DEPARTMENT OF NATURAL RESOURCES

DNR Lake Vegetation Management Plan

Crooked Lake, Anoka County (DOW# 02000084)

☒ **Final LVMP with Signatures**	
Date Signed:	**2/19/2019**
Expiration Date:	**2/19/2024**
Management Targets(s):	Curly-leaf pondweed (CLP) & Eurasian watermilfoil (EWM)
Summary:	*This Lake Vegetation Management Plan (LVMP) authorizes a 5-year variance from time of signing to treat greater than 15% of the littoral area of Crooked Lake (DOW# 02000084) to control Curly-leaf pondweed (CLP) and/or Eurasian watermilfoil using herbicides. Individual (near-shore) APM permits for submerged plants will be subject to a 2,500 square foot maximum standard and a 15 foot channel to open water. Justification for this variance include the potential for this project to further research on the control of invasive aquatic plants with long term monitoring data available. Annual monitoring and submission of data to the MnDNR is required in this LVMP.*
Cooperator(s):	1) Crooked Lake Area Association (CLAA) 2) Coon Creek Watershed District (CCWD) 3) Freshwater Scientific Services, LLC

SECTION 1: PROBLEM IDENTIFICATION

TARGET SPECIES: Curly-leaf pondweed (CLP) & Eurasian watermilfoil (EWM)

1. CLP & EWM interferes with recreational use of lake
2. CLP & EWM displaces native aquatic plants and reduces native plant diversity
3. CLP contributes to reductions in water quality through early plant senescence

SECTION 2: PLANT MANAGEMENT GOALS & MEASURABLE OBJECTIVES

(- indicates measurable outcomes*)

1. **Control CLP & EWM to reduce recreational nuisances** *(*spring delineation surveys)*
   - Reduction in surface area of CLP and/or EWM
2. **Increase native plant abundance and diversity** *(*summer point-intercept survey)*
   - Native plant frequency and species richness shall be maintained or increase
3. **Evaluate effectiveness of long-term EWM & CLP control** *(*spring delineation surveys, herbicide concentration monitoring when appropriate)*
   - On-going communication of results with MnDNR and cooperators
   - Commitment to adaptive management (large-scale and spot treatment approach as needed)
4. **Maintain or increase water clarity**
   - Secchi depth shall be maintained or increase *(*May-September Secchi average)*

SECTION 3: PROPOSED MANAGEMENT ACTIONS

Note: The treatment protocols detailed below may change as new information becomes available but must be approved by the MnDNR. Any changes will be added to the LVMP as an amendment or outlined as permit conditions and may affect future APM permits.

Proposed Actions: Selective herbicide treatments targeting CLP and/or EWM at or beyond the 15% littoral limit. The CLP treatment shall occur in the early spring (water temperatures; 50-60 °F) when the plant is actively growing and native plants are still dormant so as to minimize non-target effects. The CLP and EWM treatment areas will be delineated using MnDNR guidelines for delineations. The effect of the treatment on the native plant community will be assessed by a third party surveyor with a point intercept survey in mid-summer. Furthermore, the CLAA and CCWD are committed to minimizing the area treated as the frequency and abundance of invasives are reduced.

SECTION 4: VARIANCE & PERMIT CONDITIONS *(check all that apply)*

The commissioner may issue APM permits (and IAPM permits) with a variance from one or more of the provisions of parts 6280.0250, subpart 4, and 6280.0350. 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).

☒ **Applications of pesticides to control curly-leaf pondweed and/or Eurasian watermilfoil in more than 15 percent of the littoral area (M.R. 6280.0350, Subp. 4, A).** Selective chemical control of CLP and/or EWM with applications of DNR approved herbicide to delineated areas.

Variance Justification:

A variance would serve as a continuation of the 2014-2019 LVMP and may provide recreational and ecological benefits by (1) minimizing recreational impairment by CLP & EWM and (2) promoting the survival, growth, and spread of native submersed aquatic plants. In 2016, the DNR approved the use of whole-lake fluridone to control CLP and hybrid EWM in Crooked Lake. Very few cases in Minnesota have evaluated the long-term effects of low dose fluridone (2-4ppb) under these circumstances. Thus the continuation of an LVMP will allow MnDNR and CLAA to document the efficacy of fluridone and monitor native plant response over the next 5 years.

☒ **Individual Near-Shore Permit Standards *(near-shore permit standards)***

Chemical Treatment of Submersed Plants: Limited to an area no greater than 2,500 square feet; such as a 50 feet wide along shore (or half of lake frontage, whichever is less) x 50 feet lakeward of individual properties and a 15 foot channel to open water. No removal of sparse native vegetation will be permitted. All native plant restoration activities requires an APM permit. Permit requests are subject to inspection and the aforementioned limits are maximums allowed for native species control.

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

☒ **Variance approved with monitoring conditions** (*refer to Section 5 below)*

SECTION 5: REQUIRED ANNUAL MONITORING *(see Table 1 below for summary)*

☒ **Annual delineations of target invasive plant**

Pre-treatment CLP & EWM delineations will be provided annually to the DNR with permit application to track CLP & EWM reductions.

☒ **Point-intercept survey**

The DNR, in conjunction with other interested parties, will review the plant survey(s) and water quality results annually. If results are not meeting goals or producing negative results, then the approach to control may be revised at the discretion of the DNR. Post-treatment point-intercept plant survey conducted during peak growth of native vegetation (mid-summer) will be provided annually to the DNR.

☒ **Water quality monitoring**

Water quality data must also be collected from May-Sept and provided annually to the DNR.

☒ **DNR data report**

Post treatment report will be provided annually by 31 December of each year to the DNR Invasive Species Specialist. Data will be provided to DNR using their data reporting template. Failure to report results may results in no variance or permit the next year.

☒ **Annual evaluation meeting**

Table 1. Required monitoring activities for Crooked Lake Vegetation Management Plan

Monitoring Activity *	**Timing**	**Monitored/Submitted By**
Pre-treatment Delineation (CLP & EWM)	Spring (May) or Late Summer/Fall (August or September)	Freshwater Science LLC or approved contractor
Pesticide Application Report (PAR)	Immediately following herbicide application	CLAA or pesticide applicator
Point-Intercept Survey	Mid-Summer (July-September)	Freshwater Science LLC or approved contractor
Water Quality Monitoring *(Secchi, TP, Chl-a)*	Twice Monthly (May-September)	CCWD or approved contractor
DNR Data Report	December 31st annually	Freshwater Science LLC or approved contractor

SECTION 6: ALTERNATIVE METHODS CONSIDERED (NPDES)

This section is needed to meet the requirements of MNG87D000 Vegetative Pests and Algae Control Pesticide General Permit; issued by the Minnesota Pollution Control Agency to meet requirements of the National Pollution Discharge Elimination System.

Target Pest: Curly-leaf pondweed (CLP) & Eurasian watermilfoil (EWM)

No Action: "No action" would likely allow the current widespread, dense CLP and/or EWM to persist or increase in the lake. Consequently, recreational impairment would not be reduced and CLP and or EWM may continue to displace native plants.

Prevention: The MN DNR has an AIS Prevention program to reduce the spread of invasive species. This includes designating infested waters, posting signage, enforcing AIS laws, inspecting and educating boaters at water accesses, and decontaminating water equipment as needed.

Mechanical/Physical Methods: Hand pulling of submersed vegetation is a control option which is labor intensive and typically done in shallow water. Mechanical harvesting is another control option although the cost is significant. These methods are considered to be infeasible due to high cost and considerable investment of time.

Cultural Methods: These are manipulations of the habitat to increase pest mortality by making the habitat less suitable to the pest (e.g. dredging to make a lake too deep for invasive aquatic plants to survive). Generally, such approaches are infeasible due to high cost.

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SECTION 7: 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: Keegan Lund

Title: Invasive Species Specialist

Date: 2-25-2019

[signature] 2-25-19

Regional Fisheries Manager — Date

[signature] 2/21/19

Regional Ecological & Water Resources Manager — Date

I affirm that I am a representative of ***Crooked Lake, Anoka County*** and acknowledge participation in the development or implementation of this lake vegetation management plan.

_____ _____

Cooperator's Signature and Title — Date

_____ _____

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.

No language following this page supersedes the conditions in permits described above.