Invasive Alien Species Survey and Management Plan

Gas to GIL Power Athlone – Monksland AGI

July 2024

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Client			Project		
Fingleton White			Gas to GIL Power Athlone-Monksland AGI		
Ver.	Date	Details	Prepared by	Checked by	Approved by
1	July 2024	IAPS Survey Management Plan	Tom Donovan (Director)	Dr William Earle	Tom Donovan (Director)

Cover photo: Derelict cottage on R446.

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1. INTRODUCTION

A preliminary ecological sites survey of the Gas to GIL Power Athlone – Monksland AGI pipeline route was conducted by the Moore Group on 15th February 2024. This survey identified a Japanese knotweed (*Reynoutria japonica*) (JKO) stand growing in the grounds of a derelict cottage along the route R 446 (53.401328, -7.987874)

At the request of Fingleton White, INVAS Biosecurity Ltd. (INVAS) was commissioned to carry out an Invasive Alien Plant Species (IAPS) survey of the above site and provide a management plan to facilitate the laying of the gas pipeline within the 7 metre buffer zone of the above infestation.

A survey of the site was carried out by INVAS personnel on the 17th July 2024 to inform this management plan (Figures 1.1-1.3).

1.1. Project Background

Gas Networks Ireland are subject to S39A consent from the CRU, laying a new pipeline to tie into the existing 750 NB 'Pipeline to the West' adjacent to the R446 road south of Athlone. The pipeline will terminate at the new Monksland AGI compound located to the north of the motorway.

1.2. Objectives

The aim of the survey is to identify any issues that may impact on the pipeline construction from the Japanese knotweed on the cottage grounds, which are adjacent and wihin a 7 metre buffer zone to the pipeline route on the R446. This will inform this management plan to facilitate the operations involved in the pipeline construction through IAPS infested areas and will ensure the integrity of the pipeline and prevent any accidental spread of known IAPS infestations throughout the area and beyond.

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Figure 1.1. Japanese knotweed location.

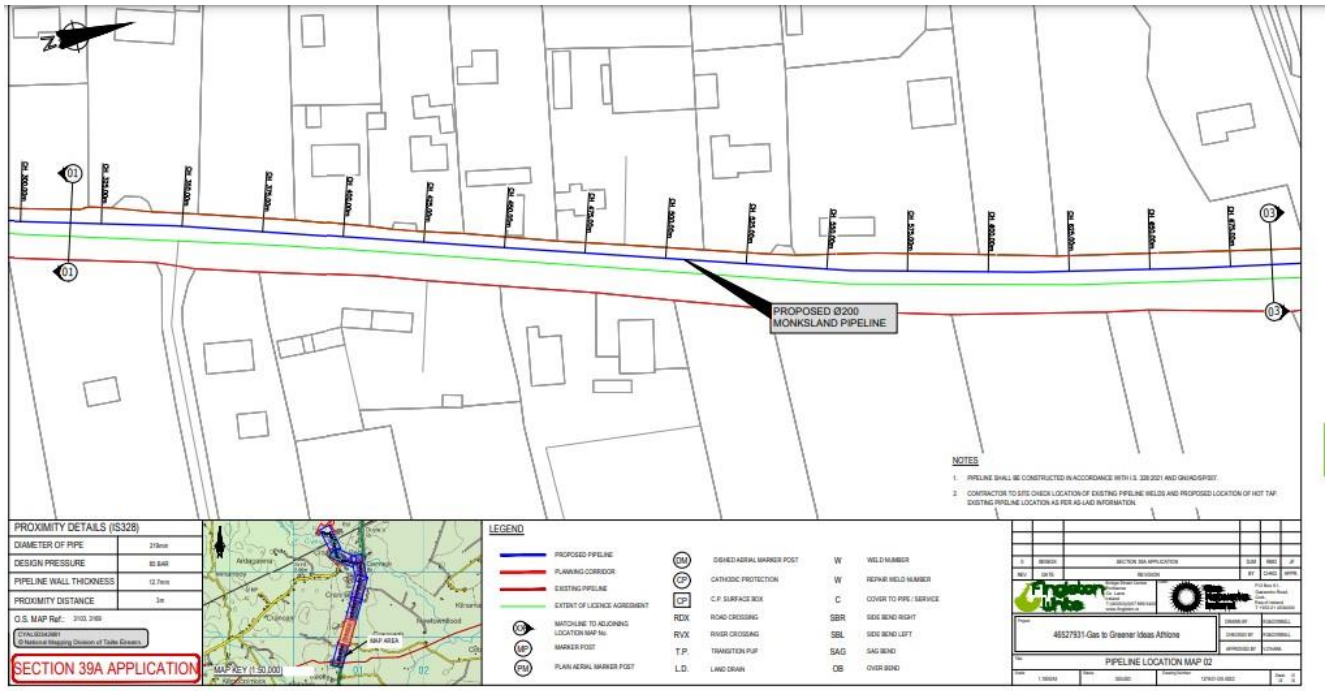

Figure 1.2: Site location CH 450.00m (Courtesy Fingleton White).

Figure 1.3: Overview of proposed gas pipeline (Courtesy Fingleton White).

1.3. 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 1.1.

Table 1.1: National and European legislation concerning invasive alien species.

Republic of Ireland: European Union (Birds and Natural Habitats) Regulations 2011, S.I. 477 **http://www.irishstatutebook.ie/eli/2011/si/477_/made/en/print**	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.
Republic of Ireland: River Basin Management Plan for Ireland 2018 – 2021 **(Water Framework Directive)** **https://www.housing.gov.ie/sites/default/files/publications/files/rbmp_report_english_web_version_final_0.pdf**	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).
Republic of Ireland: Sustainable Use of Pesticides Directive http://www.pcs.agriculture.gov.ie/sud/	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.
Invasive Alien Species Regulation (EU) 1143/2014 http://ec.europa.eu/environment/nature/invasivealien/list/index_en.htm	This EU Regulation entered into force on 1st January, 2015. Central to the legislation is the establishment, and regular updating, of a list of IAPS 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 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.

2. SURVEY RESULTS

Survey observations and photographs illustrating the IAPS infestation have been provided in the following sections of this document.

A large infestation of Japanese knotweed (*Reynoutria japonica*) was recorded growing on the property of the cottage located on the R446 (Figure 1.2) adjacent to the proposed pipe laying works. It was apparent that the JKO has been previously treated with herbicide resulting in reduced growth, excepting for a single mature stand which appears to have been missed in the original herbicide treatment (Plates 2.1-2.4). Despite this treatment, many small plants were recorded in the vicinity of the road boundary wall.

Plate 2.1: Japanese knotweed growth after herbicide treatment.

Plate 2.2: Reduced Japanese knotweed growth

Plate 2.3: Reduced Japanese knotweed growth

Plate 2.4: Mature stand of Japanese Knotweed.

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3. SPECIES DESCRIPTIONS AND LEGISLATION

3.1. Japanese knotweed

Distinguishing features	Knotweed will be described in the context of Japanese knotweed (*Reynoutria japonica*) for the purposes of this report. Japanese knotweed 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. Leaves are over to 17cm long, bright green, shield- or heart-shaped but with a flattened (truncate) base and lacking any obvious hairs on the underside. Lower leaves lack the truncated base in Japanese knotweed. Leaves arranged in zig-zag pattern on an arching stem. Flowers are small, creamy-white and hang in clusters from leaf axils; the cluster is the same size as the subtending leaf. This species has deeply penetrating, woody rhizomes – up to 2m deep and 7m from the last visible plant.
Habitat	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.
Ecology	Non-native species (native to East Asia in Japan, China and Korea) and widespread in Ireland. Two closely related knotweed species are present in Ireland and can be equally problematic to Japanese knotweed. These are Giant knotweed (*R. sachalinensis)* and Japanese knotweed *(R. japonica).*
Impact	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. 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 knotweed leaf litter in streams has also been shown to have adverse effects on the species composition of affected streams.
Dispersal	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.
Legislation	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 this 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).
Biosecurity	Do not cut or interfere with the plant. Report any sighting of additional infestations of this species immediately. Exclusion/Buffer zones for machinery and personnel will be put in place for all infestations. Do not dig or carry out ground works in or near infestations until a suitable biosecurity plan has been put in place.
Management	Mechanical (excavation or root barriers) and herbicide (foliar application or stem injection) management options can achieve effective control of all knotweed species. All management works will require a full site-specific Management Plan as well as post treatment monitoring and may require a licence from the National Parks and Wildlife Service (NPWS).

Figure 3.1: Identification of Japanese knotweed throughout the year.

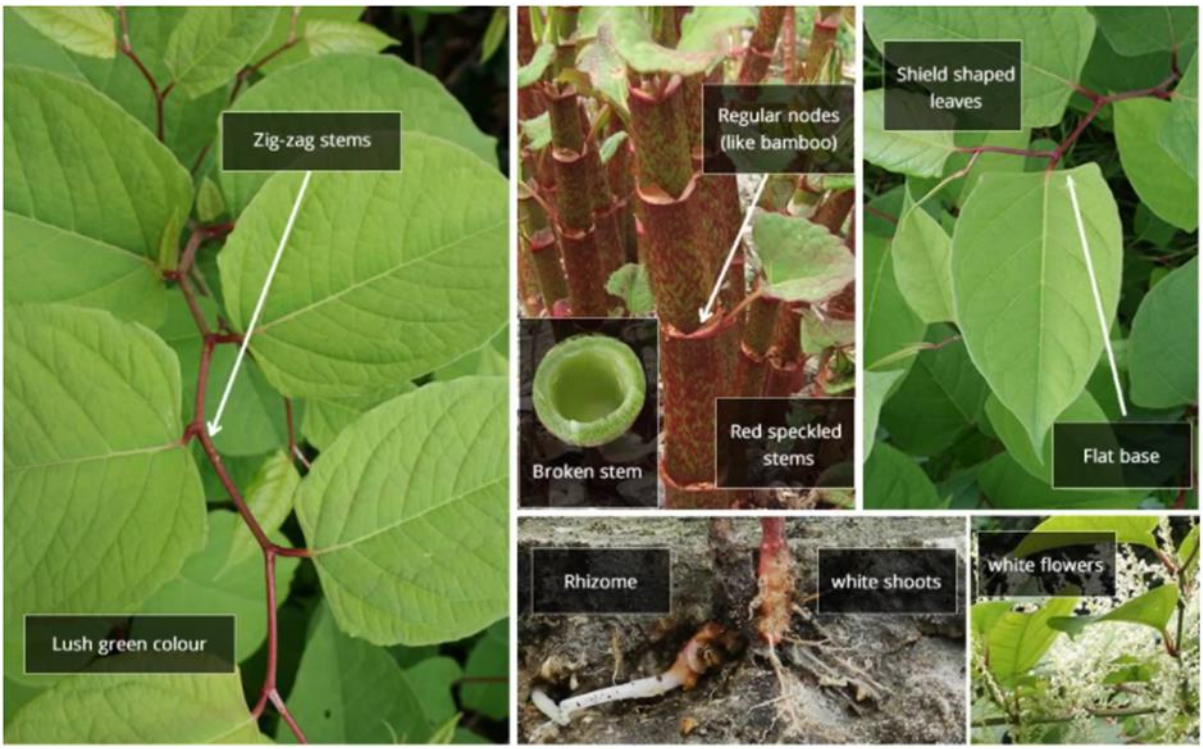


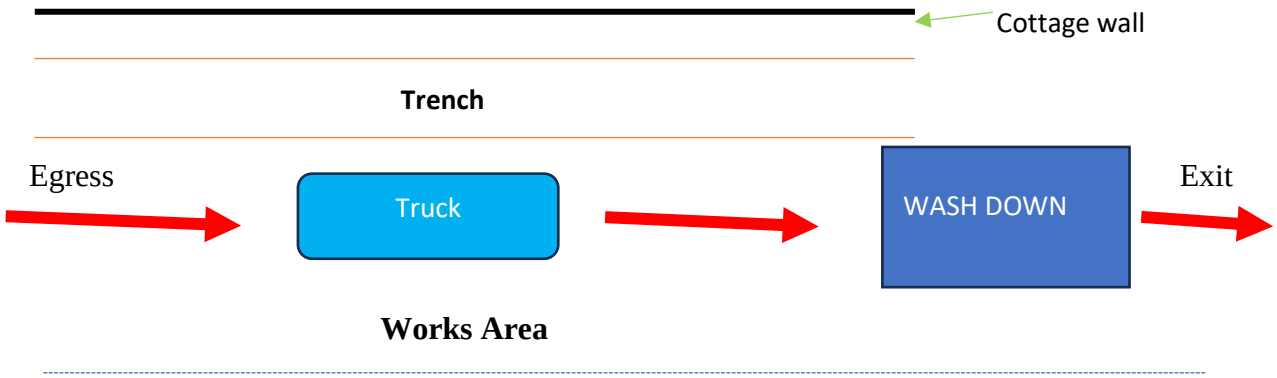
Figure 3.2: Japanese knotweed key identification features.

4. MANAGEMENT PLAN

It has been observed that the Japanese knotweed within the confines of the cottage grounds has been previously treated with herbicide, however, regrowth remains inside the boundary wall which indicates active rhizome activity. It also must be stated that while good control can be achieved over a period of 4/5 years of herbicide treatment, eradication cannot be guaranteed as rhizomes may retreat into dormancy only to reappear many years later. Japanese knotweed can reach out 7 metres below the surface from the visible growth area, and as the proposed pipeline foot print lays within 2 metres of the JKO infestation it must be assumed that they have reached into the trenching zone.

An Invasive alien plant specialist will be appointed to oversee and certify all aspects of the remedial works.

achieve guaranteed eradication, it is deemed best practice to remove soil in the infested areas to a depth of at least 1.8 metres with a minimum buffer zone of 3-4 metres (possibly 7 metres) from the last visible plant in order to be certain that no rhizomes remain in the soil following excavation operations. This methodology however is not practical for pipe laying, consequently the alternative is to focus on protection of the pipe from interference from the JKO rhizomes.



It is recommended that the trench be excavated to a depth of 1,900 mm and to extend latterly in the trench 7 metres either side of the exterior boundary wall of the cottage (total length 20 metres). A proprietary root barrier membrane (Hy-tex C3 root barrier with a puncture resistance (4500N [EN ISO 12236] CE marked with a 50 year life expectancy) will be installed on the base and on the sides of the trench. This root barrier will be inserted at a depth of 1,800mm. The membrane will be placed between two sheets of plywood on the walls and placed between

two layers of 100mm sand at the base to prevent puncturing by sharps. It is also recommended that the pipe should be wrapped in the membrane to give an extra layer of protection (Figure 5,1).

Area of infested soil to be removed 20m x.5	10m²
Depth of excavation	1.9m
Volume to be excavated	19m³
Estimated number of tons to be excavated approx..	38 tons

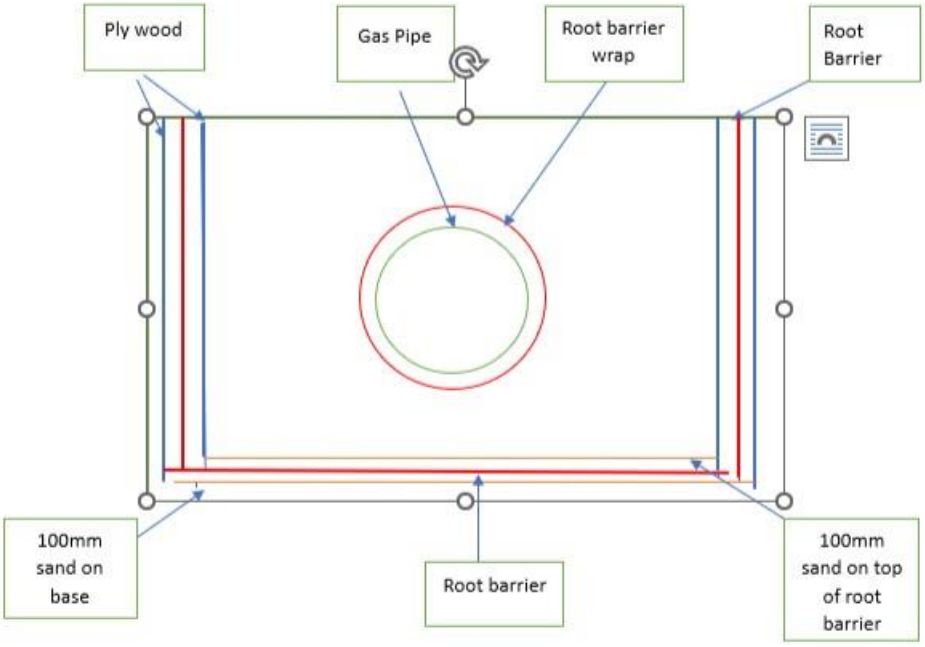


Figure 5.1: Side Profile of Root Barrier Placement

.Prior to any personnel or machinery entering the infested zone, the location must be clearly demarcated and a biosecurity station installed for any foot traffic in the area of the infestation. All staff involved in the works must have been given a toolbox talk regarding Japanese knotweed and the risks and responsibilities associated with the excavation works. This area will not be accessed by any unauthorised personnel prior to the excavation works being completed and signed off by the biosecurity supervisor.

The excavated spoil will be removed to the licenced landfill facility (IMS, Naul, Co. Dublin). To facilitate this operation a Reg 49 licence from the NPWS is required to allow for the transport of the infested spoil to the landfill. The following documents must be submitted with this application:

- A WAC (waste acceptance criteria) certificate must be applied for. A 2kg sample of soil will be required for this analysis. This is required by IMS.
- A waste acceptance document provided by IMS
- Hauliers Permit
- Management Plan

Receiving trucks will have a one-way access route to a dedicated loading zone. No truck drivers will leave their vehicle during the excavation, loading and cleaning process. The contaminated soil will be carefully loaded into bio-secure trucks that will transport the contaminated material to the landfill site. At the exit of the loading zone there will be a manned cleaning station with a high-pressure power washer and boot cleaning facilities for staff.

As there will only be 2/3 trucks required for the work, a wash down area will be placed at the exit from the site. This wash down zone will consist of a base of 20mm of sand on which a teram will be laid with a further 20mm of sand on the surface. Run-off from the cleaning process will be contained in the sand base. The sand and teram will then be removed and placed in the last truck leaving the site with the contaminated spoil from the trench excavations and be deposited at a licenced landfill registered to accept contaminated wash down IAPS infested material.

The loading zone and the truck's bodies will be checked for any spilled soil and will be cleaned down. The cover will be closed over the top of the trucks and their wheels will be power hosed prior to leaving the cleaning area.

On completion of the works the bucket of the excavator bucket will also be washed into the last truck receiving the contaminated soil. The area where the decontamination works will be carried out is a level site and there is no watercourse in the immediate vicinity of this area.

Detailed records of all operations will be maintained by the IAPS works supervisor throughout the project. This will specifically focus on the exact area excavated, the method of excavation, the depth of excavation, the volume of material (as numbers of truck loads) removed, an inventory of personnel and equipment entering and leaving the Japanese knotweed demarcated areas, and the operation of cleaning and disinfection facilities provided. Any problems encountered during the operation will also be recorded by the onsite IAPS supervisor.

The cottage ground is not in the remit of GNI, however, if possible, it is recommended that the proprietor be encouraged to continue with the ongoing treatment of the Japanese knotweed as this will reduce the viability of the rhizomes in the long term.

5. BIOSECURITY

For the purposes of this document, biosecurity refers to all practical measures used to manage and prevent the introduction and spread of Japanese knotweed.

A number of high impact aquatic and riparian IAS are currently present in Ireland and most are continuing to spread aggressively. Prominent among the terrestrial IAPS are: Japanese knotweed (Fallopia japonica), Giant knotweed (Fallopia sachalinensis), Bohemian knotweed (Fallopia x bohemica), Giant hogweed (Heracleum mantegazzianum) and Himalayan balsam (Impatiens glandulifera). All of the above are listed in the Third Schedule (Parts 1 and 2) of the Habitats Directive (S.I. 477/2011) and some are included among the list of 49 EU IAS of Union Concern (http://ec.europa.eu/environment/nature/pdf/IAS_brochure_species.pd) in the EU Invasive Alien Species Regulations (1143/2014).

The ecological effects of IAS are often irreversible and, once established, they are extremely difficult and costly to control and eradicate; hence, the urgent need to prevent their introduction and spread. Prevention is clearly more cost-effective and less environmentally damaging than long-term containment, control or eradication. The most effective measure to reduce introductions and halt spread of IAS is to promote and implement good biosecurity practice.

5.1. Biosecurity Standard Operating Procedure for Personnel and Equipment

This Biosecurity SOP applies to all equipment hand tools, buckets, boots and PPE) that are used during the eradication of IAPS. The purpose of this SOP is to provide standardised practical methods for cleaning and disinfecting all equipment that comes into contact with IAPS while carrying out control works. This Biosecurity SOP will enhance existing biosecurity activity to deliver an improved biosecurity system that will help stop the introduction and spread of IAPS during operations.

All staff that are involved in the works should have access to wash down facilities that include but is not limited to:

- Detailed guide to proper cleaning and disinfection procedure and instructions for making the correct disinfection concentration
- Hard-bristle brushes
- Disposable non-latex gloves for equipment and PPE

Best biosecurity practice will be achieved by ensuring that the following guidelines are adhered to when planning work activities.

- Clean and disinfect all equipment prior to arrival on site. If this is not possible, clean and disinfect the equipment before entering the site.
- Clean and disinfect all equipment when moving off-site.

It is important that all PPE and equipment used are cleaned and disinfected according to the procedures below. These biosecurity measures should be conducted before leaving the site.

- Put on disposable gloves before cleaning and disinfecting the equipment.
- Visually inspect all equipment that has come into contact with Japanese knotweed for evidence of attached IAPS material, or adherent mud or debris. Remove any such material before cleaning the equipment and leaving the site.
- Use the hard-bristle brush to remove all mud and debris from boots and equipment. During inspection and cleaning, pay particular attention to places where IAPS could be accidentally trapped, such as the treads of boots and attachment points on equipment.
- Visually inspect all PPE that has been in contact with vector material and remove any attached IAPS material, or adherent mud or debris.
- Remove disposable gloves and dispose of safely.

5.2. Biosecurity Standard Operating Procedure for Vehicles and Plant

An exclusion zone will be put in place and only those that are involved in the excavation will be allowed enter this zone. Prior to the commencement of works all personnel involved in the works will be presented with a toolbox talk by the site foreman. Biosecurity Wash Stations will be established at the exit point and all personnel must disinfect their boots and any equipment used on site at these stations. All machinery that will be used on the site must be thoroughly cleaned before entering the site (to avoid contaminating the site with invasive species from elsewhere) and cleaned before leaving the works area. The digger and machinery will enter the site and work directly at the dig site. The trucks wheels and undercarriage will be inspected to ensure that they are fully biosecure and will be washed down before exiting the site. All machinery used in the excavation and works process must be washed before exiting the site.

All personnel including drivers must disinfect their boots and any equipment used at the works site. Following the completion of the works an end of contract report detailing the specifics and metrics of the operations must be drawn up by the onsite IAPS supervisor.

Plates 5.1- 5-2 Biosecurity measures

Appendices

Appendix 1: Survey details

Contactor name	INVAS Biosecurity
Surveyor name	Tom Donovan
Survey date/time	17/7/2024
County	Roscommon
Area	Athlone
Site ID	R466
Risk assessment (Potential hazards)	Slips/trips/falls, isolation, disused land, steep slopes, animals, public
Health and safety (PPE required)	Safety boots, hi viz, hard hat, safety glasses
Species recorded	Japanese knotweed
GPS details	53.401328, -7.987874
Area located	Derelict cottage
Site details	Heavily overgrowth
Pervious treatment/Interference	Previous herbicide treatment.
Infestation beyond boundary	No
Notes	No
Photos	1030-1230
Is the site within or proximate to an ecologically sensitive area (SAC/SPA)	No

Appendix 2: Decontamination record sheet

Daily Biosecurity Record Sheet	
Site ID	
Project details	
Biosecurity supervisor	
Date	

Infestation /works boundary in place (Yes/No)		Vehicle access demarcated (Yes/No)	
Staff access/egress decontamination in place (Yes/No)		Vehicle/equipment decontamination in place (Yes/No)	

Vehicle (description/reg)	Activity	Time decontaminated	Picture	Driver signature

Notes/Comments:

Signed:_____ **Date:**

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

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

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

Part 3: Vector Materials

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

Appendix 4 Non-native Invasive Plant species of European Concern

PLANTS

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

ANIMALS

Scientific name	English name	Entry into force
Acridotheres tristis	Common myna	15-Aug-19
Alopochen aegyptiacus	Egyptian goose	02-Aug-17
Arthurdendyus triangulates	New Zealand flatworm	15-Aug-19
Callosciurus erythraeus	Pallas' squirrel	03-Aug-16
Corvus splendens	Indian house crow	03-Aug-16
Eriocheir sinensis	Chinese mittencrab	03-Aug-16
Herpestes javanicus	Small Asian mongoose	03-Aug-16
Lepomis gibbosus	Pumpkinseed	15-Aug-19
Lithobates catesbeianus	American bullfrog	03-Aug-16
Muntiacus reevesi	Muntjac deer	03-Aug-16
Myocastor coypus	Coypu	03-Aug-16
Nasua nasua	Coati	03-Aug-16
Nyctereutes procyonoides	Raccoon dog	02-Feb-19
Ondatra zibethicus	Muskrat	02-Aug-17
Orconectes limosus	Spiny-cheek crayfish	03-Aug-16
Orconectes virilis	Virile crayfish	03-Aug-16
Oxyura jamaicensis	Ruddy duck	03-Aug-16
Pacifastacus leniusculus	Signal crayfish	03-Aug-16
Percottus glenii	Amur sleeper	03-Aug-16
Plotosus lineatus	Striped eel catfish	15-Aug-19
Procambarus clarkii	Red swamp crayfish	03-Aug-16
Procambarus fallax f. *virginalis*	Marbled crayfish	03-Aug-16
Procyon lotor	Raccoon	03-Aug-16
Pseudorasbora parva	Stone moroko	03-Aug-16
Sciurus carolinensis	Grey squirrel	03-Aug-16
Sciurus niger	Fox squirrel	03-Aug-16
Tamias sibiricus	Siberian chipmunk	03-Aug-16
Threskiornis aethiopicus	Sacred ibis	03-Aug-16
Trachemys scripta	Red-eared, yellow-bellied and Cumberland sliders	03-Aug-16
Vespa velutina nigrithorax	Asian hornet	

Appendix 5 Noxious Weeds Act

Noxious weeds are plants whose spread has a deleterious effect on agriculture and the environment, and they are controlled under the Noxious Weeds Act of 1936 which states that it is an offence for the owner/occupier of lands not to prevent their growth and spread. In Ireland, Statutory Instrument SI No 103/1937 Noxious Weeds Order 1937 recognised thistle, ragwort and dock as noxious weeds but did not distinguish between different species. Common ragwort (*Senecio vulgaris*), for example, spreads very rapidly and it is poisonous to grazing cattle and horses, but there are other native ragwort species that are not problematic. The Noxious Weeds Act is concerned with the prevention of spread, not eradication, because many of these species have important ecological functions. For instance, there are four insect species, including the cinnabar moth, which are specifically associated with common ragwort.

The National Roads Authority (now Transport Infrastructure Ireland) has produced an excellent guide to noxious weeds and NNIS, which can be accessed via the following link:

The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads. National roads Authority (NRA) Dec 2010. –

http://www.tii.ie/technical-services/environment/construction/Management-of-Noxious-Weeds-and-Non-Native-Invasive-Plant-Species-on-National-Road-Schemes.pdf

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