**Non-Native Invasive Species Management Plan**

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# Introduction

* 1. The Invasive Species Management Plan has be written in response and to discharge the planning condition set by the Planning Authority.
  2. Relevant legislation regarding Himalayan balsam and Rhododendron:
* Wildlife & Countryside Act 1981;
* The Environmental Protection Act 1990;
* Hazardous Waste Regulations 2005;
* Control of Pesticides Regulations 2005;
* Waste Management Licensing Regulations 1994; and
* Environmental Protection (Duty of Care) Regulations 1991.
  1. Any waste containing Himalayan Balsam and Rhododendron is classed as controlled waste under the Environmental Protection (Duty of Care) Regulations 1991, which requires all parties involved in the management of waste (producers, carriers and disposers) to follow codes of practice and keep accurate records.
  2. Under the provisions laid down in the Wildlife & Countryside Act 1981, it is an offence to spread non-native invasive species (NNIS) listed in Schedule 9. Liability may also extend where a landowner has knowingly permitted the spread of invasive species onto neighbouring land.
  3. Failure to manage and dispose of NNIS in accordance with current best practice guidelines and legislation can lead to prosecution.
  4. Guidelines for the control and eradication of Himalayan balsam and Rhododendron are produced by various organisations. Where used in the production of this management plan these documents are referenced in the bibliography.

# Site Description

* 1. The site is located off Churchill Way, Brierfield, Nelson, Lancashire. BB9 6RT.
  2. The Ordnance Grid Reference for the centre of the site is SD 8436 3760.

# Identification and Implications of Himalayan Balsam

## Species Characteristics

* 1. Himalayan balsam is an attractive, non-native invasive terrestrial plant species. It was introduced to Britain in 1839 as a garden plant but escaped in to the wild and rapidly colonised watercourses and areas of damp ground. Himalayan balsam is now very widespread and common across the United Kingdom.
  2. Himalayan balsam is Britain’s tallest growing annual plant in some cases measuring up to three metres in height. The plant is easily identified. Its fleshy stems are a translucent pinkish-red, hollow and often jointed with large, oval pointed leaves with obvious serrated edging. They have a characteristic purple-pink, slipper shaped flower slipper shaped flower that is reminiscent of a large orchid. The flowers are often highly scented. The plant flowers between June to October with seed pods produced throughout the flowering season.
  3. The seed pods are green pod like structures that when mature, dry and split open, often explosively, when touched. The seeds can be expelled up to seven metres from the plant. Each plant is capable of producing up to 2500 seeds per plant.
  4. The seeds can be transported by water, remain dormant for up to two years before germination and viable for up to three years.

## Impact on Land and Development

* 1. Himalayan balsam grows in dense stands that shades out other native grasses and flora. When the plant dies back in winter it leaves a straw like mass on the banks that creates a mulching effect supressing the growth of spring plants.
  2. Recent research suggests that the plant competes for pollinator species such as bumblebees with other native species and as such reduces the seed production in these other plants. (Kelly, Maguire, & Cosgrove, 2008)

# Managing Himalayan Balsam

* 1. The program for controlling the Himalayan balsam should aim for continuous control on a yearly basis until complete eradication from the site.
  2. The program of eradication has been tailored to the site taking in to account the size of infestation, the potential for reintroduction and the landscape/ecological value of the area.
  3. It is important to consider the Himalayan balsam in the wider landscape than just in the development site. If this species is growing on an adjacent site or upstream of the river bank, then it is likely that whatever control methods are used the infestation will return.
  4. For the development site the following steps should be taken:
* Map the extent of the infestation across the development site and adjacent properties.
* Ensure everyone working on the development site is conscious of good site hygiene and;
  + - Mark out contaminated area with a fence at least 7 metres away from the plants.
    - Ensure that vehicles with caterpillar tracks do not work with in the contaminated area.
    - Clean any machinery that maybe contaminated. This will be done in a designated area as close to the contamination site as possible. Any water used to clean off vehicles and equipment should be contained in the contaminated area and not allowed to run off to adjacent land or watercourses. The water will be treat by passing it through a settlement tank to remove any soil before passing it through a very fine mesh sieve to remove and seeds or plant material before discharge. Advice from the Environment Agency will be sought prior to any water discharge.
    - Cover any vehicles that may be carrying contaminated soil or plant material. This include lorries, dumpers and haulage vehicles.
    - Carry out checks where vehicles are parked to ensure that no regrowth occurs. If evidence of Himalayan balsam is found then it will be treat with a translocating glyphosate based herbicide at the earliest opportunity.
    - Do not stockpile waste material within 10 metres of a watercourse or 7 metres of the site boundary.
* Establish how long the infestation has been on site. Long standing infestations may have created seed banks in the soil.
  1. Any top soil to be removed from site will be taken from up to 6 metres away from the parent plant and to a depth of 0.5 metres.
  2. Within the site the boundary the balsam will be treat twice annually during the growing season and before seed is set with a translocating glyphosate based herbicide.
  3. In the adjacent woodland mechanical control will be employed in the form of hand pulling due to the topography of the site.
  4. Padded gloves should be worn to avoid injury to hands. The plant should be teased out of the ground ensuring the roots come out with the stem.
  5. Pulling should be carried during April and May. No treatment should take place if seed pods are present.
  6. Follow up inspection will take place in late August to ensure that there are no late germinating plants developing.
  7. Waste created by the operations will be disposed of using a licensed waste carrier.

# Bibliography

Kelly, J., Maguire, C. M., & Cosgrove, P. J. (2008). *Best Practice Management Guidelines Himalayan balsam Impatiens glandulifera.* NIEA and NPWS as part of Invasive Species Ireland.