



# Lake Vegetation Management Plan

- Variance Requested by Cooperator
- Variance Approved (see Section VI)

## Section I: Lake Information

Name: McCarrons Lake DOW Number: 62005400 County: Ramsey  
 Fisheries Area: East Metro Surface Acres: 73 Littoral Acres: 24.6  
 Classification:  Natural Environment  Recreational Development  General Development  
 Cooperator(s): Lake McCarrons Neighborhood Association, Capitol Region Watershed District, Ramsey County, and the Minnesota Department of Natural Resources.

## Section II: Water Quality and Plant Community

### A. Water Quality

- |  |                                      |
|--|--------------------------------------|
| <input checked="" type="checkbox"/> Total Phosphorus: Mean: 24.8 ppb | Date: 2004-2009 Jun-Sept Summer Ave. |
| <input checked="" type="checkbox"/> Secchi Disc: Mean: 3.59 m        | Date: 2004-2009 Jun-Sept Summer Ave. |
| <input checked="" type="checkbox"/> chlorophyll 'a': Mean: 4.86 ppb  | Date: 2004-2009 Jun-Sept Summer Ave. |

Narrative (describe water quality concerns, quantify TSI):

Carlson Trophic Status for Total Phosphorus: 50.5  
 Carlson Trophic Status for Chlorophyll-a: 46.1  
 Carlson Trophic Status for Secchi Disk: 41.5  
 Overall Trophic Status: Mesotrophic

McCarron Lake is a mesotrophic lake and the water quality is relatively good and has shown improvement since 2004 when restoration projects and an alum treatment were initiated by the watershed district. Phosphorus loading is the major nutrient concern being addressed in McCarron Lake. The amount of aquatic plant control declined from the late 1990's through 2004 and has been stable since that time.

Shoreline restoration and stabilization projects have been occurring since 2004 with 1,580 linear feet of shoreline restored, representing 38,180 square feet of shoreland. Funding for these efforts has originated from the Ramsey Conservation District's NATURE fund and from a Board of Water and Soil Resources grant.

### B. Plant Community:

Narrative (describe plant community, list common, rare, or other important aquatic plant species, list plant surveys): Aquatic plants are valuable for a number of ecological and biological functions including using nutrients that would otherwise be available to algae, stabilizing bottom sediments and shorelines, providing shelter for a variety of game and non-game fish and aquatic insects, and providing food for waterfowl and other wading birds.

Ramsey County has conducted plant transect surveys on McCarrons Lake in the past with the most recent being 2005. Additionally the Minnesota Department of Natural Resources (DNR)



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conducted two point-intercept plant surveys in 2010, one in June and one in August. The 2010 surveys found the most common plants to be: Muskgrass (*Chara* spp.), Eurasian Watermilfoil (*Myriophyllum spicatum*), Coontail, and Water Stargrass (*Heteranthera dubia*) based on presence.

Currently, McCarrons Lake has a diverse native aquatic plant community with a moderate occurrence of invasive plants. Eurasian Watermilfoil occurred at 28% of the sampled points in the May 2010 survey (16% in September) and was most dense in the west end of the lake. Implementation strategies outlined in this plan will help to ensure this trend continues for McCarrons Lake. Strategies will also include built-in flexibility to be able to address management/control of invasive species if they become a problem in the future.

Summary of Plant Surveys from 2005 (12 Transects) and 2010 (Point-intercept, 63 points) by percent frequency:

Taxa	July 2005	May 2010	Sep 2010
Coontail	83.3%	27.0%	27.0%
Canada Waterweed	16.7%	4.8%	3.2%
Muskgrass	8.3%	36.5%	31.7%
Sago Pondweed	25.0%	6.3%	12.7%
Wild Celery	8.3%	0.0%	4.8%
Water Stargrass	0.0%	20.6%	22.2%
White Waterlily	0.0%	1.6%	3.2%
Yellow Waterlily	8.3%	1.6%	4.8%
Curlyleaf Pondweed	66.7%	3.2%	3.2%
Common Duckweed	8.3%	1.6%	3.2%
Claspingleaf Pondweed	25.0%	6.3%	4.8%
Eurasian Watermilfoil	25.0%	28.6%	15.9%
Northern Watermilfoil	91.7%	6.3%	1.6%
Illinois Pondweed	0.0%	0.0%	6.3%
Potamogeton sp.	0.0%	0.0%	3.2%
Najas sp.	0.0%	0.0%	6.3%

### **Section III: Public Input Process** (narrative):

Letters were sent to the Lake McCarrons Neighborhood Association, Ramsey County, State Senators and Representatives, and Capitol Region Watershed District (CRWD) explaining that the clause allowing McCarrons Lake to chemically treat a greater percentage of aquatic plants within the littoral area than the rest of the lakes in Minnesota is set to expire by April 15, 2014. Before this clause expires, Minnesota DNR is required to create a lake vegetation management plan (LVMP) to identify aquatic plant management issues on McCarrons Lake and develop a specific plan to address the issues, if needed. DNR is partnering with the Lake Association, CRWD, and local municipalities to create this lake vegetation management plan for McCarrons Lake. A committee is set to meet to discuss and review



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the drafts of the LVMP. Once a Draft LVMP is developed, a public notice will be posted in the local paper, a public meeting will be held, and then 30 day public comment period will be provided.

The drafting committee met on December 9, 2010 at the Capitol Region Watershed District in Saint Paul. The committee had representation from the Capitol Region Watershed District, Lake McCarrons Neighborhood Association, Ramsey County and the Minnesota DNR. The committee reviewed the draft lake vegetation management plan and made minor changes.

The Lake McCarrons Neighborhood Association is responsible for making sure any required monitoring is collected in accordance with DNR guidelines and are submitted to the DNR (if required). Currently, there are no monitoring requirements because a variance has not been issued, however; if the plan is amended to include a variance with monitoring required then ultimately it will be the permittee's responsibility to make sure the data is collected and provided to the DNR.

## **Section IV: Problems to be Addressed in this Plan** (narrative):

The DNR revised the aquatic plant management (APM) rules on April 15, 2009 (MR 6280). The clause within the revised rule allowing McCarrons Lake to chemically treat a greater percentage of littoral area than the rest of the lakes in Minnesota is set to expire by April 15, 2014. The DNR is required to develop a lake vegetation management plan for McCarrons Lake before the clause expires. The LVMP will serve as a guide for the management of aquatic plants. The LVMP is a document the DNR develops in partnership with the public to address aquatic plant issues on a lake resulting in a targeted management plan to address those issues. The problems addressed in the LVMP include: maintaining/improving water quality, restoring vegetative shoreline buffers to intercept runoff and stabilize shorelines, and ensuring plan flexibility so invasive species management can be address if they become a widespread nuisance.

## **Section V: Goals for Management of Aquatic Plants** (narrative, include a description of efforts to protect rare features):

There are four goals to be addressed in this lake vegetation management plan:

- 1) Identify strategies to restore or enhance lake shore habitat (i.e. lake shore restoration, mitigating source pollution through working with the watershed district, etc...)
- 2) Reduce the levels of silt and nutrients within and entering the lake through activities such as identification and mitigation of stormwater run-off sources.
- 3) Maintain or increase abundance and distribution of native submersed aquatic plants throughout the growing season.
- 4) Build in flexibility to address invasive aquatic plants Eurasian watermilfoil and curlyleaf pondweed if they become a problem.



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## **Section VI: Treatment Plan** (map marked with areas where control of plants is anticipated):

### A. Commons Area (>150' from shore)

Mechanical Control: Maximum total treatment acres 36.5 acres to be treated, 50 % of littoral area

Narrative: Guidelines for aquatic plant management are described in MN rule 6280. Mechanical control of aquatic plants is allowed up to 50% of the littoral area. The cumulative amount of mechanical and chemical aquatic plant control may not exceed 50% of the littoral area. Currently, mechanical treatment is not anticipated

Herbicide Control: Maximum total acreage allowed with chemical treatment is 3.69 acres to be treated, 15 % of littoral area

Product(s): Endothall (such as Aquathol K or Aquathol Super K) for curlyleaf pondweed (CLP) and Auxin mimic (such as 2,4 D and Triclopyr) for Eurasian Watermilfoil (EWM).

Rate of Application: Endothall: 0.75 -1.0 ppm; Auxin mimic: 1.00 ppm.

Timing of Application: Early spring between the temperatures of 50-60 degrees F to reduce damage to native plants and to prevent turion development.

Narrative: Aquatic plants are valuable for a number of ecological and biological functions including utilizing nutrients that would otherwise be available to algae, stabilizing bottom sediments and shorelines, providing shelter for a variety of game and non-game fish and aquatic insects, and providing food for waterfowl and other wading birds. There is evidence that removal of submersed aquatic plant through the use of herbicide can harm lakes (such as reductions in populations of vegetation-dependent fish, removal of nursery habitat for fish, removal of habitat for invertebrates (food source for waterfowl and fish), and reductions in water quality). Cumulative loss of aquatic plants (especially when coupled with nutrient loading) can lead to drastic ecological changes in lakes causing the lake to have low water clarity, become algae dominated with little to no rooted aquatic plants, and shift to disturbance-tolerant fish species such as bullhead and carp (Engle 1990; Wilcox and Meeker 1992; Scheffer and Carpenter 2003; Egertson and Downing 2004).

The 15% limit is a level of plant control the DNR has confidence in that will allow riparian owners access to the lake while maintaining the basic functions and benefits that aquatic plants provide. Most lakes never reach the 15% limit for chemical control of aquatic plants. A variance is required to remove more than 15% of the littoral area and monitoring of the plant community and the water quality is required to ensure that cumulative impacts of aquatic plant removal are not resulting in harm to the lake.

One of the situations the DNR does considers issuing a variance to the 15% limit is for the selective control of invasive species to enhance recreational benefits. Currently, invasive species are not a recreational nuisance within McCarrons Lake. If invasive species become a



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recreational problem, this LVMP may be amended to include a DNR approved treatment regime. There are no treatment regimes that are 100% selective for invasive species. However, there are some treatment regimes that are more selective using low dose, targeted herbicides, and timing of treatment to reduce the impacts to native plants. The above information on herbicides, timing, and target concentration are the current understanding of “selective control” for curlyleaf pondweed and Eurasian watermilfoil. Selective control of invasive species is an evolving science and the treatment protocol may change as new information becomes available.

Other:            acres to be treated,            % of littoral area

Narrative:

## B. Individual Permit Standards (new permits)

Chemical Treatment of Submerged Vegetation: individual shorelines may be allowed to treat up to 100 feet or half the property’s shoreline whichever is less except for properties that have less than 70 feet of shoreline may treat up to 35 feet along shore 100-150 feet lakeward

Narrative: Permit requests are subject to inspection and the aforementioned limits are maximums allowed for native species control. Selective control of invasive submerged aquatic plant species may be allowed to treat up to the entire frontage of the shoreline given that the stand of invasive species is nearly a monoculture, very dense and matted, and there are not native species present that would be affected by the “selective treatment”.

Permit standards for individual shorelines are in place to ensure each shoreline retains some aquatic habitat. Near-shore habitat, which are the most frequent targets for control efforts by shoreline property owners, are particularly important as habitat for young or small fish, and have the greatest diversity of non-game fish and amphibians (Poe et al. 1986; Bryan and Scarnecchia 1992; Weaver et al. 1992). Many species of mammals and waterfowl depend on these aquatic plants for food and nesting sites and are especially important for laying females whose reproductive success is closely tied to the availability of aquatic plants (Krull 1970; Bellrose 1976; Batt et al. 1992: 7-9). Development is increasing on lakes (particularly in the metro area) and entire reaches of near-shore habitat have been impacted through development. Having restrictions on the amount of shoreline individual properties can treat, allows each property owner to have access to the lake while retaining some of the near-shore habitat that is so critical for fish and wildlife. These restrictions also allow for an equitable distribution of aquatic plant management activities among all riparian property owners while mitigating the cumulative impacts on the lake as a whole.

Treatment of Emergent Vegetation:            feet along shore to open water

Narrative: Individuals who would like to remove emergent vegetation to access open water may apply for a permit. The necessity of removal to create an access channel will be assessed by the DNR before a permit is issued.



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Other Treatment - : feet along shore feet lakeward

Narrative:

## **Section VII: Funding** [check all that apply]

- Lake Association
- DNR Grant
- Lake Improvement District (LID)
- Conservation District
- Other (please describe) \_\_\_\_\_



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**Section VIII:** The commissioner may issue APM permits with a variance from one or more of the provisions of parts 6280.0250, subpart 4, and 6280.0350, except that no variance may be issued for part 6280.0250, subpart 4, items B and C. Variances may be issued to control invasive aquatic plants, protect or improve aquatic resources, provide riparian access, or enhance recreational use on public waters (6280.1000, subpart 1). Variance(s) and Justification(s) [check all that apply]

- Application of pesticides to control submerged vegetation in more than 15 percent of the littoral area (M.R. 6280.0350, Subp. 4, A). (list justification below)
- Application of pesticides to control aquatic macrophytes in natural environment lakes established pursuant to part 6120.3000 (M.R. 6280.0250, Subp. 4, E.). (list justification below)
- Mechanical control of aquatic macrophytes in more than 50 percent of the littoral area (M.R. 6280.0350, Subp. 3, B). (list justification below)
- Other (please explain)

Justifications (identify which variance and provide the rational for all items checked above):

A variance has not been issued at this time for McCarrons Lake. However, if invasive species become a recreational problem, the DNR and the cooperators will evaluate the conditions of the lake to determine the best course of action. This LVMP may be amended at that time to include a variance and a DNR approved treatment regime to target the invasive species if that is the agreed upon course of action. If a variance is issued then monitoring would be required to ensure that the treatments are having the desired affect and that the treatment regime is not doing more harm to the lake then good. Required monitoring would be for water quality, invasive species, and native aquatic vegetation as described below.

- 
- Variance approved without condition(s)
  - Variance approved with following conditions(s):

Pretreatment data collection

**Narrative:** pre-treatment data would include a pre-treatment point intercept inventory of the aquatic plant community and water quality data to serve as baseline data to compare the effectiveness of the treatment regime and to determine the impacts on the lake.

Post treatment data collection

**Narrative:** At least one point-intercept survey will occur annually during the peak growth of native vegetation (late June through August). It will be the responsibility of the lake association to make sure a point intercept is conducted. Again, reliable water quality data must also be collected throughout the season. The survey reports and water quality data





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must be provided to the DNR, the lake association, and other interested parties upon completion or by the fall of each year.

**Evaluation**

**Narrative:** The DNR, in conjunction with other interested parties, will review the point-intercept survey(s) and water quality results annually. If the point-intercept surveys or water quality data reveal that the herbicide treatments appear to be doing more harm than good, treatments may be ceased at the discretion of the DNR. Examples of reasons to stop treatments include, but are not limited to, notable decreases in water quality and obvious decreases in native vegetation. If treatments are ceased, the DNR will work with the association to develop an alternative management strategy.

**Other:**

**Narrative:**



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## Section IX: Signatures

This Lake Vegetation Management Plan is in effect for 5 years from date of Regional Fisheries approval. If the plan is not renewed, then permits will be issued according to the standards listed in MR6280.

DNR Approval

Submitted By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

_____	_____
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Area Fisheries Supervisor

Date

_____	_____
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Regional Fisheries Approval

Date

_____	_____
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Regional Ecological Resources Approval

Date

I affirm that I am an authorized representative of Lake McCarrons Neighborhood Association and acknowledge participation in the development and implementation of this lake vegetation management plan.

_____	_____
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Cooperator's Signature and Title

Date

Either party may terminate participation in this plan at any time, with or without cause, upon 30 days' written notice to the other party. If participation is terminated, permits will be issued according to standards listed MR6280.



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## Glossary of Terms:

**Lake Vegetation Management Plan (LVMP):** An LVMP is a document the DNR develops with public input to address aquatic plant issues on a lake. It seeks to balance riparian property owners' interest in use of shoreland and access to the lake with the preservation of aquatic plants, which are important to a lake's ecological health.

**Total Phosphorus:** The measure of the total concentration of phosphorus present in a water sample. Phosphorus is typically the nutrient that limits aquatic plant and algae growth in freshwater lakes and enters a lake through both point-source and nonpoint-sources.

**Secchi Disc:** A circular disc used to measure water transparency in lakes. The disc is slowly lowered into the water and the depth at which it is no longer visible is recorded as the Secchi Depth and is an indicator of water clarity.

**Chlorophyll 'a':** The measure of primary productivity, the rate at which light energy is incorporated into plant cells. Chlorophyll is responsible for the green color of plants and leaves.

**Mesotrophic Lake:** A lake with an intermediate level of productivity. Located on the continuum between low productivity oligotrophic lakes and high productivity eutrophic or hyper-eutrophic lakes. These lakes typically have clear water and moderate levels of submerged aquatic plants.

**Transect Survey:** A sample methodology in which lines perpendicular to shore are sampled from the shoreline lakeward. Multiple transects located around the lake are used to give an indication of plant species present.

**Point-Intercept Survey:** A sample methodology in which a grid of evenly spaced points is overlaid over the lake and a sample is taken at each point to determine presence of aquatic plant species.

**Littoral Area:** The surface area of a body of water where the depth is 15 feet or less. This is the area of the lake where submerged aquatic plants grow.