IPCC
INVASIVE PHRAGMITES CONTROL CENTRE

A Not-for-Profit
Facilitating Effective, Efficient and Environmentally Responsible Control Programs

Sundridge and Area Japanese Knotweed Management Plan

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Cover photo: Japanese Knotweed re-growth at a site that was cut and tarped by volunteers from the Lake Bernard Phragmites Community Group, August 2023 (Photo: Marilee Koenderink).

Introduction

Japanese Knotweed (Fallopia japonica), is an aggressively spreading invasive woody plant found throughout Ontario. Japanese Knotweed can severely degrade the quality of wetland and riparian habitat by outcompeting native plants, forming dense thickets which negatively impact invertebrates, amphibians, mammals and birds (Anderson, 2012). Additionally, this sturdy, bamboo-like perennial also causes significant issues for humans. The plants tend to grow along the banks of rivers and creeks blocking access for recreational use and shoots are capable of growing through asphalt and concrete foundations of homes, bridges and other structures, causing significant damage. The June 12, 2015 issue of Macleans magazine contains an extensive article entitled 'Japanese Knotweed: The plant that's eating B.C.' which includes numerous issues this plant is causing in that province including reduction of housing prices.

In 2022, members of the Lake Bernard Phragmites Working Group (LBPWG) observed Japanese Knotweed along Albert Street and at an aggregate extraction site. Both sites were treated with herbicide in July of that year by the crew from the Invasive Phragmites Control Centre (IPCC) when they were in the area controlling invasive Phragmites. Control efficacy was determined to be quite high the following growing season with only a small number of live plants remaining. The IPCC crew treated these plants in July 2023 when they were back in the area controlling Phragmites. Members of the LBPWG also undertook mechanical control (cutting and tarping) at two other sites in 2022. And, in 2023 they began mapping Japanese Knotweed occurrences throughout Sundridge and the surrounding area locating 23 stands (Figure 1). The largest infestations were found along the banks of the creek near Barrie Street, Park Street, and Belmont Street in the village of Sundridge (Figure 2). These patches will be the most challenging to control due to their large size, density, and difficulty accessing. This Management Plan provides a strategy to guide effective control of, not only this population but, all of the stands within Sundridge and the surrounding area with the goal of eradication.

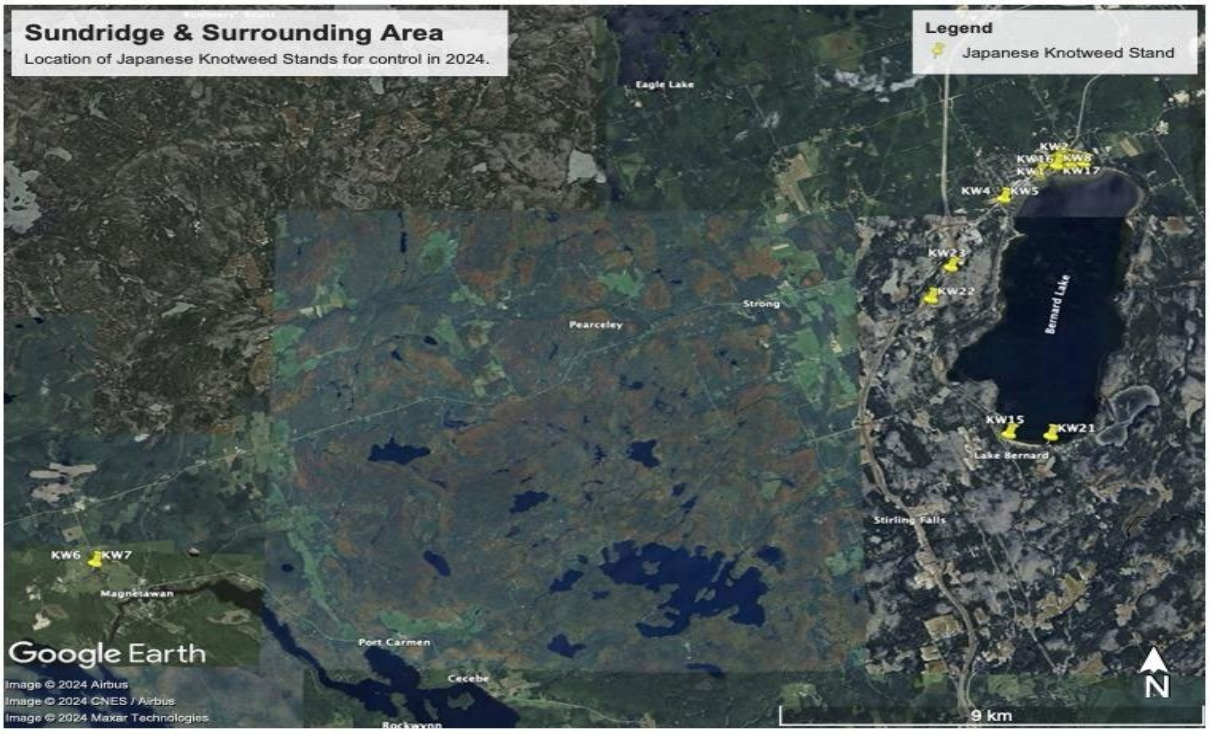

Figure 1: Locations of Japanese Knotweed observed in Sundridge and the surrounding area in 2023.

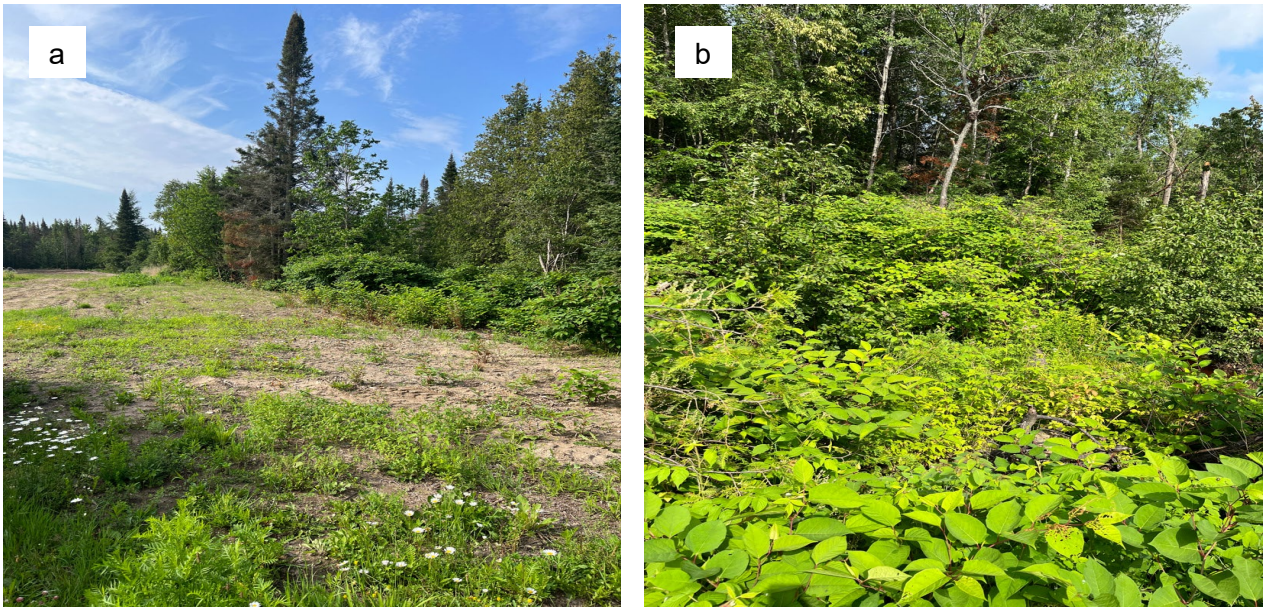

Figure 2. Japanese Knotweed near a) Albert Street and b) Barrie St. Creek, Sundridge, Ontario. (Photo taken July 24, 2023, by IPCC).

Japanese Knotweed Control Options

Much of the information available for effective Japanese Knotweed control is obtained from the United Kingdom and the United States and is summarized within the Provincial Best Management Practices document (hereafter referred to as the BMP): Invasive Japanese Knotweed (*Fallopia japonica)* Best Management Practices in Ontario (Anderson. 2012). Stand size, density, location, the presence of standing water, nearby Species at Risk or other high-value species, proximity to residences, buildings, structures, and recreational areas should be taken into consideration in the control planning process. Mechanical methods such as mowing/cutting, digging/excavation, and tarping are mentioned in the BMP. These methods are not generally effective without complementary use of herbicide and according to many sources, effective control of Japanese Knotweed cannot be achieved without the use of herbicide. While cutting, tarping, digging or other physical disturbances to the plant may at first appear effective, these activities tend to stimulate growth of the belowground structures causing new shoots to appear several metres from the original patch. If the patch is located close to a building may result in new shoots, to grow into the foundation. Shoots can also poke through heavy tarps that have been placed over cut areas. It is important to note that a 1cm viable plant piece is capable of establishing a new colony making proper disposal of all cut material very important. Clean North, a grass roots organization from the Sault Saint Marie/Algoma Region created a website to raise awareness about why the use of mechanical methods to control this invasive plant may not be appropriate (https://www.cleannorth.org/2023/08/02/do-your-homework-before-touching-invasive-japanese -knotweed-or-you-could-make-the-problem-much-worse).

Mechanical Control

The mechanical methods for controlling Japanese Knotweed are limited due to this plant's highly effective survival strategies. Cutting or pulling the plants tends to stimulate vigorous belowground growth and plant roots and rhizomes can grow several metres vertically and horizontally to obtain water and nutrients needed to survive. For small, low-density infestations, cutting the plants at the soil level and immediately covering the area with heavy tarps may provide some measure of control (Figure 3). Removal of the shoots does deprive the patch of sunlight hence temporarily removing an energy source through photosynthesis. And, covering the area with a dark, thick tarp creates a physical barrier making it difficult for new shoots to grow upright. However, when the aboveground plant parts are removed, this stimulates growth of the belowground structures causing new shoots to emerge several metres outside of the tarped area. The cutting and tarping method can be very labour intensive (Figure 4). And, because even small pieces of the plants (1 cm) can remain viable, care must be taken to ensure that all of the cut plant material is collected and disposed of in an area where it can be contained and not allowed to re-establish. Composting is not recommended since many viable plant parts may sprout roots and shoots establishing a new colony. Drying out the plants or allowing them to rot in plastic bags in the sun provide two

options for safe disposal of cut material. Thick, heavy tarps are required and should be secured to ensure they remain in place. Typically, these tarps will need to be left for at least three to five growing seasons and in some cases as long as 10 years has been required. It is important to note that tarping also creates higher than normal sediment temperatures affecting the native plant seed bank viability. Therefore, once the tarp is eventually removed, these areas will need to be seeded to re-establish desirable plant species and prevent other nonnative plants from establishing. The sites must be monitored on a frequent basis during the growing season to ensure the tarps remain in place and new shoots are controlled in a timely fashion. This method is only recommended for sites where use of herbicide is not an option. In some situations, it may be best to leave these patches undisturbed and focus on controlling new growth outside of the main patch to contain spread.

Figure 3: Tarped Knotweed stems after cutting and removal of above ground biomass (Photo taken by IPCC in 2020).

Figure 4: LBPWG volunteers cutting and tarping Japanese Knotweed at a site in Sundridge (Photo taken by LBPWG in 2023).

Excavation of a stand using a backhoe may be a feasible option in some situations such as an industrial site or other disturbed areas where there is not a concern with impacts to native plants, habitat or humans. According to the BMP, for this method to be effective, all of the belowground biomass must be removed. This usually involves excavation to at least a 2 m depth. The excavated material should **never** be used for top fill. Disposal may be feasible by creating piles on top of root barrier material in an area that can be monitored. The piles would best be covered with heavy tarps to discourage re-growth. New shoots would need to be controlled using herbicide. These piles should not be moved for at least 10 years to ensure no viable plant material remains. An alternative disposal method would be to dump the contaminated sediment into a deep pit (5 m or greater) that is lined with root barrier material. The contaminated sediment should be covered with root barrier material at least 3 m of top dressing.

Herbicide Control

Use of herbicides has been found to be the best option to control Japanese Knotweed regardless of stand size and density. In some cases, such as large, well-established stands, herbicide application provides the only viable control solution. In Ontario, the control of Japanese, and other invasive Knotweed species (Giant, Bohemian), can be undertaken using approved herbicides with the active ingredient glyphosate (VisionMAX-registration No. 27487; WeatherPRO-registration No. 27736) or imazapyr (Habitat Aqua). All of these products can be used on dry sites but, only

Habitat Aqua is registered for use over water. These herbicides are non-selective and care must be taken during application to mitigate harm to non-target plants particularly rare species. This can be managed through application technique such as paying attention to wind speed and direction, application method (wicking versus spraying), covering desirable plants and timing (Figure 5). Use of herbicide in dry sites such as natural areas, and parks requires a Letter of Opinion (LoO) from the Ministry of Natural Resources and Forestry (MNRF), under the Cosmetic Pesticides Ban Act (2008, S.O.C.11-Bill 64). Exemptions include golf courses, forests (must be 1 ha or larger and not connected to agricultural use), cemeteries, roadsides, stormwater management ponds, industrial sites, and health and safety reasons (ie. blocked site lines, flooding hazard, structural damage hazard). This permit requires the land owner to be the applicant and information about the licensed pesticide applicator, herbicide products to be used and sites to be treated must be included. If the Japanese Knotweed is located on both municipal and private lands a single LoO application can be submitted with landowner support letters attached. The IPCC can provide assistance with completing and submitting the LoOs. Use of the water safe herbicide, Habitat Aqua, to control any Japanese Knotweed growing in wet sites would require a Water Extermination Permit which is issued by the Ministry of Environment, Conservation and Parks (MECP). Unlike the LoO, this application is submitted by the applicator who must hold all appropriate licenses and insurance. The permit is only valid for one year and site location, size of area to be treated and, amount of Habitat Aqua required, must be included in this application. Although this product is safe for aquatic life and, there are no restrictions on swimming in areas that have been treated, there are strict controls prohibiting use within a 1 km zone of water intake for potable use. For private dwellings this can be mitigated by first obtaining permission, providing notice of application 24 hours in advance, not using water for 48 hours after application and provision of bottled water or other potable water supplies to the affected residents over this period.

Figure 1: Applying herbicide to Japanese Knotweed leaves using a backpack sprayer, August 2020 (Photo taken by IPCC).

The BMP recommends three treatments during the growing season, late May, early summer and again early July before seeds mature. This document also recommends cutting stalks between treatments and allowing the live plants to fully re-grow before the next application as this will help to stress the roots. Our experience with Japanese Knotweed control has found one treatment per season to be highly effective with follow up treatments on surviving plants in subsequent years. We strongly recommend that once the herbicide control program begins, touch up treatments occur on an annual basis until no live plants remain. For some sites, it may be possible to effectively control small remnant populations by repeatedly cutting new shoots throughout the growing season. This would work best for stands that initially had low density since the belowground biomass would be lower. We also recommend assessment of all sites for at least three growing seasons after no live plants have been observed to ensure Japanese Knotweed has been eradicated. Cutting and disposal of standing dead stalks is not necessary but, could take place for aesthetic reasons or to improve access into a large stand to make it easier to ensure complete herbicide coverage of live plants. This dead material can be piled on site. If moved to another location care must be taken to ensure that any surviving plants are not mixed in with this material. If only one herbicide treatment is feasible per year it would be best to target when the plants have fully grown but, before seeds establish (early to late July).

Control Strategy

There are currently 23 known Japanese Knotweed locations throughout Sundridge and the surrounding region. These range from <10 m^2 to 1,250 m^2 and are of varying densities. The largest infestations occur along the creek located near Barrie Street, Park Street, and Belmont Street in the village of Sundridge. These patches will be the most challenging to control due to their large size, density and difficulty for a crew to access as well as spot any isolated plants among the thick native vegetation (Figure 6). These patches are located on both sides of the creek and pose the greatest concern due to the high probability to spread downstream. For this reason, these patches should be of highest priority to control. Herbicide application by a crew using backpack spray units would be the only viable control option. Both WeatherPRO and Habitat Aqua would likely be required. Although Habitat Aqua could be used on the dry sections, the active ingredient in this herbicide (imazapyr) can cause mortality of mature trees. The glyphosate-based herbicides do not pose this risk and, unlike imazapyr, do not impede native plant seed germination resulting in quicker and more diverse native plant recovery. WeatherPRO could be used to treat plants from the edge of the creek inland while Habitat Aqua would be used to treat the plants in the water.

Figure 2: Knotweed found in the Barrie St. Creek. (Photo taken July 24, 2024 by IPCC)

It is recommended that the remaining 22 sites also be controlled with herbicide. It is estimated that all 23 sites could be treated in three days by a two-person crew using backpack spray units. Timing of herbicide application would likely be best in July as the plants will be fully grown but the seeds would not yet be mature. Volunteers from the LBPCG may wish to cut the standing dead stalks later in the summer or fall for aesthetic or safety reasons. The following year these sites should be assessed and live plants treated. The amount of herbicide required after the initial application would be significantly reduced (> 90%) and a two-person crew could likely treat all sites ~ 2 days. By the third year, many of the smaller, low density sites should be devoid of any new growth with only those larger, high density stands likely requiring touch up with herbicide. If a site cannot be controlled using herbicide then there would be two options: 1) leave the patch undisturbed and monitor and cut new plants emerging outside of the patch or, 2) if the patch is small, low density and not in flowing water, cut and tarp and monitor for new shoots. This second option is not recommended if the stand is in close proximity to buildings or other structures as it may stimulate growth that creates more issues.

Additional Actions

Japanese Knotweed is a regulated species in Ontario meaning that it is illegal to import, breed, sell, lease or trade. In addition to this regulation, a municipality can pass a property standards bylaw under the Building Code Act to address weeds deemed noxious or a threat to the environment or human health and safety. Japanese Knotweed can also be regulated due to concerns with flooding and infrastructure damage (see BMP document for more information).

In order for the Japanese Knotweed sites that are in close proximity to Lake Bernard to be controlled, an exemption to the Corporation of the Village of Sundridge By-Law No. 2022-016 prohibiting the use of chemical fertilizers, herbicides and pesticides within 50 metres of the lake would need to be made. This exemption would allow approved herbicide treatment of problematic invasive plants such as Japanese Knotweed (and Phragmites australis) when there is no other viable control option available. A formal control plan could be required to be submitted to Council for approval along with other stipulated requirements in order to safe guard the intent of the By-Law.

Establishing an Early Detection, Rapid Response program throughout the region would greatly assist with reducing problematic invasive plants and at significantly reduced costs long term. Once the main infestations have been controlled, having local Exterminators available to target small populations would greatly increase the ability to eradicate Japanese Knotweed from the area and maintain long term protection. Municipal staff or local contractors with the appropriate Extermination Licences could undertake this work. The IPCC can undertake training and assist with the establishment of such a program.

Members of the LBPCG have done an excellent job in not only recognizing that they had Japanese Knotweed in their community but, also educating the community about the significant threat it poses and should be commended. Their efforts could be supported by increasing community awareness by including information in the property tax mail out or by posting information signs at community parks, beaches or roads. Reducing further spread due to heavy equipment use or construction activities could be addressed by promoting the Clean Equipment Protocol (Halloran et al. 2013.) which reduces spread of numerous other problematic species.

Documents Cited

Anderson, Hayley, 2012. Invasive Japanese Knotweed (*Fallopia japonica* (Houtt.) Best Management Practices in Ontario. Ontario Invasive Plant Council, Peterborough, ON).

Halloran, Joe, Anderson, Hayley and Tassie, Danielle. 2013. Clean Equipment Protocol for Industry. Peterborough Stewardship Council and Ontario Invasive Plant Council. Peterborough, ON.