

EXECUTIVE SUMMARY

No herbicide treatment was performed in 2018, **but it will be essential for spot-treatments to be performed in 2019** to prevent further recovery of EWM. The frequency of occurrence of EWM at surveyed data points throughout Lake Morey increased from 6% in 2017 to 22% in 2018, and the potential treatment area has expanded from 10-15 acres to now potentially 40 acres in 2019. Additionally, since this permit application was originally filed, ProcellaCOR™ EC received its full aquatic registration from EPA in February 2018 and is registered for use in Vermont. This new herbicide technology was classified as a reduced-risk pesticide by EPA, it has use rates 200-400 times lower than older chemistries, has a systemic mode of action that targets the whole plant including the roots, has rapid uptake by susceptible plants facilitating spot or partial-lake treatments, and carries no drinking water, swimming or fishing restrictions on the EPA label. ProcellaCOR is the new herbicide for choice for control of Eurasian watermilfoil at Lake Morey. We are formally requesting that the pending permit application be amended to consider the use of ProcellaCOR at Lake Morey in 2019. We would request that the original application for Renovate OTF be kept active, but it would only be considered as a back-up herbicide in the event that the use of ProcellaCOR cannot be permitted in time for an application in June 2019.

INTRODUCTION

Lake Morey is a 538-acre waterbody located entirely in Fairlee, Vermont. In 2006, the Lake Morey Commission (LMC) contracted SŌlitude Lake Management (formerly Aquatic Control Technology, Inc.) to perform a comprehensive survey of Lake Morey and to develop management recommendations. A Five-Year Integrated Management Plan targeting control of Eurasian watermilfoil (*Myriophyllum spicatum*, "EWM") was developed to include the use of herbicide treatments, diver hand-pulling, bottom barrier installations and suction harvesting.

The program was initiated in 2007 and 45 acres of the northern portion of the lake were treated with Renovate 3 (triclopyr) and Renovate OTF herbicides that year. This initial treatment yielded more than a 90% reduction of EWM in treated areas, while exhibiting little to no observable impact on non-target, native plants. Based on the success of the 2007 treatment, subsequent treatments utilizing Renovate OTF were conducted in 2008, 2009, 2012, and 2015 (50, 52, 46, and 36 acres respectively) targeting EWM along the eastern, western and southern shorelines of the lake. Suction harvesting of low-density EWM growth has been performed annually since 2007 and accompanied with hand-pulling, was the primary management strategy in 2010, 2011, 2013, 2014, 2016, and 2017.

Management efforts to date have significantly reduced EWM distribution and abundance in Lake Morey. Herbicide treatments have been optimized to reduce treatment frequency, but this has also been aided by the Town's ongoing commitment to suction harvesting and hand-pulling efforts. A 10-year maintenance suction harvesting permit was issued in early 2017. Based on the successful management achieved at Lake Morey in recent years, the Town of Fairlee and the LMC have decided to continue the integrated management effort.

The following document outlines a Five-Year Integrated Management Plan that targets control of EWM through the use of area-selective aquatic herbicide treatments and the continued use of

diver hand-pulling and suction harvesting. This is essentially a continuation of what has been occurring at Lake Morey over the past decade. The Town and its project partner, the LMC, are requesting the issuance of a permit for area-selective, spot-treatments with ProcellaCOR™ EC herbicide in June 2019.

EXISTING CONDITIONS

EWM is not currently widely distributed in Lake Morey, although an increase in regrowth has been observed during the last two management season, in which no treatments have occurred. During the August 2017 aquatic plant survey, SŌLitude observed EWM growth that was scattered and at varying densities within the northern end, while individual EWM plants continued down the eastern and western shorelines from the northern portion. EWM was found at 6% of the 116 data points that were surveyed in 2017, which is a 5% increase in distribution from 2016. EWM abundance also increased slightly since 2016, from 0.09% to 0.45%. **The 2018 aquatic plant survey was recently completed in late August. While the full results of the survey are not yet compiled, the frequency of occurrence of EWM increased from 6% in 2017 to 22% in 2018.**

The entire northern end of the lake is shallow enough to support dense EWM growth, although much remains scattered and at low density. This is undoubtedly due to the efforts of the LMC, which should not go unrecognized. Their annual commitment to diver hand-pulling and suction harvesting has led to continued success and EWM control. However, based on historical conditions and regrowth patterns, both distribution and abundance are anticipated to continue increasing in the coming years.

Consistent with prior years, Lake Morey continues to support a diverse and robust population of native aquatic plants. SŌLitude documented 15 aquatic plant species in 2017; ten of these species were observed at a greater distribution than EWM. Maintaining dense, native plant growth in Lake Morey will be paramount to continued EWM control success, especially within the northern end of the lake.

OBJECTIVES / GOALS

Principal objectives of the five-year integrated management plan being proposed for Lake Morey remain unchanged as follows:

1. Effectively control invasive Eurasian watermilfoil growth to promote a diverse native plant community, to improve fish and wildlife habitat, and to support recreational use of the lake.
2. Achieve multiple-year Eurasian watermilfoil control in treatment areas in order to reduce the scope, frequency and cost of follow-up treatments in subsequent years.
3. Use a combination of techniques – treatment with the systemic-acting ProcellaCOR™ EC (florpyrauxifen-benzyl) herbicide, suction harvesting and hand-harvesting – to achieve the desired level of Eurasian watermilfoil control in the most cost-effective fashion.
4. Prevent the introduction and establishment of any other aquatic nuisance species in Lake Morey.

PROCELLACOR™ EC HERBICIDE TREATMENT PLAN

After receiving its full aquatic registration from the EPA in February 2018, ProcellaCOR was used in numerous locations throughout the country for control of milfoil and other susceptible invasive aquatic plants. SePRO Corporation is in the process of assembling a white-paper with the results of actual field treatments performed in 2018. In New England, SOLitude applied ProcellaCOR at approximately a dozen locations in New Hampshire and Connecticut for the control of variable milfoil and Eurasian watermilfoil. Results of all treatments performed to date have been extremely positive, achieving complete control of targeted milfoil growth with little or no impact to non-target native plants. Further documentation will be provided on the anticipated selectivity of ProcellaCOR, but it is expected to be even more selective for EWM control in Vermont Lakes than has been achieved using Renovate (triclopyr) herbicide in recent years.

The REVISED treatment program being proposed at Lake Morey involves the treatment of approximately 39 acres of EWM growth that was documented during surveys in August 2018 as shown in the attached map. Despite ongoing efforts in 2018, the EWM growth in these areas is now too abundant to be cost-effectively managed using suction harvesting or hand-pulling.

The treatment program is expected to follow the below timeline and protocol:

Date	Task
August / September 2018	Comprehensive late season survey
November 2018	Submission of annual report identifying preliminary plans for upcoming year
December 2018	Project review and meeting with DEC, as necessary
May 2019	Early season survey to develop final treatment map. Submission of map and specific treatment plans to DEC for review and approval. Perform required pre-treatment notifications.
Late May / June 2019	Schedule and conduct ProcellaCOR herbicide treatment to a maximum of 39.1 acres
July – September 2019	Surveys / inspections
November 2019	Submission of annual report identifying preliminary plans for upcoming year
December 2019	Project review and meeting with DEC, as necessary

Based on the recent treatment experiences with ProcellaCOR herbicide at other New England lakes, and input from SePRO Corporation, the following protocols are recommended for the proposed ProcellaCOR treatment at Lake Morey in 2019:

1. Formulation – Utilize ProcellaCOR™ EC herbicide. This is a concentrated liquid formulation.
2. Application – A solution of ProcellaCOR diluted with lake water would be prepared in a spray tank onboard the treatment boat and the solution will be evenly injected throughout the designated treatment areas using trailing drop hoses and a calibrated pumping system.
3. Timing – Treatment would be scheduled for the early to mid June period when there is sufficient EWM growth to maximize herbicide uptake.

4. **Rate** – The recommended application rate (dose) is based on the percentage of the waterbody being treated and the susceptibility of the target plant. EWM has proven to be especially susceptible to ProcellaCOR allowing for low application rates to be used. The EPA label allows for application of 25 Prescription Dose Units (PDUs) per acre-foot of water being treated. Based on the high susceptibility of EWM, and the fact that only 7% of Lake Morey is being targeted for treatment, the recommended application rate is 2-3 PDUs per acre-foot. The 3 PDU application rate is only 12% of the maximum allowable application rate listed on the product label. Approval is being requested for treatment using 3 PDUs per acre-foot, to facilitate effective treatment of narrow, shoreline beds of EWM.

Herbicide	<p>ProcellaCOR™ EC Liquid formulation EPA Reg. No.: 67690-80 Active Ingredient: florpypyrauxifen-benzyl 2.7% 1 PDU is equal to 3.2 fl. oz.</p>
Application Rate	3 PDU per acre-foot
Treatment Area	39.1 acres (maximum) – see attached map
Total product to be Applied	<p>1173 PDUs (29,325 gals) maximum * Assumes average depth of 10 feet per treatment area; Actual quantity to be applied may be reduced following pre-treatment inspection to finalize treatment areas in May 2019</p>
Treatment Timing	<p>Between early and mid-June 2019 Delay treatment until there is sufficient active EWM growth to maximize herbicide uptake.</p>
Method of Application	<p>The concentrated liquid formulation will be diluted with lake water and evenly applied throughout the designated treatment areas using a calibrated pumping system and trailing drop hoses. GPS systems with WAAS or differential accuracy will be used to provide real-time navigation and to ensure that the herbicide is evenly applied throughout the designated treatment areas.</p>

IMPACTS TO NATIVE PLANT COMMUNITY

Significant adverse impacts to the native plant community are not expected from the proposed ProcellaCOR herbicide treatment at Lake Morey. Data gathered by SePRO Corporation during the product registration process and actual results documented during the 2018 treatment season have shown that EWM is highly susceptible to low rates of ProcellaCOR. Few, if any, adverse impacts are expended on most non-target native plants. At treatments performed in New Hampshire in 2018, the only temporary impacts seen were slight stem twisting and leaf curling on watershield (*Brasenia screeberi*) and white waterlily (*Nymphaea sp.*), but the plants grew out of the effects after a period of several weeks. Based on the list of species documented in Lake Morey in recent years, no other plants are expected to be adversely impacted by the proposed treatment.

Treatment programs at other Vermont lakes, and Lake Morey previously, in recent years have not shown significant impacts to native plant populations. In recent permit determinations, DEC has summarized potential impacts and have determined that data is either too variable, inconclusive, or that the plant frequency of occurrence values have been so low that trends are not

detectable. Even though some native species are listed as being susceptible on the Renovate label (e.g. bladderwort, watershield, white waterlily, spatterdock), no change trends have been noted in these species. Overall, Lake Morey and other Vermont lakes that have been treated with Renovate have remained diverse and in many cases the native plant diversity and abundance has stayed the same or even increased.

Significant adverse impacts to the native plant community have not been documented following any previous Renovate treatment event at Lake Morey. The quantitative indices measured during the previous treatment programs, species frequency of occurrence and species richness, have remained fairly consistent even during years of treatment.

No impact to State protected plant species is anticipated following treatment with Renovate herbicide. Neither of the rare plants that were historically documented in Lake Morey by the Nongame and Natural Heritage Program, of the Vermont Department of Fish and Wildlife, *Najas guadalupensis* and *Potamogeton vaseyi*, have been seen for over 15 years.

Scientific Name	Common Name	2017 FOC ¹ (%)	Trend LSC ²	Trend Morey ³
<i>Bidens beckii</i>	Water marigold	9		v
<i>Brasenia screberi</i>	Watershield	0	nc	
<i>Ceratophyllum demersum</i>	Coontail	11	v	nc
<i>Chlorophyta</i>	Filamentous algae	10		
<i>Eleocharis sp.</i>	Spikerush	0		
<i>Elodea canadensis</i>	Common waterweed	11	+	v
<i>Isoetes spp.</i>	Quillwort	0		
<i>Fontinalis/Musci</i>	Aquatic moss	1		
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil	6	-	-
<i>Najas flexilis</i>	Slender naiad	9	v	-
<i>Nitella / Chara</i>	Stonewort / Muskgrass	10	v	v
<i>Nymphaea odorata</i>	White waterlily	2	nc	
<i>Nymphoides cordata</i>	Little floating-heart	0		
<i>Potamogeton alpinus</i>	Alpine pondweed	0		
<i>Potamogeton amplifolius</i>	Largeleaf pondweed	10	+	nc
<i>Potamogeton ephedrus</i>	Ribbonleaf pondweed	1	nc	
<i>Potamogeton gramineus</i>	Variableleaf pondweed	0	-	-
<i>Potamogeton illinoensis</i>	Illinois pondweed	22	+	+
<i>Potamogeton praelongus</i>	Whitestem pondweed	5		v
<i>Potamogeton pusillus</i>	Thinleaf pondweed	1	+	
<i>Potamogeton robbinsii</i>	Robbins' pondweed	25	v	+
<i>Potamogeton zosteriformis</i>	Flatstem pondweed	3		
<i>Utricularia purpurea</i>	Purple bladderwort	0		
<i>Vallisneria americana</i>	Tapegrass	15	v	v
<i>Zosterella dubia</i>	Water stargrass	2	+	

Abbreviations in the "Trend" columns: no change (nc), increasing (+), decreasing (-), variable (v).

¹Species and Frequency of Occurrence (FOC) data from SŌLitude 2017 survey

²Trend data following herbicide treatments for Lake St. Catherine from Permit #2009-CO2(HB)

³Trend data following herbicide treatments for Lake Morey from Permit #2012-CO1(HB)

WATER USE RESTRICTIONS AND NOTIFICATIONS

Water Use Restrictions – The only water use restrictions listed on the current ProcellaCOR™ EC label are all centered around the use of ProcellaCOR treated water for irrigation purposes. There are no restrictions on using ProcellaCOR treated water for drinking water, swimming or fishing.

Irrigation restrictions vary depending on what is being irrigated. Turf may be irrigated immediately after treatment without restriction. Irrigation of landscape vegetation and other non-agricultural plants can occur once ProcellaCOR concentrations are determined to be less than 2 ppb or by following watering periods that range from 6 hours to 7 days for the use rates being proposed.

Written Notification – The Town/LMC will provide written plans of treatment in the LMC annual newsletter. Direct mailing to all abutting and downstream property owners will also occur as required by the permit.

Posting – In accordance with DEC permit requirements, the affected shorelines and access points to the lake will be posted with signs that warn of the pending herbicide application and water use restrictions to be imposed. The Town/LMC will continue to work closely with DEC to develop posters/signs that will be the most effective for this purpose. The LMC newsletter will highlight that the signs will be the source of information for the specific treatment areas and water use restrictions.

SURVEYS AND MONITORING

Consistent with the Five-Year Integrated Management Plan for Lake Morey's previous ANC permit, the Town/LMC and SŌlitude propose to continue the comprehensive late season aquatic plant survey. The surveys are to be conducted using the methods that were used between 2006 and 2011, and refined in 2012 when the use of a swimmer with mask and snorkel for points at depths between 2 and 4 meters replaced use of a fully-equipped scuba diver. Additionally, at all points of depth greater than 4 meters, an underwater camera system will be used.

NON-CHEMICAL CONTROL PROGRAM

More than ever, the Town and the LMC remain committed to continuing with non-chemical controls as part of this integrated EWM management program. In 2017, they were issued a 10-year suction harvesting Aquatic Nuisance Control permit. All non-chemical techniques to be used include the following:

- Suction harvesting
- Scuba diver hand-harvesting
- Snorkel hand-pulling (volunteer)
- Volunteer monitoring
- Boat launch inspections
- Education outreach efforts

The LMC also remains committed to responsible and practical watershed management protection measures.

Use of herbicides are intended to supplement the LMC’s current EWM management program that involves extensive diver suction harvesting and hand-pulling, in addition to diligent monitoring efforts. Herbicide treatments would be used to target areas of more abundant EWM growth, while

the non-chemical techniques will be utilized on smaller and more widely scattered patches. The program objective is to reduce the distribution and abundance of EWM to minimize herbicide use.

FIVE-YEAR EURASIAN WATERMILFOIL MANAGEMENT PROGRAM BUDGET ESTIMATES

(prepared 12/2017 – the revised 2019 treatment program costs are expected to be higher than what is shown below)

Project cost estimates for the Five-Year Eurasian Watermilfoil Management Program being proposed at Lake Morey is provided in the following table. Please note that these are estimates and are subject to the availability of funds.

Estimated Program Costs – 2018 dollars	Year 1	Year 2	Year 3	Year 4	Year 5
Description	2018	2019	2020	2021	2022
Herbicide treatment	\$ 0	\$ 40,000	\$ 0	\$ 0	\$ 44,000
Suction harvesting	\$ 26,000	\$ 14,000	\$ 22,000	\$ 32,000	\$ 17,000
Permitting	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Monitoring	\$ 8,500	\$ 13,500	\$ 9,000	\$ 9,000	\$ 14,000
Notification (mailings, signs, etc.)	\$ 100	\$ 1,000	\$ 100	\$ 100	\$ 1,000
Town/LMC projected expenses for various tasks (e.g., salaries, taxes, supplies, equipment, storage)	\$ 40,400	\$ 34,400	\$ 37,400	\$ 39,500	\$ 36,000
Totals	\$ 75,000	\$ 102,900	\$ 68,500	\$ 80,600	\$ 112,000