

Threatened & Endangered Species Takings Permit

Statutory Authority: 10 VSA § 5408

1. Permittee**U.S. Fish & Wildlife Service,
Lake Champlain Fish and Wildlife
Conservation Office**11 Lincoln Street, Essex Jct., VT 05452,
802-662-5304, bradley_young@fws.gov**2. Permit Period****Effective Date:** 10/05/2023**Expiration Date:** 10/04/2028**Authorization #:** EH-2023-05**Amendment #** 0**3. Principal Officer:** Bradley A. Young**4. Subpermittee(s):** Staff from U.S. Fish & Wildlife Service (USFWS), Vermont Department of Fish and Wildlife (VDFW), and New York State Department of Environmental Conservation (NYSDEC).**5. Authorized Species:** Black sandshell^a (*Ligumia recta*), Pink heelsplitter^a (*Potamilus alatus*), Fluted shell^a (*Lasmigona costata*), Fragile papershell^a (*Leptodea fragilis*), Giant floater^a (*Pyganodon grandis*), Pocketbook^a (*Lampsilis ovata*), Cylindrical papershell^a (*Anodontoies ferussacianus*), Eastern sand darter^b (*Ammocrypta pellucida*), Channel darter^a (*Percina copelandi*)**6. Authorized Activity:** Two applications within five years of the lampricide TFM-HP and TFM-Bar in the Poultney and Hubbardton Rivers, VT to control larval sea lamprey (*Petromyzon marinus*).**7. Location of Authorized Activity:** Poultney River – treatment beginning at the Carvers Falls hydropower facility. Hubbardton River – treatment beginning at falls (river mile 2.3) both located in the Town of West Haven, VT.**8. 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 Poultney and Hubbardton Rivers with lampricide. The Poultney and Hubbardton Rivers were previously treated in 2019.
- 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 maximum targets of 15 sea lamprey wounds per 100 Atlantic Salmon (*Salmo salar*) and 25 sea 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

^a Occurs in Poultney River^b Occurs in Poultney River and Hubbardton River

these species can withstand and persists at those level of lamprey wounds.

- G. November 2022 lamprey wounding assessment data found 9 wounds per 100 Atlantic salmon and 23 wounds per 100 Lake trout. This represents the first year both wounding rates met programmatic management targets.
- H. The Poultney and Hubbardton Rivers are two of 25 Lake Champlain tributaries in Vermont, New York and Quebec that are a source of sea lamprey production. Pretreatment surveys conducted in 2022 identified 108 larvae within the two reaches of the Poultney River, and 0 larvae within the Hubbardton River.
- I. USFWS proposes treatment of the Poultney and Hubbardton Rivers to maintain gains achieved through implementation of the long-term program of sea lamprey control.

Treatment Strategy and Methodology

- J. Treatment planning and execution will be like that of previous treatments. Two lampricide products, TFM-HP and TFM Bar, are proposed for use and will be applied in accordance with established Great Lakes Fishery Commission's (GLFC) Standard Operating Procedures (Application p. 20).
- K. The primary Poultney River lampricide AP is at the Carvers Falls hydropower facility (river mile 10.8).
- L. The primary Hubbardton River lampricide AP is at the falls in West Haven at river mile 2.3.
- M. Application rate: TFM will be applied for 12-14 consecutive hours to achieve a target in-stream treatment concentration of no greater than 1.3 x MLC.
- N. MLC will be determined by the results of an on-site toxicity test and diurnal stream pH and alkalinity analysis prior to treatment. The MLC may be adjusted during treatment to compensate for shifts in pH or alkalinity that differ from pre-treatment conditions.
- O. The two lampricide applications will be timed to attain an approximately simultaneous convergence of both lampricide blocks at the confluence of the two streams.
- P. TFM (liquid or bar formulation) may be applied at SAPS on up to six small tributaries near their confluences with the Poultney River (at river miles 2.6, 3.9 5.3, 6.1, 6.3, and 7.1) concurrent with passage of the mainstem lampricide block at those points to block lamprey escapement into untreated water from these streams.

Post Treatment Water Quality Monitoring

- Q. Low-level lampricide monitoring relating to human health and water use advisories will be done in accordance with *Prior Notification, Posting and water supply plan (Smith 2023)* and *Monitoring Plan for VT Lampricide Treatments in Lake Champlain (Smith 2019)*, or most recent version.

Target/Non-Target Species Mortality Monitoring

- R. 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, excluding silver lamprey, will be recorded.
- S. The 14 mortality survey sections are identified in Figures 7-9 (Application p. 24-6) and comprise 23% of the treated reaches.
- T. 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 retained for later identification in the lab.
- U. 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.
- V. 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.
- W. 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

X. Mussels – Within the treatment area, there are seven known listed 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. 4).

Y. Fish

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 2000b). A treatment concentration of up to 1.3 MLC should not affect the eastern sand darter.

Z. Channel Darter – Lab studies (Table 2, Application p. 5) show no observed effect to channel darters at TFM concentrations between 1.0 and 1.2 x MLC. In 30 years with treatments up to 1.3 x MLC in rivers with channel darter populations, four dead channel darters were recorded from the Winooski River during 2004 treatment, and 0 dead during the 2008 Winooski River post-treatment assessment surveys.

AA. No listed mussel or fish mortalities were observed during the 2019 treatment.

Avoidance, Minimization and Mitigation

BB. Treatment Concentration: The Service has voluntarily compromised with State of Vermont regulators to treat at the lowest concentrations possible, at the risk of conducting ineffective lampricide treatments

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

DD. Fish – No additional mitigation is proposed for listed fish. Eastern sand darters are relatively tolerant of TFM exposure at treatment concentrations (Table 2 application), having an NOEC of 1.4 x MLC in a laboratory toxicity test (Neuderfer 2000b). Various lab studies (Table 2 application) show NOEC to channel darters at TFM concentrations up to 1.2 x sea lamprey MLC. Two in-stream cage studies found 34% mortality at 1.4 x MLC (Neuderfer 2000a) and no mortality at 1.0 x MLC (Chipman 2005). In over 30 years, when treating at TFM concentrations up to 1.3 x sea lamprey MLC, only 4 channel darters have been found dead (Winooski 2004) during post-treatment mortality surveys among the 3 treated Vermont rivers with channel darter populations.

Advice of the Endangered Species Committee

EE. On August 15, 2023, the Secretary received the advice of the Endangered Species Committee. That advice has been considered and is outlined below:

FF. After consulting the literature and recent field studies, the ESC has determined that proposed lampricide treatments pose unacceptable risks to vulnerable populations of rare, threatened, and endangered species in Poultney and Hubbardton. If the application is approved, the ESC requests inclusion of the following conditions to minimize potential harm to listed species:

- a. Purpose of the Treatment: The stated purpose on the application is listed as enhancing the propagation of a threatened or endangered species, which is lake sturgeon. However, the reason for the treatment is to control lamprey is to sustain healthy populations of Atlantic salmon and Lake trout. Controlling parasitism on Sturgeon does not appear to be the purpose of the treatment. “Incidental take” appears to be the more appropriate purpose for this application.
- b. Post Treatment Surveys: Post treatment surveys must assess sub-lethal, in addition to mortality impacts. Surveys should assess the entire treated reach of the rivers. Comprehensive post-treatment surveys of known mussel beds covering the entire treatment area using snorkel or SCUBA gear should be conducted immediately after the treatment by a third party with expertise

in mussel surveys.

- c. Population Level Surveys: Population-level surveys should be conducted by a third party annually to monitor the status and trends of threatened and endangered mussels in all the treatment rivers. Additionally, recovery plans for these should be implemented as soon as possible.
- d. Treatment of the Hubbardton River: Because no sea lamprey were identified during pre-treatment surveys in the Hubbardton River and Reach 1 of the Poultney River, the ESC recommends that the Hubbardton River not be treated unless eDNA testing conducted to prior to the proposed treatment shows sea lamprey presence. If eDNA testing is not conducted the applicant may use TFM bars or a block net at the mouth of the Hubbardton River to prevent Sea Lamprey from seeking refuge during the treatment of the Poultney River.
- e. TFM bars should also not be placed in reaches with or immediately upstream of known mussel beds as this can create higher localized TFM concentrations that could adversely impact mussels.
- f. Reduction in Treatment Concentration: To reduce the risk to mussels and non-target fish populations, the treatment concentration should be reduced to 1.0 x MLC, with a maximum of 1.2 x MLC. This would also minimize risk to Channel Darters that are endangered and may be declining in some Vermont locations. Channel Darters have a NOEC of 1.0 -1.2 x MLC.
- g. Sampling Efforts: The ESC recommends the applicant continue the Eastern Sand Darter and Channel Darter sampling efforts that it conducted on the Poultney and LaPlatte rivers between 2017 and 2019. The applicant should concentrate their sampling efforts on areas determined during the study that showed the highest and most consistent numbers of Eastern Sand Darters. Preferred habitat for the Channel Darter also needs to be identified and sampled on a regular basis. Sampling frequency should be annually, or if less frequently, conducted in 2-3 successive year sequences with 2–3-year periods of non-collection in between. The rationale is based on the species listings and no Channel Darters have been found in the Poultney River since 2008. TFM treatments on the Poultney River have occurred 6 times since 1992. Channel Darters have been shown to be the most sensitive fish species to lampricide with laboratory tests indicating the highest “no effect concentration” slightly below the proposed treatment level. This implies some potential for low mortalities with each treatment.
- h. Mudpuppies: Impacts to Mudpuppies remain a concern of the ESC due to potential sub-lethal, long-term, and synergistic effects of the regular use of these chemicals.

GG. On August 24, 2023, the USFWS provided responses to the Endangered Species Committee advice as outlined below:

- a. Purpose of the Treatment: The Vermont Department of Fish and Wildlife’s Lake Champlain Sturgeon Recovery Plan states that lake sturgeon recovery would benefit from several actions to reduce adult mortality from sea lamprey predation, reduce illegal harvest, and increase public awareness (Appendix 1). The highest action is continuing efforts to reduce sea lamprey numbers in Lake Champlain to reduce lamprey predation on sub-adult and adult lake sturgeon.
- b. Post Treatment Surveys: The survey methods used for post-treatment monitoring have been discussed and reviewed in prior ANC permits as well as previous T&E permits. USFWS proposes surveying predetermined sections of the rivers rather than surveying the entire treated reaches. USFWS has previously provided statistical arguments which show that census-sampling the entire length of visible treated river does not yield better data than what could be obtained by sampling a portion of the river.

Post-treatment surveys are conducted the next morning following the lampricide application, with surveying of the application point conducted <14 hours after conclusion of chemical addition.

Sites are progressively sampled downstream until the tail end of the block is met and results in fewer hours between block passage and surveys as the team moves downstream. Chemical block progression is monitored during the daylight hours with the only exception being unsafe high-water conditions.

- c. Population Level Surveys: Sea lamprey are the aquatic nuisance being controlled. The target species population is surveyed before and after to determine the effectiveness of the applied control. Population monitoring reflects all influences on the population versus just those impacts associated with the lampricide treatments.
- d. Treatment of Hubbardton River: Reach 1 of the Poultney River will be exposed to TFM due to the primary application point's location upstream. The Service will consider the fact that no lamprey are present when making decisions regarding treatment duration and concentration to the extent possible. If no lamprey are found in the Hubbardton River prior to the treatment it will not be treated.
- e. Reduction in Treatment Concentration: Based on mussel and fish toxicity studies, TFM treatments are expected to have negligible to low impacts on listed species populations at concentrations of up to at least 1.3 x MLC. No mortality is the most often observed effect. Thus, the proposed 1.3 x MLC maximum target TFM concentration will mitigate risk to State-listed species.
- f. Sampling Efforts: USFWS will continue to work with the State to document the effects that lampricide treatments have at the time they are conducted. Lampricide treatments apply an acute, short-term, water-soluble, non-bioaccumulable, specific dose to the environment. The Service has invested great amounts of time and resources into understanding, studying, and minimizing negative effects over the years. USFWS cannot take responsibility for the other environmental stresses, natural or human-caused, that occur in these tributaries when lampricide is not being applied. Population monitoring reflects all influences on the population versus just those impacts associated with the lampricide treatments.
- g. Mudpuppies: Impacts to Mudpuppies are reviewed through the Agency's Aquatic Nuisance Control (ANC) permit process.

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 November. The aforementioned actions reduce potential impacts to the 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

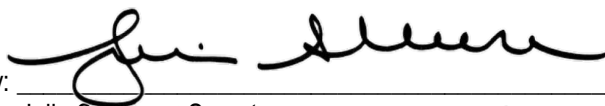
- A. The Permittee shall follow all conditions listed in the Aquatic Nuisance Control Permit #3942-ANC-C issued by the Agency's Department of Environmental Conservation
- B. USFWS shall preserve specimens of the listed species according to protocols developed with DFW scientists during a 2012 meeting with the Endangered Species Committee and provide specimens to the following DFW staff:
 - Eastern Sand Darters and Channel Darters – Bernie Pientka
 - Mussels – Mark Ferguson
- 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:  _____ Date: 10/10/2023
Julia S. Moore, Secretary
Agency of Natural Resources

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).