

## **Managing Invasive Non-Native Plants in a Riparian Environment**

### **A guide to best practice management of Invasive Non-Native Riparian Plants: Giant Hogweed, Himalayan balsam, Japanese knotweed.**

The management of invasive non-native riparian weeds can be a confusing subject, with many different organisations and individuals using a range of different techniques. Although a lot of these techniques work well, many do not and can lead to an increase in the spread of the very plants that are being controlled. This best practice guide has been developed following consultation and practical experience of INNS management. The information in this guide is for use by all who either currently manage or plan to manage invasive non-native riparian plants.

#### **Ensure you are operating within the law:**

Before undertaking any INNS management you should discuss your plans with the National Park and Natural England as sections of the stream and its tributaries may be designated as Special Areas of Conservation (SAC) or Special Sites of Scientific Interest (SSSI) which require special permissions. The use of herbicides in or near water can only be carried out with permission from the Environment Agency (England) and you must only use an aquatically approved glyphosate based product. Information of approved herbicides can be found through the Health and Safety Executive.

BASIS Professional Register. Appropriate products will state on the product label under uses: enclosed waters, open waters or on land immediately adjacent to aquatic areas. If this is not stated on the product label then it is not allowed for use in an aquatic location. UK law requires those who wish to use herbicides to have the appropriate training and qualifications (previous 'Grandfather Rights' for those born before 31st Dec 1964 are now redundant). In order to use herbicides within the riparian zone operators are required to hold the National Proficiency Test Councils PA1 (foundation module) and PA6+AW (use of applicators near water) qualifications (additional qualification required to spray from boats). If you are not the landowner consult with the owner whose land you are working on or adjacent to as they may have restrictions placed on their land which can affect your choice of control technique. Prevent the further spread of INNS by ensuring you **Check, Clean and Dry** all equipment and clothing after carrying out management work and between moving to new sites.

#### **Health and Safety:**

Every individual handling herbicides must have the NPTC PA1, PA6 and AW qualifications. This training will have fully equipped you and covered all aspects of health and safety in relation to the handling, administering and storage of pesticides. Access to river banks may be difficult and not follow maintained paths, therefore familiarise yourself with the site and take heed of any risk assessment and guidance provided before undertaking any work. Let someone know of your location and time you are expected to start and finish and carry a mobile phone for contact and any emergencies.

**When planning to carry out an eradication programme it is important to take into account the following when selecting which methods and treatments you'll be using:**

- Health and safety of work being undertaken.

- Quantify the area to be brought under management.
- Correct timing and weather conditions for the treatment.
- Proximity to water courses and other species of plants growing in the vicinity
- Proximity to protected land (or organic land).
- Strategic working - clear from the source of infestation, working downstream.

### **Himalayan balsam *Impatiens glandulifera***

Himalayan balsam is the tallest annual plant in the UK growing up to 3m high, germinating, flowering and producing seeds within one year. To successfully manage Himalayan balsam, you must prevent the plant producing seed in order to deplete the seed bank. Himalayan balsam plants can produce up to 800 seeds per plant and a seed can last up to 2 years in the soil. A management plan should therefore be planned to take place annually for at least 3 years to give the best opportunity at eradication.

**The following methods can be used to manage Himalayan balsam in a riparian environment:**

**Hand pulling:** a thorough and highly successful method.

- On a river ensure you always work in a downstream direction from the source of infestation.
- Hand pull before plants go to seed in late July/August.
- Pull the plant from the base, the shallow root system is easy to pull out.
- Shake off excess soil and then break the stem below the lowest node and crush up.
- Pile plants away from the river's edge to decompose naturally.
- Pulled plants can also be hung above ground off vegetation or fences allowing them to dry out and decompose.
- Revisit sites as often as possible during the summer months (once a week/twice a month depending on the initial scale of infestation).

**Cutting:** effective for dense monocultures

- Tools such as weed slashers, brushcutters, mowers, hedge cutters and scythes are all suitable for cutting Himalayan balsam. Strimmer line is often not strong enough and so brush cutting discs are more effective.
- Cutting will only be effective if the plant is cut below the first node, as close to the ground as possible.
- Cuttings can be left in position or raked into piles to decompose naturally.
- Himalayan balsam has a high sap/water content and so when cutting protective clothing is advised in case your skin is sensitive to the sap.

**Spraying:** glyphosate based herbicides work effectively on Himalayan balsam. Herbicide use should only be considered if manual control techniques are not possible.

- Spraying should only take place before the plant has flowered in order to protect pollinating insects.
- Herbicides can only be applied by qualified operators who have obtained their certificate of competence (PA1, PA6 + AW)
- Spraying will affect a lot of non-target vegetation and so therefore should only be considered as a last resort in less densely infested areas.

**Grazing** : effective if cattle or sheep are placed on the site early enough. This option is not always the most suitable on the riverbank due to issues with bank erosion and overgrazing.

- Cattle, sheep and goats are all effective grazers.
- Grazing can be carried out from early May- August to ensure both early and late germinating plants can be grazed.

### **Japanese knotweed *Fallopia japonica***

Japanese knotweed is a tall, vigorous herbaceous perennial which grows up to 3m tall in dense thickets. Its extensive rhizome (root) system can grow up to 7m a year and down to 3m deep. Knotweed plants in the UK tend to not produce viable seeds and only spread vegetatively (although there are known to be viable hybrids). It can regenerate from a fragment of green stem or rhizome as small as a fingernail therefore it is very important that the plant is not cut or the soil disturbed during treatment. All plant material once disturbed and waste containing Japanese knotweed is considered as a 'controlled waste'. If moved off site it must be disposed of at an appropriately registered landfill site, by a licensed haulier. Treatment of Japanese knotweed in situ should be carried out where possible.

**The following methods can be used to manage Japanese knotweed in a riparian environment:**

**Spraying:** glyphosate based herbicides are absorbed through the leaves and translocated to the root system (rhizome) killing the plant from the ground up. Spraying programmes for JKW should last no less than 3 years due to the extensive rhizome system.

- Timing is very important with the best results achieved August-October when the plant is fully grown. This ensures the herbicide is taken into the rhizome as the plant will be putting its efforts into storage and not new growth.
- Spraying young growth in May-June is a possibility but it will need to be retreated again in September thus duplicating effort and extra herbicide use making it a more expensive and less environmental friendly option.
- Both the top and undersides of the leaves should be sprayed and spraying should be avoided if possible once the plant has flowered to avoid interfering with pollinating insects.
- The use of extendable lances ensures good coverage of larger stands where access is limited.
- Cutting back dead stems in winter Dec-Jan can make access to spraying easier after the first year's treatment. Dead stems should be stacked to rot naturally or burnt.

**Stem injection** : a direct injection of glyphosate if given into each stem. A useful method for small stands and for use in sensitive areas.

- A specialist stem injection kit is set up to deliver a specific dose of herbicide per stem.
- Method only suitable on fully grown stems over 2cm thick and most effective if carried out in late summer or early autumn.
- The stem should be injected ideally between the 1st and 2nd nodes which are near to the ground.
- A marker is useful to mark which stems have been treated to avoid overuse of herbicide.
- Revisit the site after 3 weeks to retreat any missed stems.

**Biological control:** A psyllid insect called *Aphalara itadori* is currently on trial at a selection

of sites in England after being passed through lab trials. This native pest in Japan keeps knotweed in check and after being tested in the UK it appears to not attack native plants and is therefore being trialled as a biological control for Japanese knotweed growing wild in the UK. The bug's efficiency adaptability to life in the UK is still not clear and it will take a few more years to determine whether this is a viable management method for Japanese knotweed in the UK.

### **Giant Hogweed *Heracleum mantegazzianum***

Europe's tallest perennial herbaceous plant which can grow up to 5 metres high forming a dense canopy shading out other vegetation. Plants persist for up to 5 years flowering once in late spring/early summer setting up to 50,000 seeds per plant. Seeds can be viable for up to 15 years and therefore management of this plant is long term. **HEALTH WARNING: the plant sap can cause a severe reaction on contact with skin. It contains a phototoxic compound which can cause burning and blistering of the skin which can recur for many years. Contact with eyes can cause temporary or permanent blindness. Full PPE must be worn at all times when working with this plant.**

**The following methods can be used to manage Giant Hogweed in a riparian environment:**

**Spraying:** Glyphosate based herbicides work effectively on Giant Hogweed.

- Spraying can begin in late April – June before the plants flower.
- Spray the top and undersides of the leaves.
- It is easier and safer to spray plants when they are approximately 1m high. Fully grown plants can reach up to 12 feet tall.
- At least one follow-up visit and spray is required each year.

**Stem injection:** This method may be considered where there are a few isolated plants and spraying is not viable.

- Using a specialist stem injection kit, a concentrated dose of herbicide can be injected into each stem.
- Full PPE essential due to close proximity to the harmful sap.

**Cutting/Digging:** This method may be considered where there are a few isolated plants and spraying is not viable.

- Each plant's taproot must be cut with a spade 15cm below ground level.
- Cutting advisable early season April-May before the plants become too tall and unmanageable.
- If plants mature, flower and produce seed heads, these seed heads can be cut, bagged and burnt to prevent them dispersing.

Under no circumstances is it advisable to mow or cut Giant Hogweed with a strimmer/brushcutter due to the high risk of contact with the toxic plant sap.

- Follow up visits required to ensure no plants go to seed.

*These guidelines have been produced by the Dee Invasive Non-native Species Project which cannot be held responsible for the efficacy of the treatments described, or any damage to persons, property or the environment that arises from interpretation of the advice given.*