

Threatened & Endangered Species Takings Permit

Statutory Authority: 10 VSA § 5408

1. Permittee

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2. Permit Period

Effective Date: 09/28/2020
Expiration Date: 09/27/2025
Authorization #: EH-2020-15
Amendment # 0

2. Principal Officer: Andrew Milliken

3. Subpermittee(s): The trained staff of the United States Fish and Wildlife Service (USFWS) and Vermont Fish and Wildlife Department (VFWD) under the direction of the Permittee.

4. Authorized Species: Giant floater (*Pyganodon grandis*), Pink heelsplitter (*Potamilus alatus*), Fragile papershell (*Leptodea fragilis*), Pocketbook (*Lampsilis ovata*), Cylindrical papershell (*Anodontoidea ferussacianus*), Fluted-shell (*Lasmigona costata*), Eastern Sand Darter (*Ammocrypta pellucida*), Lake sturgeon (*Acipenser fulvescens*)

5. Authorized Activity: The incidental take of species listed in Section 5 during lampricide treatment in the lower Lamoille River.

6. Location of Authorized Activity: Lamoille River in the Towns of Milton and Colchester downstream of the Peterson Dam .

7. Findings

- A.** The Permittee applied for a Threatened & Endangered Species Takings Permit under 10 V.S.A. § 5408 to authorize the incidental take of the species listed in section 5 for the purpose of treating the Lower Lamoille River with lampricide. The Lamoille River was last treated in 2013 and 2009.
- B.** The Permittee is a government entity with expertise in the capture and handling of species listed in section 5.
- C.** Said activity has been determined to be non-de minimis in nature and will have the following benefits: enhance the propagation and restoration of native lake trout, landlocked Atlantic salmon, and other Lake Champlain fish species including walleye, northern pike, and endangered lake sturgeon.
- D.** The sea lamprey is a fish that parasitizes other fish, scarring or killing its host. A substantial body of information collected by the Permittee and others indicates that the sea lamprey is depressing coldwater and some warm water fisheries in Lake Champlain. The negative impacts of sea lamprey parasitism have been documented in the Great Lakes where sea lamprey control programs have been in effect for more than 50 years.
- E.** The proposed lampricide treatment is part a long-term sea lamprey control program for Lake Champlain initiated by the Permittee, along with the Lake Champlain Fish and Wildlife Management Cooperative, the New York State Department of Environmental Conservation, and the U.S. Fish and Wildlife started in 2002. This program was developed in response to an eight-year experimental sea lamprey control program conducted on Lake Champlain between 1990 and 1997. The experimental program illustrated the efficacy of the lampricide TFM in effectively reducing numbers of sea lamprey to levels resulting in significant improvement in salmonid survival and fishing quality in Lake Champlain. A primary goal of the long-term sea lamprey control program is to prevent the economic harm from sea lamprey parasitism as well as to enhance the propagation of salmonid and other fisheries in Lake Champlain.
- F.** Programmatic targets of 15 lamprey wounds per 100 Atlantic Salmon (*Salmo salar*) and 25 lamprey wounds per 100 lake trout (*Salvelinus namaycush*) were set in 1990 in the Final Supplemental Environmental Impact Statement (FSEIS). Targets are based on experience and historic data that indicate these species can withstand and persists at those level of lamprey wounds.
- G.** November 2019 lamprey wounding data identified wounding rates of 20 per 100 Atlantic Salmon and 57 per 100 lake trout. Both rates are above the set programmatic goals and are reasons to continue to control known sea lamprey populations.

- H. The Lamoille river system is one of 21 Lake Champlain tributaries in Vermont, New York and Quebec that are a source of sea lamprey production. Pretreatment surveys conducted in 2019 identified 19 larvae distributed throughout the length of the Lamoille River, downstream of the Peterson Dam. Surveys were conducted over 0.025% of the habitat area.

Treatment Strategy and Methodology

- I. The primary lampricide application point (AP) is at Peterson Dam (river mile 6.0). TFM or TFM/1% niclosamide will be applied directly to the intake to the hydro-power turbine. The lampricide will be quickly mixed into the river as it passes through the turbine.
- J. Application rate: TFM or a TFM/1% niclosamide combination (with niclosamide concentration equivalent to 1% of the TFM concentration) will be applied for 12-14 consecutive hours to achieve a target in-stream treatment concentration of no greater than 1.3 x MLC. The permittee may introduce niclosamide for 2 hours prior to addition of TFM in order to stabilize niclosamide concentrations and ensure a properly balanced mixture with TFM, once added. The early application of niclosamide will not count as part of the 12 or 14 hours of total treatment time.
- K. MLC will be determined by the results of an on-site toxicity test and diurnal stream pH and alkalinity analysis in the days prior to treatment. The MLC may be adjusted during treatment to compensate for shifts in pH or alkalinity that differ from pre-treatment conditions.
- L. TFM Bars, adjustable rate pumps, or back-pack sprayers may be used to make supplemental applications of TFM on up to 3 small tributaries (SAP 1-3 on Figure 4) near their confluences with the Lamoille River, concurrent with passage of the mainstem lampricide block at those points, to block lamprey escapement into untreated water from these streams. Flows on the day of treatment will determine the need for these supplemental applications.

Post Treatment Water Quality Monitoring

- M. Lampricide concentration will be measured and monitored at low levels in the lake following treatment. Monitoring will occur and advisories will remain in place until 24 hours after measured levels fall below the Vermont Department of Health's advisory threshold of 100 ppb. The low-level lake monitoring strategy and methodology are detailed in the *Water Use Advisory Zone Monitoring Plan for Lampricide Treatments of the Poultney/Hubbardton River, Lewis Creek, LaPlatte River, Winooski River, Lamoille River, Stone Bridge Brook, and the Missisquoi River*" (Smith 2019a)

Target/Non Target Species Mortality Monitoring

- N. Post-treatment mortality assessment crews will systematically survey pre-defined sections of each treated stream reach within 36 hours of the lampricide block passage. All visible river-bottom in each section will be inspected. Observations of non-target organism mortalities, except lamprey, will be recorded.
- O. The 5 mortality survey sections are identified in Figure 5 (Application p. 24) and comprise 23% of the treated reaches.
- P. All dead fish (excluding lampreys), amphibians, mussels, and other large invertebrates encountered will be identified and enumerated, if possible. Organisms not identified in the field will be collected, if possible, and retained for identification.
- Q. Dead lamprey larvae will not be counted during the post treatment mortality survey, but the first 30 encountered in each transect will be retained and identified.
- R. Assessment of treatment effects on lamprey populations will occur by means of a larval survey completed within one year following the treatment. Larval surveys following treatments provide more direct and statistically sound means of comparison with the pre-treatment population surveys.
- S. Results of non-target mortality surveys will be submitted to VFDW by May 1 of the year following the treatment. Post treatment larval survey results will be submitted by December 31 of the year following the year of treatment.

Takings

T. Mussels – Within the treatment area, there are six known mussel species. The toxicity of TFM to mussels concludes the mussels listed in Section 5 should incur little to no mortality during the treatment. TFM toxicity tests conducted on the mussels indicate that the TFM no observed effect concentration (NOEC) for these species ranges from 1.5 to >2.0 x MLC (Table 1, Application p. 5).

Fish

U. Lake Sturgeon – Early life stages of lake sturgeon are the most sensitive to TFM of the listed non-lamprey fishes. Boogaard et. Al (2003) conducted a series of tests on early life stages of lake sturgeon from sac fry through age 1+. The study found tolerance to TFM increased with size. Average NOEC's of three young-of-year size classes averaging 107, 157, 217 mm total length were equivalent to 1.0 x MLC, 1.0 x MLC, 1.2 x MLC, respectively; average NOEC for an age 1+ group averaging 261mm total length was equivalent to 1.5 x MLC (Table 2, Application p. 6).

V. Eastern Sand Darter – Eastern sand darters are relatively tolerant of TFM exposure at treatment concentrations, with NOECs of 1.4 x MLC and 1.6 x MLC in a laboratory toxicity test respectively (Neuderfer 2000).

W. Toxicity of the Lampricide TFM to Vermont Threatened and Endangered Species present in the Lamoille River is summarized in Figure 1 of the Application (p.7).

Avoidance, Minimization and Mitigation

X. Mussels - No additional mitigation for mussels is proposed as all listed species are relatively tolerant of TFM/1% Niclosamide exposure at the proposed treatment concentration.

Fish

Y. Eastern sand darter – No additional mitigation is proposed as eastern sand darters are relatively tolerant of TFM exposure at the proposed treatment concentrations.

Z. Lake Sturgeon – Treatment will occur between late September and late November to allow young-of-year sturgeon to increase in size prior to lampricide exposure.

AA. The treatment concentration was lowered to 1.3 x MLC to minimize potential impacts to lake sturgeon based on sensitivity to lampricides. Where no sensitive threatened and endangered species are present, treatments are typically conducted at concentrations of 1.5 x MLC to ensure effective treatment outcomes.

BB. At a treatment concentration of 1.3 x MLC, there is a risk that environmental conditions may lead to areas of the river where TFM concentrations are below those lethal to sea lamprey; however, this risk is offset by the added protections to the listed species which are sensitive to TFM.

Advice of the Endangered Species Committee

CC. On June 29, 2020, the Secretary received the advice of the Endangered Species Committee. That advice has been considered and outlined below:

- a. The ESC remains concerned about long-term effects on populations of T&E species such as mussels and on non-target species that are not listed as threatened or endangered, but in S1 or S2 categories. The ESC urges USFWS to look for other control options that are more species-specific and continue to review literature for long-term cumulative effects on non-target species, as well as consider the potential not treating one river system with lampricide.
- b. The post-treatment non-target mortality survey be conducted at each survey location no later than the next daylight period following the lampricide block passage;
- c. Sampling data that guides timing of river treatment is highly variable spatially and temporally The USWFS should increase its sampling intensity to provide more precise estimates of larval lamprey populations in rivers that are scheduled for lampricide treatment;
- d. Treatment should occur during the latter part of the proposed period to minimize impact on young-of-the-year Lake Sturgeon

- DD.** On July 09, 2020, the USFWS provided responses to the Endangered Species Committee advice as outlined below:
- a. Post-treatment surveys are conducted the morning following the lampricide application. The application point is surveyed less than 14 hours after the addition of the chemical concludes. The block progression is monitored and as it moves downstream, sites are sampled once the block has passed within daylight hours. The only exception is when high water conditions make surveys unsafe for staff.
 - b. USFWS finds pre-treatment sampling is sufficient and uses a Standardized Quantitative Assessment Sampling (QAS) protocol developed by the Great Lakes Fishery Commission. QAS estimates have wide confidence intervals, but based on the latest QAS survey, the Lamoille River larval population estimate made up over 17% of the known and surveyed larval population in the Lake Champlain tributaries. If the Lamoille were left untreated, it would not result in a 17% increase in the parasitic population due to the nonlinear recruitment relationship from larval to parasitic phase. Allowing the Lamoille to remain untreated, may result in species recruitment to the parasitic phase, allowing new unchecked recruitment in selected areas and a higher parasitism rate. The result is the 17% larval population in the Lamoille would be come more than 17% of the lake's parasitic population. Maintaining larval suppression from all sources maintains limited recruitment and minimizes resulting parasitism. Based on USFWS' prior experience in surveys and treatments, a more precise sampling regime would be an added resource expense that would not affect decisions on which rivers should be treated.
 - c. The USFWS proposes to treat the Lamoille between late September and late November to allow young-of-year sturgeon increased growth potential prior to Lampricide exposure. Growth rates of sturgeon slow later in the year as temperatures decline and the USWFS does not find an additional 2-4 weeks provides meaningful, additional protections. The distinction in juvenile sturgeon protection based on size is made between treating in the fall rather than in the summer.

9. Statutory Determination

- A. 10 V.S.A. § 5408(b) provides that "after obtaining the advice of the Endangered Species Committee, the Secretary may permit, under such terms and conditions as necessary to carry out the purposes of this chapter, the incidental taking of a threatened or endangered species or the destruction of or adverse impact on critical habitat if: (1) the taking is necessary to conduct an otherwise lawful activity; (2) the taking is attendant or secondary to, and not the purpose of, the lawful activity; (3) the impact of the permitted incidental take is minimized; and, (4) the incidental taking will not impair the conservation or recovery of any endangered species or threatened species."
- B. The Permittee requests an Endangered & Threatened Species Takings Permit for incidental take.
- C. The state of Vermont recognizes the value which plants, fish and wildlife in their natural environment have for public enjoyment, ecological balance, and scientific study. See 1981, No. 188 (Adj. Sess.), § 1(a).
- D. The state of Vermont recognizes the need for protection and preservation of these plants, fish, and wildlife in their natural environment. *Id.*
- E. The General Assembly of Vermont intends that the species of wildlife and wild plants normally occurring within this state which may be found to be threatened or endangered within the state should be accorded protection as necessary to maintain and enhance their numbers. *Id.* at § 1(b).
- F. The General Assembly of Vermont intends that the state should assist in the protection of species of wildlife and wild plants which are determined to be threatened or endangered elsewhere pursuant to the federal Endangered Species Act. *Id.*
- G. 10 V.S.A. § 5408(i)(2) allows the Secretary to require mitigation strategies and mitigation funds, in addition to the permit fees, to mitigate the impacts of a taking or the destruction of or adverse impact on critical habitat. Mitigation may include compensation, including payment into the Threatened and Endangered Species Fund,

provided that any payment is commensurate with the taking or adverse impact proposed.

- H. The Secretary has the authority to impose mitigation to offset the takings, in accordance with 10 V.S.A. § 5408 (i)(2). Here, the Permittee is proposing a treatment concentration of 1.3 x the Maximum Lethal Concentration (MLC) for sea lamprey, and treatment between late September and late November. The aforementioned actions reduce potential impacts to the identified listed species.
- I. Pursuant to 10 V.S.A. § 5408(b), the ANR Secretary hereby determines, based upon the findings detailed above and after receiving advice from the Endangered Species Committee, that the proposed activity is consistent the purposes of the 10 V.S.A. ch. 123. An Endangered and Threatened Species Takings Permit is authorized, as conditioned below.

10. General Conditions & Authorizations

- A. This permit is issued in accordance with 10 V.S.A. ch. 123. All activities authorized herein must be carried out in accord with and for the purposes described in the application submitted. Continued validity or renewal of this permit is subject to complete and timely compliance with all applicable conditions, including the filing of all required information and reports.
- B. This permit is expressly conditioned upon compliance with all applicable federal and state laws, regulations and permits.
- C. This permit does not confer upon the Permittee the authority to conduct research without the acquiring necessary landowner permission including, but not limited to, state lands.
- D. By acceptance of this permit, the Permittee and its heirs, successors and assigns agree to provide the Agency of Natural Resources with unrestricted access, at reasonable times to the animal or plant specimens and/or animal or plant parts collected and possessed under this permit, collection and monitoring records, and access to the premises as necessary to ensure compliance with this permit.
- E. The Agency maintains continuing jurisdiction over this activity, and may, at any time, order the Permittee to undertake remedial measures if necessary, to ensure the protection and conservation of listed species.
- F. This permit is not valid for endangered and threatened species that are not listed in section 5.
- G. The permit is valid for use by the named Permittee and subpermittees(s) only and may be revoked by the Secretary at any time for cause, or violations of any terms or conditions of this permit or state law.
- H. The Permittee and subpermittees shall carry copies of this permit whenever performing authorized activities and shall make the permit available upon request.
- I. Pursuant 10 V.S.A. § 5410, the locations of listed species shall be kept confidential and the sharing of such information is a violation of this permit and the law.

11. Specific Conditions, Authorizations and Reporting Requirements

- A. The Permittee shall follow all conditions listed in the [Aquatic Nuisance Control Permit #3051-ANC-C](#) issued by the Agency's Department of Environmental Conservation
- B. USFWS shall preserve specimens of the listed species according to protocols developed with DFW scientists during a 2012 meeting with the Endangered Species Committee and provide specimens to the following DFW staff:
 - Sturgeon – Margaret Murphy
 - Eastern Sand Darters – Bernie Pientka
 - Mussels – Mark Ferguson
 - Turtles – Steve Parren (highly unlikely for turtles to be affected)
- C. Six months prior to a second treatment under this permit, the Permittee shall submit a statement of intent letter

to the Agency of Natural Resources. The letter shall identify any and all known research and findings, since the submission of their most recent application for a permit, regarding the effects of TFM on the species covered in this permit.

- D. All communication and reports of results required by the Aquatic Nuisance Control Permit shall be sent via USPS mail or email to:

Permits Administrator
Vermont Fish and Wildlife Department
Commissioner's Office
1 National Life Drive, Davis 2
Montpelier, VT 05620-3702
ANR.EndangeredPermit@vermont.gov

- E. Any mortality/morbidity related to the activities authorized under this permit that was/were not specifically requested, anticipated, and/or authorized shall be reported in writing to VFWD Permits Specialist within 72 hours of each occurrence. Reports shall include species identification, date, and reason for death, along with a plan for reducing the likelihood of future occurrences. All morbid specimens shall be stored frozen until transferred to a VFWD biologist.
- F. An annual report, due by May 1 of the year following the treatment, shall be submitted to the Permit Specialist (electronic format preferred). At a minimum, the report shall summarize project methods (including explanations for any changes/adjustments to methods proposed in the permit application), activities and species handled, tagged or with transmitters installed, any mortality/morbidity, animal status, other species encounters, tags/transmitters removed, species' behavior, dates of all activities, location of activities (description and coordinates) and locations of important sites for management and conservation. Post treatment larval survey results will be submitted by December 31 of the year following the year of treatment.
- G. The Permittee shall accommodate requests by Agency of Natural Resources staff for additional information from collection activities (e.g., copies of original field sheets, computerized data in usable format). Reports of results of any subsequent analyses and copies of subsequent publications resulting from the collections made under this permit shall be forwarded to the Vermont Fish & Wildlife Department within 30 days of publication.

Issued by: _____



Julie Moore, Secretary
Agency of Natural Resources

Date: 09/28/2020

Right to Appeal to Environmental Court

Pursuant to 10 V.S.A. Chapter 220, any appeal of this decision must be filed with the clerk of the Environmental Division of the Superior Court within 30 days of the date of the decision. The Notice of Appeal must specify the parties taking the appeal and the statutory provision under which each party claims party status; must designate the act or decision appealed from; must name the Environmental Court; and must be signed by the appellant or their attorney. In addition, the appeal must give the address or location and description of the property, project or facility with which the appeal is concerned and the name of the applicant or any permit involved in the appeal. The appellant must also serve a copy of the Notice of Appeal in accordance with Rule 5(b)(4)(B) of the Vermont Rules for Environmental Court Proceedings. For further information, see the Vermont Rules for Environmental Court Proceedings, available online at www.vermontjudiciary.org. The address for the Environmental Court is 2418 Airport Road, Suite 1, Barre, VT 05641 (Tel. # 802-828-1660).