

LITTLE  
ROCK  
LAKE  
AQUATIC  
VEGETATION  
MANAGEMENT  
PLAN

2006 - 2011



# Little Rock Lake Aquatic Vegetation Management Plan 2006 -2011

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# Little Rock Lake Aquatic Vegetation Management Plan 2006 -2011

## *Background and Introduction*

In 1961, the Little Rock Lake Association was formed. The early association expressed interest in improving water quality as concern was noted about decreased fish populations. There are approximately 300 property owners on Little Rock Lake with membership in the lake association being approximately 127. The mission of the Little Rock Lake Association is: *"The intent of this Corporation is to protect, maintain and improve the ground and surface water resources within the Little Rock Lake watershed and adjacent Mississippi River area by encouraging appropriate water use and shore land management practices."*

Little Rock Lake was enhanced in 1911 when the Watab Pulp and Paper Company constructed a dam along the Mississippi River in Sartell, MN. By the end of the 1950's much development had occurred on the lake, mostly characterized as seasonal cabins.

The Little Rock Lake Association was a 2002 participant of the Healthy Lakes and Rivers Partnership program. The Initiative Foundation in Little Falls sponsors this program. The Healthy Lakes and Rivers Partnership program was developed to help fill the gap between what state agencies are able to accomplish with regard to water quality management, and what local citizens believe should be done to protect or improve the quality of their lakes and rivers. Through the program, citizen leaders are given the tools needed to assist them in developing and implementing their own lake or river management plans. The Little Rock Lake Association prepared a lake management plan outline through this program. Significant elements of the plan were related to water quality, land and water use and fisheries and aquatic vegetation.

## *Lake and Watershed Description*

Little Rock Lake (Id. No. 5-13) is located in Benton County. The north end of Little Rock Lake is approximately 1.5 miles east of Rice (Figure 1). Little Rock Lake derived its name as follows: "The southern two-thirds of Watab Township has many outcrops of granite and syenite, continuing from their much quarried area in Sauk Rapids and East St. Cloud. At each side of the river road, in the vicinity of the Watab railway station, small hills and knobs of these rocks rise about 40 feet above the road and 75 to 90 feet above the river. One of these hills of rough, bald rock, called by Henry R. Schoolcraft the Peace Rock, rises directly from the river's edge about a half mile south from the mouth of Little Rock Creek, which, with its Little Rock Lake, was thence so named. It is a translation of the Ojibwe name, signifying, as more elaborately stated by Rev. Joseph A. Gilfillan, "where the little rocky hills project out every once in a while, here and there." (Upham, 2001).

Little Rock Lake has a surface area of 1450 acres with 1392 acres or 96.0 percent of the lake being littoral<sup>1</sup>. The maximum lake depth is 23 feet. The length of the shoreline is 15.7 miles with the greatest fetch being 2.2miles with a north northeast

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<sup>1</sup> Littoral is defined as the area of the lake with a water depth of 15 feet or less.

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orientation. The Minnesota Department of Natural Resources (DNR) created a bathymetric map of Little Rock Lake in 1980 (Figure 2). Little Rock Lake is a Class 41 lake (Schupp, 1992). There are three public accesses.

Little Rock Lake lies in Langola and Watab Townships in Benton County. Much of Little Rock Lake's shoreline is developed. There are approximately 300 dwellings. Little Rock Lake has a shoreland management classification of general development.

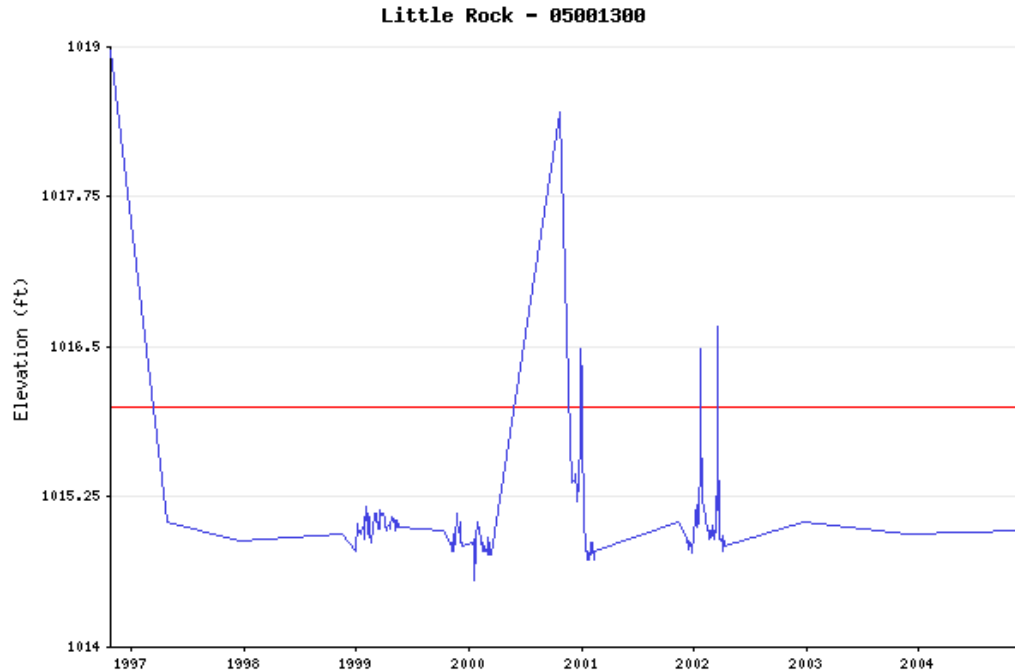
The townships and city that make up the majority of the Little Rock Lake watershed had a combined total population of 9172 in the 2000 Census and 8035 in the 1990 Census. The population density ranges from less than 30 per square mile to more than 75 per square mile in various portions of the watershed (Figure 3)

	2000	1990
Alberta Township	772	760
Bellevue Township	1115	852
Buckman Township	717	713
Graham Township	567	549
Langola Township	916	795
Mayhew Lake Township	804	751
Morrill Township	650	608
Rice City	711	610
Watab Township	2920	2394

Little Rock Lake has turbid water. Secchi disc readings collected by volunteers show a mean summer (June through September) average range of 1.4 to 2.8 feet for the years 1976 - 1999. The trophic status index calculated for Little Rock Lake based on Secchi disc readings is 68, which is considered eutrophic. Based on the available water quality data for Little Rock Lake, the Minnesota Pollution Control Agency (MPCA) has indicated that aquatic recreation use is non-supported.

Little Rock Lake has three significant inlets: Little Rock Creek, Zuleger Creek, and Sucker Creek. Its outlet, Little Rock Creek, flows to the Mississippi River. There is a dam on the Mississippi River at Sartell that controls the lake level. Water level data is available for the period from 1985 -2005. During that period, DNR staff and volunteers have collected numerous water level readings. The lowest level was recorded in 1997 at 1014.17 feet Mean Sea Level (MSL) and the highest level was also in 1997 at 1018.96 feet MSL. This is a range in fluctuation of 4.89 feet. The DNR has determined that the OHWL (ordinary high water level) for Little Rock Lake is 1016 feet MSL.

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Little Rock Lake is a popular sport angling destination. The Minnesota Department of Health (MDH) is responsible for determining fish consumption advisories for Minnesota lakes. An advisory related to the consumption of northern pike, walleye, white crappie and white (common) sucker has been issued by MDH for Little Rock Lake.

The most current Fisheries Management Plan was prepared by the DNR in 2003. The plan has as its long range goal *"maintain a naturally reproducing walleye population characterized by a gillnet catch rate of 6 to 12 per lift with fish over 14 inches comprising 50% or more of the sample. Maintain a black crappie population with 40% or more of the spring trapnet catch exceeding 9 inches in length. Maintain a northern pike population characterized by a gillnet catch within the lake class interquartile range of 1.2 to 7.8 per lift with at least 20% longer than 24 inches and maintain the presence of individuals over 30 inches"*.

The DNR conducted a creel census and water surface use study on Little Rock Lake from May 10 to September 31, 1997. In terms of craft (boat) hours, fishing was by far the greatest use on Little Rock Lake. It was followed, in descending order by runabouts, water skiing, non-motorized craft and jet skis.

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	Craft Hours	Craft Hours per Acre
Fishing	2416	7.83
Runabouts	855	.59
Water skiing	563	.39
Pontoons	409	.28
Non-motorized boats <sup>2</sup>	289	.20
Other watercraft	653	.45
Total	5186	9.74

Total estimated angler hours during the 1997 open water period were 11359. Boat angler hours totaled 5264 and shore angler hours totaled 6095. In terms of numbers, in descending order, the fish most taken by anglers were northern pike, black crappie, common carp and channel catfish. Viewed from pounds of fish caught the similar comparison would be northern pike, common carp, channel catfish and black crappie.

The Clean Water Committee of the Little Rock Lake Association estimated the greatest recreational use currently (2005) to be in descending order: pleasure boating, esthetics, summer fishing, water skiing, swimming, jet skiing, winter fishing, canoeing and hunting.

Winter angling use on Little Rock Lake was measured by means of a creel survey during the winter of 1995-1996 (December 1 to March 31). During that winter total angling pressure was estimated to be 21625 hours or 14.9 hours per acre. The fish most taken by anglers in the winter of 1995-96 by numbers in descending order were black crappie, yellow perch, white crappie, walleye and northern pike. In pounds, the catch, in descending order, was the same. A similar survey was conducted from December 1, 1997 to March 1, 1998. Total angling pressure for the winter of 1997-98 was 12892 hours or 8.9 hours per acre. The catch in descending order by number was yellow perch, black crappie, walleye, northern pike and white crappie. In descending order by pounds the catch was yellow perch, northern pike, black crappie, walleye and white crappie.

Winter fish house counts are another way to gauge winter angling pressure. Aerial counts are made twice in a winter, once in the first half of the season (early) and once in the second half (late). During the 1980-2001 period, DNR staff made 14 counts in the early part of the winter season and 15 in the later part of the winter season on Little Rock Lake. Early counts averaged 118.3 houses per count (range of 42 to 218) and late counts averaged 114.3 houses per count (range 46 to 247).

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<sup>2</sup> Sailboats, canoes, kayaks, paddleboats

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Year	Count Period	
	Early	Late
1982-81		67
1981-82	99	50
1982-83	59	57
1983-84	42	47
1984-85	53	57
1985-86	56	46
1986-87	88	106
1987-88	151	161
1988-89	149	200
1989-90	216	179
1990-91	218	247
1991-92	160	160
1992-93	86	88
1997-98	148	119
2000-01	132	130

Little Rock Lake is in the Upper Mississippi Basin. It is in the Mississippi / Sartell Watershed (HUC 7010201)<sup>3</sup> (Figure 4).

The immediate watershed of Little Rock Lake is 108 square miles (69125 acres) in area. The watershed is in the Central Hardwood Forest Ecoregion (MPCA). It also lies in the Eastern Broadleaf Forest and Laurentian provinces, the Minnesota and NE Iowa Morainal and the Western Superior sections and the Anoka Sand Plain and Mille Lacs Uplands subsections (DNR). Most of the watershed is in the Agram Sand Plain (37799 acres) and the Pierz Drumlin Plain (31322 acres). A very small part of the watershed near the lake outlet is in the Mississippi Sand Plain (less than 4 acres) (Figure 5).

The watershed of Little Rock Lake covers parts, but not all, of Langola, Watab, Mayhew, Graham and Alberta Townships and the City of Rice in Benton County and Bellevue, Buckman and Morrill Townships in Morrison County (Figure 6). Less than 10 percent of the watershed (2636 acres or 3.8 percent) is in public or conservancy ownership (Figure 7).

Agency/Organization	Acres
MN DNR - Wildlife	1191
US Fish and Wildlife Service	1177
The Nature Conservancy	164
MN DNR - Forestry	104
	2636

<sup>3</sup> HUC means Hydrologic Unit Code, a nationwide system created by the U.S. Geological Survey to identify watersheds

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Prior to European settlement, the Little Rock Lake watershed was dominated by oak forest land and prairie (Figure 8).

	Acres
Oak openings	20694
Brush prairie	13775
Aspen-oak lands	12039
Wet prairie	8396
Prairie	6589
Big Woods (hardwood forest)	3528
Conifer bog	3144
Lakes	811
River bottom forest	150
	69126

Land cover information from the 1990s indicates that much (56.6 percent) of the Little Rock Lake watershed is cultivated land (Figure 9). Forested land makes up a much smaller proportion of the watershed than prior to European settlement.

	Acres
Cultivated land	39142
Grassland	13650
Deciduous forest	7795
Grassland shrub tree	2329
Coniferous forest	1944
Lakes	1548
Rural development	1342
Wetlands	1298
Urban development	55
Gravel pits	21
	69124

A number of Minnesota DNR listed plants and animals are known from the Little Rock Lake watershed. Each of these species has a known record in the watershed that is no older than 1990. There are records of sandhill crane and greater prairie chicken from within one mile of the watershed.

Species	Scientific Name	Year	Classification
Blanding's turtle	<i>Emydoidea blandingii</i>	2001	Threatened
Tuberled rein orchid	<i>Platanthera flava</i>	1998	Endangered
Beach heather	<i>Hudsonia tomentosa</i>	1991	Special Concern
Plains pocket mouse	<i>Perognathus flavescens</i>	2000	Special Concern
Hill's thistle	<i>Cirsium hillii</i>	1992	Special Concern
Widgeon grass	<i>Ruppia maritima</i>	1990	Special Concern

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*Aquatic Plant Community Description*

Emergent plants are rooted in the lake bottom, but their leaves and stems extend out of the water and typically grow in wetlands and along the shore, where the water is less than 4 feet deep. Submerged plants have stems and leaves that grow entirely underwater, although some may also have floating leaves. Floating-leaf plants are often rooted in the lake bottom, but their leaves and flowers float on the water surface. Water lilies are a well-known example. Floating leaf plants typically grow in protected areas where there is little wave action. Free floating plants float on the water surface but their roots, if any, are not rooted in the lake bottom. Well known examples are the duckweeds.

A total of 52 species of aquatic and wetland plants have been identified from Little Rock Lake during various surveys conducted by DNR staff (Appendix 1). Three are invasive (exotic /introduced) species and one species is listed by the DNR.

Form	Native	Exotic	Total
Emergent species	27	2	29
Floating leaf species	4		4
Free floating species	2		2
Submerged species	16	1	17
	49	3	52

DNR Fisheries surveys included aquatic plant surveys in 1945, 1960,1974,1990 and 2002. A DNR Ecological Services survey using point intercept methodology was conducted in May, 2005 (Figure10). The surveys done in 1960,1974 and 1990 indicated submerged aquatic plants grew to a depth of 3 feet during each survey, while in 2002 plants grew to 3.5 feet.

Curlyleaf pondweed was found to be common at the time of the 2005 point intercept survey (Figure 11).

	Total	<4'	4-6.9"	Depth 7-9.9'	10-12'	>12'
Stations Sampled	323					
Stations w/ Curlyleaf Pondweed	137	24	84	25	1	2
Percent Occurrence	42.4					

Depth of Curlyleaf Pondweed Growth

Mean	5.6
Median	5.7
Mode	5.7
Minimum	1.5
Maximum	13.1

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The 2005 point intercept survey indicates that Little Rock Lake does not have a diverse aquatic plant community. In 2005, as indicated below, there was only one plant species, which were found at 10%, or more of the sites surveyed. Plants grew to a maximum depth of 13.1 feet with a range of depths according to species of plant.

Common Name	Mean Depth [ft]	Depth Range [ft]	Number of Sites	% Occurrence <sup>4</sup>
Curlyleaf pondweed	5.6	1.5-13.1	137	42.4
Canada waterweed	4.5	1.5-10.5	29	9.0
Narrowleaf pondweed	3.5	1.3-10.5	14	4.3
Sago pondweed	4.1	1.4-9.3	6	1.8
White water lily	3.2	1.5-4.2	5	1.5
Northern watermilfoil	4.9		1	< 0.5
Claspingleaf pondweed	3.4		1	< 0.5

### *Aquatic Plant Habitat and Ecosystem Values*

Aquatic plants have intricate relationships in the ecosystems where they exist and with the people who use lakes and streams. The relationships, or effects, may be good or bad. The effects may be quite localized or widespread. The relationships may be related to the physical, chemical or biological aspects of an ecosystem. They may also relate to human consumption, agricultural benefits or use as raw materials in various human activities. Aquatic plants may have medicinal benefits, be irritating to the skin or actually poisonous. Invasive, non-native plants can replace the native species with a resultant loss of the benefits native plants provide. Finally, their mere abundance may cause extreme difficulties in pursuing water oriented recreational activities like swimming, fishing and boating. In Minnesota, a review of readily available sources indicates some 230 aquatic and wetland plants with documented values to systems and people.

Aquatic and wetland plants have effects on the physical component of lake and stream ecosystems in several different ways. These include functioning as wave breaks, acting to stabilize sediments and soils and providing shoreline stabilization and protection against erosion. At least 43 species of Minnesota plants can have this physical relationship in the environment (Borman et. al, 1997; Dindorf, 1993; Hamel and Parsons, 2001; Henderson et. al., 1998;Lahring, 2003;Nichols and Vennie, 1991; Welsch, undated). A great proportion of these are emergent plants. Plants which function as wave breaks include hardstem and softstem bulrush (*Scirpus acutus*) and wild celery (*Valisneria americana*). The stems of these plants, and others, reduce the energy in waves and protect shorelines. A number of plants such as sedges (*Carex spp.*) have the ability to stabilize shoreline soils or bottom sediments.

Aquatic plants influence the chemical aspects of lakes and streams. These influences include aeration, nutrient use and absorption of metals, wastewater treatment

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<sup>4</sup> There were 323 total sites surveyed

and as water quality indicators. Twenty aquatic plants found in Minnesota have some documentation related to chemical relationships in ecosystems (Hamel and Parsons, 2001; Lahring, 2003; Welsch, undated; Whitley, 1990). Horsetail (*Equisetum fluviatile*) absorbs heavy metals from systems and is often used to bioassay for these metals. Since gold is a heavy metal, horsetail is sometimes used to detect it as well. Canada waterweed (*Elodea canadensis*) removes metals such as lead, mercury and cadmium. Additionally, Canada waterweed has been used experimentally to remove oil. Northern watermilfoil (*Myriophyllum sibiricum*) is an efficient user of nutrients in the water. Several plants are especially effective in aerating water. They include northern watermilfoil and bushy pondweed (*Najas flexilis*). Aquatic plants are sometimes used for treating sewage effluent in wastewater systems. Several plants that have proven efficient are hardstem bulrush (*Scirpus acutus validus*), cane (*Phragmites australis*) and duckweed (*Lemna minor*). Specific aquatic plant species may be indicators of good water quality. Among Minnesota plants with this characteristic are wild celery and white water buttercup (*Ranunculus spp.*).

Many of the aquatic plants found in Little Rock Lake have an ecological value for some species of bird (Appendix 3). Aquatic and wetland plants may provide cover, food, nesting material or nesting sites for a wide variety of bird species. For instance, hardstem bulrush and common cattail (*Typha latifolia*) provide cover for a variety of waterfowl, shorebird, marsh bird and songbird species. Cattail and bulrushes also provide both sites for nesting and materials to construct the nests. Aquatic plants such as wild celery, sago pondweed (*Stuckenia pectinatus*) and bushy pondweed are among the very best foods for waterfowl.

Aquatic plants are also valuable to several species of mammals. Whitetail deer, as an example, utilize pondweeds (*Potamogeton spp.*) and yellow waterlily (*Nuphar variegata*) as a regular part of their diet. Beaver also eat these plants in addition to duckweeds (*Lemna spp.*). Muskrats utilize hardstem and softstem bulrush and cattails for food, cover, nesting material and sites for their houses.

Aquatic plants in several ways benefit fish. Bluegill, largemouth bass and northern pike are all afforded shelter (cover) by plants such as coontail (*Ceratophyllum demersum*), muskgrass, Canada waterweed, bushy pondweed, claspingleaf pondweed (*Potamogeton richardsonii*) and flatstem pondweed (*Potamogeton zosterformis*), among others. Northern pike may use cattails and threesquare as spawning sites. Many aquatic plants serve as the substrate on which fish food organisms (insects, other invertebrates) live.

#### *Aquatic Plant Management Permits in 2005*

There were no aquatic plant management permits issued in 2005 to control nuisance plant conditions by either mechanical control or by use of an AUAPCD (automated, unattended aquatic plant control device) in Little Rock Lake. There were no permits issued for control of floating bog or for aquatic plants in offshore areas (areas more than 150 feet from shore). There were 4 permits issued for the control of nuisance conditions by application of approved aquatic herbicides. Control was for curlyleaf

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pondweed, native aquatic plants at nuisance levels (principally Canada waterweed) and algae. A total of 33.5 acres were permitted for plant control. The total control area was 2.4 percent of the littoral area of Little Rock Lake.

	Curlyleaf Pondweed	Native Plants	Algae
Number of Landowners	119	46	25
Acres Permitted	24	9.5	5.4

### *Citizen Determined Lake Issues*

On January 31, 2006 the Clean Water Committee of the Little Rock Lake Association identified a number of issues related to the lakes resources. The list of issues that follows is not prioritized.

1. Watershed issues such as feedlots, runoff and agricultural use.
2. Lack of a centralized sewer system.
3. Lack of membership from lakeshore owners, i.e. apathy.
4. Weeds, with the particular reference to curlyleaf pondweed.
5. Lack of beneficial native aquatic plants.
6. Lawn fertilizer.
7. Lack of swimming due to poor water clarity.
8. Shoreline erosion.
9. Zoning problems in particular inconsistencies with the application of variances.
10. Channel navigation is difficult because the sandbars are not marked.
11. Finding refuse (tires, glass, trash) in the lake particularly in the winter.
12. Plankton algae blooms.
13. Speedboats and jet skis are sometimes operating to close to other watercraft.
14. Potential for invasive plants through the public accesses.
15. Trash on some properties.
16. Large carp population and its affect on gamefish populations.

### *Citizen Determined Aquatic Plant Issues*

The Clean Water Committee of the Little Rock Lake Association identified the aquatic plant issues of the lake on January 31, 2006. The issues focused principally on curlyleaf pondweed. Related to curlyleaf pondweed, the issues are:

1. It is not possible to fish from the dock or swim in some parts of Little Rock Lake because of dense curlyleaf pondweed growth.
2. In the main part of Little Rock Lake heavy growth of curlyleaf pondweed on a bar plugs boat motor intakes and propellers.
3. Following the senescence (die off) of curlyleaf pondweed a severe odoriferous blue-green algae bloom occurs and swimming stops.
4. Dying curlyleaf pondweed are difficult to clean up when they wash ashore.

5. Curlyleaf pondweed is so dense that it suppresses more desirable native aquatic plants.
6. Prior to the extreme growth of curlyleaf pondweed, coontail sometimes developed to nuisance level problems in Little Rock Lake.

### *Goals and Actions*

Goal 1. Manage native aquatic plants for water quality, wildlife habitat and recreational use. [MN DNR Fisheries is available to provide technical guidance for actions 1 and 2 upon request from LRLA.](#)

Action 1. Develop a program to increase the size of beds of emergent plants (such as bulrush) and floating leaf plants (such as water lilies)

Action 2. Develop a program to increase the diversity of the native submerged plant community by encouraging desirable plants like largeleaf pondweed.

Action 3. Control native aquatic plants so that recreational use is not impaired, particularly in channel areas, on up to 10 acres in offshore areas as shown in Figure 12.

Goal 2. Control curlyleaf pondweed so that any part of Little Rock Lake can be used for recreation.

Action 1. Control curlyleaf pondweed by early treatment, as described in Appendix 3, with approved herbicides, on up to 175 acres in offshore areas as shown on Figure 13.

Action 2. The DNR (Fisheries and/or Ecological Services) will conduct a quantitative survey in 2010 to determine the effectiveness of the control program to reduce [percent frequency](#) of curlyleaf pondweed. [If Little Rock Lake is successful at the formation of a lake improvement district or a watershed district, they will be entirely responsible for completing this survey via a private consultant. MN DNR Fisheries-APM will provide the location of sample points and sampling protocol that is to be followed.](#)

Since treatment with herbicides could interfere with the survey, treatment in 2010 may need to be adjusted to avoid problems. A comparison will be made using data from 2005 and 2010 to determine changes in the curlyleaf pondweed occurrence.

Action 3. The Little Rock Lake Association will visually monitor the effects of the curlyleaf pondweed and native plant treatments and keep a record of the observations annually.

Action 4. The Little Rock Lake Association will obtain information from lakeshore owners annually regarding how effective they feel the curlyleaf pondweed and native plant control program has been. The information may be obtained through oral or written surveys, or both

Goal 3. Obtain full program funding by 2007. [The MN DNR takes a neutral position on action items 1, 2, and 4 listed below. Approval of this plan by MN DNR does not constitute promotion of these actions.](#)

Action 1. Explore and apply for grants from corporate and foundations sources, such as the Initiative Foundation

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Action 2. Explore the formation of a Lake Improvement District (LID) and a Watershed District (WD) as potential funding and management organizations.

Action 3. Apply for Department of Natural Resources (DNR) grants for control of exotic aquatic plants and for shoreline restoration.

Action 4. Explore the use of charitable gambling as a funding source.

Goal 4. Increase landowner awareness of, and participation in, aquatic plant management in Little Rock Lake.

Action 1. Develop an education and information program for all landowners concerning aquatic plant management, and specifically the Little Rock Lake Aquatic Vegetation Management Plan, using a variety of techniques and media. [MN DNR Fisheries will provide support as requested by LRLA.](#)

Action 2. Increase participation in the aquatic plant control program.

Goal 5. [Monitor for anticipated zebra mussel invasion and potential impacts to water quality and the aquatic plant community.](#)

Action 1. [Educate property owners about zebra mussel identification and how to prevent their spread by providing ID cards and “Help Stop Aquatic Hitchhikers” brochures \(to be obtained from DNR Invasive Species Program\) and also by contacting the Invasive Species Program in Brainerd to schedule an informational presentation on zebra mussels.](#)

Action 2. [Property owners should inspect their docks, bait buckets and boats for presence of zebra mussels throughout the year and especially, in the fall when they are taking them out.](#)

Action 3. [Continue to monitor secchi disk readings as part of the Citizens Lake Monitoring Program through PCA to monitor any changes in water quality.](#)

Action 4. [If zebra mussels are confirmed to be present in Little Rock Lake, a point intercept survey targeting native aquatic plants should be conducted in late July or early August of that same year and again within 3 to 5 years after infestation to monitor possible changes in the aquatic plant community.](#)

The following chart indicates the **principal party** responsible for the implementation of the goals and action of this plan.

Goal & Action	DNR	LRLA
Goal 1 Action 1		X
Goal 1 Action 2		X
Goal 1 Action 3		X
Goal 2 Action 1		X
Goal 2 Action 2	X	X
Goal 2 Action 3		X

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Goal 2 Action 4		X
Goal 3 Action 1		X
Goal 3 Action 2		X
Goal 3 Action 3		X
Goal 3 Action 4		X
Goal 4 Action 1		X
Goal 4 Action 2		X
Goal 5 Action 1	X	X
Goal 5 Action 2		X
Goal 5 Action 3		X
Goal 5 Action 4	X	X

*Permit Application and Issuance*

Minnesota Rules 6280.0350 Subpart 2 states: “When a lake vegetation management plan approved by the commissioner has been developed, APM permits will be issued according to the guidelines of the plan”.

The Little Rock Lake Association will make the permit application for offshore curlyleaf pondweed control. The application will be sent to the DNR Aquatic Plant Management (APM) office in Little Falls no later than March 1 of each year. GPS coordinates of the proposed offshore curlyleaf pondweed treatment areas, in an electronic format compatible with DNR GIS programs, need to be submitted with the permit application. The GPS coordinates of the actual area treated the previous year must also be included if this is different from the proposed treatment area. Written permission from landowners must also be obtained if offshore treatment comes within 150 feet of their shoreline. This permission must accompany the application. Permit issuance will be by the DNR Fisheries office in Little Falls. The permit will be issued within two weeks of receipt of all necessary application materials and supporting documentation.

The Little Rock Lake Association will make the permit application for offshore nuisance native plant control. The application will be sent to the DNR Aquatic Plant Management (APM) office in Little Falls. GPS coordinates of the proposed native plant treatment areas, in an electronic format compatible with DNR GIS programs, need to be submitted with the permit application. The GPS coordinates of the actual area treated the previous year must also be included if this is different from the proposed treatment area. Written permission from landowners must also be obtained if offshore treatment comes within 150 feet of their shoreline. This permission must accompany the application.

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One permit will be issued for the control of aquatic nuisance problems but may be issued in two or more parts.

### *Plan Preparation, Duration and Review*

The Clean Water Committee of the Little Rock Lake Association and the Minnesota Department of Natural Resources prepared this plan. The participants were: Bruce Christofferson, Judy Christofferson, Ed Feiler, DeAnn Harris, Kevin Kretsch, Phyllis Post, Jeff Soderholm, Earl Tuttle, Cliff Weitgenant and Chuck Wilson. It may be necessary to make minor adjustments to this plan in any one year. This may be done by mutual agreement. This plan will be in effect through January 1, 2011, at which time both parties agree to review the plan and its effectiveness in reaching its goals. Adjustments to the plan based on this review may be made at that time and the plan renewed by mutual agreement.

### *Approval*

We agree with the conditions in this vegetation management plan and will implement them.

_____ Jim Lilienthal, Area Fisheries Supervisor DNR	_____ Date
_____ Dirk Peterson, Regional Fisheries Manager DNR	_____ Date
_____ Bruce Christofferson, President, Little Rock Lake Association	_____ Date