

# Himalayan Balsam

(*Impatiens glandulifera*)

Best Management Practice Technical Document for Land Managers

March 2021

## - DISCLAIMER -

This document conveys specific information relating to invasive plant control practices that have been recommended by leading professionals across Ontario. It contains the most up-to-date research and knowledge available at the time of publication and reflects current provincial and federal legislation. It is subject to change as legislation is updated or new research findings emerge and is not intended to provide legal advice. Tailor the timing of control to your region.

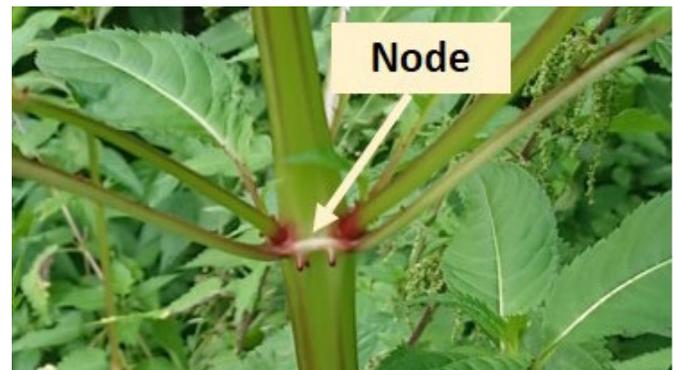
Use this document after you have monitored, assessed your area and ensured that the control options listed in this document are permitted and appropriate on your site.

## Strategy and Cautions

- HB is found along areas adjacent to streams (riparian), up to the edges of watercourses, and in damp woods. This annual plant dies in the fall, leaving riverbanks bare and prone to erosion.
- When disturbed or touched, the mature seed pods explosively release seeds, often several metres from the adult plant. Each seed pod is 3-5 cm long, containing up to 16 seeds.
- Since HB is primarily spread by seed, control should focus on preventing seed set.
- If not destroyed by winter flooding, the seed bank lasts about 18 months. Therefore, two years of control should eradicate HB if there are no further infestations from surrounding areas.
- The shallow root system and moist soils where HB is found allows the plant to be easily removed by pulling. Aim to remove all plants/leftover plants or inaccessible areas (e.g. steep riverbanks) can quickly recolonize the area.
- As HB is primarily found in sensitive aquatic environments, control with heavy machinery is not recommended. Avoid techniques that trample or damage soil as disturbance increases the chance for invasive species to move in or for HB to recolonize.
- Since HB commonly spreads by seed floating downstream, control should be targeted along a watercourse starting in the upper reaches first to limit dispersal and prevent seed from being carried downstream to previously managed sites.
- Hand pulling and cutting below the first node are the most effective and appropriate methods for non-chemical control, particularly in aquatic habitats where chemical control would be prohibited.
- New flowering stems can emerge after cutting so monitoring and follow-up treatment are important.

**Caution:** Conducting control following seed set is not ideal, as seeds can explode and disperse easily when touched. Aim to complete work before seed pods develop or mature (end of July to October). If seeds have already developed, it is better to wait to conduct control the following season.

**Caution:** Make sure that all equipment, boots, clothing, etc. are cleaned at the site to ensure seeds are not transported from the site. Do not move soil that could contain seeds, especially from riparian areas. See the Ontario Invasive Plant Council's Clean Equipment Protocol for more details.





### Management of Small Populations ( $\leq 50$ plants or $\leq 2$ m<sup>2</sup>)

Hand pulling or cutting is usually the most effective and appropriate control option, as HB is often intermixed with desirable native vegetation and found in sensitive riparian sites that cannot be mown or sprayed with herbicide. Using gloves, the base of the plant can be carefully and easily pulled from the ground, removing as much of the root as possible. They are best pulled before and during flower (late May to mid-July). The use of a hand tool (e.g. spade) can assist in digging roots in compacted soil. The site can be tarped or mulched after removal to prevent re-growth. Cutting helps reduce soil disturbance. It is best practice to cut Himalayan balsam very close to the soil surface, below the lowest node. Otherwise, it can regrow and flower later in the season, with possible vigorous regrowth of stems and seeds. The top of the plant may also be cut to prevent seed formation. Cut once while in full flower but before seeds emerge (early to mid-July). If management cannot be postponed and seeds are present, place a bag over the top while cutting to prevent the pods from exploding and dispersing. Following digging or cutting, continue to monitor the site for any re-growth.

### Management of Large Populations ( $> 50$ plants or $> 2$ m<sup>2</sup>)

Mowing or brush cutting at the base can be suitable in non-riparian sites, and in areas free of shrubs where disturbance can be minimized. Conduct in June or July before the seed pods form, cutting as close to the ground as possible. Where applicable, a foliar application of a glyphosate-based herbicide can also be effective.

## Legal Considerations and Regulatory Tools for Chemical Control

Herbicides must be applied in accordance with the federal *Pest Control Products Act*, the *Ontario Pesticides Act*, ON Regulation 63/09 and in accordance with all label directions. Ensure you have the most current label and are aware of any re-evaluation decisions. The easiest way to find a chemical label is to type “PMRA label search” in any major search engine. Only licensed pesticide applicators are legally allowed to apply restricted pesticides in Ontario.

Ontario’s Cosmetic Pesticide Ban prohibits the non-essential use of pesticides (Commercial or Restricted) on land. Exceptions exist to allow the use of these herbicides for control of plants, such as HB, that are detrimental to the environment, economy, agriculture and/or human health. To qualify for these exceptions, specific criteria must be met and appropriate ministry approval is required.

**Table 1:** Exceptions to the Cosmetic Pesticides Ban, which may be applicable for control of HB.

<b>Forestry:</b>	This species can outcompete other native species for light, nutrients and resources. This exception may apply to treed areas greater than 1 hectare.
<b>Natural resource:</b>	This species displaces native wetland species, out-competing them for light, nutrients and resources.

## Herbicide Selection and Application

Chemical control for HB is effective, but is not usually possible, nor advisable as this species is primarily found in wet sites. There are currently no pesticides available for use in or near water in Ontario for HB control. For areas where herbicides are prohibited, manual methods may be used instead and chemical control applied in dry, suitable areas only. When chemical control is used, professionals recommend the use of a glyphosate-based herbicide. Note that glyphosate is not to be applied using hand-wicking or hand-daubing methods.



**Table 2: Chemical control techniques recommended by experts for Himalayan balsam.**

Chemical Control Method	Chemical and Concentration	Timing and Application	Details
Foliar spray	Glyphosate (2-3% solution*).	Spring, when leaves have emerged and before flowering.	Use a backpack sprayer to completely cover the leaves. Low pressure and larger droplet size are recommended. Exercise caution if Himalayan balsam is interspersed with desirable species. A long-lance sprayer may help in difficult-to-reach areas.

\* Based on a product originally containing a concentration of 540 g/L of herbicide. Please read the label in full before use to ensure that these recommendations meet the requirements of the product you have selected.

## Himalayan balsam treatment times:

Manual Control	J	F	M	A	M	J	J	A	S	O	N	D
Chemical Control	J	F	M	A	M	J	J	A	S	O	N	D

\*Dark green: optimum treatment time. Light green: less optimal treatment time.

## Disposal:

*Offsite disposal:* Do not compost viable plant material (e.g. seeds) as only high temperatures kill HB seeds. Solarize flowers or seed heads in sealed black plastic bags or yard waste bags covered with a dark-coloured tarp and leave in direct sun for 1 to 3 weeks. Then, send bagged material to landfill or to a certified high-heat compost program.

*On-site disposal:* If flowers or seed pods have not formed, pulled or chemically treated plants can be left on-site to dry and compost. HB is soft and easily damaged and will not regrow once dried thoroughly. The piles can be left exposed to air or covered with a tarp. To reduce any chance of re-rooting from nodes (more common in cool or wet weather), place tarps underneath compost piles or elevate the pile above ground and dry thoroughly.

## Rehabilitation and Monitoring:

Himalayan balsam re-seeds easily and will readily colonize disturbed soil. Re-introduce native species post-control to reduce available space for HB and to enhance beneficial mycorrhizal fungi in the soil. Consider planting with native perennials that are well-suited to the growing conditions on the site or encourage native species already present on the site to recolonize, possibly assisting by spreading seed. If planting/seeding is not feasible, tarp or mulch the site after removal to prevent re-growth. Follow-up monitoring and removal of new growth throughout the season is crucial for successful control. Note that removal along riparian areas can make it easier for a more aggressive invasive species to colonize. Conduct regular inspections of the banks in spring and hand pull any germinating HB. Along watercourses, HB tends to outcompete native vegetation in areas with high nutrient load (eutrophication). Decreasing eutrophication can allow locally adapted species to outcompete stands of Himalayan balsam.