AQUATIC NUISANCE CONTROL PERMIT APPLICATION - HERBICIDE

Lake St Catherine

Wells/Poultney, Vermont

November 2018

APPLICANT:

Lake St Catherine Association PO Box 545 West Sand Lake, NY 12196

APPLICATOR:

SŌLitude Lake Management 590 Lake Street Shrewsbury, MA 01545



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Pesticides			March 2015	
Application for use of Pest	cides	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		1 no
under an Aquatic Nuisance Control Permit			VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION	33
Per 10 V.S.A. Chapter 50,	§ 1455	5	WATERSHED	12
Application Number: 27	0	and the first state of the second state of the	MANAGEMENT DIVISION LAKES & PONDS PROGRAM	1. 19.10
Submission of this application constitutes notic to control aquatic nuisance plants, insects, or is no reasonable nonchemical alternative avail negligible risk to public health; (4) a long-range pesticide minimization; and (5) there is a public pond located entirely on a landowner's propert of \$75 for a private pond or \$500 for all other v on this form must be provided, and the requisit	ce that the entities other aquatic life; lable; (2) there is a e management pla c benefit to be ach y, no undue advee vaterbodies, made e fees must be su	I listed below intend to and that the entities b acceptable risk to the an has been develope nieved from the applici- rise effect upon the pu a payable to the State abmitted to be deemed	use pesticides in waters of the State elow have demonstrated that (1) there nontarget environment; (3) there is d which incorporates a schedule of ation of a pesticide or, in the case of a blic good. Submit an application fee of Vermont. All information required I complete.	
1. Entity's Name: Lake St. Catherine As	sociation			1
2a. Mailing Address: PO Box 545				-
2b. Municipality: West Sand Lake		2c. State: NY	2d. Zip: 12196	1
3. Phone: 518-283-9287	4. Email: jpclt	d414@aol.com; jp	c142lp@verizon.net	
B. Pesticide Applicator Information (1. Entity's Name: SOLitude Lake Mana	Check box if same gement	e as above in Section	A: [])	1
2a. Mailing Address: 590 Lake Stree	t			1
2b. Municipality: Shrewsbury		2c. State: MA	2d. Zip: 01545	
3. Phone: 508-865-1000	4. Email: ksliw	oski@solitudelake.	com; mbellaud@solitudelake.com	
C. Application Preparer Information (1. Preparer's Name:	Check box if same	e as above: Section A	🗌 and/or B 🔳)	
2a. Mailing Address:				
2b. Municipality:		2c. State:	2d. Zip:	
3. Phone:	4. Email:			
D. Waterbody Information 1. Name of waterbody: St. Catherine La	ke - Wells	2, We	lls - Rutland	
3. Are there wetlands associated with the waterbody? I Yes No Contact the Vermont Wetland Program: (802) 828-1535 for additional information.				
4. Are there rare, threatened or endange Contact the Vermont Fish & Wildlife Natural Heri	ered species as tage Inventory: (8	sociated with the 02) 241-3700 for addi	waterbody? 🔳 Yes 🗌 No tional information.	
5a. Is this waterbody a private pond (per 10 V.S.A. 5210)? Yes INO If No, skip to Question D6.				
5b. Is this private pond totally contained	on landowner's	s property? Yes	s 🗌 No	
5c. Does the private pond have an outlet? Yes No				
5d. Is the flow from this outlet controlled? Yes No If yes, how and for how long?				
6. List the uses of the waterbody – check Water supply I Irrigation Boa	k all that apply: ting 🔳 Swimm	ning 🔳 Fishing 🗌] Other:	

- 1

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Pesticides	March 2015			
E. Treatment Information				
1a. Proposed start date: June 2019	1b. Proposed end date (if known): Sept 2019			
2. Aquatic nuisance(s) to be controlled: Plant/Algae/Animal: Eurasian watermilfoil	3. Pesticide(s) to be used ¹ : florpvrauxifen-benzvl Trade Name: ProcellaCOR EC			
Submit additional information as needed.	Submit a copy of the Product Label & Material Safety Data Sheet.			
4. Provide a map of control activity area. Provide location of (each) treatment area in waterbody.	5. Application rate (ppm): 3 PDU / 5.79 ppb Explain the above application rate & provide calculations.			
 6. Attach a narrative description of the proposed project to include the following items: a) Reason(s) to control the aquatic nuisance; b) Brief history of the aquatic nuisance in the waterbody; c) Reason why no reasonable nonchemical alternatives are available; and, d) Description of the proposed control activity. 				
 7. If you answered "no" to D5b above, then a Long a) Describe how control of the nuisance species of (must be at least a 5 year time span and incorr 	-range Management Plan ² (LMP) is required: will be conducted for the duration of the permit			
b) Explain how the LMP will be financed; include a	a budget and funding sources for each year.			
F. Applicant/Applicator Certification As APPLICANT, I hereby certify that the statements presented on this application are true and accurate; guarantee to hold the State of Vermont harmless from all suits, claims, or causes of action that arise from the permitted activity; and recognize that by signing this application, I agree to complete all aspects of the project as authorized. I understand that failure to comply with the foregoing may result in violation of the 10 VSA Chapter 50, § 1455, and the Vermont Agency of Natural Resources may bring an enforcement action for violations of the Act pursuant to 10 V.S.A. chapter 201.				
G. Application Preparer Certification (if applicable) As APPLICATION PREPARER, I hereby certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.				
H. Application Fees	Date:Date:Date:			
Submit this form and	the \$75 or \$500 fee to:			
Vermont Department of Environmental Conservation Watershed Management Division Aquatic Nuisance Control Permit Program 1 National Life Drive, Main 2 Montpelier, VT 05620-3522				
Direct all correspondence or questions to the <u>ANR.Shorelanc</u> For additional information visit: <u>w</u>	Aquatic Nuisance Control Permit Program at: d@vermont.gov ww.watershedmanagement.vt.gov			

¹ The application fee for the aquatic pesticide Aquashade[®] and copper compounds used as algaecides is **\$50** per application. ² Any landowner applying to use a pesticide for aquatic nuisance control on a pond located *entirely* on the landowner's property is exempt from the Longrange Management Plan requirement, as per 10 VSA §1455(e)

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APPENDIX A

Detailed Project Description

EXECUTIVE SUMMARY

Non-native and invasive Eurasian watermilfoil has infested Lake St. Catherine for over 35 years. After years of mechanical harvesting proved to be inadequate, an integrated milfoil management program was initiated in 2004. Each year, both non-chemical control and herbicide treatment efforts have been performed, to try and keep Eurasian watermilfoil below nuisance densities. The comprehensive annual survey performed in September 2018 identified approximately 100 acres that support milfoil in sufficient densities to warrant herbicide treatment. A program targeting treatment of up to a maximum of 70 acres during the 2019 season is proposed.

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 St. Catherine.

INTRODUCTION

Lake St. Catherine is a 1088-acre waterbody located in Wells and Poultney, Vermont. The three main basins from north to south include: Lily Pond 22 acres, Main Basin of Lake St. Catherine 904 acres, and Little Lake 162 acres. Presence of the invasive aquatic plant Eurasian watermilfoil (*Myriophyllum spicatum*) was first confirmed in the lake system by the State in 1983. Mechanical harvesting became the primary management tool that was used for nearly 15 years until is was determined that is was providing insufficient control. Surveys and planning for an integrated Eurasian watermilfoil control program began in 2001. A whole-lake Sonar (fluridone) herbicide treatment program was permitted and performed in 2004. Since that initial treatment efforts employed have included Renovate (triclopyr) spot-treatments, diver-assisted suction harvesting (DASH), hand-harvesting, and boat ramp monitoring. Other demonstration projects have also been attempted on Little Lake in recent years. The objective of the program has been to utilize a combination of strategies to achieve nuisance-level control of Eurasian watermilfoil and to maintain desired open-water conditions.

During the comprehensive aquatic plant survey conducted by SŌLitude Lake Management in 2018, Eurasian watermilfoil was the most common plant found in the lake, being present at 69% of the survey data points. Eurasian watermilfoil growth was characterized as being scattered to dense, with the most significant beds found along the eastern shoreline and lower western shoreline of the Main Basin. Beds and large patches of Eurasian watermilfoil growth were georeferenced using a GPS unit and approximately 100 acres of the lake appeared to support Eurasian watermilfoil at densities sufficient to warrant herbicide treatment. This represents less than 10% of the waterbody.

Excellent selectivity and minimal impact to non-target species has been demonstrated with ProcellaCOR treatments that have been performed in the Northeast to date. Of the other species reported in Lake St. Catherine by SŌLitude in 2018, the only plants that may show some sublethal impact following treatment are white and yellow waterlily (*Nymphaea odorata* and *Nuphar variegata*, respectively) and watershield (*Brasenia schreberi*). These species did show some leaf curling following some of the ProcellaCOR treatments that we conducted in New Hampshire in 2018, but the plants appeared to recover within 6-8 weeks of the treatment.

Based on historical treatment events at Lake St. Catherine, the 2019 treatment will be a maximum of 70 acres, but is anticipated to be less than 70 acres following the pre-treatment survey and consultation with the LSCA in the spring of 2019. The remaining EWM growth will be targeted by LSCA's diver assisted suction-harvesting program.

EXISITING CONDITIONS

Eurasian watermilfoil (EWM) is widely distributed in Lake St. Catherine with scattered to dense growth through the littoral area. SŌLitude found EWM at 69% of the 199 sample points that were surveyed in 2018. The greatest concentrations of EWM were found along the eastern shoreline, and the lower western shoreline of the Main Basin. Most of these areas have not been managed with herbicide for the last 3+ seasons.

Lake St. Catherine continues to support a large and robust population of native aquatic plants. SŌLitude documented 27 aquatic plant species in 2018. Common native plants included: *Potamogeton robbinsii 69%, Elodea canadensis 61%, Potagmoeton illinoensis 43%, and Zosterella dubia 38%;* there were eleven other species with frequency of occurrence values between 37% and 10%.

OBJECTIVES/GOALS

Principal objectives of the five-year integrated management plan being proposed for Lake St. Catherine are:

- 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 systemic-acting ProcellaCOR[™] EC herbicide, follow-up spot-treatments, 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 St. Catherine.

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, SŌLitude 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 treatment program being proposed at Lake St. Catherine involves the treatment of a maximum of 70 acres, although anticipated to be less, of EWM growth that was documented during surveys in September 2018 as shown in the attached map. EWM growth in these areas is now too abundant to be cost-effectively managed using suction harvesting or hand-pulling.

Date	Task
September 2018	Late season survey to document EWM infestation
November 2018	Submission of permit application for 2019 treatment
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 plants to DEC for review and approval. Perform required pre-treatment notifications.
June 2019	Schedule and conduct ProcellaCOR herbicide treatment to a maximum of 70 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

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

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 St. Catherine in 2019:

- 1. <u>Formulation</u> Utilize ProcellaCOR[™] EC herbicide. This is a concentrated liquid formulation.
- <u>Application</u> 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. <u>Timing</u> Treatment would be scheduled for the early to mid-June period when there is sufficient EWM growth to maximize herbicide uptake.

4. <u>Rate</u> – 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 less than 9% of Lake St. Catherine is being targeted for treatment, the recommended application rate is 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 of the beds of EWM.

Herbicide	ProcellaCOR™ EC
	Liquid formulation
	EPA Reg. No.: 67690-80
	Active Ingredient: florpyrauxifen-benzyl 2.7%
	1 PDU is equal to 3.2 fl. oz.
Application Rate	3 PDU per acre-foot
Treatment Area	Up to 70 acres (maximum) – see attached map
Total product to be	2209.5 PDUs (55.25 gals) maximum
Applied	* Assumes average depth of 10 feet per treatment area; Actual
	inspection to finalize treatment areas in May 2019
Target Concentration	1 PDU of ProcellaCOR EC (3.2 fl. oz) achieves 1.93 ppb/acre foot
	The proposed application rate of 3 PDU/ac-ft will result in concentrations of 5.79 ppb within the treated areas.
	Treating 70 acres at 3 PDU will yield a theoretical maximum lake-wide concentration of 0.13 ppb
Treatment Timing	Between early and mid-June 2019
	Delay treatment until there is sufficient active EWM growth to maximize herbicide uptake.
Method of Application	The concentrated liquid formulation will be diluted with lake water and evenly applied throughout the designated treatment greas
	using a calibrated pumping system and trailing drop hoses.
	GPS systems with WAAS or differential accuracy will be used to provide real-time payingtion and to ensure that the periode is
	evenly applied throughout the designated treatment areas.

IMPACTS TO NATIVE PLANT COMMUNITY

Significant adverse impacts to the native plant community are not expected from the proposed ProcellaCOR herbicide treatment at Lake St. Catherine. 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 the rate anticipated for use at Lake St. Catherine. At treatments performed in New Hampshire in 2018, the only temporary impacts seen were slight stem twisting and leaf curling on watershield (*Brasenia screberi*) and white waterlily (*Nymphaea odorata*), but the plants grew out of the effects after a period of several weeks. Based on the list of species documented in Lake St. Catherine by SŌLitude in 2018, no other plants are expected to be adversely impacted by the proposed treatment. A complete list of plant species found in Lake St. Catherine can be found in SŌLitude's 2018 annual management report.

No impact to State protected plant species is anticipated following treatment with ProcellaCOR herbicide. Of the State listed species previously observed in Lake St. Catherine, all species were found post-treatment within treated sections of lakes in New Hampshire that were treated with ProcellaCOR in 2018 and no adverse impact was seen, or no treatment is anticipated in the areas where those plants have historically been found in Lake St. Catherine.

WATER USE RESTRICTIONS AND NOTIFICATIONS

<u>Water Use Restrictions</u> – 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 a waiting period that is 7 days for the use rates being proposed.

<u>Written Notification</u> – The LSCA will provide written plans of treatment by direct mailing to all abutting and downstream property owners as required by the permit.

<u>Posting</u> – 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 LSCA will continue to work closely with DEC to develop posters/signs that will be the most effective for this purpose. The signs will be the source of information for the specific treatment areas and water use restrictions.

SURVEYS AND MONITORING

Consistent with prior Five-Year Integrated Management Plans for Lake St. Catherine and previous ANC permits, the LSCA proposes to continue the comprehensive late season aquatic plant survey performed by SŌLitude as conditioned in the permit.

NON-CHEMICAL CONTROL PROGRAM

In continuation of historical efforts outside of tentative treatment areas, the LSCA will remain committed to continuing with non-chemical controls as part of this integrated EWM management program. Non-chemical techniques to be considered and used as required include the following:

Suction harvesting

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

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

Use of herbicides are intended to supplement the LSCA's proposed EWM management program that involves 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

Project cost estimates for the Five-Year Eurasian Watermilfoil Management Program being proposed at Lake St. Catherine 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	2019	2020	2021	2022	2023
Herbicide treatment	\$ 100,000	\$ 75,000	\$ 75,000	\$ 75,000	\$ 100,000
Suction harvesting	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000
Permitting	\$ 2,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500
Monitoring	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000
Notification (mailings, signs, etc.)	\$ 5,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000
LSCA projected expenses for various tasks (e.g., salaries, taxes, supplies, equipment, storage)	\$ TBD				
Totals	\$ 163,500	\$ 133,500	\$ 133,500	\$ 133,500	\$ 158,500

APPENDIX B

Maps





1:48,000





1:38,000

Figure 5: 2019 Preliminary Management Areas



Locations of EWM growth recorded during September 2018 survey Potential DASH Areas

Potential primary treatment areas

Potential secondary treatment areas

0 1,050 2,100 4,200 Feet



Legend

Depths less than 20' (449 acres)

Lake St. Catherine		
Wells / Poultney, VT		
Rutland County		
43.4657° N, 73.2146° W		



Lake St. Catherine 3,500 7,000 Feet^N 1:42,068

0

Map Date: 02/26/19 Prepared by: KS Office: Shrewsbury, MA

APPENDIX C

ProcellaCOR EC Product Label & MSDS

SPECIMEN LABEL

ProcellaCOR. EC

A selective systemic herbicide for management of freshwater aquatic vegetation in slow-moving/quiescent waters with little or no continuous outflow: ponds, lakes, reservoirs, freshwater marshes, wetlands, bayous, drainage ditches, and non-irrigation canals, including shoreline and riparian areas in or adjacent to these sites. Also for management of invasive freshwater aquatic vegetation in slow-moving/quiescent areas of rivers (coves, oxbows or similar sites).

			_	
	FLORPYRAUXIFEN-BENZYL	GROUP	4	HERBICIDE
	L			
Produced for:				
SePRO Corporatio	n			
11550 North Meridia	n Street, Suite 600			
Carmel, IN 46032, U	J.S.A.			261110
ProcellaCOR, Presc	ription Dose Unit, and PDU		EPA Re	ea. No. 67690-80
are trademarks of Se	PRO Corporation			FPL20180226

Active Ingredient:

Florpyrauxifen-benzyl: 2-pyridinecarboxylic acid,

4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxy-

phenyl)-5-fluoro-, phenyl methyl ester	2.7%
Other Ingredients:	97.3%
TOTAL:	100.0%

Contains 0.0052 lb florpyrauxifen-benzyl per Prescription Dose UnitTM (PDUTM) or 0.21 lb florpyrauxifen-benzyl/gallon. 1 PDU is equal to 3.2 fl. oz. of product.

Keep Out of Reach of Children

Refer to the inside of label booklet for additional precautionary information including directions for use.

Notice: Read the entire label before using. Use only according to label directions. Before buying or using this product, read *Warranty Disclaimer* and *Misuse* statements inside label booklet. If terms are not acceptable, return at once unopened.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION. Causes moderate eye irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before reuse.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear:

wash PPE separately from other laundry.

- Long-sleeved shirt and long pants;
- Shoes plus socks;
- Protective eyewear; andWaterproof gloves.
- Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and

Engineering Controls: When handlers use closed systems or enclosed cabs in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(5)], the handler PPE requirements may be reduced or modified as specified in the WPS.

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

FIRST AID		
If in eyes	 Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes; then continue rinsing eye. Call a poison control center or doctor for treatment advice. 	
HOTLINE NUMBER		
Have the product container or label with you when calling a poison control		

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. In case of emergency endangering health or the environment involving this product, call **INFOTRAC** at **1-800-535-5053**.

Environmental Hazards

Under certain conditions, treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants, which may cause fish suffocation. Water bodies containing very high plant density should be treated in sections to prevent the potential suffocation of fish. Consult with the State agency for fish and game before applying to public waters to determine if a permit is needed.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling. Read all Directions for Use carefully before applying.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

Shake well before using.

PRODUCT INFORMATION

ProcellaCOR EC is a selective systemic herbicide for management of freshwater aquatic vegetation in slow-moving/quiescent waters with little or no continuous outflow: ponds, lakes, reservoirs, freshwater marshes, wetlands, bayous, drainage ditches, and non-irrigation canals, including shoreline and riparian areas in or adjacent to these sites. Also for management of invasive freshwater aquatic vegetation in slow-moving/quiescent areas of rivers (coves, oxbows or similar sites).

Apply ProcellaCOR EC directly into water or spray onto emergent foliage of aquatic plants. Depending upon method of application and target plant, ProcellaCOR EC is absorbed by aquatic vascular plants through emergent or floating leaves and from water through submersed plant shoots and leaves. In-water treatments are effective in spot and partial treatment designs with relatively short exposure times (hours to several days). Species susceptibility to ProcellaCOR EC may vary depending upon time of year, stage of growth, and water movement. For best results, apply to actively growing plants. However, effective control can be achieved over a broad range of growth stages and environmental conditions. Application to mature target plants may require higher application rates and longer exposure periods to achieve control.

Resistance Management

ProcellaCOR EC is classified as a WSSA Group 4 Herbicide (HRAC Group O). Weed populations may contain or develop biotypes that are resistant to ProcellaCOR EC and other Group 4 herbicides. If herbicides with the same mode of action are used repeatedly at the same site, resistant biotypes may eventually dominate the weed population and may not be controlled by these products. Unless ProcellaCOR EC is used as part of an eradication program or in a plant management system where weed escapes are aggressively controlled, do not use ProcellaCOR EC alone in the same treatment area for submersed and emergent plant control for more than 2 consecutive years, unless used in combination or rotated with an herbicide with an alternate mode of action.

To further delay herbicide resistance consider taking one or more of the following steps:

- Use tank mixtures with herbicides from a different group if such use is permitted; Consult your local extension service or SePRO Corporation if you are unsure as to which active ingredient is currently less prone to resistance.
- Adopt an integrated weed-management program for herbicide use that includes scouting and uses historical information related to herbicide use, and that considers other management practices.
- Scout after herbicide application to monitor weed populations for early signs of resistance development. Indicators of possible herbicide resistance include: (1) failure to control a weed species normally controlled by the herbicide at the dose applied, especially if control is achieved on adjacent weeds; (2) a spreading patch of non-controlled plants of a particular weed species; (3) surviving plants mixed with controlled individuals of the same species. If resistance is suspected, prevent weed seed production in the affected area by using an alternative herbicide from a different group or by a mechanical method that minimizes plant fragmentation.
- If a weed pest population continues to progress after treatment with this product, switch to another management strategy or herbicide with a different mode of action, if available.
- Contact your local extension specialist or SePRO Corporation for additional pesticide resistance-management and/or integrated weed-management recommendations for specific weed biotypes.

Stewardship Guidelines For Use

Apply this product in compliance with Best Management Practices (BMP) that include site assessment, prescription, and implementation. BMP have been developed to ensure accurate applications, minimize risk of resistance development, and monitor concentrations in water to document levels needed for optimal performance and manage potential irrigation use. SePRO Corporation will work with applicators and resource managers to implement BMP for application and monitoring to meet management objectives and ensure compatibility with potential water uses.

Use Precautions

 There are no restrictions for recreational purposes, including swimming and fishing.

Use Restrictions

- Obtain Required Permits: Consult with appropriate state or local water authorities before applying this product to public waters. State or local public agencies may require permits.
- Chemigation: Do not apply this product through any type of irrigation system.
- For in-water applications, the maximum single application rate is 25.0 Prescription Dose Units (PDU) per acre-foot of water with a limit of three applications per year.
- For aquatic foliar applications, do not exceed 10.0 PDU per acre for a single application, and do not apply more than 20.0 PDU total per acre per year.
- To minimize potential exposure in compost, do not allow livestock to drink treated water.
- · Do not compost any plant material from treated area.
- · Allow 14 days or greater between applications.
- Do not use water containing this product for hydroponic farming.
- Do not use treated water for any form of irrigation, except as described in the Application to *Water Used for Irrigation on Turf and Landscape Vegetation* section.
- Do not use for greenhouse or nursery irrigation.
- Make applications in a minimum of 10 gallons per acre (GPA) for ground and a minimum of 15 gallons per acre (GPA) for aerial applications.
- Do not apply to salt/brackish water.
- Do not apply ProcellaCOR EC directly to, or otherwise permit ProcellaCOR EC to come into contact during an application, with carrots, soybeans, grapes, tobacco, vegetable crops, flowers, ornamental shrubs or trees, or other desirable broadleaf plants, as serious injury may occur. Do not permit spray mists containing ProcellaCOR EC to drift onto desirable broadleaf plants. Further information on spray drift management is provided in the Spray Drift Management section of this label.
- For treatments out of water, do not permit spray mists containing this
 product to drift onto desirable broadleaf plants as injury may occur. Further
 information on spray drift management is provided in the Spray Drift
 Management section of this label.
- Do not allow tank mixes of ProcellaCOR EC to sit overnight. See additional tank mix restrictions below.
- Do not use organosilicone surfactants in spray mixtures of this product.
- Do not tank mix this product with malathion or methyl parathion.
- Do not make an application of malathion or methyl parathion within 7 days of an application of this product. See additional tank mix restrictions below.

Application to Water Used for Irrigation on Turf and Landscape Vegetation

To reduce the potential for injury to sensitive vegetation, follow the waiting periods (between application and irrigation) and restrictions below, and inform those who irrigate with water from the treated area. Follow local and state requirements for informing those who irrigate.

When monitoring ProcellaCOR EC concentrations, analyze water samples using an appropriate analytical method for both the active ingredient and the acid form. Use of HPLC (High-Performance Liquid Chromatography), which is also referenced as FasTEST[®], is recommended.

Applications to invasive freshwater aquatic vegetation in slow-moving/ quiescent areas of rivers (coves, oxbows or similar sites).

 Users must be aware of relevant downstream use of water for irrigation that may be affected by the treatment and must ensure all label restrictions are followed. All potential downstream water intakes with irrigation practices that may be affected by the treatment must be documented and affected irrigation users notified of the restrictions associated with such treatment.

Residential and other Non-Agricultural Irrigation (such as shoreline property use including irrigation of residential landscape plants and homeowner gardens, golf course irrigation, and non-residential property irrigation around business or industrial properties. <u>Excludes greenhouse or nursery irrigation</u>).

- Turf Irrigation: Turf may be irrigated immediately after treatment.
- For irrigation of landscape vegetation or other forms of non-agricultural irrigation not excluded above, conduct one of the following:
- o analytically verify that water contains less than 2 ppb (SePRO recommends use of FasTEST); or
- o if treated area(s) have the potential to dilute with untreated water, follow the precautionary waiting periods described in the tables 1 and 2 below for in-water or foliar application.

TABLE 1: Non-agricultural irrigation following in-water application

Waiting Period (Days) for Irrigation at Specific Target Treatment Rates (PDU per acre-foot)						
Percent Area of Waterbody Treated*	1-3 PDU	>3-5 PDU	>5.0 to 10.0 PDU	>10.0 to 15.0 PDU	>15.0 to 20.0 PDU	>20.0 to 25.0 PDU
2% or less	6 hours	1 day	1 day	2 days	2 days	3 days
3 - 10%	1 day	3 days	5 days	7 days	10 days	14 days
11 - 20%	3 days	7 days	10 days	10 days	14 days	21 days
21 - 30%	5 days	10 days	14 days	21 days	28 days	35 days
>30%	7 days	14 days	21 days	28 days	35 days	35 days

* Assumes treated area(s) have the potential to dilute with untreated water. If the treated area is not projected to dilute rapidly (example: confined cove area), utilize FasTEST to confirm below 2 ppb or verify vegetation tolerance before irrigation use. Consult a SePRO Aquatic Specialist for additional site-specific recommendations.

TABLE 2: Non-agricultural irrigation following foliar application

-					
Waiting Period (days) for Irrigation at Specific Target Treatment Rates					
Percent Area of Waterbody Treated*	5.0 PDU / acre	>5.0 to 10.0 PDU / acre			
10% or less	0.5 day	1 day			
11 - 20%	1 day	2 days			
>20%	2 days	3 days			

* Assumes treated area(s) have the potential to dilute with untreated water. If the treated area is not projected to dilute rapidly (example: confined cove area), utilize FasTEST to confirm below 2 ppb or verify vegetation tolerance before irrigation use. Consult a SePRO Aquatic Specialist for additional site-specific recommendations.

Susceptible Plants

Do not apply where spray drift may occur to food, forage, or other plantings that might be damaged. Spray drift may damage or render crops unfit for sale, use or consumption. Small amounts of spray drift that may not be visible may injure susceptible broadleaf plants. Before making a foliar or surface spray application, please refer to your state's sensitive crop registry (if available) to identify any commercial specialty or certified organic crops that may be located nearby. At the time of a foliar or surface spray application, the wind cannot be blowing toward adjacent cotton, carrots, soybeans, corn, grain sorghum, wheat, grapes, tobacco, vegetable crops, flowers, ornamental shrubs or trees, or other desirable broadleaf plants.

Spray Drift Management

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment- and weather-related factors determines the potential for spray drift. The applicator is responsible for considering all these factors when making decisions.

The following drift management requirements must be followed to limit off-target drift movement from aerial applications:

Aerial Application:

- Aerial applicators must use a minimum finished spray volume of 15 gallons per acre.
- Drift potential is lowest between wind speeds of 2 to 10 mph. Do not apply below
- 2 mph due to variable wind direction and high potential for temperature inversion. Do not apply in wind speeds greater than 10 mph.
- To minimize spray drift from aerial application, apply with a nozzle class that ensures coarse or coarser spray (according to ASABE S572) at spray boom pressure no greater than 30 psi.
- The distance of the outer most operating nozzles on the boom must not exceed 70% of wingspan or 80% of rotor diameter.
- Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.
- Do not apply under conditions of a low-level air temperature inversion.
- The maximum release height must be 10 feet from the top of the weed canopy, unless a greater application height is required for pilot safety.

Evaluate spray pattern and droplet size distribution by applying sprays containing a water-soluble dye marker or appropriate drift control agents over a paper tape (adding machine tape). Mechanical flagging devices may also be used. Do not apply under conditions of a low-level air temperature inversion. A temperature inversion is characterized by little or no wind and lower air temperature near the ground than at higher levels. The behavior of smoke generated by an aircraft-mounted device or continuous smoke column released at or near site of application will indicate the direction and velocity of air movement. A temperature inversion is indicated by layering of smoke at some level above the ground and little or no lateral movement.

Ground Application

- Ground applicators must use a minimum finished spray volume of 10 gallons per acre.
- To minimize spray drift from ground application, apply with a nozzle class that ensures coarse or coarser spray (according to ASABE S572).
- For boom spraying, the maximum release height is 36 inches from the soil for ground applications.
- Where states have more stringent regulations, they must be observed.

The applicator should be familiar with, and take into account the information covered in the following Aerial Drift Reduction Advisory (this information is advisory in nature and does not supersede mandatory label requirements.)

Aerial Drift Reduction Advisory

Information on Droplet Size: The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversions).

Controlling Droplet Size:

- Volume Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- Pressure Do not exceed the nozzle manufacturer's specified pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- Number of Nozzles Use the minimum number of nozzles that provide uniform coverage.
- Nozzle Orientation Orienting nozzles so that the spray is released parallel to the air stream produces larger droplets than other orientations. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- Nozzle Type Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

Boom Length: To further reduce drift without reducing swath width, boom must not exceed 70% of wingspan or 80% of rotor diameter.

Application Height: Do not make applications at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment: When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase with increasing drift potential (higher wind, smaller drops, etc.).

Wind: Drift potential is lowest between wind speeds of 2 to 10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Do not make applications below 2 mph due to variable wind direction and high inversion potential. Do not apply in wind speeds greater than 10 mph. Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

Temperature and Humidity: When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions: Do not apply during a local, low level temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of the smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates a inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

USE DIRECTIONS

ProcellaCOR EC performance and selectivity may depend on dosage, time of year, stage of growth, method of application, and water movement.

Aquatic Plants Controlled: In-Water Application

 Table 3 lists the expected susceptible species under favorable treatment conditions for aquatic plant control. Use of lower rates will increase selectivity on some species listed. Consultation with SePRO Corporation is recommended before applying ProcellaCOR EC to determine best in-water treatment protocols for given target vegetation.

TABLE 3. Vascular aquatic plant control with in-water application

Vascular Aquatic Plants Controlled: In-Water Application			
Common name	Scientific name		
Floating Plants			
Mosquito fern	Azolla spp.		
Water hyacinth	Eichhornia crassipes		
Emersed Plants			
Alligatorweed	Alternanthera philoxeroides		
American lotus	Nelumbo lutea		
Floating heart	Nymphoides spp.		
Water pennywort	Hydrocotyle umbellata		
Water primrose	Ludwigia spp.		
Watershield	Brasenia schreberi		
Submersed Plants			
Васора	Bacopa spp.		
Coontail ¹	Ceratophyllum demersum		
Hydrilla ¹	Hydrilla verticillata		
Parrotfeather	Myriophyllum aquaticum		
Water chestnut	Trapa spp.		
Watermilfoil, Eurasian	Myriophyllum spicatum		
Watermilfoil, Hybrid Eurasian	Myriophyllum spicatum X M. spp.		
Watermilfoil, Variable	Myriophyllum heterophyllum		
1 Higher rate applications within the spe	cified range may be required to control		

¹ Higher-rate applications within the specified range may be required to control less-sensitive weeds.

Aquatic Plants Controlled: Foliar Application

Table 4 lists the expected susceptible species using labeled foliar rates (5.0 - 10.0 PDU per acre) under favorable treatment conditions for aquatic plant control. Use higher rates in the rate range on more established, dense vegetation. Consultation with SePRO Corporation is recommended before applying ProcellaCOR EC to determine best foliar treatment protocols for given target vegetation.

TABLE 4. Vascular aquatic plant control with foliar application

Vascular Aquatic Plants Controlled: Foliar Application		
Common name Scientific name		
Floating Plants		
Mosquito fern	Azolla spp.	
Water hyacinth	Eichhornia crassipes	
Emersed Plants		
Alligatorweed	Alternanthera philoxeroides	
American lotus	Nelumbo lutea	
Floating heart	Nymphoides spp.	
Parrotfeather (emersed)	Myriophyllum aquaticum	
Water pennywort	Hydrocotyle umbellata	
Water primrose	Ludwigia spp.	
Watershield	Brasenia schreberi	

APPLICATION INFORMATION

Mixing Instructions

In-Water Application to Submersed or Floating Aquatic Weeds

ProcellaCOR EC can be applied undiluted or diluted with water for in-water applications. To dilute with water, it is recommended to fill the spray tank to one-half full with water. Start agitation. Add correct quantity of ProcellaCOR EC. Continue agitation while filling spray tank to required volume and during application.

Foliar Application to Floating and Emergent Weeds

Dilute ProcellaCOR EC with water to achieve proper coverage of treated plants. To dilute with water, it is recommended to fill spray tank to one-half full with water. Start agitation. A surfactant must be used with all post-emergent foliar applications. Use only surfactants that are approved or appropriate for aquatic use. For best performance, a methylated seed oil (MSO) surfactant is recommended. Read and follow all use directions and precautions on aquatic surfactant label. After adding ProcellaCOR EC and surfactant, continue agitation while filling spray tank to required volume and during application.

TANK-CLEANOUT INSTRUCTIONS

ProcellaCOR EC should be fully cleaned from application equipment prior to use for other applications. Contact a SePRO Aquatic Specialist for guidance on methods for thorough cleaning of application equipment after use of the product.

APPLICATION METHODS

In-Water Application to Submersed or Floating Aquatic Weeds

ProcellaCOR EC can be applied via trailing hose, by sub-surface injection, or surface spray as an in-water application to control weeds such as hydrilla, floating heart, water hyacinth, and other susceptible weed species. This product has relatively short exposure requirements for in-water treatments (hours to days), but treatments with high exchange and short exposure periods should be carefully planned to achieve best results. Where greater plant selectivity is desired - such as when controlling hydrilla or other more susceptible species, choose a lower dose in the specified range. A SePRO Aquatic Specialist can provide site-specific prescriptions for optimal control based on target weed, management objectives, and site conditions.

Apply ProcellaCOR EC to the treatment area at a prescription dose unit (PDU) to achieve appropriate concentrations. A PDU is a unit of measure that facilitates the calculation of the amount of product required to control target plants in 1 acre-foot of water or 1 acre for foliar applications. Per Table 5 below, 1-25 PDU are needed to treat 1 acre-foot of water, depending on target species and the percent of waterbody to be treated.

Use Table 5 to select the dose needed to treat 1 acre-foot of water.

TABLE 5: Prescription Dose Units (PDU**) per acre-foot of water*

Percent Area	Target Species			
of Waterbody Treated	Eurasian Watermilfoil	Hybrid Watermilfoil	Variable Leaf Watermilfoil	Other
≤2%	3 - 4	4 - 5	3 - 5	3 - 25
>2 - 10%	2 - 3	3 - 5	3 - 4	3 - 20
>10 - 20%	1 - 3	3 - 4	2 - 4	3 - 15
>20 - 30%	1 - 2	2 - 3	2 - 3	2 - 10
>30%	1 - 2	2 - 3	1 - 2	1 - 5

* In all cases, user may apply up to the maximum of 25 PDU per acre-foot. Consult your SePRO Aquatics Specialist for site-specific recommendations.

** 1 PDU contains 3.17 fl. oz. of product.

To calculate the amount of product needed in fluid ounces, use the formula below:

Number of acres X average depth (feet) X PDU* X 3.17 = fluid ounces *: from Table 5

Example Calculation:

To control hybrid watermilfoil in 2 acres of a 5-acre lake (>30% treated) with an average depth of 2 feet: 2 acres X 2 feet X 3 PDU X 3.17 = 38.04 fl. oz.

2 acres X 2 reel X 3 PDU X 3.17 = 38.04 II. 02.

For in-water applications, the maximum single application is 25.0 PDU / acre-foot, with a limit of three applications per year. Allow 14 days or greater between applications. Product may be applied as a concentrate or diluted with water prior to or during the application process. Use an appropriate application method that ensures sufficiently uniform application to the treated area.

Foliar Application to Floating and Emergent Weeds

Apply ProcellaCOR EC as a foliar application to control weeds such as water hyacinth, water primrose, and other susceptible floating and emergent species. Use an application method that maximizes spray interception by target weeds while minimizing the amount of overspray that inadvertently enters the water.

For all foliar applications, apply ProcellaCOR EC at 5.0 to 10.0 PDU per acre. Use of a surfactant is required for all foliar applications of ProcellaCOR EC. Use only surfactants that are approved or appropriate for aquatic use. Methylated seed soil (MSO) is a recommended surfactant and is typically applied at 1.0% volume/volume. Refer to the surfactant label for use directions. For best results, apply to actively growing weeds. ProcellaCOR EC may be applied more than once per growing season to meet management objectives. Do not exceed 10.0 PDU per acre during any individual application or 20.0 PDU total per acre, per year from all combined treatments.

Foliar Spot Treatment

To prepare the spray solutions, thoroughly mix ProcellaCOR EC in water at a ratio of 5.0 to 10.0 PDU per 100 gallons (0.12 to 0.24% product) plus an adjuvant. For best results, a methylated seed oil at 1% volume/volume is the recommended spray adjuvant. When making spot application, ensure spray coverage is sufficient to wet the leaves of the target vegetation but not to the point of runoff.

Aerial Foliar Application to Floating and Emergent Weeds

Apply ProcellaCOR EC in a spray volume of 15 gallons per acre (GPA) or more when making a post-emergence application by air. Apply with coarse to coarser droplet category per S-572 ASABE standard; see NAAA, USDA or nozzle manufacturer guidelines. Follow guidelines and restrictions in the *Spray Drift Management and Aerial Drift Reduction Advisory* sections to minimize potential drift to off-target vegetation. Aircraft should be patterned per Operation Safe/PAASS program for calibration and uniformity to provide sufficient coverage and control.

Boat or Ground Foliar Application to Floating and Emergent Weeds

When applying ProcellaCOR EC by boat or with ground equipment to emergent or floating-leaved vegetation, use boom-type, backpack or hydraulic handgun equipment. Apply ProcellaCOR EC in a sufficient spray volume (e.g. 20 to 100 gpa) to provide accurate and uniform distribution of spray particles over the treated vegetation while minimizing runoff. Use higher spray volumes for medium to high density vegetation. For boom spraying, use coarse or coarser nozzle spray quality per S-572 ASABE standard; see USDA literature or nozzle manufacturer guidelines. Follow nozzle manufacturer's recommendations for nozzle pressure, spacing and boom height to provide a uniform spray pattern. Follow appropriate spray drift management information where drift potential is a concern.

TANK MIXES WITH OTHER AQUATIC HERBICIDES

DO NOT TANK MIX ANY PESTICIDE PRODUCT WITH THIS PRODUCT without first referring to the following website for the specific product: www.3206tankmix.com. This website contains a list of active ingredients that are currently prohibited from use in tank mixture with this product.

Only use products in tank mixture with this product that: 1) are registered for the intended use site, application method and timing; 2) are not prohibited for tank mixing by the label of the tank mix product; and 3) do not contain one of the prohibited active ingredients listed on www.3206tankmix.com website.

Applicators and other handlers (mixers) who plan to tank-mix must access the website within one week prior to application in order to comply with the most up-to-date information on tank mix partners.

Do not exceed specified application rates for respective products or maximum allowable application rates for any active ingredient in the tank mix.

Read carefully and follow all applicable use directions, precautions, and limitations on the respective product labels. It is the pesticide user's

responsibility to ensure that all products in the mixtures are registered for the intended use. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Always perform a (jar) test to ensure the compatibility of products to be used in tank mixture.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal. **Pesticide Storage:** Store in original container only. Keep container closed when not in use. Do not store near food or feed. In case of spill or leak on floor or paved surfaces, soak up with vermiculite, earth, or synthetic absorbent.

Pesticide Disposal: Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

Container Handling

Non-refillable Container. DO NOT reuse or refill this container. Triple rinse or pressure rinse container (or equivalent) promptly after emptying; then offer for recycling, if available, or reconditioning, if appropriate, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures approved by state and local authorities.

Triple rinse containers small enough to shake (capacity \leq 5 gallons) as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¹/₄ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank, or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

Triple rinse containers too large to shake (capacity > 5 gallons) as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank, or store rinsate for later use or disposal. Repeat this procedure two more times.

Pressure rinse as follows: Empty the remaining contents into application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank, or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Warranty Disclaimer: SePRO Corporation warrants that this product conforms to the chemical description on the product label. Testing and research have also determined that this product is reasonably fit for the uses described on the product label. To the extent consistent with applicable law, SePRO Corporation makes no other express or implied warranty of fitness or merchantability nor any other express or implied warranty and any such warranties are expressly disclaimed.

Misuse: Federal law prohibits the use of this product in a manner inconsistent with its label directions. To the extent consistent with applicable law, the buyer assumes responsibility for any adverse consequences if this product is not used according to its label directions. In no case shall SePRO Corporation be liable for any losses or damages resulting from the use, handling or application of this product in a manner inconsistent with its label.

For additional important labeling information regarding SePRO Corporation's Terms and Conditions of Use, Inherent Risks of Use and Limitation of Remedies, please visit <u>http://seprolabels.com/terms</u> or scan the image below.



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SAFETY DATA SHEET



ProcellaCOR EC

Section 1. Identification

GHS product identifier	: ProcellaCOR EC
Recommended use of the	chemical and restrictions on use
Identified uses EPA Registration No.	: End use herbicide product : 67690-80
Supplier's details	: SePRO Corporation 11550 North Meridian Street Suite 600 Carmel, IN 46032 U.S.A. Tel: 317-580-8282 Toll free: 1-800-419-7779 Fax: 317-580-8290 Monday - Friday, 8am to 5pm <u>E.S.T.</u> www.sepro.com
Emergency telephone number (with hours of operation)	INFOTRAC - 24-hour service 1-800-535-5053

The following recommendations for exposure controls and personal protection are intended for the manufacture, formulation and packaging of this product. For applications and/or use, consult the product label. The label directions supersede the text of this Safety Data Sheet for application and/or use.

Section 2. Hazards identification

Hazard classification:	This material is not hazardous under the criteria of the Federal OSHA Hazard Commun	
	Standard 29CFR 1910.1200.	

Other hazards: No data available.

Section 3. Composition/information on ingredients

Chemical nature:

This product is a mixture.

Component	CASRN	Concentration
Florpyrauxifen-benzyl	1390661-72-9	2.7%
Ethylhexanol	104-76-7	2.1%
Methanol	67-56-1	0.9%
Balance	Not available	94.3%

Section 4. First aid measures

Description of first aid measures

General advice:	If potential for exposure exists refer to Section 8 for specific personal protective equipment.	
Inhalation:	Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice.	
Skin contact:	Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.	
Eye contact:	Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. Call a poison control center or doctor for treatment advice.	
Ingestion:	No emergency medical treatment necessary.	
Most important symptoms and effects, both acute and delayed:	Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.	
Indication of any immediate r	nedical attention and special treatment needed	
Notes to physician:	No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.	

Section 5. Fire-fighting measures

Suitable extinguishing media	Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. May spread fire. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function.
Unsuitable extinguishing media:	No data available
Special hazards arising from	the substance or mixture
Hazardous combustion products:	During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Hydrogen fluoride. Hydrogen chloride. Carbon monoxide. Carbon dioxide.
Unusual Fire and Explosion Hazards:	Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.
Advice for firefighters Fire Fighting Procedures:	Keep people away. Isolate fire and deny unnecessary entry. Consider feasibility of a controlled burn to minimize environment damage. Foam fire extinguishing system is preferred

because uncontrolled water can spread possible contamination. Do not use direct water stream. May spread fire. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this SDS.
 Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

Section 6. Accidental release measures

Personal precautions, protective equipment and	
emergency procedures:	Isolate area. Keep unnecessary and unprotected personnel from entering the area. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
Environmental precautions:	Spills or discharges to natural waterways are likely to kill aquatic organisms. Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.
Methods and materials for	
containment and cleaning up	Contain spilled material if possible. Small spills: Absorb with materials such as: Clay. Dirt. Sand. Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact SePRO Corporation for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

Section 7. Handling and storage

Precautions for safe handling: Keep out of reach of children. Do not swallow. Avoid contact with eyes, skin, and clothing. Avoid breathing vapor or mist. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Store in a dry place. Store in original container. Keep container tightly closed when not in use. Do not store near food, foodstuffs, drugs or potable water supplies.

Section 8. Exposure controls/personal protection

Control parameters: Exposure limits are listed below, if they exist.

Component	Regulation	Type of Listing	Value/Notation
Ethylexanol	Dow IHG	TWA	2 ppm
	Dow IHG	TWA	SKIN
Methanol	ACGIH	TWA	200 ppm
	ACGIH	STEL	250 ppm
	OSHA Z-1	TWA	260 mg/m ³ 200 ppm
	ACGIH	TWA	SKIN, BEI

ACGIH	STEL	SKIN, BEI
CAL PEL	С	1,000 ppm
CAL PEL	PEL	260 mg/m ³ 200 ppm
CAL PEL	STEL	325 mg/m ³ 250 ppm

RECOMMENDATIONS IN THIS SECTION ARE FOR MANUFACTURING, COMMERCIAL BLENDING AND PACKAGING WORKERS. APPLICATORS AND HANDLERS SHOULD SEE THE PRODUCT LABEL FOR PROPER PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING.

Exposure controls Engineering controls:	Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.
Individual protection measure Eye/face protection: Skin protection	ess Use safety glasses (with side shields).
Hand protection:	Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Chlorinated polyethylene. Neoprene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. Examples of acceptable glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Nitrile/butadiene rubber ("nitrile" or "NBR"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.
Other protection:	Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.
Respiratory protection:	Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

Section 9. Physical and chemical properties

Appearance

Physical State	Liquid
Color	Amber
Ddor	Solvent
Ddor Threshold	No data available
ЭΗ	4.24 (1% aqueous suspension)
Melting point/range	Not applicable to liquids
Freezing point	No data available
Boiling point (760 mmHg)	No data available
Flash point	> 100 °C (> 212 °F)
Evaporation Rate	
Butyl Acetate =1)	No data available
lammability (solid, gas)	Not applicable
ower explosion limit	No data available
Jpper explosion limit	No data available
/apor pressure	0.0000002 mmHg at 20°C (68°F)
Relative Vapor Density	
(air = 1)	No data available

Relative Density (water = 1) Water solubility Partition coefficient: n-octanol/water Auto-ignition temperature Decomposition temperature Dynamic Viscosity Kinematic Viscosity Explosive properties Oxidizing properties	0.93 0.015 mg/l at 20°C (68°F) No data available 260°C (500 °F) No data available 15.4 mPa.s at 20°C (68°F) 8.90 mPa.s at 40°C (104°F) 14.2 mm ² /s at 20°C (68°F) 7.91 mm ² /s at 40°C (104°F) Not explosive Not oxidizing
Oxidizing properties Liquid Density Molecular weight	Not oxidizing 0.9257 g/cm3 at 20 °C (68 °F) <i>Digital density meter</i> No data available
NOTE:	The physical data presented above are typical values and should not be construed as a specification.

Section 10. Stability and reactivity

Reactivity:	No dangerous reaction known under conditions of normal use.	
Chemical stability:	Thermally stable at typical use temperatures.	
Possibility of hazardous reactions:	Polymerization will not occur.	
Conditions to avoid:	Exposure to elevated temperatures can cause product to decompose.	
Incompatible materials:	None known.	
Hazardous decomposition products:	Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon monoxide. Carbon dioxide. Hydrogen chloride. Hydrogen fluoride. Nitrogen oxides	

Section 11. Toxicological information

Toxicological information appears in this section when such data is available.

Acute toxicity Acute oral toxicity	Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts. As product: LD50, Rat, female, > 5,000 mg/kg
Acute dermal toxicity	Prolonged skin contact is unlikely to result in absorption of harmful amounts. As product: LD50, Rat, male and female, > 5,000 mg/kg
Acute inhalation toxicity	No adverse effects are anticipated from single exposure to mist. Based on the available data, respiratory irritation was not observed. As product: LC50, Rat, male and female, 4 Hour, dust/mist, > 5.40 mg/l No deaths occurred at this concentration.
Skin corrosion/irritation	Brief contact may cause slight skin irritation with local redness.
Serious eye damage/ eye irritation	May cause slight eye irritation. Corneal injury is unlikely.
Sensitization	Did not cause allergic skin reactions when tested in guinea pigs. For respiratory sensitization: No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)	Evaluation of available data suggests that this material is not an STOT-SE toxicant.
Specific Target Organ Systemic Toxicity (Repeated Exposure)	For the active ingredient(s): Based on available data, repeated exposures are not anticipated to cause significant adverse effects. For the major component(s): Based on available data, repeated exposures are not anticipated to cause significant adverse effects. For the minor component(s): In animals, effects have been reported on the following organs: Blood, kidney, liver, and spleen.
Carcinogenicity	For the active ingredient(s): Did not cause cancer in laboratory animals. For the major component(s): No relevant data found.
Teratogenicity	For the active ingredient(s): Did not cause birth defects or any other fetal effects in laboratory animals. For the major component(s): No relevant data found. For the minor component(s): Has caused birth defects in laboratory animals only at doses toxic to the mother. Has been toxic to the fetus in laboratory animals at doses toxic to the mother. These concentrations exceed relevant human dose levels.
Reproductive toxicity	For the active ingredient(s): In animal studies, did not interfere with reproduction. For the major component(s): In animal studies, did not interfere with reproduction. In animal studies, did not interfere with fertility.
Mutagenicity	In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.
Aspiration Hazard	Based on physical properties, not likely to be an aspiration hazard. No aspiration toxicity classification

Section 12. Ecological information

Ecotoxicological information appears in this section when such data is available.

Toxicity Acute toxicity to fish	Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L).
	EC50, <i>Cyprinus carpio</i> (Carp), static test, 96 Hour, > 120 mg/l, OECD Test Guideline 203 or Equivalent
Acute toxicity to aquatic invertebrates	Material is slightly toxic to aquatic invertebrates on an acute basis (LC50/EC50 between 10 and 100 mg/L). EC50, <i>Daphnia magna</i> (Water flea), 48 Hour, 49 mg/l, OECD Test Guideline 202
Acute toxicity to algae/aquatic plants	Material is very highly toxic to some aquatic vascular plant species. ErC50, <i>Pseudokirchneriella subcapitata</i> (green algae), 72 Hour, > 5.4 mg/l, OECD Test Guideline 201 ErC50, <i>Myriophyllum spicatum</i> , 14 d, 0.000919 mg/l

Toxicity to Above Ground OrganismsMaterial is practically non-toxic to birds on an acute basis (LD50 > 2000 mg		Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).
		oral LD50, <i>Colinus virginianus</i> (Bobwhite quail), > 2500mg/kg bodyweight.
		oral LD50, <i>Apis mellifera</i> (bees), 48 Hour, > 212.2µg/bee
		contact LD50, Apis mellifera (bees), 48 Hour, >200µg/bee
Toxicit organis	y to soil-dwelling sms	LC50, <i>Eisenia fetida</i> (earthworms), 14 d, mortality, >2,500 mg/kg
Persist	ence and degradability	/
<u>florpyr</u>	<u>auxifen-benzyl</u> Biodegradability:	Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.
	Biodegradation: Exposure time: Method:	14.6 % 29 d OECD Test Guideline 301B
Stability in Water (1/2-life) Hydrolysis, DT50, 913 d, pH 4, Half-life Temperature 25 °C Hydrolysis, DT50, 111 d, pH 7, Half-life Temperature 25 °C Hydrolysis, DT50, 1.3 d, pH 9, Half-life Temperature 25 °C		-life) Hydrolysis, DT50, 913 d, pH 4, Half-life Temperature 25 °C Hydrolysis, DT50, 111 d, pH 7, Half-life Temperature 25 °C Hydrolysis, DT50, 1.3 d, pH 9, Half-life Temperature 25 °C
<u>Ethylh</u>	exanol	
	Biodegradability:	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability). 10-day Window: Not applicable
	Biodegradation: Exposure time:	> 95 % 5 d
	Method:	OECD Test Guideline 302B or Equivalent
	Biodegradation: Exposure time: Method:	68 % 17 d OECD Test Guideline 301B or Equivalent
	Theoretical Oxygen Demand:	2.95 mg/mg
	Chemical Oxygen Demand:	2.70 mg/mg

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	26-70 %
10 d	75-81 %
20 d	86-87 %

Photodegradation

Test Type:	Half-life (indirect photolysis)
Sensitizer:	OH radicals
Atmospheric half-life:	9.7 Hour
Method:	Estimated.

<u>Methanol</u>

Biode Biode Expo Methe	egradability: egradation: sure time: od:	 Iity: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. 10-day Window: Pass on: 99% e: 28 d OECD Test Guideline 301D or Equivalent 	
Theo Dema	retical Oxygen and:	1.50 mg/mg	
Cherr Dema	Chemical OxygenDemand:1.49 mg/mg Dichromate		
Biolo	gical oxygen de	mand (BOD)	
Γ	Incubation Ti	me BOD	
	5 d	72 %	
	20 d	79 %	
Photo	odegradation		

Test Type:	Half-life (indirect photolysis)
Sensitizer:	OH radicals
Atmospheric half-life:	8-18 d
Method:	Estimated.

Balance Biodegradability: No relevant data found.

Bioaccumulative potential

Florpyrauxifen-benzyl Bioaccumulation:	Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).
Partition coefficient: n-octanol/water(log Pow): Bioconcentration	5.5 at 20 °C
factor (BCF):	356 Lepomis macrochirus (Bluegili suntish) 30 d
Ethylhexanol Bioaccumulation:	Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).
Partition coefficient: n-octanol/water(log Pow):	3.1 Measured
<u>Methanol</u> Bioaccumulation: Partition coefficient: n-octanol/water(log Pow): Bioconcentration	Bioconcentration potential is low (BCF < 100 or Log Pow < 3). -0.77 Measured
factor (BCF):	<10 Fish Measured
Balance Bioaccumulation:	No relevant data found.

Mobility in soil

Florpyrauxifen-benzyl	Expected to be relatively immobile in soil (Koc > 5000). Partition coefficient (Koc): 34200
<u>Ethylhexanol</u>	Potential for mobility in soil is low (Koc between 500 and 2000). Partition coefficient (Koc): 800 Estimated.
<u>Methanol</u>	Potential for mobility in soil is very high (Koc between 0 and 50). Partition coefficient (Koc): 0.44 Estimated.
<u>Balance</u>	No relevant data found.

Section 13. Disposal considerations

Disposal methods:

If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

Section 14. Transport information

DOT

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Proper shipping name	Environmentally hazardous substance, liquid, n.o.s. (Florpyrauxifen-benzyl)
UN number	UN 3082
Class	9
Packing group	
Marine pollutant	Florpyrauxifen-benzyl
Transport in bulk	Consult IMO regulations before transporting ocean bulk
according to Annex I or II	
of MARPOL 73/78 and the	
IBC or IGC Code	

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Environmentally hazardous substance, liquid, n.o.s. (Florpyrauxifen-benzyl)
UN number	UN 3082
Class	9
Packing group	

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

Section 15. Regulatory information

OSHA Hazard Communication Standard	This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312	This product is not a hazardous chemical under 29CFR 1910.1200, and therefore is not covered by Title III of SARA.
Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.
Pennsylvania Worker and Community Right-To-Know Act:	The following chemicals are listed because of the additional requirements of Pennsylvania law: Components Ethylhexanol 104-76-7
California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)	WARNING: This product contains a chemical(s) known to the State of California to cause birth defects or other reproductive harm.
United States TSCA Inventory (TSCA)	This product contains chemical substance(s) exempt from U.S. EPA TSCA Inventory requirements. It is regulated as a pesticide subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.

Section 16. Other information

Hazard Rating System National Fire Protection Association (U.S.A.)

Health: 1 Flammability: 1 Instability: 0

Legend	

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
С	Ceiling
CAL PEL	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
Dow IHG	Dow Industrial Hygiene Guideline
OSHA Z-1	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants
PEL	Permissible exposure limit
SKIN	Absorbed via skin
SKIN, BEI	Absorbed via Skin, Biological Exposure Indice
STEL	Short term exposure limit
TWA	Time weighted average

History	
Date of issue mm/dd/yyyy	: 10/09/2017
Version	: 1.0

Notice to reader To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

LAKE ST. CATHERINE

Aquatic Vegetation Management Program

2018 Annual Report

November 2018

PREPARED FOR:

Lake St. Catherine Association c/o Jim Canders, President 443 Old Best Road West Sand Lake, NY 12199

PREPARED BY:

SŌLitude Lake Management 590 Lake Street Shrewsbury, MA 01545



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APPENDICES

Appendix A: Herbicide Residue Testing Results Appendix B: Comprehensive Aquatic Vegetation Survey Information


1 INTRODUCTION

The 2018 season was SŌLitude Lake Management's fifteenth year of involvement in an Integrated Management Plan at Lake St. Catherine developed to control non-native Eurasian watermilfoil (*Myriophyllum spicatum*) throughout the lake. Under this plan, Eurasian watermilfoil management efforts have included herbicide treatment, diver assisted suction harvesting (DASH) and hand-pulling, boat ramp monitoring and educating lake residents and lake users.

In 2018, management activities included spot-treatment of five areas, totaling 47.2 acres with Renovate OTF (triclopyr granular) and Renovate 3 (triclopyr liquid) herbicides as well as diver hand-pulling and diver assisted suction harvesting. These efforts were consistent with the current five-year Integrated Management Plan (2014-2019).

The following report summarizes the results of 2018 Treatment Program and details findings from the late season comprehensive aquatic plant survey that has been performed annually to document in-lake plant conditions and help evaluate and refine management goals. Specific information on the 2018 diver hand-pulling and diver assisted suction harvesting efforts will be provided by the Lake St. Catherine Association (LSCA) under a separate cover.

2 HERBICIDE TREATMENT PROGRAM - 2018

2.1 Program Chronology

A chronology of the 2018 treatment program is provided below:

\triangleright	Pre-treatment inspection to finalize treatment areas	
≻	Treatment of 47.2 acres with Renovate 3 and Renovate OTF	June ['] 18
≻	Herbicide residue monitoring	June 19, July 17
\triangleright	Comprehensive aquatic plant survey	

2.2 Pre-Treatment Inspection

On May 9 the entire littoral area of Lake St. Catherine (Lily Pond, Main Lake and Little Lake) was surveyed by SŌLitude biologists Amanda Mahaney and Brea Arvidson to determine the stage of Eurasian watermilfoil (EWM) growth and finalize potential management areas.

EWM plants were generally 3-4 feet tall, depending on water depth, and showing active growth with red apical meristems. Notable growth was observed within Atwater Bay, the cove along Oxbow Bay Drive and West Lake Road, another more northern small localized patch along West Lake Road, along Ferncliff Road western shoreline in the Northern Bay, and an offshore patch just south of Halls Bay along Route 30. Results of the survey were communicated to LSCA for their input and final determination on proposed treatment and DASH areas.



2.3 Summary of 2018 Treatment

A total of 47.2 acres amongst five areas were targeted for treatment (Figure 1). Consistent with previous years, each treatment area was evaluated with regards to EWM cover/distribution as well as several other factors including: potential for increased EWM spread; potential for effective treatment; and the overall benefit of milfoil control with respect to the lake, lake residents and other potential users. A final treatment map was provided to VT DEC for review and approval prior to treatment.

Treatment was conducted on Monday, June 18, 2018 to allow enough time to comply with the notification requirements of ANC Permit #2014-C01 and so that the two-day swimming restriction (day of treatment and one additional day) would not be imposed over a weekend.

Weather conditions on the day of treatment were mostly sunny, with a passing thunderstorm and an air temperature of 89°F; wind was out of the north, estimated at <5-10 mph. Surface water temperature in the main basin was approximately 22.7°C.



Figure 1. 2018 Treatment Areas

The treatment was conducted with a 20-foot aluminum work skiff. The granular Renovate OTF herbicide was applied using back-mounted calibrated cyclone-spreader systems. The liquid Renovate 3 herbicide was injected at depth subsurface using weighted hoses that trailed the spray boat. An onboard GPS unit was used to provide real-time guidance and ensure an even application in each of the treated areas. The State Boat Ramp located on the channel between the Main Lake and Little Lake was used as the base of operations.

Treatment was performed as a split application whereby roughly 70% of the herbicide was applied to each of the designated areas initially and then the remaining 30% was applied several hours later. There was approximately 3-4 hours between each application. This split application approach has been used in recent years to increase concentration-exposure-time and help increase treatment efficacy. Both Renovate 3 (liquid) and Renovate OTF (granular) formulations of triclopyr herbicide were used at Lake St. Catherine in 2018. The granular formulation has proven to be effective for steeply sloped areas, smaller EWM beds and in areas where there is potential for excessive dilution from untreated water. The liquid formulation was used in larger treatment and cove areas that were not subject to as much dilution.

The application rate for Renovate OTF (granular) was 2.25 ppm in bottom 4-6 feet of water, or 240 lbs/ac. The liquid Renovate 3 was applied at 1.5 ppm, assuming a 6 foot average depth in most treatment areas. A total of 1968 pounds of Renovate OTF and 316.7 gallons of Renovate 3 were applied. The treatment took approximately 7 hours to complete.



2.4 Herbicide Residue Testing

In compliance with conditions of the ANC Permit #2014-C01, water samples were collected from within and immediately downstream of Lake St. Catherine following treatment for analysis of triclopyr concentrations. Sampling was conducted 24 hours following treatment and approximately 4 weeks after treatment. Concentrations at all sample locations were below 75 ppb after 24 hours, which was the drinking water restriction imposed by DEC.

A map of the sampling locations is attached in Appendix A. Sampling instructions and sample bottles were provided to LSCA representatives by SOLitude and SePRO. Collected samples were shipped via overnight delivery to SePRO's laboratory in Whittakers, North Carolina.

Samples were collected on June 19 and July 17 (Table 1). Consistent with prior years' posttreatment triclopyr sampling, residues dropped quickly with no in-treatment sample locations above the 75ppb threshold after 24 hrs. Four weeks post-treatment almost all 7 sample locations were less than 1 ppb. The LSCA was comfortable discontinuing sampling before all results were less than 1ppb, which is the irrigation restriction per the Renovate labels.

Table I. FOSTE	SI Sampling R	esuiis (ppp)
Site	19-June	17-July
1/A	17.6	3.3
2/B	33.8	2.4
3/C	20.3	2.2
4/D	63	1.6
5/E	45.1	2.6
6/outlet	<1	<]
7/downstream	<1	<1

able 1.	FasTEST	Sampling	Results	(ppb)	

3 LATE SEASON COMPREHENSIVE AQUATIC VEGETATION SURVEY

3.1 Survey Methods

Using methods employed in previous years of this management program, the late season comprehensive aquatic vegetation survey conducted on September 24 & 25. All three lake basins were systematically toured by boat by SOLitude biologists Amanda Mahaney and Kara Sliwoski. Transect and data point locations established in 2001 were relocated using a Differential GPS system (Appendix B – Figure 1).

Weather conditions the first day were sunny, calm and cool with temperatures in the mid 50s, while the second day was cloudy, very breezy, and rainy with similar temperatures.

Recorded at each data point was the following information: aquatic plants present, dominant species, plant biomass, percent total plant cover and percent EWM cover. Water depths that were recorded during the pre-treatment survey were verified using a high-resolution depth finder. The plant community was assessed through visual inspection, use of a throw-rake and with an Aqua-Vu underwater camera system. Locations where EWM plants were observed were recorded with a GPS unit. Plants were identified to genus and species level when possible. Plant cover was given a percentage rank based on the areal coverage of plants within an approximate 400 square foot area assessed at each data point. Generally, in areas with 100% cover, bottom sediments could not be seen through the vegetation; percentages less than 100% indicated the amount of bottom area covered by plant growth. The percentage of EWM was also recorded at each data point. In addition to cover percentage, a plant biomass index was



assigned at each data point to document the amount of plant growth vertically through the water column. Plant biomass was estimated on a scale of 0-4, as follows:

- 0 No biomass; plants generally absent
- 1 Low biomass; plants growing only as a low layer on the sediment
- 2 Moderate biomass; plants protruding well into the water column but generally not reaching the water surface
- 3 High biomass; plants filling enough of the water column and/or covering enough of the water surface to be considered a possible recreational nuisance or habitat impairment
- 4 Extremely high biomass; water column filled and/or surface completely covered, obvious nuisance conditions and habitat impairment severe

Field data recorded at each transect and data point location is provided in the Field Survey Data Table in Appendix B.

3.2 Survey Findings

Quantitative measures of the aquatic plant community documented in 2018 were comparable to some prior years. Lake-wide EWM distribution (FOC - frequency of occurrence) increased slightly from 62% in 2017 to 69% this season (Table 3). However, EWM abundance (% cover) doubled since 2017 from 8% to 16%. Overall vegetative cover also increased compared to prior years, from 46% in 2017 to 70% this year.

The composition of the vegetative community has also remained relatively unchanged since 2001 and is dominated by native pondweed species, namely (in decreasing FOC): *Potamogeton robbinsii, Elodea canadensis, Potamogeton illinoensis, and Zosterella dubia.* Slight FOC increases in *Ceratophyllum demersum, Elodea canadensis, Nymphaea odorata, Nuphar varigata, Potamogeton foliosus, Potamogeton zosteriformis, Vallisneria americana* and *Zosterella dubia* were observed this year in comparison to last year. Diversity has also been maintained throughout the course of management with 27 different aquatic plant species identified this fall and an average of approximately 5.5 species per point.

Comparative data for all three basins, and overall, collected during late season surveys between 2001 and 2018 is listed below (Table 2).



			iuo		Junio	, 01, 11		110, 00	210, 200	2010						
LILY POND	2001	2004	2005	2006	2007	2008	5005	2010	1102	2012	2013	2014	2015	2016	2017	2018
# of Data Points								2	4							
Total Plant Cover (%)	90	80	98	88	91	98	94	98	93	94	96	94	90	78	60	99
Milfoil Cover (%)	9	6	2	0	2	7	<]	<]	<]	1	5	1.5	2.2	7	6	6.7
Plant Biomass Index	3.1	2.5	3.3	2.5	2.8	3.3	2.7	2.3	2.9	3.1	3.5	3.4	3.5	3.2	2.9	3.9
Average Species Richness	5.67	3.58	5.17	3.59	4.54	5.58	4.83	5.46	4.13	4.21	4.46	5.04	4.8	5.5	5.54	7.75

 Table 2.
 Summary of Annual Survey Data, 2001-2018

LAKE ST. CATHERINE (Main Basin)	2001	2004	2005	2006	2002	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
# of Data Points								13	32							
Total Plant Cover (%)	66	46	51	57	58	66	58	63	59	56	63	63	63	37	43	60
Milfoil Cover (%)	43	16	0	4	11	4	5	2	7	8	16	15	7	6	7	16
Plant Biomass Index	1.9	1.5	1.6	1.8	2.0	2.0	2.0	1.3	1.8	1.5	2.0	2.0	2.0	2.6	1.6	2.9
Average Species Richness	2.96	2.39	2.85	3.50	3.75	4.09	3.68	3.06	2.88	2.88	2.85	2.87	3.2	3.1	3.35	4.59

LITTLE LAKE	2001	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
# of Data Points								4	3							
Total Plant Cover (%)	72	66	78	83	83	77	58	62	76	81	80	86	96	54	49	84
Milfoil Cover (%)	15	0	0	2	7	10	<]	5	9	14	7	10	42	25	13	22
Plant Biomass Index	2.3	2.1	2.4	2.9	2.8	2.7	2.2	2.7	3.3	2.5	3.0	3.2	3.8	3.8	2.3	3.9
Average Species Richness	5.62	3.23	3.30	3.81	4.58	4.3	4.23	4.65	3.84	4.42	4.63	4.77	4.4	4	5.49	6.79

OVERALL	2001	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
# of Data Points								19	99							
Total Plant Cover (%)	70	54	63	66	67	73	63	67	67	66	70	72	-	45	46	70
Milfoil Cover (%)	49	0.1	0.5	3	9	5	3	3	7	8	13	12	13	10	8	16
Plant Biomass Index	2	2	2	2	2	2	2	2	2	2	2	2	-	3	2	3.2
Average Species Richness	-	-	-	3.57	4.03	4.32	3.94	3.70	3.23	3.38	3.44	3.56	3.71	3.52	4.08	5.45



Macrophyte Species (Common Name / Scientific Name)	2001	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Water marigold Bidens beckii†	3	0	0	0	0	0	0	0	1	0	0	0.5	0	0	0	0
Watershield Brasenia schreberi	4	8	7	7	7	6	5	5	5	3	4	4	3	3	3	5
Coontail Ceratophyllum demersum	20	8	11	12	21	18	17	22	10	21	15	17	15	14	21	24
Muskgrass / Stonewort Char asp. / Nitella sp.	17	6	36	40	14	14	13	2	2	1	0	3	19	5	8	12
Spikerush Eleocharis asicularia	1	1	1	0	0	0	0	0	0	0	0	0	2	<1	0	0
Common waterweed Elodea canadensis	32	1	1	1	5	43	60	30	10	14	23	12	30	38	50	61
Quillwort Isoetes sp.	2	6	2	5	2	3	1	0	1	1	0	0	1	<1	<1	<1
Lemna minor	7	1	0	1	0	1	1	0	0	0	0	0	<]	<]	<]	0
Eurasian watermiltoil Myriophyllum spicatum	94	44	17	33	74	65	38	40	43	51	64	54	48	25	62	69
Myriophyllum verticillatum													1	0	5	0
Najas flexilis	22	0	8	39	34	22	15	16	14	8	4	7	10	9	20	19
Najas gracillima																5
Najas minor	0	0	0	0	0	0	0	0	0	0	0	0	<1	2	0	1
Yellow waterlily Nuphar variegata	5	5	5	2	2	1	2	1	2	1	1	0	2	<1	13	2
White waterlily Nymphaea odorata	16	5	11	10	11	11	10	7	7	12	12	14	13	8	1	24
Largeleat pondweed Potamogeton amplifolius	33	38	43	49	52	53	51	56	23	35	32	31	13	20	19	23
Curlyleat pondweed Potamogeton crispus	2	1	7	5	3	1	0	0	1	1	0	1	0	<1	1	0
Ribbonleaf pondweed Potamogeton epihydrus	2	6	7	3	3	5	1	1	1	4	1	2	<1	1	2	8
Leafy Pondweed Potamogeton foliosus																12
Variable leaf pondweed Potamogeton gramineus	23	1	6	6	2	4	4	4	11	8	3	3	4	3	4	14
Illinois pondweed Potamogeton illinoensis	4	1	2	9	23	39	29	36	35	53	56	57	44	47	50	43
Floating leaf pondweed Potamogeton natans	0	0	0	9	0	8	8	13	8	0	0	13	0	0	0	<1
Whitestem pondweed Potamogeton praelongus	0	0	0	0	0	0	0	0	0	<1	<1	3	6	10	<1	5
Thinleaf pondweed Potamogeton pusillus	0	0	0	5	12	6	5	12	12	5	4	0	14	2	0	12
Robbins' pondweed Potamogeton robbinsii	52	76	88	74	77	68	84	78	57	76	76	73	57	58	65	69
Flatstem pondweed Potamogeton zosteriformis	28	3	29	29	23	19	16	26	22	20	23	36	15	16	15	31
White water crowfoot Ranunculus aquatilis															2	0
Humped bladderwort Utricularia gibba	2	0	1	5	1	1	4	1	0	0	0	0	2	5	5	5
Flat leaf bladderwort Utricularia intermedia																3
Purple bladderwort Utricularia purpurea																8
Common bladderwort Utricularia vulgaris	8	9	2	6	7	7	11	8	2	4	4	7	7	4	10	13

 Table 3.
 Entire Lake System – Annual Species List and Frequency of Occurrence (%), 2001-2018



Tapegrass Vallisneria americana	29	13	2	4	9	8	15	15	14	15	18	19	26	21	24	34
Watermeal Wolffia sp.	0	0	0	5	4	0	0	0	0	0	0	0	0	0	0	0
Water stargrass Zosterella dubia	1	1	9	8	23	17	7	13	4	2	4	11	15	19	20	38

[†]Formerly listed as *Megalodonta beckii* in previous years' reports.

3.3 Lily Pond

Annual increases in EWM frequency of occurrence in Lily Pond have been observed, as treatment has not been conducted within this basin since 2014. There was only a slight increase in both EWM FOC and percent cover within Lily Pond since last year (Chart 1, Figure 2).

Both plant biomass and average species richness values within Lily Pond remained similar to prior years' data, with healthy and plentiful native species.

Potamogeton robbinsii (100%) remained the most abundant plant in the basin followed by Ceratophyllum demersum (92%), Elodea canadensis (88%), Potamogeton zosteriformis (79%), Utricularia vulgaris (67%), Zosterella dubia (63%) Nymphaea odorata (71%), and Potamogeton amplifolius (54%) (Table 4). All other species' FOC was similar to that of previous years, with a few species showing slight increases or decreases.



Figure 2: Lily Pond - Fall 2018 EWM distribution



Macrophyte Species (Common Name / Scientific Name)	2001	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Watershield Brasenia schreberi	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Coontail Ceratophyllum demersum	71	4	50	46	83	83	83	79	75	63	67	54	64	67	67	92
Muskgrass / Stonewort Chara sp. / Nitella sp.	0	0	0	5	4	0	0	0	0	0	0	0	0	0	4	0
Common waterweed Elodea canadensis	29	0	8	0	8	29	46	79	17	29	17	13	48	63	83	88
Quillwort Isoetes sp.	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common duckweed Lemna minor	46	8	0	5	0	0	0	0	0	0	0	0	0	0	0	0
Eurasian watermilfoil Myriophyllum spicatum	79	8	33	0	33	79	13	25	8	29	42	17	28	38	63	67
Slender naiad Najas flexilis	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow waterlily Nuphar variegatum	17	17	17	0	0	0	0	4	4	0	0	0	0	0	0	0
White waterlily Nymphaea odorata	63	17	29	9	21	25	33	17	25	29	38	38	28	33	42	71
Largeleaf pondweed Potamogeton amplifolius	33	100	92	77	79	88	92	88	38	46	75	75	24	50	38	54
Curlyleaf pondweed Potamogeton crispus	4	4	4	5	13	0	0	0	4	0	0	0	0	0	0	0
Ribbonleaf pondweed Potamogeton epihydrus	0	13	4	0	4	4	4	0	4	4	0	0	0	4	0	8
Variable leaf pondweed Potamogeton gramineus	17	0	8	0	4	0	8	0	8	8	0	0	0	0	0	0
Illinois pondweed Potamogeton illinoensis	0	4	8	9	46	42	25	17	46	42	46	54	16	46	33	29
Floating leaf pondweed Potamogeton natans	0	0.	0	9	0	8	8	13	8	0	0	13	0	0	0	4
Whitestem pondweed Potamogeton praelongus																17
Thinleaf pondweed Potamogeton pusillus																4
Robbins' pondweed Potamogeton robbinsii	96	92	96	96	92	88	96	96	86	96	100	100	68	71	92	100
Flatstem pondweed Potamogeton zosteriformis	58	8	63	0	25	46	13	67	46	33	29	67	48	46	33	79
Humped bladderwort Utricularia gibba	0	0	0	41	0	0	4	0	0	0	0	0	12	25	8	0
Purple bladderwort Utricularia purpurea																17
Common bladderwort Utricularia vulgaris	29	38	0	27	4	13	17	4	17	21	17	29	28	29	50	67
Tapegrass Vallisneria americana	33	46	0	0	0	0	8	4	4	0	0	0	4	38	0	8
Watermeal Wolffia sp.	0	0	0	5	4	0	0	0	0	0	0	0	0	0	0	0
Water stargrass Zosterella dubia	4	0	38	0	25	21	8	50	0	0	0	17	40	58	29	63

 Table 4. Lily Pond – Annual Species List and Frequency of Occurrence (%), 2001-2018



3.4 Lake St. Catherine (Main Basin)

The Main Basin of Lake St. Catherine has shown slight fluctuations in native plant species distribution and composition through the years of management. Observed at 62% of the survey points EWM was the most common plant species in the Main Basin. In decreasing FOC, the following species were also prevalent in this basin: *Elodea canadensis, Potamogeton robbinsii, Vallisneria americana*, and *Zosterella dubia*. All other species observed showed FOC values that were similar to last year with <±10% change (Table 5).

EWM distribution increased from 46% to 62% over last year's FOC and percent EWM cover only increased by 9, at survey points within the Main Basin. Although EWM biomass is being kept incheck by ongoing management efforts, previously managed areas are beginning to recover.

EWM control varied throughout treatment areas, with only a few viable stems observed in some, while significant regrowth was observed in others. However, EWM growth continued to be observed outside of treatment areas and survey data points, with several dense areas throughout shoreline areas of the Main Basin (Figure 3). Annual spot-treatments and DASH efforts have been effective, but can only provide control to those areas while EWM growth remains well distributed throughout this basin.

Locations of EWM observed during the survey, in addition to those survey points where observed, were recorded with a GPS unit. All EWM points observed during the September 2018 survey are depicted in Figure 3.

Chart 2 (below) illustrates the year-to-year change in EWM frequency of occurrence and percent cover in the Main Basin.







Figure 3: Main Basin - Fall 2018 EWM distribution



Macrophyte Species (Common Name / Scientific Name)	2001	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Water marigold Bidens beckii†	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Watershield Brasenia schreberi	0	<1	<]	2	2	2	2	2	2	<]	<]	2	3	3	2	5
Coontail Ceratophyllum demersum	11	11	6	7	11	10	8	14	6	11	2	5	3	5	5	6
Muskgrass / Stonewort Chara sp. / Nitella sp.	2	17	62	57	21	22	19	2	<]	0	0	5	16	9	11	14
Common waterweed Elodea canadensis	28	0	0	<1	5	52	71	15	9	7	19	7	30	37	45	58
Quillwort Isoetes sp.	2	9	<]	6	2	5	0	0	<]	<]	0	0	2	0	<]	<1
Common duckweed Lemna minor	2	0	0	0	0	<]	<]	0	0	0	0	0	<1	0	0	0
Eurasian watermilfoil Myriophyllum spicatum	98	65	15	36	77	59	44	28	50	47	66	56	39	34	46	62
Slender naiad Najas flexilis	19	0	12	57	50	34	22	25	20	12	6	6	16	2	28	25
Thread leaf naiad Najas gracillima																8
Brittle naiad Naias minor																2
Yellow waterlily Nuphar variegatum	<]	0	0	<]	<]	0	0	<]	<]	0	0	0	0	0	2	0
White waterlily Nymphaea odorata	3	2	2	3	3	3	3	2	2	2	<1	2	5	2	0	8
Largeleaf pondweed Potamogeton amplifolius	29	15	26	34	39	38	41	44	26	35	27	25	12	12	18	15
Curlyleaf pondweed Potamogeton crispus	2	0	9	5	2	<1	0	0	0	0	0	<1	0	0	<1	0
Ribbonleaf pondweed Potamogeton epihydrus	2	3	5	2	<1	4	<1	<1	<1	2	0	2	0	0	<1	4
Leafy pondweed Potamogeton foliosus																17
Variable leaf pondweed Potamogeton gramineus	18	0	5	2	2	6	3	6	15	9	3	4	6	4	5	21
Illinois pondweed Potamogeton illinoensis	6	<1	<]	9	16	34	23	31	33	53	57	56	40	38	52	34
Whitestem pondweed																4
Thinleaf pondweed Potamogeton pusillus	0	0	0	5	12	6	5	12	12	5	4	0	14	2	0	17
Robbins' pondweed	31	65	82	62	67	58	78	73	58	67	66	61	49	47	44	58
Flatstem pondweed Potamogeton zosteriformis	24	2	31	42	28	19	19	23	30	20	20	32	10	4	10	23
Common bladderwort Utricularia vulgaris	<]	<1	<]	0	0	2	<]	3	0	<]	0	<1	<1	<]	2	2
Tapegrass Vallisneria americana	14	3	<]	3	9	9	13	13	10	9	15	14	23	20	19	31
Water stargrass Zosterella dubia		<3	5	12	28	22	8	9	5	2	2	13	13	24	21	32

Table 5: Lake St. Catherine (Main Basin) - Annual Species List and Frequency of Occurrence (%), 2001-2018



3.5 Little Lake

Overall plant cover within Little Lake saw a significant increase, from 49% in 2017 to 84% this year. Only nineteen (19) species were observed within this basin this year, compared to twenty-five (25) last year. Little Lake's consistent, shallow depth (6 foot average), allows for such a diverse plant community, but also allows for plant growth to dominate the entire water column, likely hindering recreational uses of the basin. Additionally, average species richness increased by ~1 species per point compared to 2017.

EWM distribution hovered around 88% of survey points, which is similar to last year, while EWM percent cover increased to ~22% (Figure 4, Table 6, Chart 3). However, as treatment is not conducted within Little Lake, this increase was anticipated.

The most commonly observed species, in decreasing order, were as follows: Myriophyllum spicatum, Potamogeton robbinsii, Potamogeton illinoensis, Vallisneria americana, Elodea canadensis, and Nymphaea odorata (Table 6). A notable increase in Zosterella dubia was also observed this year.





Water maringloid Bidens back/sector 7 0 0 0 2 0	Macrophyte Species (Common Name / Scientific Name)	2001	2004	2005	9002	2007	2008	2009	2010	2011	2012	2013	5014	2015	9102	2017	2018
Martine Direction Data Data <thdata< th=""> Data Data<td>Water marigold Bidens beckiit</td><td>7</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>2</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></thdata<>	Water marigold Bidens beckiit	7	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
Brasenia schreberi 14 30 30 23 24 21 14 12 14 12 14 12 2 2 2 3 7 Warkgras / Niella sp. 7 5 7 12 0 0 2 0 5 2 0 0 2 0 0 14 44 40 Conontal Cerratophylum demonsum 5 5 5 0<	Watershield	1.4	20	20	00	0/	01	1.4	10	1.4	10	14	10	0	0		7
Muskgross / Stoneworth 7 5 7 12 0 2 0 5 2 0 0 2 0 0 12 Coontail Contail Contail <thcontail< th=""> Contail Co</thcontail<>	Brasenia schreberi	14	30	30	23	26	21	14	ΙZ	14	ΙZ	14	IZ	2	Z	Э	/
Sindup / Michage/ Caratophyllum demensum Spikensh 21 0 2 9 16 7 9 16 28 28 28 35 23 14 44 40 Caratophyllum demensum Spikensh 5 5 5 0	Muskgrass / Stonewort	7	5	7	12	0	0	2	0	5	2	0	0	2	0	0	12
Ceretaphyllum demensum 21 61 7 16 7 16 7 16 70 70 <td>Coontail</td> <td>21</td> <td>0</td> <td>2</td> <td>0</td> <td>14</td> <td>7</td> <td>0</td> <td>14</td> <td>28</td> <td>28</td> <td>28</td> <td>35</td> <td>23</td> <td>14</td> <td>4.4</td> <td>40</td>	Coontail	21	0	2	0	14	7	0	14	28	28	28	35	23	14	4.4	40
Spikerusing Eleocharissp. 5 5 5 5 0 <td>Ceratophyllum demersum</td> <td>21</td> <td>0</td> <td>2</td> <td>/</td> <td>10</td> <td>/</td> <td>/</td> <td>10</td> <td>20</td> <td>20</td> <td>20</td> <td>55</td> <td>23</td> <td>14</td> <td>44</td> <td>40</td>	Ceratophyllum demersum	21	0	2	/	10	/	/	10	20	20	20	55	23	14	44	40
Common waterweed Etadea canadensis 47 5 0 0 2 23 40 47 21 28 40 26 28 28 74 54 Golliwort soetes sp. 0 0 5 2 0 0 2 0<	spikerusn Eleocharis sp.	5	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0
Elodea canadensis N O O O P	Common waterweed	17	5	0	0	2	23	40	47	21	28	40	26	28	28	71	54
Balancy in the solution of the solution	Elodea canadensis	-17	Ŭ	0	Ŭ	2	20	-10	-17	21	20	-10	20	20	20	74	64
Euroscian watermilloii Myriophyllum spicatum 88 0 16 40 88 77 32 81 44 77 74 72 86 74 88 88 Myriophyllum sylicatum Whorled watermilloi Myriophyllum verticilatum Slender noidod 40 0 0 5 2 0 5 0 5 0 2 14 0 2 7 9 Vellow wateriliy Nuphar variegatum 9 14 12 7 7 2 5 2 2 0 7 55 5 9 White wateriliy Nuphare variegatum 30 9 26 30 28 10 19 19 23 32 30 37 27 12 42 44 Largeleaf pondweed Potamogeton amplifolus 44 72 70 77 74 77 50 0 2 0 0 0 2 2 2 2 2 2 2 2 2 2<	lsoetes sp.	0	0	5	2	0	0	2	0	0	2	0	0	0	0	0	0
Myriophylum spicatum In In <td>Eurasian watermilfoil</td> <td>88</td> <td>0</td> <td>16</td> <td>40</td> <td>88</td> <td>77</td> <td>32</td> <td>81</td> <td>44</td> <td>77</td> <td>74</td> <td>72</td> <td>86</td> <td>74</td> <td>88</td> <td>88</td>	Eurasian watermilfoil	88	0	16	40	88	77	32	81	44	77	74	72	86	74	88	88
Name Name <th< td=""><td>Myriophyllum spicatum Whorled watermilfoil</td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	Myriophyllum spicatum Whorled watermilfoil		-														
Siender notider 40 0 0 5 2 0 5 0 5 0 2 14 0 2 7 9 Vellow woteriliy Nupharvariegatum 9 14 12 7 2 7 2 5 2 2 0 7 5 5 9 Vellow woteriliy Nupharea odorata 30 9 26 30 28 10 19 19 23 32 30 37 27 12 42 44 Vertice interviewed potamogeton amplifolds 44 72 70 77 74 77 56 72 28 30 21 23 14 28 12 24 Outpeted pondweed Potamogeton amplifolds 0 12 14 7 7 7 50 51 51 21 23 24 25 51 23 24 25 25 25 25 22 25 25 26 <td>Myriophyllum verticillatum</td> <td></td> <td>4</td> <td>0</td> <td>5</td> <td>0</td>	Myriophyllum verticillatum													4	0	5	0
Najes thexinis 0	Slender naiad	40	0	0	5	2	0	5	0	5	0	2	14	0	2	7	9
Number Varian 9 14 12 7 7 2 7 2 5 2 2 0 7 5 5 9 White woterlily Nymphae adorata and getan applifolus 30 9 26 30 28 10 19 19 23 32 30 37 27 12 42 44 Largelead pondweed Potamogeton applifolus 44 72 70 77 74 77 56 72 28 30 21 23 14 28 12 26 Cuttyleed pondweed Potamogeton cipydrus 0 12 14 7 7 7 0 0 2 9 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 10 Variable leaf pondweed Potamogeton gindrus 0 0 9 33 47 49 36 62 61 61	Najas fiexilis Yellow waterlily																
White wateriliy 30 9 26 30 28 10 19 19 23 32 30 37 27 12 42 44 Largelect pondweed Potamogeton pondweed Potamogeton crispus 0 0 0 77 74 77 56 72 28 30 21 23 14 28 12 26 Curlyleaf pondweed Potamogeton crispus 0 0 0 2 0 0 0 2 9 2 2 2 2 5 21 Variable leaf pondweed Potamogeton gramineus 42 5 9 23 0 0 5 5 2 0 0 0 0 2 14 14 7 7 7 0 0 2 2 2 2 2 2 5 14 14 14 14 14 14 14 14 14 14 14 14 14 14	Nuphar variegatum	9	14	12	7	7	2	7	2	5	2	2	0	7	5	5	9
Instructional description Image of the second s	White waterlily	30	9	26	30	28	10	19	19	23	32	30	37	27	12	42	44
Potamogeton amplifolius 44 72 70 77 74 77 56 72 28 30 21 23 14 28 12 26 Curlyled pondweed Potamogeton crispus 0 0 0 2 0 0 0 0 2 0 0 0 2 0 0 0 2 0 0 0 2 0 0 0 2 0 0 0 2 0 0 0 2 0 0 0 2 0 0 0 2 0 0 0 2 0 0 0 2 0 0 0 2 0 0 0 0 2 0 0 0 0 2 0	Largeleaf pondweed		70	70		7.4		E /	70			01	00	1.4	00	10	<u> </u>
Curlyleaf pondweed Potamogeton cispus 0 10 <	Potamogeton amplifolius	44	72	70	//	/4	//	56	72	28	30	21	23	14	28	12	26
Outbody O 12 14 7 7 7 0 0 2 9 2 2 2 2 5 21 Variable leaf pondweed Potamogeton gramineus 42 5 9 23 0 0 5 0 5 5 2 0 0 0 2 0 0 0 2 0 0 0 2 0 0 0 2 0 0 0 2 0 0 0 0 2 0 <td>Curlyleaf pondweed</td> <td>0</td> <td>0</td> <td>0</td> <td>2</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>2</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>2</td> <td>0</td>	Curlyleaf pondweed	0	0	0	2	0	0	0	0	0	2	0	0	0	0	2	0
Potamogeton epinyarus 42 5 9 23 0 0 5 0 5 5 2 0 0 0 2 0 Variable leaf pondweed Potamogeton gramineus 0 0 0 9 33 47 49 36 62 61 61 65 71 72 51 61 Illinois pondweed Potamogeton lillinoensis 0 0 0 2 7 2 0 0 0 0 2 0 0 0 2 0	Ribbonleaf pondweed	0	12	14	7	7	7	0	0	2	9	2	2	2	2	5	21
Potamogeton gramineus 42 5 9 23 0 0 5 0 5 2 0 0 0 2 0 Illinois pondweed Potamogeton lilinoensis 0 0 0 9 33 47 49 36 62 61 61 65 71 72 51 61 Thinleaf pondweed Potamogeton nobilius 0 0 0 2 7 2 0	Potamogeton epinyarus Variable leaf pondweed	10				-	-	-	â			â	<u>^</u>	<u>^</u>	â	-	
Illinois pondweed Potamogeton illinoensis 0 0 0 9 33 47 49 36 62 61 61 65 71 72 51 61 Thinled pondweed Potamogeton nuslius 0 0 0 2 7 2 0 0 0 0 0 2 0 0 0 0 0 2 0 <	Potamogeton gramineus	42	5	9	23	0	0	5	0	5	5	2	0	0	0	2	0
Thinled pondweed Potamogeton pusillus 0 0 0 0 2 7 2 0 0 0 0 2 0 0 0 Robbins' pondweed Potamogeton robbinsii 88 100 100 100 100 88 95 81 86 91 93 95 73 86 86 81 Flatstem pondweed Potamogeton zosteriformis 23 2 5 5 7 5 7 9 9 14 28 33 11 19 19 30 White water crowfoot Ranuculus aquatilis - - - - - - - - - 2 0 Humped bladderwort Utricularia gibba 7 0 2 0 5 2 14 5 0 0 0 2 7 16 21 Flat leaf bladderwort Utricularia intermedia - - - - - - 12 26 Common bladderwort Utricularia purpurea 16 19 7 12 30	Illinois pondweed Potamogeton illinoensis	0	0	0	9	33	47	49	36	62	61	61	65	71	72	51	61
Potamogeton pusilius I	Thinleaf pondweed	0	0	0	2	7	2	0	0	0	0	0	0	2	0	0	0
Noblinity polativedation 88 100 100 100 100 88 95 81 86 91 93 95 73 86 86 81 Potamogeton robbinsii 23 2 5 5 7 5 7 9 9 14 28 33 11 19 19 30 White water crowfoot Ranunculus aquatilis 2 0 0 2 0 2 0 5 2 14 5 0 0 0 2 7 16 21 Humped bladderwort 7 0 2 0 5 2 14 5 0 0 0 2 7 16 21 Flatstem pondwerd 7 0 2 0 5 2 14 5 0 0 0 0 2 7 16 21 Humped bladderwort 7 0 2 0 5 2 14	Potamogeton pusillus Robbins' pondweed		-					-	-	-	-	-	-	_	-	-	-
Flatstem pondweed Potamogeton zosteriformis 23 2 5 5 7 5 7 9 9 14 28 33 11 19 19 30 White water crowfoot Ranunculus aquatilis	Potamogeton robbinsii	88	100	100	100	100	88	95	81	86	91	93	95	73	86	86	81
Polamogeton ZosteniormisII	Flatstem pondweed	23	2	5	5	7	5	7	9	9	14	28	33	11	19	19	30
Ranunculus aquatilis Image: Second Secon	White water crowfoot															-	
Humped bladderwort 7 0 2 0 5 2 14 5 0 0 0 2 7 16 21 Utricularia gibba 7 0 2 0 5 2 14 5 0 0 0 0 2 7 16 21 Flat leaf bladderwort Image: Comparison of the bladderwort <td>Ranunculus aquatilis</td> <td></td> <td>2</td> <td>0</td>	Ranunculus aquatilis															2	0
Flat leaf bladderwort Utricularia intermediaImage: Subset of the subset	Humped bladderwort Utricularia aibba	7	0	2	0	5	2	14	5	0	0	0	0	2	7	16	21
Utricularia intermedia Image: Constrainty of the i	Flat leaf bladderwort																12
Only be blocked worf Image: Stress worf Image:	Utricularia intermedia																12
Common bladderwort Utricularia vulgaris 16 19 7 12 30 19 35 26 5 2 9 14 14 0 11 14 Tapegrass Vallisneria americana 72 26 7 9 14 9 26 26 35 40 40 44 50 35 0 58 Water stargrass Vallisneria divisio 2 2 5 0 7 2 5 5 2 5 14 2 9 9 9 42	Utricularia purpurea																26
Utricularia vulgaris 10 17 12 00 17 00 17 14 00 11 14 Tapegross 72 26 7 9 14 9 26 26 35 40 40 44 50 35 0 58 Water stargross 2 2 5 0 7 2 5 5 2 5 14 2 9 9 42	Common bladderwort	16	19	7	12	30	19	35	26	5	2	9	14	14	0	11	14
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Water stargrass 2 2 5 0 7 2 5 5 2 5 14 2 9 9 9 42	Vallisneria americana	72	26	7	9	14	9	26	26	35	40	40	44	50	35	0	58
	Water stargrass Zosterella dubia	2	2	5	0	7	2	5	5	2	5	14	2	9	9	9	42

 Table 6:
 Little Lake – Annual Species List and Frequency of Occurrence (%), 2001-2018

[†]Formerly listed as *Megalodonta beckii* in previous years' reports.



3.6 Species Richness

In all three basins, species richness increased compared to findings from past years with an overall average of approximately five and a half species per point (Table 2, Chart 4). Each basin's increase is likely related to the higher number of species and new species observed. Overall, species richness or native plant diversity in any of the basins does not appear to be impacted adversely by the herbicide spot-treatments or other EWM management activities.





4 SUMMARY OF 2018 AQUATIC VEGETATION MANAGEMENT PROGRAM

4.1 <u>Renovate Herbicide Treatments</u>

Results of the 2018 Renovate herbicide treatment program at Lake St. Catherine vary slightly with prior treatment efforts performed in recent years, as some areas exhibited excellent control through the growing season, while others had more regrowth than anticipated. As with previous years, the full extent of treatment success will not be realized until regrowth can be observed next season.

Although triclopyr's high selectivity for EWM and negligible impact to non-target species at Lake St. Catherine validates its importance as part of an integrated management program, this year's varied EWM control results were interesting and persuading to switch to ProcellaCOR herbicide going forward. Although species richness and frequency of occurrence indices have fluctuated within each basin over time, no major plant composition changes have been observed as a result of triclopyr treatments. Based on data collected within the Lake St. Catherine system, as well as other large Vermont waterbodies, seasonal variability and limitations of the data point survey methodology are likely the primary factors responsible for changes in the measurable indices that have been observed year over year.



4.2 Spread Prevention and Non-Chemical Control Activities

As required by the ANC Permit, non-chemical milfoil control activities continued at Lake St. Catherine during the 2018 season. Efforts included volunteer monitoring, boat ramp greeter program, diver assisted suction harvesting and other educational efforts. Details of the non-chemical control efforts will be provided by LSCA under separate cover.

5 RECOMMENDATIONS FOR 2019 SEASON

Controlling areas of dense EWM growth and maintaining it at non-nuisance levels has been the focus of recent EWM management efforts at Lake St. Catherine. Triclopyr herbicide treatments have selectively controlled EWM where used, but treatment has typically only provided control for one to two growing seasons. Triclopyr has shown some limitations in open water or small treatment area situations where dilution is increased and concentration-exposure-time (CET) is decreased, sometimes resulting in less than optimal control.

Although triclopyr has been the herbicide of choice for EWM control in Vermont for over a decade, the new herbicide, ProcellaCOR[™] EC, is a perfect fit for Lake St. Catherine's integrated management approach. ProcellaCOR has an extremely short CET compared to triclopyr, which will make it effective for the shoreline spot-treatments. It is also applied at concentrations targeting less than 10 parts per billion in the water, as opposed to the 1.5-2.0 parts per million (1500-2000 ppb) rates needed for triclopyr.

As such, for 2019 we are recommending treatment with ProcellaCOR using a similar management approach as has been used with triclopyr in the past. Based on the results of the September 2018 survey, preliminary 2019 treatment areas are illustrated on the following page (Figure 5). Using the EWM distribution and density observed this fall, treatment in 2019 is anticipated to be 50-70 acres within the Main Basin. Consistent with previous years, potential treatment areas will be inspected in the early spring and treatment areas will be finalized in coordination with the LSCA and VT DEC prior to conducting treatment in 2019.

If VT DEC and VT DOH have not completed their internal review of ProcellaCOR in a timely manner for treatment in 2019, the current Renovate permit for Lake St. Catherine does not expire until June 10 and treatment could be coordinated to be performed prior to that expiration, if necessary.







APPENDIX A

Herbicide Residue Testing Results

- FasTEST Sampling Location Map
- SePRO Laboratory Report 06/19/18
- SePRO Laboratory Report 06/19/18
- (sample 3 only not shipped with original package)
- ➢ SePRO Laboratory Report 07/17/18

2018 FasTEST Sampling Locations





Wells / Poultney, VT Rutland County 43.4657° N, 73.2146° W



Lake St. Catherine 4,000 8,000

1:45,000

⊐Feé

0

Map Date: 05/18/18 Prepared by: KS Office: SHREWSBURY, MA



16013 Watson Seed Farm Road, Whitakers, NC 27891

Chain of Custody: LABORATORY REPORT

Customer Company Customer Contact

Company Name Solitude Lake Management	Contact Person: Kara Sliwoski	
Address: 1320 Brookwood Drive, Ste. H Little Rock, AR 72202	E-mail Address: KSliwoski@solitudelake.com	
	Phone: 508-865-1000	

Waterbody Information

Waterbody:	Lake St. Catherine
Waterbody size:	1100
Depth Average:	25

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM10203-1	1	Triclopyr (ug/L)	FAST 02	17.6	06/19/2018
CTM10204-1	2	Triclopyr (ug/L)	FAST 02	33.8	06/19/2018
CTM10205-1	4	Triclopyr (ug/L)	FAST 02	63	06/19/2018
CTM10206-1	5	Triclopyr (ug/L)	FAST 02	45.1	06/19/2018
CTM10207-1	6	Triclopyr (ug/L)	FAST 02	<1	06/19/2018
CTM10293-1	7	Triclopyr (ug/L)	FAST 02	<1	06/19/2018

ANALYSIS STATEMENTS:

SAMPLE RECEIPT /HOLDING TIMES: All samples arrived in an acceptable condition and were analyzed within prescribed holding times in accordance with the SRTC Laboratory Sample Receipt Policy unless otherwise noted in the report.

PRESERVATION: Samples requiring preservation were verified prior to sample analysis and any qualifiers will be noted

in the report.

QA/QC CRITERIA: All analyses met method criteria, except as noted in the report with data qualifiers.

COMMENTS: No significant observations were made unless noted in the report.

MEASUREMENT UNCERTAINTY: Uncertainty of measurement has been determined and is available upon request.

Disclaimer: The results listed within this Laboratory Report relate only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a dry weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the exclusive use of SRTC Laboratory and its client. This report shall not be reproduced, except in full, without written permission from SRTC Laboratory. The Chain of Custody is included and is an essential component of this report.

This entire report was reviewed and approved for release.

Reviewed By: Laboratory Supervisor

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16013 Watson Seed Farm Road, Whitakers, NC 27891

Chain of Custody: COC3346 LABORATORY REPORT

Customer Company Customer Contact

Company Name SOLitude Lake Management	Contact Person: Kara Sliwoski		
Address: 1320 Brookwood Drive, Ste. H Little Rock, AR 72202	E-mail Address: ksliwoski@solitudelake.com		
	Phone: 508.885.0101		

Waterbody Information

Waterbody:	Lake St. Catherine - MA
Waterbody size:	0
Depth Average:	0

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM10325-1	3	Triclopyr (ug/L)	FAST 02	20.3	

ANALYSIS STATEMENTS:

SAMPLE RECEIPT /HOLDING TIMES: All samples arrived in an acceptable condition and were analyzed within prescribed holding times in accordance with the SRTC Laboratory Sample Receipt Policy unless otherwise noted in the report.

PRESERVATION: Samples requiring preservation were verified prior to sample analysis and any qualifiers will be noted

in the report.

QA/QC CRITERIA: All analyses met method criteria, except as noted in the report with data qualifiers.

COMMENTS: No significant observations were made unless noted in the report.

MEASUREMENT UNCERTAINTY: Uncertainty of measurement has been determined and is available upon request.

Laboratory Information Date / Time Received: 06/21/18 12:00 PM Date Results Sent: Friday, June 22, 2018 accordance with the applicable certifications as noted. All soil samples are reported on a dry weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the exclusive use of SRTC Laboratory and its client. This report shall not be reproduced, except in full, without written permission from SRTC Laboratory. The Chain of Custody is included and is an essential component of this report.

This entire report was reviewed and approved for release.

Reviewed By: Laboratory Supervisor

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16013 Watson Seed Farm Road, Whitakers, NC 27891

Chain of Custody: COC3637 LABORATORY REPORT

Customer Company Customer Contact

Company Name SOLitude Lake Management	Contact Person: Kara Sliwoski		
Address: 1320 Brookwood Drive, Ste. H Little Rock, AR 72202	E-mail Address: ksliwoski@solitudelake.com		
	Phone: 508.885.0101		

Waterbody Information

Waterbody:	Lake St. Catherine - VT
Waterbody size:	1100
Depth Average:	25

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM11225-1	1	Triclopyr (ug/L)	FAST 02	3.3	07/17/2018
CTM11226-1	2	Triclopyr (ug/L)	FAST 02	2.4	07/17/2018
CTM11227-1	3	Triclopyr (ug/L)	FAST 02	2.2	07/17/2018
CTM11228-1	4	Triclopyr (ug/L)	FAST 02	1.6	07/17/2018
CTM11229-1	5	Triclopyr (ug/L)	FAST 02	2.6	07/17/2018
CTM11230-1	6	Triclopyr (ug/L)	FAST 02	<1	07/17/2018
CTM11231-1	7	Triclopyr (ug/L)	FAST 02	<1	07/17/2018

ANALYSIS STATEMENTS:

SAMPLE RECEIPT /HOLDING TIMES: All samples arrived in an acceptable condition and were analyzed within prescribed holding times in accordance with the SRTC Laboratory Sample Receipt Policy unless otherwise noted in the report.

PRESERVATION: Samples requiring preservation were verified prior to sample analysis and any qualifiers will be noted

in the report.

QA/QC CRITERIA: All analyses met method criteria, except as noted in the report with data qualifiers.

COMMENTS: No significant observations were made unless noted in the report.

MEASUREMENT UNCERTAINTY: Uncertainty of measurement has been determined and is available upon request.

Laboratory Information Date / Time Received: 07/19/18 11:00 AM Date Results Sent: Friday, July 20, 2018

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This entire report was reviewed and approved for release.

Reviewed By: Laboratory Supervisor

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APPENDIX B

Comprehensive Aquatic Vegetation Survey Information

- Survey Point Location Maps
- > 2018 Total Vegetation Biomass
- > Fall 2018 Native Vegetation Distribution Maps
- > Fall 2018 Eurasian Watermilfoil Distribution Map
- Field Data Tables





Main Basin - Survey Point Locations





Little Lake - Survey Point Locations







Legend

- 0 No plant growth
- 1 Very low plant growth
- 2 Plant growth extending into water column
- 3 Plant growth extending near surface
- 4 Plant growth at surface





Lake St. Catherine

⊐Feet

Map Date: 10/13/18 Prepared by: KS Office: SHREWSBURY, MA

1:37,000

Fall 2018 Native Vegetation Distribution (1 of 7)





Fall 2018 Native Vegetation Distribution (2 of 7)





Fall 2018 Native Vegetation Distribution (3 of 7)





Fall 2018 Native Vegetation Distribution (4 of 7)





Fall 2018 Native Vegetation Distribution (5 of 7)





Fall 2018 Native Vegetation Distribution (6 of 7)





Fall 2018 Native Vegetation Distribution (7 of 7)





Lake St. Catherine	Lake St. Catherine	Map Date: 10/24/18
Rutland County	0 6,000 12,000	Prepared by: KS
43.4657° N, 73.2146° W	1:79,000	Office: SHREWSBURY, MA


Legend

- Littoral zone EWM locations
- Pre-established point EWM locations
 2018 Herbicide Treatment Areas



Lake St. Catherine Wells / Poultney, VT Rutland County 43.4657° N, 73.2146° W



Lake St. Catherine

5,600

⊐Feet ⊾

Map Date: 10/13/18 Prepared by: KS Office: SHREWSBURY, MA

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BJECT	IDENT	SPECIES BMI	% COV	% COV	MS	BFA	BS	CD	CE	СН	D	EC	EN	IS	MV	NF	NGR	NGU	NI	NM	NO	NV	PA	PC	PE	PF	PG	PI	PN	PPR	PPU	PR	PS	ΡZ	RA	UG	UI	UM	UPU	UV	VA	ZD
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				%	62.1	3.8	4.5	6.1	0.0	0.8	0.0	58.3	0.0	0.8	0.0	25.0	7.6	0.0	14.4	1.5	8.3	0.0	15.2	0.0	3.8	17.4	20.5	39.4	0.0	3.8	16.7	58.3	0.0	22.7	0.0	0.0	0.0	0.0	0.0	2.3	31.1	31.8

BJEC	IDENT	SPECIES RICHNESS	BMI	% COV ALL	% COV TRG	MS	BFA	BS	CD	CE	СН	D	EC	EN	IS	MV	NF	NGR	NGU	NI	NM	NO	NV	PA	PC	PE	PF	PG	PI	PN	PPR	PPU	PR	PS	ΡZ	RA	UG	UI	UM	UPU	UV	VA	ZD
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161	181	3	2	30	0											Т																	T				(¹				r I		
160	182	6	4	100	0																	D	T														T	S		T			S
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164	184	7	3	80	10	Т			S				S													T							D							T	5		
165	185	9	4	100	5	T	S		T				T									D	S			S							S							S			
166	186	11	4	100	15	Т							S									S				Т			S				М		T		T	S		T		S	
170	187	9	4	100	10	Т	S		Т				S									D															S	S		S			S
169	188	10	4	90	20	S	S						S									T		T					S				м		Т					T		м	
168	189	7	4	85	20	S	S						S											S									D								ſ		S
167	190	9	4	100	25	S	М		S													М							T				D		T		T				ſ		
174	191	11	4	100	15	Т	S		Т		М											T		S		Т							М				(¹				S	M	Т
173	192	6	4	100	35	S					T		S																S				М		S								
172	193	7	4	100	30	S							T			T													М						S		(¹					S S	S
171	194	5	4	80	40	М			T													T											М									S	
178	195	8	4	100	35	S	S															м		T					T								T					S S	S
177	196	6	4	80	20	S					T		T																м													S 1	T
176	197	5	4	85	25	S																							М				М		T							М	
175	198	5	4	90	50	м							T											S					T				М										
182	199	5	4	50	15	Т							S																T				S									1	м
181	200	6	4	100	40	S							S																М				М		S							М	
180	201	4	4	85	35	S																							м				М									S	
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183	203	5	4	90	25	S																							S				М		T							М	
184	204	6	4	100	30	S			Т																				м				М		T							М	
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187	210	7	4	60	20	S	S		S				м																				М									S 1	T I
194	211	5	4	60	20	м			T																								S				\square					S S	S
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197	217	4	4	90	40	м		S														м															\square					S	
198	218	3	4	100	0			S														D															S						
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					%	88.4	25.6	70	39.5	0.0	11.6	0.0	53.5	0.0	0.0	0.0	9.3	0.0	0.0	0.0	0.0	44.2	93	25.6	0.0	20.9	0.0	0.0	60.5	0.0	0.0	0.0	81.4	0.0	30.2	0.0	20.9	11.6	0.0	25.6	14.0	58.1	41.9







Complete Species Roster

SpeciesID	Genus/species	Earliest Record	Most Recent Record	Common Name	RTE State	Ranks Global
ST. CATHERINE				Total Numbe	r of Spec	cies: 56
AST.MEG.BEC	Bidens beckii	7/24/1984	7/24/1984	water marigold		
CAB.BRA.SCH	Brasenia schreberi	10/10/1973	9/28/2015	watershield		
CER.CER.DEM	Ceratophyllum demersum	7/16/1974	9/28/2015	coontail		
CER.CER.ECH	Ceratophyllum echinatum	8/13/1974	8/26/1974	prickly hornwort	S2	G4?
CHA.CHA	Chara sp.	10/10/1973	9/28/2015	muskgrass		
CYP.ELE	Eleocharis sp.	8/1/2001	9/20/2004	spikerush		
CYP.ELE.ACI	Eleocharis acicularis	8/6/2003	7/2/2012	slender spikerush		
HYD.ELO.CAN	Elodea canadensis	7/16/1974	9/28/2015	common elodea		
HYD.ELO	Elodea sp.	10/10/1973	7/10/2007	waterweed		
ERI.ERI.AQU	Eriocaulon aquaticum	7/24/1984	8/5/1999	pipewort		
ISO.ISO	Isoetes sp.	7/24/1984	9/28/2015	quillwort		
LEM.LEM.MIN	Lemna minor	6/22/1990	9/28/2015	little duckweed		
HAL.MYR.SPI	Myriophyllum spicatum	7/26/1978	9/28/2015	Eurasian watermilfoil		
HAL.MYR.SIB	Myriophyllum sibiricum	7/24/1984	7/10/2007	northern watermilfoil		
HAL.MYR	Myriophyllum sp.	10/10/1973	8/13/1974	watermilfoil		
HAL.MYR.FAR	Myriophyllum farwellii	7/24/1984	7/24/1984	Farwell's watermilfoil	S2	G5
NAJ.NAJ.FLE	Najas flexilis	8/13/1974	9/28/2015	common naiad		
NAJ.NAJ.GRA	Najas gracillima	7/24/1984	9/29/2010	slender naiad	S 1	G5?
NAJ.NAJ	Najas sp.	6/25/1986	8/5/1999	waternymph		
CHA.NIT	Nitella sp.	8/5/1999	9/14/2010	brittlewort		
NYM.NUP	Nuphar sp.	10/10/1973	9/20/2004	pond-lily		
NYM.NUP.VAR	Nuphar variegata	7/16/1974	7/2/2012	cow lily		
NYM.NYM.ODO	Nymphaea odorata ssp. Odorata	7/24/1984	9/28/2015	white waterlily		
NYM.NYM	Nymphaea sp.	10/10/1973	9/24/2013	water lily		
PON.PON.COR	Pontederia cordata	10/10/1973	7/2/2012	pickerel-weed		
POT.POT.ILL	Potamogeton illinoensis	8/26/1974	9/28/2015	Illinois pondweed		
POT.POT.PER	Potamogeton perfoliatus	7/16/1974	7/24/1984	claspingleaf pondweed		
POT.POT.PRA	Potamogeton praelongus	7/16/1974	6/27/2007	boat-tipped pondweed		
POT.POT.PUP	Potamogeton pusillus ssp. Pusillu	7/24/1984	7/24/1984	slender pondweed		
POT.POT.PUS	Potamogeton pusillus	7/16/1974	9/28/2015	small pondweed		
POT.POT.PUT	Potamogeton pusillus ssp. Tenuis	7/24/1984	7/24/1984	small pondweed		
POT.POT.RIC	Potamogeton richardsonii	8/13/1974	7/26/1978	Richard's pondweed		
POT.POT.SPI	Potamogeton spirillus	9/29/2010	9/29/2010	snailseed pondweed		
POT.POT.EPI	Potamogeton epihydrus	8/5/1999	9/9/2014	ribbonleaf pondweed		
POT.POT.STR	Potamogeton strictifolius	8/2/1989	8/5/1999	straight-leaf pondweed	S3?	G5
POT.POT.ZOS	Potamogeton zosteriformis	7/16/1974	9/28/2015	flatstem pondweed		

Monday, April 22, 2019

SpeciesID	Genus/species	Earliest Record	Most Recent Record	Common Name	RTE State	Ranl Glo	ks bal
ST. CATHERINE				Total Number	of Spec	ies:	56
POT.POT.ROB	Potamogeton robbinsii	8/2/1989	9/28/2015	Robbin's pondweed			
POT.POT.EPE	Potamogeton epihydrus var. epih	7/24/1984	7/24/1984				
POT.POT.CRI	Potamogeton crispus	10/10/1973	9/9/2014	curly-leaf pondweed			
POT.POT.AMP	Potamogeton amplifolius	10/10/1973	9/28/2015	big-leaf pondweed			
POT.POT	Potamogeton sp.	7/16/1974	7/10/2007	pondweed			
POT.POT.GRA	Potamogeton gramineus	8/13/1974	9/28/2015	variable-leaf pondweed			
RAN.RAN	Ranunculus sp.	7/24/1984	7/2/2012	buttercup			
ALI.SAG	Sagittaria sp.	7/24/1984	8/6/2003	arrowhead			
CYP.SCI.SUB	Schoenoplectus subterminalis	8/6/2003	8/6/2003	water bulrush			
LEM.SPI.POL	Spirodela polyrhiza	7/5/2000	7/2/2012	big duckweed			
TRA.TRA.NAT	Trapa natans	7/10/2007	7/10/2007	water chestnut			
TYP.TYP.LAT	Typha latifolia	10/10/1973	7/2/2012	broad-leaved cattail			
TYP.TYP	Typha sp.	7/26/1978	7/26/1978	cattail			
LEN.UTR.VUL	Utricularia macrorhiza	7/24/1984	9/27/2012	common bladderwort			
LEN.UTR.INT	Utricularia intermedia	6/22/1990	8/6/2003	flatleaf bladderwort			
LEN.UTR.GIB	Utricularia gibba	6/22/1990	6/27/2007	humped bladderwort	S 3	C	35
LEN.UTR	Utricularia sp.	7/10/2007	7/10/2007	bladderwort			
HYD.VAL.AME	Vallisneria americana	10/10/1973	9/28/2015	wild celery			
LEM.WOL.COL	Wolffia columbiana	8/6/2003	8/6/2003	water-meal			
PON.ZOS.DUB	Zosterella dubia	8/13/1974	9/28/2015	water stargrass			

ST. CATHERINE

17 Records

Basin

Lake Area = acres

		Rare, T	hreatened	l Endange	red Info
Common Name	Scientific Name	State Rank	Global Rank	State Status	Federal Status
Alewife	Alosa pseudoharengus				
Brown bullhead	Ameiurus nebulosus				
Black crappie	Pomoxis nigromaculatus				
Banded killifish	Fundulus diaphanus				
Blacknose dace	Rhinichthys atratulus				
Emerald shiner	Notropis atherinoides				
Golden shiner	Notemigonus crysoleucas				
Largemouth bass	Micropterus salmoides				
Lake trout	Salvelinus namaycush				
Lake whitefish	Coregonus clupeaformis				
Northern pike	Esox lucius				

Pumpkinseed	Lepomis gibbosus			
Rock bass	Ambloplites rupestris			
Rainbow trout	Oncorhynchus mykiss			
Smallmouth bass	Micropterus dolomieu			
Rainbow smelt	Osmerus mordax			
Yellow perch	Perca flavescens			





Complete Species Roster

SpeciesID	Genus/species	Earliest Record	Most Recent Record	Common Name	RTE State	Ranks Global
LILY (POULTY)				Total Number	of Spec	eies: 54
CAB.BRA.SCH	Brasenia schreberi	9/20/2004	7/16/2013	watershield		
CYP.CAR	Carex sp.	7/8/2011	7/8/2011	sedge		
CER.CER	Ceratophyllum sp.	8/13/1974	8/13/1974	hornwort		
CER.CER.DEM	Ceratophyllum demersum	8/6/2003	7/8/2014	coontail		
CER.CER.ECH	Ceratophyllum echinatum	7/8/2011	7/10/2012	prickly hornwort	S2	G4?
CHA.CHA	Chara sp.	7/16/1974	7/10/2012	muskgrass		
LYT.DEC.VER	Decodon verticillatus	7/10/2012	7/10/2012	swamp loosestrife		
CYP.DUL.ARU	Dulichium arundinaceum	8/4/2010	8/4/2010	3-way sedge		
HYD.ELO	Elodea sp.	6/19/1998	7/10/2007	waterweed		
HYD.ELO.CAN	Elodea canadensis	7/16/1974	7/8/2014	common elodea		
LEM.LEM.MIN	Lemna minor	8/1/2001	7/16/2013	little duckweed		
LEM.LEM	Lemna sp.	6/19/1998	6/19/1998	duckweed		
LYT.LYT.SAL	Lythrum salicaria	8/4/2010	7/10/2012	purple loosestrife		
HAL.MYR	Myriophyllum sp.	7/16/1974	7/16/1974	watermilfoil		
HAL.MYR.SPI	Myriophyllum spicatum	6/25/1986	7/8/2014	Eurasian watermilfoil		
NAJ.NAJ.FLE	Najas flexilis	8/4/2008	7/16/2013	common naiad		
CHA.NIT	Nitella sp.	9/19/2006	9/17/2007	brittlewort		
NYM.NUP.VAR	Nuphar variegata	7/16/1974	9/22/2011	cow lily		
NYM.NYM.ODT	Nymphaea odorata ssp. Tuberosa	6/19/1998	7/10/2012	American white waterlily		
NYM.NYM.ODO	Nymphaea odorata ssp. Odorata	6/19/1998	7/8/2014	white waterlily		
NYM.NYM	Nymphaea sp.	7/16/1974	9/24/2013	water lily		
POL.POL.AMP	Polygonum amphibium	8/1/2001	7/16/2013	water smartweed		
PON.PON.COR	Pontederia cordata	7/16/1974	7/10/2012	pickerel-weed		
POT.POT.ILL	Potamogeton illinoensis	6/19/1998	9/24/2013	Illinois pondweed		
POT.POT.PUS	Potamogeton pusillus	7/8/2011	7/8/2011	small pondweed		
POT.POT.PRA	Potamogeton praelongus	7/16/1974	8/6/2003	boat-tipped pondweed		
POT.POT.PUT	Potamogeton pusillus ssp. Tenuis	8/4/2010	7/10/2012	small pondweed		
POT.POT.AMP	Potamogeton amplifolius	7/16/1974	7/8/2014	big-leaf pondweed		
POT.POT.RIC	Potamogeton richardsonii	9/17/2007	9/17/2007	Richard's pondweed		
POT.POT.ROB	Potamogeton robbinsii	6/19/1998	7/8/2014	Robbin's pondweed		
POT.POT.SPI	Potamogeton spirillus	8/8/2006	8/8/2006	snailseed pondweed		
POT.POT.PUP	Potamogeton pusillus ssp. Pusillu	7/10/2012	7/10/2012	slender pondweed		
POT.POT.NAT	Potamogeton natans	9/19/2006	7/10/2012	floating-leaf pondweed		
POT.POT.PER	Potamogeton perfoliatus	7/16/1974	8/4/2010	claspingleaf pondweed		
POT.POT.GRA	Potamogeton gramineus	9/17/2007	7/8/2014	variable-leaf pondweed		
POT.POT.EPI	Potamogeton epihydrus	6/19/1998	7/8/2014	ribbonleaf pondweed		

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SpeciesID	Genus/species	Earliest Record	Most Recent Record	Common Name	RTE State	Ranks Global
LILY (POULTY)				Total Numb	er of Spec	cies: 54
POT.POT.CRI	Potamogeton crispus	6/19/1998	7/8/2014	curly-leaf pondweed		
POT.POT	Potamogeton sp.	6/25/1986	7/16/2013	pondweed		
POT.POT.ZOS	Potamogeton zosteriformis	7/16/1974	9/24/2013	flatstem pondweed		
RAN.RAN	Ranunculus sp.	7/10/2012	7/10/2012	buttercup		
ALI.SAG	Sagittaria sp.	7/8/2014	7/8/2014	arrowhead		
SPA.SPA.AME	Sparganium americanum	8/8/2006	8/8/2006	American bur-reed		
LEM.SPI.POL	Spirodela polyrhiza	8/6/2003	7/10/2012	big duckweed		
POT.STU.PEC	Stuckenia pectinata	7/8/2011	7/8/2011	sago pondweed		
TRA.TRA.NAT	Trapa natans	7/10/2007	7/8/2011	water chestnut		
TYP.TYP.LAT	Typha latifolia	8/8/2006	7/10/2012	broad-leaved cattail		
TYP.TYP	Typha sp.	6/19/1998	7/8/2014	cattail		
LEN.UTR	Utricularia sp.	7/10/2007	7/15/2009	bladderwort		
LEN.UTR.GIB	Utricularia gibba	6/19/1998	7/10/2012	humped bladderwort	S 3	G5
LEN.UTR.VUL	Utricularia macrorhiza	6/19/1998	7/8/2014	common bladderwort		
HYD.VAL.AME	Vallisneria americana	7/16/1974	7/8/2014	wild celery		
LEM.WOL.COL	Wolffia columbiana	8/6/2003	8/6/2003	water-meal		
LEM.WOL	Wolffia sp.	8/8/2006	9/17/2007	water-meal		
PON.ZOS.DUB	Zosterella dubia	8/6/2003	7/10/2012	water stargrass		





Complete Species Roster

SpeciesID	Genus/species	Earliest Record	Most Recent Record	Common Name	RTE State	Ranks Global
LITTLE (WELLS)				Total Numbe	r of Spec	ies: 58
AST.MEG.BEC	Bidens beckii	9/22/2011	9/22/2011	water marigold		
CAB.BRA.SCH	Brasenia schreberi	7/26/1978	9/24/2013	watershield		
CYP.CAR	Carex sp.	7/13/2011	7/13/2011	sedge		
CER.CER	Ceratophyllum sp.	8/13/1974	8/13/1974	hornwort		
CER.CER.DEM	Ceratophyllum demersum	8/2/1989	9/24/2013	coontail		
CER.CER.ECH	Ceratophyllum echinatum	8/26/1974	7/10/2012	prickly hornwort	S2	G4?
CHA.CHA	Chara sp.	7/16/1974	9/27/2012	muskgrass		
LYT.DEC.VER	Decodon verticillatus	6/30/2010	7/10/2012	swamp loosestrife		
CYP.ELE	Eleocharis sp.	9/15/2005	7/2/2012	spikerush		
HYD.ELO.CAN	Elodea canadensis	7/16/1974	9/24/2013	common elodea		
FON.FON	Fontinalis sp.	6/30/2010	6/30/2010	aquatic moss		
IRI.IRI.PSE	Iris pseudacorus	6/30/2010	6/30/2010	yellow iris		
IRI.IRI.VER	Iris versicolor	7/13/2011	7/13/2011	blue-flag iris		
ISO.ISO	Isoetes sp.	9/15/2005	9/27/2012	quillwort		
LEM.LEM.MIN	Lemna minor	9/20/2004	9/20/2004	little duckweed		
LYT.LYT.SAL	Lythrum salicaria	6/30/2010	7/2/2012	purple loosestrife		
HAL.MYR.VER	Myriophyllum verticillatum	6/30/2010	7/10/2012	whorled watermilfoil	S2S3	G5
HAL.MYR.SPI	Myriophyllum spicatum	7/16/1974	9/24/2013	Eurasian watermilfoil		
HAL.MYR	Myriophyllum sp.	8/13/1974	8/13/1974	watermilfoil		
NAJ.NAJ.FLE	Najas flexilis	8/26/1974	9/24/2013	common naiad		
NAJ.NAJ	Najas sp.	7/26/1978	6/22/1990	waternymph		
CHA.NIT	Nitella sp.	9/15/2005	9/17/2009	brittlewort		
NYM.NUP.VAR	Nuphar variegata	7/16/1974	9/24/2013	cow lily		
NYM.NUP	Nuphar sp.	6/25/1986	6/25/1986	pond-lily		
NYM.NYM.ODO	Nymphaea odorata ssp. Odorata	6/27/2007	7/2/2012	white waterlily		
NYM.NYM	Nymphaea sp.	7/16/1974	9/24/2013	water lily		
NYM.NYM.ODT	Nymphaea odorata ssp. Tuberosa	7/2/2012	7/10/2012	American white waterlily		
ARA.PEL.VIR	Peltandra virginica	8/14/2015	8/14/2015	arrow-arum	S2	G5
POL.POL.AMP	Polygonum amphibium	8/1/2001	9/19/2006	water smartweed		
PON.PON.COR	Pontederia cordata	7/16/1974	7/16/2013	pickerel-weed		
POT.POT.RIC	Potamogeton richardsonii	7/26/1978	7/26/1978	Richard's pondweed		
POT.POT.OBT	Potamogeton obtusifolius	7/13/2011	7/13/2011	blunt-leaf pondweed	S 3	G5
POT.POT.PER	Potamogeton perfoliatus	8/13/1974	7/26/1978	claspingleaf pondweed		
POT.POT.PRA	Potamogeton praelongus	6/27/2007	6/27/2007	boat-tipped pondweed		
POT.POT.ZOS	Potamogeton zosteriformis	6/25/1986	9/24/2013	flatstem pondweed		
POT.POT.ROB	Potamogeton robbinsii	7/5/2000	9/24/2013	Robbin's pondweed		

Wednesday, May 8, 2019

SpeciesID	Genus/species	Earliest Record	Most Recent Record	Common Name	RTE State	Ranl Glo	xs bal
LITTLE (WELLS)				Total Number	of Spec	ies:	58
POT.POT.PUT	Potamogeton pusillus ssp. Tenuis	7/10/2012	7/10/2012	small pondweed			
POT.POT.GRA	Potamogeton gramineus	6/25/1986	9/24/2013	variable-leaf pondweed			
POT.POT.PUS	Potamogeton pusillus	9/19/2006	9/24/2008	small pondweed			
POT.POT.FOL	Potamogeton foliosus	6/30/2010	7/2/2012	leafy pondweed			
POT.POT.EPI	Potamogeton epihydrus	9/15/2005	9/24/2013	ribbonleaf pondweed			
POT.POT.CRI	Potamogeton crispus	6/22/1990	7/16/2013	curly-leaf pondweed			
POT.POT.AMP	Potamogeton amplifolius	7/16/1974	9/24/2013	big-leaf pondweed			
POT.POT.ILL	Potamogeton illinoensis	8/26/1974	9/24/2013	Illinois pondweed			
RAN.RAN	Ranunculus sp.	6/30/2010	7/13/2011	buttercup			
ALI.SAG	Sagittaria sp.	6/25/1986	7/2/2012	arrowhead			
LEM.SPI.POL	Spirodela polyrhiza	7/13/2011	7/10/2012	big duckweed			
POT.STU.PEC	Stuckenia pectinata	7/13/2011	7/2/2012	sago pondweed			
TRA.TRA.NAT	Trapa natans	7/13/2011	7/13/2011	water chestnut			
TYP.TYP	Typha sp.	8/1/2001	9/20/2004	cattail			
TYP.TYP.LAT	Typha latifolia	7/16/1974	7/10/2012	broad-leaved cattail			
LEN.UTR.VUL	Utricularia macrorhiza	8/2/1989	9/24/2013	common bladderwort			
LEN.UTR.MIN	Utricularia minor	6/30/2010	7/13/2011	lesser bladderwort	S2	(35
LEN.UTR.INT	Utricularia intermedia	6/22/1990	6/22/1990	flatleaf bladderwort			
LEN.UTR.GIB	Utricularia gibba	8/2/1989	7/16/2013	humped bladderwort	S 3	(35
LEN.UTR	Utricularia sp.	8/13/1974	8/13/1974	bladderwort			
HYD.VAL.AME	Vallisneria americana	7/16/1974	9/24/2013	wild celery			
PON.ZOS.DUB	Zosterella dubia	6/25/1986	9/24/2013	water stargrass			



State of Vermont Department of Health Environmental Health Division Radiological and Toxicological Sciences Division 108 Cherry Street-PO Box 70 Burlington, VT 05402-0070

[phone] 800-439-8550

MEMORANDUM

DATE:	April 4, 2019
SUBJECT:	Aquatic Nuisance Control Permit, ProcellaCOR, EPA Registration 67690-80
FROM:	Sarah Vose, State Toxicologist
TO:	Misha Cetner, Department of Environmental Conservation

The Vermont Department of Environmental Conservation (DEC) recently received aquatic nuisance control permit applications that propose use of the aquatic herbicide product ProcellaCOR with the active ingredient florpyrauxifen-benzyl, to help control the growth and spread of the aquatic nuisance plant Eurasian watermilfoil.

Per the request of DEC, the state of Vermont Department of Health (Health) has examined the product proposed for use in 2019 and the potential level of concern for public health that may be associated with exposure to water that has been treated with such. Health reviewed the 2019 permit applications for the use of ProcellaCOR at Burr Pond, Hortonia Lake, Indian Brook Reservoir, Morey Lake, Lake St. Catherine, and Sunrise Lake.

The EPA label for ProcellaCOR does not include any restrictions on use of the treated water for domestic (including drinking and cooking) or recreational use. The proposed treatments at the six sites would result in a maximum floryrauxifen-benzyl concentration of 7.72 ppb, or ~4 PDUs. The EPA label allows use of up to 25 PDUs, which corresponds to roughly 50 ppb. While EPA identified no adverse impacts in animals across the required toxicology studies, Health selected a point of departure of 300 mg/kg/day and derived a chronic oral reference dose of 3 mg/kg/day. Use of this chronic oral reference dose in Health's standard drinking water equations, assuming daily exposure to a 0-1 year old, gives a drinking water health advisory of 3,429 ppb. The drinking water health advisory for florpyrauxifen-benzyl is over 400 times higher than the highest proposed concentration in the treated areas, and over 60 times higher than the highest use amount allowed on the EPA label. Thus, the proposed treatments of the six lakes with ProcellaCOR are expected to result in negligible risk to public health.

Based on a review of the confidential statement of formulation, it is reasonable to conclude that human exposure to the inert compounds contained in ProcellaCOR at the concentrations that would result under the conditions proposed by the applicants, is not likely to result in an increase in the level of concern for public health.







Public notification of property owners and residents of the treated water body area as well as commercial camps and parents whose children are attending camps which use the treated water body and/or waters within one contiguous watermile of the treated water body will occur 30 days prior to application. Water body access areas as well as any nearby campgrounds should be posted for public awareness.

