



# Lake Vegetation Management Plan

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

## Section I: Lake Information

Name: Owasso                      DOW Number: 62005600                      County: Ramsey  
 Fisheries Area: East Metro                      Surface Acres: 393, MN DNR                      Littoral Acres: 293  
 Classification: General Development

Cooperator(s): Lake Owasso Association, Grass Lake WMO, City of Shoreview, City of Roseville and the MN DNR.

## Section II: Water Quality and Plant Community

### A. Water Quality

- |  |                                       |
|--|---------------------------------------|
| <input checked="" type="checkbox"/> Total Phosphorus: 79 ppb | Date: 2000-2009 June-Sept Summer Ave. |
| <input checked="" type="checkbox"/> Chlorophyll-a: 17.9 ppb  | Date: 2000-2009 June-Sept Summer Ave. |
| <input checked="" type="checkbox"/> Secchi Disc: 1.46 meters | Date: 2000-2009 June-Sept Summer Ave. |

Narrative (describe water quality concerns, quantify TSI, NOTE if impaired or if TMDL exists):

Carlson Trophic Status for Total Phosphorus: 67                      (TSI(TP) = 14.42 ln(TP) +4.15  
 Carlson Trophic Status for Chlorophyll-a: 59                      (TSI(CHL) = 9.81 ln(CHL) + 30.6  
 Carlson Trophic Status for Secchi Disk: 55                      (TSI(SD) = 60-14.41 ln(SD))  
 Overall Trophic Status: Eutrophic 60.3

Lake Owasso is a eutrophic lake. The amount of aquatic plant control in acres has remained the same or has decreased since 2000. The watershed district has been addressing water quality problems in the Lake and throughout watershed as has commissioned a major update of watershed management plans.

### B. Plant Community:

Narrative (describes plant community, list plant surveys, include a table of percent frequency, and make sure to note rare species and species of concern):

The Grass Lake WMO conducted a point-intercept plant survey in June 2010, which is the only recent plant survey that has been conducted on Lake Owasso. The Grass lake WMO also had conducted a plant survey in May, 2007. The June 2010 plant community was dominated by Eurasian Watermilfoil which is a non-native plant. Some other common and abundant aquatic plants found in the survey were Elodea, Slender Niad, and Chara. In 2007 Eurasian Watermilfoil (EWM) was found in 23% of the sites but in 2010 it was found at 54% of the sites sampled, a 135% increase in abundance. In 2007 curly-leaf pondweed (CLP) was found at 71% of the sample sites but it makes up only 17% of the points sampled in 2010, a decrease of 76% abundance. Currently, Lake Owasso is dominated by Eurasian watermilfoil, the lake also has a fairly low occurrence of Curly leaf Pondweed at this time. We want to continue the trend of decrease in abundance of CLP, and we also want to see a decline in abundance of



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EWM. This plan will address these non-native aquatic plant problems and will have flexibility built into it to address other problems should they arise in the future.

Percent frequencies of occurrence of surveyed sites.

	June-2010 197 pts.	May-2007 197 pts.
<b>Eurasian Watermilfoil</b>	<b>54</b>	<b>23</b>
Elodea	34	0
Slender Naiad	30	4
Chara	30	19
Sago Pondweed	19	9
Filamentous Algae	18	56
<b>Curlyleaf Pondweed</b>	<b>17</b>	<b>71</b>
Flat-stem Pondweed	13	0
Coontail	11	14
Northern Watermilfoil	7	7
Large-leaf Pondweed	7	9
White Waterlily	3	3
Yellow Waterlily	2	7
Watershield	1	0
Horned pondweed	0	1
Floatingleaf Pondweed	0	2

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

Email and phone calls were sent to the Lake Owasso Association, Cities of Shoreview and, Roseville, and Grass Lake WMO explaining the clause allowing Lake Owasso to chemically treat a greater percentage of littoral area than the rest of the lakes in Minnesota is set to expire in April of 2014. Before this clause expires the DNR is partnering with the Lake Owasso Association and Grass Lake WMO to create this lake vegetation management plan for Lake Owasso. DNR representatives met with the Lake Owasso Association, Grass lake WMO and board member, and representatives from the city of Shoreview and the City of Roseville on November 29, 2011 and discussed the issues that required the LVMP and how it would affect the lakeshore owners. From the input process there were two main goals identified. The first was to aggressively control the invasive aquatic plants, Eurasian water milfoil and Curly-leaf Pondweed. A second goal would be maintain/improve the diversity and abundance of native aquatic plants and maintain or improve the water quality in Lake Owasso and is to build some flexibility into the plan to address other problems if they become apparent in the future. The Lake Owasso Association recognizes that they are responsible for organizing permit requests for treatment, obtaining permission from landowners for near shore property management (areas less than 150 feet from shore), ensuring that water quality monitoring is done in accordance to DNR guidelines, if monitoring is required, and submitting reports of annual activities and ongoing monitoring results. Once an LVMP is developed there will be a notice in the paper, a public meeting, and a 30 day comment period.



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The LVMP drafting committee met in late January, 2012 at the Roseville city hall in Roseville, MN. This second meeting consisted of the groups that initially met to discuss and review the draft of the LVMP. DNR representatives met with the Lake Owasso Association and Grass Lake WMO to discuss the issues associated with the development and implementation of the lake vegetation management plan and what the potential affects may be for the lakeshore owners. From the discussion at this input process The committee reviewed the draft lake vegetation management plan and made minor changes and built flexibility into the plan to address invasive species. The LVMP was posted to the DNR's website late January 2012. A press release through the DNR, and a public notice was published in the Shorview Bulletin on February 8, 2012. The LVMP was presented to the public on February 27, 2012 at the Roseville city hall. There were 4 people in attendance at this public meeting, no written comment were received at this time. The plan was made available on the DNR website in late Januray, 2012 and a 30-day comment period started on February 27, 2012 and ends March 27, 2012.

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

The Minnesota Department of Natural Resources (DNR) revised the aquatic plant management (APM) rules on April 15, 2009. The clause allowing the Lake Owasso Association 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 lake vegetation management plan (LVMP) for Lake Owasso before the clause expires, to guide the management of aquatic plants in the lake. LVMP is a document the DNR develops with public input to address aquatic vegetation issues on a lake and allows a targeted management plan to address those issues.

The problems addressed and solutions implemented will control invasive aquatic plants, maintain/improve native aquatic plant diversity, maintain/improve water quality and build flexibility into the plan so if future problems become widespread those issues may be addressed.

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

There are four goals to be address by this plan:

- 1) Reduce the abundance and distribution of Eurasian Watermilfoil within the lake through targeted herbicide treatments.
- 2) Reduce the abundance and distribution of Curly leaf Pondweed within the lake through targeted herbicide treatments.
- 3) Maintain or increase the diversity, abundance and distribution of native submersed, floating leaf and emergent aquatic plants throughout the growing season.
- 4) Build in flexibility to this plan to address future problems if needed.
- 5) To maintain a treatment program that will prevent matting of Eurasian Watermilfoil at the surface or enable treatment after matting of Eurasian Watermilfoil at the surface occurs.



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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 146 acres to be treated, 50 % of littoral area

#### Narrative:

Mechanical control of aquatic plants is allowed up to 50% of the littoral area (M.R. 6280). 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: In 2010, an estimated 146 acres to be treated, ~50 % of littoral area. For a detailed description of the treatment plan see Appendix 1. A second treatment may be authorized if the 1<sup>st</sup> treatment has failed or conditions have changed and Eurasian Watermilfoil has proliferated post initial treatment. The DNR will consider all second treatment requests and are pending inspection by the DNR.

- Other: ##### acres to be treated, ##### % of littoral area

#### Narrative:

Traditionally the Lake Owasso Association has treated a 10 acre area off shore in the south arm of the lake and a 5 acre area in the north section of the lake. The DNR will consider and grant such requests on a case by case basis, depending on the plant species and abundance in the requested areas.

### B. Individual Permit Standards

Chemical Treatment of Submerged Plants: 50 feet or half of the frontage whichever is less feet along shore 50 feet lakeward.

#### Narrative:

Any permit applications received from riparian landowners for chemical treatment of native submersed plant on Lake Owasso after the lake-wide treatment will be considered on an individual basis. Removal of native submersed vegetation will be limited to only that area necessary to allow reasonable use, with the maximum area being no more than 50 feet wide, or half of the owner's frontage whichever is less, by 50 feet lakeward plus a 15 foot wide channel to open water that may extend from the lakeward side of the 50 x 50 foot area. No removal of sparse native vegetation through the use of chemicals will be permitted.

Permit requests are subject to inspection and the aforementioned limits are maximums allowed for native species control. Selective control of invasive submersed 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 many native species present that would be affected by the "selective treatment".



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Treatment of Emergent Plants: ##### feet along shore to open water

Narrative:

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

Other Treatment - Click here to enter text.: ##### feet along shore ##### feet lakeward

Narrative:

Click here to enter text.



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## **Section VII: Variances and conditions of permits**

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)

Waiver of dated signature requirement for invasive aquatic plant management permits because collecting a signatures would create an undue burden (M.S. 103G.615, Subp. 3a(b)). (list justification below)

Other (please explain)

[Click here to enter text.](#)

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

Narrative:

A variance to the 15% limit is required to meet the goals LVMP mentioned above. Specifically the variance will allow bay-wide control of Eurasian Watermilfoil and Curly leaf pondweed;

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 considers issuing a variance to the 15% limit is for the selective control of invasive species to enhance ecological and recreational benefits. Currently, Eurasian Watermilfoil makes up a significant proportion of the plant community and could be an ecological and recreational nuisance on Lake Owasso.

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The overall diversity of native submersed plants, as measured by the mean number of native species per point (littoral zone), will be maintained or allowed to increase in the first year after bay-wide treatment. The mean number of native species per point may decrease during the year of bay-wide treatment. If the mean number of native species per point decreases during a year of bay-wide treatment, it is possible that bay-wide treatments may not be done during at least the first year following a bay-wide treatment in order to meet Goal 3. Bay-wide treatments may be repeated at intervals of every other to every third year, depending on trends in the frequencies of the target invasive plants and also non-target native plants. If the mean number of native species per point does not decrease during the first year of bay-wide treatment, then bay-wide treatments may be considered during the following year

Monitoring data will be collected as described below.

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**Variance approved without condition(s)**

**Variance approved with following conditions(s):**

**Pre-treatment data collection**

**Narrative:**

Two pre-treatment point-intercept plant surveys and water quality data were collected by the Grass Lake WMO to serve as baseline data to compare the effectiveness of the treatment regime and to determine the impacts on the lake..

During each year of bay-wide treatment, the Lake Owasso Associations or its agent will inspect the lake prior to treatment to delineate areas to be treated. If any deviations from the most recent inventories are observed during pre-treatment inspections, these results should be noted and the treatments adjusted accordingly, in a manner consistent with the APM permit issued by the MnDNR. Treatment areas should be delineated using GPS and Geographic Digital Data, including all necessary electronic files, will be submitted to the DNR to enable re-creation with GIS software of all polygons, waypoints, track logs, etc.



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## **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). Reliable water quality data must also be collected throughout the season. The survey reports and water quality data must be provided to the DNR, the lake association, and other interested parties by 31 December of each year. It will be the responsibility of the lake association to make sure a point intercept is conducted. (Currently the Grass lake WMO has been conducting point-intercept surveys).

## **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 treatments appear to be producing results that do not meet the goals of this plan, then the approach to control may be revised at the discretion of the DNR. Examples of reasons to revise the approach may include, but are not limited to, notable decreases in water quality or obvious decreases in native vegetation. If treatments need to be modified, the DNR will work with the associations to develop an alternative management strategy.

## **Requirements for Signature Waiver:**

### **Narrative:**

Currently a waiver for signature is not authorized.

If a waiver for the signature requirement is issued under MS 103G.615 Subp 3a(b) an alternative form of notification is required. The allowed alternate forms of notification are a news releases or public notices in a local newspaper, a public meeting, or a mailing to the most recent permanent address of affected landowners. The notification must be given annually and must include: the proposed date of treatment, the target species, the method of control or product being used, and instructions on how the landowner may request that control not occur adjacent to the landowner's property.

## **Conditions of permits [limits on amounts of area to be treated, method and timing of control, etc]:**

Product(s): Herbicides to be used may include 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) or others. Protocols describing our current understanding of selective treatments including: target concentraion, timing of application and frequency of treatments are attached in Appendix 1.





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**Other:**

**Narrative:**

Additional information is contained in the following appendices:

Appendix 1: Background Information.

Appendix 2. Water quality Data

Appendix 3. Literature Cited.



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## **Section VIII: Signatures**

This Lake Vegetation Management Plan is in effect for five (5) years from date of Regional Ecological and Water Resources 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: \_\_\_\_\_

_____	_____
Area Fisheries Supervisor	Date
_____	_____
Regional Fisheries Approval	Date
_____	_____
Regional Ecological and Water Resources Approval	Date

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

_____	_____
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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## **Appendix 1: Background Information.**

### **Rationale for Section II: Water quality and plant community**

#### **Values of Aquatic Plants in Lakes**

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).

### **Section VI: Treatment plan**

**Target Concentration:** Current recommended rates for selective CLP treatment utilize Endothall applied at a rate to achieve a target concentration of 0.75-1.0 ppm up to 1.5 ppm for areas less than 1 acre. For 2012, the selective treatment of EWM uses Auxin Mimics applied at rates to achieve target concentrations of up to 1.0 ppm bay wide. Selective control of invasive species is an evolving science and the treatment protocol may change as new information becomes available.

**Timing of Application:** Timing of bay wide application for Curly leaf pondweed will be early spring when invasive plants are actively growing but before the majority of the native plants begin to germinate (before 60 degrees F) to reduce the damage to native plant and to prevent turion development. Timing for Eurasian Watermilfoil treatments will be according to product label directions.

**Frequency of Treatments:** If the mean number of native species per point decreases during the first year of lake wide treatment, it is expected that lake-wide treatments will not be done during at least the first year after lake-wide treatment until native species per point reach pretreatment levels in order to meet Goal 3. Lake-wide treatments may be repeated at intervals of every other to every third year, depending on trends in the frequencies of the target invasive plants and also non-target native plants. If the mean number of native species per point does not decrease during the first year of lake-wide treatment, then lake-wide treatments may be considered during the following year.

#### **Narrative:**

One of the situations the DNR considers issuing a variance to the 15% limit is for the selective control of invasive species for ecological and recreational benefit. Currently, invasive species do make up a significant proportion of the plant community and are an ecological or recreational nuisance. Applying herbicides in early spring can potentially increase their selectivity by targeting CLP and EWM at a time when these invasive species are actively growing and when many native species remain dormant (Netherland et al. 2000).



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There are no treatment regimes that are 100% selective for only 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. If the treatment protocol changes the new treatment protocol and why it was changed will be added to the LVMP in appendix 4 and those conditions will be incorporated into the APM pemrits.

## **Section VI: Treatment Plan, B. Individual Permit Standards**

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. 1997). 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.

## **Appendix 2: Water quality data.**

All Lake Owasso water quality data may be found on the Minnesota Pollution Control Agency website.  
<http://www.pca.state.mn.us/water/clmp/lkwqReadFull.cfm?lakeid=62-0056>  
<http://www.pca.state.mn.us/water/clmp/clmpSearchResult.cfm?lakeid=62-0056>



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## **Appendix 3: Literature cited.**

- Batt, B.D.J., A.D. Afton, M.G. Anderson, C.D. Ankeny, D.H. Johnson, J.A. Kadleck, and G.L. Krapue, editors. 1992. Ecology and management of breeding waterfowl. University of Minnesota Press, Minneapolis and London.
- Bellrose, F.C. 1976. Ducks, geese and swans of North America. Stackpole Books, Cameron and Keller Streets, Harrisburg, PA, 17105.
- Bryan, M.D. and D.L. Scarnecchia 1992. Species richness, composition, and abundance of fish larvae and juveniles inhabiting natural and developed shorelines of a glacial Iowa lake. *Environmental Biology of Fishes* 35: 329-341.
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- Krull, J.N. 1970. Aquatic plant-macroinvertebrate associations and waterfowl. *Journal of Wildlife Management* 34: 707-718.
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