



## Invasive Alien Species Survey for a new Pontoon Installation at Islandbridge



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*Cover photo: The existing pontoon at the Islandbridge site in February 2023.*

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## 1. INTRODUCTION

At the request of Dublin City Council (DCC), INVAS Biosecurity Ltd. (INVAS) was commissioned to carry out a survey for Invasive Alien Species (IAS) at the location of a proposed installation of a new pontoon at Islandbridge in Dublin 8.



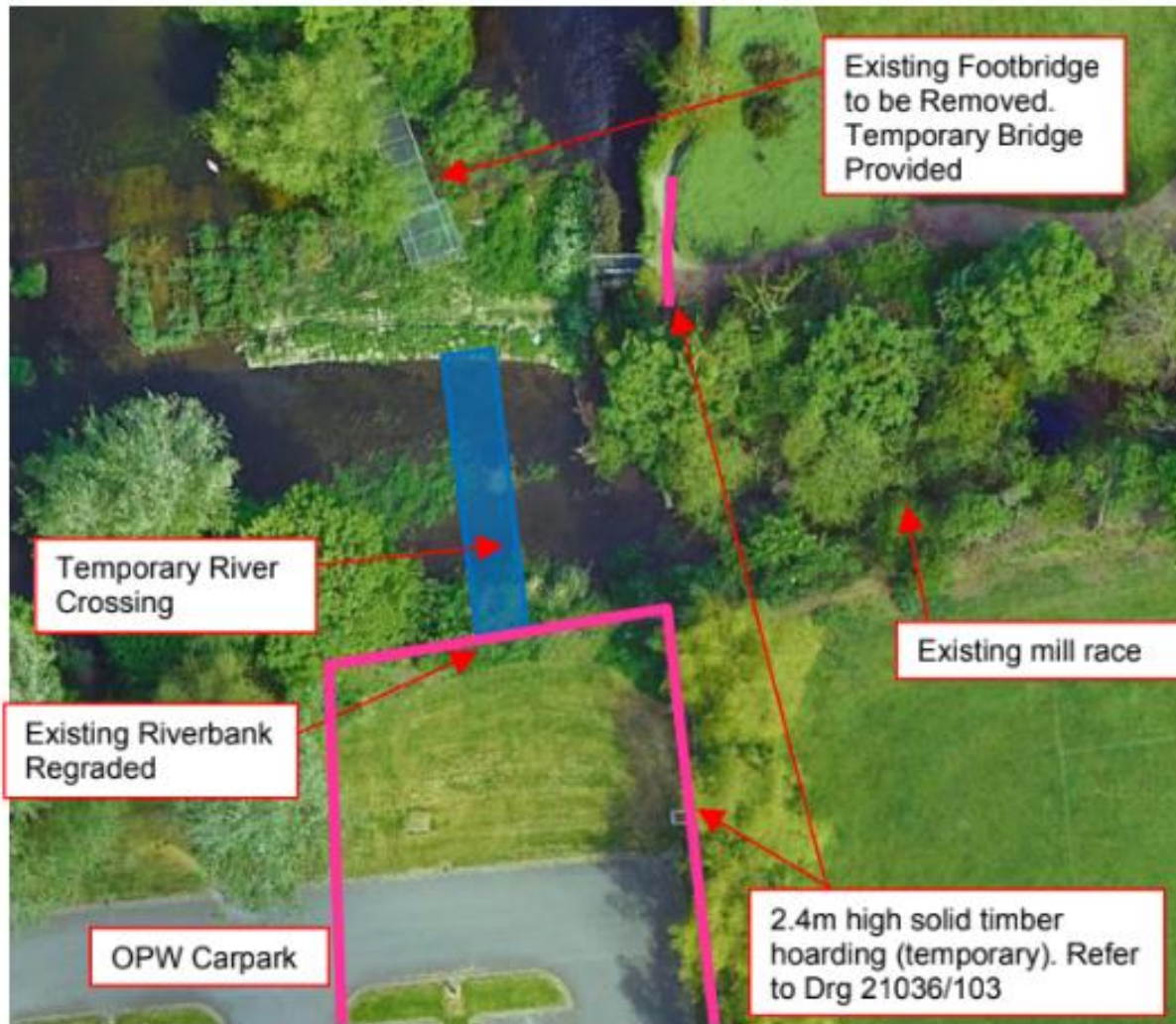
*Plate 1.1: A general view of the location for the proposed pontoon at Islandbridge in February 2023.*

### 1.1. Project Background

The main purpose of the pontoon installation is to allow the several rowing clubs located on the River Liffey to access the lower reaches of the river, downstream of the existing weir. A report has been prepared to outline the proposed methodology for the installation of the pontoon and construction of the various ancillary items including footpaths and access footbridges. Modified maps from the report are included in this document for the purposes of ascertaining the areas to be surveyed (Figure 3.1 – 3.3).

DCC will use the information provided by this survey to aid in the development of site-specific Management Plans for the pontoon installation project. To date, localised general maintenance has been responsible for weed and IAS management in the area, with many areas left unmanaged adjacent to and downstream of the weir. The closest Natura 2000 sites lie to the east of the survey site including South Dublin Bay SAC (000210), North Dublin Bay SAC (000206), North Bull Island SPA (004006) and South Dublin Bay and River Tolka Estuary SPA (004024), all coastal/marine SAC's located over 5km downstream of the proposed works site.





*Figure 4.1 – Temporary Causeway*

**Figure 1.1:** A modified map from the ‘New Pontoon Installation at Islandbridge - Construction Methodology’ prepared by Malone O’Regan for DCC.

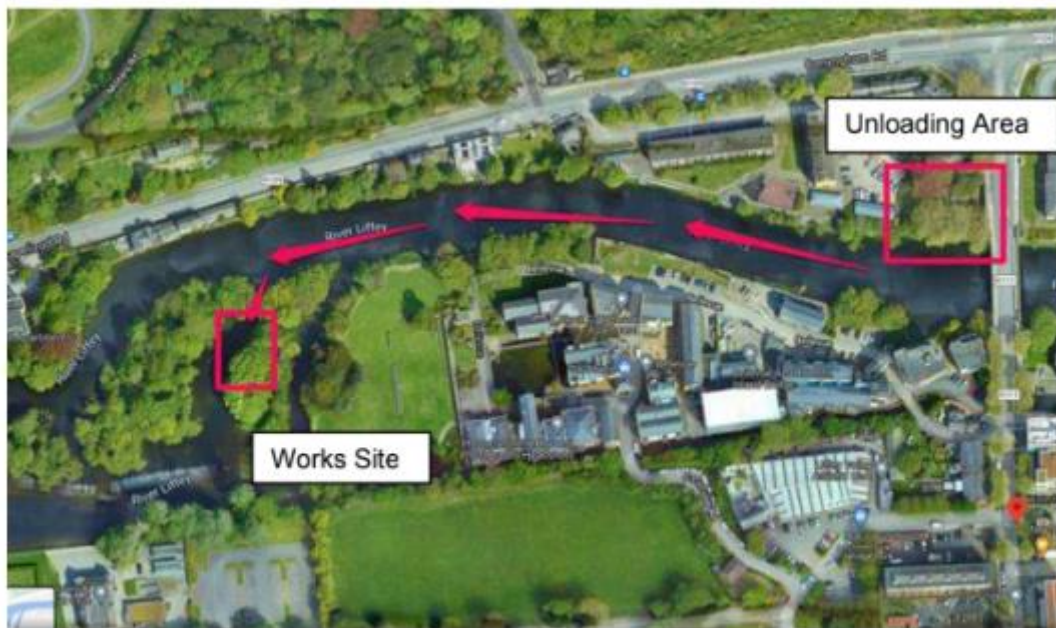


Figure 4.3 – Installation of Pontoon and Gangway

**Figure 1.2:** A modified map from the ‘New Pontoon Installation at Islandbridge - Construction Methodology’ prepared by Malone O’Regan for DCC.



Figure 7.1 – Primary Construction Vehicle Access Route

**Figure 1.3:** A modified map from the ‘New Pontoon Installation at Islandbridge - Construction Methodology’ prepared by Malone O’Regan for DCC.

### 1.2. Objectives

The aim of the survey was to identify all infestations of IAS in the vicinity of the proposed works site and associated access routes (Plate 1.1), in particular invasive species that are restricted under Irish legislation (S.I. 477/2011) and those listed as being of Union concern in the EU IAS Regulations (1143/2014). The survey would further generate an accurate distribution map for infestations of all regulated species, as well as GIS shapefiles containing individual infestation data for each species.

## 2. INTRODUCTION

### 2.1. National and European legislation concerning invasive alien species

Globally, IAS are regarded as one of the biggest causes of biodiversity loss next to climate change. The environmental impact of IAS was discussed at the ground-breaking international Convention on Biological Diversity in 1992 and, since that time, targeted legislation to prevent introduction and spread of these harmful species has been introduced at a national and European level. The most relevant legislation that takes IAS into account in Ireland is summarised in Table 2.1.

Giant knotweed (*Reynoutria sachalinensis*), Japanese knotweed (*Reynoutria japonica*), Himalayan balsam (*Impatiens glandulifera*) and Nuttall’s pondweed (*Elodea nuttallii*) are all subject to restrictions under Regulations 49 and 50 (the latter not currently commenced) of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI No. 477), being listed in the Third Schedule (Part 1) of this legislative Act. Himalayan balsam and Nuttall’s pondweed are also regulated under the Invasive Alien Species Regulation (EU) 1143/2014.

**Table 2.1:** National and European legislation concerning invasive alien species.

<p><b>Republic of Ireland: European Union (Birds and Natural Habitats) Regulations 2011, S.I. 477</b></p> <p><a href="http://www.irishstatutebook.ie/eli/2011/si/477/made/en/print">http://www.irishstatutebook.ie/eli/2011/si/477/made/en/print</a></p>	<p>Regulation 49 on the ‘Prohibition on introduction and dispersal of certain species’ makes it an offence to knowingly disperse or allow to escape species that are listed in the Third Schedule, which is the list of high impact IAS that are subject to restrictions under the Regulations.</p>
<p><b>Republic of Ireland: River Basin Management Plan for Ireland 2022 – 2027</b></p> <p><b>(Water Framework Directive)</b></p> <p><a href="https://www.housing.gov.ie/sites/default/files/publications/files/rbmp_report_english_web_version_final_0.pdf">https://www.housing.gov.ie/sites/default/files/publications/files/rbmp_report_english_web_version_final_0.pdf</a></p>	<p>For the first time invasive species have been explicitly mentioned in this latest cycle of the River Basin Management Plan (RBMP) for Ireland. A list of Principal Actions on invasive species has been included (e.g. implement the EU (European Union) IAS Regulation, develop Management Plans for IAS, develop national guidelines for biosecurity).</p>
<p><b>Invasive Alien Species Regulation (EU) 1143/2014</b></p> <p><a href="http://ec.europa.eu/environment/nature/invasivealien/list/index_en.htm">http://ec.europa.eu/environment/nature/invasivealien/list/index_en.htm</a></p>	<p>This EU Regulation entered into force on 1<sup>st</sup> January, 2015. Central to the legislation is the establishment, and regular updating, of a list of IAS considered to be of Union concern (‘the Union list’). The placing of a species on the Union list activates a number of obligations on Member States (MS) regarding those species (e.g. “Within 18 months of an IAS being included on the Union list, MS shall have in place effective management measures for those invasive alien</p>



	<p>species of Union concern...”. The 49 species included on the Union list are subject to restrictions on keeping, importing, selling, breeding and growing. Member States are required to take action on pathways of unintentional introduction, take measures for early detection and rapid eradication of these species, and to manage species that are already widely spread in their territory.</p>
<p><b>Republic of Ireland: Control of the use of pesticides and biocides</b></p> <p><a href="https://www.nibusinessinfo.co.uk/content/pesticides-and-biocides">https://www.nibusinessinfo.co.uk/content/pesticides-and-biocides</a></p>	<p>A guide to appropriate use of herbicides, pesticides, and other biocides.</p>
<p><b>Republic of Ireland: Sustainable Use of Pesticides Directive</b></p> <p><a href="http://www.pcs.agriculture.gov.ie/sud/">http://www.pcs.agriculture.gov.ie/sud/</a></p>	<p>The Sustainable Use of Pesticides Directive (SUD) establishes a framework for European Community action to achieve the sustainable use of pesticides by setting minimum rules to reduce the risks to human health and the environment that are associated with pesticide use. It also promotes the use of integrated pest management. The Directive is designed to further enhance the high level of protection achieved through the entire regulatory system for pesticides.</p>



### 3. SURVEY

#### 3.1. Survey Details

A full field survey was conducted on the 8<sup>th</sup> of February 2023 by Dr William Earle (INVAS). During the field survey the footprint of the proposed development and associated access routes was walked. Survey points were recorded using a Garmin® GPSmap78 at a height of one metre. Points were recorded at 0.5-metre intervals around the perimeter of IAS infestations. In some cases, survey points were taken along the extremities of certain infestations due to dangerous terrain, inaccessibility of sites or overgrowth with vegetation. In the case of some difficult sites, Google Maps was used in the field to record additional information regarding the extent of an infestation, using local landmarks as reference points. Records were maintained on printed satellite imagery. A Small Unmanned Aerial Vehicle (SUAV) survey was not carried out due to the presence of restricted airspace in proximity to Áras an Uachtaráin. Microsoft® Bing™ Maps were used to provide an overview of the distribution for each species within the survey area and for the development of visual aids to assist with future works. Digital photographs were taken of each species as supplementary material to this survey.

#### 3.2. General IAS distribution

Four IAS, that are listed in the Third Schedule (Part I) of SI 477/2011 and three that are known to be invasive in Irish terrestrial and riparian habitats, were recorded throughout the survey area (Table 3.1). Listed species included Giant knotweed (Plate 3.1), Japanese knotweed (Plate 3.2), Himalayan balsam (Plate 3.3) and Nuttall's pondweed (Plate 3.4). Winter heliotrope (*Petasites pyrenaicus*) (Plate 3.5), Buddleja (*Buddleja davidii*), Cherry laurel (*Prunus lurocerasus*) and Crocosmia/Montbretia (*Crocosmia x crocosmiiflora*) were also recorded. Because of the timing of the surveys, the Regulated species Three-cornered leek and Spanish bluebell would have been clearly visible at this site if they were present. Neither listed species were recorded, with only a similar non-invasive native species, Snowdrop (*Galanthus nivalis*), observed during the survey (Plate 3.6).

**Table 3.1:** The IAS recorded and a description of their general location at the site in Islandbridge in February 2023. The colours refer to the polygons represented by each species on the maps (Figure 3.1).

Common	Scientific name	Location	Map Colour
<b>Species included in S.I. 477</b>			
Giant knotweed	<i>Reynoutria sachalinensis</i>	Dead canes recorded in Trinity College Boat Club, beyond the footprint of the pontoon project. Anecdotal evidence within the footprint of the project in the War Memorial car park adjacent to the River Liffey.	Red
Japanese knotweed	<i>Reynoutria japonica</i>	Sporadic infestations long the south and north riverbanks outside of the footprint of the proposed works site, but adjacent to the route where the gangway will be towed into position along the River Liffey.	Yellow
Himalayan balsam	<i>Impatiens glandulifera</i>	Sporadic dead canes found in proximity to the works zone. Full extent impossible to determine due to the timing of the survey.	N/A
Nuttall's pondweed	<i>Elodea nuttallii</i>	Sporadic stems found in the slow-moving waters upstream of the weir. Full extent impossible to determine due to the timing of the survey.	N/A
<b>Species not yet included in any regulations or legislation</b>			
Winter heliotrope	<i>Petasites pyrenaicus</i>	Widespread in riparian habitats and throughout the proposed works zone.	N/A
Buddleja	<i>Buddleja davidii</i>	Sporadic infestations in proximity to the proposed works zone.	N/A
Cherry laurel	<i>Prunus lurocerasus</i>	Sporadic planted areas in proximity to the proposed works zone.	N/A
Montbretia	<i>Crocsmia x crocosmiiflora</i>	Sporadic infestations in proximity to the proposed works zone.	N/A



*Plate 3.1 & 3.2: Dead canes of Giant knotweed (3.1) and Japanese knotweed (3.2) recorded in proximity to the works zone for the proposed pontoon at Islandbridge in February 2023.*



*Plate 3.3 & 3.4: Dead canes of Himalayan balsam (3.3) and Nuttall's pondweed (3.4) recorded in proximity to the works zone for the proposed pontoon at Islandbridge in February 2023.*



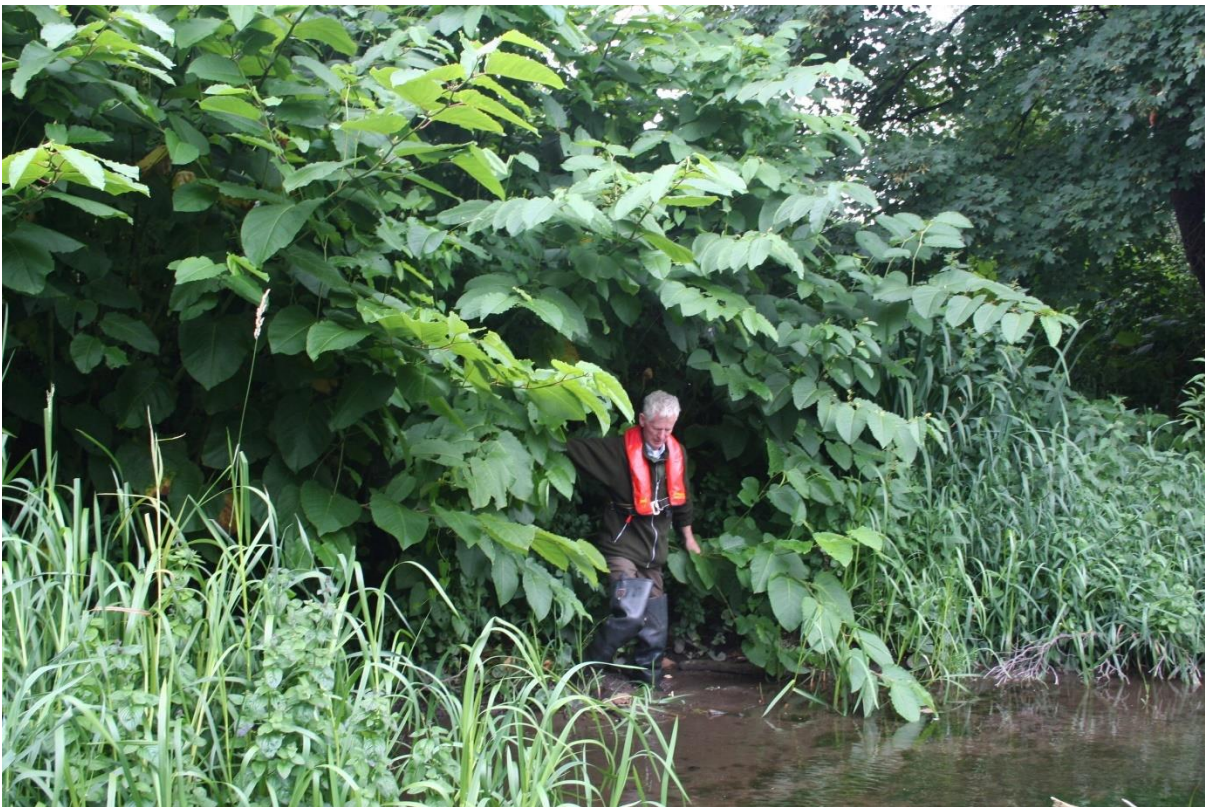


**Plate 3.5 & 3.6:** *The problematic IAS Winter heliotrope (3.5) and native Snowdrops (3.6) observed in proximity to the works zone for the proposed pontoon at Islandbridge in February 2023.*

Detailed distribution maps for Giant and Japanese knotweed were recorded throughout the general survey area are provided (Figure 3.1). These maps provide an overview of the distribution for each species within the survey area, with linked images relating to the general distribution of the IAS on the ground (Plate 3.1-3.2). Anecdotal evidence is also available for the presence of Giant knotweed within the footprint of the proposed project (Plate 3.7 & 3.8). This knotweed has been managed following a herbicide treatment program and at the time of the survey no visible evidence of root crowns or dead canes was found (Plate 3.9 & 3.10). While no evidence was recorded at this location, as this area will form part of the site compound and primary access route it should be assumed that dormant underground rhizomes are present in the location where previous growth has been observed (Figure 3.2).

No IAS were recorded in the loading area on the north side of the River Liffey (Plate 3.11). Due to the timing of the survey, it was impossible to determine the full extent of Himalayan balsam and Nuttall's pondweed infestations with any confidence, but it is important to be aware of their presence in the context of the proposed pontoon project. The riparian and island habitats are an ideal location for Himalayan balsam growth, and it should be assumed that it is present throughout these areas. Dead canes from Himalayan balsam growth were observed in the riparian zone (Plate 3.3) and stems of Nuttall's pondweed were visible in the slow-moving water upstream of the weir (Plate 3.4).





*Plate 3.7 & 3.8: Evidence of Giant knotweed infestations in 2010 (Google Street View)(3.7) and 2015 (3.8) prior to targeted herbicide control programs at the War Memorial car park in proximity to the works zone for the proposed pontoon at Islandbridge.*



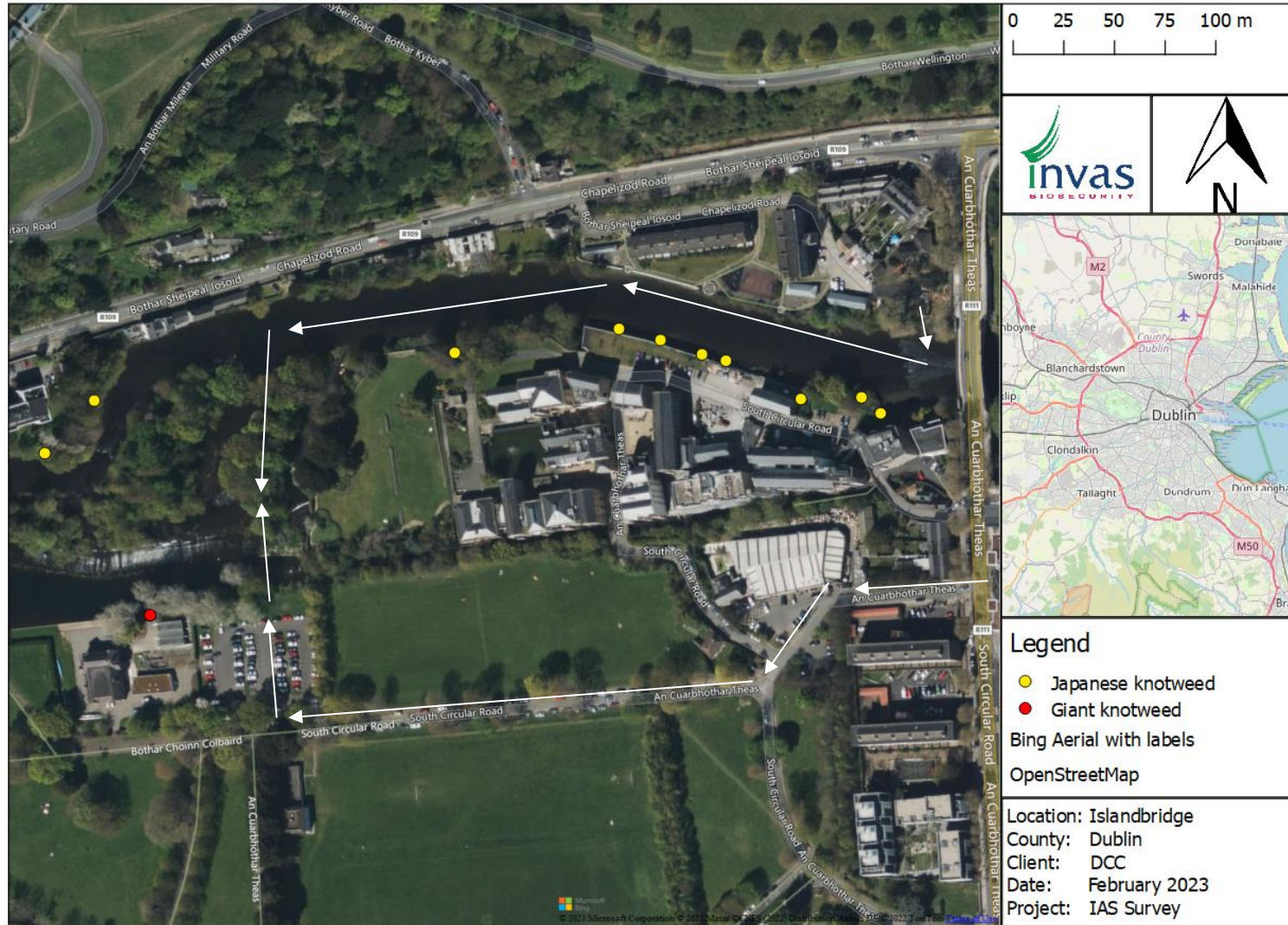


*Plate 3.9 & 3.10: The area where Giant knotweed infestations were previously recorded at the War Memorial car park in proximity to the works zone for the proposed pontoon at Islandbridge in February 2023.*



*Plate 3.11: The proposed loading area adjacent to South Circular Road in February 2023*





**Figure 3.1:** A satellite image of the survey area where Giant knotweed (red) and Japanese knotweed (yellow) canes were recorded in February 2023. Proposed access routes are indicated through the white arrows.

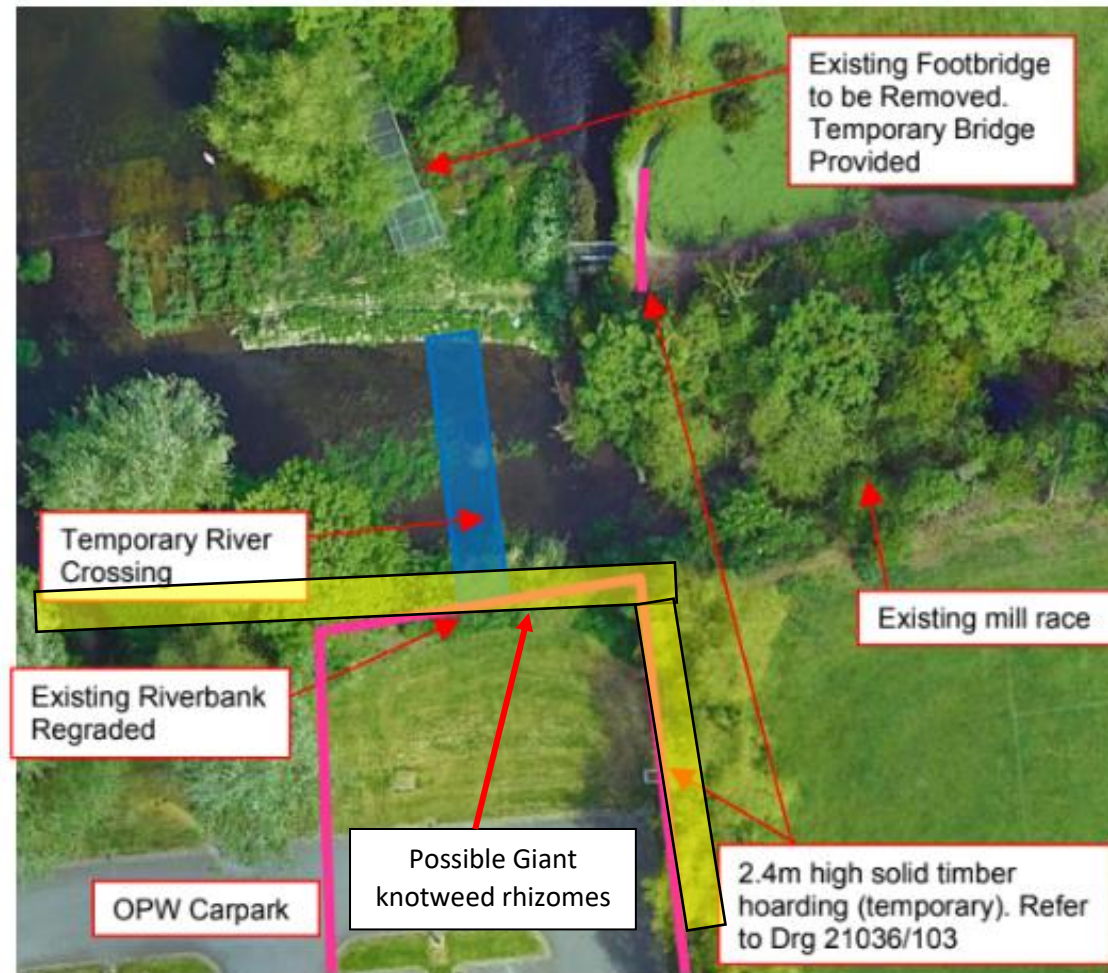
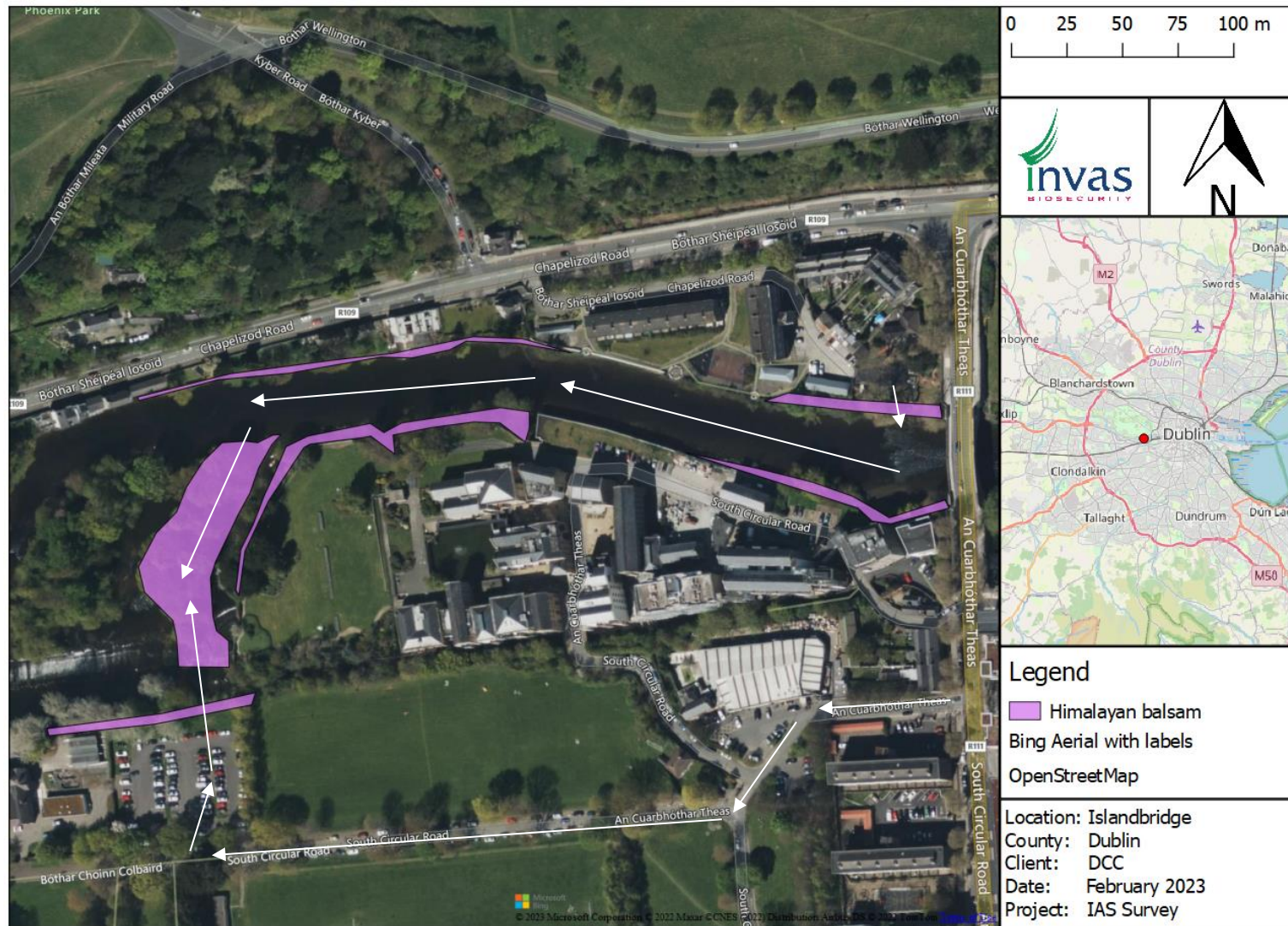


Figure 4.1 – Temporary Causeway

**Figure 3.2:** A modified map from the ‘New Pontoon Installation at Islandbridge - Construction Methodology’ prepared by Malone O’Regan for DCC with the location of previous knotweed growth (transparent yellow rectangles).





**Figure 3.3:** Suitable Himalayan balsam habitat within the site with proposed access routes indicated through the white arrows.

## 4. SPECIES, GENERAL LOCATIONS, DESCRIPTIONS AND LEGISLATION FOR IAS RECORDED IN THE ISLANDBRIDGE SITE

The following sections contain information relating to Giant knotweed and Japanese knotweed recorded within and adjacent to the survey area, in February 2023. For each species maps are provided that detail the specific distribution of that species within the survey area (see Section 3). These maps are supported by photographic images of the infestations. There follows a Table that provides a description of the individual invasive species, to include their general ecology, impacts and dispersal mechanisms. This Table also identifies any national or European legislation relating to the keeping, propagation and dispersal of this species.

### 4.1. Giant knotweed

Dead Giant knotweed canes were recorded in Trinity College Boat Club, beyond the footprint of the pontoon project in February 2023 (Figure 3.1). Anecdotal evidence is available of historic infestations within the footprint of the project in the War Memorial car park adjacent to the River Liffey (Figure 1.1 - 1.3, Plate 3.7-3.10).

**Table 4.1:** Species description and legislation relating to Giant knotweed.

<b>Distinguishing features</b>	<p><i>Fallopia sachalinensis</i> (Giant knotweed) is a robust, vigorous herbaceous perennial that grows in dense and often continuous stands. Giant knotweed has branched, hollow, green bamboo-like shoots to 5m tall. In winter the stems remain visible as tall, dry, red/purple, hollow canes.</p> <p>The leaves are large (up to 40cm) and distinctively indented/cordate at the base, with long hairs present on the underside, especially along midvein. They are arranged in a zig-zag pattern on an arching stem. The leaf texture is rougher than in other knotweeds.</p> <p>Flowers are small, creamy-white and hang in clusters from leaf axils; the cluster is shorter than the subtending leaf.</p> <p>This species has deeply penetrating, woody rhizomes– to 1.8m deep and 3m from the last visible plant.</p>
<b>Habitat</b>	This is a species of waste ground, roadsides, rail corridors and riparian habitats - alongside lakes, rivers, canals, ponds and ditches in rich to poor soil types.
<b>Ecology</b>	<p>Non-native species (native to Japan and Sakhalin Island, Russia) and not as widespread in Ireland as the other two knotweed species.</p> <p>Giant hogweed has hybridised with Japanese knotweed to produce Bohemian knotweed.</p>

<p><b>Impact</b></p>	<p>This species can impact on biodiversity by outcompeting native plants. Riparian habitats invaded by knotweeds have lower invertebrate abundance, species richness and biomass, and lower plant species richness compared to uninvaded sites, which is likely to impact on local fauna that use riparian habitats.</p> <p>Following dieback in winter the ground surrounding infestations is left vulnerable to soil erosion and bankside subsidence due to the absence of a root weft that is normally produced by native grasses and herbs to bind the soils against winter floods.</p> <p>The presence of knotweed leaf litter in streams has also been shown to have adverse effects on the species composition of affected streams.</p>
<p><b>Dispersal</b></p>	<p>The rhizomes of this species are highly regenerative and even small rhizome fragments can produce new plants. Rhizome material can remain dormant in the soil for many years. Cut or discarded stems with nodes can also root and produce new plant stands. As only female plants have been recorded in Ireland, no viable seeds are produced.</p>
<p><b>Legislation</b></p>	<p>Giant knotweed is subject to restrictions under Regulations 49 and 50 (the latter not currently commenced) of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI No. 477), being listed in the Third Schedule (Part 1) of this legislative Act. Soil taken from a place that is infested with Giant knotweed (vector material) is also restricted under Part 3 of the Third Schedule. The law relating to Giant knotweed is primarily contained in Regulation 49 (2), which states that it is an offence to ‘allow or cause to disperse’ plants listed in the Third Schedule, of which Giant knotweed is one. As such, any Giant knotweed plant material or contaminated soil that is to be removed from an infested site can only be done so under a licence issued by the National Parks and Wildlife Service (NPWS).</p>
<p><b>What to do if you find this species</b></p>	<p>Do not cut or interfere with the plant. Report any sighting of this species immediately.</p> <p>Do not dig or carry out ground works in or near infestations until a suitable biosecurity plan has been put in place.</p>
<p><b>Control options</b></p>	<p><b>Mechanical:</b></p> <p>Excavation of Giant knotweed-contaminated soils may not be suitable for riparian infestations but has been successfully used in construction sites. Methods of disposal include deep burial (&gt; 5m deep), bunding (encapsulation in root barrier membrane) and off-site disposal to licensed landfill. When excavating, a buffer zone of 3 metres from the last visible plant must be removed. Contaminated soil should be removed to a depth of 1.8metres.</p> <p><b>Chemical:</b></p> <p>Chemical control can be highly successful in managing Giant knotweed. Infestations should be treated by foliar application (or stem injection in sensitive areas) of a glyphosate-based herbicide. Spraying will be carried out at a rate of 5 l/ha using knapsacks fitted with low pressure drift beta nozzles. Treatment should be carried out between mid-August to mid-October when plants have flowered/set seed. Extra care should be taken where infestations are located among or near non-target plant species. Where an infestation is located adjacent to a watercourse, only one glyphosate-based product is cleared for use.</p>

	<p>Control using herbicide application will take a minimum of three years and, even then, no guarantee can be given that the rhizome is totally dead.</p> <p>Monitoring: For rhizomatous species such as the knotweeds, annual monitoring in June or July is vital. Any Japanese knotweed plants or stands that are observed at this time should be recorded, mapped and scheduled for retreatment.</p>
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#### 4.2. Japanese knotweed

Sporadic infestations were detected along the south and north riverbanks outside of the footprint of the proposed works site, but adjacent to the route where the gangway will be towed into position along the River Liffey (Figure 1.2 & 3.1).

**Table 4.2:** Species description and legislation relating to Japanese knotweed.

<b>Distinguishing features</b>	<p>Japanese knotweed (<i>Fallopia japonica</i>) is a robust, vigorous herbaceous perennial that grows in dense and often continuous stands. Individual plants are up to 3m tall. Japanese knotweed has branched, hollow, red or purple mottled bamboo-like shoots. In winter the stems remain visible as tall, dry, straw-coloured, hollow canes.</p> <p>Leaves are up to 17cm long, bright green, shield- or heart-shaped but with a flattened (truncate) base and lacking any obvious hairs on the underside. Leaves arranged in zig-zag pattern on an arching stem.</p> <p>Flowers are small, creamy-white and hang in clusters from leaf axils; the cluster is longer than the subtending leaf.</p> <p>This species has deeply penetrating, woody rhizomes – up to 2m deep and 3m from the last visible plant.</p>
<b>Habitat</b>	This is a species of waste ground, roadsides, rail corridors and riparian habitats - alongside lakes, rivers, canals, ponds and ditches in rich to poor soil types.
<b>Ecology</b>	<p>Non-native species (native to East Asia in Japan, China and Korea) and widespread in Ireland.</p> <p>Two closely related knotweed species are present in Ireland and can be equally problematic to Japanese knotweed. These are Giant knotweed (<i>F. sachalinensis</i>) and Bohemian knotweed (<i>F. x bohemica</i>).</p>
<b>Impact</b>	<p>This species can impact on biodiversity by outcompeting native plants. Riparian habitats invaded by knotweeds have lower invertebrate abundance, species richness and biomass, and lower plant species richness compared to uninvaded sites, which is likely to impact on local fauna that use riparian habitats.</p> <p>Following dieback in winter the ground surrounding infestations is left vulnerable to soil erosion and bankside subsidence due to the absence of a root weft that is normally produced by native grasses and herbs to bind the soils against winter floods. The presence of Japanese</p>



	<p>knotweed leaf litter in streams has also been shown to have adverse effects on the species composition of affected streams.</p>
<b>Dispersal</b>	<p>The rhizomes of this species are highly regenerative and even small rhizome fragments can produce new plants. Rhizome material can remain dormant in the soil for many years. Cut or discarded stems with nodes can also root and produce new plant stands. As only female plants have been recorded in Ireland, no viable seeds are produced.</p>
<b>Legislation</b>	<p>Japanese knotweed is subject to restrictions under Regulations 49 and 50 (the latter not currently commenced) of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI No. 477), being listed in the Third Schedule (Part 1) of this legislative Act. Soil taken from a place that is infested with Japanese knotweed (vector material) is also restricted under Part 3 of the Third Schedule. The law relating to Japanese knotweed is primarily contained in Regulation 49 (2), which states that it is an offence to ‘allow or cause to disperse’ plants listed in the Third Schedule, of which Japanese knotweed is one. As such, any Japanese knotweed plant material or contaminated soil that is to be removed from an infested site can only be done so under a licence issued by the National Parks and Wildlife Service (NPWS).</p>
<b>What to do if you find this species</b>	<p>Do not cut or interfere with the plant. Report any sighting of this species immediately. Do not dig or carry out ground works in or near infestations until a suitable biosecurity plan has been put in place.</p>
<b>Control options</b>	<p><b>Mechanical:</b> Excavation of Japanese knotweed-contaminated soils may not be suitable for riparian infestations but has been successfully used in construction sites. Methods of disposal include deep burial (&gt; 5m deep), bunding (encapsulation in root barrier membrane) and off-site disposal to licensed landfill. When excavating, a buffer zone of 3metres from the last visible plant must be removed. Contaminated soil should be removed to a depth of 1.8 metres.</p> <p><b>Chemical:</b> Chemical control can be highly successful in managing Japanese knotweed. Infestations should be treated by foliar application (or stem injection in sensitive areas) of a glyphosate-based herbicide. Spraying will be carried out at a rate of 5 l/ha using knapsacks fitted with low pressure drift beta nozzles. Treatment should be carried out between mid-August to mid-October when plants have flowered/set seed. Extra care should be taken where infestations are located among or near non-target plant species. Where an infestation is located adjacent to a watercourse, only one glyphosate-based product is cleared for use. Control using herbicide application will take a minimum of three years and, even then, no guarantee can be given that the rhizome is totally dead.</p> <p><b>Monitoring:</b> For rhizomatous species such as Japanese knotweed, annual monitoring in June or July is vital. Any Japanese knotweed plants or stands that are observed at this time should be recorded, mapped and scheduled for retreatment.</p>

### 4.3. Himalayan balsam

Sporadic dead canes found in proximity to the works zone. Full extent impossible to determine due to the timing of the survey.

**Table 4.3:** Species description and legislation relating to Himalayan balsam.

<b>Distinguishing features</b>	Himalayan balsam ( <i>Impatiens glandulifera</i> ) is one of the largest annual herbs in Ireland, growing to 3m tall. The stems are erect, hollow, succulent, thick ribbed, reddish and hexagonal in cross section. The leaves are up to 20cm long, stalked, have a rounded base with serrated margins, pointed tips, and hairless. They are pale green with a red midrib. The flowers are pink to whitish, borne at the apex of the plant. They are characteristically trumpet-shaped and mildly scented. The seed capsules are 2.5cm long, green to red, ridged and explode when ripe. The roots are very short, bulbous and red.
<b>Habitat</b>	This species prefers moist, nutrient-rich habitats, although it has a wide habitat tolerance, particularly along rivers, canals, ditches, margins of wet woodland and roadsides.
<b>Ecology</b>	Non-native (native to west and central Himalayas) and widespread in Ireland. It lives for just one season, seeds and dies. The majority of the seeds germinate in their first year, although a small percentage can survive for two years.
<b>Impact</b>	Dense monodominant stands can dominate entire riparian zones, significantly decreasing native plant species richness. These dense infestations can cause soil erosion and bankside subsidence on river banks, as well as affecting instream biotic communities by the addition of nutrient-rich sediment.  The flowers of Himalayan balsam are very rich in nectar and attract pollinator insects away from adjacent native flowering plants.
<b>Dispersal</b>	This species is dispersed solely by seeds from ‘explosive’ seed heads. If the stem of a plant that is pulled from the ground and not broken or crushed, it may root from any node that comes into contact with the ground, producing a new plant.
<b>Legislation</b>	Subject to restrictions under EU (Birds and Natural Habitats) Regulations, 2011 ( <a href="#">SI 477</a> ) and listed as an ‘IAS of Union concern’ under <a href="#">EU IAS Regulation (1143/2014)</a> .
<b>What to do if you find this species</b>	Record location and extent; plan for control programme.
<b>Control options</b>	Mechanical: Manual control by pulling the plant from the ground, known as balsam bashing, can be a highly successful method of managing Himalayan balsam. Two ‘bashes’ should be carried out, the first in early May when the plants are < 1m tall and the second before plants produce the explosive seed pods, probably in July (dependent on growth conditions). All plants should be pulled by hand ensuring that the root ball is completely removed from the soil. The stem between the root ball and first node should then be crushed or completely severed to prevent any regrowth. If plants have produced flower heads, these must be removed before the pulling process commences and placed in heavy

	<p>duty plastic bags for disposal. All pulled plant material should be piled away from any nearby watercourses and covered with biodegradable jute matting to prevent regrowth.</p> <p><b>Chemical:</b> The herbicide glyphosate can effectively control Himalayan balsam plants. Foliar application should be carried using knapsacks fitted with low pressure drift beta nozzles. Treatment should be carried out between early May and July, before the plants flower. A repeat treatment may be necessary in late summer/autumn. Where an infestation is adjacent to a watercourse, only herbicidal products that are cleared for use near water may be used.</p> <p><b>Monitoring:</b> It will be necessary to monitor for regrowth and carry out treatment at each Himalayan balsam infestation annually. This should be carried out in May/June each year and retreatment, as necessary, will follow the same process as outlined above. It should be noted that for the long-term control of this weed to be achieved, the treatment process ('balsam bashing' or herbicide treatment) will need to be carried out on a catchment-wide basis.</p>
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#### 4.4. Nuttall's pondweed

Sporadic stems found in the slow-moving waters upstream of the weir. Full extent impossible to determine due to the timing of the survey and without a full aquatic survey.

**Table 4.3:** Species description and legislation relating to Nuttall's pondweed.

<b>Distinguishing features</b>	Nuttall's pondweed ( <i>Elodea nuttallii</i> ) is a perennial, submerged aquatic plant. The leaves are narrow arranged in whorls of 3 (occasionally 4) along the stem. Leaves are lanceolate often recurved with folded margins. They are minutely toothed with a tapered tip. The stems are round and slender, often freely branched. White (adventitious) roots commonly emerge from nodes along the stem.
<b>Habitat</b>	Nuttall's pondweed will grow in lakes, rivers, reservoirs, wetlands, streams, canals and ponds. It's preferred habitat is still water between 1.5 and 2m deep but can grow in water up to 5m deep.
<b>Ecology</b>	<p>Nuttall's pondweed is an aggressive, non-native (North America) species with a wide ecological tolerance, which allows it to establish in most aquatic habitats.</p> <p>Small white female flowers grow to the surface on very thin stalks. Only female plants are present in Ireland and all reproduction is by fragmentation or vegetative reproduction.</p>

<p><b>Impact</b></p>	<p>The rapid growth rate and dense surface canopies of Nuttall's pondweed exclude light to indigenous macrophytes and alter native macroinvertebrate community structure.</p> <p>The vegetation masses create improved conditions for non-salmonid fish such as pike and perch. It also provides a refuge for other invasive species, such as Zebra mussel.</p> <p>Dense infestations interfere with angling and navigation, reducing local amenity value and potentially causing a decline in local tourism.</p> <p>Vegetation can impede water abstraction and increase the risk of flooding due to water retention.</p>
<p><b>Dispersal</b></p>	<p>It is spread asexually by fragmentation. The stem fregments are dispersed by the wind, by boat movement, angling equipment and, possibly, birds. Detached stems root from the nodes and establish new populations.</p> <p>This aggressive weed has been sold as an oxygenating plant for use in garden ponds or in aquaria.</p>
<p><b>Legislation</b></p>	<p>Subject to restrictions under EU (Birds and Natural Habitats) Regulations, 2011(<a href="#">SI 477</a>) and listed as an 'IAS of Union concern' under <a href="#">EU IAS Regulation (1143/2014)</a>.</p>
<p><b>What to do if you find this species</b></p>	<p>Report any sighting of this species immediately.</p> <p>Arrange for control measures to be undertaken as soon as possible in order to halt further dispersal.</p>
<p><b>Control options</b></p>	<p><b>Mechanical:</b></p> <p>Mechanical cutting using weed-cutting boats can clear large bays of the weed but this action generates a large volume of viable plant fragments that will propogate the species. Yhe use of light-excluding environmentally friendly jute matting is currently being trialled.</p> <p><b>Chemical:</b></p> <p>As this is a submerged species, no chemical control methods are available in Ireland.</p> <p><b>Monitoring:</b></p> <p>It will be necessary to monitor closely for regrowth and continue to carry out treatment to manage this species.</p>



#### 4.5. Winter Heliotrope

Widespread in riparian habitats and throughout the proposed works zone.

**Table 4.4:** Species description and legislation for Winter heliotrope.

<b>Distinguishing features</b>	<p>Winter heliotrope (<i>Petasites pyrenaicus</i>) is a perennial, rhizomatous species that can form very dense and continuous stands. The rounded-kidney shaped leaves of this species can be present throughout the year and grow to 25cm in diameter, with large lobes where the leaf stalks attach. They have a conspicuous, regular toothed margin with dull downy hair beneath that rubs off easily.</p> <p>The rhizome network is extensive, but it is usually quite shallow (to 30cm deep). Winter heliotrope flowers produce an inflorescence up to 15mm across in short, loose, cone-like racemes. Individual florets are pink/lilac and tubular with sweet vanilla-scented flowers. Flowering stems are erect, D-shaped (don't roll freely between fingers), pinkish and covered with scale-like bracts.</p>
<b>Habitat</b>	<p>Riparian species on fertile soil adjacent to rivers and canals, but also in disturbed terrestrial habitats such as ditches, roadsides, railway embankments and waste places.</p>
<b>Ecology</b>	<p>Non-native species (native to Mediterranean region) and widespread in Ireland. It is one of few plants that actively grow throughout winter, flowering from November to February. This species readily forms monocultures in suitable habitats.</p> <p>Winter heliotrope may be confused with native Butterbur (<i>Petasites hybridus</i>) and Coltsfoot (<i>Tussilago farfara</i>). To date, only male plants have been recorded in Ireland. This plant is favoured by beekeepers as it provides a rare source of nectar during the winter months. Is becoming particularly prevalent along river and canal banks in Ireland.</p>
<b>Impact</b>	<p>Because of the dense vegetation that the species produces it can easily outcompete native species and become locally dominant.</p>
<b>Dispersal</b>	<p>It is dispersed by rhizome expansion and fragments. Rhizomes are often transported accidentally during ground works <i>via</i> machinery, equipment and soil movement.</p>
<b>Legislation</b>	<p>Not yet contained in any legislative lists.</p>

#### 4.6. Buddleja

Sporadic infestations in proximity to the proposed works zone.

**Table 4.5:** Species description and legislation for Buddleja.

<b>Distinguishing features</b>	<p>Buddleia (<i>Buddleja davidii</i>) is a perennial shrub that can grow to up 4 metres tall. Leaves are grey-green, lanceolate and oppositely arranged. Stems are light brown, with a cracked appearance. This species has an extensive network of large and fine roots.</p> <p>Scented lilac flowers are borne on a long conical spike. Each plant produces large numbers of small seeds that can persist for up to four years in the soil.</p>
<b>Habitat</b>	In waste ground, roadsides, rail corridors and along lakes, rivers, canals, ponds and ditches in rich to poor soil types.
<b>Ecology</b>	Introduced from China as an ornamental and butterfly attractant, Buddleja has now become widespread in urban environments throughout Ireland. This species is highly adaptable and tolerant of disturbed conditions.
<b>Impact</b>	The penetrating roots can cause damage to buildings and hard structures, while the profusion of above-ground growth produced each growing season can have a very adverse impact on native biodiversity.
<b>Dispersal</b>	Buddleja reproduces by seeds that are spread primarily by wind. It can also reproduce asexually <i>via</i> stem and root cuttings.
<b>Legislation</b>	Not yet contained in any legislative lists.

#### 4.7. Cherry laurel

Sporadic planted areas in proximity to the proposed works zone.

**Table 4.7:** Species description and legislation for Cherry laurel.

<b>Distinguishing features</b>	<p>Cherry laurel (<i>Prunus lauroceracus</i>) is a fast-growing evergreen shrub that can grow to 15m tall and is tolerant of a wide range of habitat conditions and soil types. Its leaves are hairless, dark green and glossy above, with a paler underside. Leaves are arranged alternately on the stems, ending with a single leaf.</p> <p>Flowering occurs in spring and summer with white flowers being produced on racemes (upright spikes). Seeds are produced in black berries.</p>
<b>Habitat</b>	Cherry laurel is well adapted to the understory of forestry and woodlands. It also thrives in areas of rocky banks and hillsides, gardens and riparian zones.
<b>Ecology</b>	It is a non-native species (originally South-West Asia) that has become widespread in forestry and estates throughout Ireland. Cherry laurel is hardy and is tolerant of drought and shade. It has become highly invasive in Ireland. It's rapid growth rate and the toxicity of its leaves give it a competitive advantage over native species. This aids in the creation of dense thickets that can cover large areas. These thickets can reduce access and make it difficult to implement control measures.
<b>Impact</b>	Because of the dense vegetation that the weed produces it can easily outcompete native species and becomes abundant. Cherry laurel has a significant adverse impact on native floral (and associated faunal) biodiversity. The leaves contain toxins (cyanide) that result in herbivore avoidance and suppresses regeneration of native understorey species
<b>Dispersal</b>	Spreads by suckers and seeds.
<b>Legislation</b>	N/A
<b>What to do if you find this species</b>	<p>Report any sighting of this species.</p> <p>Arrange for control measures to be undertaken as soon as possible in order to halt seed production and dissemination.</p>
<b>Control options</b>	<p>Most of the control methods that apply to Rhododendron also apply to Cherry laurel.</p> <p>Manual/Mechanical:</p> <p>Manual pulling of plants that are less than 20cm high is successful, once all of the roots are removed. It will be important to knock the soil from the roots to minimise the possibility of re-rooting. Exposure of the root system to air and sunlight will result in dehydration and death of the plant.</p>

	<p>Large plants can be cut down, if access for machinery is available.</p> <p>It is possible to mechanically uproot mature Cherry laurel plants due to the relatively shallow nature of the root system (most roots are in the top 40cm of soil. However, this is generally only appropriate for sites where access to machinery is possible and at sites of low ecological interest where damage to existing native vegetation is not a concern. Where chemical control of cut stumps and rootstocks is not an option, stump extraction will be necessary. This will normally involve using machinery, where access is possible.</p> <p>Any cut material will need to be removed from the site to avoid resprouting or suckering, which will produce new plants and potential infestations. Mulching is a good option for disposal and the mulch may be left on site, if no seeds are present.</p> <p><b>Herbicide:</b></p> <p>With isolated plants (&gt; 1m tall) or small infestations, effective control can be achieved by cutting the plant to the stump and immediately treating the latter with herbicide (cut-stump treatment). The use of an inert dye mixed with the herbicide will ensure that no stumps are missed.</p> <p>Another option is to cut the stem and treat the tender regrowth with herbicide.</p> <p>For plants greater than 2cm in diameter, notches can be cut in the stem using a hatched or saw (referred to as feathering) and a concentrated solution of herbicide immediately applied.</p> <p>This type of treatment is effect all year-round, although it is deemed to be most effective when conducted between November and April.</p> <p><b>Monitoring:</b></p> <p>Monitoring should take place between November and February, looking for any new seedlings or regrowth. To achieve long-term control of this invasive plant, it will be important to factor in a number of work phases over several years.</p> <p>A monitoring program should focus on areas where Cherry laurel has been previously recorded and is likely to be present in the seed bank.</p>
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#### 4.8. Montbretia

Sporadic infestations in proximity to the proposed works zone.

**Table 4.8:** Species description and legislation for Montbretia.

<b>Distinguishing features</b>	<p>Montbretia (<i>Crocsmia x crocosmiiflora</i>) is an erect, emergent, perennial plant. It is stoloniferous (often called runners), with characteristic strings of flattened corms (swollen underground stem). The leaves are up to 2cm wide, strap-shaped, with a conspicuously raised midrib and pointed tip. Leaves are flattened at the base like an Iris.</p> <p>Stems will grow up to 90cm long and are erect, cylindrical and unbranched (except in the inflorescence). Flowers grow as an inflorescence and are up to 40mm long with six deep orange to red petals. These appear as a funnel-like tube, arranged on one side of an arching, branched spike. Fruit appear within a capsule that is 7mm long and 9mm wide; the seeds can be viable.</p>
<b>Habitat</b>	<p>Montbretia is a species that thrives in mild, damp conditions in disturbed, lowland habitats, along roadsides and river banks.</p>
<b>Ecology</b>	<p>Non-native (originally from South Africa) and widespread in Ireland, particularly in the south-west, west and north-west. This is a horticultural hybrid that was developed in the 1880s in France for ornamental purposes. It has naturalised in many parts of Ireland and in aggressively invading roadside and riparian habitats throughout the country. In these habitats, Montbretia can form dense monocultural stands and become locally dominant.</p>
<b>Impact</b>	<p>Because of the dense covering of vegetation that the weed produces it can easily outcompete native species and become locally abundant. Montbretia has a significant adverse impact on native floral (and associated faunal) biodiversity.</p>
<b>Dispersal</b>	<p>Dispersed vegetatively by underground corms and stolon fragments, and occasionally by seeds.</p>
<b>Legislation</b>	<p>Not yet contained in any legislative lists.</p>



## 5. BIOSECURITY

Preventing the introduction of invasive species and pathogens is significantly more cost-effective and less environmentally damaging than long-term containment, control or eradication. The most effective measure for DCC to limit introductions and halt the spread of invasive species and pathogens by their staff and associates is to promote and implement good biosecurity practice within the organisation.

The availability of clear and concise biosecurity protocols for all staff and associates will minimise the risks of the inadvertent introduction and spread of these harmful organisms. However, apart from being effective and practical, they must be supported by comprehensive training and with the necessary equipment and/or facilities.

It is clear that the activity of DCC staff and associates involved in this project could inadvertently facilitate the spread of IAS and pathogens that are already present in or adjacent to the working environment. The transfer of equipment and maintenance craft can provide a vector for the spread of invasive plants, animals and pathogens. The rigorous implementation of good biosecurity practice will limit the introduction and spread of harmful invasive species and pathogens.

### 5.1. Cleaning and Disinfection Kits

All vehicles should carry an appropriate Disinfection Kit. The general kit should comprise the following:

- Sturdy storage box and lid
- Detailed guide to proper cleaning and disinfection procedure and instructions for preparing the correct disinfection concentration
- Container (1 litre or 5 litre) for clean water (to make extra disinfection solution)
- Boot bath (for washing dirty boots of small items of equipment)
- Portable or handheld sprayer (3 litre or 1.5 litre)
- Virkon Aquatic tablets or powder or another proprietary disinfectant\*
- Hard-bristle brush
- Box of absorbent cloths (J cloths)

- Box of disposable non-latex gloves
- Plastic bags and cable ties (for disposing of IAS material removed from equipment).

[\* Disinfectants must be used with care and in strict accordance with the manufacturer's instructions. Disposable gloves should be worn when using the disinfectant solution.]

Before embarking on an operation where disinfection of PPE and light equipment will be required, prepare a disinfection solution and have it available in the portable sprayer. Always have clean water and a supply of disinfectant powder or tablets available.

## 5.2. Biosecurity protocol for planning

In preparation for work activities and prior to arrival at a work site, the following steps must be carried out.

- During the establishment of the site compound and associated works it may be necessary to conduct a further site survey to determine the presence and extent of any invasive species infestations, such as Himalayan balsam.
- Where infestations are known to be present or have been identified, clear exclusion zones should be established and suitably signed. Where this is not possible further biosecurity measures must be put in place. This may involve the placement of mats to facilitate the movement of plant, machinery and personnel without coming into contact with potentially infested soils. This may also involve the excavation and disposal of infested soils.
- Schedule operations so that uncontaminated sites are accessed before sites that are known or suspected to support invasive species.
- Where possible and practical, conduct operations on watercourses in a downstream direction in order to avoid the potential introduction of invasive species into the upper catchment.
- Where multiple sites must be accessed and there is no opportunity to clean and disinfect the equipment, make sure to have alternative and clean equipment and PPE available.
- Clean and disinfect all PPE, vehicles, machinery and equipment prior to arrival at the work site.

- Where equipment or machinery is commissioned from abroad or from other parts of the country, proof of cleaning and disinfection must accompany each piece of equipment or machinery.
- Staff must report suspected IAS accompanied by a description, location (grid reference) and good quality photographs to DCC management.

### 5.3. Biosecurity Protocol Mobilisation, Operations and Cleaning/Disinfection

Staff and associates must be aware that any section of the works zone may contain an invasive species and pathogens. It is their responsibility to make every effort to reduce the risk of spreading these harmful species. Biosecurity protocols for PPE, light equipment, machinery, boats and heavy plant used by DCC staff and associates are presented individually below. These are presented separately as protocols to be followed before works commence, during works or post-works.

#### 5.3.1. PPE (including waders, boots, life jackets)

##### *Mobilisation*

- All staff must have access to clean PPE prior to arrival on site.
- Designated work routes and any known infestations will be clearly demarcated before operations commence.

##### *Operations*

- Staff should avoid any known infestations of invasive species and be vigilant for any undocumented infestations.
- Staff will not unnecessarily encroach into any demarcated invasive species areas.
- Staff must clean and disinfect their boots when they exit an invasive species infested site.

##### *Cleaning/Disinfection*

- On completion of any field operation or when moving from one location to another staff must clean and disinfect using the following protocol.
- Put on disposable gloves before cleaning and disinfecting PPE.

- Visually inspect all PPE for evidence of attached invasive species material or adherent mud or debris. Remove any such material before disinfecting the PPE.
- During inspection and cleaning, pay particular attention to places where the seeds or fragments of invasive species could be accidentally trapped, such as the treads of boots.
- Safely dispose of any invasive species material taken from the PPE.
- Wipe down PPE that has come into contact with water using an absorbent cloth soaked a 1% solution of Virkon Aquatic or another proprietary disinfectant.
- For heavily soiled boots and PPE, thorough cleaning will be required. Using the hard-bristle brush remove mud and debris, and then spray with the disinfectant solution.
- Remove disposable gloves and dispose of safely.

Where time permits and it is practical, it is good biosecurity practice to air dry equipment following cleaning and disinfection.

### *5.3.2. Light equipment (including hand-held tools)*

#### *Mobilisation*

- All staff should have access to clean equipment prior to arrival on site.
- Designated work routes and any known infestations will be clearly demarcated before operations commence.

#### *Operations*

- Staff should avoid any known infestations of invasive species and be vigilant for any undocumented infestations.
- Staff will not unnecessarily encroach into any demarcated invasive species areas.
- Staff must clean and disinfect their hand-held equipment when they exit an invasive species infested site.

#### *Cleaning/Disinfection Post-operations*

- On completion of any field operation or when moving from one location to another staff must clean and disinfect using the following protocol.



- Put on disposable gloves before cleaning and disinfecting all equipment.
- Visually inspect all equipment for evidence of attached invasive species material or adherent mud or debris. Remove any such material before disinfecting the equipment.
- During inspection and cleaning, pay particular attention to places where invasive species could be accidentally trapped or obscured.
- Safely dispose of any invasive species material taken from the equipment.
- Used equipment that has come into contact with water must be wiped down with an absorbent cloth soaked a 1% solution of Virkon Aquatic or another proprietary disinfectant.
- For heavily soiled equipment, thorough cleaning will be required. Using the hard-bristle brush remove mud and debris from the equipment, and then spray with the disinfectant solution.
- If returning to the depot at the end of the day, it may be more efficient to conduct the more thorough cleaning operations here.
- Remove disposable gloves and dispose of safely.

Where time permits and it is practical, it is good biosecurity practice to air dry equipment following cleaning and disinfection.

### *5.3.3. Machinery (including vehicles)*

#### *Mobilisation*

- Machinery should be visually inspected prior to arrival on site and all plant and animal material, mud or associated debris must be removed and safely disposed of.
- Designated work routes and any known infestations will be clearly demarcated before operations commence.

#### *Operations*

- Operators should avoid any known infestations of invasive species and be vigilant for any undocumented infestations.
- Staff will not unnecessarily encroach into any demarcated invasive species areas.

- Staff must clean and disinfect machinery when they exit an invasive species infested site.

#### *Cleaning/Disinfection Post-operations*

- On completion of any field operation or when moving from one location to another staff must clean and disinfect using the following protocol.
- When moving machinery from a work site remove any attached plant and animal material, mud or associated debris.
- If moving between sites without returning to the depot the machinery must be cleaned, with a power washer using clean water.
- Any machinery that has come into contact with water should be sprayed to run-off with a 1% Virkon Aquatic solution or another proprietary disinfectant using a knapsack with a high-volume nozzle.
- At the depot apply a high-pressure steam cleaning, with water > 40 degrees °C. Ensure the wheels, undercarriage and anywhere that invasive species could be concealed, are cleaned.
- Where steam cleaning is not available, the machinery should be power-hosed with cold water and then sprayed to run-off with disinfectant using a knapsack with a high-volume nozzle.

#### *5.3.4. Boats (including towing craft or pontoons)*

##### *Mobilisation*

- Prior to arrival on site, boats should be visually inspected and all plant and animal material, mud or associated debris must be removed and safely disposed of.

##### *Operations*

- When travelling on the watercourse, avoid obvious and previously recorded infestations of invasive species.

##### *Cleaning/Disinfection*

- On completion of any field operation or when moving from one location to another staff must clean and disinfect using the following protocol.
- On removing a boat from a waterway, all water should be drained from the craft. Water should be removed from all live wells and other water retaining compartments.
- Inboard and outboard motors should be flushed with a disinfectant solution before being used in another watercourse or section on the waterway.
- Any plant and animal material, mud or associated debris should be removed before leaving the site of operation.
- Following this inspection, boats must be returned to the depot where a more thorough cleaning and disinfection will be given.
- At the depot, apply a high-pressure steam cleaning, with water > 40 degrees °C.
- Where steam cleaning is not available, the machinery should be power-hosed with cold water and then sprayed to run-off with disinfectant using a knapsack with a high-volume nozzle.
- Wet or live wells and other water retaining compartments in all boats must be cleaned, rinsed or flushed with a 1% solution of Virkon Aquatic or another proprietary disinfection product.

*5.3.5. Heavy plant (including tractors, trailers, low loaders, tracked vehicles, flails, dumpers, excavators)*

*Mobilisation*

- Heavy plant should be visually inspected and all plant and animal material, mud or associated debris must be removed and safely disposed of prior to works.

*Operations*

- Plant operators should avoid any known infestations of invasive species and be vigilant for any undocumented infestations.
- Staff will not unnecessarily encroach into any demarcated invasive species areas.

- Staff must clean and disinfect plant on every occasion that it is removed from an infested site.

#### *Cleaning/Disinfection*

- On completion of any field operation or when moving from one location to another staff must clean and disinfect using the following protocol.
- When leaving a work site ensure that any water is drained from any water-retaining compartments.
- Any attached or adherent material (vegetation and debris) should be removed before leaving the site of operation.
- Particular attention must be paid to tracked machinery as the cleats can accumulate large amounts of potentially invasive species contaminated soil. The tracks must be cleaned before removing the machine from the site with a power washer using clean water.
- Following this initial cleaning, any plant that has come into contact with water must be returned to the depot where it will be steam cleaned with water > 40 degrees °C.
- Where steam cleaning is not available, the machinery should be power-hosed with cold water and then sprayed to run-off with disinfectant using a knapsack with a high-volume nozzle.
- Wet or live wells and other water retaining compartments in all heavy plant must be cleaned, rinsed or flushed with a 1% solution of Virkon Aquatic or another proprietary disinfection product.

#### *5.4. Himalayan balsam (*Impatiens glandulifera*)*

When Himalayan balsam seed pods are ripe, they explode and scatter small seeds in all directions. Seeds can readily become entangled in clothing and in this manner can be inadvertently spread between sites. Always visually inspect treads of boots and clothing for seeds before leaving sites that are infested with Himalayan balsam.





## Appendices

**Appendix 1:** Survey details for the Islandbridge site in February 2023.

<b>Contactor name</b>	INVAS Biosecurity Ltd.
<b>Surveyor name</b>	William Earle
<b>Survey date/time</b>	8 <sup>th</sup> of February
<b>County</b>	Dublin
<b>Area</b>	Islandbridge
<b>Site ID</b>	SUR_Islandbridge_DCC
<b>Risk assessment (Potential hazards)</b>	Slips/trips/falls particularly in dense undergrowth, working in isolation, watercourse wildlife.
<b>Health and safety (PPE required)</b>	Hi viz, Safety boots
<b>Regulated species recorded</b>	GKO, JKO, HBA, ELO
<b>GPS details</b>	Throughout survey area
<b>Area located</b>	Throughout survey area
<b>Site details</b>	Pontoon installation adjacent to weir
<b>Pervious treatment/Interference</b>	General maintenance
<b>Infestation beyond fence line</b>	Yes, several species crossing boundaries to private property.
<b>Notes</b>	No
<b>Photos</b>	Throughout survey area
<b>Is the site within or proximate to an ecologically sensitive area (SAC/SPA)</b>	Yes
<b>Other invasive species observed</b>	BUD, WHO, CRO, CHL

**Appendix 2:** Schedule of activities for IAS recorded on the Islandbridge site.

 <span style="margin-left: 200px;">Schedule of Activities</span> 			
Site ID	MGMT_Islandbridge_DCC		
Project details	IAS Management		
Biosecurity supervisor			
Date	February 2023		
	Phase	Date	Additional comments
Site survey and development of Management Plan	1	Feb 2023	
Establish and implement biosecurity protocol	2		
Toolbox talks to appropriate staff	3		
Implementation of Management Plan	4		
Decontamination of vehicles and equipment	5		
Sign off	6		



**Appendix 3: Non-native invasive plant species regulated by the European Union (Birds and Natural Habitats) Regulations 2011 to 2015.**

<b>Common name</b>	<b>Scientific name</b>	<b>Geographical application</b>
American skunk-cabbage	<i>Lysichiton americanus</i>	Throughout the State
A red alga	<i>Grateloupia doryphora</i>	Throughout the State
Brazilian giant-rhubarb	<i>Gunnera manicata</i>	Throughout the State
Broad-leaved rush	<i>Juncus planifolius</i>	Throughout the State
Cape pondweed	<i>Aponogeton distachyos</i>	Throughout the State
Cord-grasses	<i>Spartina</i> (all species and hybrids)	Throughout the State
Curly waterweed	<i>Lagarosiphon major</i>	Throughout the State
Dwarf eel-grass	<i>Zostera japonica</i>	Throughout the State
Fanwort	<i>Cabomba caroliniana</i>	Throughout the State
Floating pennywort	<i>Hydrocotyle ranunculoides</i>	Throughout the State
Fringed water-lily	<i>Nymphoides peltata</i>	Throughout the State
Giant hogweed	<i>Heracleum mantegazzianum</i>	Throughout the State
<b>Giant knotweed</b>	<b><i>Fallopia sachalinensis</i></b>	<b>Throughout the State</b>
Giant-rhubarb	<i>Gunnera tinctoria</i>	Throughout the State
Giant salvinia	<i>Salvinia molesta</i>	Throughout the State
<b>Himalayan balsam</b>	<b><i>Impatiens glandulifera</i></b>	<b>Throughout the State</b>
Himalayan knotweed	<i>Persicaria wallichii</i>	Throughout the State
Hottentot-fig	<i>Carpobrotus edulis</i>	Throughout the State
<b>Japanese knotweed</b>	<b><i>Fallopia japonica</i></b>	<b>Throughout the State</b>
Large-flowered waterweed	<i>Egeria densa</i>	Throughout the State
Mile-a-minute weed	<i>Persicaria perfoliata</i>	Throughout the State
New Zealand pigmy weed	<i>Crassula helmsii</i>	Throughout the State
Parrot's feather	<i>Myriophyllum aquaticum</i>	Throughout the State

Common name	Scientific name	Geographical application
Rhododendron	<i>Rhododendron ponticum</i>	Throughout the State
Salmonberry	<i>Rubus spectabilis</i>	Throughout the State
Sea-buckthorn	<i>Hippophae rhamnoides</i>	Throughout the State
Spanish bluebell	<i>Hyacinthoides hispanica</i>	Throughout the State
Three-cornered leek	<i>Allium triquetrum</i>	Throughout the State
Wakame	<i>Undaria pinnatifida</i>	Throughout the State
Water chestnut	<i>Trapa natans</i>	Throughout the State
Water fern	<i>Azolla filiculoides</i>	Throughout the State
Water lettuce	<i>Pistia stratiotes</i>	Throughout the State
Water-primrose	<i>Ludwigia</i> (all species)	Throughout the State
Waterweeds	<i>Elodea</i> (all species)	Throughout the State
Wireweed	<i>Sargassum muticum</i>	Throughout the State

### Part 3: Vector Materials

Vector material	Species referred to	Geographical application
Blue mussel ( <i>Mytilus edulis</i> ) seed for aquaculture taken from places (including places outside the State) where there are established populations of the slipper limpet ( <i>Crepidula fornicata</i> ) or from places within 50 km. of such places	Mussel ( <i>Mytilus edulis</i> ) Slipper limpet ( <i>Crepidula fornicata</i> )	Throughout the State
Soil or spoil taken from places infested with Japanese knotweed ( <i>Fallopia japonica</i> ), giant knotweed ( <i>Fallopia sachalinensis</i> ) or their hybrid Bohemian knotweed ( <i>Fallopia x bohemica</i> )	Japanese knotweed ( <i>Fallopia japonica</i> ) Giant knotweed ( <i>Fallopia sachalinensis</i> ) Bohemian knotweed ( <i>Fallopia x bohemica</i> )	Throughout the State

## Appendix 4 Non-native Invasive Plant species of European Concern

### PLANTS

Scientific name	English name	Entry into force
<i>Acacia saligna</i> ( <i>Acacia cyanophylla</i> )	Golden wreath wattle	15-Aug-19
<i>Ailanthus altissima</i>	Tree of heaven	15-Aug-19
<i>Alternanthera philoxeroides</i>	Alligator weed	02-Aug-17
<i>Andropogon virginicus</i>	Broomsedge bluestem	15-Aug-19
<i>Asclepias syriaca</i>	Common milkweed	02-Aug-17
<i>Baccharis halimifolia</i>	Eastern baccharis	03-Aug-16
<i>Cabomba caroliniana</i>	Fanwort	03-Aug-16
<i>Cardiospermum grandiflorum</i>	Balloon vine	15-Aug-19
<i>Cortaderia jubata</i>	Purple pampas grass	15-Aug-19
<i>Eichhornia crassipes</i>	Water hyacinth	03-Aug-16
<i>Elodea nuttallii</i>	Nuttall's waterweed	02-Aug-17
<i>Ehrharta calycina</i>	Perennial veldt grass	15-Aug-19
<i>Gunnera tinctoria</i>	Chilean rhubarb	02-Aug-17
<i>Gymnocoronis spilanthoides</i>	Senegal tea plant	15-Aug-19
<i>Heracleum mantegazzianum</i>	Giant hogweed	02-Aug-17
<i>Heracleum persicum</i>	Persian hogweed	03-Aug-16
<i>Heracleum sosnowskyi</i>	Sosnowsky's hogweed	03-Aug-16
<i>Humulus scandens</i>	Japanese hop	15-Aug-19
<i>Hydrocotyle ranunculoides</i>	Floating pennywort	03-Aug-16
<i>Impatiens glandulifera</i>	Himalayan balsam	02-Aug-17
<i>Lagarosiphon major</i>	Curly waterweed	03-Aug-16
<i>Lespedeza cuneata</i> ( <i>Lespedeza juncea</i> var. <i>sericea</i> )	Chinese bushclover	15-Aug-19
<i>Ludwigia grandiflora</i>	Water-primrose	03-Aug-16
<i>Ludwigia peploides</i>	Floating primrose-willow	03-Aug-16
<i>Lygodium japonicum</i>	Vine-like fern	15-Aug-19
<i>Lysichiton americanus</i>	American skunk cabbage	03-Aug-16
<i>Microstegium vimineum</i>	Japanese stiltgrass	02-Aug-17
<i>Myriophyllum aquaticum</i>	Parrot's feather	03-Aug-16
<i>Myriophyllum heterophyllum</i>	Broadleaf watermilfoil	02-Aug-17
<i>Parthenium hysterophorus</i>	Whitetop weed	03-Aug-16
<i>Pennisetum setaceum</i>	Crimson fountaingrass	02-Aug-17
<i>Persicaria perfoliata</i>	Asiatic tearthumb	03-Aug-16
<i>Prosopis juliflora</i>	Mesquite	15-Aug-19
<i>Pueraria lobata</i>	Kudzu vine	03-Aug-16
<i>Salvinia molesta</i> ( <i>Salvinia adnata</i> )	Salvinia moss	15-Aug-19
<i>Triadica sebifera</i> ( <i>Sapium sebiferum</i> )	Chinese tallow	15-Aug-19



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