

## APPENDIX C

### **2021 Monitoring Plan for Glyphosate Concentrations in Surface Water Samples adjacent to residences near Long Point and the outlet of Big Creek.**

#### **Background**

Environment and Climate Change Canada – Canadian Wildlife Service (ECCC-CWS) and the Nature Conservancy of Canada (NCC), two members of the Project Team, will be implementing a Phragmites management and monitoring project within the Big Creek and Long Point National Wildlife Areas (NWAs) and adjacent, privately-owned lands. Phragmites has severely degraded coastal wetlands and beaches in North America by outcompeting diverse native vegetation and replacing it with dense, monotypic stands with limited ecological value. Best Management Practices for Phragmites includes the application of herbicide in the fall to effectively kill the stem and root systems (OIPC, 2020), followed by mechanical rolling in winter conditions as part of an integrated pest management program. The herbicide selected for this project is RoundUp Custom for Aquatic and Terrestrial Use (active ingredient glyphosate), which has a long history of successful use in the United States, as well as within the Long Point region. More than 1,300 ha of Phragmites has been managed in this region over the past 5 years. In 2021, approximately 250-300 ha of Phragmites (not previously treated) will be treated using herbicide. Large, dense patches will be treated aerially via helicopter, and small and sparse patches will be treated on the ground via hydraulic and backpack sprayer. Aerial application methods are efficient and highly effective, while minimizing the required herbicide volume, therefore aerial application will be used wherever possible.

This monitoring plan will enable the Project Team to assess the concentrations of glyphosate in surface water samples adjacent to the herbicide application areas within the Long Point Region. The purpose of this sampling is:

1. To provide confidence in the safety of the project for residents in the Long Point region
2. To ensure that, following treatment, glyphosate concentrations in the surface waters adjacent to the municipal water intake and private water intakes are less than the Ontario Drinking Water Quality Standard (ODWQS) for glyphosate

Herbicide (RoundUp Custom) application will take place between August and October 2021 (locations are outlined in Appendix I). The proposed surface water sampling plan was used in 2016, 2017, 2018 and 2019 by the Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNR) and in 2020 by the MNDMNR and ECCC-CWS, following herbicide application for Phragmites control. All samples collected over the 5 years found glyphosate levels to be well below the ODWQS of 0.28 mg/L.

## Sampling Plan

If the use of RoundUp Custom is approved, and treatment proceeds as planned, 3 sampling sites are proposed to be monitored adjacent to Big Creek NWA: LBC1, LBC2 and LBC3. For 2021, this is the only area where herbicide treatment plans using Roundup Custom have the potential to be near surface water intakes. See Figure 1 for sampling locations.



Figure 1. Proposed surface water sampling locations within Lower Big Creek.

Proposed surface water sampling sites were selected by the Project Team in consultation with the HNHU, Norfolk County and the MECP based on proximity of treatment to the municipal water intake system operated by the County of Norfolk. The municipal water intake supplying Port Rowan and the surrounding area is located in the Long Point Inner Bay, adjacent to the Big Creek Unit, Big Creek NWA and is approximately 800m from a private marsh treatment location. It has a regulated intake protection zone of 1000m in diameter.

In 2019, MECP and HNHU determined that treatment at Big Creek Unit, Big Creek NWA and the adjacent private lands sites was low-risk to the municipal water intake, due to low connectivity to Lake Erie, and that sampling at LBC1 and LBC2 was sufficient. In 2020, when treatment within the Big Creek Unit, Big Creek NWA was expanded, it was decided that a third site (LBC3) would be established adjacent to Sandboy Marina. This Marina does not contain a drinking water in-take, but has high public use. Sampling and response procedures at LBC3 would be the same as at LBC2.

LBC1: located at the mouth of Big Creek, in closest proximity to the Phragmites treatment area

LBC2: location at the Port Rowan water intake

LBC3: location near the Sandboy Marina

LBC2, LBC3 sites would only be sampled in the event that LBC1 exceeds the ODWQS. In 2019 and 2020, samples from LBC1 never exceeded the ODWQS of 0.28 mg/L. Therefore, per the approved sampling plan, LBC2 and LBC3 were not sampled.

In 2021, the majority of herbicide treatment will be occurring in the Big Creek Unit, Big Creek NWA on the west side of the Long Point causeway. Re-treatment of Phragmites on a private marsh property will be very minimal, and may only require dry land application. Based on the project locations and the results of previous monitoring, we proposed the same monitoring sites and sampling plan for 2021.

Discussions will occur with the HNHU and the County of Norfolk throughout planning and implementation of the project, to ensure they are updated and informed about treatment timing and locations, and surface water monitoring results. At the upstream end of the project area, landowners adjacent the Big Creek treatment areas will be notified prior to herbicide application.

#### *Sampling Method*

Water samples will be collected slightly upstream from the mouth of Big Creek at Long Point Inner Bay (LBC1; Figure 1). This sample location is proposed to ensure monitoring and protection for the Port Rowan municipal water intake, as well as residents along the Big Creek causeway. A GPS point of the sample location will be taken at the time of sampling to ensure consistency.

Baseline samples will be collected at LBC1 prior to herbicide treatment. Post-treatment samples will be taken within 12 hours and again at 24 hours post-treatment, continuing every 24 hours until a downward trend in the glyphosate level is confirmed or baseline levels are reached. The samples will be analysed within a 36 hour turn-around time, for the presence of glyphosate. The laboratory will have a method of minimum detection limit of 0.005 mg/L for glyphosate, which is more sensitive than the ODWQS of 0.28 mg/L. If necessary, the Project Team will continue sampling at 24 hour intervals post-treatment, to demonstrate a downward trend and that the levels are below the ODWQS. If glyphosate levels exceed the ODWQS, the Project Team will inform the Medical Officer of Health at the HNHU and the County of Norfolk, and take a sample as soon as possible at the Port Rowan municipal water intake (LBC2; Figure 1) and at the Sandboy Marina (LBC3; Figure 1). Arrangements will be made with the County to collect a filtered water sample at the same time, and have it submitted to the licensed accredited laboratory. Should the raw water sample at LBC2 or LBC3 exceed or be equal to the ODWQS, then the filtered water sample will be analyzed with expedited turnaround time. If samples taken from the raw water intake and/or filtered samples exceed the ODWQS, the Medical Officer of Health at the HNHU and the County of Norfolk will be consulted regarding next steps. Sampling at LBC1, LBC2 (intake), LBC3, and filtered water intake will still continue simultaneously at 24 hour intervals until a declining trend is evident and glyphosate levels fall and remain below the ODWQS. The Port Rowan municipal water system does filter out glyphosate as standard procedure, but CWS-ON has the option of trucking either raw water or potable water to the Port Rowan municipal water system if glyphosate

levels at the water intake are found to be above the ODWQS. In the event that the reservoir and/or distribution system is contaminated, the Project Team will work with Norfolk County, the HNHU and MECP to ensure potable water is supplied to the residents by alternative means (e.g. bottled water, fill stations). A list of approved water suppliers has been provided by HNHU and County of Norfolk and one or more of those suppliers will be contracted if needed.

**Table 2:** Location coordinates and schedule for surface water sample collection at Lower Big Creek. Samples marked with an “X” will be conducted; samples without an “X” will occur contingent on the results from the first 3 samples at LBC1 (see note).

Sample ID	UTM	Baseline	12hr.	24hr.	48hr.	72hr.	96hr.
LBC1	17T 544796 4716715	X	X	X			
LBC2 *	17T 545109 4718298						
LBC3*	17T 545888 4715133						

*Note: LBC2 and LBC3 will only be sampled if LBC1 12hr. and 24hr. samples exceed the ODWQS for glyphosate. If this LBC2 and LBC3 sampling is required, LBC1 will also continue to be sampled every 24 hours until a downward trend in the glyphosate levels is confirmed below the ODWQS or a return to baseline levels is reached.*

## APPENDIX I - Maps

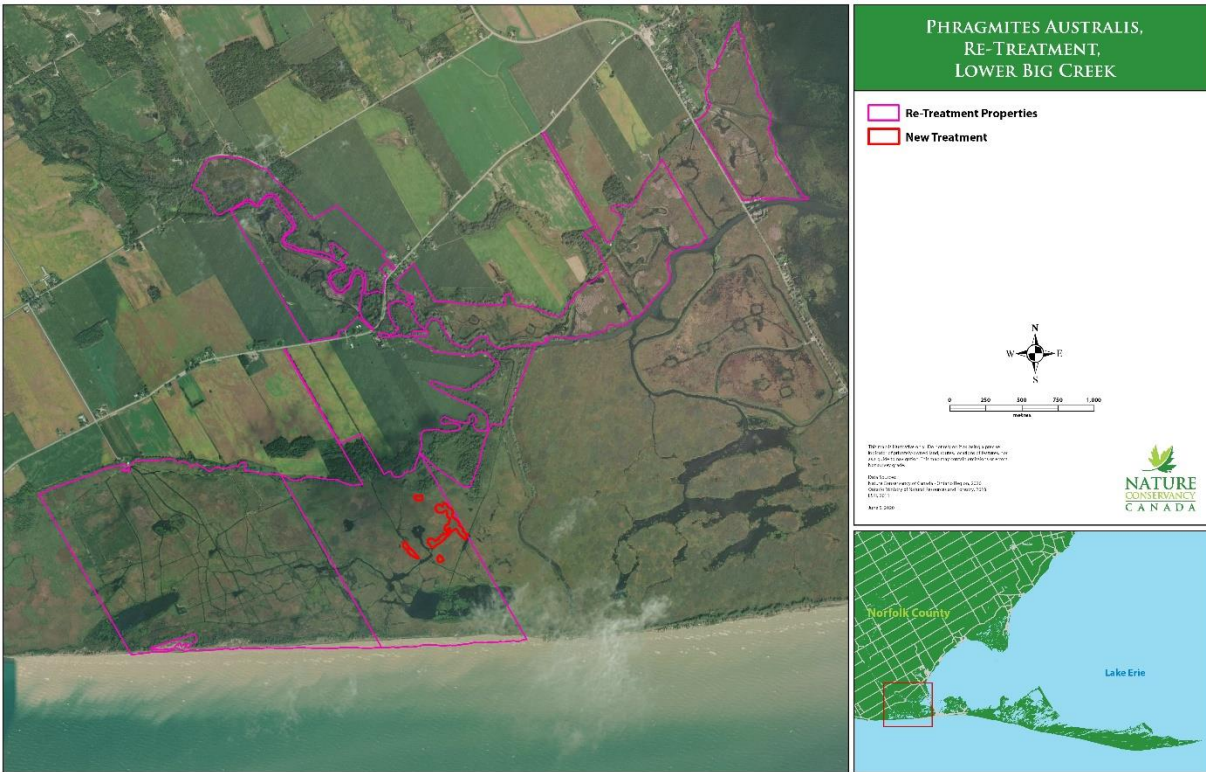


Figure A1. 2020 map showing potential re-treatment sites in the Lower Big Creek area wetland complex, to occur between August 15 and October 31st, 2021. No new treatment planned for this area in 2021.

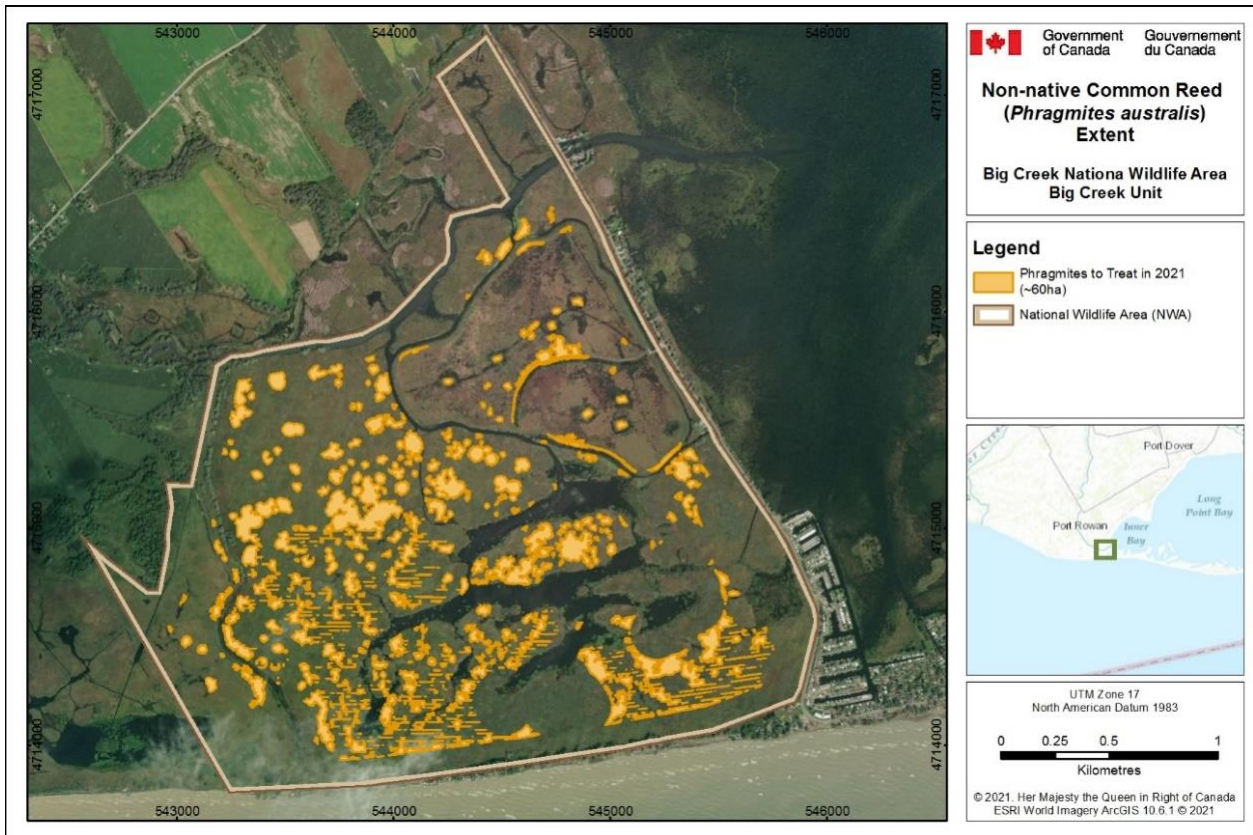


Figure A2. New treatment and potential retreatment areas on federal land within the Big Creek National Wildlife Area.



Figure A3. Phases where properties will be surveyed for Phragmites and treated as necessary. Most sites are dry and not connected to waterways but rather low-lying areas at farm field edges etc. These sites are more than 1000m from the water intake system.