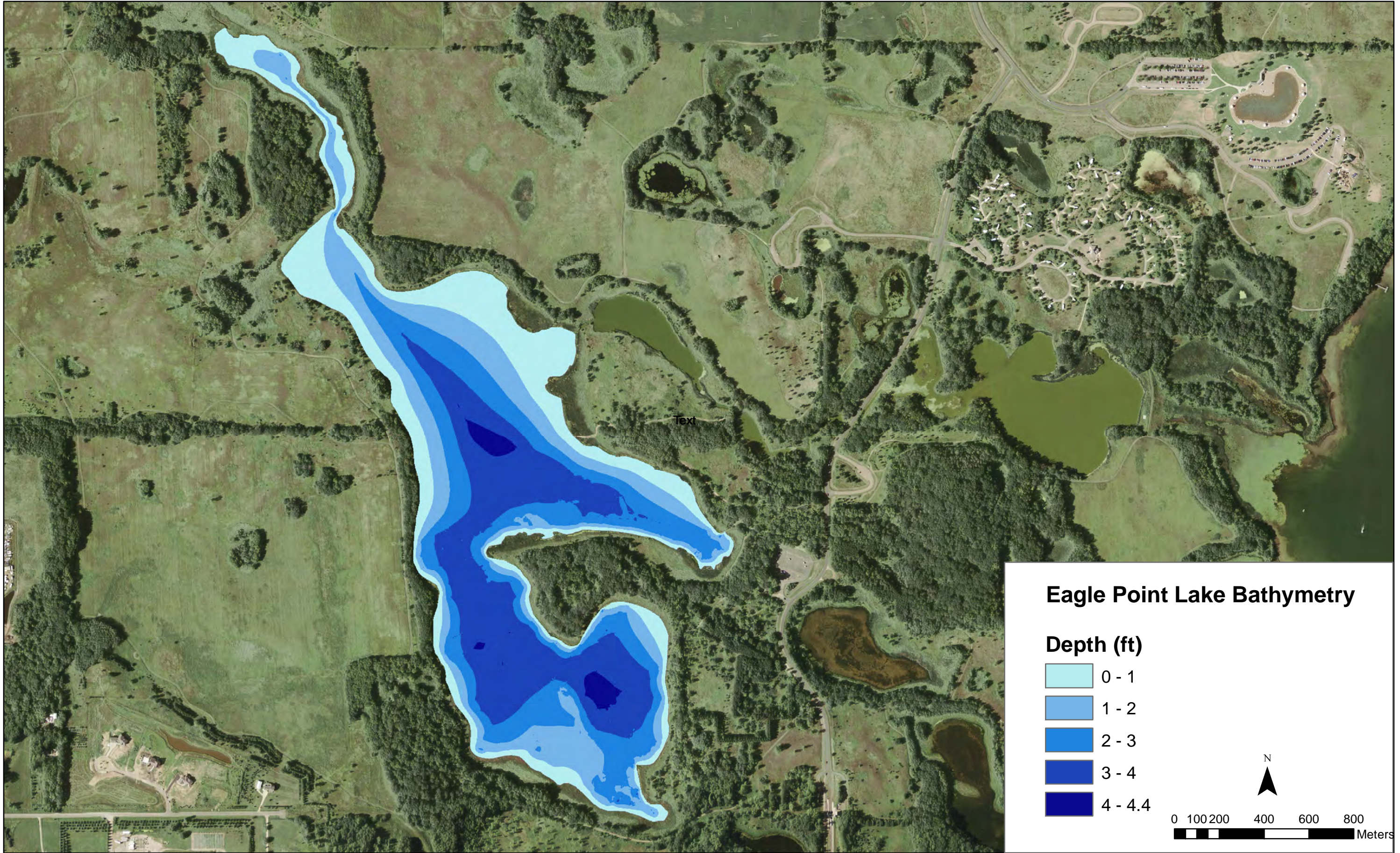




## **Appendix C**

### **2007 Bathymetric Map**

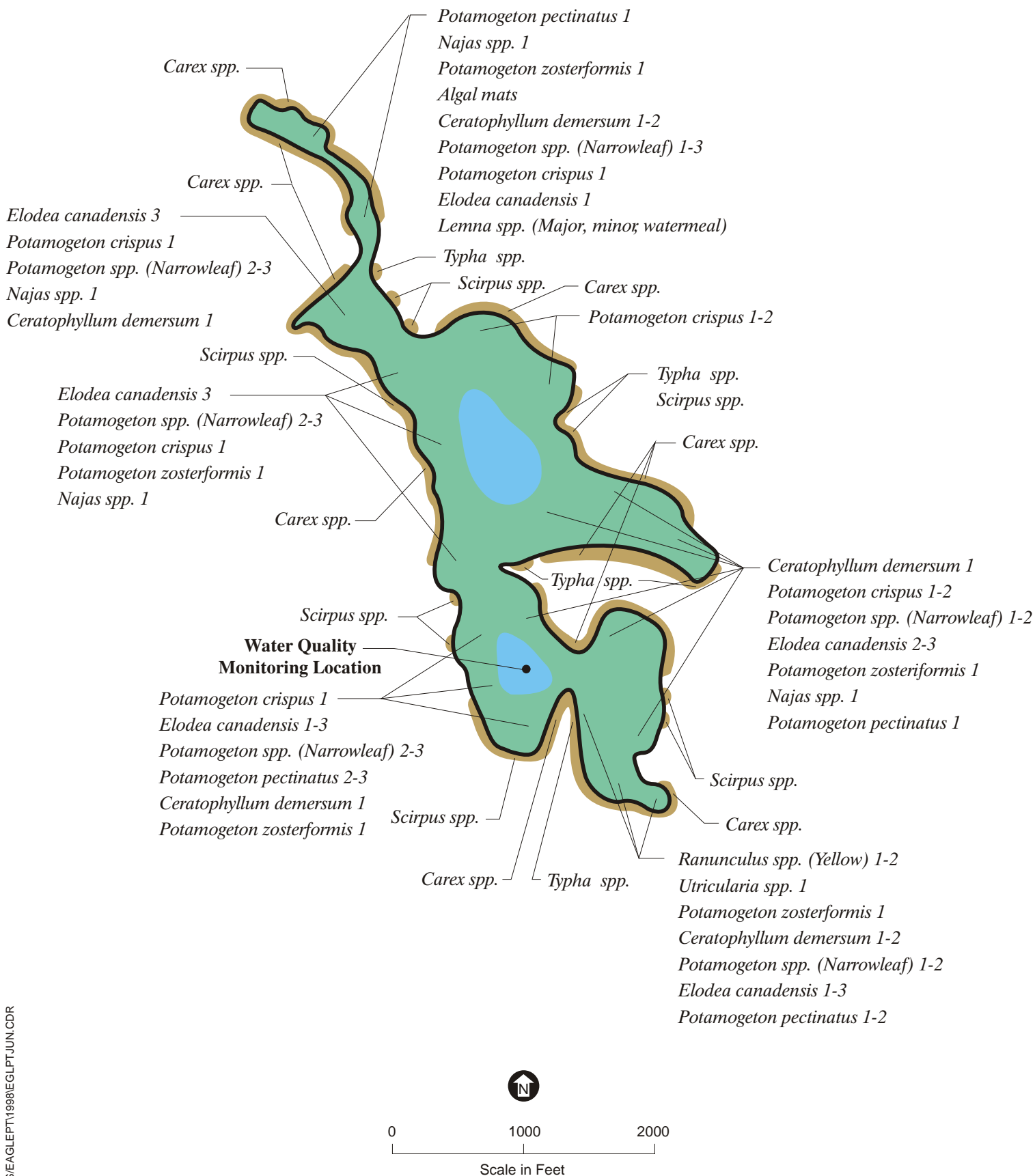






## **Appendix D**

### **Macrophyte Surveys (1998-2011 Maps)**

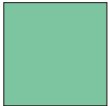


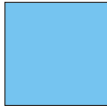


EAGLE POINT LAKE MACROPHYTE SURVEY  
 JUNE 17, 1998

# EAGLE POINT LAKE MACROPHYTE SURVEY

## JUNE 17, 1998

- No macrophytes found in water > 5-6.5 feet
- Macrophyte growth is heaviest along shoreline
- Macrophyte densities estimated as follows: 1=light; 2=moderate; 3= heavy

		<u>Common Name</u>	<u>Scientific Name</u>
Submerged Aquatic Plants:		Curly leaf pondweed Flatstem pondweed Sago Pondweed Leafy/Narrowleaf pondweed Coontail Bushy pondweed Yellow water buttercup Bladderwort Elodea	<i>Potamogeton crispus</i> <i>Potamogeton zosteriformis</i> <i>Potamogeton pectinatus</i> <i>Potamogeton spp.</i> <i>Ceratophyllum demersum</i> <i>Najas spp.</i> <i>Ranunculus spp.</i> <i>Utricularia spp.</i> <i>Elodea canadensis</i>
Floating Leaf:		Water meal Lesser duckweed Greater duckweed	<i>Wolffia columbiana</i> <i>Lemna minor</i> <i>Spirodela polyrhiza</i>
Emergent:		Cattail Sedge Bullrush	<i>Typha spp.</i> <i>Carex spp.</i> <i>Scirpus spp.</i>
No Aquatic Vegetation Found:			

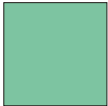


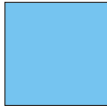
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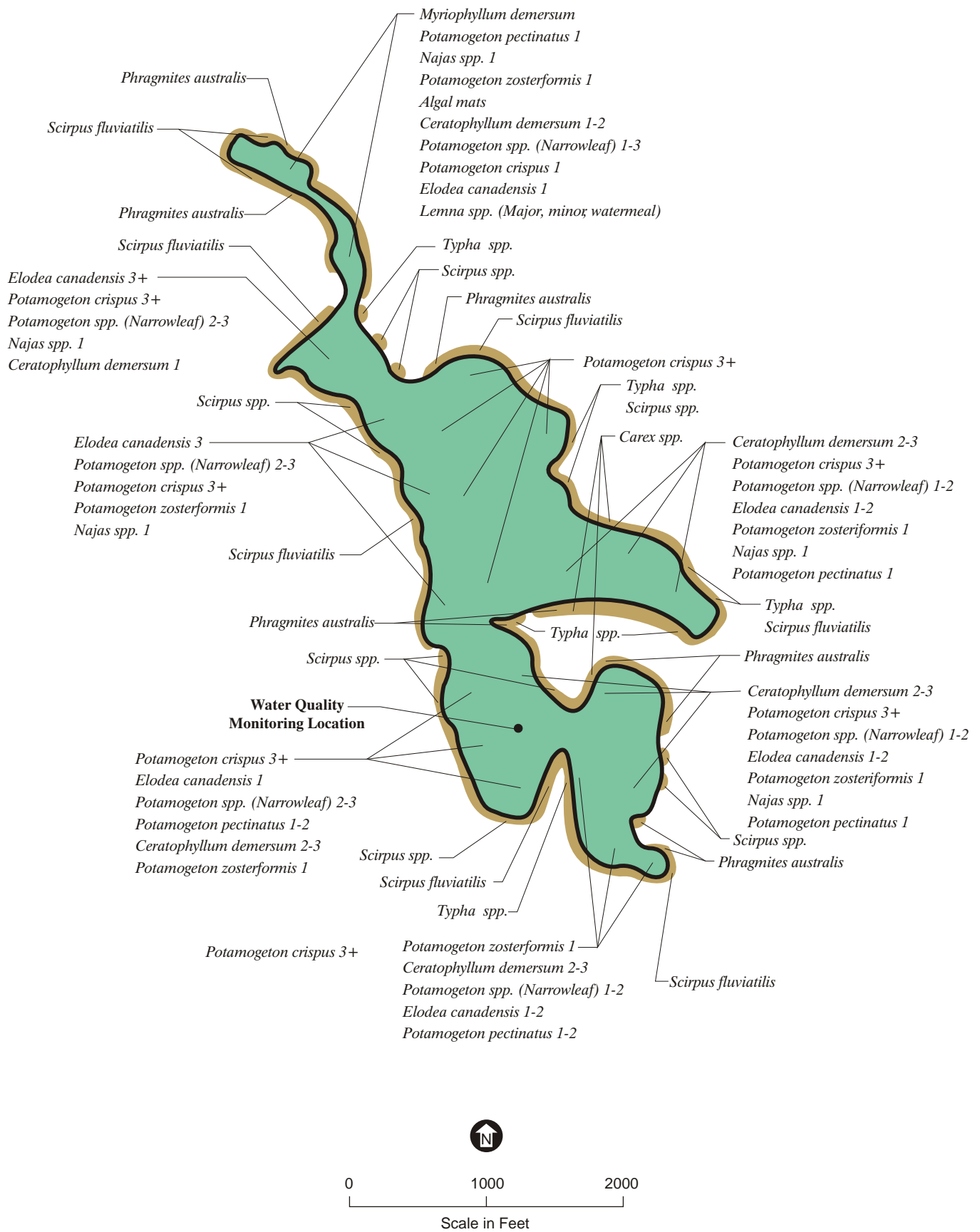
# EAGLE POINT LAKE MACROPHYTE SURVEY

## AUGUST 18, 1998

- No macrophytes found in water > 3-4 feet
- Macrophyte growth is heaviest along shoreline
- Macrophyte densities estimated as follows: 1=light; 2=moderate; 3= heavy

		<u>Common Name</u>	<u>Scientific Name</u>
Submerged Aquatic Plants:		Curly leaf pondweed Flatstem pondweed Sago Pondweed Leafy/Narrowleaf pondweed Coontail Bushy pondweed Yellow water buttercup Bladderwort Elodea	<i>Potamogeton crispus</i> <i>Potamogeton zosteriformis</i> <i>Potamogeton pectinatus</i> <i>Potamogeton spp.</i> <i>Ceratophyllum demersum</i> <i>Najas spp.</i> <i>Ranunculus spp.</i> <i>Utricularia spp.</i> <i>Elodea canadensis</i>
Floating Leaf:		Water meal Lesser duckweed Greater duckweed	<i>Wolffia columbiana</i> <i>Lemna minor</i> <i>Spirodela polyrhiza</i>
Emergent:		Cattail Sedge Bullrush	<i>Typha spp.</i> <i>Carex spp.</i> <i>Scirpus spp.</i>
No Aquatic Vegetation Found:			


Comments:



EAGLE POINT LAKE MACROPHYTE SURVEY  
JUNE 12, 2003

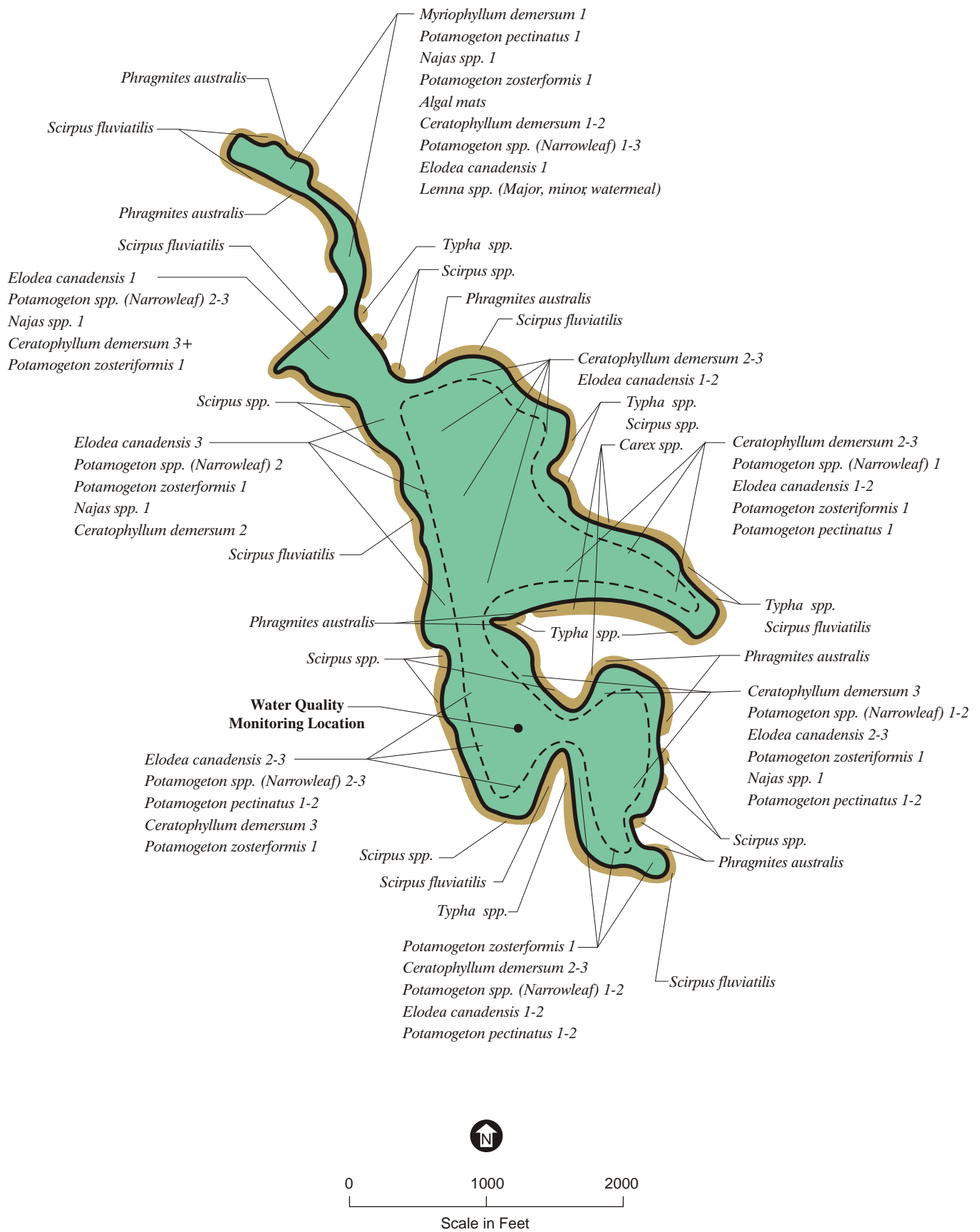
EAGLE POINT LAKE MACROPHYTE SURVEY  
JUNE 12, 2003

- Macrophytes found in throughout entire water body
- Macrophyte growth is heaviest along shoreline
- Macrophyte densities estimated as follows: 1=light; 2=moderate; 3= heavy

		<u>Common Name</u>	<u>Scientific Name</u>
Submerged Aquatic Plants:		Curly leaf pondweed Flatstem pondweed Sago Pondweed Leafy/Narrowleaf pondweed Coontail Bushy pondweed Elodea Northern milfoil	<i>Potamogeton crispus</i> <i>Potamogeton zosteriformis</i> <i>Potamogeton pectinatus</i> <i>Potamogeton spp.</i> <i>Ceratophyllum demersum</i> <i>Najas spp.</i> <i>Elodea canadensis</i> <i>Myriophyllum exalbens</i>
Floating Leaf:		Water meal Lesser duckweed Greater duckweed	<i>Wolffia columbiana</i> <i>Lemna minor</i> <i>Spirodela polyrhiza</i>
Emergent:		Cattail River bullrush Bullrush Giant reed grass	<i>Typha spp.</i> <i>Scirpus fluviatilis</i> <i>Scirpus spp.</i> <i>Phragmites australis</i>
No Aquatic Vegetation Found:			

Found  
Throughout  
Lake

Comments:

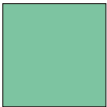






EAGLE POINT LAKE MACROPHYTE SURVEY  
AUGUST 15, 2003



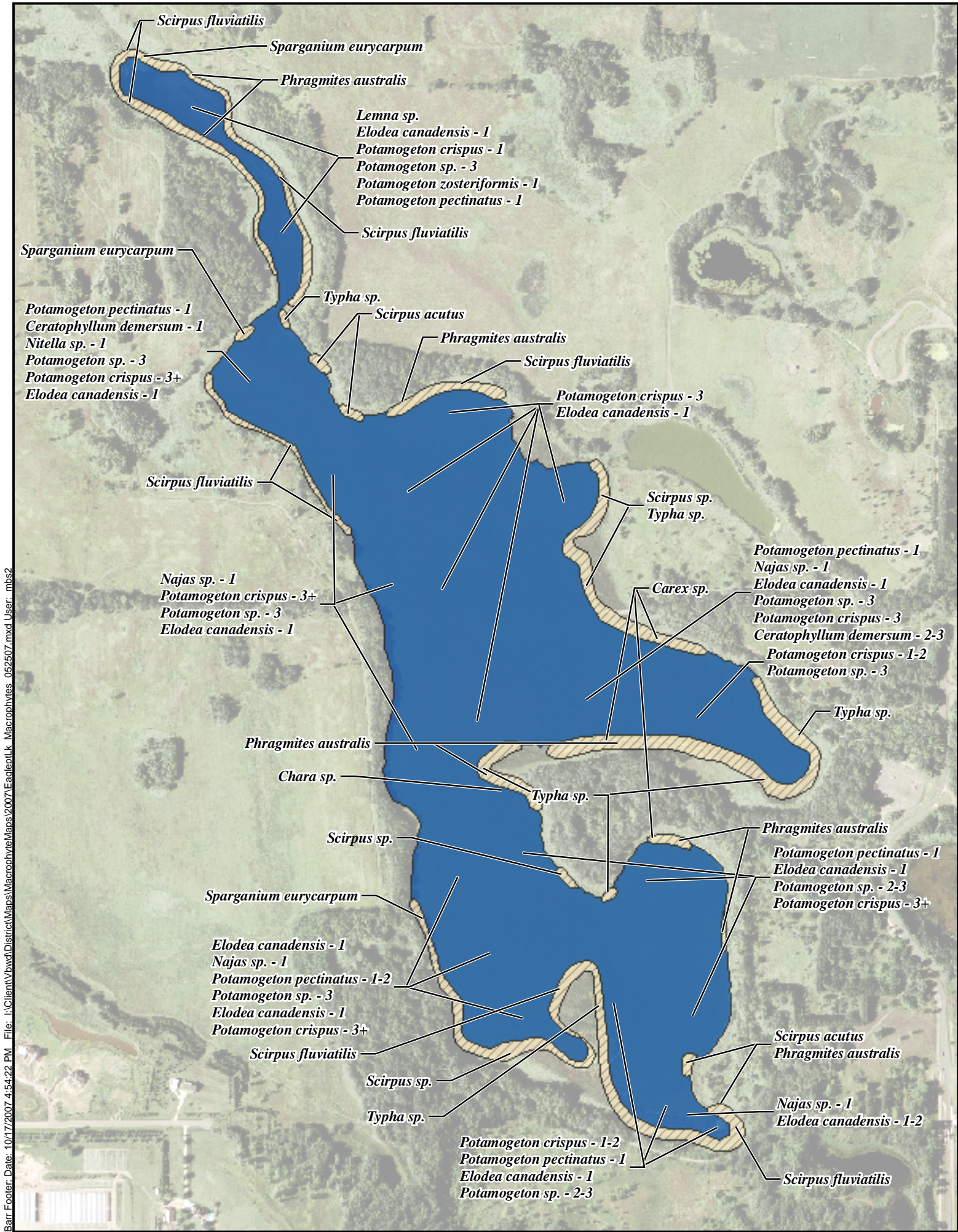
EAGLE POINT LAKE MACROPHYTE SURVEY  
AUGUST 15, 2003

- Macrophytes found in throughout entire water body, P. crispus bloom which was dense throughout entire lake has dissipated
- Macrophyte growth is heaviest along shoreline
- Macrophyte densities estimated as follows: 1=light; 2=moderate; 3= heavy
- Filamentous algal mats growing on Ceratophyllum demersum

		<u>Common Name</u>	<u>Scientific Name</u>	
Submerged Aquatic Plants:		Curly leaf pondweed Flatstem pondweed Sago Pondweed Leafy/Narrowleaf pondweed Coontail Bushy pondweed Elodea Northern milfoil	<i>Potamogeton crispus</i> <i>Potamogeton zosteriformis</i> <i>Potamogeton pectinatus</i> <i>Potamogeton spp.</i> <i>Ceratophyllum demersum</i> <i>Najas spp.</i> <i>Elodea canadensis</i> <i>Myriophyllum exallescens</i>	
Floating Leaf:		Water meal Lesser duckweed Greater duckweed	<i>Wolffia columbiana</i> <i>Lemna minor</i> <i>Spirodela polyrhiza</i>	<div>Found Throughout Lake</div>
Emergent:		Cattail River bullrush Bullrush Giant reed grass	<i>Typha spp.</i> <i>Scirpus fluviatilis</i> <i>Scirpus spp.</i> <i>Phragmites australis</i>	
No Aquatic Vegetation Found:				
Comments:		Area inside dashed line macrophyte growth is less dense beneath surface 1. <i>Ceratophyllum demersum</i> 2. <i>Elodea canadensis</i>		



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Submerged Aquatic Plants	
Common Name	Scientific Name
bushy pondweed and naiads	<i>Najas sp.</i>
coontail	<i>Ceratophyllum demersum</i>
curlyleaf pondweed	<i>Potamogeton crispus</i>
flatstem pondweed	<i>Potamogeton zosteriformis</i>
muskgrass	<i>Chara sp.</i>
pondweed	<i>Potamogeton sp.</i>
sago pondweed	<i>Potamogeton pectinatus</i>
stonewort	<i>Nitella sp.</i>
Canada waterweed	<i>Elodea canadensis</i>

Floating Leaf Plants	
Common Name	Scientific Name
water meal	<i>Wolffia columbiana</i>
duckweed	<i>Lemna sp.</i>
greater duckweed	<i>Spirodela polyrhiza</i>

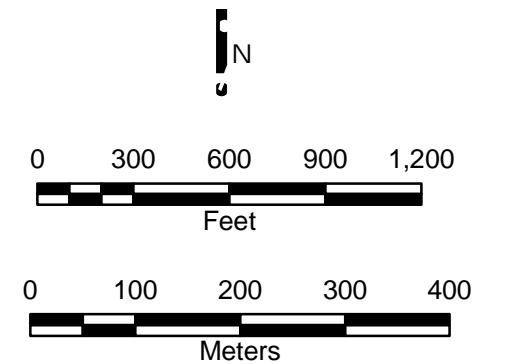
Emergent Plants	
Common Name	Scientific Name
bulrush	<i>Scirpus sp.</i>
cattail	<i>Typha sp.</i>
common bur-reed	<i>Sparganium eurycarpum</i>
giant reed grass	<i>Phragmites australis</i>
hardstem bulrush	<i>Scirpus acutus</i>
river bulrush	<i>Scirpus fluviatilis</i>
sedge	<i>Carex sp.</i>

FIELD NOTES:

- *Wolffia columbiana*, *Lemna sp.* and *Spirodela polyrhiza* found throughout entire waterbody
- Macrophyte growth is heaviest along the shoreline
- Macrophyte densities estimated as follows:  
1=light; 2=moderate; 3=heavy

**Legend**

- Emergent Plants
- Floating Leaf Plants
- Submerged Aquatic Plants
- No Aquatic Vegetation

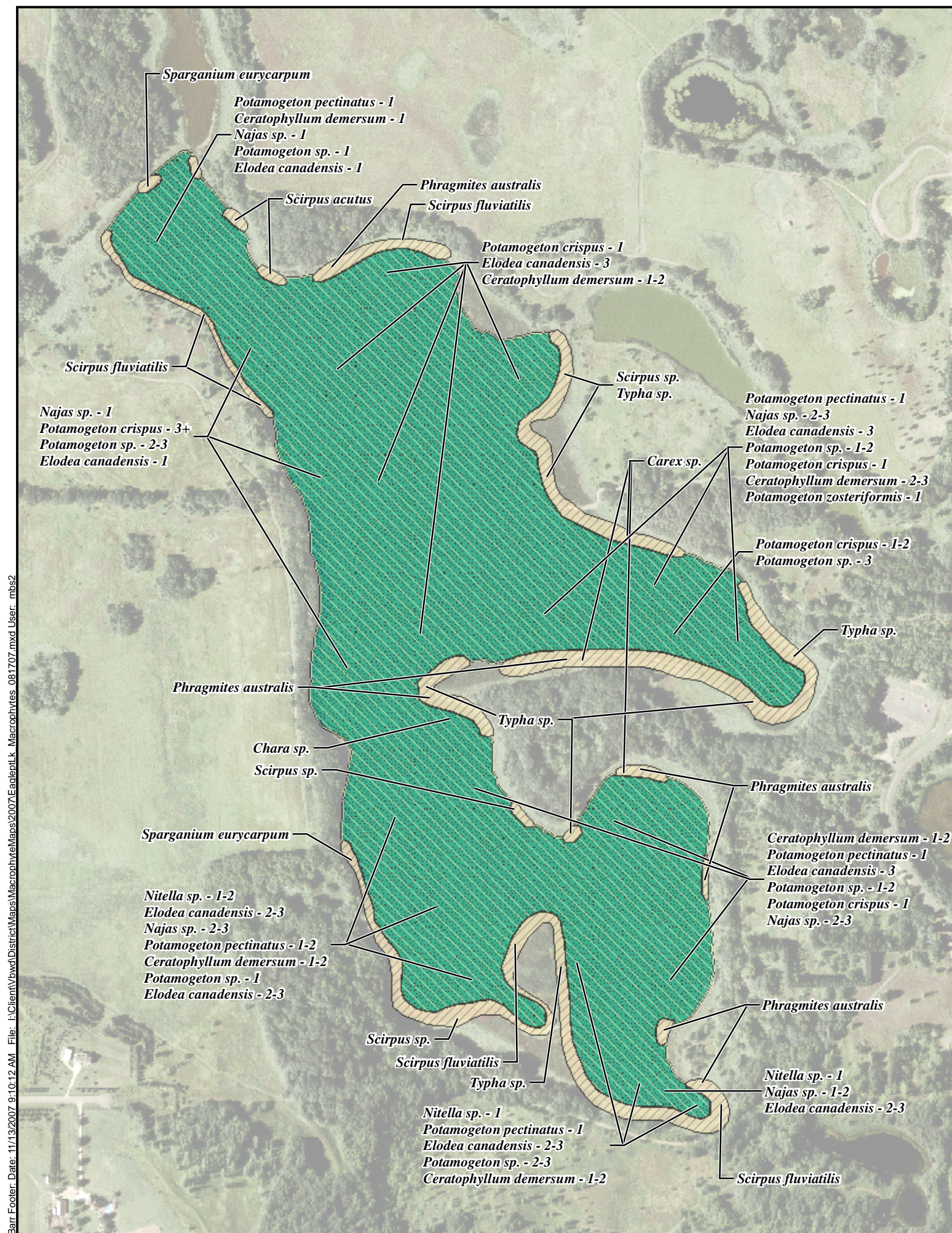


Imagery Source: 2006 AE



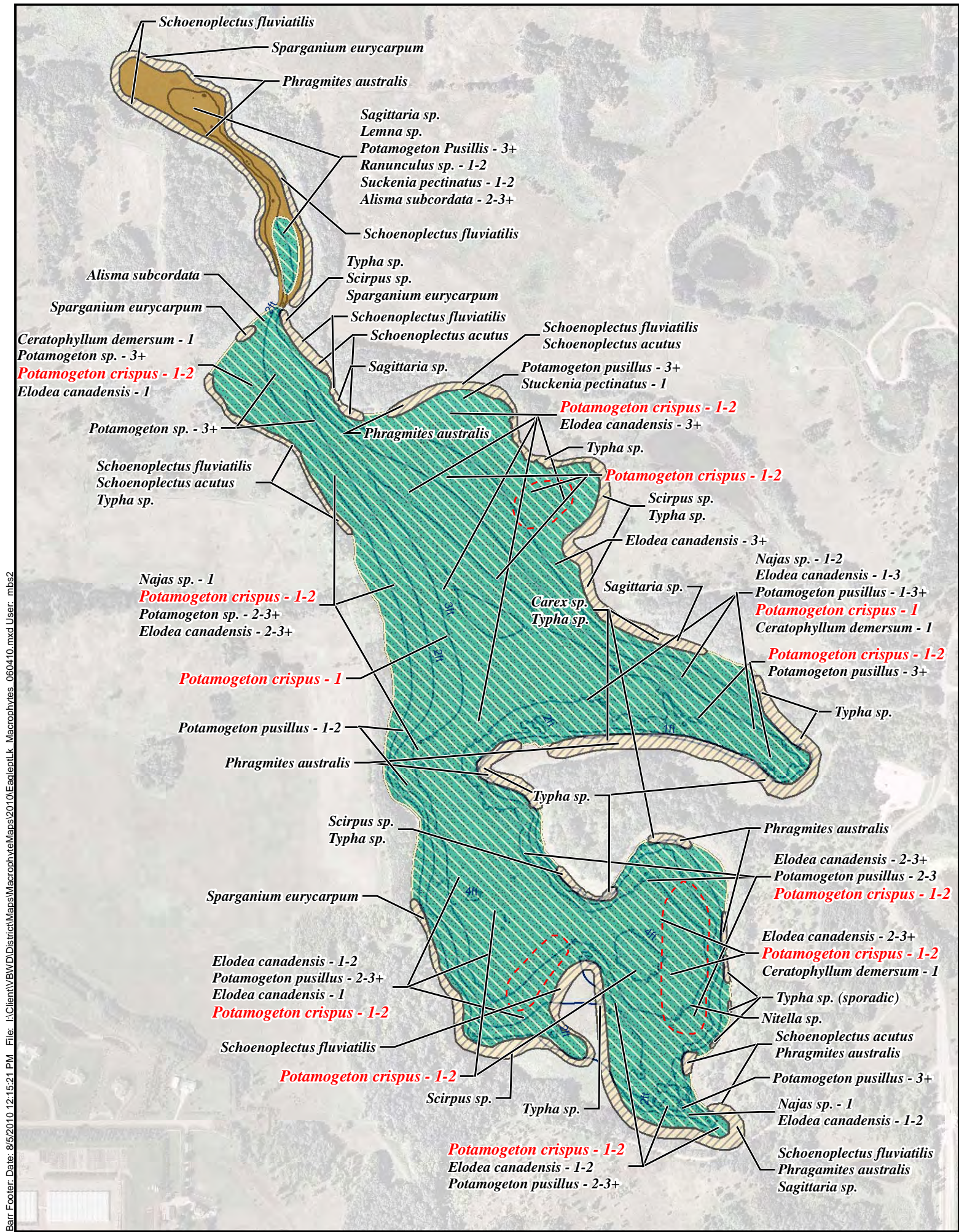
EAGLE POINT LAKE MACROPHYTE  
SURVEY RESULTS  
May 25, 2007  
Valley Branch Watershed District





EAGLE POINT LAKE MACROPHYTE  
SURVEY RESULTS  
August 17, 2007  
Valley Branch Watershed District





### Submerged Aquatic Plants

Common Name	Scientific Name
bushy pondweed and naiads	<i>Najas sp.</i>
water crowfeet	<i>Ranunculus sp.</i>
coontail	<i>Ceratophyllum demersum</i>
<b>curlyleaf pondweed</b>	<b><i>Potamogeton crispus</i></b>
small pondweed	<i>Potamogeton pusillus</i>
sago pondweed	<i>Stuckenia pectinatus</i>
stoneworts	<i>Nitella sp.</i>
Canada waterweed	<i>Elodea canadensis</i>

### Floating Leaf Plants

Common Name	Scientific Name
water meal	<i>Wolffia columbiana</i>
duckweed	<i>Lemna sp.</i>
greater duckweed	<i>Spirodela polyrhiza</i>

### Emergent Plants

Common Name	Scientific Name
bulrush	<i>Scirpus sp.</i>
cattail	<i>Typha sp.</i>
common bur-reed	<i>Sparganium eurycarpum</i>
giant reed grass	<i>Phragmites australis</i>
hardstem bulrush	<i>Schoenoplectus acutus</i>
river bulrush	<i>Schoenoplectus fluviatilis</i>
arrowhead	<i>Sagittaria sp.</i>
water plantain	<i>Alisma subcordata</i>
sedge	<i>Carex sp.</i>

\*Note: Bold red name indicates extremely aggressive/invasive introduced species.

FIELD NOTES:

- Macrophyte densities estimated as follows:  
1=light; 2=moderate; 3=heavy
- Densities generally not noted for emergent and floating leaf plants
- *Wolffia columbiana*, *Lemna sp.* and *Spirodela polyrhiza* found throughout entire waterbody
- Macrophyte growth is heaviest along the shoreline
- Low water level
- Algal mats present
- Wet shoreline is sporadic with: *Schoenoplectus fluviatilis*, *Typha sp.*, *Schoenoplectus acutus*, *Sagittaria sp.*
- *Potamogeton crispus* is less dense than 2009 and those present are not healthy in appearance.
- *Potamogeton sp.* and *Potamogeton pusillus* is dense in areas close to shore

### Legend

- Dry
- Emergent Plants
- Floating Leaf Plants
- Submerged Aquatic Plants
- No Aquatic Vegetation
- Extremely Dense Areas of *Potamogeton Crispus*



0 300 600 900 1,200  
Feet

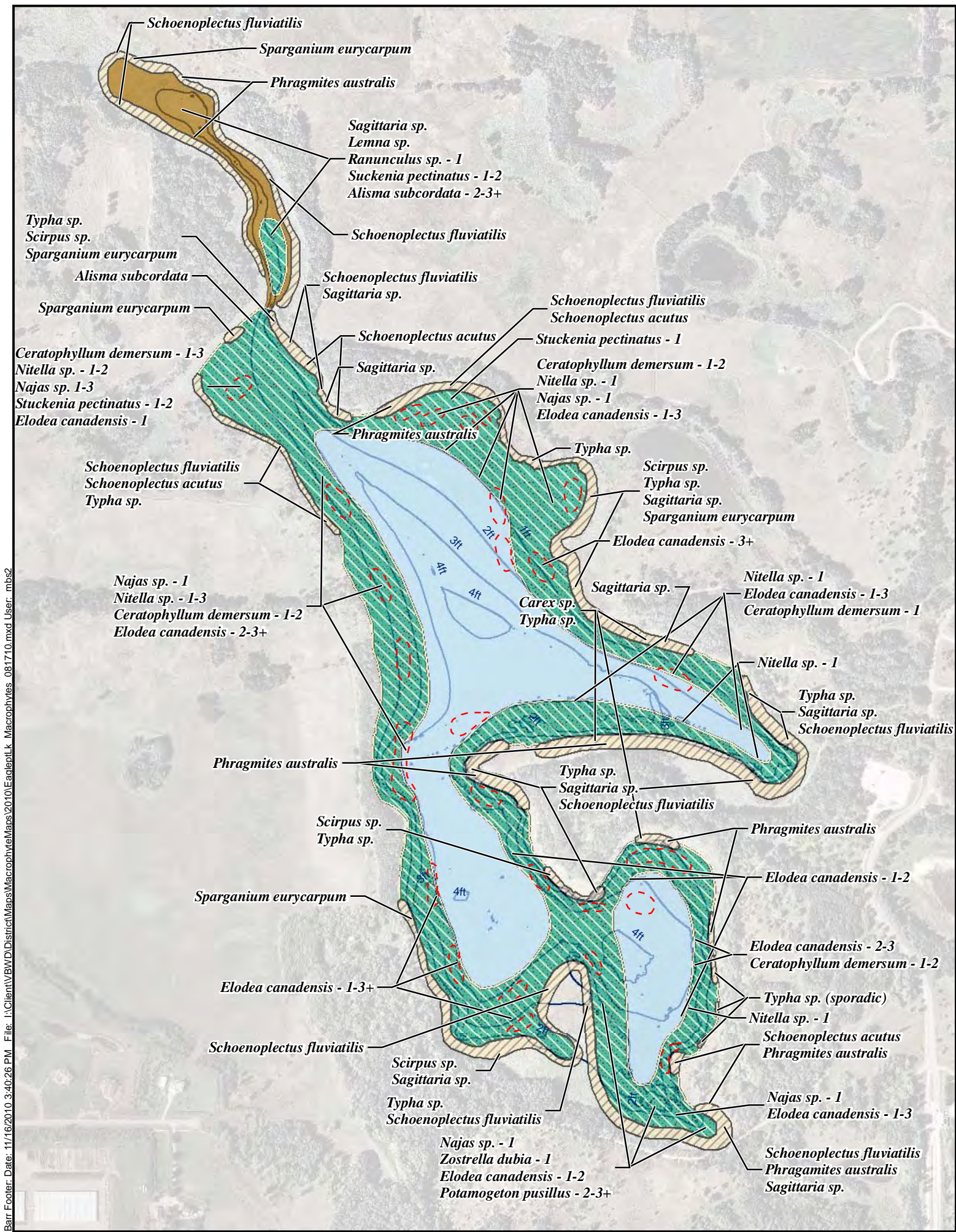
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Meters

Imagery Source: 2009 AE



EAGLE POINT LAKE MACROPHYTE  
SURVEY RESULTS  
June 4, 2010  
Valley Branch Watershed District





Submerged Aquatic Plants

Common Name	Scientific Name
bushy pondweed and naiads	<i>Najas sp.</i>
water crowfeet	<i>Ranunculus sp.</i>
coontail	<i>Ceratophyllum demersum</i>
small pondweed	<i>Potamogeton pusillus</i>
sago pondweed	<i>Stuckenia pectinatus</i>
water stargrass	<i>Zostrella dubia</i>
stoneworts	<i>Nitella sp.</i>
Canada waterweed	<i>Elodea canadensis</i>

Floating Leaf Plants

Common Name	Scientific Name
duckweed	<i>Lemna sp.</i>

Emergent Plants

Common Name	Scientific Name
bulrush	<i>Scirpus sp.</i>
cattail	<i>Typha sp.</i>
common bur-reed	<i>Sparganium eurycarpum</i>
giant reed grass	<i>Phragmites australis</i>
hardstem bulrush	<i>Schoenoplectus acutus</i>
river bulrush	<i>Schoenoplectus fluviatilis</i>
arrowhead	<i>Sagittaria sp.</i>
water plantain	<i>Alisma subcordata</i>
sedge	<i>Carex sp.</i>

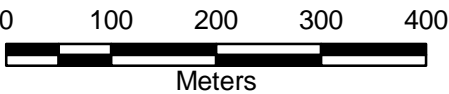
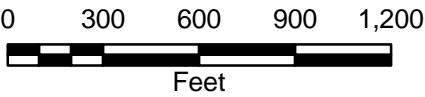
\*Note: Bold red name indicates extremely aggressive/invasive introduced species.

FIELD NOTES:

- Macrophyte densities estimated as follows:  
1=light; 2=moderate; 3=heavy
- Densities generally not noted for emergent and floating leaf plants
- *Wolffia columbiana*, *Lemna sp.* and *Spirodela polyrhiza* found throughout entire waterbody
- Macrophyte growth is heaviest along the shoreline
- Low water level
- Wet shoreline is sporadic with: *Schoenoplectus fluviatilis*, *Typha sp.*, *Schoenoplectus acutus*, *Sagittaria sp.*
- *Potamogeton crispus* is less dense than 2009 and those present are not healthy in appearance.
- Areas of dense *Elodea canadensis* - dashed red lines

Legend

- Dry
- Emergent Plants
- Floating Leaf Plants
- Submerged Aquatic Plants
- No Aquatic Vegetation
- Extremely Dense Areas of *Elodea canadensis*



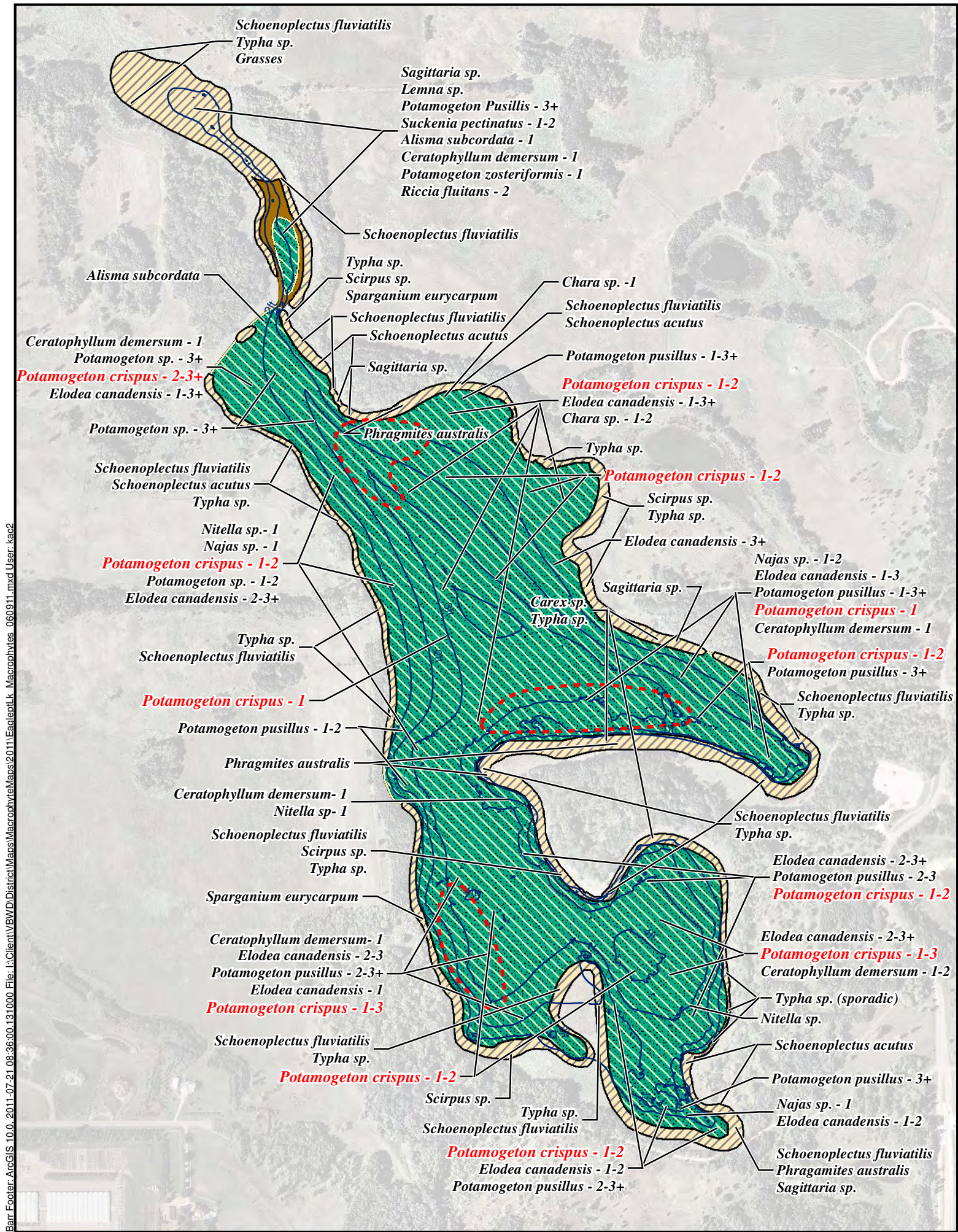
Imagery Source: 2009 AE



EAGLE POINT LAKE MACROPHYTE  
SURVEY RESULTS  
August 17, 2010  
Valley Branch Watershed District



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### Submerged Aquatic Plants

Common Name	Scientific Name
Muskgrass	<i>Chara</i> sp.
Slender naiad	<i>Najas</i> sp.
Water crowfeet	<i>Ranunculus</i> sp.
Coontail	<i>Ceratophyllum demersum</i>
<b>Curlyleaf pondweed</b>	<b><i>Potamogeton crispus</i></b>
Small pondweed	<i>Potamogeton pusillus</i>
Sago pondweed	<i>Stuckenia pectinatus</i>
Stoneworts	<i>Nitella</i> sp.
Canada waterweed	<i>Elodea canadensis</i>

### Floating Leaf Plants

Common Name	Scientific Name
Water meal	<i>Wolffia columbiana</i>
Duckweed	<i>Lemna</i> sp.
Greater duckweed	<i>Spirodela polyrhiza</i>
Slender riccia	<i>Riccia fluitans</i>

### Emergent Plants

Common Name	Scientific Name
Bulrush	<i>Scirpus</i> sp.
Cattail	<i>Typha</i> sp.
Common bur-reed	<i>Sparganium eurycarpum</i>
Giant reed grass	<i>Phragmites australis</i>
Hardstem bulrush	<i>Schoenoplectus acutus</i>
River bulrush	<i>Schoenoplectus fluviatilis</i>
Arrowhead	<i>Sagittaria</i> sp.
Water plantain	<i>Alisma subcordata</i>
Sedge	<i>Carex</i> sp.

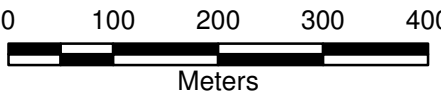
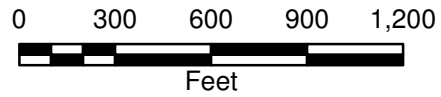
\*Note: Bold red name indicates extremely aggressive/invasive introduced species.

FIELD NOTES:

- Macrophyte densities estimated as follows:  
1=light; 2=moderate; 3=heavy
- Densities generally not noted for emergent and floating leaf plants
- *Wolffia columbiana*, *Lemna* sp. and *Spirodela polyrhiza* found throughout entire waterbody
- Algal mats present - north arm
- Wet shoreline is sporadic with: *Schoenoplectus fluviatilis*, *Typha* sp., *Schoenoplectus acutus*, *Sagittaria* sp.
- *Potamogeton* sp. and *Potamogeton pusillus* is dense in areas close to shore

### Legend

- Dry
- Emergent Plants
- Floating Leaf Plants
- Submerged Aquatic Plants
- No Aquatic Vegetation
- Extremely Dense Areas of *Potamogeton Crispus* Growing to Surface

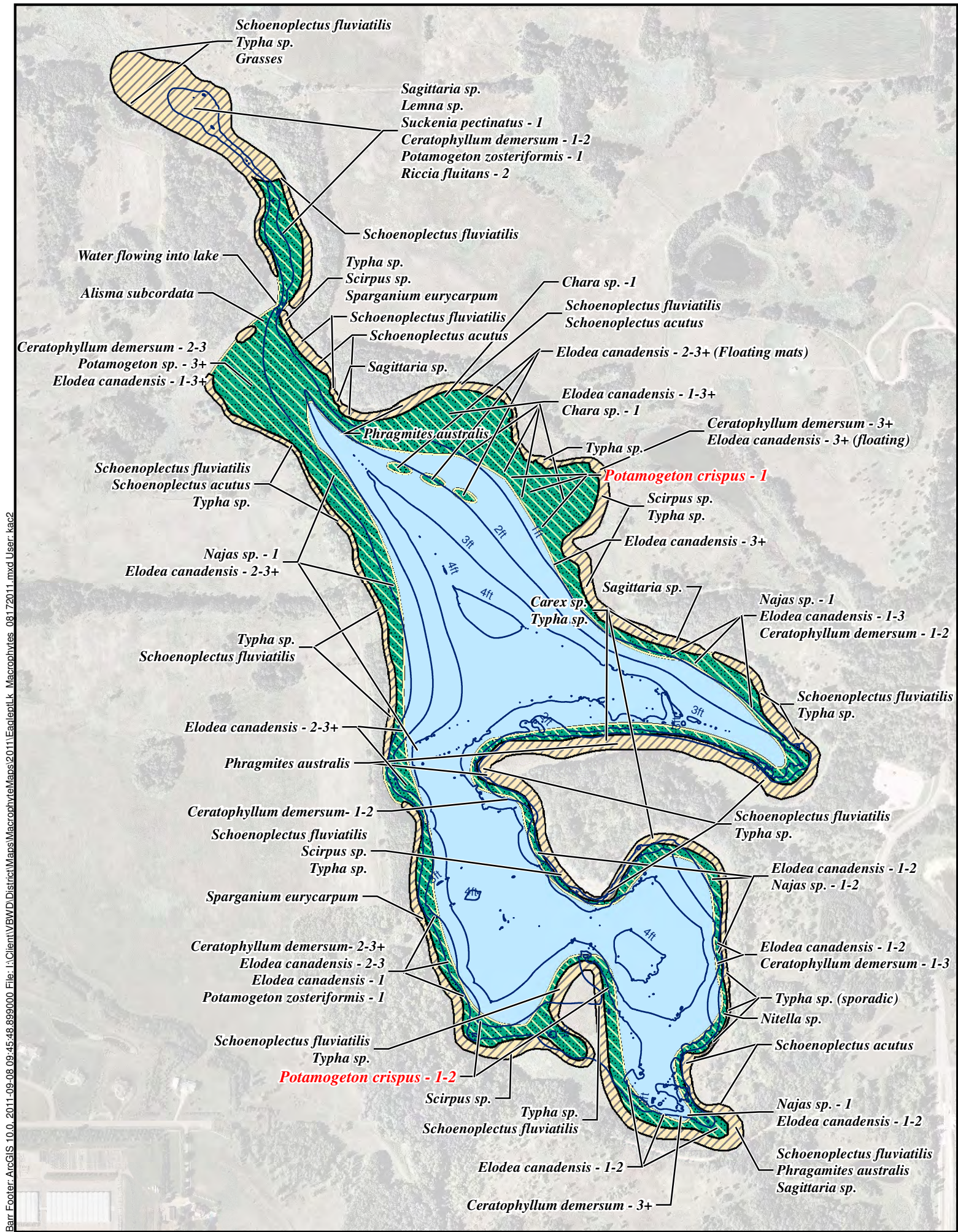


Imagery Source: 2009 AE



EAGLE POINT LAKE MACROPHYTE  
SURVEY RESULTS  
June 9, 2011  
Valley Branch Watershed District





### Submerged Aquatic Plants

Common Name	Scientific Name
Muskgrass	<i>Chara</i> sp.
Flatstem pondweed	<i>Potamogeton zosteriformis</i>
Slender naiad	<i>Najas</i> sp.
Water crowfeet	<i>Ranunculus</i> sp.
Coontail	<i>Ceratophyllum demersum</i>
<b>Curlyleaf pondweed</b>	<b><i>Potamogeton crispus</i></b>
Small pondweed	<i>Potamogeton pusillus</i>
Sago pondweed	<i>Stuckenia pectinatus</i>
Stoneworts	<i>Nitella</i> sp.
Canada waterweed	<i>Elodea canadensis</i>

### Floating Leaf Plants

Common Name	Scientific Name
Water meal	<i>Wolffia columbiana</i>
Duckweed	<i>Lemna</i> sp.
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### Emergent Plants

Common Name	Scientific Name
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Cattail	<i>Typha</i> sp.
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Hardstem bulrush	<i>Schoenoplectus acutus</i>
River bulrush	<i>Schoenoplectus fluviatilis</i>
Arrowhead	<i>Sagittaria</i> sp.
Water plantain	<i>Alisma subcordata</i>
Sedge	<i>Carex</i> sp.

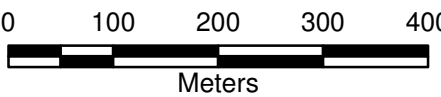
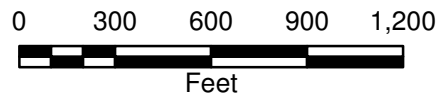
\*Note: Bold red name indicates extremely aggressive/invasive introduced species.

FIELD NOTES:

- Macrophyte densities estimated as follows:  
1=light; 2=moderate; 3=heavy
- Densities generally not noted for emergent and floating leaf plants
- *Wolffia columbiana*, *Lemna* sp. and *Spirodela polyrhiza* found throughout entire waterbody
- Wet shoreline is sporadic with: *Schoenoplectus fluviatilis*, *Typha* sp., *Schoenoplectus acutus*, *Sagittaria* sp.
- High water level, water flowing into lake on north end
- Lake appears to have been treated since June. *Elodea* is brown with green tips (growing)

### Legend

- Emergent Plants
- Floating Leaf Plants
- Submerged Aquatic Plants
- No Aquatic Vegetation



Imagery Source: 2009 AE



EAGLE POINT LAKE MACROPHYTE  
SURVEY RESULTS  
August 17, 2011  
Valley Branch Watershed District



## **Appendix E**

### **Historic Water Quality Data**



## Eagle Point Lake Water Quality Summary

Impairment (Year Listed)	MPCA Class	MPCA Lake Standards (NCHF)	10-Year Summer Average Water Quality	2012 Summer Average Water Quality	Water Quality Trend <sup>1</sup>
Excess Nutrients (2012)	Shallow	TP ≤ 60 ug/L Chl a ≤ 20 ug/L Secchi ≥ 1.0 m	TP = 320 ug/L Chl a = 71 ug/L Secchi = 0.6 m	TP = 397 ug/L Chl a = 122 ug/L Secchi = 0.6 m	No significant change for Secchi Depth

1 – Trend analysis performed for 2003-2012 as part of the 2012 VBWD Annual Report

## Eagle Point Lake Historic Water Quality Total Phosphorus Growing Season Averages

