

METROLINK

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**Outline Invasive
Species Management
Plan**



Outline Invasive Species Management Plan

MetroLink

prepared for Jacobs Engineering Ireland Ltd.

on behalf of Transport Infrastructure Ireland

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1 Introduction

This Outline Invasive Species Management Plan (hereafter referred to as the outline ISMP) for the proposed Metrolink (hereafter referred to as the “proposed Project”) contains management recommendations in respect of preventing the spread of and managing a range of non-native invasive species along the proposed Project. Invasive Species (IS), Invasive Alien Species (IAS) or Invasive Alien Plant Species (IAPS) are terms sometimes referenced in legislation and or guidance. They are referred to as non-native invasive species in this outline ISMP but are interchangeable.

The outline ISMP describes the options available to manage and prevent the spread of Third Schedule, non-native invasive plant species identified in the vicinity of the proposed Project. Only non-native invasive species listed on the Third Schedule of *S.I. No 477/2011 – European Communities (Birds and Natural Habitats) Regulations 2011* (hereafter referred to as the Birds and Natural Habitats Regulations) are dealt with in this outline ISMP.

The outline ISMP will be revisited prior to the commencement of on-site works. As time is likely to have elapsed between the production of this outline ISMP and the commencement of works on-site, it may be necessary to update and amend this document immediately prior to the commencement of works for the proposed Project. Therefore, this document should be treated as a working document. Nonetheless, the measures contained within this outline ISMP are sufficient to ensure that the proposed Project will not result in likely significant effects on any European sites with respect to Appropriate Assessment, and is sufficient to ensure that there will be no significant residual effects arising from the spread of invasive species with respect to the EIAR produced for the proposed Project.

Construction works can disturb stands of Third Schedule non-native invasive plants and / or soils contaminated with non-native invasive plant material, as well as potentially lead to a new infestation. Therefore, management measures which will be contained in the final ISMP will be implemented to avoid any direct or indirect impacts to habitats and species contained within the locality or as a result of its introduction to the area.

1.1 Legislative Context

The Birds and Natural Habitats Regulations contain specific provisions that govern control of listed invasive species. It is an offence to release or allow to disperse or escape, to breed, propagate, import, transport, sell or advertise species listed on the Third Schedule of the Birds and Natural Habitats Regulations without a Licence. The two regulations that deal specifically with this scheduled list of species are:

- Regulation 49: Prohibition of introduction and dispersal of certain species; and
- Regulation 50: Prohibition on dealing in and keeping certain species.

Following on from that the following are strictly prohibited:

- Dumping invasive species cuttings anywhere other than in facilities licensed to accept them;
- Planting or otherwise causing to grow in the wild, hence the landowner (in respect of the proposed Project this being the NTA and the appointed contractor) should be careful not to cause further spread);
- Disposing of invasive species at a landfill site without first informing the landfill site (that is licensed under Number 10 of 1996 - Waste Management Act, 1996 (as amended) (hereafter referred to as the Waste Management Act, as amended) to take such Third Schedule material (plant or soil) that the waste contains invasive species material (this action requires an appropriate licence);
- Moving soil which contains Third Schedule-specific non-native invasive species in the Republic of Ireland, unless under licence from the National Parks and Wildlife Service (NPWS) (this licence is separate from and does not discharge any person being in receipt of other necessary waste permits / licences etc.); and

- Regulation (EU) No. 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species (hereafter referred to as the IAS Regulation) lists specific Species of Union Concern, some of which overlap with the Third Schedule species.

The IAS Regulation conveys the rules to prevent, minimise and mitigate the adverse impacts of the introduction and spread (both with and without intention) of IAS on biodiversity and the related ecosystem services, as well as other adverse impacts on human health or the economy. Target 4.4 of Ireland's third National Biodiversity Action Plan 2017-2021 (Department of Culture, Heritage and the Gaeltacht 2017) requires that 'harmful invasive alien species are controlled and there is reduced risk of introduction and / or spread of new species'.

1.2 Limitations

It should be noted that any decision on efficacy of chemical treatments can only be provided by a registered pesticides advisor. A suitably qualified specialist will be appointed by the appointed contractor to monitor the treatment of non-native invasive species. This outline ISMP shall be updated as necessary by the specialist upon their appointment.

2 Methodology

2.1 Guidance

This outline ISMP and the mitigation strategies that are discussed relating to invasive plant species have been prepared with regard to the following guidance documents, where relevant:

- *The Management of Invasive Alien Plant Species on National Roads – Technical Guidance* (TII 2020a);
- *The Management of Invasive Alien Plant Species on National Roads – Standard* (TII 2020b);
- *The Environment Agency (EA) Managing Japanese knotweed on development sites - the Knotweed Code of Practice* (Version 3, amended in 2013, withdrawn from online publication in 2016) (EA 2013). (This document, although no longer supported by the EA, is nonetheless a practical document in determining the approach and control mechanisms for Japanese knotweed);
- *Managing Invasive Non-Native Plants in or near Freshwater* (EA 2010);
- *Invasive Species Ireland (ISI) Best Practice Management Guidelines for Japanese knotweed* (ISI 2008a);
- *Best Practice Management Guidelines for Himalayan balsam* (ISI 2008b);
- *Best Practice Management Guidelines for Giant hogweed* (ISI 2008c);
- *Non-Native Species Secretariat (NNSS) Allium triquetrum [Online] (Three-cornered garlic) Great Britain non-native species organism risk assessment scheme. Risk assessment information page Version 1.2* (NNSS 2011);
- *Countryside Management Publications, Giant hogweed (Department of Agriculture and Rural Development (Northern Ireland) (2016);*
- *Good Practice management, New Zealand pigmyweed (Crassula helmsii) Version 1, August 2018* (Animal and Plant Health Agency et al. 2018);
- *Management Measures for Widely Spread Species (WSS) in Northern Ireland Nuttall's waterweed (Elodea nutallii)* (Northern Ireland Environment Agency 2021);
- *Aquatic and Riparian Plant Management: Controls for Vegetation in Watercourses, Technical Guide* (EA 2014); and
- *Biosecurity Protocol for Field Survey Work* (Inland Fisheries Ireland 2010).

2.2 Surveys

A desk study involving retrieval of records of invasive species from the National Biodiversity Data Centre (NBDC), and consultation with the National Parks and Wildlife Service (NPWS), Fingal County Council, Dublin City Council, and Inland Fisheries Ireland was completed between 2017 and 2022. Invasive species were recorded in the study area of the proposed Project during the following surveys:

- Habitat surveys conducted by Scott Cawley Ltd. in May, June and September 2018; June and September 2019; June, July and October 2020; and February 2021;
- Habitat surveys conducted by Triturus Environmental Services Ltd. conducted in June 2021; and,
- Invasive species surveys conducted by Jacobs Engineering Ireland Ltd. in March 2020.

Survey dates spanned several seasons over several years, and the surveys included coverage of all parts of the study area in the appropriate season for identification of invasive species, when species are readily observable and identifiable.

Non-native species listed on the Third Schedule of the Birds and Natural Habitats Regulations were searched for within the study area. Surveys were conducted by competent specialists and all Third Schedule non-native invasive species recorded were mapped and attributed a unique reference identifier. Full details of the surveys are included in Chapter 15 (Biodiversity) of the EIAR for the proposed Project.

3 Results

There were seven non-native invasive plant species (four terrestrial species and three aquatic species) listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 present within or in close proximity to the proposed Project. The locations of these non-native invasive plant species are summarised below in Table 1 and shown on Figure 1, overleaf.



Figure 1: Invasive plant species locations in the context of the proposed Project and its alignment. Base map © Open Street Maps 2022

Table 1: Summary of Non-native Invasive Plant Species Listed in the Third Schedule of the Birds and Habitats Regulations 2011 Recorded along or adjacent to the proposed Project

Common name	Latin name	Location ¹
Canadian pondweed	<i>Elodea canadensis</i>	<p>Survey:</p> <p>Located on the Royal Canal at the 5th level, Cross Gun's Quay, Cabra</p> <p>Located on the Grand Canal near the existing Luas Green Line crossing point</p> <p>Desktop study:</p> <p>Located across almost the entirety of the Royal Canal and Grand Canal (Waterways Ireland, 2019a and 2019b and NBDC, 2020)</p>
Giant hogweed	<i>Heracleum mantegazzianum</i>	<p>Surveys:</p> <p>Located on the northern and southern banks of the Broadmeadow River, east of the R132, in scattered patches</p> <p>Located on the southern and eastern banks of the Ward River, west of the R132</p> <p>Located in Ballymun, south of Northwood Avenue, west and east of the Domville Wood Road</p> <p>Desktop study:</p> <p>Located on the banks of the Broadmeadow River and River Tolka</p>
Indian balsam	<i>Impatiens glandulifera</i>	<p>Survey:</p> <p>N/A</p> <p>Desktop study:</p> <p>Located on the banks of the River Tolka and River Liffey</p>
Japanese knotweed	<i>Fallopia japonica</i>	<p>Survey:</p> <p>Located in Dardistown within the eastern section of a field to south of the existing Long-term car park at Dublin Airport</p> <p>Located in Dardistown within the south-western section of a field to south of the existing Long-term car park at Dublin Airport</p> <p>Located within Irish Rail lands along the existing railway embankments and adjacent lands north of the Royal Canal south-east of Glasnevin Cemetery</p> <p>Desktop study:</p> <p>Located on banks of the River Tolka and Royal Canal, and within St. Stephen's Green Park</p>
New Zealand pigmyweed	<i>Crassula helmsii</i>	<p>Survey:</p>

¹ These records were identified during surveys. Additional to these results are records of invasive plants species found during the desktop study, as specified.

Common name	Latin name	Location ¹
		Located on the Grand Canal near the existing Luas Green Line crossing point Desktop study: N/A
Nuttall's pondweed	<i>Elodea nuttalli</i>	Survey: Located on the Royal Canal at the 5th level, Cross Gun's Quay, Cabra Desktop study: Located across almost the entirety of the Royal Canal and Grand Canal (Waterways Ireland, 2019a and 2019b and NBDC, 2020)
Three-cornered leek	<i>Allium triquetrum</i>	Survey: Located on bank west of fields in Bellenstown Located in a garden of St. Anne's private dwelling off Charter School Hill Road Located along the eastern boundary of the DCU Sports Complex playing pitches Located at the north-western boundary of CLG Na Fianna playing pitches Located along the northern bank of the Grand Canal directly west of the Luas Green Line crossing point Desktop study: N/A

It is recognised that other non-native invasive species, not listed in the Third Schedule, can and do occur within the footprint of the proposed Project and the wider metropolitan surrounds of Dublin. These are not ordinarily dealt within an ISMP, and there is separate legislation and guidance for the control of noxious weeds e.g., Noxious Weeds Act 1936 – No. 38 of 1936 and Noxious Weeds (Thistle, Ragwort and Dock) Order 1937 – S.I. No. 103 of 1937. Species such as Butterfly bush *Buddleia davidii* can quickly become established and spread in suitable urban areas, including gaps in the built environment such as the sides of old buildings, pavements, and on derelict ground. Where large populations occur, it may be a requirement of some local authorities within the Greater Dublin Area that they be managed to ensure no excessive spread e.g., Dublin City Council (DCC). The implementation of the general measures provided in Section 4 will minimise the risk of any spread of these species as a result of the construction of the proposed Project.

4 General Measures to Control and Prevent the Spread of Non-Native Invasive Plant Species

4.1 Pre-construction Survey

During the interim between the original non-native invasive species surveys and the commencement of construction following grant of planning permission, it is possible that the existing stands of Third Schedule non-native invasive species may have expanded (if unmanaged) or decreased (if there is an active management regime in place), or that newly established Third Schedule non-native invasive species may have become established within the footprint of the proposed Project. A confirmatory pre-construction invasive species survey will be undertaken by a suitably qualified specialist, arranged by the NTA, to confirm the absence, presence and / or extent of all Third Schedule non-native invasive species within the footprint of the proposed Project. Where an infestation is confirmed / identified within the footprint of the proposed Project, this will require the implementation of the final ISMP.

Data collected as part of the pre-construction invasive species survey will include a detailed description of the infestation including the approximate area of the respective colonies (m²) (metres squared), where feasible, the approximate total number of stems, pattern of growth and information on other vegetation present. This information will enable calculations of volumes of infested soils to be excavated where necessary, as part of the measures outlined below.

Following on from the pre-construction invasive species survey, the outline ISMP will be amended and updated, as advised by a suitably qualified specialist, with regard to the *Management of Invasive Alien Plant Species on National Roads - Technical Guidance* (TII 2020a) and Standard (TII 2020b) and other species-specific guidance documents including those listed in the outline ISMP, as necessary. The final ISMP will detail the strategy that will be adopted during the Construction (and Operational) Phase in order to manage and prevent the spread of invasive plant species, and where Third Schedule non-native invasive species are encountered directly in the works area, the method of treatment / eradication.

4.2 Final Invasive Species Management Plan (ISMP)

Following on from the pre-construction invasive species survey, the ISMP will be updated to detail the exact measures for any non-native invasive species population present within the footprint of the proposed Project. Depending on the extent and nature of the works, a number of approaches / treatments may be approved, all following on from the measures in the ISMP. The updated ISMP is referred to as the 'final ISMP' in this document.

The NTA will ensure that all control measures specified in the final ISMP shall be implemented by a suitably qualified and licenced specialist prior to the Construction Phase of the proposed Project to control the spread of newly established non-native invasive species within the footprint of the proposed Project. Furthermore, the appointed contractor will adhere to control measures specified within the final ISMP throughout the Construction Phase of the proposed Project. The site will be monitored by the appointed contractor after control measures have been implemented. Any re-growth will be subsequently treated.

All measures that are prescribed in the final ISMP shall be equally applicable to advance works as to construction works. In the Operational Phase the management of the infrastructure will be the responsibility of the local authority and the control of invasive species will be as per their plans and procedures, and responsibilities under The Birds and Natural Habitats Regulations.

4.3 General Measures to Avoid Spread of Non-native Invasive Species

The unintentional spread of Non-Native Invasive Species during construction works (within the proposed Project, from outside, such as through the importation of materials or poor biosecurity practices regarding plant and machinery) can be a significant issue, and if not managed properly, can result in the spread of non-native invasive species to uninfested areas (within or adjacent to works areas). This would increase the future cost and effort required to control the species and could pose further public health and safety risks (Japanese knotweed can cause damage to weaknesses in built environment, whilst Giant hogweed is an environmental public health hazard).

The most common ways that invasive species can spread are:

- Site and vegetation clearance, mowing, hedge-cutting or other landscaping activities;
- Spread of seeds or plant fragments during the movement or transport of soil;
- Spread of seeds or plant fragments through the local surface water and drainage network;
- Contamination of vehicles or equipment with seeds or plant fragments which are then transported to other areas;
- Importation of soil from off-site sources contaminated with invasive species plant material; and
- Leaving riparian corridors bare of vegetation thus allowing establishment of seed material from outside the site.

4.3.1 Site Establishment

During advance works and prior to commencement of construction, any areas where Third Schedule non-native invasive species have been recorded by the pre-construction surveys must be clearly fenced off prior to and during construction (in order to avoid spreading seeds or plant fragments around or off the construction site) until such time that the recommended mitigation measures are implemented and treatment has been completed, or that works in these areas are monitored in accordance with the requirements of the final ISMP.

This includes Construction Compounds and the entirety of the proposed Project footprint. Earthworks or machinery movement must be avoided in any areas where non-native invasive species have been identified during the pre-construction surveys, until the relevant stands have been eradicated.

4.3.2 Biosecurity and Site Hygiene

It is important to ensure that the further spread of non-native invasive species, where present, is curtailed. It is also necessary to ensure that in areas where non-native invasive species are not present, that they are not unintentionally spread e.g. through the importation of contaminated material being brought onto the site.

Unwashed construction equipment, plant and vehicles, and footwear can provide a vector for the spread of non-native invasive species within a proposed Project and from areas outside the scheme where infestation is present or where vector material potentially containing seed / root material is attached to plant. The following hygiene measures shall be undertaken for the proposed Project.

- Known or potentially infested areas within the working area of the proposed Project shall be clearly fenced off in advance of works and access restricted until such time that treatment has commenced and / or construction works are monitored in accordance with the final ISMP in the area. In relation to Japanese knotweed, the guidance recommends an exclusion buffer of 7m (metres) in all directions (within the works area and 3m vertically underground);
- Erection of clear signage at the Construction Compounds etc. and inclusion of detail during toolbox talks or similar (environmental induction) for construction staff in respect of the management of Third Schedule non-native invasive species. The signage and notification should be easily understood so that users are aware of the measures to be taken for known non-native invasive species, or what they should do in the case of suspected non-native invasive species identified. In particular the potential health risks posed by Giant hogweed, where it is recorded from within or adjacent to a proposed Project should be clearly notified to personnel;
- Identify dedicated access points into and out of fenced off areas. These shall not be breached until such time that eradication / removal of non-native invasive species is confirmed or monitoring of the treatment / eradication process is commenced;
- Where possible, the locations of dedicated footwear and wheel wash facilities should be identified in the final ISMP. Where a dedicated / bespoke wheel wash cannot be installed owing to space limitations, the appointed contractor will ensure that no excavated loose material is allowed off site from within an exclusion zone. Similarly, where plant that is used to excavate soils, it shall be visually checked for loose soil before movement to another part of site (where possible, the movements of tracked machinery should be restricted within the non-native invasive species exclusion zone). Loose soil shall be scraped off and disposed of, and a solution of Virkon® (or similar approved disinfectant) applied to machinery to ensure that no obscured seed / root material remains viable. Vehicular movements within the exclusion area shall be minimised as far as is practical;
- Machinery which has been used for the transport and/or excavation of infected/suspected infected vector material shall be thoroughly washed down and the washings captured for disposal. All such machinery/plant shall not be permitted to commence work elsewhere on or off-site until written confirmation of same has been undertaken;

- Dedicated wash down and solution capture will be set up in Construction Compounds. All washings should be stored in a quarantined bunded container that is rated for such storage until such time that they are removed offsite for disposal and transferred to a facility that is authorised to accept such waste;
- Except in very particular circumstances, under the guidance of the specialist, there shall be no temporary storage of infected / suspected infected soils on-site. They must be removed off site as per the guidance in Section 4.3.3; and
- Where small volumes (e.g. volumes capable of being double bagged in quarantine bags such as cut plants, bulbs or loose soil occur), it may be practical to bag the material and bring it to a clearly demarcated and dedicated quarantine area within the Construction Compounds until such time that the material is disposed of to an authorised facility, similar to the process of disposing of bulk excavated infected soil.

4.3.3 Soil Excavation

No excavations within a clearly demarcated and fenced off buffer zone shall be permitted. For Japanese knotweed, guidance recommends a horizontal distance of up to 7m from the outside of the stand. This could include under built ground, should suitable areas of weakness or uncompacted ground be encountered by the plants' rhizomes. For other species there will be different buffer zones as guided by the specialist.

Where the excavation of soil containing Third Schedule non-native invasive species (vector material) is the preferred option, the operation shall be monitored for its entirety until the risk of spread of Third Schedule non-native invasive species is negated.

There should be no temporary storage on-site of bulk excavated infected material. Where the outline ISMP calls for shallow / deep burial, this material shall be removed from the excavated area and transported immediately to approved receptor area on-site. Furthermore, the temporary storage of uninfected material should not occur within a European or National designated site nor within 10m of any watercourse and any land within an identified flood zone. Where temporary stockpiles of infected material cannot for practical limitations, be situated away from a potential flood risk area, the appointed contractor will be required to include a flood response plan within the Environmental Incident Response Plan (see Section 4.3 of the Outline Construction Environmental Management Plan) to ensure that any inundation of Construction Compounds does not result in a pollution event to nearby water bodies.

Plant and machinery used in the control, excavation and transport of invasive material shall also be subject to the recommendations described in Section 4.3.2.

The installation of industry-rated non-native invasive species-proof membrane before infilling construction of road / paths surface may be required. All waste arising out of this process which has been in contact with the excavated ground shall be treated as infected waste and disposed of at a facility that is authorised to accept such waste (See Section 4.3.4).

Where the movement of any Third Schedule non-native invasive species is required off site, a licence will be required from NPWS in advance of any movement to a site / facility licensed to accept such waste, as per the Birds and Natural Habitats Regulation. This licence is separate to and does not negate the need for licences / permits / authorisations required under waste legislation.

4.3.4 Disposal of Material

Where any non-native invasive plant material is collected (e.g. by hand-pulling or mowing), it is important that its disposal does not result in a risk of further spread. The movement of invasive plant material, off site, requires a licence from the NPWS, as per the Birds and Natural Habitats Regulations. Invasive species (particularly roots, flower heads or seeds) must be disposed of at licensed waste facilities or composting sites, appropriately buried, or incinerated having regard to relevant legislation (e.g. Waste Management Act, as amended, Section 4 of Number 6 of 1987 - Air Pollution Act, 1987, relevant local authority byelaws

and any other relevant legislation). All disposals must be carried out in accordance with the relevant waste management legislation, as per guidance in the Guidelines for the Management of Waste from National Road Construction Projects (TII 2017).

It should be noted that some invasive species plant material or soil (vector material) containing residual herbicides may be classified as either 'hazardous waste' or 'non-hazardous waste' under the terms of the Waste Management Act, as amended, and both categories may require special disposal procedures or permissions. Advice should be sought from a suitably qualified waste expert regarding the classification of waste and the suitability of different disposal measures.

4.3.5 Measures to be implemented during the Application of Herbicides

Some of the control options may require the use of herbicides, which can pose a risk to human health, to non-target plants or to wildlife. In order to ensure the safety of herbicide applicators and of other public users of the site, a suitably qualified pesticides advisor, registered with the Department of Agriculture, Food and the Marine must be employed.

The appointed contractor is required to refer to the appropriate guidance documents, including but not limited to those listed in Section 2.1, which provide detailed recommendations for the control of invasive species and noxious weeds.

These documents include measures to aid the identification of relevant species, with details for the timing, chemicals and methodology for chemical control (if applicable), and for measures to avoid environmental damage during the use of herbicides. The appointed contractor (or the specialist as appropriate) will update the outline ISMP in accordance with the relevant guidelines before commencing works.

It should be noted that where a chemical treatment is to be used, there is a risk of contaminating a watercourse. The choice of herbicide is typically limited to formulations of Glyphosate or 2,4-D amine that are approved for use near water. Full details of any chemical used, where required and as advised by a registered pesticides advisor, will be included in the final ISMP prepared in advance of construction of the proposed Project.

4.3.6 Importation of Soil and Other Material

The bulk importation of material from offsite could potentially result in the accidental spread of Third Schedule non-native invasive species, as it is uncertain if these site(s) are free from non-native invasive species. This is likely less an issue for road building material. However, in terms of landscaping, if soil is imported to the site for landscaping, infilling or embankments, the contractor shall seek documentation from suppliers confirming that the material is free from invasive species.

4.3.7 Post-Construction Monitoring

Following the construction of the proposed Project, there may be ongoing treatment programmes which extend for a number of years into the Operational Phase. In the Operational Phase, the management of the infrastructure will be the responsibility of the local authority and the control of invasive species will be as per their plans and procedures, and responsibilities under The Birds and Natural Habitats Regulations.

The above measures are important for all Third Schedule non-native invasive species, and in particular Japanese knotweed, where it occurs, as maintenance works associated with landscaping, such as mowing and hedge cutting have the potential to spread this plant via the dispersal of very small amounts of shredded plant material. If invasive plants are found, then they shall be treated as per the measures outlined in the ISMP and any species-specific guidelines.

4.4 Assessment of Management Options for identified Third Schedule Non-Native Invasive Species

The general measures included in Section 4.3 are required to ensure good on-site practices in respect of known or potential Third Schedule Non-Native Invasive Species.

Sections 4.4.1 to Section 4.4.6 further identify practical management controls with respect to species that have been identified within the proposed Project boundary, or have the potential to establish within the proposed Project boundary in the medium term. The colour scheme shown, is a qualitative tool intended to assist the reader to focus on the most likely practical solutions. It is acknowledged that more than one potential control measure exists and that a single or combination of measures may be required. The recommendations presented in this outline ISMP provide the minimum requirements for the likely control measures, and the measures outlined in this outline ISMP shall be updated (with further detail on methodology used at each location, timing, practical management etc) by the appointed contractor (or the specialist as appropriate).

The use of chemical treatments is recognised as a potential treatment option. However, the services of a registered pesticide advisor must be employed in the specifying named chemicals including those rated for use adjacent to aquatic environments where required, treatment type, dosage, and timing etc., and / or use of pesticides in the management of potential Third Schedule non-native invasive species within the proposed Project.

The selected management control to be defined for each non-native invasive species stand within the proposed Project will depend on:

- Results of the pre-construction survey; and,
- Construction requirements – timing of works at specific locations, level of infestation and practical considerations such as reducing disturbance to road users / homeowners.

The final which will be updated following on from the pre-construction surveys, may require the utilisation of a number of controls that are described and assessed below.

4.4.1 Japanese knotweed *Reynoutria japonica*

Japanese knotweed is high impact non-native invasive species that is particularly effective at colonising disturbed ground (e.g., construction sites) and can spread by the re-growth of cut fragments or root material, so if it is broken up during site clearance or other earthworks it can readily re-grow in new areas to which soil is moved. Japanese knotweed readily reproduces asexually (in Ireland, at least, as only Female plants have been recorded) and regrowth can occur from plant material weighing as little as 0.7g (grams) of viable material. It is acknowledged to be very difficult to effectively control and even more difficult to fully eradicate.

Given the nature of Japanese knotweed, chemical treatments are often preferred over physical methods as they can, if implemented properly, reduce the disturbance of the plant/population thus reducing the chances of its spread. If herbicide is applied as the treatment option, it will need to be reapplied for up to five years after the first application to ensure the plant control measures have been effective; or monitored for a minimum of two years during which no regrowth is recorded.

Table 2 presents an assessment of potential treatment options available for the treatment of Japanese knotweed. The various methods are analysed and described in further detail as necessary. It should be noted that where it might occur within the proposed Project, that a number of the measures described below may be applicable, depending on the nature of works, the timing etc. These will be fully detailed in the final ISMP after the pre-construction survey of the proposed Project

Table 2: Assessment of Management Methods for Japanese knotweed

Approach	Treatment Options	Comment	Potential for Implementation on the Proposed Project
Physical	Dig and dispose offsite, under licence	This option requires that all plant material (above and below ground) is excavated along with soil and disposed of to a facility authorized to accept it. In addition to waste permits / authorizations, a wildlife	Likely – given the nature of the schemes, there may be a need to excavate soil and plant material to enable construction works to go ahead in timely manner.

Approach	Treatment Options	Comment	Potential for Implementation on the Proposed Project
		licence issued by NPWS is required for the transport of Third Schedule non-native invasive species offsite. Depending on the nature of the excavation the proximity of services etc, the use of root barrier membrane could be required.	
	Dig and dispose onsite. - Shallow burial - Deep burial	A wildlife licence from NPWS is not ordinarily required if the burial of collected material is proposed for within the consented proposed Project. Shallow burial in a constructed cell such as a dedicated sealed cell within a constructed berm will allow for periodic monitoring and of easy chemical treatment of any regrowth. Deep burial entails a dedicated sealed cell within a constructed excavation, that is at least 2m below the surface of the ground. The landscaping regime should not specify trees or scrub to be planted above. Either shallow or deep option could require the use of root barrier membrane. The use of chemical pre-treatment of deep / shallow cells could also be required.	Unlikely – given the lack of suitable lands within the largely developed metropolitan area.
	Screen on site – remove fragments offsite and reuse soil.	A control option that can be used to reduce the volume of soil / sediment to be moved elsewhere for burial, this option requires suitable plant, adequate space and volumes of soil to make the operation at a location cost effective. This option often requires the use of root barrier membrane owing to reuse of screened soil. The use of chemical pre-treatment of deep / shallow cells could also be required.	Possible but unlikely given the space requirements for a screener (unless a bespoke small-scale screener is available).
	Cutting and / or strimming	Not recommended and does not apparently diminish vigour of plants over time. Largely cosmetic and can result in considerable spread of viable vegetative material that can readily regenerate on suitable conditions.	Not Recommended.
Chemical	Spot	Used for isolated plants – knapsack or weep sprayers. Chemical treatments for infestations near	Chemical treatments are often a preferred option for treating Japanese knotweed, but the process can take

Approach	Treatment Options	Comment	Potential for Implementation on the Proposed Project
		water should be rated for use near aquatic locations.	between 3 to 5 years before eradication can be guaranteed and requires at least 2-year post implementation monitoring. However, given the nature of the proposed Project, the use of chemical treatment alone is unlikely to be adequate unless treatment regime begins a number of years before construction commencement.
	Spray	Used for isolated plants or large populations using knapsack or weep sprayers. In accessible areas including along riverbanks, lance sprayers can be used. Chemical treatments for infestations near water should be rated for use at or near aquatic locations. Can result in chemical drift.	
	Stem injection	This method is considered very effective, if the injection is timed appropriately for growth phase. However, it is labour-intensive (sometimes) requiring some cutting and is usually only carried out on small / isolated populations. Chemical treatments for infestations near water should be rated for use at or near aquatic locations.	Possible and requires specialist equipment to enable working alongside the biohazardous plant. – Despite some advantages over other conventional chemical treatments e.g., reduces drift, not weather dependent.

Root Barrier Membrane

Following on from the excavation of Japanese knotweed, there may be a need to install a root barrier membrane. These are specialised products that can provide protection to structures/services etc from regrowth from within or outside a site if suitably rated and properly installed. Thereafter, any small adjacent infestation can be more readily treated with chemical treatment for example.

Reseeding Following Eradication

This is not strictly a control method. However, where treated ground is not being built upon, planting or resowing mixtures of native grass species helps to restore the original vegetation and aids post-control management of affected sites. A grass sward established in autumn will compete with germinating Japanese knotweed seedlings in the following spring.

4.4.2 *Giant Hogweed Heracleum mantegazzianum*

This is a high-risk invasive species, that is also a biohazard in that it can pose a threat to humans. The chemistry of its sap is such that exposure to it on skin can result in prolonged photosensitizing reactions with blistering. Thus, a clearly demarcated exclusion buffer, in excess of 4m, is recommend for any individual / populations of this species before commencing works.

It spreads via heavy seeds which can easily be transported by water; hence, it is often found along river corridors. While the plant favours riverbanks, it is known to be found on waste / derelict ground as well as railway lines for instance. Its presence can impact local biodiversity and undermine bankside integrity. The seedling stage is the most vulnerable. Mortality of seedlings is comparable to many other plants and its seed bank is considered to be persistent for a short number of years only. Since giant hogweed can only reproduce via seed, control measures applied before flowering and fruit set will limit subsequent generations (and even then, only with favourable conditions). The ideal time to control Giant hogweed via chemical treatment is April, with follow on monthly applications targeting regrowth, although for this treatment options, it can require up to 5 years before successful eradication.

Table 3 presents an assessment of potential treatment options available for the treatment of Giant hogweed. The various methods are analysed and described in further detail as necessary.

Table 3: Assessment of Management Methods for Giant hogweed

Approach	Treatment Options	Comment	Potential for Implementation on the Proposed Project
Physical	Aboveground cutting	Not recommended. Largely cosmetic and prolongs flowering until such time that control halted. However, if digging is used, it is recommended that the removal be attempted in April / early May when the plant is usually less than 30cm tall. However, the root must be captured also.	Unlikely - requires specialist equipment to enable working alongside the biohazardous plant
	Root cutting	Individual plants may be killed by cutting at a 45-degree angle 15cm below ground level with a spade in April or May. Can be laborious unless small/isolated stands. Can be effective if combined with chemical treatment over 4-5 years repeat treatment	Given the nature of the proposed Project, could be used to remove biohazard plant and thereafter allow for chemical control against any regrowth. Requires specialist equipment to enable working alongside the biohazardous plant
	Strimming	Not recommended owing to spread of sap.	Not Recommended.
	Ploughing	Can provide total control where seedlings and young plants encroach onto agricultural land. However not practical in metropolitan areas or isolated stand along riverbanks.	Unlikely given the locations that Giant hogweed is often found in.
	Grazing	Grazing should begin when early foliage appears in April and should continue until early autumn when re-sprouting stops. Eradication can take between 5 and 10 years so that seed bank and root stock is fully depleted of resources.	Not possible in metropolitan area
	Pulling	Hand pulling is only suitable for small / immature plants (and with suitable PPE to protect exposure of bare skin). Potential remains for tap root to remain underground and regenerate.	Unlikely for mature plants. Requires specialist equipment to enable working alongside the biohazardous small / immature plants
	Biological control	Other than natural soil biota, it is not currently permitted to introduce any organisms to areas to deal with Giant hogweed. Research ongoing which would requires permitting thereafter.	Not possible at present.
	Dig and dispose offsite, under licence	This option requires that all plant material (above and below ground) is excavated along with soil and disposed of to a facility authorized to accept it. Given the phytotoxic nature of the plant, it should not be buried onsite nor disposed of with general Construction and Demolition waste.	Possible and depending on location may be required.

Approach	Treatment Options	Comment	Potential for Implementation on the Proposed Project
		In addition to waste permits / authorisations, a wildlife licence issued by NPWS is required for the transport of Third Schedule non-native invasive species offsite.	
Chemical	Spot treatment	Used for isolated plants – knapsack or weep sprayers. Chemical treatments for infestations near water should be rated for use near aquatic locations.	Most widely used method, but to be wholly effective, requires total control over ~5 years of treatments within a river catchment or the isolated location. Is weather dependent and can result in chemical drift to adjacent vegetation or watercourses.
	Spray	More suitable for large stands, where machine-mounted blanket sprays are used. Chemical treatments for infestations near water should be rated for use near aquatic locations.	Possible but unlikely owing to nature and size of population recorded on proposed Project.
	Stem injection	Can only be carried out on young stems. Due to difficulties with the timing of application and the potential safety risk of contact with the large leaves this method requires specialist safety equipment.	Possible and requires specialist equipment to enable working alongside the biohazardous plant – Despite some advantages over other conventional chemical treatments e.g., reduces drift, not weather dependent.

Temporary storage of Collected Material

Given the phytotoxic nature of Giant Hogweed, cut material should not be discarded. Ideally it should be disposed of immediately with similar non-native invasive species waste to a facility authorised to accept such waste.

However, given the nature and relative sizes of Giant hogweed infestations it may be suitable to collect cut biomass (where not disposed of immediately to a facility authorised to accept such waste), and to double bag it for transport to dedicated quarantine area (location to be approved as part of the final ISMP) to decompose before disposal with similar non-native invasive species waste in facility authorised to accept such waste.

The locations of areas for which Giant hogweed has been eradicated should be notified to the local authority, so that any future public health issue involving similar symptoms can be tracked.

Reseeding Following Eradication

This is not strictly a control method. However, where treated ground is not being built upon, resowing mixtures of native grass species helps to restore the original vegetation and aids post control management of affected sites. A grass sward established in autumn will compete with germinating Giant hogweed seedlings in the following spring and retard its establishment.

4.4.3 *Himalayan balsam Impatiens glandulifera*

This high-risk invasive species is easily disturbed, particularly if in flower and readily become re-established along riparian corridors, which are annually subject to alluvial flooding. Unlike Japanese knotweed though, it does not reproduce asexually. Plants can produce in excess of 6000 seeds, and it aggressively colonises

bare ground along riverbanks - including wet woodlands as well as waste ground where suitable conditions exist. Due to its rapid growth, it can outcompete most native species. While its seedbanks are viable for up to 18 months, the resupply of seed is often achieved through annual river flooding and riparian inundation with freshly deposited soil-laden alluvium.

Although this species was not found present within the study area during surveys, measures for addressing this species are covered within this outline ISMP on a precautionary approach, as it is known in the wider area and in the event that it becomes established within the proposed Project boundary between the surveys taking place and construction commencing.

Table 4 presents an assessment of potential treatment options available for the treatment of Himalayan balsam. The various methods are analysed and described in further detail as necessary. Control measures for Himalayan balsam should aim to prevent flowering and are therefore undertaken before June. However, eradication may take up to 5 years. It should be noted that successful localised management of Himalayan balsam is difficult along watercourses, as the spread of this non-native invasive species from upstream areas (e.g., outside of the proposed Project) onto bare ground often occurs after winter flooding.

Table 4: Assessment of Management Methods for Himalayan Balsam

Approach	Treatment Options	Comment	Potential for Implementation on the Proposed Project
Physical	Hand pull	Small isolated and immature infestations, such as in gardens or roadsides can usually be readily pulled prior to flowering e.g., care must be taken not to leave lower plant sections as these can regrow rapidly. Additionally, any flower heads (if present) should be covered by a tied bag before pulling to ensure no seed drop.	Possible, ideal for smaller areas adjacent to the proposed Project boundary.
	Dig and dispose offsite, under licence	This option requires that all plant material (above and below ground) is excavated along with soil and disposed of to a facility authorized to accept it. In addition to waste permits / authorisations, a wildlife licence issued by NPWS is required for the transport of Third Schedule non-native invasive species offsite.	Possible given the nature of the proposed Project, this may be an optimal control measure.
	Mechanical	Repeated cutting or mowing is effective for larger stands, but plants can regrow if the lower parts (above lowest node) are left intact. Regeneration can be further halted by ensuring full ground vegetative layer through reseeding.	Possible but unlikely main option given the nature of works along existing road infrastructure.
	Grazing	Regular grazing is said to suppress the plant over time.	Not practical given the nature of the metropolitan landscape and nature of the proposed Project.
Chemical	Spot / weed wiper	Can be used for smaller infestations in spring before flowering occurs, but as late as to allow germinating seedlings to have become established and thus be able to uptake the chemical treatment. Adjacent to the works boundary, chemical treatments for infestations near water should be rated for use near aquatic locations.	Possible, within the proposed Project boundary, where ground is to be excavated, may require physical control also.

Approach	Treatment Options	Comment	Potential for Implementation on the Proposed Project
	Foliar spray	Can be applied to larger infestations via knapsack spray / lance spray etc. in spring before flowering occurs, but as late as to allow germinating seedlings to have become established and thus be able to uptake the chemical treatment. Chemical treatments for infestations near water should be rated for use near aquatic locations.	Possible, within the proposed Project boundary, where ground is to be excavated, may require physical control also.

Temporary Storage of Collected Material

Given the nature and relative extent of Himalayan balsam infestations in some urban situations, collected biomass (pulled stems / roots and bagged flower heads), where not disposed of immediately to a facility authorised to accept such waste, could be double bagged and put in dedicated quarantine areas (locations to be approved as part of the final ISMP). Here, the material could be left to decompose before disposal with similar Non-native Invasive Species waste at an authorised facility.

Reseeding Following Eradication

Areas devoid of or cleared of vegetative cover near watercourses should be resown with appropriate riparian ground cover species in summer months to ensure that bare banks do not provide favourable conditions for Himalayan balsam to become re-established and to protect banks from accelerated erosion.

For any area of ground that is cleared of this non-native invasive species, and which is not subsequently constructed upon, follow-on mechanical cutting regimes and / or chemical treatments may be required to ensure the seed bank is fully exhausted.

4.4.4 *Three-Cornered Garlic*² *Allium triquetrum*

A medium impact, rhizomatous species, Three-cornered garlic is often planted and can become established in natural and semi-natural habitats, where it is reported to spread by ant-dispersed seed and division of clumps (NNSS 2011). It can readily establish in suitable ground resulting in it posing a threat to biodiversity where the plant forms early season dense monocultural masses, particularly at protected sites.

Management of this species is relatively straightforward, although there is a requirement that it be visible above ground so as to delineate its likely extent and ensure efficacy of management. Management of infestations can be managed through chemical or physical-based options or a combination of both. However, given the possibility of some underground bulbs / seedbank remaining within the ground post-treatment, eradication may require a number of repeat treatments over a number of years to ensure effective treatment of all bulbs.

Table 5 presents an assessment of potential treatment options available for the treatment of Three-cornered garlic. The various methods are analysed and described in further detail, as necessary.

² Three cornered garlic *Allium triquetrum* is also known as Three cornered leek

Table 5: Assessment of Management Methods for Three-cornered garlic

Approach	Treatment Options	Comment	Potential for Implementation on the Proposed Project
Physical	Hand dig	Hand-dig when small population present, ensuring that all biomass including bulbs collected. May also require a number of years of mechanical cutting to exhaust seed/bulb bank in wider subsurface environment. In addition to waste permits / authorisations, a wildlife licence issued by NPWS is required for the transport of Third Schedule non-native invasive species offsite.	Likely
	Mechanical excavation	For larger areas of infestation only, soil can be screened, and bulbs removed. In addition to waste permits / authorisations, a wildlife licence issued by NPWS is required for the transport of Third Schedule non-native invasive species offsite.	Unlikely given the nature and size of the identified populations
Chemical	Spray	Chemical treatment can be made in the spring (when above ground vegetation visible) but before flowering. Multiple applications may be required due to persistence of bulbs and soil seed bank.	Possible, where ground is to be excavated, may require physical control also.

Temporary Storage of Collected Material

Given the nature and relative sizes of infestations of Three-cornered garlic, bulbs and vegetative material, where not disposed of immediately to authorised facilities, could be double bagged and placed in dedicated quarantine areas to decompose before disposal with similar non-native invasive species waste at authorised facilities.

Reseeding Following Eradication

For any area of ground that is cleared of Three-cornered garlic, and is not constructed upon, a follow-on mechanical hand-pulling / cutting regime and / or chemical treatment may be required post construction to ensure full exhaustion of the bulb / seed bank.

4.4.5 New Zealand Pigmyweed *Crassula helmsii*

The trade and potential escape of New Zealand Pigmyweed through the aquarium and garden industry is considered the principal vector for the introduction of this species into new locations, particularly discarded material. Once established, it can readily spread resulting in a threat to native biodiversity, where the plant can form monocultural masses. It does not reproduce from seed, but readily grows from small stem fragments (~5mm (millimetres) in length). It does not like shaded areas and where present can thrive in open, slow-moving waters and ponds. It responds well to nutrient enrichment, particularly nitrate enhancement.

Three forms of the plant are recognised, namely submerged, emergent, and terrestrial, with emergent and terrestrial forms easily identified. It is considered to be an extremely difficult and costly to control, particularly where large monodominant stands occur, and its ability to form new plants vegetatively from small fragments facilitates its spread to new locations. Management of infestations may be managed through a range of measures, although it is recognised that it is very difficult to fully eradicate unless a

catchment- based approach is taken. It is also noted that physical/chemical management is avoided in Late summer and autumn.

Table 6 presents an assessment of potential treatment options available for the treatment of New Zealand pigmyweed.

Table 6: Assessment of Management Methods for New Zealand pigmyweed

Approach	Treatment Options Potential Actions	Comment	Potential for Implementation on the Proposed Project
Physical	Dredging	Dredging of material including soils (between October to March) followed by offsite composting or incineration. Up and downstream areas would need to be fully enclosed with fine net to capture released material. In addition to waste permits / authorisations, a wildlife licence issued by NPWS is required for the transport of Third Schedule non-native invasive species and contaminated soil offsite.	Possible but unlikely. Onerous to undertake and efficacy is considered low unless strictly applied, as it could result in further spread.
	Burying	Drying out the waterbody followed by burial (February to March) in excess of 20 centimetres (cm) of collected dredged material.	Considered successful, when combined with chemical treatment but usually applied to ponds etc. Not possible if canal navigation to be retained and other species of note e.g., <i>Groenlandia densa</i> potentially present.
	Hand pull	Up and downstream areas would need to be fully enclosed with fine net to capture released material. Collected material (All year if plant is visible) could be composted offsite or sent for incineration. In addition to waste permits / authorisations, a wildlife licence issued by NPWS is required for the transport of Third Schedule non-native invasive species and contaminated soil offsite.	Only suitable for areas that can be contained e.g., water flow unhindered despite area being netted. Submerged material may be overlooked.
	Covering	Cover with black polythene or a similar material to shade the plant for at least three months, but preferably six. Has been demonstrated to work for other submerged	Unlikely, given the nature of <i>Crassula</i> , treatment likely for small discrete infestation only. Would be very onerous to cover submerged infested area with jute / polythene to shade outgrowth for 3 months plus. Could locally alter the area

Approach	Treatment Options Potential Actions	Comment	Potential for Implementation on the Proposed Project
		species e.g., <i>Lagarosiphon</i> , but untested for <i>Crassula</i> .	to detriment of native biodiversity. Does not confirm that dormant submerged material would not become established after removal of covering.
	Saltwater inundation	Flood affected areas with saltwater for a minimum of 31 days.	Only suitable for areas near the sea and where saline water can be prevented from flowing off. Not suitable in freshwater systems, where other native species would not tolerate saline conditions.
Chemical	Knapsack sprayer	Chemical treatment can be made in the April to November. Multiple applications within a season are not usually required if applied at the appropriate time and no further physical disturbance of the treated population occurs. Chemical treatments for infestations should be rated for use near aquatic locations.	Possible, but only captures emergent and terrestrial forms. Emergent form where present would remain untreated.
Environmental		Steepening banks, increasing the shading of the area and introducing fast growing, native species have all been shown to be effective in certain situations, particularly when used in conjunction with other methods above.	Unlikely given the nature of the project

Other options for which unconfirmed data is available or licenced to release biological controls are not yet approved and have been discounted from assessment as potential control methods. They include - grazing by introduced Grass Carp (a non-native fish species), the release of gall forming mites (currently at EU approval stage), hot foam and hot water, drying out the ground.

A pre-construction survey will be required in advance of works. Given that the presence of submerged vegetation is difficult to note and can be overlooked if dormant, the final ISMP will detail the measures that are applicable for all works affecting water bodies. The key element for the proposed Project will be the avoidance, as far as practical, of unnecessary disturbance of water body edge and sediments. Thereafter, standard environmental measures will be applied. This will include rigorous application of biosecurity measures for all plant / equipment brought onto or near water bodies and again before moving to another area. No instream works will be permitted where this species is found present unless specific precautions and control measures have been clearly identified and implemented, to reduce for potential disturbance of riparian vegetation (where it occurs).

Temporary Storage of Collected Material

If this non-native invasive species is found present, all material, where not disposed of immediately to authorised facilities, will be double bagged and placed in dedicated quarantine areas (away from

watercourses) to decompose before disposal with similar non-native invasive species waste at authorised facilities.

4.4.6 Canadian pondweed *Elodea canadensis* & Nuttall's Pondweed *E. nuttallii*

Both species are regarded as perennials, overwintering in deeper water, and reproducing asexually. Disturbance increases the dispersal of a considerable number of propagules and the vigorous re-growth is enhanced through changes in availability of nutrients. In Ireland although both are ranked as a medium risk plant, they are both ranked as highly invasive. Both species has a wide ecological tolerance and can grow relatively fast, resulting in displacement of native flora. The plant can form dense mats which outcompete native plant species and therefore decrease the biodiversity in an area, as well as interfering with navigation and recreational activities on watercourses.

Although, not considered as widespread as Canadian pondweed, Nuttall's pondweed is nonetheless spreading, and in the UK and Ireland is regarded as now displacing the former, possibly due to increased eutrophication. Nuttall's pondweed is also more tolerant of poorer water quality, disturbance, and poorly implemented management such as navigation clearance. Both share many of the same attributes and are usually found in deeper water, rooted in sediment these pondweeds can be free floating in water column if disturbed.

Table 7 presents an assessment of potential treatment options available for the treatment of both pondweeds.

Table 7: Assessment of Management Methods for both Pondweeds

Approach	Treatment Options	Comment	Potential for Implementation on the Proposed Project
Physical	Draw down	Some studies indicate success where water levels can be dropped and sediments dried out, that this can be effective	Not likely, given the nature of the proposed Project and the likely occurrence of this species further up the canal which could result in later reestablishment.
	Cutting	By hand or on specially adapted barges. Best undertaken before July, Repeat harvesting can result in nutrient depletion (if source of eutrophication into watercourse controlled). This is a longer-term solution that would require careful implementation to ensure no unnecessary spread of material.	This is long-term solution would require commitment from NTA and other stakeholders to undertake.
	Covering	Cover with Jute or a similar material to shade the plant. Has been demonstrated to work for other submerged species e.g., <i>Lagarosiphon</i> , and a DCC sponsored project on the use of jute matting has been undertaken on parts of the River Liffey between Islandbridge and Chapelizod.	Possible but unlikely - given the nature of <i>Elodea</i> , and its potential distribution elsewhere could be onerous in terms of timeframes and difficult to cover submerged infested area with jute to shade-out growth. Would not guarantee prevention of re-establishment and would require pollution sources to be addressed to reduce eutrophication.
Environmental	Water dyes	Both species can tolerate some shade of deeper water, but water	Not likely given the location of the canal in highly populated area unless a

		dyes have been found to be effective in static waters. Additional landscape planting to increase shade are considered to be effective.	well-developed PR campaign is put in place to explain. Potential for landscape planting is also limited by virtue of location and space requirements.
Chemical	There is currently no known herbicide product approved for treatment of submerged macrophytes such as <i>Elodea spp.</i>		

Other options for which unconfirmed data is available or licenced to release biological controls are not yet approved and have been discounted from assessment as potential control methods. They include biological control through the introduction of Grass Carp (a non-native fish) and other bottom feeders.

Temporary Storage of Collected Material

If these non-native invasive species are encountered, all material, where not disposed of immediately to authorised facilities, will be double bagged and placed in dedicated quarantine areas (away from watercourses) to decompose before disposal with similar non-native invasive species waste at authorised facilities.

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