



Lake Vegetation Management Plan

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

Section I: Lake Information

Name: Coon DOW Number: 02004200 County: Anoka

Fisheries Area: East Metro Surface Acres: 1779 Littoral Acres: 1647

Classification: Natural Environment Recreational Development General Development

Cooperator(s): The Anoka Conservation District (ACD), the Coon Lake Improvement Association (CLIA), the Coon Lake Improvement District (CLID), Coon Lake Community and Senior Center, MNDNR-Invasive Species Program, and MNDNR Fisheries-Aquatic Plant Management

Section II: Water Quality and Plant Community

A. Water Quality

- Total Phosphorus: 21.0-45.0 ppb; 35.1 ppb summer mean (28May08 to 16Sept08); 9 obs.
32.9 ppb 10 yr average (May-Sept). 70 obs. Date: 5/1/99 to 9/18/09
- Secchi Disc: 0.88-2.56 m; 1.5 m summer mean (28May08 to 16Sep08); 9 obs.
1.88 m 10 yr average (May-Sept). 70 obs. Date: 5/1/99 to 9/18/09
- chlorophyll 'a': 5.9-38.4 ppb; 18.6 ppb summer mean (28May08 to 16Sept08); 9 obs.
15.7 ppb 10 yr average (May-Sept); 70 obs. Date: 5/1/99 to 9/18/09

Narrative (describe water quality concerns, quantify TSI):

- Carlson Trophic Status for Total Phosphorus: 56
- Carlson Trophic Status for Chlorophyll-a: 60
- Carlson Trophic Status for Secchi Disk: 54
- Overall Trophic Status: Eutrophic

Coon Lake is in the North Central Hardwood Forests Ecoregion (NCHF). Coon Lake is composed of three basins that differ from one another. Beginning in the southwest portion of the lake, Choo Choo, Breezy, and Theilen bays have relatively high water clarity [Secchi disk – 2.3 m – average of 10 observations in 2008] and moderate depths. To the west is West Arm, which is shallow. To the northeast is Beach Bay or East Bay, which has relatively low water clarity [Secchi disk – 1.5 m – average of eight observations in 2008] and greater depths. MPCA standards for NCHF lakes are total phosphorous (TP) less than 40 ppb; chlorophyll A (Ch-a) less than 14 ppb; and Secchi depths greater than 1.4 meters. Measurements in 2008 indicated that Coon Lake's East bay narrowly met the water quality standards for TP and Secchi, but did not meet standards for Chl-a, suggesting Coon Lake may be nearing impaired status. Trophic state indexes ranged from 54 to 60. Therefore, Coon Lake is classified as eutrophic by the MPCA. Factors that may be contributing to water quality issues are failing lakeshore septic systems, the need to restore lakeshores (i.e. plant native vegetation), abundant curly-leaf pondweed, and algal blooms.



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B. Plant Community:

Narrative (describe plant community, list common, rare, or other important aquatic plant species, list plant surveys):

- *A total of 23 species were found in Coon Lake during the August 2008 survey, compared with 13 species identified in June 2009. Of these species, 3 were floating-leaved, 3 were emergent and the remaining 17 species were considered submergent vegetation. Two species identified during this survey were non-native: Eurasian watermilfoil (*Myriophyllum spicatum*) and Curly-leaf pondweed (*Potamogeton crispus*).
- *A brief overview of how the bays of Coon Lake differ shows that Choo Choo, Breezy, and Theilen bays have a high number of aquatic plant species, while the West Arm is dominated by native water-lilies, and Beach Bay/East Bay has a low number of plant species based on surveys from June 2008, August 2008, and August 2009 (Kelly LaFortune, 2008-9).
- *The spring submerged plant community was dominated by curly-leaf pondweed (*Potamogeton crispus*), which was found at 66.1% of the sample sites (June 2008). Flatstem pondweed (*Potamogeton zosteriformis*) was the next most dominant species in the lake, found at 57.2% of stations sampled. No vegetation was found in the basin in depths greater than 13 feet. In areas that were less than 13 feet, 93% of sampled stations had native submergent plants. The average native species per point was 1.6 +/- 1 (LaFortune June 2008; Appendix A).
- *Overall, the summer 2008 survey found that the submerged native plant community was dominated by Coontail (*Ceratophyllum demersum*), Flat Stem (*Potamogeton zosteriformis*), and Canada Waterweed (*Elodea canadensis*), which were found at 53.2, 50.1, and 49.9% of sample sites respectively. Native submergent species were found in 85% of stations sampled. No vegetation was found in Coon Lake in depths greater than 12.0 feet during this survey. The average number of submerged native species at each sample point was 3.5 +/- 1 (LaFortune August 2008; Appendix B). Based on the observed increases in native plants as CLP senesces, it appears that native plants may be filling in once the CLP dies off in mid summer.
- *A nuisance control grant and permit was issued for the treatment 73 acres of EWM with triclopyr herbicide on July 23, 2009. A post treatment survey (LaFortune Aug 23, 2009) showed that the percent occurrence of native plants decreased from 85% to 70% of sample points and average native plant per point decreased from 3.5 to 2.8.
- *As per this plan, the MNDNR is allowing early season selective treatment for Curly-leaf pondweed in DNR designated areas in the East Bay. Early-season treatment is defined by applying herbicides to delineated areas within the water temperature range of 50 to 60 degrees F. In 2010, an early-season CLP treatment with Endothall herbicide will occur in the East Bay of Coon Lake only. The DNR may or may not decide to expand the treatment area in future years. The treatment is aimed at controlling CLP while improving water quality and increasing native plants. Coon Lake has an abundance of native plants that may be able to fill in if invasive plants are under control. The results of the project will be carefully monitored to ensure that the treatments are not doing more harm than good (i.e. if treatments cause decreases in water quality or native species). As stated previously, control efforts will be focused in the East bay of Coon Lake to demonstrate the effectiveness of the project and possibly expand the project pending a successful outcome in the



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East Bay (control of invasive while maintaining/increasing water quality and native plant abundance).

*If necessary, the Coon Lake Improvement Association and/or the Coon Lake Improvement District may apply for a grant to control nuisance conditions of Eurasian Watermilfoil (EWM) using triclopyr herbicide. The requested treatment area(s) will be assessed by the DNR's Invasive Species Program to determine if the area(s) meet the accepted definition of a nuisance. A map of the areas that are deemed appropriate will be sent to the applicant. The applicant must attach this map to the permit application to be submitted to the DNR's APM program. This grant application can be found online at: <http://www.dnr.state.mn.us/grants/habitat/eurasian.html>

Section III: Public Input Process (narrative):

This plan was prepared by the Minnesota Department of Natural Resources' Division of Fish and Wildlife & Division of Ecological Resources, the Anoka Conservation District, the Coon Lake Improvement Association (CLIA), the Coon Lake Improvement District (CLID), and with technical information provided by PLM Lake & Land management Corp. (PLM). There have been several public meetings held since 2008 regarding invasive species treatment regimes and this LVMP.

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

1. Curly-leaf pondweed and Eurasian watermilfoil can interfere with recreation: The presence of excessive growth of these invasive species in many regions of the lake can impede recreational use of the lake, including fishing, boating, and swimming.
2. Excessive growth of curly-leaf pondweed is hypothesized to cause some mid to late-summer ecological problems. CLP senesces during mid-summer, after which water quality may decrease due to increases in phosphorus and/or blooms of algae. A definitive connection between decreases in water quality and CLP senescence has not been found. However, it is hypothesized that the senescence of CLP may release enough phosphorus into the water column to cause declines in water quality. For this reason, early-season treatment of CLP may help improve water quality by removing CLP from the system before it senesces. It should be noted that nutrients from other sources, such as the sediments in the bottom of the lake, may also contribute to declines in water quality. This is known as "internal loading." Further, external loading, such as fertilizer run-off from lawns, may also cause decreases in water quality.

It is recognized that demonstrating ecological benefits and problems associated with curly-leaf pondweed may be difficult. The hypothesized effects of CLP senescence to lake systems are the subject of continuing research in the DNR and other organizations. Aquatic plant distribution/abundance and water clarity will be closely monitored to determine if the control of curly-leaf pondweed is beneficial or detrimental to the lake system. If treatments on Coon Lake appear to be doing more harm than good, the DNR may choose to cease future treatments.

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

1. Reduce interference caused by CLP & EWM to the recreational use of Coon Lake.



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2. Increase abundance and distribution of native submersed aquatic plants throughout the growing season.
3. Improve water quality (reduce phosphorous & chl-a and increase secchi depth readings).
4. Identify strategies to restore or enhance lakeshore habitat.
5. Bay-wide treatments with herbicide may carry the risk of unintended negative impacts. In order to minimize this potential, the bay-wide treatment will be done using specific protocols as set by the DNR and the results of the treatment will be carefully monitored. Treatments of CLP will be done when water temperatures are between 50 and 60 degrees F. Areas to be treated will be delineated by a DNR employee prior to treatment occurring.
6. Work toward reducing EWM and CLP populations to levels where herbicide control does not exceed 247 acres (which equals <15% of the littoral zone).
7. As stated in the grant description, individual treatments of native plants along private shorelines must only occur at reduced levels.

*Bay-wide treatments of CLP will adhere to selective early season protocols as set by the MN DNR. Note that these protocols are actively being developed and may change as more data is gathered and analysed regarding the effectiveness and selectivity of early-season treatments. Currently, the early-season protocol states that treatment must occur when water temperatures are between 50-60 degrees F. At this temperature range, CLP growth is active, but most native plants are not yet actively growing. It is hypothesized that by treating actively growing CLP before the plants can build up sufficient carbohydrate reserves, the plants will not be able to reproduce. Thus, over time, the turion bank will be depleted, and abundance and distribution of CLP will decrease. By treating early in the season, before native plants are actively growing, chemicals used for treatment of CLP pondweed should only effect CLP and not native plants.

*As previously discussed, EWM treatments shall be for nuisance control only.



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

A. Commons Area (>150' from shore)

Mechanical Control: acres to be treated, % of littoral area

Narrative: None anticipated

Herbicide Control: East Bay of Coon Lake: approximately 130 acres to be treated, maximum of 50 % of littoral area

Product(s): Endothall as Aquathol K or Aquathol Super K

Rate of Application: anticipate 0.75-1 ppm

Timing of Application: In East Bay, when the water temperature is between 50-60 degrees F, when there is active CLP growth, but before most native plants are actively growing. Actual application timing will depend on weather, water temperature, growth of CLP and scheduling of applicators. (Note: the above herbicide control description is just for the East Bay - not the whole lake. For example, the 50% littoral area refers to the littoral area of the bay, not the whole lake.)

Narrative: The bay-wide treatment of CLP that is associated with the MnDNR grant program will only be allowed within DNR-delineated areas during the spring. Within the East bay, no herbicide will be applied outside of the delineated/permitted treatment areas. CLP treatment acreage (offshore and near shore combined) in the East bay is estimated to be, but not limited to, 130 acres (approximately 8% of the whole lake littoral area). Estimates of acreage will be based upon results of the pre-treatment delineation conducted by the DNR. Actual acreage of each area may vary from year to year.

Upon finalization of this LVMP, Coon Lake may apply for permits to treat up to 16% of their lake-wide littoral area (~263 acres). All permit applications for herbicide treatment will be carefully reviewed by the MnDNR, which reserves the right to deny permits to anyone if the proposed treatment may harm the ecological or recreational functions of the lake. Further, permits may be denied if the DNR believes that the proposed treatment may effect the results/findings of the Pilot Project study.

In summary, the DNR does not have to grant permits to treat all the way up to the 16% limit. The actual % littoral zone that will be treated each year will be assessed on a case-by-case basis. For example, depending on lake ecology and available information, some years the DNR might only allow treatment in 12% of the littoral zone. On the other hand, if it is deemed necessary by the DNR and its cooperators to exceed the 16% variance for the purposes of invasive species control, improving water quality, and/or increasing native vegetation growth, this LVMP may be amended to reflect that decision. Overall, the DNR will work with the lake association and LID to devise a yearly treatment regime that is best suited to the overall protection of the lake.



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As previously stated, Coon Lake may apply for a permit to treat nuisance areas of EWM. If they receive a DNR grant, they must use triclopyr herbicide on the designated areas. If Coon Lake applies for permits to conduct early-season treatments of dense areas of CLP in other bays, outside of the Pilot Project Program area, the DNR's Aquatic Management Program will consider these permit requests on a case by case basis.

Other: acres to be treated, % of littoral area

Narrative:

B. Individual Permit Standards (new permits)

Chemical Treatment of Submerged Vegetation: 50 feet along shore 50 feet lakeward

Narrative: Any permit applications received from riparian landowners for chemical treatment of native submersed vegetation on properties along Coon Lake after the lake-wide treatment of CLP will be considered individually. Removal of native submersed vegetation will be limited to only that 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.

Mechanical Treatment of Emergent Vegetation: 15 feet along shore to open water

Narrative: If permit applications are received for removal of emergent or floating leaf vegetation, they would be limited to 15 foot wide channels through dense areas of emergent or floating leaf vegetation that prevent access to open water. In some cases where emergent vegetation extends beyond 40 feet to 50 feet lakeward, docking over the top of the vegetation with a permanent or floating dock would be the typical method allowed to gain access. All applications will be considered individually.

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



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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):

Variance to 15% Rule requested. Recommend raising it to 16% for Coon Lake due to the fact that a portion of the littoral zone will be devoted to the Pilot Project program in the East Bay of Coon Lake (8%). Invasive Species are wide-spread throughout the lake; raising the limit to 16% gives the lake associaton/LID some additional acreage to work with (if needed) to manage invasive species in the rest of the lake that is not a part of the Pilot Project Program.

Pilot Project: Bay-wide treatments to control and reduce non-native CLP in order to provide recreational and ecological benefits by increasing abundance of native submerged aquatic plants and improving water quality. To maximize control area of CLP by treating as large a contiguous area as possible, including along undeveloped shoreline (variance to M.R. 6280.0350, Subp. 4, A).

Other:

- 1) Application of pesticides to control submerged vegetation along more than 100 feet of shoreline per site belonging to an individual riparian owner (M.R. 6280.0350, Subpart 4,A). Justification: The DNR or cooperating entity will delineate areas where CLP treatment should occur. Delineated areas may be within 150 feet of shore. This effort is likely the only circumstance where this variance would apply.
- 2) Application of pesticides to control dense growths of aquatic macrophytes that do not interfere with watercraft use, swimming, or other traditional recreational uses. [Includes the prohibition on application of herbicides to improve the appearance of undeveloped shoreline.] (M.R. 6280.0250, Subp 4.B). Justificaton: The DNR or cooperating entity will delineate areas where CLP treatment should occur. Delineated areas may be near undeveloped shoreline. Treatments will not occur be to improve the appearance of undeveloped shoreline. The treatments are meant



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to control areas of dense CLP and subsequently reduce or maintain the turion population in the lake. This effort is likely the only circumstance where this variance would apply.

Variance approved without condition(s)

Variance approved with following condition(s):

Pretreatment data collection

Narrative:

Pretreatment plant data are based on the June and August 2008 survey by Kelly LaFourtune (Attachment A and B). Pretreatment water quality data was collected by Anoka Conservation District. The successfulness of treatments will be determined by comparing pretreatment data with post treatment data collected as described in the Monitoring section below. The goal of these treatments is to control invasive species while maintaining or increasing water quality and native plants. Examples of metrics that will be used are percent occurrence invasive plants, percent occurrence of native species, total phosphorus, chlorophyll a, Secchi depths, and average native species per point. If native plants or water quality begin to decrease, the treatment plan will have to be re-examined. The DNR may cease future treatments if it is determined that the treatments are doing more harm than good.

Post treatment data collection

Narrative: Monitoring:

Monitoring of Coon lake to document the effectiveness of treatments and to provide updated, accurate data for permit issuance is required. At a minimum, monitoring will include pre-treatment delineation of CLP, post-treatment point-intercept survey during mid-summer when native plants are at or near maximum abundance, bi-weekly observations of Secchi disk transparency, and monthly water quality samples (total phosphorus and chlorophyll-a). This monitoring data will be evaluated to determine if the CLP treatments were effective and therefore warrant continued treatment. If the bay-wide treatment of CLP is in association with the MnDNR grant program, DNR Invasive Species Program staff will conduct the pre-treatment delineation and the post-treatment point intercept survey. The lake association will be responsible for bi-weekly observations of Secchi disk transparency and the collection of monthly water quality samples for the determination of total phosphorous and chlorophyll-a levels. (Note: If for some reason, a private consultant is contracted to do the point intercept survey, the same consultant (or someone affiliated with that consultant) cannot do the commercial herbicide application. All monitoring data shall be submitted to the MnDNR's Invasive Species Program staff at 1200 Warner Rd., St. Paul, MN prior to the end of the treatment year. Results must be compiled and submitted in a manner that is readily reviewable by Invasive Species Program staff. This data must be received before a permit will be issued for the following year as APM staff will consult with Invasive Species Program staff before permit issuance.



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The results of the pre-treatment survey detailing proposed treatment areas for that season must either accompany the permit application sent to the St. Paul APM Office or follow the application, as long as it is received by the St. Paul office prior to permit issuance and treatment. The MnDNR will not issue a permit before the results of the pre-treatment delineation of CLP are received.

Evaluation

Narrative: Lake-wide treatment of CLP may not be permitted if results of monitoring indicate that the treatment is doing more harm than good. In the event that treatments are found to cause significant negative impacts to the native plant community, water quality, or both in Coon Lake, the MnDNR will work with the Coon Lake Improvement District to develop an alternative management plan.

Other:

Narrative:

[Faint handwritten notes and signatures are visible in this section, including the name "M. J. Blum" and various illegible scribbles.]



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Section IX: Signatures

This Lake Vegetation Management Plan is in effect for 5 years from date of Regional Fisheries approval.

DNR Approval

Submitted By: Brittany Hummel

Title: Invasive Species Specialist

Date: _____

[Signature]
Area Fisheries Supervisor

15 April 2010
Date

[Signature]
Regional Fisheries Approval

4/15/10
Date

[Signature]
Regional Ecological Resources Approval

April 12, 2010
Date

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

[Signature]
Cooperator's Signature and Title
CLID CHAIRMAN

04/05/2010
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.