

# AQUATIC PLANT MANAGEMENT PLAN FOR SPRINGVILLE POND, PORTAGE COUNTY, WISCONSIN

**March 2007**



**Prepared By:  
University of Wisconsin Stevens Point  
Center for Watershed Science and Education  
Kelly Mumm and Nancy Turyk**



## **Springville Pond Aquatic Plant Management Plan Committee Members:**

The Springville Pond Management Committee (SPMC) consisted of a Village of Plover Administrator, two Village Board members, one Chairman, and four citizen members. The SPMC was created by the Village prior to the receiving the Aquatic Plant Management grant, to address concerns and decisions related to Springville Pond.

- Thomas Davies, Board Member
- Nancy Freund, Citizen Member
- Jim Gifford, Chairman and Citizen member
- Mike Kochinski, Citizen Member
- Fred LaRosa, Board Member
- Warren Lensmire, Citizen Member
- Dan Mahoney, Village of Plover Administrator
- Pat Martin, Citizen Member

## **A special thank you for additional support:**

- Jeff Hartman, GIS/LIS Manager, Portage County Planning and Zoning
- Deborah Konkell, Water Resources Management Specialist WDNR
- Amy Kowalski, UW- Lakes Extension Program
- Buzz Sorge, Land Management Planner WDNR
- Amy Thorstenson, Executive Director of Golden Sands Resource Conservation & Development
- Bonnie Wizek, Village of Plover Secretary



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Developing an aquatic plant management plan is a large undertaking that involves informed decisions and familiarity of citizen opinions. Development of the plan needs to consider the aquatic ecosystem as well as the community and public. In the case of Springville Pond, wildlife and fish habitat, water quality, and physical characteristics of the pond along with the extent of the aquatic plant problem needed to be balanced with aesthetic and recreational use of the waterbody.

The beginning of this document contains background information about the pond followed by a summary of the citizen survey. The plan to address aquatic plants in Springville Pond is in the later part of this document. The plan is dynamic and will need to be evaluated annually.

### **Springville Pond Aquatic Plant Management Plan Background:**



*Fall colors on Springville Pond.*

The Springville Pond Committee, citizens, Village of Plover, UW-Stevens Point Center for Watershed Science and Education (CWSE), and the Wisconsin Department of Natural Resources (WDNR) worked together for the creation of the Springville Pond Aquatic Plant Management Plan. The APM was carefully developed in order to achieve the best plan that considered the plant ecosystem of Springville Pond, the wildlife and fisheries of Springville Pond, and the recreation in the pond.

The creation of the Springville Pond APM was conducted by the Springville Pond Committee with the help of CWSE. The WDNR provided technical expertise and funding throughout the process. In addition to providing an opportunity for input, the process of producing the APM also provided an forum for local citizens to learn about Springville Pond, the important role the aquatic ecosystem plays in the pond, and how their actions and land use activities can produce different outcomes.

The Springville Pond committee met five times between October 2006 and February 2007. Presentations and technical support was provided by Nancy Turyk (UWSP Water Resource Scientist) at each meeting. Other sources of technical support at the meetings came from Buzz Sorge (Lake Management Planner, WDNR) and Deborah Konkel (Aquatic Plant Specialist, WDNR). The presentations and technical support helped to provide important information on aquatic ecosystems and Wisconsin laws to inform the committee about different management techniques that can be used specific for Springville Pond.

The committee wanted to query public's opinion about Springville Pond prior to developing their suggested aquatic plant management techniques

and treatments so a survey was produced and mailed to residents in November 2006. Out of the 53 surveys mailed, seventy five percent (40) were returned.

### ***APM Goals:***

The Springville Pond Committee selected five main goals for this plan/process:

- 1) Feasibly minimize the amount of Eurasian watermilfoil to a controllable state.
- 2) Enhance Springville Pond's native aquatic plant community and ecosystem.
- 3) Improve the aesthetic beauty and recreation on Springville Pond.
- 4) Reduce the odors from Springville Pond
- 5) Educate the waterfront homeowners on the importance of a sustainable aquatic ecosystem and how their actions affect the aquatic ecosystem.

### **Brief Description of Springville Pond and Its Watershed**

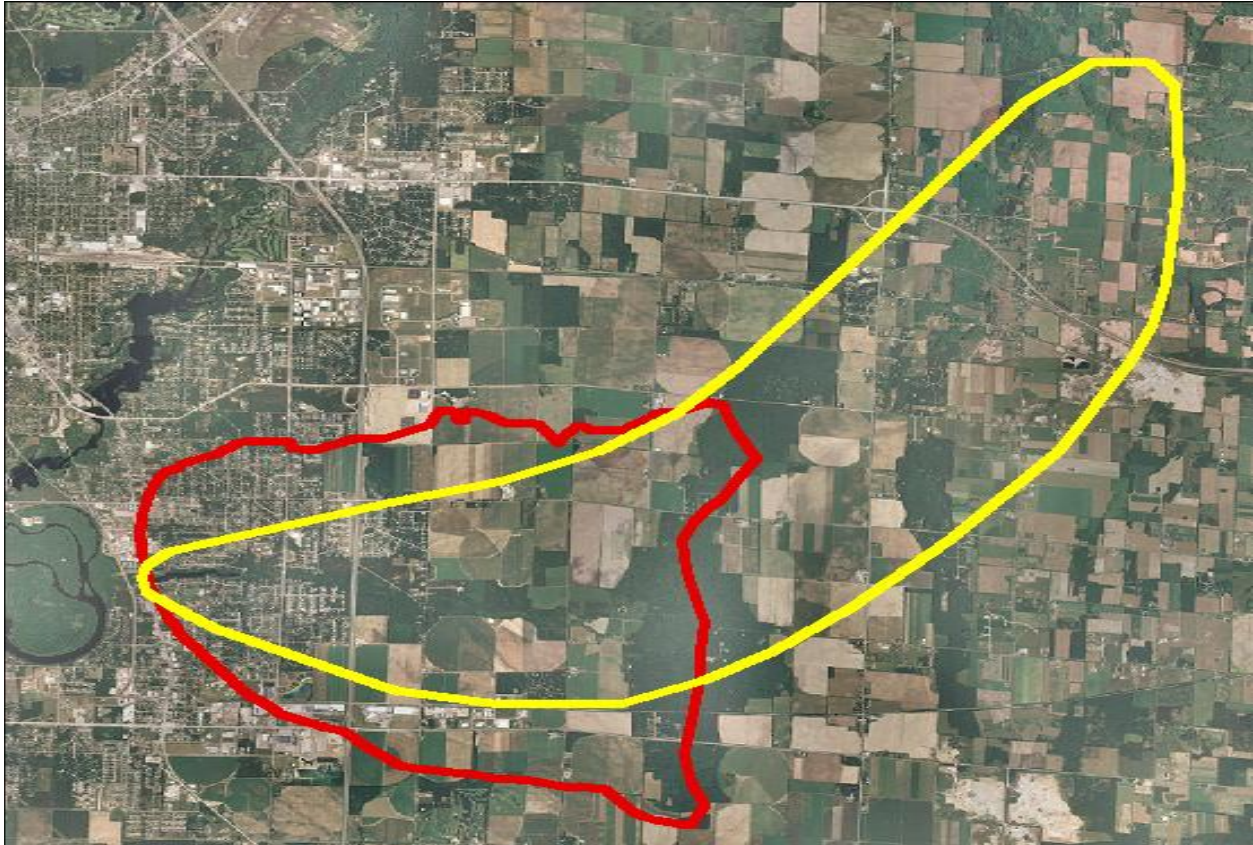
Springville Pond is located on the east side of Business 51 (also known as Post Road) in the Village of Plover. Springville Pond is an 18 acre impoundment that was created by a dam on the Little Plover River, a Class 1 trout stream. Springville Pond has a maximum depth of 12 feet and an estimated volume of 107.3 acre-feet (Figure 1). The majority of the water in the pond comes from the Little Plover River. Other sources of water are runoff, groundwater, and precipitation. The groundwater and surface watershed boundaries are show in Figure 2. The fishery in Springville Pond includes largemouth bass, panfish, and trout. Since motor boats are not allowed for use on the pond, it is moderately recreated with low-impact usage mainly from local residents.

The sandy, highly permeable soils common in this watershed allow for rapid infiltration of water to groundwater. The water moves quickly from the surface to groundwater, so pollutants are not held in the soils as they would be in clay. Thus, the land use activities have a greater impact on ground water quality in this watershed than in other areas with heavier, less permeable soils that can filter out contaminants (Lambert, Lee & Associates). Within the surface watershed there are three dominant land uses which include: forest, residential, and agriculture. The most prominent land use within 1000 feet of the shoreline of Springville Pond is residential. Residential land use has significantly increased around the pond in the last fifty years (Figure 3 and 4, UWSP, 2005). There is also one public park that is located on the southwest shoreline where the public can use for carry-in boating access.

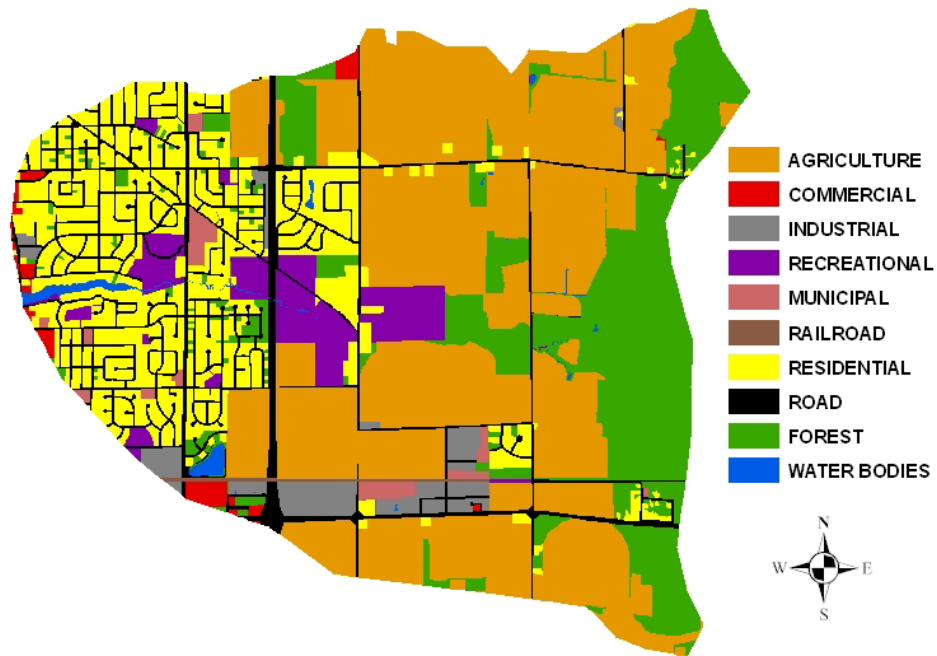
**Figure 1. Map of Springville Pond showing depth contours. (Portage County Planning and Zoning**



**Figure 2. Map of Springville Pond Watershed boundaries.**



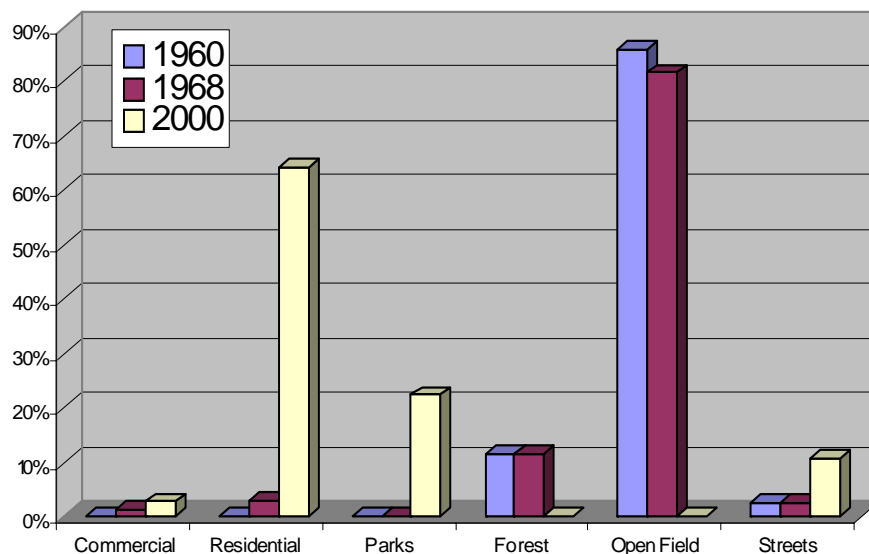
**Figure 3. Land Use in the Springville Pond Surface Watershed 2002.**



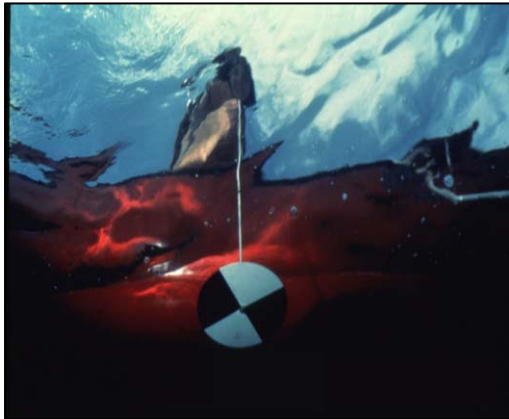
**Table 1. Land cover within 1,000 feet of Springville Pond between 1960 to 2000 (UWSP, 2005)**

Cover (acres)	1960	1968	2000
Impervious Surface	4	8	50
Open Fields	185	175	0
Forest	25	25	0

**Figure 4. Percent Land Cover within 1000 feet of Springville Pond (UWSP, 2005)**



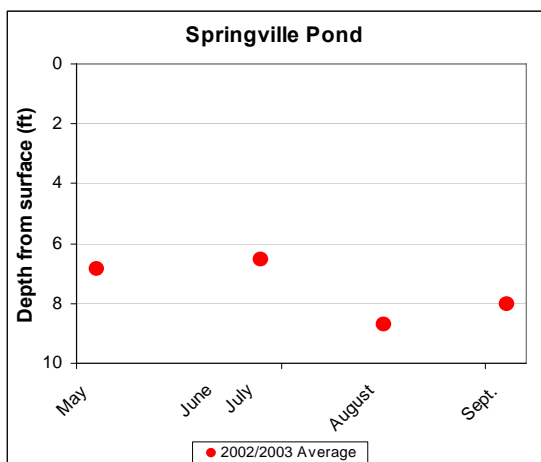
## Water Quality and Quantity



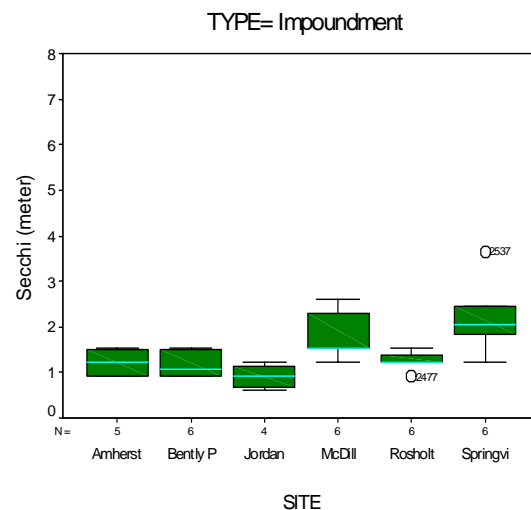
Several measures are used to characterize water quality in a pond as it relates to aquatic plants and algae. The most common measures are water clarity (Secchi depth), chlorophyll *a* (a measure of algae), and nutrients (nitrogen and phosphorus).

Water clarity is a measure of how deep light can penetrate. It is an aesthetic measure and is related to how deep rooted aquatic plants can grow. Water clarity is affected by water color, turbidity (suspended sediment), and algae (chlorophyll *a*). Compared with other ponds in Portage County the water clarity in Springville Pond is considered good. The average Secchi depth for similar ponds in Portage County was 5 feet (Figure 6) clarity in Springville Pond was better. During 2002-03, the water clarity of Springville Pond was the best during the month of August and the worst during July (Figure 5). These fluctuations throughout the summer are normal as algae populations and sedimentation increase and decrease.

**Figure 5. Monthly average water clarity measurements in Springville Pond 2002-2003.**



**Figure 5. Comparison of Secchi readings for all impoundments in Portage County (2004).**

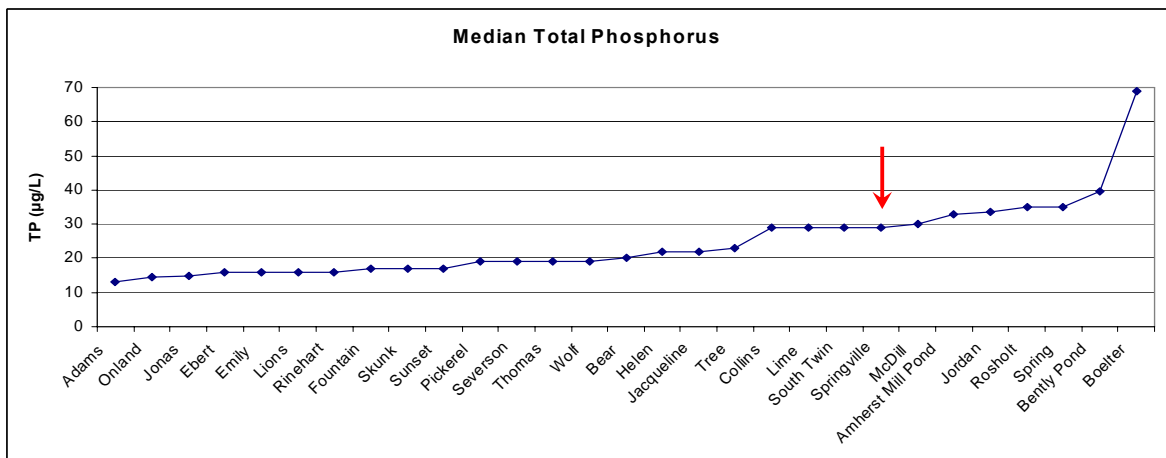


Nutrients (phosphorus and nitrogen) are important measures of water quality in lakes because they are used for growth by algae and aquatic plants (similar to houseplants and crops). On average, phosphorus concentrations in Springville Pond were elevated but similar to other impoundments in Portage County (Figure 6). Although phosphorus concentrations were quite low during spring and fall, they increased

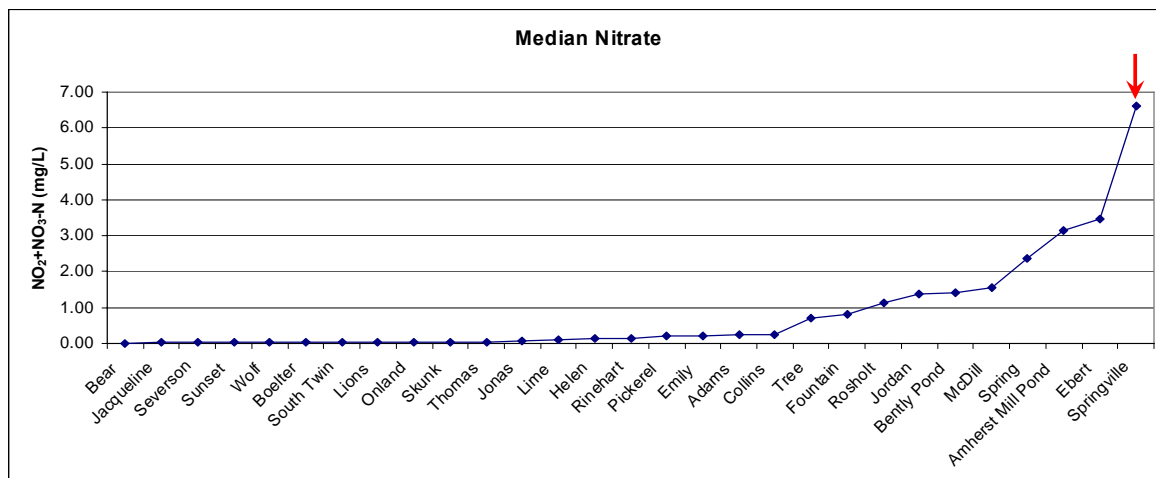
significantly during the summer when aquatic plants and algae are growing. These concentrations were enough to fuel nuisance algae blooms and abundant aquatic plant growth.

Nitrogen concentrations were extremely elevated for surface water (particularly nitrate) however these concentrations are similar to those measured in the Little Plover River and local groundwater (Figure 7). Phosphorus and nitrogen can be significantly increased by exposing soil, animal waste, septic systems, re-suspending bottom sediments, and lawn/garden/agriculture fertilizer. Efforts should be made to substantially reduce phosphorus and nitrogen in Springville Pond. Timing and the amount of aquatic plant removal must be approached with caution as removing too much biomass could result in more frequent algae blooms.

**Figure 6. Median total phosphorus concentrations measured during the 2003/03 Portage County Lake Study.**



**Figure 7. Median nitrate (NO<sub>2</sub>+NO<sub>3</sub>-N) concentrations measured between and in the Portage County Lake Study**



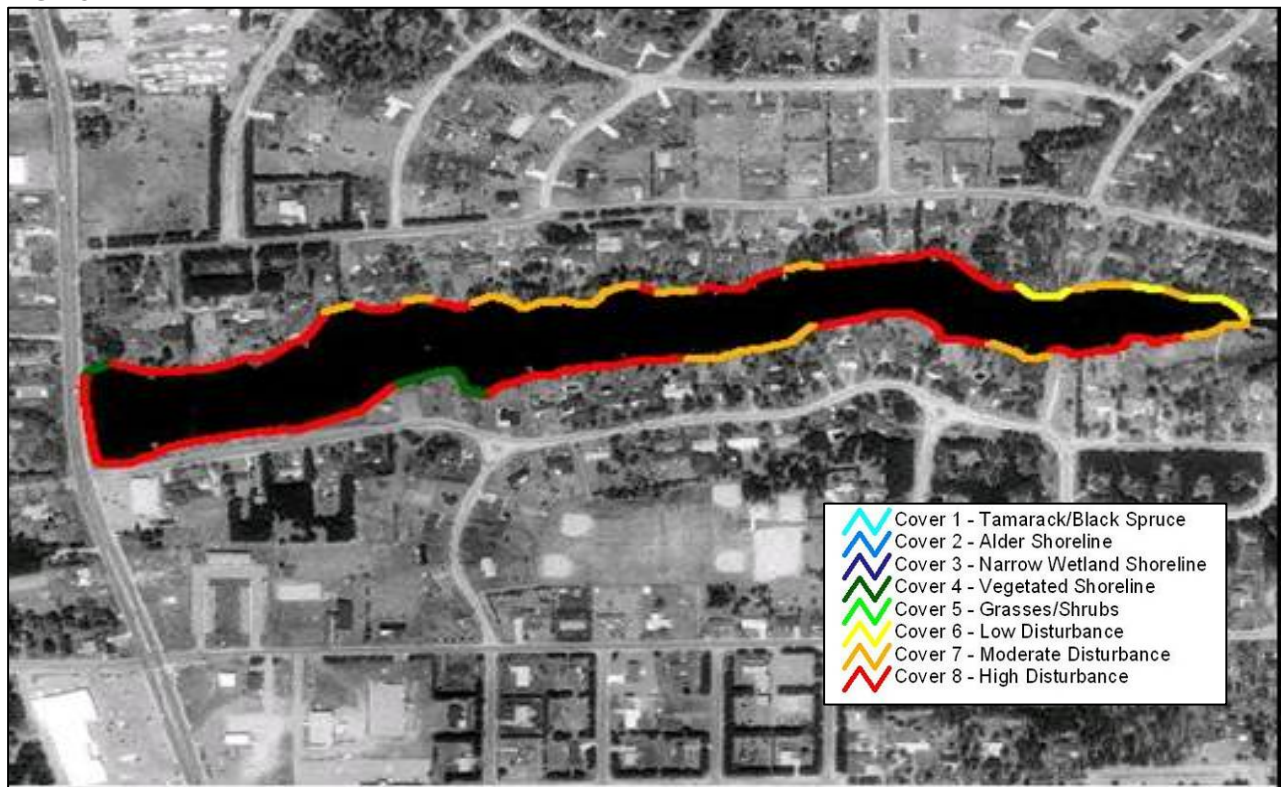
## Aquatic Vegetation and Shoreline Wildlife Habitat

The UWSP Center for Watershed Science and Education conducted a study on all the lakes in Portage County between the years 2002 – 2004. Shoreline vegetation is a critical area around a lake or river that provides habitat for many animals, filters runoff, utilizes nutrients, and reduces soil erosion. The WDNR recommended distance from shore for effective buffers is a minimum of 30 feet. Ideally the buffer should be a mix of grasses/forbs, shrubs, and trees.



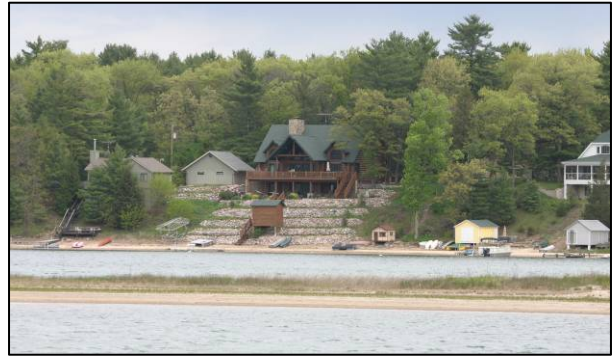
The following is an excerpt from the Portage County Study Results and Discussion for Springville Pond. The shoreline around Springville Pond includes 5.1% vegetated shoreline. Vegetated shoreline is characterized as being upland areas with dense vegetation comprised of undisturbed natural tall grasses or shrubs that lacks a rocky component. It is represented by dark green in (Figure 8).

**Figure 8. Shoreline Vegetation and Disturbance around Springville Pond.**



In 2004 95% of the shoreline was considered to be disturbed. Of that, 5.8% of the lake's shoreline vegetation was considered low disturbance, 26.2% was moderately disturbed and 62.9% of the disturbed shoreline was classified as highly disturbed. An area that exhibits low vegetation disturbance is defined as a location where there is an unaltered natural vegetated shore zone except for pier access. An area that has moderate vegetation disturbance is an area of shore that may contain a mowed lawn but has an intact overstory and an area that exhibits high vegetation disturbance is defined as a beach, rip rap, sea wall or where the shore is mowed to the water line. Since this evaluation the Village of Plover has allowed vegetative growth along the shoreline in their park on the south side of the pond.

Natural shoreline habitat is essential for enhancing the native weevil population in Springville Pond. These weevils help to control milfoil by eating their terminal buds. The following is an excerpt from a weevil population density survey completed by Golden Sands Resource Conservation and Development Council, Inc in December, 2006.



Springville Pond already has a healthy population of milfoil weevils, but some steps can be taken to try to boost the weevil population and maximize the control potential the weevils hold. Of the factors suspected to be impacting weevil success in Beds A and B (Figure 9), the one factor within human control is the amount of natural shoreline, a necessity for successful weevil hibernation. Some of the shoreline around Springville Pond is in somewhat natural condition, but could be improved. Other areas are greatly manipulated (mowed lawn, rip-rap, sea-walls, sandy beach) and are not good weevil habitat. Because weevils are weak fliers, the day they emerge from the water to fly to shore and hibernate, they are at the mercy of the wind. The more shoreline that is in natural condition the better the weevils' chances are of landing on suitable habitat. Recent changes in park maintenance at Springville Pond are likely to provide much more habitat this winter than previously and are a step in the right direction.

Weevils were stocked in Springville Pond in August 2006 to enhance the population for better control of EWM. Weevil surveys were conducted on August 10, 2006. Results showed the average population in the pond was 0.58 weevils per stem (Table 2). The stem collections for the survey avoided the stocking area, but depending on how far stocked weevils may have migrated, surveys may reflect some influence of weevil stocking.

**Figure 9. Springville Pond Eurasian Water Milfoil and Milfoil Weevil Survey, Golden Sands Resource & Conservation, 2006**



A comparison of surveys over the last 3 years shows that weevil densities dropped significantly with the explosive EWM expansion between 2004 and 2005 surveys, but that weevil population densities may have held steady between the 2005 and 2006 surveys. This suggests that the EWM stems may have increased and the same numbers of weevils were spread over more stems. The whole pond average for 2004 was 1.65 weevils per stem compared to only 0.54 weevils per stem in 2005. The weevil population has remained about the same in 2006 with 0.58 weevils per stem. Weevils were sampled monthly during 2006 in an effort to gain an understanding as to what factors may be influencing the weevil population in Springville Pond. The June survey showed quite low results, which may be expected if winter survival rates are low. Improvements to winter hibernation habitat may help to improve the survival rate and promote early season weevil levels.

**Table 2. Weevil Population Density Survey – Results Summary, Golden Sands Recovery & Conservation, 2006**

Lab Date	Bed No.*	Depth Range (ft)	Tot # Stem Samples <sup>1</sup>	Ave # Broken Tips	Ave # of Apical Tips	% Stems w/ Weevil Damage	Ave # Eggs per Stem	Ave # Larvae per Stem	Ave # Pupae per Stem	Ave # Adults per Stem	Ave Weevils per Stem (All Life Stages)
8/23/06	1	4-12	30	0.33	2.6	10%	0.00	0.00	0.00	0.00	0.00
8/23-24	2	6-8	30	2.04	2.91	77%	0.77	0.40	0.17	0.10	1.43
8/22-24	3	2-8	28	1.22	4.58	54%	0.14	0.25	0.07	0.04	0.50
8/11-24	4	2-4	30	0.48	2.14	61%	0.17	0.20	0.03	0.00	0.40
<b>Whole Pond Results</b>		2-12	118	1.1	3.0	50%	0.3	0.20	0.10	0.00	0.58

\*Refer back to Figure 3 for EWM sample bed locations.

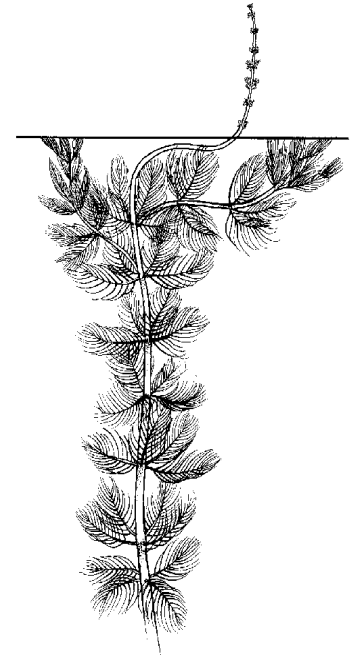
<sup>1</sup>Note that sample size is twice the sample size used in 2005. Number of samples collected was increased to assure statistical confidence with large bed sizes.

## Aquatic Plant Community



During the Portage County Lake Study Dr. Bob Freckmann identified 22 species of aquatic and wetland macrophytes (21 species of vascular plants plus a macrophytic alga) that have been found in Springville Pond or on the

shoreline (Table 3). This is below average for Portage County lakes. Springville Pond is highly infested with two aggressive non-native submersed aquatic plants; Eurasian milfoil and curlyleaf pondweed. In particular, the Eurasian milfoil has taken over most of the aquatic ecosystem in Springville Pond (Figure 10).



The wet shore habitat is mainly located at the east end of the pond where the Little Plover River flows through mucky areas of the pond. On the north and south shorelines, wet shore habitats are scarce. Most of the shorelines are residential developments or mowed parkland where the banks arise abruptly from the edge of the water. (Portage County Lakes Study Results and Discussion 2007)

**Table 3. UWSP herbarium records for Springville Pond, Freckmann, 2003**

<u>Submersed</u>	<u>Emergent</u>
Cetatophyllum demersum, <b>Coontail</b> Chara, <b>Stonewort</b> Elodea nuttallii, <b>Narrow-leaved Waterweed</b> Myriophyllum sibiricum, <b>Common water-milfoil</b> Myriophyllum spicatum, <b>Eurasian water-milfoil</b> Potamogeton crispus, <b>Curlyleaf pondweed</b> Stuckenia pectinata, <b>Sago pondweed</b> Zannichellis palustris, <b>Horned-pondweed</b>	Eleocharis palustris, <b>Common spikerush</b> Juncus effusus, <b>Common rush</b> Typha latifolia, <b>Broad-leaved cattail</b> Schoenoplectus tabernaemontani, <b>Soft-stemmed bulrush</b>
<u>Shore</u>	<u>Free Floating</u>
Calamagrostis canadensis, <b>Blue-joint grass</b> Carex comosa, <b>Bristly sedge</b> Epilobium coloratum, <b>Cinnamon willow-herb</b> Impatiens capensis, <b>Orange jewelweed</b> Phalaris arundinacea, <b>Reed canary grass</b> Polygonum hydropiperoides, <b>Swamp smartweed</b> Rumex verticillatus, <b>Swamp dock</b> Solanum dulcamara, <b>Bittersweet nightshade</b>	Lemna minor, <b>Small duckweed</b>

## History of Aquatic Plant Management in Springville Pond

Springville Pond has had an increasing problem with nuisance aquatic plants and receives a heavy sediment load which is characteristic of an impoundment. The Little Plover River delivers sediment and nutrients that settle in Springville Pond and can cause issues such as excessive plant and algae growth from the nutrients. In addition, surface runoff and groundwater also



transport nutrients to the pond. Over the course of 32 years, nuisance aquatic plant growth in Springville Pond has periodically been treated with herbicides. WDNR aquatic plant management treatment records show the use of herbicides in the years 1967, 1991, 1992, 1993, 1994, and 1999. The chemicals used included Diquat, Aquathol, Aquathol K, 2, 4-D, Cutrine Plus, and X77 surfactant. Deborah Konkel, WDNR compiled a table of known chemical treatments and amounts ( Table 4.).

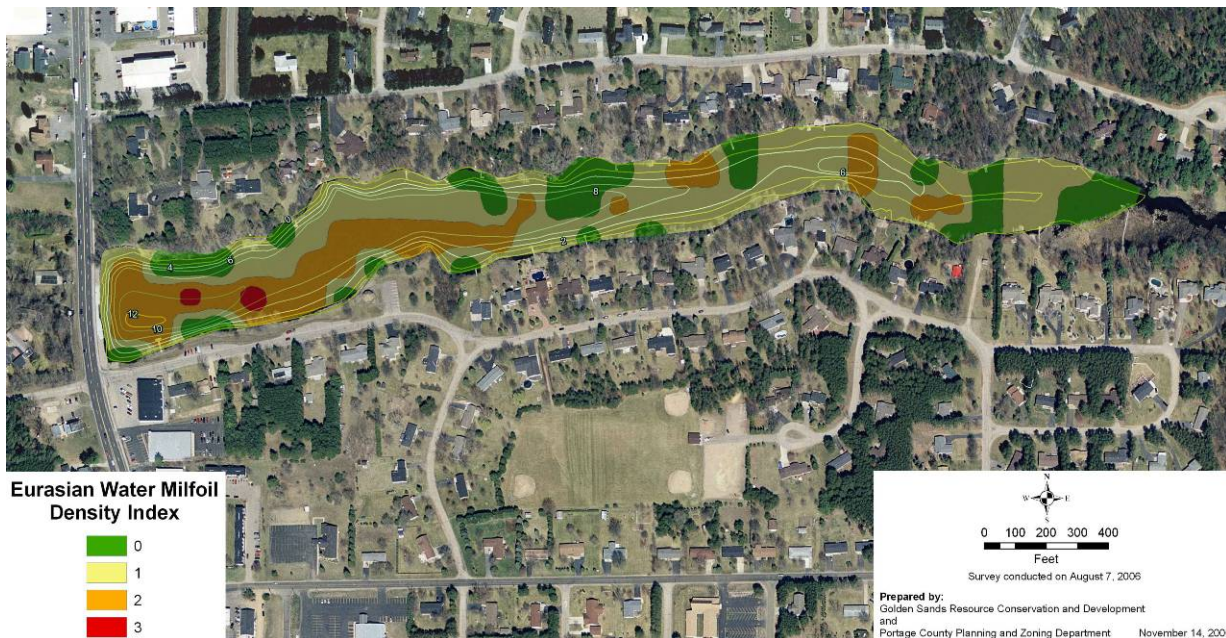
The Springville Pond Watershed Management Plan (Lambert & Lee 1997) and the WNDR records show that the herbicide treatments usually focused on the eastern third of the pond and on one large, dense patch of aquatic plants in the deeper water of the western end.

**Table 4. Chemicals used in Springville Pond.**

	Arsenic (lbs.)	2, 4, 5T (gal.)	Cutrine + (gal.)	Diquat (gal.)	Aquathol (gal.)	2, 4-D	# of treatments
<b>1967</b>	1800	300 ?	300 ?	300 ?	300gal?		2
<b>1992</b>			25	25	25		1
<b>1993</b>			25	25	25		1
<b>1994</b>						112.5 gal.	1
<b>1999</b>					1.5	550 lbs 112.5 gal and	3
<b>Totals</b>	1800	300 ?	50 or 350?	50 or 350?	51.5 or 351.5?	550 lbs	8

Drawdowns were also conducted in 1985, 1991, 1996, and 1999. Another drawdown was done *not related to plant control*, in 2003 for dam repairs. Mechanical harvesting was performed in 1987 as well as planting of native aquatic vegetation in 1992 and 1993 (Golden Sands RC&D 2007).

**Figure 10. Springville Pond Aquatic Plant Survey, Golden Sands RC&D, 2006**



## **Survey of Residents Opinions**

The Springville Pond Aquatic Plant Management Committee selected to conduct a survey in order to find out the opinions of residents that live on Springville Pond. The surveys were mailed out November 16<sup>th</sup>, 2006. The surveys had to be received by December 4<sup>th</sup> for them to be recorded prior to the next meeting. The original survey, including the results from all the surveys is located in Appendix A.

Fifty-three surveys were sent to residents near Springville Pond. Forty responses (75%) were received. Most but not every question was answered on each survey. Of the responses received, all owned or rented property on Springville Pond. About 20% of the respondents have lived on the Pond less than 5 years, 18% between 5 and 10 years, 15% between 10 and 20 years, and 48% more than 20 years. The greatest length of time reported was 55 years. Ninety-three percent (37) used the Pond year-round, two used the pond only in the summer, and one used the pond only on weekends.

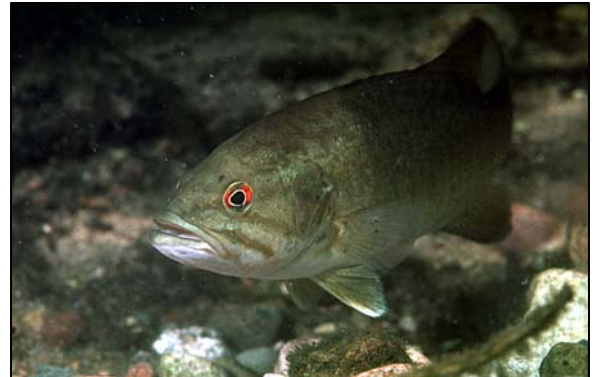
## **Water Quality**

Ninety percent (37) of the respondents felt the water quality has declined. The duration they have lived on/recreated on the Pond did not appear to influence this result. Seventy percent (29) ranked the water quality as poor this past year. Only four felt there was good/very good water quality. Weeds and algae were the water quality problems identified by more than 70% of the respondents. About 30% of the respondents felt that smell/odors were a problem and 22% felt water clarity was an issue. Litter was less of a concern. Additional water quality problems included shallow

depths and build-up of muck. Of those that felt water quality had declined, water level/low flow, use of fertilizer, and vegetable agriculture were identified as the top reasons for decline. Fewer respondents felt soil erosion, development, herbicide use, sediment from the east side, and introduction of aquatic invasive species were also issues. Seventy-five percent of the respondents agreed that the presence of native aquatic plants are essential to maintaining water quality/clarity in Springville Pond.

### **Fishing**

Thirty respondents (75%) indicated they fish in Springville Pond. The number of years they have fished Springville Pond ranged from less than one to 45. There was little difference in response to this question based on the years of familiarity with fishing in the Pond; 90% felt the quality of fishing had declined. The majority of respondents (70%) rated the fishing as average or fair, while 30% felt the fishing was poor. The top reasons selected for fishing decline included overabundance of weeds and low water level/low inflow. Other issues identified included use of fertilizer, vegetable agriculture, development, use of herbicides/pesticides, soil erosion, fluctuating water levels/drawdowns, release of fish downstream when the dam was stuck open, and poor management. Seventy-four percent of the respondents believe that healthy native aquatic plant beds improve the quality of fishing.



### **Wildlife**



Wildlife is important to those that were surveyed. Seventy percent indicated that it is very important, 27% indicated it is somewhat important and one responded that it is not important. Fifty-five percent of the respondents indicated that they feel the overall wildlife habitat in/near the Pond is excellent/very good, 35% feel it is average, and 10% feel it is fair/poor. The majority of respondents felt the quality of

wildlife habitat in the Pond has stayed the same, 37% feel it has declined, and one feels it has improved. Overabundance of weeds and water level/low flow were identified as the primary contributors to wildlife decline. Other issues identified as contributing to wildlife decline included fertilizer use (27%), development (17%), and vegetable agriculture (5%). Livestock

agriculture, herbicide/pesticide use, and poor water quality were also identified by individuals.

### **Aquatic Plants**

Ten percent of the respondents felt they are very familiar with issues related to native aquatic plants and pond ecology, 45% felt they are moderately familiar, 35% felt they are slightly familiar, and 10% are not at all familiar. Eighty-three percent of respondents agreed that native aquatic plants serve important functions that maintain the health of Springville Pond. Sixty percent of respondents felt that native aquatic plants add to the scenic beauty of Springville Pond, 25% disagreed, and 17% were neutral. When asked if native aquatic plants reduce the economic values of the Pond in the long-term, 47% believed this to be false, 35% were not sure, and 18% believed this to be true.

Eighty-seven percent of the respondents felt that moderate aquatic plant growth (described as just the right amount for fish and wildlife) is a desirable amount for Springville Pond. Fewer than 2% felt heavy to choked growth is desirable and less than 2% felt light growth was desirable. When asked if abundant floating and emergent **native** aquatic plants are a sign of an unhealthy pond 31% of the respondents were neutral, 41% agreed, and 28% disagreed. However, when asked the same question relating to **exotic** aquatic plants, 99% of the respondents agreed and less than 1% disagreed. Sixty-nine percent of respondents believe that the removal of **native** aquatic plants is harmful to the Pond's health, 13% believe removal of native aquatic plants is not harmful to the Pond's health, and 18% were unsure. When asked the same question referencing **exotic** aquatic plants, 92% felt removal of exotic aquatic plants is not harmful to the pond's health. Fifty-nine percent of respondents believed the removal of **native** aquatic plants increases shoreline erosion, the balance was split between feeling this was false and being unsure. Respondents were queried about the use of various aquatic plant management tools including harvesting, winter drawdown, and professional application of chemicals. Generally the majority supported the use of these tools. Sixty-four percent of respondents felt use of a plant harvester was an acceptable tool while 33% disagreed. Sixty-six percent felt the use of winter drawdown was an acceptable tool while 23% disagreed. Eighty-two percent felt the use of professionally applied chemicals was an acceptable tool while 10% disagreed.

Seventy-two percent of respondents believe that low flows in the Little Plover River can create conditions that enhance the growth of aquatic plants in Springville Pond, 15% disagree, and 13% indicated a neutral response. The question "to help prevent the spread of exotic plants into the Pond, do you clean your boat, trailer, and fishing equipment before using it in Springville Pond after it had been used in another lake" was asked; only 23 responded to this question with 74% indicating they always did, 17% indicated sometimes they did, and two surveys indicated they never did.

Additional responses indicated they only used their boat on the pond, they don't have a boat, and one felt it was irrelevant because only canoes and paddle boats are used on the Pond.

### **Shorelines and Near Shore Activities**

Seventy-four percent of the respondents disagreed that pond shorelines were more beautiful when lawns and turfgrass are mowed to the edge. Nearly the same percent response (72%) indicated that they feel pond shorelines are more attractive when they have an abundance of native vegetation. Fifty-nine percent indicate that undeveloped/natural best describes the location where their property meets the



pond. The balance of descriptions were fairly evenly distributed between rock-riprap, retaining wall, landscaped, undeveloped rock-riprap, undeveloped/retaining wall, undeveloped/lawn. The question "if you have undeveloped natural landscape or a combination of un-mowed vegetation with trees and shrubs, how far from the edge of the pond on to the property does it extend" was posed. Only 19% indicated that at least 35 feet (which is the state and county buffer requirement) fit this description. Thirty-one percent indicated they had less than 10 feet of distance from shore in a relatively undeveloped state.

Eighty percent of respondents indicated that they use fertilizer; 31 use it on the lawn and 6 on the garden. Of those that use fertilizer, the nearest distance from the lake that it is used ranged from 4 to 200 feet. Sixty-eight percent use it within 35 feet of the pond.

### **Decisions**

The survey queried who should be involved in making management decisions for Springville Pond. The response was pond shore residents (88%), local government (75%), pond association members (53%), university personnel (43%), watershed residents (30%), state government (25%), county government (20%), and fishing club (5%).

## Springville Pond Aquatic Plant Management Plan for Control of Eurasian Water Milfoil



The focus of the Springville Pond APM is the reduction of EWM in balance with the enhancement of the native aquatic plant community. This should prevent abundant algae growth in response to the reduced aquatic plant (EWM) population. The SPMC selected to use a multiple treatment approach to reduce the presence of EWM from Springville Pond (the duration of time EWM has

been in the pond along with the extent of growth thwarts complete removal of EWM). The treatments each have criteria for use to optimize success and reduce risk to aquatic biota and human health. Three scenarios were developed by UWSP and WDNR to address areas of nuisance-levels of EWM in Springville Pond. The SPMC selected one of these scenarios in January 2007. The options included the following considerations:

**Maintaining the integrity of the aquatic ecosystem. This involves ensuring enough habitat (aquatic vegetation) and water volume to support the fishery, supporting habitat to maintain a high population of weevils that help to reduce the success of EWM in the pond, and reducing impacts on hibernating animals.**

The WDNR biologists require leaving a minimum of 45-50% of the pond vegetation for fishery and aquatic biota habitat. In addition, excess removal of aquatic plants would result in increased algae blooms.

Weevils have helped to control EWM in Springville Pond for a number of years and provide the best potential for long term control of EWM in the pond. Captive reared weevils were released in August 2006 to enhance the natural population and if over-wintering is successful, the population should increase during summer 2007 and their lifecycle should begin to effect the EWM population. These beneficial insects will be killed by the use of chemicals and harvesting as they reside at the tips of the plants that are removed by the harvester.

Animals that hibernate near shore (e.g. amphibians and reptiles) do so in late fall. Draw down of water level for the winter must occur prior to October 1 to reduce mortality.

**Physical limitations in the pond include areas that can not be reached by a harvester, areas with springs that will not freeze during drawdown, and flow in the Little Plover River.**

To protect habitat in the pond, mechanical harvesters are not allowed in areas less than 3 feet deep (Figure 1).

Flow in the Little Plover River complicates EWM control due to several mechanisms. Higher flows in the spring limit the more typically-used pelletized form of 2,4-D which requires a 14 day contact time. Low flows in the later part of the summer increase retention time and temperature in the pond which can adversely affect the weevil population. When retention time is greater later in the summer, the plants have matured and chemicals are not as effective.

**Protection of the health of humans and aquatic biota.**

Although some tests have been conducted for 2,4-D and some formulas are currently approved for use in aquatic ecosystems, a lot is unknown about the effects of this chemical on human and aquatic biota. Contact with it will kill the desired weevils. If the community selects to use this option, contracting with custom applicators that use the appropriate amount of the product applied in the early spring is recommended.

**Physical removal of plant biomass and the resulting removal of phosphorus from the Pond may also reduce algae blooms.**

Ponds created by damming rivers generally have high levels of sediment and phosphorus inputs from the watershed via the river and direct runoff which provides ideal conditions for aquatic plant and algae growth. Removal of plants by mechanical and hand harvesting will help to reduce the buildup of additional substrate and phosphorus created by the decomposition of the plants. If the community selects an option that includes chemicals, application should be conducted in late spring when water temperatures are about 50-60°F, when the plant is actively growing and taking in substances from the water column prior to production of an abundant biomass of aquatic plants.

EWM management activities are already underway in Springville Pond. In August 2006 weevils were released in the pond to enhance the existing weevil population. The pond was drawdown 3 feet in fall 2006 to reduce near shore EWM by freezing/desiccating the crowns of the plants. This was to control the EWM in the areas exposed and most areas upon which the ice sheet rests, however rains in December refilled the Pond and frozen gates prevented the Pond to be drawn down again.

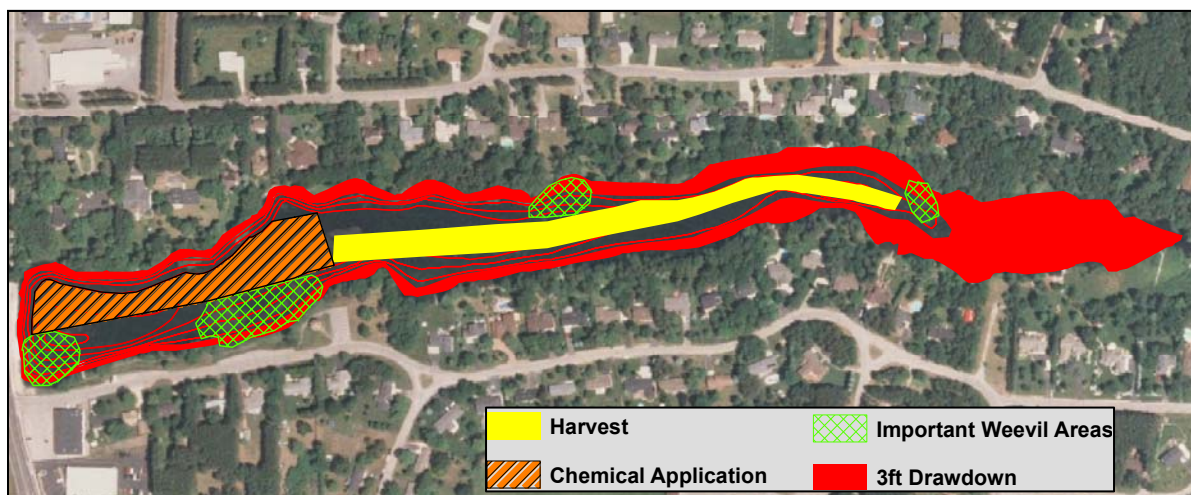
**The major components of the Springville Pond Aquatic Plant Management Plan include:**

- Weevils
- Winter drawdown – 3 feet
- Use of Weedar 64 in ½ of the approved removal area in early spring (see map)
- Mechanical harvesting in ½ approved removal area (see map)
- Hand harvesting around docks by lakeshore residents or their agents with pickup service by mechanical harvester
- Monitoring of treatments and EWM status and an annual plan review with WDNR

**Treatments:**

Approved locations for the treatments for 2007 are shown in Figure 12.

**Figure 11. Potential manipulation area for harvesting or chemical application.**



**Table 5. Potential treatments with surface area and percent of lake effected.**

Treatment	Surface Area (Acres)	% Lake Effected
3ft Drawdown (not including east end)	4.3	22.9
Chemical Application	2.3	12.3
Harvest	2.5	13.6
<b>Total:</b>	<b>9.5</b>	<b>48.7</b>

## Weevils

Photos taken on June 21<sup>st</sup> show the difference between healthy, pink stems and black, weevil-damaged stems. Stems become weak and disintegrate.



Milfoil Weevils (*Eurhrychiopsis lecontei*) can be used as a biological long term control for EWM. Milfoil weevils kill EWM by eating the tips and burrowing into the stems. The milfoil weevil prefers the EWM to the native northern milfoil. The northern milfoil has a slightly wider stem so that when the weevils burrow into the stem, they do not completely kill the plant, likely only weaken it. These weevils are native to Springville Pond and lab reared weevils were released into the pond in August 2006.

### **Aquatic Plant Management Plan Weevil Component:**

Enhance weevil population the year following a drawdown and continue monitoring. Habitat for the over-wintering success of weevils should be maintained/enhanced around the pond. They require thick vegetative or leaf duff provided by uncut near shore vegetation for hibernation. This habitat is consistent with Portage County and State Shoreland zoning regulations and should be enhanced. Other in-pond treatments should be conducted in a manner that leaves sufficient in-pond habitat to maintain the weevil population. Chemicals should be applied in late May/early June or when the water is still less than 60 degrees Fahrenheit and EWM has not reached the surface (ideally only 6" tall) to reduce impacts to weevils.

### **Winter Drawdown**

Winter drawdown is not species specific, but it does freeze the crown of EWM. It can favor certain species that produce viable seed and germinate easily, like sago pondweed, *Najas*. Drawdown will control species that rely on sprouting from roots. Drawdowns can affect reptiles and amphibians if it is not done prior to October 1. The drawdown needs six weeks of freeze for it to kill the EWM and should be conducted every three to five years.

### **Aquatic Plant Management Plan Winter Drawdown Component:**

Winter drawdowns should not be conducted more than once every 3 years. The timing of the drawdown will be dependent upon the growth of EWM in the near shore drawdown impact area. When EWM is approaching nuisance levels a drawdown could be conducted the fall and winter of that year. The pond level should not drop more than 3 feet from full pool and must be held

constant through winter. The pond level must be drawn down prior to Oct 1 to reduce impacts to animals hibernating in the Pond sediment.

The water level should be monitored at least weekly throughout the drawdown.

### **Mechanical Harvesting**

Mechanical harvesting is not species specific unless timed to remove species that start growth early, such as EWM and curly-leaf. It removes the upper layer of aquatic plants, including weevil habitat. This type of control technique can be conducted in parts of the lake more than once a summer. The plant biomass must be removed from the lake and will result in nutrients being removed as well. This technique is an immediate response and will only provide short term effects. However, by using an early season cut to set back curly-leaf or EWM and a later summer harvest to remove EWM biomass before it fragments and spreads, harvesting can be used to gradually reduce these exotic species. The harvester can be used to the minimum depth of 3 feet.



### **Aquatic Plant Management Plan Mechanical Harvesting Component:**

Harvesting must be conducted in water deeper than 3 feet and limited to the yellow strip shown on the map (width ranges from 40 to 80 feet). This width may be increased in years that do not follow a winter drawdown. Generally harvesting is done 2-3 times/year. The plant material must be removed from the pond. Permit would be granted up to 5-years with a WDNR-approved Aquatic Plant Management Plan.

The dates of harvesting, an associated map of the harvested area with GPS coordinates, and estimated volume of plant removal for each date is required for the annual plan review.



### **Hand Pulling**

Hand harvesting can help remove EWM by physically pulling or raking the aquatic plant. The plants must be removed from the lake and can be done by landowners or person hired by landowners. This control technique is an immediate response to the exotic EWM. Some groups that use a harvester have pick up programs to remove piled plants from the

end of docks. The hand pulled plants also make great mulch for gardens and flower beds and many farmers or city compost sites will readily take it.

### **Aquatic Plant Management Plan Hand Pulling Component:**

Hand pulling of EWM by residents, Village, and divers does not require a permit and can be conducted throughout the growing season. However, training for proper identification of the plant is essential to avoid pulling native aquatic plants (pulling native vegetation requires an approved permit). If a harvester is being used, arrangements for end-of-dock pick up may be made.

If large areas of EWM are removed via hand pulling, provide a map showing the location for the annual plan review.

### **Chemicals**

Chemical treatment is a control technique that kills broad leaved aquatic plants that contact the chemical. This technique is not species specific except for dicots (broadleaves) and or timing of treatment and response occurs in two-weeks after a certain contact period. The chemical must be applied by a licensed professional and at the right time in the EWM life cycle to be effective. EWM must be actively growing to effectively absorb the chemical and transport it to the root. EWM is usually at this stage in May when the water temperatures are between 50 – 60 degrees Fahrenheit. Once the EWM reaches the surface of the water, it will slow its growth and chemical application won't be as effective. There is limited knowledge of aquatic organism chronic exposure to a specific chemical, but the chemical will impact aquatic insects including milfoil weevils.

### **Aquatic Plant Management Plan Chemical Component:**

The use of Weedar 64 (a formulation of liquid 2,4-D licensed by DATCP for use in aquatic systems) is the only chemical that is included in the permit. Use is subject to annual evaluation and an annual permit from WDNR is required for use.

Conditions for using chemicals in the Pond require:

1. A flow lower than 16 cfs, which will provide enough retention time of at least 3-4 days at the time of treatment.
2. No storm event predicted within the 3-4 days following application.
3. Application when the EWM is actively growing but not yet to the surface, generally when water temperatures are between 50 and 60°F in late May/early June.
4. Applicator should monitor and map EWM within the proposed area no sooner than 1 week prior to treatment.
5. Chemical treatment only in deep end of pond (greater than 8 feet) to allow for maximum time for herbicide contact.

6. Signs indicating the application of chemicals need to be posted at all public access areas and on docks with in 150 feet from the treatment area.

Date, temperature, the map of EWM prior to application and map of areas of application (with GPS coordinates) along with amount and method of application is required for the annual review.

## **Monitoring and Annual Review**

For all options, monitoring of aquatic plants in the pond and weevil population is required in August. An annual review of these results will be required to evaluate the monitoring results and prepare plans for the next year. This review should take place between November 1 and February 1 with WDNR, the Village of Plover, and the aquatic plant survey consultant with the results reported to the Springville Pond Management Committee.

Success of treatments and re-establishment of native vegetation will be evaluated with pond-wide monitoring of aquatic plants. These surveys should be conducted annually in August for at least three years. The surveys should be conducted using the point-intercept methodology and the same sampling site locations that were used in the 2006 aquatic plant survey that was conducted by Golden Sands RC&D (Appendix).

When mechanical harvesting is employed, the dates of harvesting, an associated map of the harvested area with GPS coordinates, and estimated volume of plant removal for each date is required for the annual plan review.

In years when chemicals are applied, the date, water temperature in the treatment areas, a map of EWM prior to application and a map of areas of application (with GPS coordinates) along with amount and method of application is required for the annual review.

## APPENDICES