

H31/Act 57 Relating to Aquatic Nuisance Control 2023 Study Committee



Vermont Department of Environmental Conservation - Lakes and Ponds Program

September 29, 2023

Aquatic Nuisance Control Study Committee Report

The Aquatic Nuisance Control Study Committee is created to assess the environmental and public health effects of the use of pesticides, chemicals other than pesticides, biological controls, and other controls in comparison to the efficacy of their use in controlling aquatic nuisances. Report to the VT General Assembly On or before December 15, 2023

Recommendations regarding whether and when pesticides, chemicals other than pesticides, or biological controls should be used to control aquatic nuisances in Vermont. The recommendations of the Committee shall include:

- (1) a summary of the [use of pesticides, chemicals other than pesticides, and biological controls](#) in the lakes and ponds of Vermont since January 1, 2000, including the types of pesticides, chemicals other than pesticides, and biological controls [approved for use and why they were approved instead of nonchemical controls](#);
- (2) [an assessment](#) of the use of pesticides, chemicals other than pesticides, or biological controls [on the nontarget environment or nontarget species](#); and
- (3) [recommended legislative changes](#) to the aquatic nuisance control requirements under 10 V.S.A. chapter 50 to:
 - (A) [implement the use](#) of pesticides, chemicals other than pesticides, or biological controls [in a more precautionary manner](#) that ensures the protection of State waters and is designed [to protect fish, reptiles, amphibians, and all other aquatic biota](#);
 - (B) [establish the appropriate standard for approval of the use](#) of pesticides, chemicals other than pesticides, and biological controls for aquatic nuisance control;
 - (C) [amend the process for the application](#) of an aquatic nuisance control permit in a manner [that improves the opportunity for interested parties to participate in the permitting process and that ensures full transparency in the permitting process](#); and
 - (D) [provide other changes that the Study Committee determines are necessary or appropriate](#) for implementation of effective aquatic nuisance control in the State.

Aquatic Nuisance Control Program [10 V.S.A. § 1451](#)

- An aquatic nuisance is defined as an undesirable or excessive substance or population (rooted aquatic plants, animals, or algal populations) that interferes with the recreational potential or aquatic habitat of a body of water, including rooted aquatic plants, and animal and algal populations.
- Aquatic Nuisance Control (ANC) Permits are issued under [10 V.S.A. § 1455](#)
 - ANC permits are for use of bottom barriers, powered mechanical devices, pesticides, pond dyes, copper-based algaecides, and structural / biological controls
 - A permit is required for activities used to control nuisance aquatic plants, insects, or other aquatic life (including lamprey) in Vermont's waterbodies
- ANC activities can occur when adequate measures are taken to preserve and protect the quality of the receiving waters, to protect the public health, and to minimize the impact on the non-target environment
- Any person can apply for an ANC permit; DEC must determine that there is a public benefit to be achieved from the application of a pesticide
- Projects are implemented by permittees. DEC works with permittees to ensure compliance with ANC permit conditions.

ANC General Permit – Non-chemical control using bottom barriers or diver assisted suction harvesting (DASH) by an association or individual that is small-scale and does not exceed 1,500 ft² ~OR ~ Association using rapid response control.

ANC Individual Permit – Control using bottom barriers, DASH, mechanical harvesting vessels, pesticides/herbicides, structural, and biological control.

Aquatic Nuisance Control Permitting

Who and What gets permitted?

- Permittees are typically lake associations, municipalities, and property owners.
- Projects target dense nuisance aquatic vegetation impacting public good uses (e.g., swimming, navigation).
- Projects that target an aquatic invasive species are more likely to be permitted.
 - Invasive species are considered one of the ten major stressors on Vermont's surface waters as identified under the Vermont Surface Water Management Strategy.
- Projects targeting native aquatic plant species are typically not permitted or are limited in scale and scope because the related risk to the non-target environment is often unacceptable.

The most common project types are for controlling:

- Eurasian watermilfoil. This includes the use of bottom barriers, DASH, mechanical harvesting vessels, herbicides.
- Water chestnut. This includes the use of mechanical harvesting vessels.
- USFWS - Sea Lamprey. This includes the use of chemical and non-chemical control projects.

Permits for pesticide use or chemicals other than pesticides may be issued for up to five (5) years. Permits for bottom barriers, powered mechanical devices, structural controls, or biological controls may be issued for up to ten (10) years.

Exemptions: Private pond with a surface area of one acre or less located entirely on a person's property with an outlet where the flow can be controlled for at least three days are exempt for the use of bottom barriers, structural barriers, structural controls, powered mechanical devices, and copper compounds used as an algaecide (copper compound mixed with other solutions such as bacteria or enzymes are not exempt).

Aquatic Nuisance Control (ANC) Permitting

Types of Control Practices

- Handpulling - No permit needed, practical only for new introductions/small populations
- Bottom Barriers – Not species specific, works for small populations, high maintenance
- Diver Assisted Suction Harvesting – Highly targeted, expensive, lack of providers
- Hydroraking – Not species specific, creates immense turbulence, disrupts benthic layer
- Mechanical Harvesting Vessels – Not targeted, may spread invasive plants, “mowing”
- Pesticide Treatment – Can be highly targeted, expensive, non-target impacts
- Pond Dyes – Not species specific, may impact water downstream, not permitted in VT
- Copper-based Algaecides – Algae specific, used in small ponds
- Structural Controls – Targeted, barrier to inhibit movement of treatment or species
- Biological controls – May be targeted, resource intensive, potential new invasives



Pesticide Use for ANC in Perspective

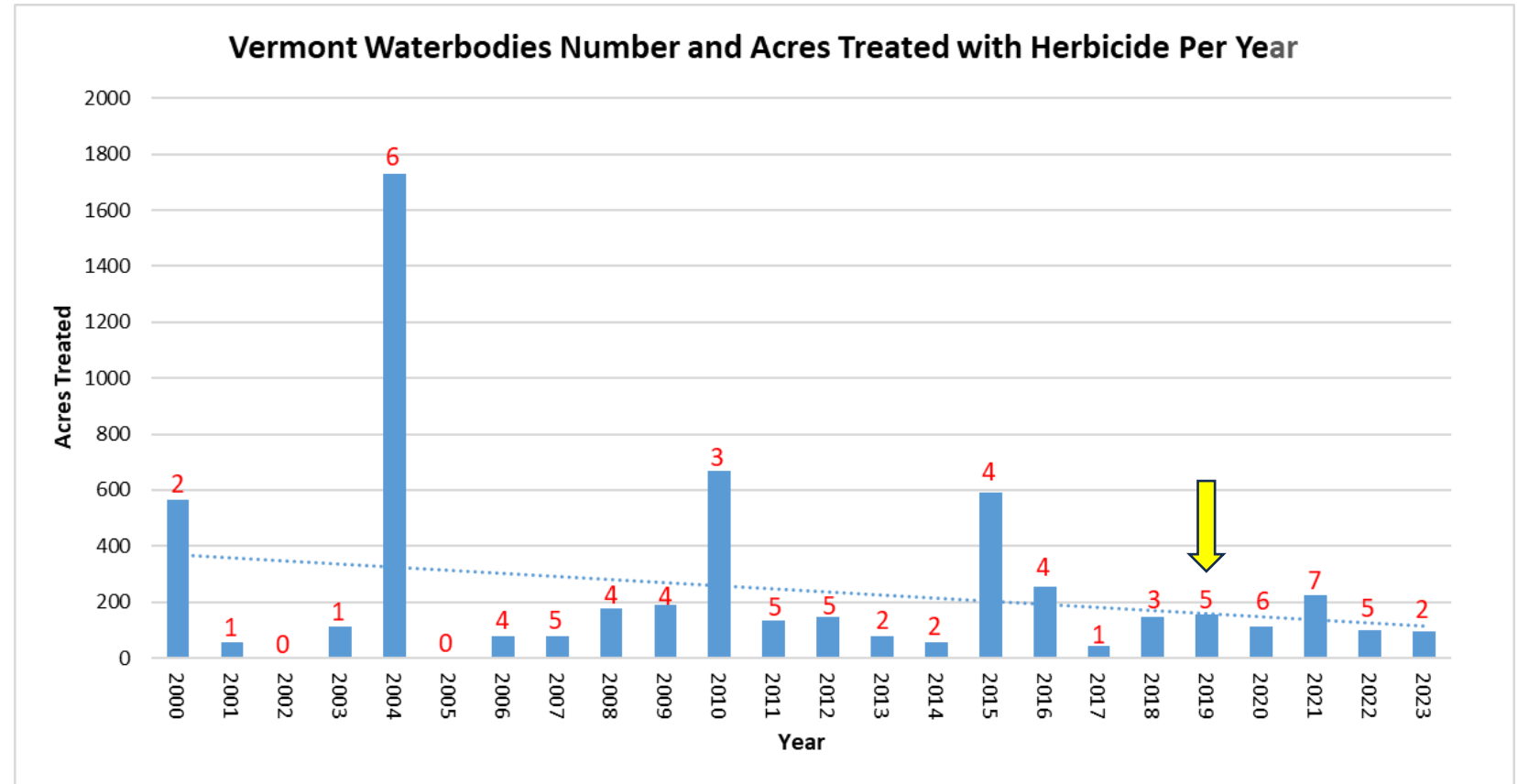
Systemic Herbicides

- Sonar
- Renovate
- Procellacor ↓

Whole Lake Treatments Completed Prior to 2018

2019 to Present – Procellacor
40% Limited Spot Treatment

16 Total Waterbodies Treated



Pesticide Use for ANC in Perspective

- **16 Total Waterbodies Treated with Herbicide from 2000-2023**
- **2000-2004 Sonar – Whole Lake Treatments in 8 Lakes**
Beebe, Burr (2000, 2004), Hortonia (2000, 2004), Lily (Poultney), Little (Wells), St. Catherine, Star, Sunrise (Benson)
- **2006-2019 Renovate – Spot Treatments in 11 Lakes**
Burr (2006, 2011); Dunmore (2016, 2019); Fairlee (2010, 2013, 2015, 2018); Fern; Hortonia (2006, 2007, 2008, 2010, 2015, 2018); Indian Brook; Lily (Poultney) (2006, 2009, 2011, 2014); Little (Wells) (2006, 2009, 2011, 2012); St. Catherine (2007-2018); Star, Sunrise (Benson)
- **2010, 2011, 2015 Sonar - Whole Lake Treatments in 2 Lakes**
Hortonia (2010, 2015); Star (2011)
- **2019 – 2023 Procellacor - Spot Treatments in 11 Lakes**
Beebe (2020-2022); Burr; Hortonia (2019-2023); Iroquois; Lily (Poultney); Little (Wells) (2021,2022); Morey; Pinneo (2020, 2021); Salem Lake; St. Catherine (2020-2022), Sunrise (Benson)

Aquatic Nuisance Control Permitting – Current Permits

- Currently 108 active ANC Permits - **38 General Permits and 70 Individual Permits**
- Of the 70 Individual Permits, 53 are specifically for the control of an aquatic invasive species (51 Eurasian watermilfoil (EWM); 1 Water chestnut and 1 for EWM/Curly leaf pondweed), 11 are for native plants, 6 are for Lamprey control. (14 BB; 26 DASH; 13 MH; 2 Lampricide; 4 Structural)
- Of the 51 Individual Permits to control Eurasian watermilfoil (EWM), 11 are for Herbicide using Procellacor (15.7% of 70).
- The first permit for Procellacor was issued on 6/4/2019 (Lake Morey).
- Procellacor treatment generally occur in mid-June, plants must be growing to take up herbicide, earlier in the season is beneficial for treatment and to reduce the risk to non-target species.
- EWM begins to fall out of the water column 2-4 weeks post treatment.
- Per agreement with VT Department of Fish and Wildlife, Procellacor treatment is limited to an upper threshold of 40% of littoral zone on an annual basis since 2018.
- There are no active ANC permits for biological controls, formerly used *Eurychiopsis lecontei* (Milfoil weevil) for EWM control.

USFWS Lampricide and Lamprey Control

- 25 Rivers and Deltas chemically controlled on a quadrennial cycle; Lampricides (TFM and Bayluscide) are applied to rivers and deltas to kill larval sea lamprey before they become parasitic.
- 226 Champlain tributaries surveyed on a quadrennial cycle to identify distribution and density of larval sea lamprey in the basin; data guide control decisions and strategies.
- 9 Rivers controlled using barriers that block lamprey from reaching their spawning habitat. One new barrier is in the process of being built on the LaPlatte River.

Procellacor Projects in Perspective

- Vermont has 438 lakes and ponds greater than 10 acres, totaling 220,334 acres
- Acreage of 11 permitted Procellacor waterbodies = 4,743 acres (2.15%)
- Procellacor acreage treatment totals:
 - 2019: 154 acres (0.07%), 2020: 112 acres (0.05%), 2021: 223 acres (0.1%)
2022: 100.5 acres (0.045%), 2023: 93.88 acres (0.042%)
- Active Permits for Long-Term Management:
 - Addison County (1): Lake Dunmore
 - Chittenden County (1): Lake Iroquois
 - Orange County (2): Lake Fairlee, Lake Morey
 - Orleans County (1): Salem Lake (*EWM infestation identified in 2018)
 - Rutland County (5): Lake St. Catherine (w/ Lily Pond & Little Lake), Burr Pond, Lake Hortonia, Beebe Pond, Sunrise Lake
 - Windsor County (1): Lake Pinneo

ANC Permit Application Process

ANC Permit Applications follow Type 3 Procedures ([10 V.S.A. § 7714](#)). This includes:

- Posting application materials, draft decisions, and the final decision on the [Environmental Notice Bulletin](#) (ENB).
- Holding a minimum 30-day public comment period for the draft decision.
- Holding a public meeting on the draft decision whenever anyone requests one or if the Lakes Program decides to proactively schedule one.
- Responding to public comments received during the public comment period.

Application for use of **Pesticides**
under an **Aquatic Nuisance Control Permit**
Per 10 V.S.A. Chapter 50, § 1455



VERMONT DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
**WATERSHED
MANAGEMENT DIVISION**
LAKES & PONDS PROGRAM

For Aquatic Nuisance Control Permit Program Use Only

Application Number: _____

Submission of this application constitutes notice that the entities listed below intend to use pesticides in waters of the State to control aquatic nuisance plants, insects, or other aquatic life; and that the entities below have demonstrated that (1) there is no reasonable nonchemical alternative available; (2) there is acceptable risk to the nontarget environment; (3) there is negligible risk to public health; (4) a long-range management plan has been developed which incorporates a schedule of pesticide minimization; and (5) there is a public benefit to be achieved from the application of a pesticide or, in the case of a pond located entirely on a landowner's property, no undue adverse effect upon the public good. Submit a permit review fee of \$75 for a private pond or \$500 for all other waterbodies, made payable to the State of Vermont. All information required on this form must be provided, and the requisite fees must be submitted to be deemed complete.

A. Applicant Information

1. Entity's Name: _____

2a. Mailing Address: _____

2b. Municipality: _____

2c. State: _____

2d. Zip: _____

3. Phone: _____

4. Email: _____

B. Pesticide Applicator Information (Check box if same as above in Section A:)

1. Entity's Name: _____

2a. Mailing Address: _____

2b. Municipality: _____

2c. State: _____

2d. Zip: _____

3. Phone: _____

4. Email: _____

C. Application Preparer Information (Check box if same as above: Section A and/or B)

1. Preparer's Name: _____

2a. Mailing Address: _____

2b. Municipality: _____

2c. State: _____

2d. Zip: _____

3. Phone: _____

4. Email: _____

D. Waterbody Information

1. Name of waterbody: _____

2. Town - County _____

3. Are there wetlands associated with the waterbody? Yes No
Contact the Vermont Wetland Program: (802) 828-1535 for additional information.

4. Are there rare, threatened or endangered species associated with the waterbody? Yes No
Contact the Vermont Fish & Wildlife Natural Heritage Inventory: (802) 241-3700 for additional information.

5a. Is this waterbody a private pond (per 10 V.S.A. 5210)? Yes No If No, skip to Question D6.

5b. Is this private pond totally contained on landowner's property? Yes No

5c. Does the private pond have an outlet? Yes No

If yes, what is the name of the receiving water from this outlet?

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 all that apply:

Water supply Irrigation Boating Swimming Fishing Other: _____

Application Process

- Receive Application
- Administrative Review
 - Once an application is deemed administratively complete, it's posted to the [ENB](#).
- Technical Review
- Draft Decision
- Public Notice Period
- Final Decision
- Appeal Period

ANC Internal Technical Review Procedure

As a part of the technical review, which can take 180 days or longer depending on the complexity of the project, the Lake and Ponds Program initiates a technical review process that solicits comments from various other experts within the State. This includes:

- Department of Health
- Department of Forests, Parks and Recreation:
 - State Park Managers (if applicable)
- Fish and Wildlife Department:
 - Fisheries biologists
 - Natural Heritage Program biologists (RTE's)
- Department of Environmental Conservation:
 - Drinking Water Groundwater Protection Division
 - Wetlands Program
 - Monitoring and Assessment Program

[ANC Internal Review Procedure:](#)

- The intent of the procedure is to:
 - Get State experts to review an application through the lens of their expertise.
 - Clarify to these experts how they can participate with the review process.
 - Help ensure a decision is not in conflict with other regulations or the goals and missions of other Departments.
- Be transparent to applicants and the public how applications are reviewed.

Internal Technical Review – ANC Permit Standards

Prior to a draft decision being posted on the ENB, the Lake and Ponds Program conducts the following technical review of the application to determine whether the project meets the following statutory criteria ([10 V.S.A. § 1455\(d\)](#)):

1. there is no reasonable nonchemical alternative available
2. there is acceptable risk to the nontarget environment
3. there is negligible risk to public health
4. a long-range management plan has been developed which incorporates a schedule of pesticide minimization
5. there is a public benefit to be achieved from the application of a pesticide or, in the case of a pond located entirely on a landowner's property, no undue adverse effect upon the public good.

Internal Technical Review of Herbicide/Pesticide Projects

(1) there is no reasonable nonchemical alternative available

The review of this finding largely focuses on reasonable alternatives that are available to manage a well-established lake-wide population of the aquatic nuisance species (EWM for the majority of projects, and Lamprey control).

General premise for a positive finding from previous Herbicide/Pesticide permits:

- The project is for the management of an aquatic nuisance species that is an aquatic invasive species (exception of Lamprey control)
- The project is to manage a lake-wide population that is a dense population and an infestation
- The use of herbicide is focused to areas of dense invasive growth only where nonchemical control methods may be unreasonable due to the size or density of the AIS or the potential non-target impacts associated with conducting a nonchemical control activity.

Internal Technical Review of Herbicide/Pesticide Projects

(2) there is acceptable risk to the nontarget environment

The following is considered the non-target environment:

- Aquatic plants and animals
- Wetlands
- Human use of waters treated with the Herbicide/Pesticide. This includes, hydroponic farming, greenhouse and nursery plants, and all locations irrigated with waters treated with the Herbicide/Pesticide.
- The ecological integrity of the waterbody, which is the culmination of how the biological, chemical, and physical integrity of the waterbody interact.
- It is assumed that the control activity for an aquatic nuisance species will have an impact on the ecological integrity of the waterbody as the non-target environment cannot be avoided completely.

Internal Technical Review of Herbicide/Pesticide Projects

(2) there is acceptable risk to the nontarget environment

General premise for a positive finding from previous Herbicide or Procellacor Permits:

- Procellacor is highly selective at controlling Eurasian watermilfoil while having minimal to no impact on native aquatic vegetation.
- A targeted spot treatment approach can be used to avoid the several native aquatic plant species that are sensitive to Procellacor.
- Procellacor is practically non-toxic to fish on an acute basis and the material is slightly toxic to aquatic invertebrates on an acute basis. Review of ecotoxicity studies based on the maximum label rate of 50 parts per billion, indicates parent compound and degradates show toxicity levels are well above the application rates used in aquatic environments. Therefore, the potential for acute risk to fish, invertebrates, amphibians, birds, and mammals is expected to be low. Chronic toxicity of concern would be short lived due to rapid degradation in the environment, and rapid dilution from spot application use pattern.
- In collaboration with the Fish & Wildlife Department, it was determined that no more than 40% of the littoral zone may be targeted annually. This was done as a measure to reduce potential non-target impacts on the ecological integrity of the waterbody. Generally, EWM has been identified as providing poor fish and wildlife habitat compared with native aquatic vegetation. The removal of EWM promotes native plant biodiversity, which improves the biological integrity of the lake over time. However, EWM may provide beneficial structural habitat in the absence of other aquatic vegetation. Additionally, the 40% limitation helps to reduce concerns related to a depletion in dissolved oxygen and algae/cyanobacteria blooms.

Example: Internal Technical Review of Procellacor Projects

To determine acceptable risk to the non-target environment, DEC studies plant impacts:

- A post treatment statistical analysis on the impact of the treatment on plant species showed:
 - For Eurasian watermilfoil, frequency of occurrence (%FO) **decreased** after treatment, showing that milfoil frequency of occurrence is significantly lower after treatment
 - That the pretreatment and the post treatment %FO did not show statistically significant decreases for all non-target native plant species
 - While some native species are known to be impacted by Procellacor, these findings demonstrate that the treatment areas have been strategically selected to avoid non-target impacts
 - Several species demonstrated statistically significant **increases** in %FO after treatment, including *Potamogeton illinoensis*, *Potamogeton praelongus*, *Vallisneria americana*, and *Zosterella dubia*, showing that their populations significantly increased after treatments

Internal Technical Review of Herbicide/Pesticide Projects

(2) there is acceptable risk to the nontarget environment

General premise for a positive finding from previous Pesticide or Lampricide Permits:

- The aquatic pesticide TFM-HP & TFM-Bar is highly selective at controlling Sea Lamprey. Non-chemical alternatives have not resulted in development of additional, feasible alternative control methods. The use of barriers and traps to block and intercept spawning-phase sea lamprey remains the only currently feasible, non-pesticide control alternative in the Lake Champlain Basin but is not used extensively.
- Lampricide Permit also requires an Endangered and Threatened Species Takings Permit as it is expected there will be impacts to non-target Rare, Endangered and Threatened mussel (several) and amphibian (Mudpuppy) species.
- Treatment-caused mortality for aquatic animal non-target species is generally low with a few exceptions. While a few non-state-listed aquatic animal species have demonstrated sensitivity to lampricide, the Secretary found that their extensive distributions and/or ample population densities have ensured recolonization following lampricide treatment-caused mortality in Vermont waters.

Internal Technical Review of Herbicide/Pesticide Projects

(3) there is negligible risk to public health

The Vermont Department of Health (VDH), Radiological and Toxicological Sciences Division reviews the risk of the proposed activity to public health, in which it examined potential concerns for public health that may be associated with exposure to Procellacor and TFM-HP & TFM-Bar.

General premise for a positive finding from previous Procellacor permits:

- VDH has reviewed the confidential statement of formulation and concluded that a treatment with Procellacor is expected to result in negligible risk to public health, from both the active and inert compounds in Procellacor.
- VDH - "...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."

General premise for a positive finding from previous TFM-HP & TFM-Bar permits:

- The drinking water health advisory for TFM is 100 ppb and swimming should not occur in treated waters until the TFM concentrations are below 3.9 ppm. It is not anticipated that TFM concentrations will reach or exceed these concentrations for a long period of time.
- The proposed treatments of waters with TFM are expected to result in negligible risk to public health. Based on a review of the confidential statements of formulation, it is reasonable to conclude that human exposure to the inert compounds contained in TFM 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."

Internal Technical Review of Herbicide/Pesticide Projects

(4) a long-range management plan has been developed which incorporates a schedule of pesticide minimization (Procellacor)

Aquatic invasive species are considered stressors on Vermont's surface waters. A well-established population of Eurasian watermilfoil is highly unlikely to ever be eradicated and would continue to be a part of the aquatic environment for the foreseeable future. As a result, a targeted use of chemical and non-chemical control methods as a part of an integrated pest management plan to control nuisance levels of Eurasian watermilfoil that are impacting public good uses must be developed.

General premise for a positive finding from previous Procellacor permits:

- An applicant has a long-range plan (e.g., 5 years) to achieve the project purpose that includes pesticide minimization measures.
- Pesticide minimization measures must include one or a combination of Eurasian watermilfoil non-chemical control projects and/or efforts that reduce the likelihood of Eurasian watermilfoil populations from developing (e.g., implementing watershed and shoreline management strategies to address sources of phosphorus and to promote the long-term stability and resilience of the waterbody).

Internal Technical Review of Herbicide/Pesticide Projects

(4) a long-range management plan has been developed which incorporates a schedule of pesticide minimization (TFM-HP & TFM-Bar)

Sea lamprey have spread throughout Lake Champlain, are well-established, and eradication is a highly unlikely outcome from control efforts. Sea lamprey will continue to be a part of the aquatic environment of Lake Champlain for the foreseeable future. As a result, a targeted use of chemical and non-chemical control methods as a part of an integrated pest management plan to control nuisance levels of sea lamprey has been developed in accordance with the Final Supplemental Environmental Impact Statement – A Long-Term Program of Sea Lamprey Control in Lake Champlain (FSEIS).

General premise for a positive finding from previous TFM-HP & TFM-Bar permits:

- An applicant has a long-range plan, FSEIS, to achieve the project purpose that includes pesticide minimization measures.
- The permittee will need to implement pesticide minimization measures annually and report to the Secretary on those effort. Pesticide minimization measures must include one or a combination of sea lamprey non-chemical control projects and/or efforts that reduce the likelihood of sea lamprey populations from developing.

Internal Technical Review of Herbicide/Pesticide Projects

(5) there is a public benefit to be achieved from the application of a pesticide.

To make a public good determination, the following is reviewed:

- Whether carrying out the control activity produces tangible benefits to public good uses, such as boating, fishing, and swimming, that outweigh potential impacts on the water resource.
- Whether the potential cumulative impacts from carrying out the control activity adversely affect the water resource and the public that utilizes that resource.
- Whether measures to reduce impacts on the water resource have been taken.
- Whether the control activity is excessive for the stated purpose.

General premise for a positive finding from previous Procellacor permits:

- The control activity proposed to control Eurasian watermilfoil only, which is an aquatic invasive species.
- Tangible benefits to public good uses are likely to be associated with the temporary decrease in the frequency of occurrence and biomass of Eurasian watermilfoil.
- Procellacor has minimal to no direct impacts on the non-target environment.
- Impacts on the public that utilize the water resource are anticipated to be temporary and minor as it is expected that Procellacor will dissipate rapidly (typically non-detect within two days post treatment).
- The tangible benefits to the public good outweigh the potential negative impacts.

Internal Technical Review of Herbicide/Pesticide Projects

(5) there is a public benefit to be achieved from the application of a pesticide.

To make a public good determination, the following is reviewed:

- Whether carrying out the control activity produces tangible benefits to public good uses, such as boating, fishing, and swimming, that outweigh potential impacts on the water resource.
- Whether the potential cumulative impacts from carrying out the control activity adversely affect the water resource and the public that utilizes that resource.
- Whether measures to reduce impacts on the water resource have been taken.
- Whether the control activity is excessive for the stated purpose.

General premise for a positive finding from previous TFM-HP & TFM-Bar permits:

- Tangible benefits to public good uses are likely to be associated with an increased opportunity for fishing, which in turn may increase other public good uses related to fishing, such as boat-related recreation. Tangible benefits to public good uses have been determined to outweigh potential impacts on the water resource.

Thanks for your attention!

