

VICTORIA LAKE PESTICIDE USE PERMIT 2022-2025

TREATMENT PLAN

Prepared by: Becky Brown, P.Ag. and Denise McLean, P.Ag.

Original: March 30, 2022

Revised: Dec. 13, 2022

INTRODUCTION

Knotweeds present a significant threat to aquatic ecosystems, including fish and wildlife habitat, bank stability and water quality. Knotweed also presents a threat to the structural integrity of infrastructure, such as bridge abutments, roads and pumps. Knotweed is present in limited amounts, and it is imperative to control these infestations while they remain small, to protect the important values of the Marble River system.

This Pesticide Use Permit (PUP) proposes to continue the work previously done under PUP #738-0028-18/21, which treated knotweed infestations within the Pesticide Free Zone adjacent to Victoria Lake and rights-of-ways using Roundup WeatherMAX (a.i. glyphosate) foliar and stem injection applications.

The 2022 to 2025 PUP will use both Roundup WeatherPro (a.i. glyphosate) and aquatic herbicide Habitat Aqua (a.i. imazapyr). The glyphosate product change is due to manufacturer label changes which now permit stem injection to occur only under the Roundup WeatherPro label. This management plan proposes to treat all knotweed clones detected growing in or adjacent to Victoria Lake, Marble River and adjacent rights-of-ways to protect the Marble River system. Wherever feasible, foliar application methods will be used to limit the volume of herbicide entering the environment. Stem injection using Roundup WeatherPro may be required in some instances if the knotweed foliage cannot be effectively accessed using foliar application. Habitat Aqua is specifically formulated for use in and adjacent to aquatic environments and will be the preferred product for knotweed treatments during the 2022 to 2025 treatment period. These treatments will occur as foliar applications. The addition of Habitat Aqua to the management plan will also limit the risk of knotweed developing herbicide resistance, as Habitat Aqua chemistry and modes of action are different from that of the glyphosate products. In addition, Habitat Aqua is well-suited for knotweed treatments not only to water's edge but also emergent, wetted plant applications. All foliar treatment applications will be made as targeted spot treatments with the intention of limiting drift and non-target vegetative damage.

The extent of knotweed adjacent to Victoria Lake is currently limited to a total area of 0.35 ha, occurring sporadically on rights-of-ways adjacent to Victoria Lake and the Neucel pump station heading north up the west shore of the lake, with the most northern clone located at the outflow of the Marble River where it eventually connects to Alice Lake. The total area proposed for inclusion in the PUP is significantly larger at 1700 ha, including Victoria Lake in its entirety and the segment of Marble River that connects Victoria Lake to Alice Lake. The large PUP boundary will allow for the treatment of newly detected knotweed clones that may be introduced to a new part of the lake or river as a result of high-water events or disturbance. The limit to total treatment area each year will not exceed 1 ha, however it is anticipated that the actual annual treatment area will be significantly less based on currently known knotweed locations.

The management plan includes surveys, three treatment passes of all sites (known and newly detected) and ongoing monitoring annually.

The goal of the Victoria Lake Knotweed Management Plan is to prevent knotweed from expanding outside of Victoria Lake and eventually eradicate knotweed from Victoria Lake in its entirety.

TREATMENT AREA & SITES

Knotweed is present in limited amounts along the west shoreline of Victoria Lake, at the mouth of the Marble River segment that connects Victoria Lake to Alice Lake, and a pump station and right of way. The general area for this project includes the shoreline of Victoria Lake including the mouth of the Marble River at the south end and Link River to its outflow into Alice Lake (See Appendix 1 – Project Area & Treatment Sites). As well, it includes the Neucel right-of-way near the mid-western shore of Victoria Lake and around the private cabins and buildings in that area. Note, the Province has authority to treat knotweed in the vicinity and adjacent to private cabins on the Victoria Lake shoreline. The recreational cabins on Victoria Lake are privately held under Provincial Public lease agreements, whereby the cabin owners are responsible for structure maintenance and the Province is responsible for vegetation management adjacent to the private structures.

The project area includes locations where no knotweed has been observed in the past as well as known sites which will be surveyed and treated if new growth appears (See Table 1. Treatment Site Summary).

Table 1. Knotweed Treatment Site Summary Victoria Lake, December 2021.

Site ID	UTM Zone	UTM Easting	UTM Northing	Site Location
344004	9	613176	5587364	RDMW - Victoria Lake - site is located on exposed lakeshore on the north end of Victoria Lake approximately 40 m southeast of the weir
313530	9	612944	5581915	Regional District of Mount Waddington; From Port Alice Pulp Mill, go E along Port Alice Main. At the intersection with W Main, continue straight onto the unnamed road. The site is at the end of the road, centered around the boat launch
240055	9	612462	5581518	RD Mount Waddington; approx. 4.5km south of Pt Alice; located east of private cellulose plant, approx. 2.8 km up Victoria Lk pumphouse rd ("connector road"); Western Forest Products is the Crown permit holder for this road.
313529	9	612761	5581829	Regional District of Mount Waddington; From Port Alice Pulp Mill, go E along Port Alice Main. At the intersection with W Main, continue straight onto the unnamed road (access road to Victoria Lk and pump station). The site is along the side of this road.
316603	9	612859	5582670	RD Mount Waddington; Victoria Lk west shoreline and around cabins.
316604	9	613012	5582484	RD Mount Waddington; Victoria Lk; west shore and around private cabins (Crown land leases).

HERBICIDE PRODUCTS

Table 2. Proposed herbicide and adjuvant products to be used for Knotweed treatments at Victoria Lake, 2022 to 2025.

Trade Name	Habitat Aqua	Aquasurf Adjuvant	Roundup WeatherPro
Active Ingredient	Imazapyr	Surfactant blend	Glyphosate
PCP #	32374	32152	33653
Application Rate	3.0 to 4.68 L/ha (foliar)	0.25% v/v (added to Habitat Aqua)	6 L/ha (foliar), 5 mL/stem (injection)
Comments	Well suited for use in and adjacent to aquatic ecosystems and will provide protection from herbicide resistance developing in the knotweed by using a different herbicide chemistry as compared to glyphosate products. This is the preferred herbicide product for use on and adjacent to Victoria Lake.	Used with Habitat Aqua to achieve better efficacy.	Retained as a secondary foliar treatment option or where stem injection is the preferred treatment method at a given site.

METHODS

Several factors can influence treatment efficacy and it is important to have access to more than one herbicide and treatment method to ensure effective control can be obtained under varying site and growth conditions over the course of the growing season.

Foliar Spray

- Selective, foliar spot applications are the preferred treatment method as it minimizes the volume of herbicide product entering the environment. Foliar spray applications can be made by backpack or quad mounted sprayers. These sprayer options will be used to make careful targeted applications, directly and uniformly to the leaves of invasive knotweed.
- Habitat Aqua is specifically formulated for use in and adjacent to aquatic environments and will be the preferred product for knotweed treatments during the 2022 to 2025 treatment period. These treatments will occur as foliar applications. Targeted foliar spray applications of Habitat Aqua in and adjacent to water are considered safe for aquatic life and the overall environment.
- RoundupWeatherPro will be retained as a secondary foliar treatment option and is not suitable for use over water. In order to eliminate incidental contact with water when using RoundupWeatherPro in close proximity, drift shielding in the form of a nozzle cone or wind barrier will be employed.
- Foliar applications in close proximity to culturally sensitive or recreational structures will employ drift shielding in the form of a nozzle cone or wind barrier if deemed necessary by the applicator.

Stem Injection

- Applied through hand-held injection devices that deliver specified amounts of herbicide to hollow-stem plants (knotweed spp.)
- Inject 5 mL per stem of concentrated RoundupWeatherPro into each cane between the second and third internode. Most effective if stems are at least 1.25 cm in diameter.
- Plants are to be actively growing at the time of application.

Timing

- June to September - Treatment application will occur during the dry season when water levels will not rise for an extended period following pesticide application, allowing for the breakdown of glyphosate (half-life 32 days when not exposed to water).

TREATMENT HERBICIDE & APPLICATION METHOD SELECTION

Non-chemical treatment options were critically evaluated for efficacy in treating knotweed during project development, along with the potential unintended risks. The outcome of this evaluation determined that the proposed herbicide products will achieve the greatest treatment efficacy while minimizing impacts to adjacent ecosystems, aquatic life and the public.

Herbicide and application methods were selected based on chemistry suitability to site type, treatment efficacy, product toxicology, limiting the quantity of herbicide entering the environment and potential non-target effects.

All knotweed sites (existing and new) will be monitored throughout the growing season for treatment efficacy and non-target effects.

Foliar Spray

Wherever feasible, foliar application methods will be used to limit the volume of herbicide entering the environment. Habitat Aqua is specifically formulated for use in and adjacent to aquatic environments and will be the preferred product for knotweed treatments during the 2022 to 2025 treatment period. These treatments will occur as foliar applications. All foliar treatment applications will be made as targeted spot treatments with the intention of limiting drift and non-target vegetative damage.

Stem Injection

Stem injection may be selected as the preferred treatment method in the following circumstances:

- Where knotweed foliage cannot be effectively accessed using foliar application
- Where Habitat Aqua herbicide is not available and the knotweed clone occurs in close proximity to water or a private residence and shrouding/shielding, to prevent foliar drift, is not practicable
- Where foliar applications are not achieving effective control of knotweed. For example, if treatment monitoring after the first treatment pass is indicating low efficacy, the stem injection method may be preferred for the second treatment pass to ensure sufficient translocation of herbicide to the root system.

Table 3. Summary of herbicide site type and application method suitability at Victoria Lake, 2022 to 2025.

Site Type	Herbicide	Application Method	Comments
Emergent, wetted plants	Habitat Aqua	Foliar	Habitat Aqua is a registered aquatic herbicide formulated to be used for the treatment of emergent plants in and adjacent to water. The toxicology data indicates that there are no ill effects to aquatic life when used in accordance with the herbicide label.
Plants occurring within 5 m of wetted edge to High Water Mark	Habitat Aqua	Foliar	Preferred herbicide and method for this site type.
	Roundup WeatherPro	Foliar with shrouding to prevent risk of drift.	Shrouding may include nozzle cone or wind barrier.
Plant foliage that cannot be effectively accessed using foliar application	Roundup WeatherPro	Stem injection	Roundup WeatherPro is currently the only herbicide product registered for the use of stem injection in Canada.

Appendix 1 – Map: Victoria Lake Project Area & Treatment Sites

