Rome Pond:
Aquatic Plant Survey
and Management Plan

2011

Jefferson County
Land and Water Conservation Department

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INTRODUCTION

Rome Pond is a 379 acre impoundment on the Bark River in the Town of Sullivan in Jefferson County.

This project was made possible by an Aquatic Invasive Species grant from the Department of Natural Resources. The Jefferson County Land and Water Conservation Department was the sponsor of the grant and worked on the project in coordination with the Rome Pond Improvement Association.

CHARACTERISTICS OF ROME POND AND ITS WATERSHED

Rome Pond is a 379 acre impoundment on the Bark River in the Town of Sullivan in Jefferson County. The watershed of Rome Pond includes portions of Jefferson, Waukesha, and Washington Counties. The physical characteristics of Rome Pond are contained in Table 1.

Table 1. Physical Characteristics of Rome Pond

Watershed Area (mi^2)	Lake Area (acres)	Maximum Depth (feet)	Mean Depth (feet)	Shoreline Length (miles)
111.7	448	7	2	13.6

Rome Pond contains 2 basins (see Appendix A). The basin west of County Highway F is the portion of the lake that contains development. The west basin is 133.3 acres. The basin east of County Highway F is undeveloped, except for one house, and the land adjacent to it is mostly wetlands and includes the Wisconsin Department of Natural Resources' Rome Pond Wildlife Area. The east basin is 314.4 acres.

Jefferson County Rome Pond Park is located east of County Highway F and includes a parking lot, restroom, picnic shelter, drinking water well, and a boat ramp to Rome Pond. The parking lot is very big and could accommodate at least 50 car-trailers. The Town of Sullivan has a park at the outlet of the lake. Citizens use the park mainly to fish from shore.

As part of the aquatic plant survey, depths throughout the lake were recorded and a new bathymetry map was developed (Appendix A). Please note that some areas of the lake, mainly the far east end of the lake, were not able to be accessed due to navigation difficulties. During the plant survey, water levels in Rome Pond were elevated due to the large and unprecedented precipitation events between the fall of 2007 and the spring of 2008. As a result, the survey recorded a maximum depth of 7.5 feet and a mean depth of 3.3 feet.

WATER QUALITY

Rome Pond has not received extensive water quality sampling in the past. The 1968 DNR report, Surface Water Resources of Jefferson County, states that the water is "very hard and generally clear over a muck bottom." (DNR 1968). "Hard" refers to the presence of calcium and magnesium in the lake. Hard water lakes contain water that was in contact with limestone minerals contained in the groundwater system or soils in the watershed. The DNR report also states that "winterkill and weeds are major use problems."

The DNR State of the Rock River Basin publication classifies Rome Pond as having a phosphorus sensitivity classification of IIB (DNR 2002). This means that the lake is less

responsive to changes in phosphorus loading and that the existing water quality is poor to very poor.

Some lake characteristics can give some insight into the water quality conditions of Rome Pond. These are detailed below.

Watershed-to-Lake Ratio

The watershed-to-lake size ratio is used as a measure of the potential nutrient and pollutant loading to a lake from its watershed. If there are two lakes with the same surface acreage but one has a much larger watershed, then there is greater likelihood that the lake with the larger watershed will have more nutrient and pollutant loading from runoff. Runoff occurs when rainwater and snowmelt transport nutrients, sediment, and other pollutants to water. Lakes with watershed-to-lake size ratios greater than 10:1 are known to more often experience water quality problems when compared to lakes with smaller ratios. The watershed-to-lake size ratio for Rome Pond is 160:1.

Stratification

The stratification factor measures the degree to which lake water separates into distinct layers. Stratification occurs when warmer, lighter waters near the surface are not able to mix with colder, heavier bottom waters. Stratification occurs in the summer for lakes that are greater than 20 feet in depth. In shallower lakes, wind and wave action effectively mixes the water and therefore, shallow lakes do not remain stratified for extended periods of time.

The stratification factor can be determined with the following equation. Higher ratios indicate more stratification. Ratios of 13.5 and higher are more strongly stratified. Rome Pond has a stratification factor of 4.5 and does not stratify.

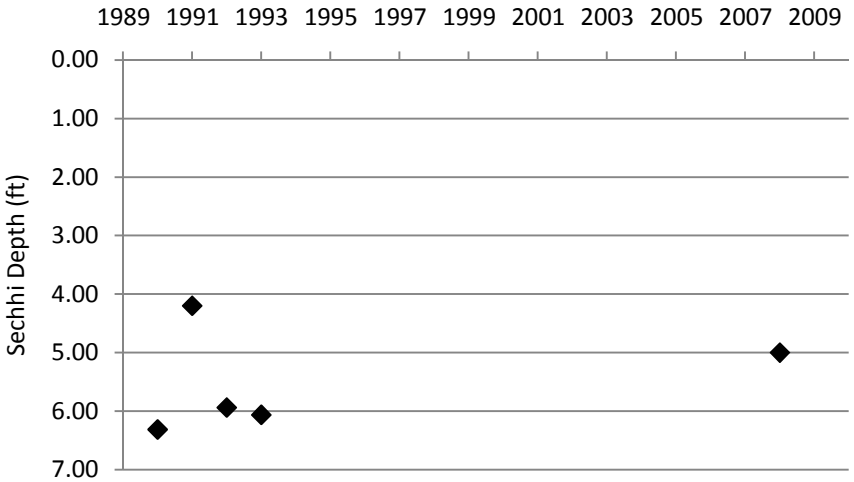
$$\text{Stratification Factor} = \frac{\text{Maximum Depth (ft)} + 4.5}{\text{Log of surface area (acres)}}$$

Water Clarity

A Secchi disc is an 8-inch disc that is painted black and white. It is lowered into the water until it disappears from sight, then raised until it becomes visible – that depth is recorded as the water clarity reading. Materials suspended (especially algae) and dissolved in the water will impact the water clarity of a lake. Water clarity measurements can indicate the overall water quality of a lake.

The average summer (July/August) water clarity measurements at the deepest point in Rome Pond's west basin are shown in Chart 1.

Chart 1. Average Summer Water Clarity Measurements on Rome Pond



In 2008, water clarity measurements were also taken at the deepest point in the east basin of Rome Pond which is very close to the boat launch. The 2008 summer average in the east basin (3.5 feet) was less than the summer average in the west basin (5 feet). Because there is long-term data in the west basin (the location of the deepest part of Rome Pond), the west basin data will be used to determine the Trophic State Index of the lake.

Trophic State Index

By determining a lake's trophic state, its water quality can be characterized as eutrophic, mesotrophic, or oligotrophic. These trophic states are based on water clarity, total phosphorus concentration, and chlorophyll *a* concentration.

Oligotrophic lakes are clear, deep, and free of weeds or large algae blooms. They contain low amounts of nutrients and therefore do not support large fish populations. However, they can develop a food chain capable of sustaining a desirable fishery of large game fish. Mesotrophic lakes have moderately clear water. They can have deep waters that are low in dissolved oxygen during the summer, and as a consequence, can limit cold water fish and cause phosphorus release from the bottom sediments. Eutrophic lakes are high in nutrients and support a large biomass that includes weeds, or frequent algae blooms, or both. Rough fish (such as carp) are often common in eutrophic lakes.

A natural aging process occurs in all lakes to shallower and more eutrophic lakes. It is important to point out that this aging process is accelerated by human activities that increase sediment and nutrient delivery to our lakes including agriculture, existing and new development, fertilizers, storm drains, etc.

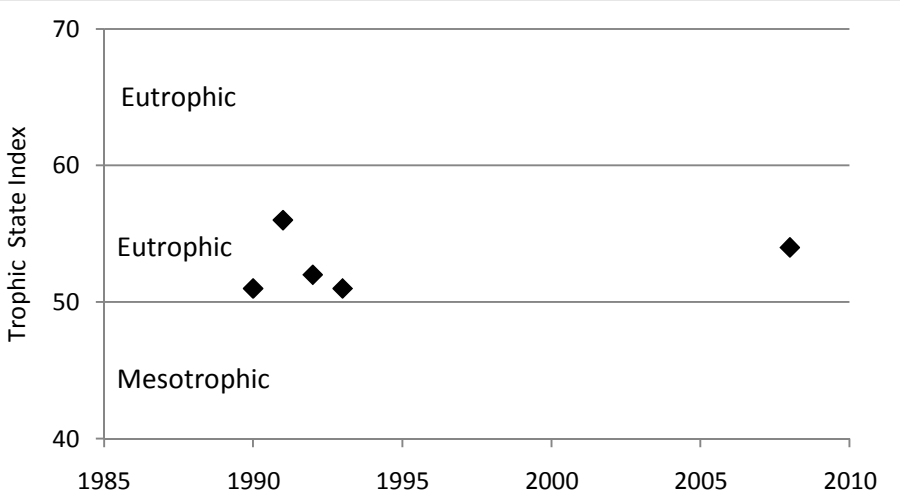
The Trophic State Index is determined using mathematical formulas that convert water clarity, total phosphorus, and chlorophyll *a* measurements into a TSI score on a scale of 0 to 110. Lakes that are less fertile have a low TSI. The scale is described in Table 2.

Total phosphorus and chlorophyll *a* measurements have not been taken on Rome Pond. The Trophic State Index calculated is shown in Chart 2 for the average summer (July, August) secchi depths. Rome Pond is classified as an eutrophic lake. It is important to note that a better understanding of Rome Pond's trophic state would be possible with chlorophyll and phosphorus data that is not currently being collected. It is likely that phosphorus levels are high in the lake because of the very large watershed and the evidence of very dense plant growth.

Table 2. Description of the Trophic State Index Scale

TSI Score	Description
TSI < 30	Classical oligotrophic: clear water, many algal species, oxygen throughout the year in 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 (pike, perch, bass, etc.) 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 blocks sunlight).
TSI > 80	Algal scums, summer fish kills, few plants, rough fish dominant. Very poor water quality.

Chart 2. Trophic State Index based on Water Clarity for Rome Pond (Note: This chart does not contain the entire Trophic State Index scale.)



A water quality index was developed for Wisconsin lakes using data collected in July and August (Lillie and Mason 1983). Table 3 shows this index and contains the 2008 data on Rome Pond for water clarity. Again, a better understanding of Rome Pond's water quality index would be gained with phosphorus and chlorophyll data.

Table 3. Water Quality Index for Wisconsin Lakes with 2008 Rome Pond Data Indicated (adapted from Lillie and Mason 1983)

Water Quality Index	Water Clarity (feet)	Chlorophyll a (ug/l)	Total Phosphorus (ug/l)
Excellent	> 19.7	< 1	< 1
Very Good	9.8-19.7	1-5	1-10
Good	6.6-9.8	5-10	10-30
Fair	4.9-6.6 Rome Pond = 5	10-15	30-50
Poor	3.3-4.9	15-30	50-150
Very Poor	< 3.3	> 30	> 150

Dissolved Oxygen

Dissolved oxygen levels were measured at the deepest locations in both the east and west basins of Rome Pond. The dissolved oxygen levels in the west basin were good and ranged from 8.7 mg/l to 10.3 mg/l. However, the dissolved oxygen levels in the east basin ranged from 1.9 mg/l to 2.5 mg/l. Low dissolved oxygen is a concern for aquatic life. Fish need adequate dissolved oxygen to live in the lake – a minimal amount is 5 mg/l of dissolved oxygen.

FISH

The Surface Water Resources of Jefferson County (DNR 1968) states that the fishery consists of Northern pike, largemouth bass, bluegills, and black crappies. During the public meeting, citizens also reported the presence of smallmouth bass, bowfin, and carp.

ZEBRA MUSSEL SAMPLERS

Zebra mussel samplers were hung from piers in two different areas of the west basin. As of the date of this report, no zebra mussels were found in the lake. However, the landowners have agreed to continue to place the samplers in the lake. They will contact the Jefferson County Land and Water Conservation Department if any mussels are found. Any mussels found on the samplers will be verified by the DNR.

WILDLIFE

A large portion of the land surrounding the east basin of Rome Pond is owned and managed by the Department of Natural Resources as the Rome Pond Wildlife Area. The Rome Pond Wildlife Area consists of approximately 2,500 acres of public land. It has a long history of being managed for waterfowl use. In more recent years, efforts have been made to restore some of the oak savanna features on the adjacent uplands.

This wildlife area provides excellent opportunities for waterfowl hunting, deer hunting, and wildlife watching. The pond provides not only habitat for waterfowl migrating through the area but also nesting areas for many wetland species like the Black Tern.

Wildlife observed on or adjacent to the lake was document in 2008. The following is the list of species observed and documented by the public. Certainly, there is other wildlife that inhabits or visits the lake that was not documented.

Birds: Blue winged teal
Canada goose
Eagle
Egrets
Great blue heron
Green heron
Kingfisher
Merganzer
Red winged black bird
Sandhill crane
Swans
Purple martin
White pelicans
Wood duck

Fish: Carp

Mammals: Muskrat

Turtles: Painted turtle
Snapping turtle

Other: Backswimmer
Damselfly
Dragonfly
Leech

AQUATIC PLANTS

Aquatic plants are a vital part of a lake's ecosystem. Aquatic plants provide the following benefits:

- Aquatic plants filter runoff from uplands to protect lake water quality.
- Plant roots create networks that stabilize sediments at the water's edge where waves might otherwise erode the lakeshore.
- Submersed plants absorb phosphorus and nitrogen over their leaf surface and through their roots.
- Plants use nutrients, making them less available for nuisance algae.
- Aquatic plants create a thriving habitat for animals.
- Plants are essential to the spawning success of many fish species.
- Plants provide shade and refuge for near shore animals.
- Plants photosynthesize, creating oxygen for the animals that live in the shallow area.
- Plant fruits and tubers provide food for mammals, waterfowl, insects and fish.
- Native aquatic plants can limit aquatic invasive plant growth.

The aquatic plant community in Rome Pond was sampled in June 2008 according to the point intercept method. This method was performed according to the "Protocol for Aquatic Plant Survey – Collecting, Mapping, Preserving, and Data Entry" (Aron et al. 2006). Herbarium specimens were collected and submitted to the UW Madison Herbarium. The species found in the survey are listed in Table 4. There were a total of 23 aquatic plant species identified in 2008.

The following species were noted to be present in the lake, but were not associated with a sample point: Northern watermilfoil or a hybrid milfoil, white water crowfoot, long-leaf pondweed, common arrowhead , creeping spikerush.

It should be noted that the occurrence of flat-stem pondweed (*Potomogeton zosteriformis*) could be elevated because identification of herbarium samples included water stargrass (*Heteranthera dubia*) and a cross between flat-stem pondweed and small pondweed (*Potomogeton pusillus*). Both of these species were mistaken for flat-shetm pondweed during the survey.

Another herbarium sample was identified as Northern watermilfoil (*Myriophyllum sibiricum*) or perhaps a hybrid of Northern and Eurasian watermilfoil. The only way to determine if there is a hybrid watermilfoil in Rome Pond is to send fresh samples to a laboratory that is able to perform DNA sampling on the plants.

The summary of statistics from the 2008 sampling is contained in Table 5. Maps of the distribution and density of some of the plants are contained in Appendix B. There were a number of points that were not navigable due to shallow depths or very dense vegetation. The largest area that was not able to be sampled is the far east part of the lake. Visually, this area contained both white water lily and spatterdock.

Table 4. Aquatic Plants in Rome Pond, 2008

Aquatic Plant *Species name* Common name	**Plant Type**	**Coefficient of Conservatism**	**Ecological Significance**
Ranunculus trichophyllus White water crowfoot	S	8	Fruit and foliage are consumed by waterfowl. In shallow area it is sometimes consumed by upland game birds. Stems and leaves provide invertebrate habitat.
Decodon verticillatus Swamp loosestrife	E	7	Seeds are grazed by waterfowl. It can also be a locally important source of food and cover for muskrats.
Potamogeton nodosus Long-leaf pondweed	S	7	Fruit is eaten by ducks and geese. Portions of plant eaten by muskrat, beaver, and deer. Plant provides invertebrate habitat and foraging for fish.
Utricularia vulgaris Common bladderwort	S	7	Provides food and cover for fish.
Zannichellia palustris Horned pondweed	S	7	Fruit and foliage are grazed by waterfowl.
Cicuta maculata Water hemlock	E	6	The fruit is occasionally eaten by marsh birds, but is usually considered of low importance to wildlife.
Eleocharis palustris Creeping spikerush	E	6	
Zosterella dubia Water stargrass	S	6	Locally important food source for geese and ducks. Provides cover and foraging opportunities for fish.
Lemna trisulca Forked duckweed	FF	6	Food source for waterfowl. Provides cover for fish and invertebrates.
Myriophyllum sibiricum Northern water milfoil (or hybrid)	S	6	Leaves and fruit are often eaten by waterfowl. Provides excellent habitat for invertebrates as well as game fish.
Nuphar variegate Spatterdock	F	6	Provides shade and shelter for fish and habitat for invertebrates. Seeds are eaten by a variety of waterfowl. Leaves, stems, and flowers are eaten by deer. Rhizomes eaten by muskrat, beaver, and porcupine.
Nymphaea odorata White water lily	F	6	Provides shade and cover for fish and invertebrates. A food source for waterfowl, muskrat, and beaver.
Potamogeton zosteriformis Flatstem pondweed	S	6	Food source for waterfowl and wetland mammals. Provides cover for fish and invertebrates. Supports insects valuable as food source for fish and waterfowl.

Aquatic Plant *Species name* Common name	**Plant Type**	**Coefficient of Conservatism**	**Ecological Significance**
Lemna minor Small duckweed	FF	4	Important food source for ducks and geese. Consumed by muskrats, beaver, and fish. Provides shade and cover for fish and invertebrates. Extensive mats of duckweed can inhibit mosquito breeding.
Ceratophyllum demersum Coontail	S	3	Provides good shelter for young fish, supports insects valuable as food for fish and ducklings, and fruits are eaten by waterfowl.
Elodea canadensis Common waterweed	S	3	Offers valuable shelter and grazing opportunities for fish. Also provides food for muskrats and waterfowl that eat the plant itself or the wide variety of invertebrates that use the plant as habitat.
Stuckenia pectinata Sago pondweed	S	3	Fruits and tubers are a very important food source for a variety of waterfowl. Supports insects that are eaten by game fish and also provides cover for young game fish.
Sagittaria latifolia Common arrowhead	E	3	
Lythrum salicaria Purple loosestrife - Invasive species -	E		Little wildlife value: The seeds are low in nutrition, and the roots are too woody. The flowers are attractive to insects and produce nectar, regularly visited by honeybees.
Myriophyllum spicatum Eurasian water milfoil - Invasive species-	S		Waterfowl graze on fruit and foliage to a limited extent. Habitat for insects but not as good as other plants.
Phalaris arundinacea Reed canary grass - Invasive species -	E		Low food value, but offers summer cover and habitat for waterfowl at disturbed sites.
Potamogeton crispus Curly-leaf pondweed - Invasive species -	S		Provides winter and spring habitat for fish and invertebrates. Mid-summer die-off releases nutrients which may trigger algae blooms and create turbid water conditions.
Typha angistifolium Narrow-leaved Cattail	E		Naturalized exotic, provides nesting habitat for waterfowl and wetland birds. Roots and shoots are often eaten by muskrats and geese. Provides spawning habitat for some fish.
Filamentous algae	S		Provides habitat for many micro and macro invertebrates which are in turn used as food by fish and other wildlife species.

Table Key: E= Emergent F= Floating
S= Submerged FF = Free Floating

Table 5. Summary of Statistics of Aquatic Plant Sampling

Total number of points set-up	352
Total number of points sampled	274
Total number of sites with vegetation	261
Total number of sites shallower than maximum depth of plants	274
Frequency of occurrence at sites shallower than maximum depth of plants	95.26
Simpson Diversity Index	0.86
Maximum depth of plants (ft)	7.50
Average number of all species per site (shallower than max depth)	3.22
Average number of all species per site (veg. sites only)	3.38
Average number of native species per site (shallower than max depth)	2.42
Average number of native species per site (veg. sites only)	2.99
Species richness	15
Species richness (including visuals)	20
Species Richness (including visuals and boat survey)	23

There are several ways to analyze aquatic plant data for a lake. These include the coefficient of conservatism, the floristic quality index, the frequency of occurrence, the relative frequency of occurrence, and the Simpson Diversity Index.

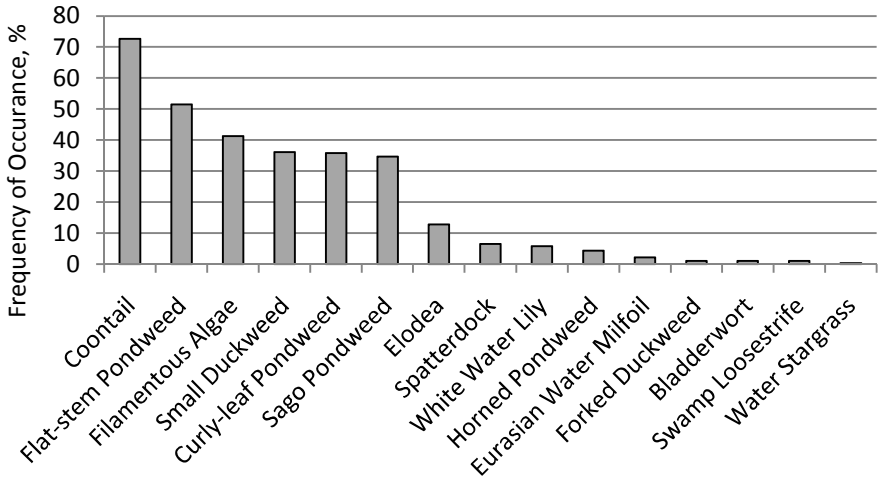
The Coefficient of Conservatism is a number on a scale from 0 to 10 that represents an estimated probability that a plant species is likely to occur in a lake unaltered from what is believed to be pre-settlement conditions. A Coefficient of 10 indicates the plant is almost certain to be found only in an undegraded natural community, and a Coefficient of 0 indicates the probability is almost 0. Introduced plants were not part of the pre-settlement flora, so no coefficient is assigned to them. In addition, hybrid species do not have an assigned coefficient. Table 4 lists the species from highest coefficient to lowest. The average Coefficient of Conservatism for Rome Pond is 5.5.

The floristic quality index (FQI) is used to assess a lake's quality using the aquatic plants that live in it. Developed by Stan Nichols (WI Geological and Natural History Survey), the floristic quality index is the average coefficient of conservatism multiplied by the square root of the number of plants in the lake. The FQI varies around Wisconsin but ranges from 3.0 to 44.6 with a median of 22.2. Generally, higher FQI numbers mean better lake quality. The floristic quality index for Rome Pond is 27.5.

The frequency of occurrence for a plant species is the number of times a species is observed, divided by the total number of sampling points contained within the area shallower than the maximum depth of plants in a lake. The maximum rooting depth of Rome Pond is 7.5 feet. The frequency of occurrence for Rome Pond is contained in Chart 3.

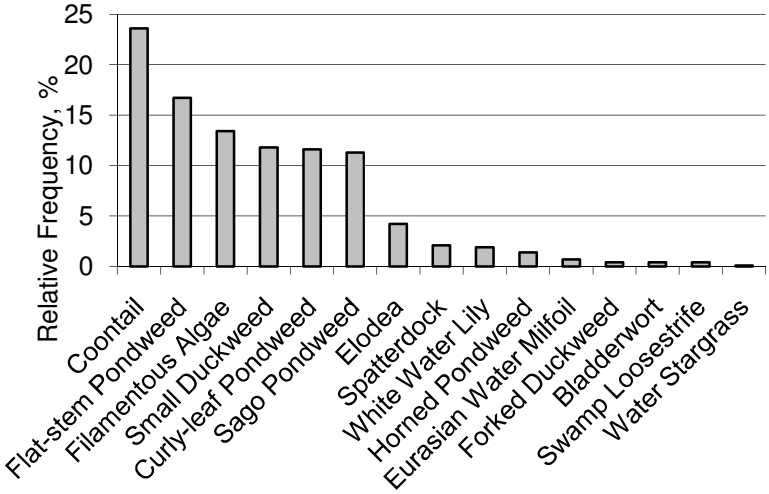
Filamentous algae was very prevalent in Rome Pond during the 2008 survey. It might be the case that filamentous algae was worse than normal years because of the higher than normal precipitation events that delivered more phosphorus to the lake.

Chart 3. The Frequency of Occurrence for Rome Pond Aquatic Plants



The relative frequency of occurrence gives an indication of how the plants occur throughout a lake in relation to each other. It is the frequency of a species divided by the sum of the frequencies of all species. The sum of the relative frequencies should be equal to 100%. The relative frequency of occurrence for the aquatic plants in Rome Pond is shown in Chart 4.

Chart 4. Relative Frequency of Occurrence for Rome Pond Aquatic Plants



Based on the Simpson Diversity Index (one minus the sum of the relative frequencies squared) for the community, the closer the index value is to one, the greater the diversity within the lake. The Simpson Diversity Index for Rome Pond is 0.86.

PUBLIC INPUT

The project manager with the Jefferson County Land and Water Conservation Department attended several meeting of the Rome Pond Improvement Association to update the group on the project and obtain their input. In addition, on February 10, 2010, a public meeting was held to present the data and obtain public comments on usage of the lake and the draft report.

The following are citizen comments on lake usage:

- There is a lot of canoe and kayak usage of the lake (from inlet to dam) during the early summer and early fall.
- Navigation from the inlet to the dam is very restricted in the late summer due to dense plant growth.
- Paddle boats use the lake early in the season.
- Pontoon boats are not used on the lake.
- Swimming occurs in the deep area of the west basin of Rome Pond.
- Fishing occurs around the island, along the west side of the lake, by the dam, and by the boat launch.
- Bow fishing for carp is done on the lake.
- Ice fishing usually occurs just east of the island in the west basin.
- During the fall, there are numerous waterfowl hunters using the lake.

The public also reported fish and wildlife they viewed on the lake. This information is contained in the lake characteristics section of the report.

The public was in agreement that the plant population is dense and restricts boat access and recreation. In the summer, there is not much open water for recreation. They knew that full control of the plants is not feasible at this time because of the expense. However, they agreed that if the river channel through the lake could be controlled, then recreation would be improved.

Workshop on Aquatic Invasive Species

On June 6, 2009, the Jefferson County Land and Water Conservation Department held a workshop on aquatic invasive species in Rome, WI. This workshop followed the training guidance developed for the Citizen Lake Monitoring Network Aquatic Invasive Species Monitoring Program.

There were 16 citizens in attendance that represented 6 different lakes in 3 counties. Citizens learned how to monitor their lakes for a variety of aquatic invasive species. Each lake represented by citizens at the training received a monitoring kit.

GOALS, RECOMMENDATIONS, AND IMPLEMENTATION

Problem Identification

In the course of this study, a number of problems facing Rome Pond were identified.

Aquatic Exotic Plants

The lake contains two exotic plant species: Eurasian water milfoil, and curly-leaf pondweed. Curly-leaf pondweed is found throughout the lake. Curly-leaf pondweed is a plant that dies off in late June or early July. The decaying plant matter releases phosphorus into the water, resulting in algae blooms and sometimes decreases in oxygen.

Eurasian water milfoil was only found in a few locations (6 sites with plants on the rake, and one visual site). However, some of these milfoils could have possibly been a hybrid of Northern watermilfoil and Eurasian watermilfoil. It is not possibly to visibly identify a hybrid milfoil – laboratory analysis is required.

Both Eurasian water milfoil and curly-leaf pondweed potentially have negative impacts to a lake ecosystem. Eurasian water milfoil and curly-leaf pondweed can grow to the surface of the water (and the milfoil continues to grow across the surface). This is especially true in Rome Pond because the lake is very shallow. This can significantly hamper boat passage and other recreational activities such as swimming. Both Eurasian water milfoil and curly-leaf pondweed can out-compete native plant species and form dense beds. These growth patterns negatively impact the native plants that provide many benefits to the lake. Fish are also impacted by the growth patterns of exotic species because the dense beds of exotic species prevent fish passage and do not supply ideal fish habitat.

More information on aquatic exotic species and their impacts on recreation and lake ecology can be found at the following DNR website: http://dnr.wi.gov/invasives/aquatic/.

Sometimes native plants can become a nuisance in a lake. This is the case for coontail in Rome Pond. Coontail is the most prevalent plant in the lake as it was found in 199 points of the 261 vegetated points sampled. However, the average density of coontail (scored 1-3) was a 1 in the plant survey.

Dissolved Oxygen

Dissolved oxygen levels in the east basin were very low – less than the 5 mg/l that is needed to support fish.

Goals

The goal of the aquatic plant management plan for Rome Pond is to control the invasive species so that recreational opportunities are increased and water quality is improved. The ultimate goal would be to have only 10% lake coverage of invasive species as measured by frequency of occurrence.

Achieving this goal would likely result in improving the dissolved oxygen levels in the east basin.

It is important to note that achieving this goal will not be possible without local funding for invasive aquatic plant control techniques. As of the writing of this report, local funding is not available.

Recommendations

Aquatic Plants

Samples of Eurasian watermilfoil, Northern watermilfoil, and the potential hybrid milfoil should be taken from the lake and sent to a laboratory that is able to perform DNA sampling on the plants. *Implementer: Jefferson County LWCD, DNR; Timeframe: by 2013; Funding: LWCD staff time, DNR funding of lab costs.*

Because the Eurasian watermilfoil was found only in a few locations (6 sites with plants on the rake, and one visual site), those areas should be visited and any Eurasian watermilfoil should be hand picked. This activity should be done early in the summer when there is less plant growth and navigability is not excessively hampered. *Implementer: citizen volunteers, Jefferson County LWCD; Timeframe: 2012, then as needed; Funding: LWCD staff time.*

Reducing the population of curly-leaf pondweed in Rome Pond could help to reduce the internal loading of phosphorus in the lake and help to deter the loss of dissolved oxygen. It should be noted however, that these benefits may be very minimal given the productivity of the native plants in the lake. However, additional benefits could include: better navigation because of reducing the density of plants in the lake; and benefits to the fish population because they would have greater passage through areas without dense plant growth.

Mechanical control of curly-leaf pondweed with use of a harvester is not very viable given the shallowness of the lake. DNR permits do not allow a harvester to be used in areas with less than 3 feet of depth.

Chemical control of curly-leaf pondweed would require a commitment of at least 4 years of spring treatments. This is the case because curly-leaf pondweed produces winter buds that are deposited in the sediments and can be viable for several years. It is important to note that aquatic invasive species control through herbicides is an

expensive endeavor (current costs are approximately $400 per acre). Even with DNR grants, there will always be a local match. Lakes in Wisconsin that do this control typically have lake districts with taxing authority. Unless there is a local match to pay for part of the long-term treatment, invasive plant control will not be viable for Rome Pond.

Water level drawdown is one option to control curly-leaf pondweed in Rome Pond because of the existence of the outlet dam for the lake. A drawdown would take place in the fall and last through the winter with a return to normal levels in the spring. The idea is that exposed sediment would dry and freeze and would kill the curly-leaf turions and young plants. The drawdown would need to begin in early fall or else hibernating reptiles and amphibians would be killed. Lake sediments should be dry before freezing to make the drawdown effective. However, a mild winter or an early snow cover could nullify any benefits. An early deep snow cover could eliminate a hard sediment freeze, and prevent a substantial kill of curly-leaf pondweed.

Besides reducing the population of curly-leaf pondweed, a drawdown could result in a consolidation of loose sediments. Some studies of the impacts of drawdowns on native plants show that coontail, the most dominant plant in the lake, could decrease it's abundance which could be a good thing given the density of the plant in the lake. In addition, decreases in Eurasian watermilfoil are common with drawdowns.

Drawdowns have some disadvantages that include the following:

- Adjacent wetlands could be negatively impacted.
- There is a potential for fish kills in the winter because the oxygen could become depleted with lower water levels.
- There could be some recreational impacts such as the inability of waterfowl hunters to access the lake in the fall and the reduction or elimination of ice fishing during the drawdown.
- The drawdown could increase or decrease the abundance of some native aquatic plants.

Another aspect of drawdowns is that an Environmental Assessment would be required to evaluate alternatives, benefits, and drawbacks. Part of this process, as regulated by the DNR, would include sufficient public notice as well an opportunity for the public to comment on the proposed plan. And certainly, the management of the dam and the impacts of a drawdown on the dam would need to be evaluated.

There are upstream sources of curly-leaf pondweed. In addition, any areas that remain under water during the drawdown will not have the curly-leaf turions killed. Therefore, the likelihood of the lake continuing to be infested with curly-leaf pondweed is high. Regular water drawdowns (perhaps every 3 years) would be needed to keep curly-leaf pondweed from reaching nuisance levels.

Citizens with lake frontage are able to employ limited nuisance aquatic plant control by manually removing exotic species in front of their properties. A DNR permit is not

required for the manual removal of rooted aquatic plants provided that the removal meets ALL of the following:

- Removal of native plants is limited to a single area with a maximum width of no more than 30 feet measured parallel to the shoreline. Any piers, boatlifts, swim rafts, and other recreational and water use devises must be located within that 30 foot wide zone.
- Removal of nonnative plants designated by the DNR (such as Eurasian watermilfoil, curly-leaf pondweed) is allowed when performed in a manner that does not harm the native aquatic plant community.
- Removal of plants from the water is required. This is very important because some plants can effectively re-root if they are left to float in the water.
- The location is NOT in a sensitive area or in an area known to contain threatened or endangered resources. Sensitive areas in Rome Pond have not been designated by the DNR.
- The removal does not interfere with the rights of other lakeshore owners.

A permit is required from the Department of Natural Resources if the manual removal does not adhere to all of the requirements listed above. Please note that there is no permit required for manual removal of ***free-floating*** plants that wash up and accumulate along the shore.

Manual removal of rooted plants other than Eurasian water milfoil and curly-leaf pondweed is not recommended. If native plants are removed from an area, that location will be prone to colonization by Eurasian water milfoil and curly-leaf pondweed. The growth of these two exotic species is much more of a nuisance than native plants because of their tendency to grow in dense populations and to grow to the surface of the water.

If landowners are not sure which plants are exotic and which are native, they can contact the LWCD or the DNR for identification information for Eurasian water milfoil and curly-leaf pondweed.

The DNR should be consulted for guidance in terms of aquatic plant control and permit requirements. Herbicides, mechanical removal, and in some instances hand removal of plants require a permit. In addition, DNR Rapid Response grants are available throughout the year to combat new discoveries of invasive species in a lake. *Implementers: future lake group, citizens, Jefferson County LWCD, Town of Lake Mills; Timeframe: when there is a local sponsor for a control program; Funding: DNR grants, local funding, LWCD staff time.*

Monitoring

Currently, there is a citizen lake monitor that measures water clarity in Rome Pond. It would be beneficial for the monitor to be trained to also take samples for phosphorus and chlorophyll *a*. This additional information would give lake managers a better understanding of the water quality of Rome Pond. The Jefferson County LWCD or the

DNR can provide this training. *Implementer: citizen monitor, Jefferson County LWCD; Timeframe: 2011-2012, then ongoing; Funding: DNR funded program.*

Several citizens (5) who live on Rome Pond attended the aquatic invasive species monitoring training. However, the only monitoring that has been done includes the zebra mussel samplers. These citizens should be encouraged to search for other species and report their findings to the Jefferson County LWCD or they should enter their data on the DNR website for the Citizen Lake Monitoring Network. *Implementers: citizen monitors, Jefferson County LWCD; Timeframe: 2011-2012, then ongoing; Funding: LWCD staff time.*

Education

Education is key to preventing the spread of invasive exotic species. The signage at the boat launch should be determined. A new aquatic invasive species sign is now available and should be posted at the launch if it is not already there. The launch owner is the Jefferson County Parks Department and they should be contacted for permission to install this sign. *Implementer: Jefferson County LWCD, Jefferson County Parks Department; Timeframe: 2011; Funding: not needed.*

Other educational activities include press releases regarding invasive species and citizen training events. *Implementer: Jefferson County LWCD; Timeframe: ongoing; Funding: LWCD staff time.*

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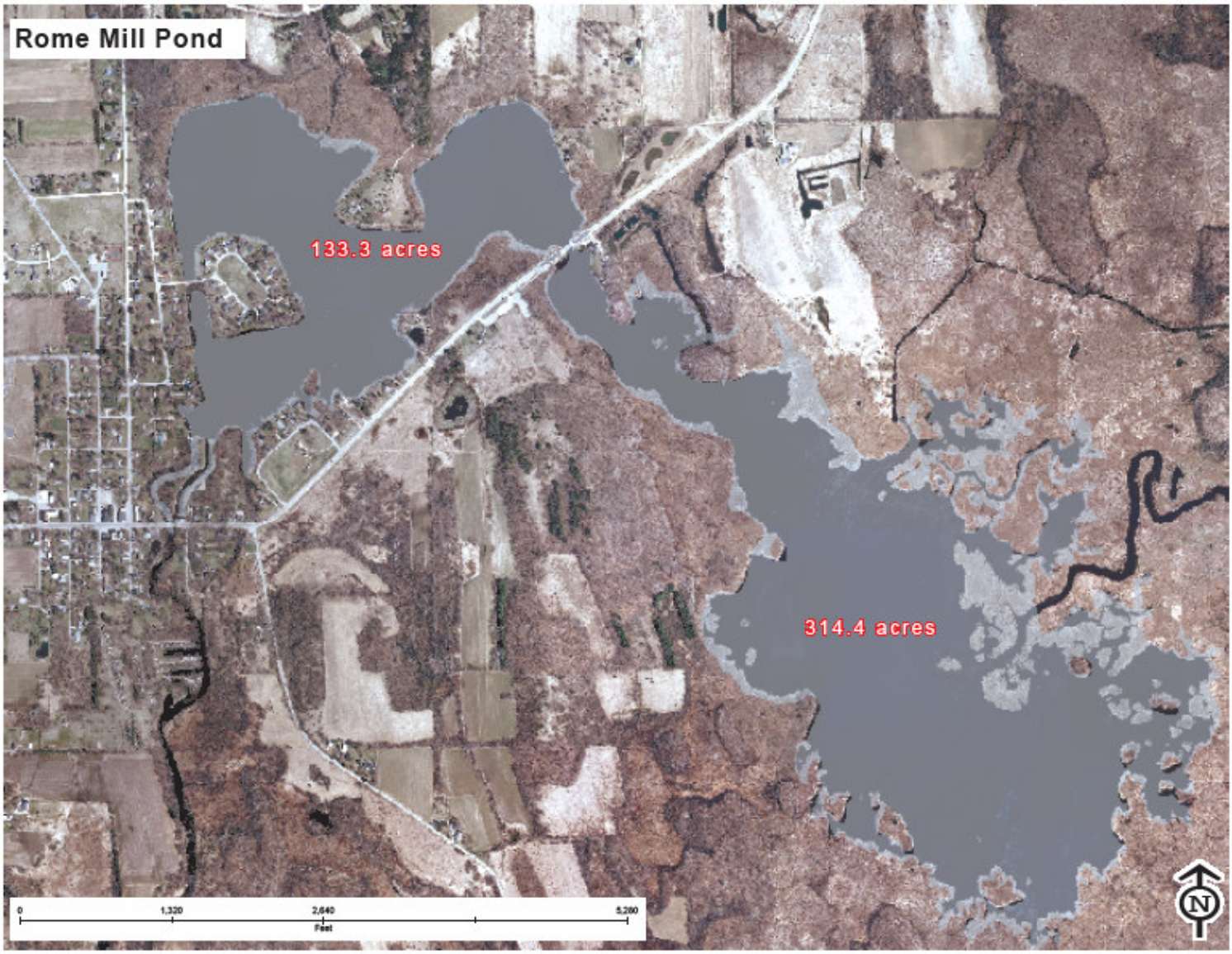
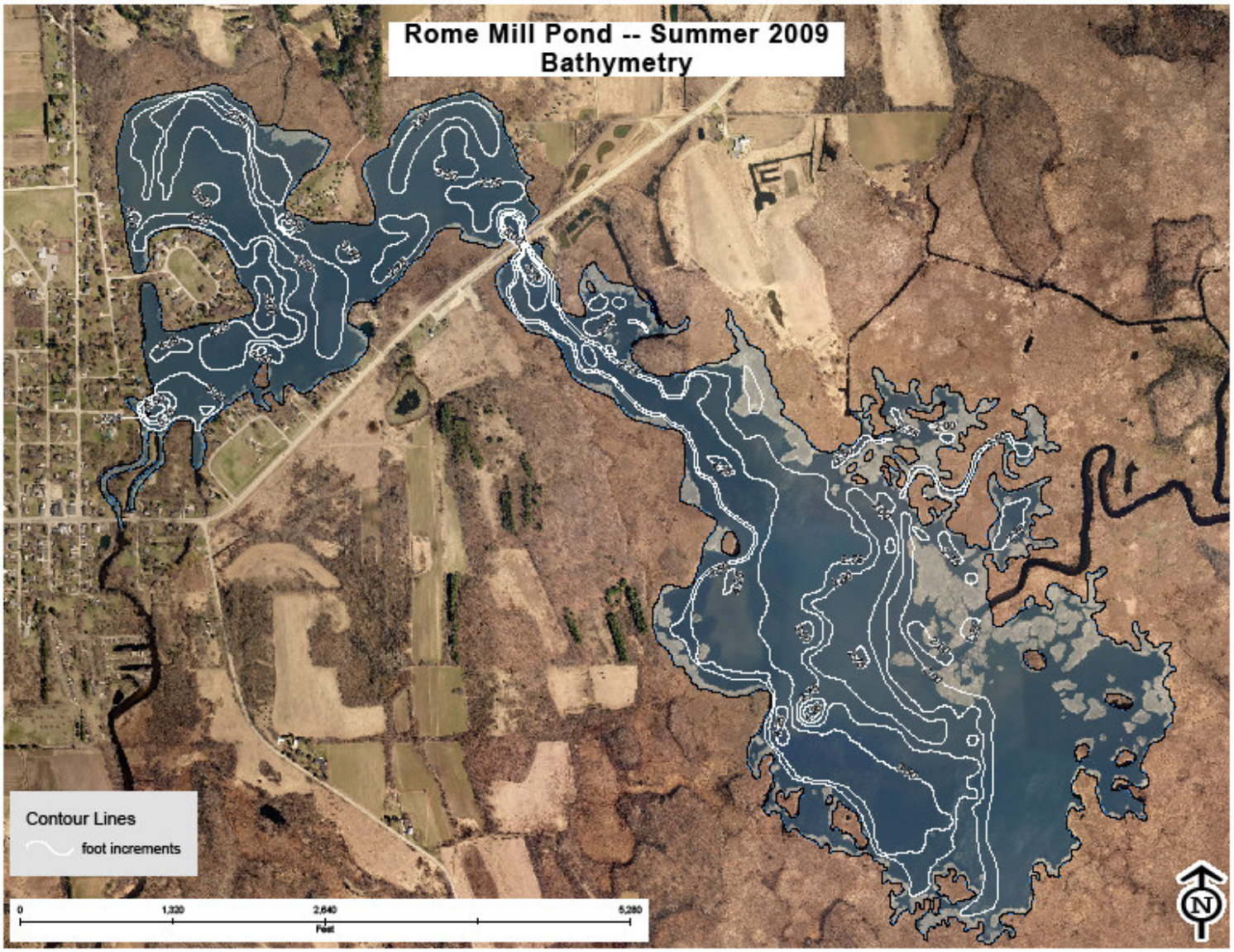
APPENDIX A

Lake Characteristics Maps

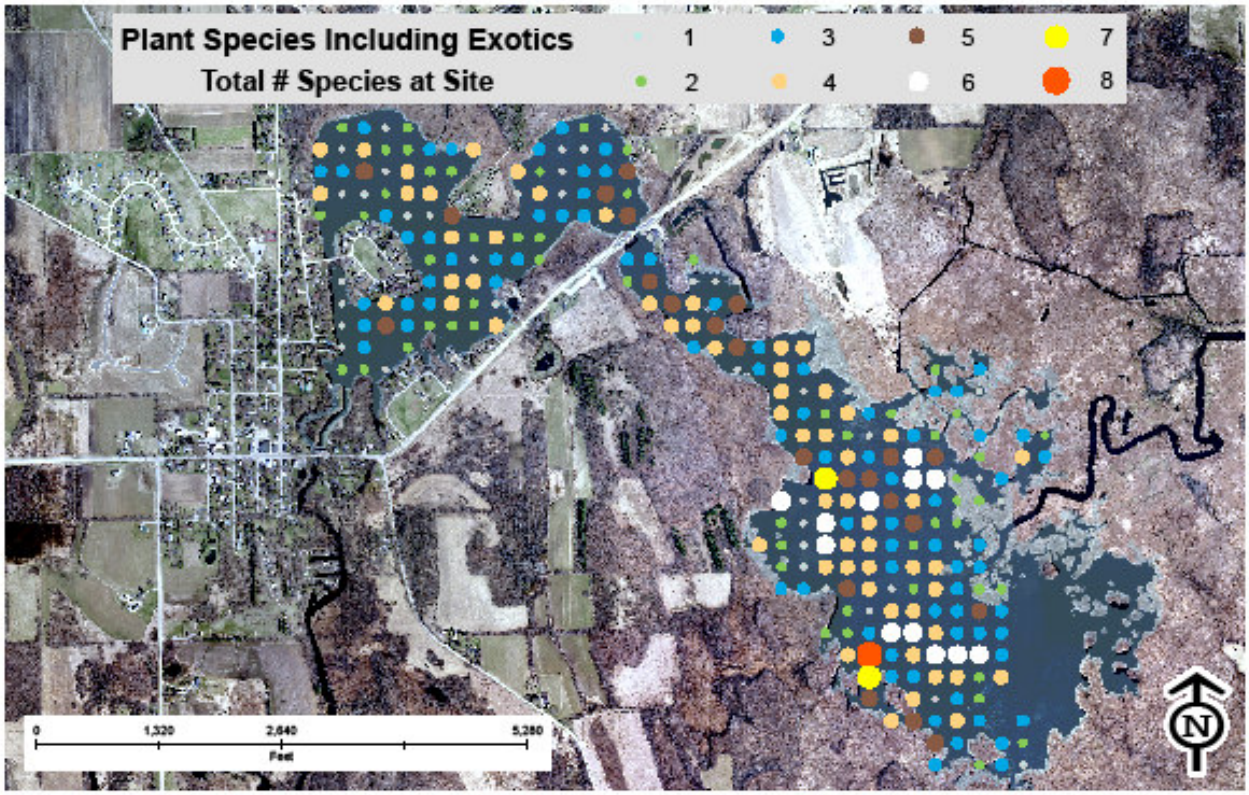

Rome Mill Pond
133.3 acres
314.4 acres
0
1,320
2,640
5,280
Feet
N

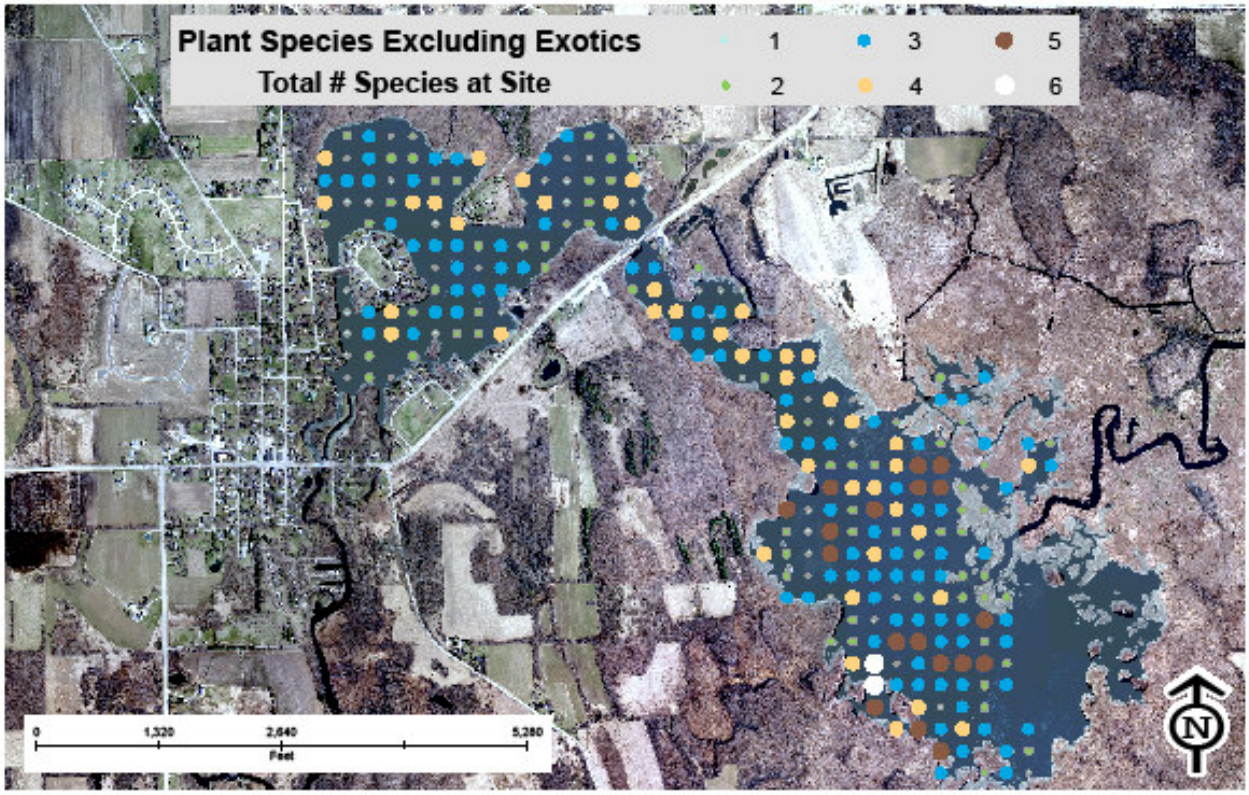

Rome Mill Pond -- Summer 2009
Bathymetry
Contour Lines
foot increments
0
1,320
2,640
5,280
Feet
N

APPENDIX B

Aquatic Plant Density and Distribution Maps

Rome Mill Pond Total Number of Plant Species





Aquatic Plant Densities

Rake Sampling Plant Density
1 = Few Plants on Rake
2 = Rake head 1/2 - full
3 = Rake overflowing