

## **APPENDIX I**

**PMRA Emergency Use Registration Application, Support Letters,  
Correspondence and Questions/Answers**



Fisheries and Oceans    Pêches et Océans  
Canada                            Canada

343 Université Avenue  
P.O. Box 5030  
Moncton, New Brunswick  
E1C 9B6

June 12, 2020

*Our file    Notre référence*  
19-IGLF-00001

Mr. James Ward  
North Shore MicMac District Council  
38 MicMac Rd  
Eel Ground NB  
E1V 4B1

Dear Mr. Ward,

**Subject: DFO response for the request to be the department sponsor for the emergency use registration of rotenone under the Pest Management Regulatory Agency process.**

This letter is a response to the correspondence received by DFO on May 20, 2020 from your organization and partners requesting DFO to become the department sponsor and to provide a letter of support for the application under the Pest Management Regulatory Agency (PMRA) emergency use registration process. This is needed to allow the use rotenone (Noxfish Fish Toxicant II) in the areas downstream of Miramichi Lake (including Southwest Miramichi river).

DFO agrees to be the sponsor as part of the PMRA regulatory process for the rotenone emergency use registration application. It is important to understand that the acceptance of this role does not constitute a guarantee that an authorization pursuant s.19(3) of the AIS regulations will be approved. The emergency use registration process and the issuance of an s.19(3) AIS regulations authorizations are distinct regulatory processes. The decision related to the authorization has to consider the results of the Indigenous Consultations, which have not been completed yet.

As the sponsor, DFO will contact all groups involved (your organization, project partners, product manufacturer and the Province of New Brunswick (Department of Environment and Local Government and Department of Natural Resources and Energy Development)) to collect the information required for the application. We have already received some of the information required from the product manufacturer and from the Atlantic Salmon Federation and will count



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Canada                            Canada

on the support of each organization to ensure all needed information is provided in a timely manner so as to facilitate a prompt review by the PMRA.

In the meantime, should you have questions or concerns that you would like to discuss regarding the content of this letter, please contact Fabiola Akaishi at

Sincerely,

**Hall, Paulette** Digitally signed by Hall,  
Paulette  
Date: 2020.06.12 15:26:33  
-03'00'

Paulette Hall  
Director, Ecosystems Management  
Gulf Region  
Fisheries and Oceans Canada

Cc:    Paul Vanderlaan, NBDELG  
       Kristian Moore, NBNRED



Date received	Submission Number
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Please print clearly. Leave shaded areas blank. Fields with an asterisk (\*) are required.

1. Product Name (Full name, no abbreviations)* Noxfish Fish Toxicant II	2. Registration Number 33247
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3. Registrant - This is the intended or current registrant of the product, in whose name the Certificate of Registration will be issued. This contact must appear on the label.

Registrant Name (Full legal name, no abbreviations)* WELLMARK INTERNATIONAL D.B.A. CENTRAL LIFE SCIENCE
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Postal Delivery Address* Suite 200 West, 1501 East Woodfield Road
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City / Town* Schaumburg	Province / State* IL	Country* USA	Postal Code / ZIP* 60173
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Contact Name* Heather Friedli	Job Title* Regulatory Affairs Specialist
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Phone Number* 847-330-5378	Email address* hfriedli@central.com
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4. Regulatory Contact - Must be the same for all products registered to the registrant. SAME AS BOX 3 ABOVE?

Company Name (Full legal name, no abbreviations) Wellmark International
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Regulatory Mailing Address 100 Stone Road West, Suite 111
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City / Town Guelph	Province / State ON	Country Canada	Postal Code N1G 5L3
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Contact Name Brent Dunsby	Job Title Managing Director
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Phone Number 519-836-3684	Email address bdunsby@central.com
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5. Submission Contact - Where PMRA will direct all clarifications. Only valid for the life-cycle of the submission. SAME AS BOX 4 ABOVE?

Company Name (Full Name - No Abbreviations) Fisheries and Oceans Canada
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Submission Contact Mailing Address 343 Université Avenue
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City / Town Moncton	Province / State NB	Country Canada	Postal Code / ZIP E1C 9B6
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Contact Name Guy Robichaud	Job Title Aquatic Invasive Species Manager
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Phone Number 506-851-2508	Email address guy.robichaud@dfo-mpo.gc.ca
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6. Formal correspondence and official documents will be sent to the Regulatory Contact. Indicate below if you would like copies sent to:

Registrant     Submission Contact

7. Product Type\* - Select from list on the left, then click the 'Add Selected' button to add them to the field on the right, or input directly into the field to the right.

BRP - Bird Repellent	Add Selected	FTX - Fish Toxicant
BTX - Bird Toxicant		
DEV - Device		
FTX - Fish Toxicant		
Clear Selections		

8. Classification\*

Technical   
 Manufacturing Concentrate   
 Integrated System Product   
 End Use Product   
 Domestic   
 Commercial   
 Restricted

9. Containers\*

Material	Type (e.g. Jug)	Size (range needs both fields)		Units
<input checked="" type="checkbox"/> Metal	Pails	1	to: 20	Litres (L)
<input type="checkbox"/> Glass			to:	---
<input type="checkbox"/> Plastic			to:	---
<input type="checkbox"/> Paper			to:	---
<input type="checkbox"/> Other				

10. Other Product Information

Is the product a microbial/semiochemical?     Does the product contain nanomaterials?



Date received	Submission Number
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Please print clearly. Leave shaded areas blank. Fields with an asterisk (\*) are required.

1. Product Name (Full name, no abbreviations) Noxfish Fish Toxicant II	2. Registration Number 33247
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11. Purpose of Application\* - Select all that apply.

Product Status* Master Product	Category* B - New or Amendment with Supporting Data	Application Type* Amendment
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**A**  Canadian Registration  Import Maximum Residue Limit only (MRL)  User Requested Minor Use Registration (URMUR)  Major New Use

**B**  New or Amended Product Chemistry  New or Amended Label Statements  Reinstatement (lapsed >1 year old)  
 Similar Product with accompanying data/waivers  New Maximum Residue Limit only (MRL) for previously assessed active ingredient  
 Other: Emergency Use

**C**  New or Amended Product Chemistry  New or Amended Label Statements  Registration or Addition of Minor Use  
 Similar Product, no data/waivers  Change in source of registered active ingredient  Reinstatement (lapsed <1 year old)  
 Other:

**D**  Import Manufacture Export Product (IMEP)  Label Improvement Program  Master Copy

**F**  Statement of Product Specifications (SPS)  
 Label  
 Product Name Change (provide names below dotted line)  
 Other:  
 Repack/Relabel Registration

**L**  New Product  Amended Product  Request to Extend the Exclusive Use Protection Period

12. Precedent Product Name(s) (if applicable; max. 2 for Categories C and L)	Precedent Regn. No(s).
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13. Form 6023 (Proposed New Uses and/or Uses to be Withdrawn from Label) submitted?\* Yes

**Privacy Notice Statement:**  
Collection and use of personal information in this application is in accordance with the federal [Privacy Act](#).  
The personal information you provide is collected under the authority of sections 6(1)(a) of the *Pest Control Products Regulations* for the purpose of contacting the Applicant in regards to the application and to communicate any decisions and outcomes of the application.  
The [Privacy Act](#) gives you the rights of access to, correction of and protection of your personal information. For further information about this Privacy statement please contact Health Canada's Access to Information and Privacy Coordinator by email at [atip-aiprp@hc-sc.gc.ca](mailto:atip-aiprp@hc-sc.gc.ca).

14. Declaration\* - "I, the undersigned, certify that"

By submitting my personal information, I am consenting to its collection, use and disclosure in accordance with the Privacy Notice Statement.

<input checked="" type="checkbox"/> On the basis of direct knowledge, that no changes, unless explicitly identified in the application, have been made to the SPS(s) or labels for this product since they were last approved by the PMRA.	Sub.# of last approved labels 2017-3386	Sub.# of last approved SPS(s) (all applicable) 2017-3386
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Type or write signature (required before submitting) Fabiola Akaishi	Printed Name* Fabiola Akaishi	Date* 2020-06-16
Company affiliation of the signer* Fisheries and Oceans Canada,	Phone Number* 506-851-6790	Email Address* Fabiola.Akaishi@dfo-mpo.gc.ca

**For Office Use Only**  
Pursuant to the application and attachments and subject to amendments (if any) made therein, registration is granted and the above registration number is hereby assigned.

Health Canada - Pest Management Regulatory Agency Official	Date
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This certificate is for the registration period ending December 31, 20  
Registration has been granted under the following provisions:

Validate

**NOXFISH® FISH TOXICANT II**

**LIQUID EMULSIFIABLE  
RESTRICTED**

**EMERGENCY USE ONLY**

For use only to control non-native invasive Smallmouth Bass in flowing streams and rivers, upstream and downstream of ponds, lakes and reservoirs, of the Southwest Miramichi River Watershed, New Brunswick, Canada from .15 August . . 2020 to . 15 August. . 2021.

ACTIVE INGREDIENT: Rotenone..... 5.0%

This product contains aromatic solvents and petroleum distillates.

REGISTRATION NO. 33247    PEST CONTROL PRODUCTS ACT

DANGER



POISON  
FLAMMABLE

EYE AND SKIN IRRITANT

NET CONTENTS \_\_\_\_\_ LITRES

Wellmark International D.B.A. Central Life Sciences  
Suite 200 West  
1501 East Woodfield Road  
Schaumburg IL 60173  
1-800-248-7763

READ THE LABEL BEFORE USING

IMPORTANT GUIDANCE ON THE EFFECTIVE USE OF THIS PRODUCT IS PROVIDED IN THE ROTENONE SOP MANUAL AVAILABLE FROM THE REGISTRANT OR THE AMERICAN FISHERIES SOCIETY AT <https://units.fisheries.org/rotenone-stewardship>

**FIRST AID:**

**IF SWALLOWED:** Call a poison control centre or doctor immediately for treatment advice. Do not induce vomiting unless told to do so by a poison control centre or doctor. Do not give **any** liquid to the person. Do not give anything by mouth to an unconscious person.

**IF ON SKIN OR CLOTHING:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15–20 minutes. Call a poison control centre or doctor for treatment advice.

**IF INHALED:** Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control centre or doctor for further treatment advice.

**IF IN EYES:** Hold eye 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 eye. Call a poison control centre or doctor for treatment advice.

Take container, label or product name and PCP Registration Number with you when seeking medical attention.

**TOXICOLOGICAL INFORMATION:**

Contains petroleum distillate - vomiting may cause aspiration pneumonia. Treat symptomatically.

**PRECAUTIONS:**

**KEEP OUT OF REACH OF CHILDREN.** Fatal or poisonous if swallowed. May be harmful if absorbed through skin. Fatal if inhaled. Causes eye and skin irritation. **DO NOT** inhale sprays or vapours. Do not get in eyes, on skin or on clothing. In case of contact, wash immediately with soap and water. Wash all contaminated clothing with soap and hot water before reuse. Avoid contamination of feed and foodstuffs. Apply this product only as specified on this label. Do not contaminate water by cleaning of equipment or disposal of wastes.

Do not allow recreational access (e.g., wading, swimming, boating and fishing) to treated areas while rotenone is being applied. Do not allow swimming or wading in treated water for 72 hours after last application.

Wear chemical-resistant coveralls over long-sleeved shirt and long pants, chemical-resistant gloves, socks and chemical-resistant footwear, goggles or face shield, and either a respirator with a NIOSH-organic-vapour-removing cartridge with a prefilter approved for pesticides or a NIOSH-approved canister approved for pesticides during mixing, loading, application, clean-up and repair.

**Engineering Controls for Mixing/Loading:**

Mixers and loaders (except mixing/loading to support backpack sprayers) must use a closed system that is designed by the manufacturer to remove the product from the shipping container and transfer the product into mixing tanks and/or application equipment. Or alternatively, use a semi-closed probe system described in SOP 8.1 of the Rotenone SOP Manual. At any disconnect point, the system must be equipped with a dry disconnect or dry couple shut-off device that will limit drippage to no more than 2 ml per disconnect. The closed or semi-closed mixing/loading system must function properly and be used and maintained in accordance with

the manufacturer's written operating instructions, if applicable, and otherwise, be in a state of good repair.

**ENVIRONMENTAL HAZARDS:**

Toxic to aquatic organisms.

**NOTICE TO USER:**

This pest control product is to be used only in accordance with the directions on the label. It is an offense under the Pest Control Products Act to use this product in a way that is inconsistent with the directions on the label.

**NATURE OF RESTRICTION:**

This product is to be used only in the manner authorized; consult local pesticide regulatory authorities about use permits that may be required. Apply this product only as specified on this label. NOXFISH FISH TOXICANT II is registered for use by or under permit from and after consultation with Provincial and Federal Fish and Wildlife Agencies.

**RESTRICTED USES**

**USE LIMITATIONS:**

Since such factors as pH, temperature, depth, organics, sunlight and turbidity will change effectiveness, use this product only at locations, rates and times authorized and approved by appropriate Provincial and Federal agencies. Rates must be within the range specified in the labeling. Properly dispose of dead fish and unused product. Do not use dead fish for food or feed. Do not use water treated with rotenone to irrigate crops

**DIRECTIONS:** For control of non-native invasive Smallmouth Bass in all ponds, lakes, reservoirs, streams and rivers, including upstream and downstream of ponds, lakes and reservoirs, of the Southwest Miramichi River Watershed, New Brunswick, Canada. In order to treat streams and rivers you must: (1) Use the concentration of active rotenone 0.050 to 0.100 ppm; (2) Compute the flow rate of the stream; (3) Select an exposure time; (4) Select dilution of product and calculation of application rate; (5) Estimate the amount of product needed; (6) Follow the method of application; and (7) Deactivate the rotenone with  $\text{KMnO}_4$  at the end of the application area. For practicality, flows  $> 0.708 \text{ m}^3/\text{s}$  should be treated with undiluted product, and flows  $< 0.708 \text{ m}^3/\text{s}$  should be treated with diluted product applied. For streams associated with a treatment of an impoundment, to prevent movement of fish from the pond, lake, or reservoir, the stream treatment should begin before and continue throughout treatment of the pond, lake or reservoir until mixing has occurred. See Rotenone SOP Manual (SOP 5.1) for more information on treatment rates and strategies and deactivation techniques (SOP 7.1).

**Table** – Recommended rotenone treatment concentration range and number of cubic meters per second ( $\text{m}^3/\text{s}$ ) flowing water treated for 4-and 8-h periods with one liter of (5% A.I.) product. Adjust amount of product according to the actual rotenone content on Ingredient Statement on Label.



Type of Use	Product (5% Rotenone) (ppm)	Active Rotenone (ppm)	m <sup>3</sup> /s per Liter Product (4-h)	m <sup>3</sup> /s per Liter Product (8-h)
Smallmouth Bass ( <i>Micropterus dolomieu</i> )	1.0 – 2.0	0.05 – 0.10	0.069 to 0.034	0.034 to 0.018

### Measurement of Flow Rate for Stream

Select a cross section of the stream where the banks and bottom are relatively smooth and free of obstacles and the flow appears laminar. Best discharge measurements are achieved with an electronic flow meter and use of the United States Geological Survey *Weighted Area Method*.

### Rotenone Exposure Time and Spacing

Apply rotenone as a drip or spray for 4 to 8 hours to the flowing portion of the stream or river. Multiple application sites are used along the length of the treated stream or river, spaced approximately 0.8 to 3.2 km apart depending on sunlight, water depth and the water travel time between sites. Multiple sites are used because rotenone is diluted and detoxified with distance. Application sites are generally spaced at no more than 2-h or at no less than 1-h travel time intervals. This assures that the treated stream remains lethal to fish for a minimum of 2 hours. A non-toxic dye such as Rhodamine-WT or fluorescein can be used to determine travel times. Cages containing live fish placed immediately upstream of the downstream application sites can be used as sentinels to assure that lethal conditions exist between sites.

### Amount of Product and Calculation of Application Rate of Undiluted Product:

- [1] ml/min Noxfish II = stream flow (m<sup>3</sup>/s) x 1.2 x ppb rotenone (50-100)  
 [2] total ml Noxfish II per application site = [1] x treatment min (260-520)

### Amount of Product and Calculation of Application Rate of Diluted Product:

- [3] ml of undiluted Noxfish II [2] plus H<sub>2</sub>O to volume in reservoir Z (ml)  
 [4] ml/min diluted Noxfish II = volume (ml) reservoir Z ÷ treatment min (260-520)

### Method of Rotenone Application:

Contact the local water department to determine if any water intakes are within 0.5 km downstream of the section of stream, river, or canal to be treated. If so, coordinate the application with the water department to make sure the intakes are closed during treatment and deactivation.

Rotenone Application to Streams and Rivers – Rivers and streams should be treated for 4 to 8 hours in order to clear the treated section of Smallmouth Bass. Noxfish II is applied diluted or undiluted above the flowing water's surface by drip from a drip station or spray or drip from a peristaltic pump directly into the flow of the stream or river which provides for rapid mixing. See Rotenone SOP Manual (SOP 11.1) for instructions on drip stations and peristaltic pumps. Discharge rate should be checked at least hourly. Apply rotenone as a drip with multiple

application sites along the length of the stream or river, spaced roughly 0.8 to 3.2 km apart depending on environmental conditions and water travel time between sites (SOP 5.1).

Rotenone Application to Backwater, Seep and Spring Areas of Ponds, Lakes, Reservoirs, Streams and Rivers – If safely accessible, these areas should be sprayed by hand with a backpack sprayer (Rotenone SOP Manual SOP 12.1) or if inaccessible, sprayed by other methods such as aerial or by boat (Rotenone SOP Manual SOP 8.1) to ensure complete coverage. Use a 1 to 2% solution of Noxfish II as spray. Some of these areas may require special treatment using the inert media Vectocarb 30-OM as specified in the Rotenone SOP Manual (SOP 13.1).

#### **Method of KMnO<sub>4</sub> Deactivation:**

To minimize rotenone exposure outside of the treatment area, rotenone must be deactivated using potassium permanganate at the downstream extent of the treatment area in the river, stream, pond, lake or reservoir. See Rotenone SOP Manual (SOP 7.1) for detailed guidance for deactivating with KMnO<sub>4</sub>.

Within 1 to 2 hours travel time from the furthest downstream rotenone application site, the rotenone is deactivated with KMnO<sub>4</sub> solution or granules at a resultant stream concentration of roughly 2 to 4 ppm, depending on rotenone concentration and organic demand of the water. A 2.5% (4.53 kg KMnO<sub>4</sub> in 189 L H<sub>2</sub>O) permanganate solution is dripped in at a continuous rate using the equation:

$$[5] \text{ ml/min } 2.5\% \text{ KMnO}_4 \text{ solution} = \text{ppm KMnO}_4 \times 2,472 \times \text{m}^3/\text{s stream flow}$$

Or granular KMnO<sub>4</sub> is applied at a continuous rate using the equation:

$$[6] \text{ g/min granular KMnO}_4 = \text{ppm KMnO}_4 \times 60.02 \times \text{m}^3/\text{s stream flow}$$

Flow of permanganate should be checked at least hourly. Live fish in cages placed immediately above the permanganate application site will show signs of stress signaling the need for beginning deactivation. Deactivation can be terminated when replenished fish survive and show no signs of stress for at least 4 h. Deactivation of rotenone by permanganate requires between 15 to 30 min contact time (travel time). Cages containing live fish can be placed at these downstream intervals to judge the effectiveness of deactivation. At water temperatures less than 10°C, deactivation may be retarded, requiring a longer contact time.

#### **DISPOSAL**

1. Triple-or pressure-rinse the empty container. Add the rinsings to the spray mixture in the tank.
2. Follow provincial instruction for any required additional cleaning of the container prior to its disposal.
3. Make the empty container unsuitable for further use.
4. Dispose of the container in accordance with provincial requirements.
5. For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean-up of spills.

**NOXFISH<sup>MD</sup> AGENT ICHTYOTOXIQUE II**

**LIQUIDE ÉMULSIFIABLE  
USAGE RESTREINT**

**RÉSERVÉ AUX CAS D'URGENCE**

Destiné uniquement pour la suppression des achigans à petite bouche envahissants non indigènes dans les ruisseaux et rivières à courant, en amont et en aval d'étangs, de lacs et de réservoirs, du bassin hydrographique de la rivière Miramichi Sud-Ouest, Nouveau-Brunswick, Canada du .15 août. . 2020 au . 15 août. . 2021.

**PRINCIPE ACTIF : Roténone..... 5,0 %**

Ce produit contient des solvants aromatiques et des distillats de pétrole.

**N° D'HOMOLOGATION 33247    LOI SUR LES PRODUITS ANTIPARASITAIRES**

**DANGER**



**POISON  
INFLAMMABLE**

**IRRITANT POUR LES YEUX ET POUR LA PEAU**

**CONTENU NET \_\_\_\_\_ LITRES**

Wellmark International S/N Central Life Sciences  
Suite 200 West  
1501 East Woodfield Road  
Schaumburg IL 60173  
1 800 248-7763

**LIRE L'ÉTIQUETTE AVANT L'UTILISATION**

**DES DIRECTIVES IMPORTANTES CONCERNANT LA BONNE UTILISATION DE CE  
PRODUIT SONT FOURNIES DANS LE *ROTENONE SOP MANUAL* DISPONIBLE AUPRÈS  
DU DÉCLARANT OU DE LA *AMERICAN FISHERIES SOCIETY* AU**

<https://units.fisheries.org/rotenone-stewardship>

**PREMIERS SOINS :**

**EN CAS D'INGESTION :** Appeler immédiatement un centre antipoison ou un médecin pour obtenir des conseils sur le traitement. Ne pas faire vomir à moins d'avoir reçu le conseil de procéder ainsi par le centre antipoison ou le médecin. Ne donner **aucun** liquide à la personne empoisonnée. Ne rien administrer par la bouche à une personne inconsciente.

**EN CAS DE CONTACT AVEC LA PEAU OU LES VÊTEMENTS :** Enlever tous les vêtements contaminés. Rincer immédiatement la peau à grande eau pendant 15 à 20 minutes. Appeler un centre antipoison ou un médecin pour obtenir des conseils sur le traitement.

**EN CAS D'INHALATION :** Déplacer la personne vers une source d'air frais. Si la personne ne respire pas, appeler le 911 ou une ambulance, puis pratiquer la respiration artificielle, de préférence le bouche-à-bouche, si possible. Appeler un centre antipoison ou un médecin pour obtenir des conseils sur le traitement.

**EN CAS DE CONTACT AVEC LES YEUX :** Garder les paupières écartées et rincer doucement et lentement avec de l'eau pendant 15 à 20 minutes. Le cas échéant, retirer les lentilles cornéennes au bout de 5 minutes et continuer de rincer l'œil. Appeler un centre antipoison ou un médecin pour obtenir des conseils sur le traitement.

Emporter le contenant, l'étiquette ou prendre note du nom du produit et de son numéro d'homologation lorsqu'on cherche à obtenir une aide médicale.

**RENSEIGNEMENTS TOXICOLOGIQUES :**

Contient des distillats de pétrole – le vomissement peut causer une pneumonie par aspiration. Traiter selon les symptômes.

**PRÉCAUTIONS :**

**GARDER HORS DE LA PORTÉE DES ENFANTS.** Fatal ou toxique en cas d'ingestion. Peut être nocif en cas d'absorption par la peau. Fatal en cas d'inhalation. Provoque une irritation des yeux et de la peau. **NE PAS** inhaler les vapeurs et le brouillard. Éviter tout contact avec les yeux, la peau ou les vêtements. En cas de contact, se laver immédiatement à l'eau et au savon. Laver tous les vêtements contaminés avec de l'eau chaude et du savon avant de les remettre. Éviter de contaminer les aliments destinés à la consommation humaine ou animale. Appliquer ce produit uniquement selon les directives spécifiques de cette étiquette. Ne pas contaminer l'eau en procédant au nettoyage de l'équipement ou à l'élimination des déchets.

Ne pas permettre l'accès aux zones traitées à des fins récréatives (p. ex., barbotage, baignade, navigation, pêche) durant l'application de la roténone. Ne pas permettre la baignade ou le barbotage dans les eaux traitées moins de 72 heures après la dernière application.

Porter une combinaison résistant aux produits chimiques par-dessus une chemise à manches longues et un pantalon long, des gants résistant aux produits chimiques, des chaussettes et des chaussures résistant aux produits chimiques, des lunettes de protection ou un écran facial, et soit un appareil de protection respiratoire avec cartouche pour vapeurs organiques approuvée par le NIOSH avec un préfiltre approuvé pour les pesticides ou une boîte filtrante approuvée par le NIOSH approuvée pour les pesticides pendant les opérations de mélange, de chargement, d'application, de nettoyage et de réparation.

Mesures d'ingénierie pour les opérations de mélange et de chargement :

Les préposés au mélange et au chargement (sauf dans le cas des opérations de mélange/chargement pour les pulvérisateurs à dos) doivent utiliser un système fermé conçu par le fabricant pour transférer le produit du contenant d'expédition directement dans le réservoir de mélange et/ou l'équipement d'application. Sinon, utiliser un système de tubes semi-fermé tel que décrit dans la section SOP 8.1 du *Rotenone SOP Manual*. Le système doit être muni d'un dispositif de débranchement à sec ou d'un dispositif de fermeture couplé à sec à tous les points de raccord qui limitera les fuites à un maximum de 2 ml par raccord. Le système fermé ou semi-fermé de mélange/chargement doit être en bon état de marche et être utilisé et entretenu selon les instructions d'utilisation écrites du fabricant, le cas échéant; sinon, il doit être en bon état de fonctionnement.

### **RISQUES POUR L'ENVIRONNEMENT :**

Toxique pour les organismes aquatiques.

### **AVIS À L'UTILISATEUR :**

Ce produit antiparasitaire doit être employé strictement selon le mode d'emploi qui figure sur la présente étiquette. L'emploi non conforme à ce mode d'emploi constitue une infraction à la *Loi sur les produits antiparasitaires*.

### **NATURE DE LA RESTRICTION :**

N'utiliser ce produit que de la façon autorisée; se renseigner auprès des autorités provinciales chargées de la réglementation des pesticides au sujet des permis d'utilisation qui pourraient être exigés. S'en tenir strictement aux directives de l'étiquette pour appliquer ce produit. NOXFISH AGENT ICHTYOTOXIQUE II est homologué pour une utilisation par les agences provinciales et fédérales responsables de la faune et du poisson, ou encore, sous licence d'une telle agence, après consultation adéquate.

### **USAGES RESTREINTS**

### **RESTRICTIONS D'EMPLOI :**

Étant donné que certains facteurs tels que le pH, la température, la profondeur, les matières organiques, la lumière du soleil et la turbidité de l'eau modifient l'efficacité du produit, n'utiliser celui-ci qu'aux endroits, doses et moments autorisés et approuvés par les agences fédérales et provinciales appropriées. Les doses doivent se situer à l'intérieur de la plage de doses précisée sur l'étiquette. Éliminer les poissons morts et le produit inutilisé de façon appropriée. Ne pas utiliser les poissons morts pour l'alimentation humaine ou animale. Ne pas utiliser d'eau traitée à la rotenone pour irriguer les cultures.

**MODE D'EMPLOI :** Pour la suppression des achigans à petite bouche envahissants non indigènes dans tous les étangs, lacs, réservoirs, ruisseaux et rivières, y compris en amont et en aval d'étangs, de lacs et de réservoirs, du bassin hydrographique de la rivière Miramichi Sud-Ouest, Nouveau-Brunswick, Canada. Afin de traiter les ruisseaux et les rivières, vous devez : (1) utiliser une concentration de principe actif (rotenone) entre 0,050 et 0,100 ppm; (2) calculer le débit de l'eau; (3) choisir un temps d'exposition; (4) choisir le taux de dilution du produit et calculer la dose d'application; (5) estimer la quantité de produit nécessaire; (6) suivre la méthode

d'application; et (7) neutraliser la roténone avec du  $\text{KMnO}_4$  à la fin de la zone d'application. À des fins pratiques, les cours d'eau au débit supérieur à  $0,708 \text{ m}^3/\text{s}$  devraient être traités avec le produit non dilué, et les cours d'eau au débit inférieur à  $0,708 \text{ m}^3/\text{s}$  devraient être traités avec le produit dilué. Pour les ruisseaux où un endiguement doit également être traité, afin de prévenir le déplacement des poissons de l'étang, du lac ou du réservoir, le traitement du ruisseau devrait commencer avant et se poursuivre tout au long du traitement de l'étang, du lac ou du réservoir jusqu'au mélange du produit. Consulter le *Rotenone SOP Manual* (SOP 5.1) pour de plus amples renseignements sur les doses et les stratégies de traitement et les techniques de neutralisation (SOP 7.1).

**Tableau** – Plage de concentrations recommandée et quantité de mètres cubes par seconde ( $\text{m}^3/\text{s}$ ) d'eau vive traitée à la roténone pendant une période de 4 h et de 8 h avec un litre de produit (5 % m.a.). Ajuster la quantité de produit selon la teneur réelle en roténone indiquée sur l'étiquette dans la section Principe actif.

Type d'utilisation	Produit (5 % de roténone) (ppm)	Concentration du principe actif (roténone) (ppm)	$\text{m}^3/\text{s}$ par litre de produit (4 h)	$\text{m}^3/\text{s}$ par litre de produit (8 h)
Achigan à petite bouche ( <i>Micropterus dolomieu</i> )	1,0 à 2,0	0,05 à 0,10	0,069 à 0,034	0,034 à 0,018

#### Mesure du débit pour les ruisseaux

Choisir une section du ruisseau où les rives et le fond sont relativement réguliers et exempts d'obstacles et où l'écoulement semble laminaire. Les mesures du débit optimales sont obtenues à l'aide d'un débitmètre numérique, en suivant la *Weighted Area Method* du United States Geological Survey.

#### Espacement et temps d'exposition à la roténone

Appliquer la roténone en goutte à goutte ou par pulvérisation pendant 4 à 8 heures dans la partie du ruisseau ou de la rivière où l'eau s'écoule. Plusieurs sites d'application sont utilisés le long du ruisseau traité ou de la rivière traitée, espacés d'environ 0,8 à 3,2 km les uns des autres, selon la lumière du soleil, la profondeur de l'eau et le temps d'écoulement de l'eau entre les sites. Plusieurs sites sont utilisés, car la roténone est diluée et détoxifiée avec la distance. Les sites d'application sont généralement espacés par un temps de transport minimal d'une heure et maximal de deux heures. Cela permet de garantir que le ruisseau traité demeure mortel pour les poissons pendant un minimum de 2 heures. Un colorant non toxique, comme la Rhodamine-WT ou la fluorescéine, peut être utilisé afin de déterminer les temps de déplacement. Des cages contenant des poissons vivants placées immédiatement en amont des sites d'application en aval peuvent être utilisées comme témoins pour garantir que des conditions létales sont présentes entre les sites.

**Quantité de produit et calcul de la dose d'application pour le produit non dilué :**

[1] ml/min de Noxfish II = débit de l'eau (m<sup>3</sup>/s) x 1,2 x ppb de roténone (50-100)  
[2] ml totaux de Noxfish II par site d'application = [1] x min de traitement (260-520)

### **Quantité de produit et calcul de la dose d'application pour le produit dilué :**

[3] ml de Noxfish II non dilué [2] + quantité de H<sub>2</sub>O dans le réservoir Z (ml)  
[4] ml/min de Noxfish II dilué = quantité dans le réservoir Z (ml) ÷ min de traitement (260-520)

### **Méthode d'application de la roténone :**

Communiquer avec le service d'aqueduc local pour savoir si des prises d'eau sont situées à moins de 0,5 km en aval de la section de ruisseau, de rivière ou de canal à traiter. Si tel est le cas, coordonner le traitement avec le service d'aqueduc pour veiller à ce que les prises d'eau soient fermées pendant le traitement et la neutralisation.

Application de roténone dans les ruisseaux et rivières – Les rivières et les ruisseaux doivent être traités pendant 4 à 8 heures afin d'éradiquer les achigans à petite bouche de la section traitée. Noxfish II est appliqué, dilué ou non dilué, à la surface de l'eau en mouvement par goutte à goutte à l'aide d'une station d'égouttage, d'un pulvérisateur ou d'une pompe péristaltique directement dans le courant du ruisseau ou de la rivière qui mélangera rapidement le produit. Consulter le *Rotenone SOP Manual* (SOP 11.1) pour des directives concernant les stations d'égouttage et les pompes péristaltiques. Le débit d'application doit être vérifié au moins une fois par heure. Appliquer la roténone en goutte à goutte à plusieurs sites d'application le long du ruisseau ou de la rivière, espacés d'environ 0,8 à 3,2 km les uns des autres, selon les conditions environnementales et le temps d'écoulement de l'eau entre les sites (SOP 5.1).

Application de roténone dans les bras, les suintements et les sources des étangs, lacs, réservoirs, ruisseaux et rivières – Si ces zones sont accessibles sans danger, elles doivent être traitées à la main à l'aide d'un pulvérisateur dorsal (*Rotenone SOP Manual* SOP 12.1); si elles sont inaccessibles, elles doivent être traitées par d'autres moyens, notamment à l'aide d'un aéronef ou d'un bateau (*Rotenone SOP Manual* SOP 8.1) afin d'assurer une couverture complète. Utiliser une bouillie composée de 1 à 2 % de Noxfish II. Certaines de ces zones peuvent nécessiter un traitement spécial à l'aide de la matière inerte Vectocarb 30-OM, comme spécifié dans le *Rotenone SOP Manual* (SOP 13.1).

### **Méthode de neutralisation au KMnO<sub>4</sub> :**

Afin de minimiser l'exposition à la roténone en dehors de la zone de traitement, la roténone doit être neutralisée à l'aide de permanganate de potassium au point le plus en aval de la zone de traitement dans la rivière, le ruisseau, l'étang, le lac ou le réservoir. Consulter le *Rotenone SOP Manual* (SOP 7.1) pour des directives détaillées sur la neutralisation à l'aide de KMnO<sub>4</sub>. À moins d'une ou de deux heures de transport du site d'application de roténone le plus en aval, la roténone est neutralisée à l'aide d'une solution ou de granules de KMnO<sub>4</sub> afin d'obtenir une concentration dans le ruisseau d'environ 2 à 4 ppm, selon la concentration de roténone et la demande organique de l'eau. Une solution de permanganate à 2,5 % (4,53 kg de KMnO<sub>4</sub> dans 189 L d'eau) est appliquée par goutte à goutte à un débit continu selon l'équation suivante :

[5] ml/min de solution de  $\text{KMnO}_4$  2,5 % = ppm de  $\text{KMnO}_4$  x 2 472 x  $\text{m}^3/\text{s}$  débit de l'eau

Ou des granules de  $\text{KMnO}_4$  sont appliquées à un débit continu selon l'équation suivante :

[6] g/min de granules de  $\text{KMnO}_4$  = ppm de  $\text{KMnO}_4$  x 60,02 x  $\text{m}^3/\text{s}$  débit de l'eau

Le débit de permanganate doit être vérifié au moins une fois par heure. Des poissons vivants dans des cages placées immédiatement avant le site d'application de permanganate montreront des signes de stress, indiquant la nécessité de commencer la neutralisation. La neutralisation peut cesser lorsque les poissonsensemencés survivent et ne montrent aucun signe de stress pendant au moins 4 heures. La neutralisation de la roténone à l'aide du permanganate nécessite une durée de contact variant entre 15 et 30 minutes (temps d'écoulement). Des cages contenant des poissons vivants peuvent être placées en aval à ces intervalles afin de vérifier l'efficacité de la neutralisation. Lorsque la température de l'eau est inférieure à 10 °C, la neutralisation peut être retardée et nécessiter une durée de contact plus longue.

## **ÉLIMINATION**

1. Rincer le contenant trois fois ou le rincer sous pression. Ajouter les rinçures au mélange à pulvériser dans le réservoir.
2. Vérifier si un nettoyage supplémentaire du contenant avant son élimination est exigé en vertu de la réglementation provinciale.
3. Rendre le contenant vide inutilisable.
4. Éliminer le contenant conformément à la réglementation provinciale.
5. Pour tout renseignement concernant l'élimination des produits non utilisés ou dont on veut se départir, s'adresser au fabricant ou à l'organisme de réglementation provincial. S'adresser également à eux en cas de déversement ainsi que pour le nettoyage des déversements.



# Emergency Use Application (Technical and Value Information)

## 1- Description of emergency situation

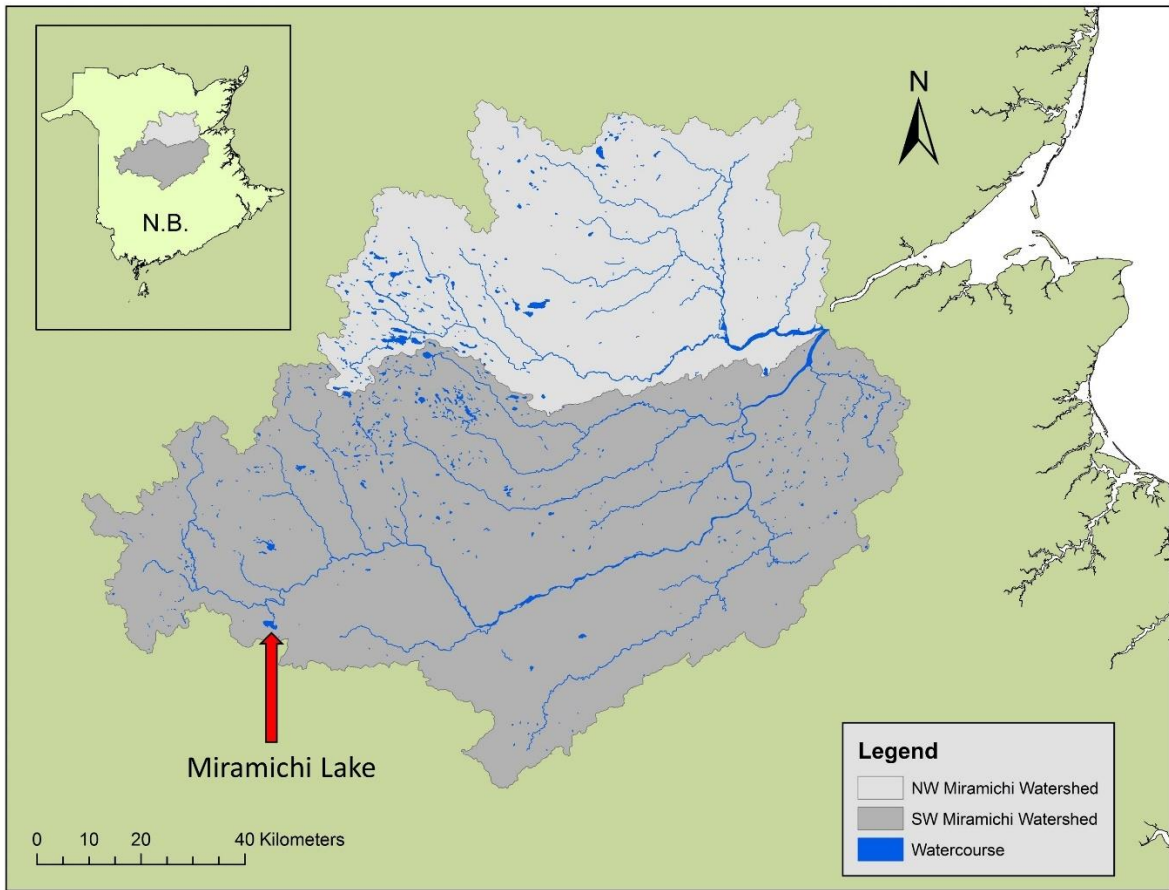
In 2008, The non-native Smallmouth Bass (SMB) (*Micropterus dolomieu*) were discovered in Miramichi Lake, New Brunswick (NB) (Map 1). The Miramichi River and other rivers of the Gulf Region are recognized as the most productive Atlantic salmon (*Salmo salar*) rivers in the world. Smallmouth Bass are recognized as an effective predator and competitor of other fish. The Smallmouth Bass range has been extending into a large number of watersheds in Nova Scotia and New Brunswick with unauthorized introductions and natural dispersal as the vector in recent decades.

Since 2008, the stakeholders, Indigenous groups, and the province of NB raised their concerns indicating that SMB should be chemically eradicated from Miramichi Lake. In 2009, DFO has employed a physical removal and control measures approach with a barrier at the outlet of Miramichi Lake and removal efforts of SMB through netting, angling, and electrofishing. The initial objective was physical eradication then was moved to a control management measure due to lack of dedicated funding and resources. Every year class of SMB has been found in the Lake between 2008-2020.

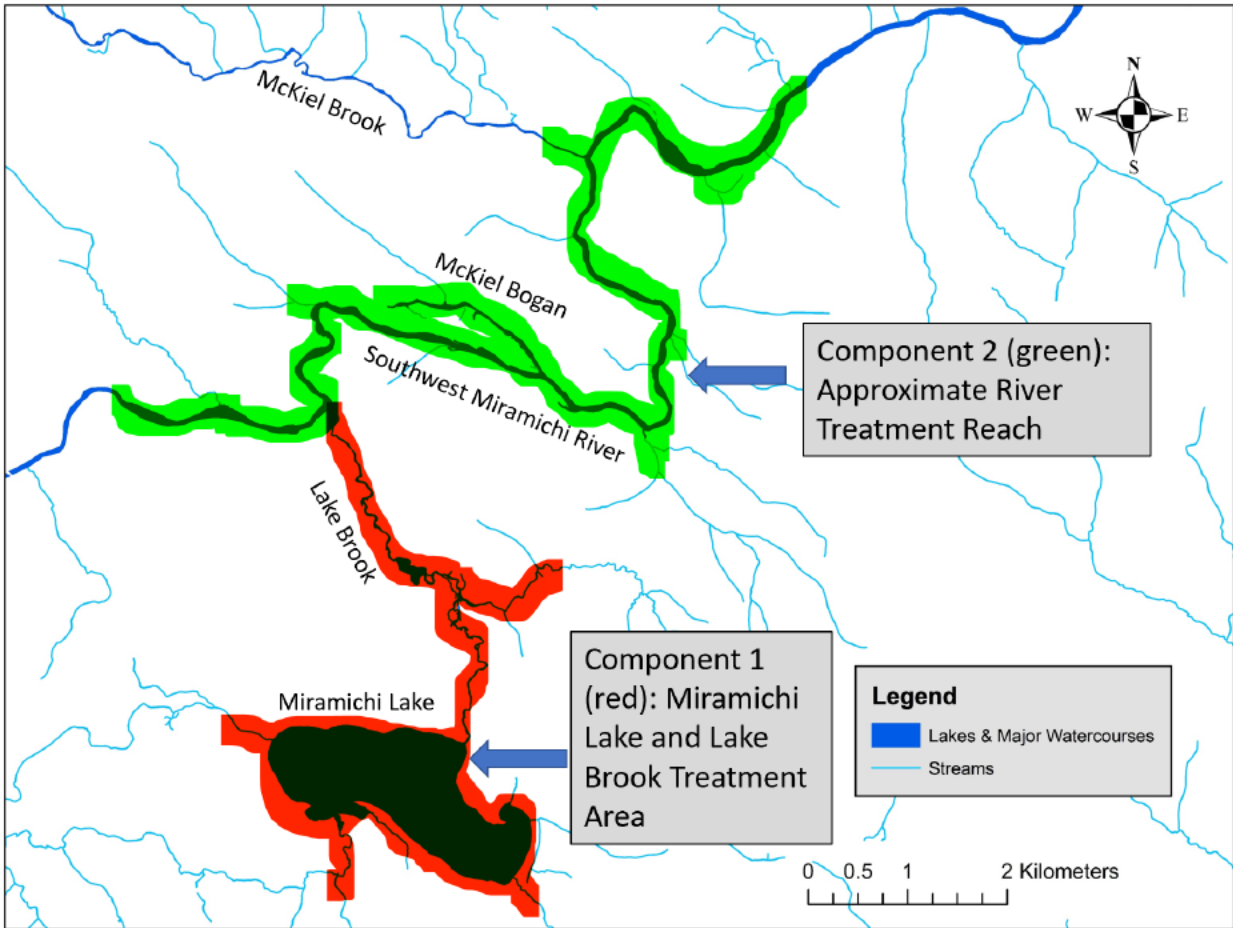
On August 22, 2019, SMB were discovered in a remote stretch of the Southwest (SW) Miramichi River a short distance below the confluence with Lake Brook, which connects Miramichi Lake to the river (See Map 2). Stable isotope analysis is being performed by the University of New Brunswick to potentially determine the origin of the SMB, i.e., whether they came from the lake or have been rearing or illegally introduced in the river. Based on current information, SMB presence in SW Miramichi are limited on only a few kilometres in the river, but the risk of further spread and establishment exists and could become a threat to the entire ecosystem of the Miramichi river system. The watershed comprises of 13,000 km<sup>2</sup> (see Map 1). The river system supports Indigenous food, social and ceremonial fisheries for wild Atlantic Salmon and a recreational Atlantic Salmon fishing industry that contributes \$16 million to the GDP and 637 full time equivalent rural jobs (Gardner Pinfold 2010).

The presence of SMB in the SW Miramichi river poses an emergency situation because there is significant risk of further spread both upstream and downstream. Environmental DNA (eDNA) surveys conducted by DFO in fall 2019 showed that SMB are only currently confirmed in a few kilometres of the river, and electrofishing has indicated SMB presence also in Lake Brook, the outflow of the lake which connects the lake and the river. Map 2 highlights the proposed treatment areas: Miramichi Lake, Lake Brook and approximately a 15 km reach of the SW Miramichi River. The actual treatment extents will be based on the most up to date eDNA data from summer 2020, which results are not available yet and may include more or less than the 15 km reach, with a buffer on either end of the confirmed SMB distribution zone to be conservative.

Without a chemical eradication action, which requires an Emergency Use registration of Noxfish Fish Toxicant II, SMB could become established and widespread in the SW Miramichi, as they have in adjacent river systems like the Nashwaak River. SMB could have negative impacts to the native ecosystem and the important fisheries it supports. Wild Atlantic Salmon are already under severe pressure from factors including low sea survival, land use issues, poaching, and climate change, and another pressure from invasive species needs to be avoided.



**Map 1. The Miramichi River watershed located in central New Brunswick, showing the location of Miramichi Lake.**



**Map 2. Smallmouth Bass eradication components: (1) Miramichi Lake and Lake Brook (red); (2) reach of the Southwest Miramichi River (green).**

## 2- Rationale for emergency use.

**PMRA requirement:** The sponsor must describe how the application meets both criteria for an emergency use described above. It must include a rationale addressing why the pest outbreak is considered to be a seriously detrimental infestation with respect to health or the environment, or why it would result in significant economic loss. The rationale should also address why the pest was not considered to be a problem in recent years, and why the situation cannot be addressed either with the currently registered alternatives, or through registration via the normal regulatory process. The sponsor should also justify why the emergency use is required for the requested time period.

### 2.1. The application meets both criteria for an emergency use:

- An unexpected and unmanageable pest outbreak or pest situation occurs that can cause significant health, environmental or economic problems

SMB pose a threat to species culturally valued by Indigenous communities, such as Atlantic Salmon and the Brook Floater, a SARA-listed freshwater mussel. SMB and other invasive species fish are identified as potential threat to the host fish for the Brook Floater larvae as per DFO's Management Plan for the species (DFO 2018). The Miramichi river system supports Indigenous food, social and ceremonial fisheries and is world-renowned for its recreational Atlantic Salmon fishery that contributes \$16 million annually to the GDP and supports 637 full time equivalent rural jobs (Gardner Pinfold 2011).

Environmental effects caused by SMB include predation and competition for habitat and resources, and overall food web disruption. SMB are known to alter community structures by decreasing abundances and diversity of native fish species (i.e. cyprinids, perch) (Kerr and Grant 1999, MacRae and Jackson 2001), trigger resource competition and restrict habitat usage (MacRae and Jackson 2001, Morbey et al. 2007). DFO (2009) completed an assessment regarding the risks that the introduction and spread of SMB would pose to Atlantic Salmon and other freshwater fish within the Miramichi River and within the Gulf Region rivers. This assessment conclude that the overall risk to the aquatic ecosystem of the Southwest Miramichi and to rivers in Gulf Region is different for lakes and riverine habitats. The overall risk to the aquatic biota in lakes is considered to be high with low uncertainty. The overall risk for riverine environments is considered to be moderate but with high uncertainty. There is high uncertainty in the riverine assessment because: (1) there are few studies on the suitability of habitat in rivers like the Southwest Miramichi to accommodate Smallmouth Bass, and (2) there are few studies on direct interactions between Smallmouth Bass and Atlantic Salmon to inform the assessment of ecological impacts. .

A major concern within the Miramichi River system, however, is the high likelihood of upstream and downstream dispersal and colonization resulting in habitat overlap and predation on Atlantic Salmon. Juveniles of both species prefer similar riverine habitat features, resulting in direct competition (DFO 2009). SMB bass are also predators of juvenile Atlantic Salmon (Carr and Whoriskey 2009).

- **Registered pesticides and cultural control methods or practices are insufficient to address the pest outbreak.**

A SMB invasion into Lake Brook and the SW Miramichi River is a pest problem. The eradication through alternative means such as physical control methods (electrofishing, angling, netting, others) requires an intensive effort and very large resources and capacity to be effective as an eradication method. Currently, there are not enough resource to apply this method in the Southwest Miramichi. Considerations when deciding the method of eradication are the complexity of the environment and the time between introduction and establishment of the species. The physical removal have been used in Miramichi Lake to effectively contain SMB, but in the case of the Southwest Miramichi it might be more complicated to implement effectively due to the environment complexity. The number one reason for physical removal failure tends to be timelines between introduction, establishment and effort to eradicate the species. If intense and early physical control methods are applied there is a much higher chance of success and that's why prior to chemical methods all other methods need to be considered. We have considered other fish control options (see Table 1 below) and the piscicide rotenone (i.e., Noxfish Fish Toxicant II) has been identified as the most effective means of eradication with highest likelihood of success.

**Table 1.** List of SMB control and eradication options for Miramichi Lake and River

<b>Options</b>	<b>Comments</b>
Physical removal and nets	Limited success in achieving eradication due to the level of effort needed and the resource capacity; most promising in very simple environments. May lead to decreased intraspecific competition and accelerated maturation of SMB and thus, greater recruitment. SMB control in Miramichi Lake between 2010-2012 decreased SMB biomass, while all age classes continue to be caught annually to 2018, including YOY
Biological Control – predator & pathogen	Rarely used for eradication due to lack of potential, selective control agents. Predators will likely attack Atlantic Salmon too. Pathogens carry risks to non-target species and other environmental concerns. Two SMB parasites (tapeworm and protozoan) are known but would need to be tested.
Genetic Manipulation – sterile or triploid individuals	Generally not 100% sterile. More sophisticated methods such as genetic control would take years and much study.
Dewatering	No an option for the river section. Likely impractical to the Lake due to groundwater recharge, ability of SMB to burrow in mud, and risk of SMB being discharged to nearby areas or downstream.
Explosives – detonating cord	Not effective in water depths >3 m.
Piscicide	Rotenone is the only piscicide registered in Canada for eradication of SMB. Exposure times and concentrations of rotenone necessary to kill fish are well known and technologies for treatment are well developed. Application can be timed to avoid or mitigate impacts to Alewives and other species.
Permanent Dam	With the current situation where SMB is in the SW Miramichi river, installing a permanent dam structure at the outlet of Miramichi Lake into Lake Brook would not isolate the lake from the Southwest Miramichi River anymore. Such a structure would continuously spill water year-round and only serve to regulate the lake level; the risk of SMB escaping the lake would remain. Furthermore, a dam would create the added complexity of upstream and downstream fish passage requirements for several migratory species like alewife, sea lamprey, American eel, brook trout, and Atlantic salmon. This creates a risk to alewives and the associated commercial fishery, particularly given that Miramichi Lake is the primary spawning area for the stock. The dam option would be of no advantage over the current barrier fence system: water would still flow from the lake into Lake Brook and the risk of SMB escape would remain. This approach would cause unnecessary further disruption and harm to the native ecosystem.

The proposed product, Noxfish Fish Toxicant II (PMRA Reg. No. 33247), is currently registered for use in Canada under PMRA; however, the product label does not include instructions for use on rivers or in streams that are downstream of lakes, ponds, and reservoirs. The same limitations apply to the other registered rotenone product Nusyn-Noxfish Fish Toxicant (PMRA Reg. No. 19985). Therefore, an Emergency Use registration is required for the product's expanded use in streams and rivers downstream of Miramichi Lake.

The situation cannot be addressed through a normal label revision given the lack of time between now and the scheduled treatment interval of mid-August to late-September 2021. However, a product label revision is being pursued for future use. There is urgency for eradication in 2021 for the reasons described above and below and there is not enough time to go through the label revision process for risk of further SMB spread in the river.

Other methods such as physical control can be used to contain SMB in Miramichi Lake and River, but it might not be the most efficient method. Now that SMB is in the SW Miramichi River with no barriers limiting spread, it is not possible to effectively control the SMB through physical means over the long term.

## **2.2. Why the pest was not considered a problem in recent years**

The pest has been considered a problem for years, but there was not legal mechanism to enable the application of chemical products to manage the invasion.

The project proponent and partners have been considering SMB a threat to the SW Miramichi River since the species' discovery in Miramichi Lake. Eradication of SMB while contained in the lake has been pursued by the these group (Indigenous and NGO partners) for years. However, the deposit of a deleterious substance like rotenone was not permitted for use until 2015 when the *Aquatic Invasive Species Regulations* (AISR) came into effect in Canada. Even then, despite the legislation allowing its use, there was no process in place and it was only in 2018 that DFO Aquatic Invasive Species National Core Program (AIS-NCP) developed a regulatory process allowing the submission of chemical eradication proposal pursuant s.19 of the AISR.

On April 2019, North Shore Micmac District Council (NSMDC) with the support of organizations coalition submitted a proposal to DFO to use of rotenone in Miramichi Lake under the s.19 of the AISR. On August 2019, SMB was found in the SW Miramichi river. Since then, the proponent indicated an urgency for chemical eradication on both (lake and river) to avoid further spread of SMB beyond the few kilometers of currently known distribution by amending the proposal on April 2020 and including a 15km stretch of the river.

## **2.3. Why the emergency use is required for the requested time period.**

The situation cannot be addressed through a normal label revision given the lack of time between now and the scheduled treatment in mid-August/late-September 2021. There is urgency for eradication in 2021 for the reasons described above and there is not enough time to go through the label revision process for risk of further SMB spread in the river.

For higher likelihood of SMB eradication success, both lake and river need to be treated with rotenone concurrently. The reason for the treatment to take place in mid-August/ late-September is to

maximize effectiveness of the rotenone on SMB. Finlayson et al. 2018, indicates that treating the systems in mid-August to late-September when water temperatures are  $\geq 15$  °C is ideal since rotenone is more effective and susceptible to breakdown and it will also avoid impacts to all life stages of Alewife. Post-spawned adult Alewife leave Miramichi lake after spawning into mid-July (O'Donnell and Reid 2009). Based on data from 2010 to 2017, YoY exiting the lake appeared to leave in successive waves over the summer from mid-July to late September, with the peak being in late July-early August (up to 200,000 fish/day) (Biron, 2018). The latest YOY Alewife to have left the lake was reported on October 5, 2010 (Biron, 2018). Alewife are expected to be largely not present in the lake by September and therefore have minimized potential for exposure to rotenone. There is no information available on the presence and duration of stay for Alewife and its YoY in the SW Miramichi River in September, but because of the proximity with the Lake it is possible that they follow the same temporal distribution seen in the Lake. A fall treatment will also enhance the recovery of YOY alewife forage for the following year because planktonic organisms such as cladoceran, copepod, and rotifer populations have laid eggs by fall (Bradbury 1986). These eggs are resistant to rotenone and lakes the spring following a rotenone treatment show rapid plankton resurgence (Brynildson and Kempinger 1973).

### 3- Description of Proposed Product and Use Patterns

**PMRA requirements:** A summary of the proposed product and use pattern should be provided, including: the common, trade and chemical (International Union of Pure and Applied Chemistry) names for pesticide(s) proposed, the *Pest Control Products Act* registration number(s), the application rate (of both the product and active ingredient), maximum number of applications per use season or crop cycle, number of crop cycles per year (if applicable), initial application timing, application intervals, application method, re-entry interval, and pre-harvest interval (if for crop use). The applicant is encouraged to provide this information in table format. If the proposed product is approved for the same use in another country, the registration number in the country in which the product is registered, and a copy of the label of the approved product should also be provided.

**Table 2. Summary of Product information**

<b>Pesticide information</b>	
Common name	<u>Rotenone</u>
Trade Name	<u>Noxfish Fish Toxicant II</u>
IUPAC Name	(1S,6R,13S)-16,17-dimethoxy-6-prop-1-en-2-yl-2,7,20-trioxapentacyclo[11.8.0.0 <sup>3,11</sup> .0 <sup>4,8</sup> .0 <sup>14,19</sup> ]henicosa-3(11),4(8),9,14,16,18-hexaen-12-one
CAS Number	83-79-4
Canadian Registration Number	<u>PMRA Reg. No. – 33247</u>
<b>Rate, Number and Timing of Applications</b>	
Rate	1.0 to 2.0 ppm Noxfish II (0.050 to 0.10 ppm rotenone)
Number of Applications	<u>2</u>
Initial timing of applications	<u>Between August 15 to September 30, 2021</u>
<b>Product Information from another country</b>	
EPA registration number	89459-85
Label and SDS are attached to this application	Appendix M and N

### **3.1. Application Methods (see [American Fisheries Society Rotenone SOP Manual; Finlayson et al. 2018](#))**

Rotenone Application to Streams and Rivers – Rivers and streams should be treated for 4 to 8 hours in order to clear the treated section of SMB. Noxfish II is applied diluted or undiluted above the flowing water's surface by drip from drip station or peristaltic pump directly into the flow of the stream or river which provides for rapid mixing (SOP 11.1). Discharge rate should be checked at least hourly. Apply rotenone as a drip with multiple application sites along the length of the stream or river, spaced roughly 0.8 to 3.2 km apart depending on environmental conditions and water travel time between sites (SOP 5.1).

Rotenone Application to Backwater, Seep and Spring Areas of Ponds, Lakes, Reservoirs, Streams and Rivers – If safely accessible, these areas should be sprayed by hand with a backpack sprayer (SOP 12.1) or if inaccessible, sprayed by other methods such as aerial or by boat (SOP 8.1) to ensure complete coverage. Use a 1 to 2% solution of Noxfish II as spray. Some of these areas may require special treatment using the inert media Vectocarb 30-OM as specified in the Rotenone SOP Manual (SOP 13.1).

Method of Potassium Permanganate (KMnO<sub>4</sub>) Deactivation – To minimize exposure outside of the treatment area, rotenone must be deactivated using potassium permanganate at the downstream extent of the treatment area in the river, stream, pond, lake or reservoir. See Rotenone SOP Manual (SOP 7.1) for detailed guidance for deactivating with KMnO<sub>4</sub>. Within 1 to 2 hours travel time from the furthest downstream rotenone application site, the rotenone is deactivated with KMnO<sub>4</sub> solution or granules at a resultant stream concentration of roughly 2 to 4 ppm, depending on rotenone concentration and organic demand of the water, so that a residual of 1 ppm is maintained 30 minutes downstream of the permanganate injection site. Flow of permanganate should be checked at least hourly. Live fish in cages placed immediately above the permanganate application site will show signs of stress signaling the need for beginning deactivation. Deactivation can be terminated when replenished fish survive and show no signs of stress for at least 4 h. Deactivation of rotenone by permanganate requires between 15 to 30 min contact time (travel time). Cages containing live fish can be placed at these downstream intervals to judge the effectiveness of deactivation. At water temperatures less than 10°C, deactivation may be retarded, requiring a longer contact time.

### **3.2. Quantity of Active Ingredient or Product per Application**

The metrics below are estimates based on the most recent survey of SMB distribution and likely flows in Lake Brook and the SW Miramichi River, all subject to change based on conditions during the treatment:

Miramichi Lake (5.36 million m<sup>3</sup> x 106 m<sup>3</sup>) – Roughly 8,850 liters of Noxfish II (1 treatment)

Lake Brook (0.45 m<sup>3</sup>/s) – < 100 liters

SW Miramichi River (5.6 m<sup>3</sup>/s) – Roughly 1,930 liters (2 treatments = 3,850 liters total)

### **3.3 Proposed Preharvest Interval – N/A**

### **3.4. Location of Pest Infestation and Proposed Treatment**



See Maps 1 and 2 in Section 1 of this document

### 3.5. Total Hectares and Kilometers

Miramichi Lake – Roughly 225 ha

Lake Brook – Roughly 7 km

SW Miramichi River –Roughly 15 km ( need confirmation from proponent once delineation of distribution of SMB is confirmed with field activities conducted during summer 2020)

### 3.6. Length of Time Material Must be Available

One year

### 3.7. Supply of Noxfish II

Adequate supply of Noxfish II is available per discussion with the registrant; they have provided a bid for the product needed. The product will be imported into Canada from United States.

## 4- Summary of registered alternatives

**PMRA requirements:** Applicants should provide the product names, registration numbers, and indicate the type of control measure (for example, conventional or non-conventional pesticide, pheromone, or cultural control method) for each alternative end-use product and an explanation for why these are not acceptable to manage the pest outbreak. The applicant is encouraged to provide this information in table format.

Currently Registered Pesticides – The proposed product, Noxfish Fish Toxicant II, is currently registered for use in Canada by PMRA (Reg. No. 33247). However, the current label is deficient in providing instructions for use on streams and rivers that are downstream of ponds, lakes, and reservoirs. The same limitations apply to the other registered rotenone product Nusyn-Noxfish Fish Toxicant (Reg. No. 9985). The Emergency Use registration of Noxfish Fish Toxicant II is required for the product's expanded use in streams and rivers downstream of Miramichi Lake in the eradication of invasive SMB. The situation cannot likely be corrected through a label revision in time to have the product available for use in September 2021.

Alternative Control Methods – The proponent on Smallmouth Bass Eradication in Miramichi Lake and SW Miramichi River with its partners commissioned an expert report that explored options for eradication of SMB in Miramichi Lake (Van den Heuvel et al. 2017). Containment and control measures, including a temporary seasonally installed barrier and exhaustive fishing efforts, have been in place in Miramichi Lake since 2008. While populations of SMB are greatly reduced, these efforts have failed to eradicate the species and SMB of numerous age groups have persisted in the lake up to the present day after a decade of control effort. The SMB have now spread further downstream into Lake Brook and a small section (roughly 15 km) of the SW Miramichi River. The expert report looked at the control measures presented in the Table 1 (section 3 above).

The report concluded that eradication of a target species from a water body is difficult and usually only attained through the use of chemical means or in theory, dewatering. Given that rotenone is the most widely used fish eradication method in North America, its toxicity to fish has been well documented, and standard operating procedures for its use in standing and flowing water have

been developed (Finlayson et al. 2018), the use of rotenone is the only feasible and practical means of achieving SMB eradication from the Miramichi River watershed.

## 5- Explanation for choice of product and use pattern

**PMRA requirements:** The applicant should describe what level of pest management is required to mitigate the outbreak, and provide evidence that the product will deliver an acceptable level of pest control when applied as proposed. Applicants can provide efficacy data (including foreign data), use history, scientific rationales or other scientific information to address product performance, resistance management and crop tolerance (where applicable). If resistance to other registered alternatives is cited as justification for the emergency use, evidence supporting this should be submitted.

Toxicity to Smallmouth Bass (SMB) – Data of Marking and Bills (1976) show a 24-h LC50 value of 0.093(0.085-0.102) ppm Noxfish [0.0047(0.0042-0.0051) ppm rotenone] using laboratory water. A preliminary toxicity test conducted by Atlantic Salmon Federation in 2017 show a 24-h LC50 value of 0.131(0.09-0.19) ppm CFT Legumine [0.0065(0.0045-0.0095) ppm rotenone] using tea-colored water from Miramichi Lake.

Influence of Dissolved Oxygen Concentration (DOC) – A comparison of the two tests above suggests an approximate reduction of toxicity to SMB of 40% in Miramichi Lake tea-colored water which is likely due to high DOC. A reduction in rotenone toxicity has been documented in other waters high in DOC. A recent unpublished study in Montana found that a pond with tea-colored water and high levels of DOC produced LC50 values 70-140% higher than other unstained and low DOC waters (Skaar and Selch 2018, personal communication).

Verification of Rotenone Toxicity – It is likely that only the rotenone content determines the toxicity of the Noxfish, Noxfish II, and CFT Legumine formulations. The scientific evidence indicates that the toxicity of the formulations to fish is primarily, if not entirely, due to rotenone. For example, Bills and Marking (1986) demonstrated that the toxicity of technical rotenone (96.5 % purity) is undistinguishable from the toxicity of formulated rotenone (5% rotenone) Noxfish. In replicate tests on rainbow trout, the 96-h LC50 values (as rotenone) were 2.72 and 2.73 ppb for technical rotenone in acetone compared to 2.25 and 2.45 ppb from Noxfish. In replicate tests on bluegill sunfish (a relative of SMB), the 96-h LC50 values (as rotenone) were 6.09 and 5.07 ppb for technical rotenone in acetone compared to 7.60 and 5.85 ppb from Noxfish. This study is important since the same sources of rotenone and fish were used in the comparisons eliminating confounding influences of biological variability of test fish and different sources or lots of rotenone. Thus, it is solely the rotenone content that dictates the toxicity of the formulation.

Verification of Noxfish II Efficacy – Tests are scheduled this summer to verify the toxicity of Noxfish II to SMB or a surrogate (i.e., Yellow Perch) in water from the Miramichi Lake and the SW Miramichi River. Verification has not been completed yet (as per September 9, 2020). Because of the varying DOC content and the influence on rotenone toxicity, we are requesting a treatment rate range of 0.050 to 0.100 ppm rotenone (1.0 to 2.0 ppm Noxfish II).

## 6- Description of socio-economic impact

**PMRA requirements:** Applicants should discuss the anticipated economic, social, and environmental costs that may occur without the emergency registration. For agricultural emergency uses, a description of crop value can be included, as well as the expected percent field loss or percent economic loss of gross or net revenues without the emergency registration. For non-agricultural emergency uses, the impact of not accessing a pest control product can be described, including the potential ecological loss or any adverse effects on the environment or human health.

The socio-economic impact (Benefits and losses) for this project will be discussed in terms of fisheries, cultural value and a rural economy associated with Atlantic Salmon fishing.

### 6.1. Economic Analysis

The Mi'kmaq communities on the Miramichi river system have relied on wild Atlantic Salmon as a food source for millennia. The cultural connection between the Indigenous communities and the salmon cannot be quantified. The Miramichi currently supports an active Food, Social, and Ceremonial fishery at various First Nations along the river, which is threatened by the spread and permanent establishment of invasive SMB.

There is also a strong cultural connection to salmon by non-indigenous people through a recreational fishery attracting visitors from around the world and residents alike. A 2011 study by Gardner Pinfold provides an economic value assessment of wild Atlantic Salmon in eastern Canada, with a case study of the Miramichi. The study found that the recreational fishery contributes \$16 million annually to the provincial GDP and supports 637 full time equivalent rural jobs. The recreational Atlantic Salmon fishery is of substantial socio-economic value to the region and to the province of NB, and is potentially threatened by the establishment and impacts of SMB throughout the river system.

### 6.2. Social Analysis

As mentioned above a large number of organizations (Indigenous and non-government organizations) are working together since 2016 to pursue the common goal of eradicate SMB in Miramichi river system.

The Working Group for the Eradication of SMB in the Miramichi Watershed includes:

- North Shore Micmac District Council (Project Proponent)
- Atlantic Salmon Federation
- Maliseet Nation Conservation Council
- Miramichi Salmon Association
- Miramichi Watershed Management Committee
- New Brunswick Salmon Council
- New Brunswick Wildlife Federation

These groups represent a significant number of organizations and thousands of supporters throughout the province of NB, nationally and internationally, including both Mi'kmaq and Maliseet peoples. For example, the New Brunswick Salmon Council and New Brunswick Wildlife Federation alone represent nearly all watershed groups and fish and game groups throughout the province (>50 organizations).

The Working Group (which includes the proponent for this project) also developed a public engagement plan that was formalized in van den Heuvel et al. (2017) and used to guide communication efforts throughout the process of preparing for and carrying out the chemical eradication project.

**Public engagement actions by the SMB Working Group**

Public engagement actions by the SMB Working Group have included the following key groups and activities:

Key groups and constituencies engaged by the SMB working group:

- Miramichi area First Nations, principally people at Eel Ground and Metepenagiag
- Miramichi Lake camp owners
- Stakeholders (river camp owners, guides, anglers, local business owners)
- Public officials (civil servants + municipal, provincial, and federal politicians)
- Environmental/conservation NGOs

Table 3. List of public engagement activities conducted by the SMB working group

Activity	Description/Timeline	Targeted Group
Media relations	Response to several media requests regarding the eradication of Smallmouth Bass from the Miramichi <b>Ongoing</b>	All
Website design and launch	Created a website for Miramichi Smallmouth Bass eradication to educate the public and key groups about the project <b>Complete</b> (www.miramichismallmouth.com)	All
Proactive communications	Development of blog posts, op-eds, Atlantic Salmon Journal articles, informational pamphlet, and social media to convey key messages <b>Blog:</b> complete/ongoing ( <a href="https://www.asf.ca/news-and-magazine/salmon-news/clear-and-present-danger">https://www.asf.ca/news-and-magazine/salmon-news/clear-and-present-danger</a> ) Next blog to be prepared in conjunction with resumption of spring work in May 2020 <b>Social media:</b> ongoing, timed with media relations and proactive communications <b>Atlantic Salmon Journal:</b> Article published in winter 2020 edition, entitled “The Great Escape” <b>Pamphlet:</b> complete January 2020	All

Meeting with camp owners	Letter sent to camp owners in October 2019. Conducted a public meeting with Miramichi Lake camp owners involving experts on rotenone eradication and presentation of the eradication plan for Miramichi Lake, Lake Brook, and the SW Miramichi River <b>Completed January 26<sup>th</sup> with follow-up meeting in March, 2020 with camp owner steering committee</b>	Miramichi Lake camp owners
Meet with members of Eel Ground and Metepenagiag First Nations	Conducted a public meeting with community members involving experts on rotenone eradication <b>Completed January 27<sup>th</sup></b> Further community information sessions at Eel Ground and Metepenagiag First Nations scheduled for March postponed due to Covid-19	Miramichi First Nations
Brief public officials	Letters sent to all New Brunswick MPs and MLAs. Held meetings with key officials and politicians from federal and New Brunswick governments to share project details, update progress, and seek support. <b>Several sessions have been held from 2017-2020</b>	Public officials
Atlantic salmon stakeholder engagement	Stakeholder meetings with guides and outfitters from the Miramichi in Doaktown, NB <b>Meeting held in February 2020 &amp; ongoing</b> Public meetings along the Miramichi in the communities of Boiestown and Blackville were cancelled due to Covid-19 but replaced by online public webinar on April 28 with broad participation from 184 participants including international	Stakeholders, public officials
Inform and seek support from non-government organizations	Contacted all major environmental and conservation NGOs in NB to inform them of the eradication project <b>Complete in October 2019 &amp; ongoing</b>	Environmental/Conservation NGOs

Results from Public Engagement conducted by SMB working group:

Overall, the feedback received from the various groups and constituencies has been broad and in support for the Working Group's proposal to eradicate SMB from the Miramichi watershed. The only opposition has been from several Miramichi Lake camp owners as it relates to the lake treatment and the Working Group continues its dialogue with the camp owners to share information about rotenone, the eradication process, and ecosystem recovery post-treatment. The current product label governs its use in the lake, and this Emergency Use registration pertains to the use of Noxfish II in Lake Brook and the SW Miramichi River, downstream of Miramichi Lake. The sole landowner surrounding the entire proposed treatment reach of Lake Brook and the SW Miramichi River is J.D. Irving, Limited, who is in full support of the eradication (see letter of support submitted with the application- Appendix L).

### Engagement and Consultation actions led by Provincial and Federal Departments

Under the s.19 of AIS Regulations project review and authorization process, DFO does not have the obligation to conduct public engagement/ consultation. On the other hand, DFO has the responsibility to engage and consult with Indigenous communities.

As mentioned above, a group of cottage owners from Miramichi Lake has raised serious concerns about the application of rotenone in the lake and river. They submitted several letters to the Province of NB and DFO requesting clarification on multiple issues, including:

- The provincial decision of not conduct an Environmental Impact Assessment (EIA) (decision only related to the Lake). The additional segment of the river triggered a provincial EIA for this project which is currently ongoing (as per September 9, 2020)
- Impact on other species (species at risk and others)
- Impact of rotenone formulation on human health
- Impact of rotenone on drinking water

The Province of NB and DFO met with cottage owners on June 5, 2020 to provide clarifications on some of the questions. The cottage owner representative is still raising concerns by writing letters to DFO senior management and sharing information through local news articles.

### Indigenous Consultations

On May 4, 2020 DFO sent an engagement letter to all 17 Indigenous communities in NB. As of June 24, DFO had received requests from three Indigenous Consultations bodies, which represents 10 Indigenous communities. Two of the Indigenous Consultation bodies responded to DFO in writing indicating the support of this project, one consultation body oppose the project. The consultations process with most Indigenous groups have been completed but DFO is still waiting for a meeting with one of the consultation bodies representing seven communities. Therefore, Indigenous consultation are still considered ongoing and DFO will inform PMRA once consultation is completed.

The Provincial EIA is also responsible to conduct public and Indigenous consultations through their process.

### **6.3. Environmental Analysis**

Without the emergency registration of rotenone for use in Lake Brook and SW Miramichi River, the spread of SMB will not be eradicated and there is a high risk for the species to spread further in the Miramichi watershed. As mentioned earlier, the major environmental effects caused by SMB include predation and competition for habitat and resources, and overall food web disruption. SMB are known to alter community structures by decreasing abundances and diversity of native fish species (i.e. cyprinids, perch) (Kerr and Grant 1999, MacRae and Jackson 2001), trigger resource competition and restrict habitat usage (MacRae and Jackson 2001, Morbey et al. 2007). There is a high likelihood of dispersal and colonization of SMB without the chemical eradication in the SW Miramichi river by 2021, which can result in habitat overlap and predation on Atlantic Salmon. Juveniles of both species prefer similar riverine habitat features, resulting in

direct competition (DFO 2009). SMB are also predators of juvenile Atlantic Salmon (Carr and Whoriskey 2009).

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847-330-5391 fax  
  
sspaulding@central.com

***Letter of Support***

May 22, 2020

The Director  
Efficacy and Sustainability Assessment Division  
Pest Management Regulatory Agency  
2720 Riverside Drive  
Ottawa, ON K1A 0K9

**RE: Emergency Use Application for Noxfish Fish Toxicant II for Use to Control Non-Native Invasive Smallmouth Bass in the Southwest Miramichi River Watershed in New Brunswick, Canada**

We are pleased to support the emergency registration of Noxfish Fish Toxicant II for use to control non-native invasive Smallmouth Bass in the Southwest Miramichi River Watershed in New Brunswick, Canada

Wellmark International intends to pursue a label amendment with the PMRA to add the emergency use application directions to the Noxfish Fish Toxicant II label (PMRA Reg. No. 33247) for use on rivers or in streams that are downstream of lakes, ponds and reservoirs. Please find enclosed a draft emergency use label for inclusion in the submission to support the emergency registration. As this product is registered in Canada and existing stocks are quickly accessible, there will be product available should the emergency registration be approved.

If you have any questions, please do not hesitate to contact me at 847-330-5380 or at [sspaulding@central.com](mailto:sspaulding@central.com) or contact our regulatory consultant, Brenda Nailor, at 519-837-8704 or [brendanailor@rogers.com](mailto:brendanailor@rogers.com).

Kind Regards,

A handwritten signature in black ink that reads "Steven R. Spaulding". The signature is written in a cursive, flowing style.

Steven R. Spaulding  
Vice President Regulatory Affairs  
Wellmark International



**J.D. IRVING, LIMITED**

**Woodlands Division**

P. O. Box 5777, 300 Union Street, Saint John, New Brunswick, Canada E2L 4M3

Tel: (506) 632-7777 Cellular: (506) 654-7758 email: [willett.andrew@jdirving.com](mailto:willett.andrew@jdirving.com)

June 16, 2020

Pest Management Regulatory Agency  
2720 Riverside Drive  
Ottawa, Ontario  
K1A 0K9

Attention: Mr. Kurt Randall

**Re: Support for Emergency Use of Noxfish II in the Southwest Miramichi River**

Mr. Randall,

I am writing on behalf of J.D. Irving, Limited (JDI) in support of the Emergency Use Registration of Noxfish Fish Toxicant II, to eradicate the invasive smallmouth bass (SMB) from the main Southwest Miramichi River (SMR).

JDI has been a forest landowner and manager in New Brunswick since 1882. The forests we own or manage provide the wood supply for local forest products operations, provide habitat for wildlife, clean water and are important for storing carbon. Over 25% of the lands we own or manage have the primary purpose of conservation. Since the early 1990s JDI has invested approximately \$1.4 million every year in peer reviewed research related to growing better trees and studies to understand habitat for salmon, trout, songbirds, deer, moose and other wildlife.

In addition, we are founding partners in the Collaboration for Atlantic Salmon Tomorrow (CAST). The CAST science team at the Canadian Rivers Institute and Université Laval are focused on results-based approaches for restoring Atlantic salmon populations in NB.

JDI has been concerned about the potential impact of invasive SMB in Miramichi Lake on Atlantic salmon for many years. Concern increased in 2017 when SMB were discovered in the SWR by CAST scientists using eDNA technology.

JDI is the private landowner on both sides of the SWR where SMB have been identified. We are pleased to be a partner in the efforts to eradicate SMB with the Miramichi Salmon Association, Atlantic Salmon Federation and North Shore MicMac District Council. As such, JDI has provided access, new roads, trails, and other resources to help make the collaboration more successful.

JDI strongly supports efforts to obtain an Emergency Use Registration for the use of Noxfish Fish Toxicant II (PCP #33247) in the SWM at the earliest possible convenience in 2020.

If you have any questions, please feel free to contact me directly.

Sincerely,

**J.D. IRVING, LIMITED**  
**WOODLANDS DIVISION**

**Andrew Willett**  
**Director of Research and Engagement**

Cc: Nathan Wilbur, Mark Hambrook, Jim Ward



10 June 2020

Pest Management Regulatory Agency  
Attn: Kurt Randall

**SUBJECT: Letter of support for Noxfish II emergency use registration to eradicate invasive smallmouth bass on the Miramichi River system in New Brunswick**

Mr. Randall,

This letter is to demonstrate broad indigenous and stakeholder support for the emergency use registration of Noxfish Fish Toxicant II to eradicate invasive smallmouth bass from the Miramichi River system in New Brunswick.

This product is already registered for use in Canada under PMRA, so we know that it can be used safely and effectively. In our circumstance, its use will eliminate the threat of an invasive species and restore the native ecosystem of the Miramichi watershed. This is an ecologically, culturally, and socio-economically important watershed that supports indigenous food fisheries and a recreational Atlantic salmon fishery that contributes \$16 million to the GDP and supports 637 full time equivalent rural jobs.

The situation is indeed an emergency, as smallmouth bass have escaped from Miramichi Lake downstream into Lake Brook and the Southwest Miramichi River. It is critical that eradication take place before the bass spread further in the river.

Thank you for considering our strong support for this emergency use registration.

Yours in Conservation,

Nathan Wilbur  
Co-Chair of Working Group  
Atlantic Salmon Federation

Mark Hambrook  
Co-Chair of Working Group  
Miramichi Salmon Association

Jim Ward  
Project Proponent  
North Shore Micmac District Council

Peter Cronin  
New Brunswick Salmon Council

Debbie Norton  
Miramichi Watershed  
Management Committee

Charlie Leblanc  
New Brunswick Wildlife Federation

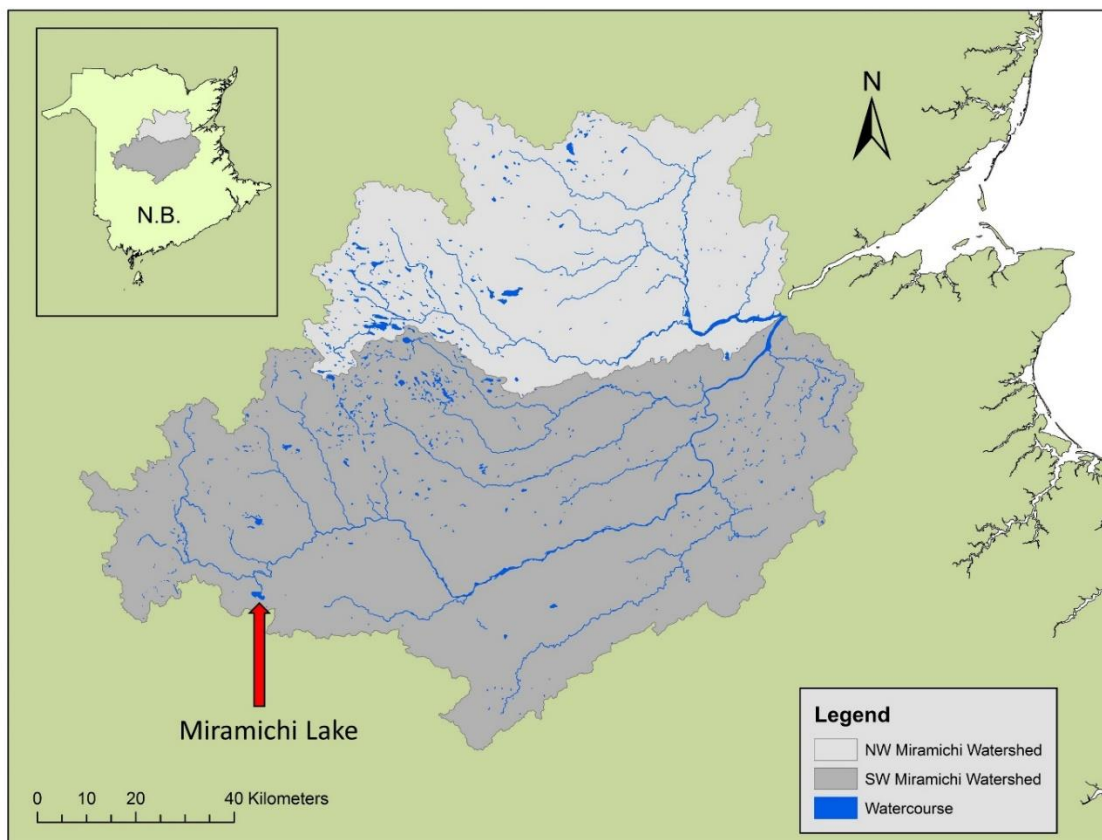
# Proponent Responses to PMRA Questions

## Emergency Use Registration Process

Date: 7 August 2020

- 1- What are the uses of the treated water (e.g. irrigation of crops, swimming, drinking, fishing, household purposes)?

Miramichi Lake is located in a remote area of west-central New Brunswick (Map 1). It has 16 cottages along its shores located on the east side of the lake. The majority of land surrounding the lake includes crown land (province of NB) and industrial freehold forestry land (J.D. Irving, Limited). Cottage owners use the lake for swimming throughout the summer months and there is occasional recreational fishing activity but the lake does not support any well known or popular fisheries for the general public. It is not a fishing destination or typically used by anyone other than the cottagers. The recreational fishing season closes on September 15 each year on the Lake and Lake Brook. There is no agricultural land in the area and neither the lake nor any of the treated waters are used to irrigate crops. For drinking and household purpose water use, please see response to question 2. For recreational uses of Lake Brook and the proposed treatment area of the SW Miramichi River, please see response to question 3.



Map 1. Location of Miramichi Lake in New Brunswick.

- 2- Where are the drinking water intakes relative to the treated water bodies (i.e. are campers/cottage owners drawing water from the treated body? Upstream or downstream of the treatment, within what distance?)

We contacted the NB Source and Surface Water Management Branch under the Department of Environment and Local Government regarding records of drinking water sources around the lake. The response was: “From a drinking water and household perspective, the department doesn’t regulate nor keep track of individual private drinking water systems from surface water bodies. Furthermore, a search all around the Miramichi Lake in our Online Well Log database doesn’t return any well log report. Which means that existing cottages around the Miramichi Lake might have their drinking and household water either from the Lake or from a well drilled before 1994 or from a dug well.”

Through our direct engagement with cottage owners, we understand there are two water sources that are each used for drinking water and household use. The majority of cottages, except two, obtain water from a communal drinking water supply fed by a small inlet tributary to the lake located uphill from the cottages (upstream from the lake) and upstream/outside of the proposed treatment area. Two cottage owners indicated that they share a 20-foot deep shallow well which they believe is fed by groundwater and surface water adjacent to the lake (see Map 2). As potential mitigation measures for the two cottages with the shallow well, we have officially offered those cottage owners three options in writing:

**Email to cottage owner, [REDACTED], on July 15, 2020:**

*We have discussed amongst the group the matter you brought forward about your shallow well that is shared between 2 cottages and is potentially fed in part by surface water from the lake. We have consulted with Brian Finlayson and Steve Maricle to get guidance on what the standard protocol is for lakeside wells. Both of them have had experience with similar situations.*

*The literature and their experience monitoring deep and shallow wells before/after rotenone treatments show that no traces of rotenone or any other formulation ingredients have been found in the well monitoring. Also, rotenone does not travel further than a few centimetres into the soil and is not known to be a groundwater contaminant. This indicates that there should be no impact to your well water; however, we understand your genuine concerns and recognize that drinking water is one of the most basic and important aspects of life anywhere, and that one needs to be comfortable with their drinking water source.*

*As such, we have put together 3 options for you to consider. All 3 options include a request that you not use the well for the duration of the project as a precaution. Should the project go ahead, we offer to:*

- 1. Provide drinking water to your two cottages on the well for the duration of rotenone presence in the lake (2-3 weeks), and test the well water before and after the treatment; or*
- 2. If logistically possible, connect your two cottages to the existing spring water source used by the other cottages that is upstream of the treatment area; or*
- 3. Drill you a new proper deep well with no surface water input*  
*Alternatively, if some combination of these options is favourable to you or you have another option in mind, we are certainly open for discussion on the approach that makes you feel most comfortable.*

Map 2 shows the location of the shallow well that supplies two cottages, including coordinates and the distance from lake shore. The map also shows the location of a spring water source and reservoir tank that supplies most cottages along the lake, located 500 m uphill from Miramichi Lake.



*Map 2. Locations of two water sources used by cottages for drinking water and household use adjacent to Miramichi Lake.*

The photographs below show the spring water intake location (located 500 m uphill from Miramichi Lake) which runs by pipe into the water reservoir approximately 40 m downhill from the intake.



(a) Spring water intake

(b) Water reservoir fed by spring

***1) With the sampling/analytical method for rotenone planned for monitoring, how soon are results available after sampling? In the application package, please include the proposed monitoring plan.***

The sampling approach monitoring for the shallow well will be as follows:

1. One day pre-treatment of Miramichi Lake,
2. When rotenone is gone from the lake (est. 18-d post-treatment), and
3. One month post-treatment.

A laboratory will analyze water samples for rotenone with an MDL of 1 ppb and a RL of 2 ppb using liquid chromatography (LC) or LC/mass spectrometry (MS) and the methods described by Dawson et al. (1983), Vasquez et al. (2012), and Sandvik et al. (2018). We are only planning on looking for rotenone since the inert ingredients are gone by the time rotenone is gone.

The sample containers, sample volume and analytical turnaround time are dependent on the analytical laboratory. Typically, results can be available within a day or two from a local laboratory. Samples would be collected in duplicate utilizing travel blanks. The well would need to be purged prior to each sampling to ensure that the quality of the water is reflective of the surrounding aquifer. Typically, the well would be sampled from an exterior faucet closest to the well. Most of this is detailed in SOP 16.1 of the Rotenone SOP Manual (Finlayson et al. 2018).

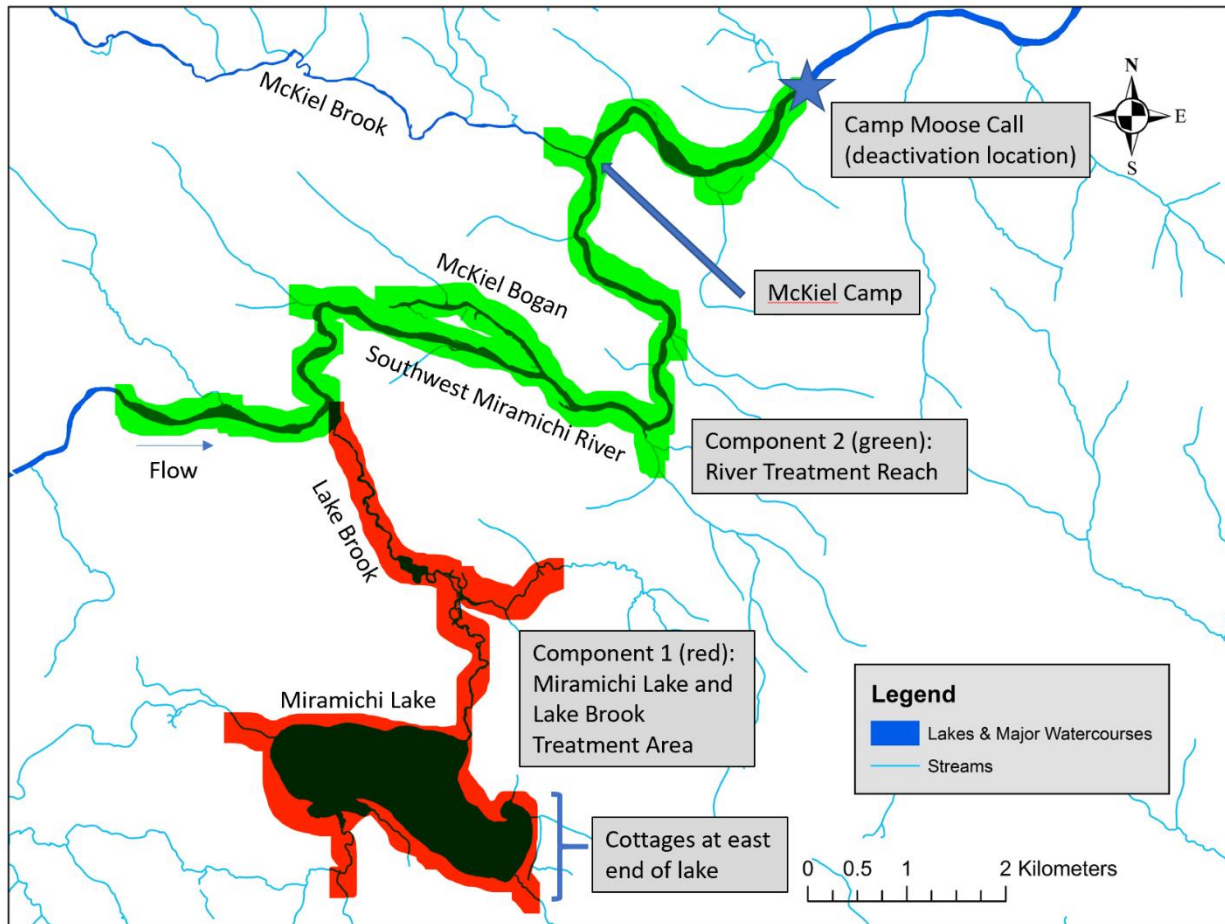
### 3- What activities are expected around the treatment areas (i.e. hiking, camping)?

**Lake** – There are no campgrounds or hiking trails around the lake, thus the area is not normally used by the public for these activities. Cottage owners use the lake for swimming throughout the summer months and there is occasional recreational fishing activity but the lake does not support any well known or popular fisheries for the general public. It is not a fishing destination. The recreational fishing season closes on September 15 each year.

**Lake Brook** – Lake Brook is very remote and is inaccessible by road. Due to its remoteness, it is not normally used for any recreational activity. The sole landowner along both sides of the brook is J.D. Irving, Limited, who is a partner in the eradication project (see their support letter as part of the Emergency Use Registration application package).

**SW Miramichi River** – The proposed treatment reach of the SW Miramichi River is remote, and land access is restricted by controlled gate. There are no public access points via land to this stretch of the river. The sole landowner along both sides of the river is J.D. Irving, Limited, who is a partner in the eradication project (see their support letter as part of the Emergency Use Registration application package). There are occasional canoers that paddle through this reach of river, but not typically in the low water conditions in late summer/early fall when we propose to treat. Signage will notify canoers at the two canoe launch points upriver of the treatment area and at the upstream extent of the treatment area, as well as personnel there operating the drip station to notify any potential canoers. The Atlantic salmon recreational angling season closes on the river on October 15. There is 1 camp on the treatment reach (mouth of McKiel Brook), and 1 camp at the deactivation location (Camp Moose Call) (see Map 3). Both camp owners lease the land from J.D. Irving, Limited, and are in support of the eradication of smallmouth bass.





Map 3. Locations of camps and cottages adjacent to treatment areas.

4- What is the timing, frequency and duration of potential post application activities?

Activities are explained in detail in the AIS application. Post application activities will include:

- Fish collection and disposal period for approximately 2 weeks (Section 5.3 of the AIS application)
- 5-year monitoring program consisting of four components: (1) rotenone treatment monitoring (2) rotenone deactivation monitoring, (3) short-term and long-term SMB eradication monitoring, and (4) ecological recovery monitoring. **See Appendix E of the AIS application for the standalone detailed monitoring plan.** Ecological monitoring will be carried out annually for 5 years with spring, summer, and fall sampling period frequency.
- Testing of the shallow well that supplies two cottages with drinking and household use water (see sampling details in Question 2 above)

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