Lissinagroagh Windfarm

Invasive Alien Species Management Plan

November 2025

TOBIN

EcoQuest Environmental

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Rev	Date	Details	Prepared by	Checked by	Approved by
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Cover photo: Generic image of Invasive Alien Species in Ireland.

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1. INTRODUCTION

This Invasive Alien Species Management Plan (IASMP) has been developed by INVAS Biosecurity (INVAS) in partnership with EcoQuest Environmental (EcoQuest), on behalf of Tobin Consulting Engineers (Tobin) for the proposed Lissinagroagh Windfarm, associated grid connection route (GCR) and turbine delivery route (TDR). Ecologists representing Tobin Consulting Engineers carried out all ecological and Invasive Alien Species (IAS) surveys between September 2020 and August 2025.

1.1. Project Background

The proposed Lissinagroagh Windfarm site is located within both forested Coillte and privately owned lands, approximately 3km north of Manorhamilton in north County Leitrim. The project comprises of a development of a wind farm of up to 14 no. wind turbines and all associated infrastructure including turbine foundations, hardstanding areas, borrow pits, access tracks, an on-site 110kV electrical substation and a grid connection comprising a tail-fed underground connection into the Srananagh 220 kV Substation in Co. Sligo. The project will also comprise facilitating accommodation areas on the public road network and at private properties to accommodate the delivery of turbine components along the TDR which will run to the port of Killybegs in Co. Donegal. The study is shown in Figure 1.1 below. The survey results are shown in Figures 3.1, 3.2 and 3.3.

1.2. Objectives

The primary objectives of this Invasive Species Management Plan (IASMP) are as follows:

- Prepare an IASMP based on the findings of surveys carried out by Tobin and advise on appropriate management approaches for the construction of the Lissinagroagh Windfarm, associated grid connection route (GCR) and turbine delivery route (TDR);
- To document and map the findings from the surveyed areas;
- Recommend best practice techniques in the vicinity of invasive species to avoid their spread within and outside of the site; and,
- Recommend approaches to invasive species removal or retention where feasible if required using standard and accepted methodologies

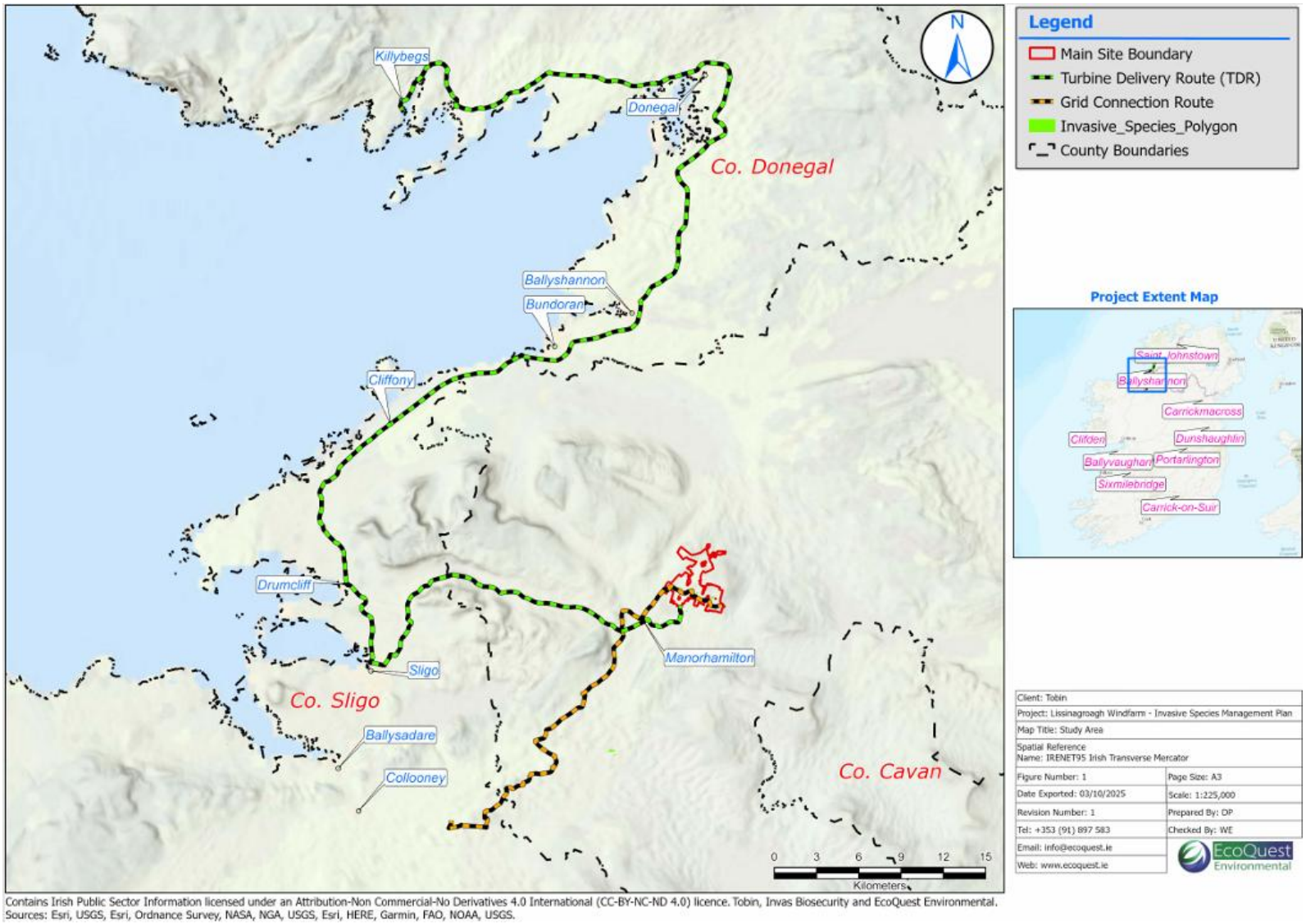

Figure 2.1: The study area associated with the proposed Lissinagroagh Windfarm provided to INVAS in October 2025 by Tobin..

1.3. Experience of Consultants

The report was prepared by Senior Ecologist Dr. William Earle and Principal Environmental Consultant David Parkinson (BSc., MIEMA, CEnv). William is responsible for IAS, macrophyte and ecological field surveys using drone and GPS technology. He is in charge of GIS mapping and map production in INVAS. IAS survey reports and Appropriate Assessment preparation. William has produced AA Screenings and NIS reports for IFI on the management of Natura sites and their conservation objectives throughout Ireland, with some of the most relevant projects including; AA Stage 1 Screening for IAPS Management on the Owenea River 2021, AA Stage 1 Screening for Wild Salmon and Sea Trout Tagging Scheme (Amendment) Regulations (2020-2024), AA Screening for the Management of *Lagarosiphon major* in Lough Corrib 2020 and AA Stage 1 Screening and NIS for Fisheries Enhancement and Maintenance Projects the Lough Corrib Catchment in 2020, 21 and 22. INVAS have worked with statutory/regulatory bodies, stakeholders and IFI staff responsible for overseeing these projects, both virtually and in person, to produce AAS, NIS and EcIA's in line with National and international guidance, as well as all relevant legislation and existing baseline datasets.

William delivers invasive species identification and management training to Local Authorities staff, Waterways Ireland, Engineers Ireland and other private, state and semi-state bodies. He carries out invasive plant surveys, treatment, GIS mapping and map production for County Councils, independent developers, NPWS, ESB and several other bodies. He is resoponsible for the development and implementation of site-specific management plans for several invasive aquatic and terrestrial plant species including: Japanese, Giant and Himalayan knotweed – Excavation, disposal and bund construction; Lagarosiphon and Nuttall's pondweed – Mechanical removal and benthic jute matting; Giant Hogweed – Coordinated management for Local Authorities; Himalayan balsam – Coordinated management of catchments including Camcor and Castlebar Rivers.

David is the Principal Environmental Consultant of EcoQuest Environmental with 17 years of environmental consultancy experience in Ireland and Australia. David has previously been involved in numerous invasive species surveys, management plans, invasive species awareness presentations, is a Full Member of the Institute of Sustainability & Environmental Professionals (MISEP) and is a Chartered Environmentalist (CEnv).

David's experience spans multiple industry sectors or disciplines, including numerous flood alleviation schemes, windfarm projects, infrastructure projects, transport, aviation, wastewater

schemes, contaminated land and advisory on emerging contaminants. He has extensive environmental management and invasive species management experience on major Irish rivers or their tributaries such as the Shannon, Dodder, Morell, Corrib, Broadmeadow, Finisk, Bandon, Poddle, Whitechurch and Garavogue rivers. In addition to invasive species management across major Irish river networks, David has also assisted with the management of invasive species at sensitive wetlands of international significance in Australia.

2. LEGISLATIVE CONTEXT

2.1. European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024).

The control of invasive alien species in Ireland is regulated through the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024). Those species listed in the First Schedule of these regulations, and which are known to be present on the study area are highlighted in **Error! Reference source not found.** below.

2.1.1. First Schedule: Part 1 - Plants

Table 2.1: Non-Native Plant Species Subject to Restrictions

Common Name	Scientific Name	Geographical Application
American skunk-cabbage	*Lysichiton americanus*	Throughout the State
A red alga	*Grateloupia doryphora*	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 pigmyweed	*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

Table 2.1: Second Schedule: 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 (*Reynoutria japonica*), giant knotweed (*Reynoutria sachalinensis*) or their hybrid Bohemian knotweed (*Reynoutria x bohemica*)	Japanese knotweed (*Fallopia japonica*) Giant knotweed (*Fallopia sachalinensis)* Bohemian knotweed (*Reynoutria x bohemica*)	Throughout the State

2.2. EU Regulation 1143/2014 on Invasive Alien Species

On 14 July 2016, the European Commission published Commission Implementing Regulation 2016/1141 which set out an initial list of 37 species to which the EU Invasive Alien Species Regulation 1143/2014 applies. The associated restrictions and obligations came into force on 3rd August 2016. This list has undergone several updates and now contains 115 IAS. From the Tobin IAS surveys, Japanese knotweed and Himalayan balsam are currently both contained on the EU list. Three distinct types of measures are envisaged under the Directive, which follow an internationally agreed hierarchical approach to combatting IAS:

- Prevention: a number of robust measures aimed at preventing IAS of Union concern from entering the EU, either intentionally or unintentionally;
- Early detection and rapid eradication: Member States must put in place a surveillance system to detect the presence of IAS of Union concern as early as possible and take rapid eradication measures to prevent them from establishing;
- Management: some IAS of Union concern are already well-established in certain Member States and concerted management action is needed so that they do not spread any further and to minimise the harm they cause.

2.3. Other Non-native Species Which Threaten Biodiversity

Several other non-native invasive species have been recorded within the environs of the project area. These include:

- Box hedge (*Buxus sempervirens*)
- Butterfly bush (*Buddleia davidii*);
- Cherry laurel (*Prunus laurocerasus*);
- Fuchsia (*Fuchsia magellanica*)
- Himalayan honeysuckle/ Pheasant berry (*Leycesteria formosa*)
- Lesser Knotweed (*Persicaria campanulata*)
- Montbretia (*Crocosmia* x *crocosmiiflora*);
- Prince of Wales (*Juniperus horizontalis*)
- Laurel (*Aucuba japonica*);
- Snowberry (*Symphoricarpos albus*).

Many of these non-native species are listed in the Transport Infrastructure Ireland (TII) document "*The Management of Invasive Alien Plant Species on National Roads – Technical Guidance GE-ENV-01105 December 2020"* and in the previous document NRA Guidelines *on "The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads".*

Information on the control and eradication of some of these species is presented on the Invasive Species Ireland website (https://invasives.ie/), and although there are no legal requirements to eradicate or control these species, it is important that the project does not further their spread and the development and implementation of a plan to remove/control them during the works is in line with best practice. It is recommended that the non-native species listed above, which are non-First Schedule listed species, are also removed as part of the works when feasible to do so as they are also invasive and cause issues for biodiversity.

3. METHODOLOGY

3.1. Survey Data Review

Survey location data in the form of maps, photographs, GIS files and tables have been provided by the client. The survey results have been grouped into both First Schedule listed species under the *European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024)*, and non-First Schedule listed species.

The locations of each identified species relative to the proposed project design elements have also been reviewed. Recommendations for the removal and/or treatment of various plant species have been derived based on their legal designation and on their locations relative to various design elements such as turbine locations, hardstand areas, substation, met mast, access roads, cable routes and road widening areas etc.

3.2. GIS Mapping

Following receipt of the field survey data, maps were produced illustrating the results of the field survey using the ArcGIS Pro 3.5.3 software. The GPS locations of the invasive species that were recorded during the surveys were plotted onto base maps. The study area has been mapped on Figure 1, the results of the field surveys are visually represented on Figures 2, 3 and 4

3.3. Guidelines and Standards

The recommendations contained in this report have been developed with cognisance to the following best practice guidelines:

- Best Practice Management Guidelines for Japanese knotweed (Invasive Species Ireland, 2008);
- Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA, 2010), Revision 1, December 2010;
- Managing Japanese knotweed on development sites - the knotweed code of practice (Environment Agency, September 2013);
- Invasive Species Ireland guidance (http://invasivespeciesireland.com);
- Department of Housing, Local Government and Heritage, Ireland's Draft 4th National Biodiversity Action Plan (2022)

- The Management of Invasive Alien Plant Species on National Roads – Technical Guidance. GE-ENV-01105. (Transport Infrastructure Ireland, 2020). December 2020; and,
- The Management of Invasive Alien Plant Species on National Roads – Standard GE-ENV-01104. (Transport Infrastructure Ireland, 2020). December 2020.
- Connemara Green, Inspiring Action for Conservation, Rhododendron Control Training Video https://connemaragreen.ie/watch-this-video-on-rhododendron-control-in-killarney-national-park/

3.4. Constraints

Representatives from INVAS and EcoQuest were not present during any of the field surveys, the content in this report is dependent on the data which has been provided by the client. It has been assumed that all data provided is correct in terms of both species' identification and location. Scientific names have not been provided for the species which were recorded during the field surveys, and this has resulted in species level identification assumptions being made in this report. It is noted that in some cases, it is possible that the species level identification may be different to the original Tobin surveys. While it is possible that there are no records of IAS in the northern portion of the study area, there does not appear to be any data included for this region.

4. SURVEY RESULTS

4.1. Invasive Species listed under European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) and EU Invasive Alien Species Regulation 1143/2014

Japanese knotweed (*Reynoutria japonica*), Himalayan balsam (*Impatiens glandulifera*) and Rhododendron (*Rhododendron ponticum*) are all listed under the *European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024)* and were recorded during the field surveys. Japanese knotweed and Himalayan balsam are also contained in EU Regulation 1143/2014. This section provides background information on each Regulated IAS and provides a table outlining their recorded distributions in relation to the proposed project.

4.1.1. Japanese Knotweed

Under the aforementioned Regulations, there is a legal requirement that treatment measures are prepared and enacted in advance of works commencing as part of any proposed development. Vector materials for this species (soil or spoil taken from infested sites) are also covered under the Regulations. A high degree of caution should be exercised whilst working in areas where this species is known to be either currently or historically present due to the risk of accidental spread or dispersal.

Table 4.1: Species description and legislation relating to Japanese knotweed.

Distinguishing features	Japanese knotweed (*Reynoutria japonica*) (and the closely related Bohemian knotweed (*Reynoutria x bohemica*)) is a robust, vigorous herbaceous perennial that grows in dense and often continuous stands. It has branched, hollow, red or purple mottled bamboo-like shoots that grow to 3m tall (Bohemian knotweed grows to 4m and Giant knotweed grows to 5m tall). In winter, stems remain on site as the tall, dry, red or straw-coloured hollow canes. All the leaves of Japanese knotweed plants are flattened (truncate) at the base. (The leaves of Bohemian knotweed are larger and more variable than those of Japanese knotweed, supporting both heart-shaped (indented/cordate at the base) and flattened (truncate at the base) forms, the former being more prominent lower down the stem.) Leaves are arranged in a zig-zag pattern on an arching stem. Flowers are small, creamy-white and hang in clusters from leaf axils; the clusters are longer than leaves in Japanese knotweed, while they are roughly the same length as the subtending leaf for Bohemian knotweed. Japanese knotweed has deeply penetrating, woody rhizomes – to 2m deep and 7m laterally from the last visible plant.

Habitat	Knotweeds are species of waste ground, roadsides, rail corridors and riparian habitats - alongside lakes, rivers, canals, ponds and ditches in rich to poor soil types.
Ecology	Knotweeds are non-native (and invasive) species (native to East Asia in Japan, China and Korea) and widespread in Ireland. Bohemian knotweed is a hybrid between the smaller Japanese and the larger Giant knotweed species.
Impact	Knotweeds 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 knotweed leaf litter in streams has also been shown to have adverse effects on the species composition of affected streams. # The robust and extensive woody rhizomes of knotweed species are capable of penetrating asphalt, cracked foundations, walls, land drainage works and other built structures, causing significant structural damage.
Dispersal	The rhizomes are highly regenerative and even small rhizome fragments can produce new plants. Rhizome material can remain dormant in the soil for up to 20 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	Subject to restrictions under EU (Birds and Natural Habitats) Regulations, 2011(S.I. No. 477/2011), EU (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) and listed as an 'IAS of Union concern' under EU IAS Regulation (1143/2014). Soil taken from a place that is infested with knotweed (vector material) is also restricted under Part 3 of the Third Schedule in S.I.477. The law relating to 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 and Bohemian knotweed are included. As such, any 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).

Table 4.2: General locations for Japanese knotweed records provided to INVAS in October 2025 as part of the Tobin IAS surveys.

Area	**Record location**
Main site	*circa*. 70m south of the T8 hardstand area
Main site	*circa*. 20m southeast of the largest borrow pit
Main site	*circa*. 250m northwest of the smaller borrow pit, along the access road to T13/T14.
South of the main site planning boundary Grid Connection Route	Multiple stands have been recorded beyond the southern site boundary in the townlands of Boleyboy, Cashelaveela and Cherrybrook Along the L-2169 road in the townland of Cornastauk
Grid Connection Route	Along the L-2169 road in the townland of Srabrick
Grid Connection Route	Along the L-2169 road in the townland of Cloonaquin (two separate locations)
Grid Connection Route	Along the L-4166 road in the townland of Carrigeencor
Grid Connection Route	Along the R-289 road in the townland of Cleen
Turbine Delivery Route	Along the N56 national road in the townland of Ballymogowan, Co. Donegal
Turbine Delivery Route	Along the N56 national road in the townland of Bruckless, Co. Donegal

4.1.2. *Himalayan Balsam*

Under the aforementioned Regulations, there is a legal requirement that treatment measures are prepared and enacted in advance of works commencing as part of any proposed development. Vector materials for this species (soil or spoil taken from infested sites) are not covered under the Regulations, however, a high degree of caution should be exercised whilst working in areas where this species is known to be either currently or historically present due to the risk of accidental spread or dispersal.

Table 4.4: Species description and legislation for Himalayan balsam.

Distinguishing features	Himalayan balsam (*Impatiens glandulifera*) is one of the largest annual herbs in Ireland, growing to 3m tall. The stems are erect, hollow, succulent, thick ribbed, reddish and hexagonal in cross section. The leaves are up to 20cm long, stalked, have a rounded base with serrated margins, pointed tips, and hairless. They are pale green with a red midrib. The flowers are pink to whitish, borne at the apex of the plant. They are characteristically trumpet-shaped and mildly scented. The seed capsules are 2.5cm long, green to red, ridged and explode when ripe. The roots are very short, bulbous and red.
Habitat	This species prefers moist, nutrient-rich habitats, although it has a wide habitat tolerance, particularly along rivers, canals, ditches, margins of wet woodland and roadsides.
Ecology	Non-native (native to west and central Himalayas) and widespread in Ireland. It lives for just one season, seeds and dies. The majority of the seeds germinate in their first year, although a small percentage can survive for two years.
Impact	Dense monodominant stands can dominate entire riparian zones, significantly decreasing native plant species richness. These dense infestations can cause soil erosion and bankside subsidence on river banks, as well as affecting instream biotic communities by the addition of nutrient-rich sediment. The flowers of Himalayan balsam are very rich in nectar and attract pollinator insects away from adjacent native flowering plants.
Dispersal	This species is dispersed solely by seeds from ‘explosive’ seed heads. If the stem of a plant that is pulled from the ground and not broken or crushed, it may root from any node that comes into contact with the ground, producing a new plant.
Legislation	Subject to restrictions under EU (Birds and Natural Habitats) Regulations, 2011(SI 477) and listed as an ‘IAS of Union concern’ under EU IAS Regulation (1143/2014).

Table 4.5: General locations for Himalayan balsam records provided to INVAS in October 2025 as part of the Tobin IAS surveys.

Area	**Record location**
Grid Connection Route	Along the L-4165 road in the townland of Cleen
circa. 1.5km East of the Grid Connection Route	Along the riverbank of the Bonet River, in the townlands of Conahgil and Corcuscoony

4.1.3. Rhododendron

Under the aforementioned Regulations, there is a legal requirement that treatment measures are prepared and enacted in advance of works commencing as part of any proposed development. Vector materials for this species (soil or spoil taken from infested sites) are not covered under the Regulations, however, a high degree of caution should be exercised whilst working in areas where this species is known to be either currently or historically present due to the risk of accidental spread or dispersal.

Table 4.5: Species description and legislation relating to Rhododendron.

Distinguishing features	Rhododendron (*Rhododendron ponticum*) is a fast-growing evergreen shrub that can grow to 8m tall and is tolerant of a wide range of conditions and soil types. It is capable of producing dense thickets. Its leaves are hairless, dark green and glossy above, with a paler underside. Leaves are borne in a spiral at the end of each stem. Flowering normally occurs from late April to June, with plants capable of producing large quantities of seed. Each flower is violet to purple and borne in groups of 10 to 15.
Habitat	Rhododendron favours acid soils, in areas of wetland, rocky banks and hillsides, gardens and riparian zones. It is also well adapted to the understory of forestry and woodlands.
Ecology	It is a non-native species (originally from the Iberian Peninsula and wider Mediterranean) that has become widespread in mountainous areas of Ireland, especially in the west. It was introduced into Great Britain in 1763 for ornamental purposes. Rhododendron thrives on peaty, sandy and acidic soils and is extremely hardy. This invasive plant is highly prolific in terms of seed production. These are normally spread up to 100m from the parent plant by wind action or along watercourses. It has become highly invasive in Ireland, with a wide distribution along the west coast due to its prolific seeding, rapid growth rate and its toxicity, which gives it a competitive advantage over native species. This aids in the creation of dense impenetrable thickets that can cover large areas, such as the infestations in Killarney National Park. These mature thickets reduce access and make it difficult to implement control measures.
Impact	Because of the dense vegetation the species produces, it can outcompete native species and become dominant. Rhododendron has a significant adverse impact on native floral (and associated faunal) biodiversity. The leaves contain toxins (free phenols) that result in herbivore avoidance and suppresses regeneration of native understorey species. It is host to *Phytophthora ramorum,* which causes Sudden oak death.

Dispersal	*Via* rhizome fragments, suckers and seeds. Each flower produces between 3,000 to 7,000 fine powder-like seeds that can persist for up to three years.
Legislation	Subject to restrictions under EU (Birds and Natural Habitats) Regulations, 2011 (SI 477) (as amended).

Table 4.4: General locations for Rhododendron records provided to INVAS in October 2025 as part of the Tobin IAS surveys.

Area	**Record location**
Main site	*circa*. 560m south of the T12 hardstand area
Main site	*circa*. 30m north of the small borrow pit, c. 410m west of T13 hardstand area
South of the main site planning boundary	Multiple stands have been recorded beyond the southern site boundary in the townland of Boleyboy
Grid Connection Route	Along the riverbank of the Bonet River, c. 45m south of the L-2136 road in the townland of Milltown
Grid Connection Route	Along the L-21361 road in the townland of Cornastauk
Grid Connection Route	Along the L-4166 road in the townland of Kilcoosy
circa. 1.1km to 1.5km East of the Grid Connection Route	Along a trail in the townland of Conahgil

4.1.4. Non-First Schedule Listed Species

Multiple other plant species which are not subject to restrictions under the First Schedule of the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) and EU Regulation (1143/2014) were also recorded during the field surveys. These species were recorded at multiple locations at the main site, along the turbine delivery route and along the grid connection route. All locations of all species recorded during the field surveys are mapped on the maps provided (Figures 4.1 - 4.3).

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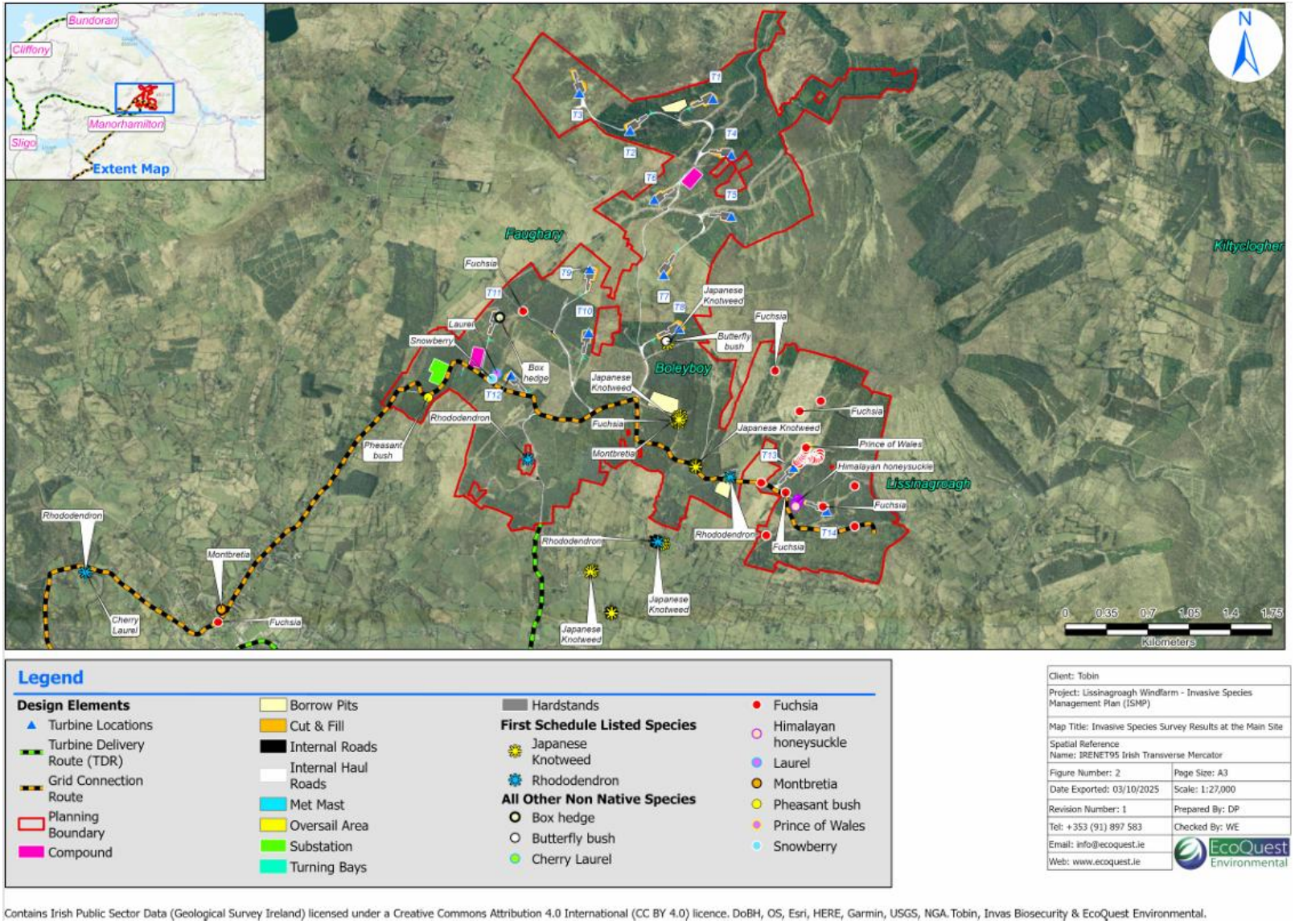

Figure 4.1: Invasive Species Survey Results at the Main Site provided to INVAS by Tobin in October 2025.

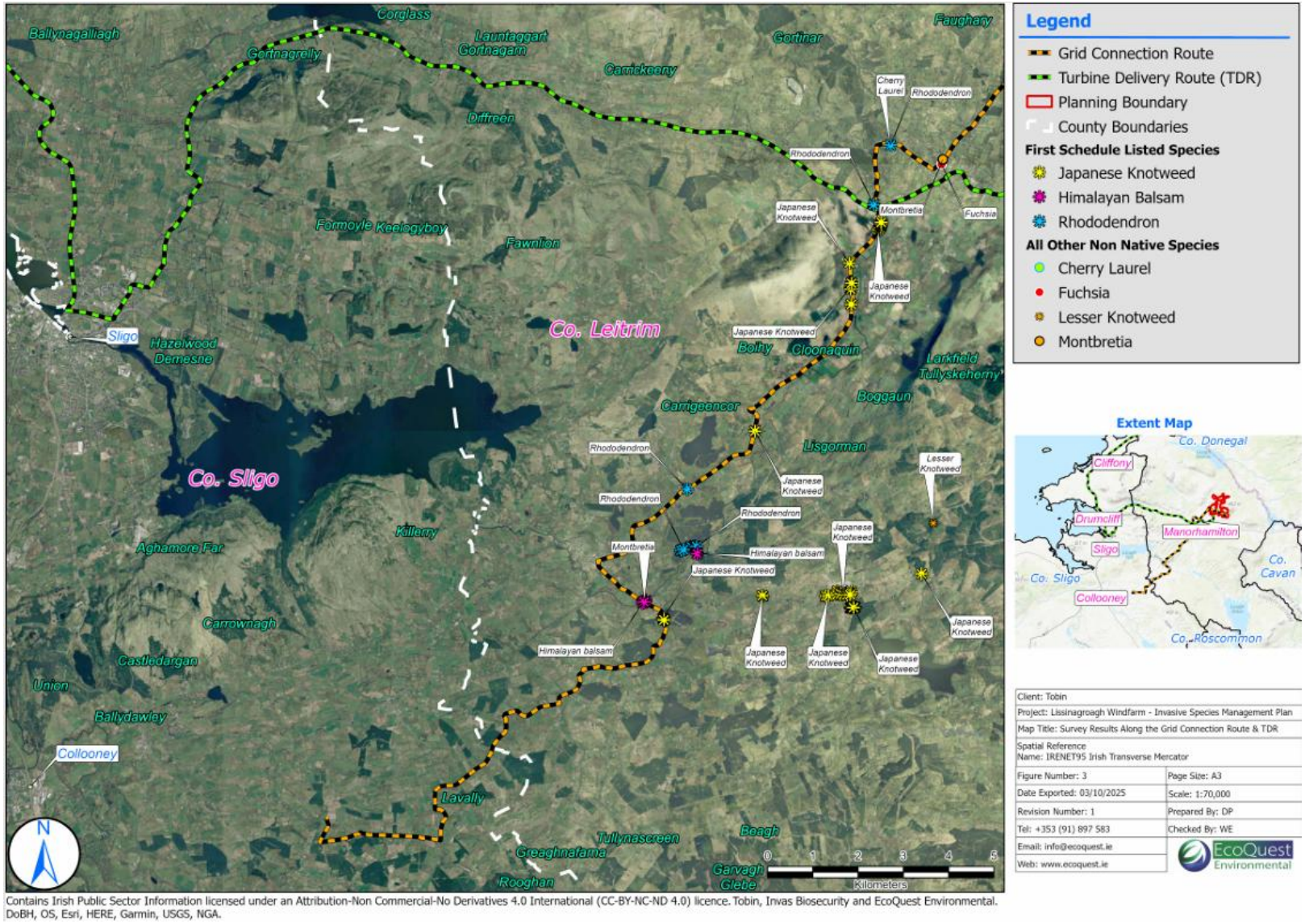

Figure 4.2: Invasive Species Survey Results Along the Grid Connection Route and TDR provided to INVAS by Tobin in October 2025.

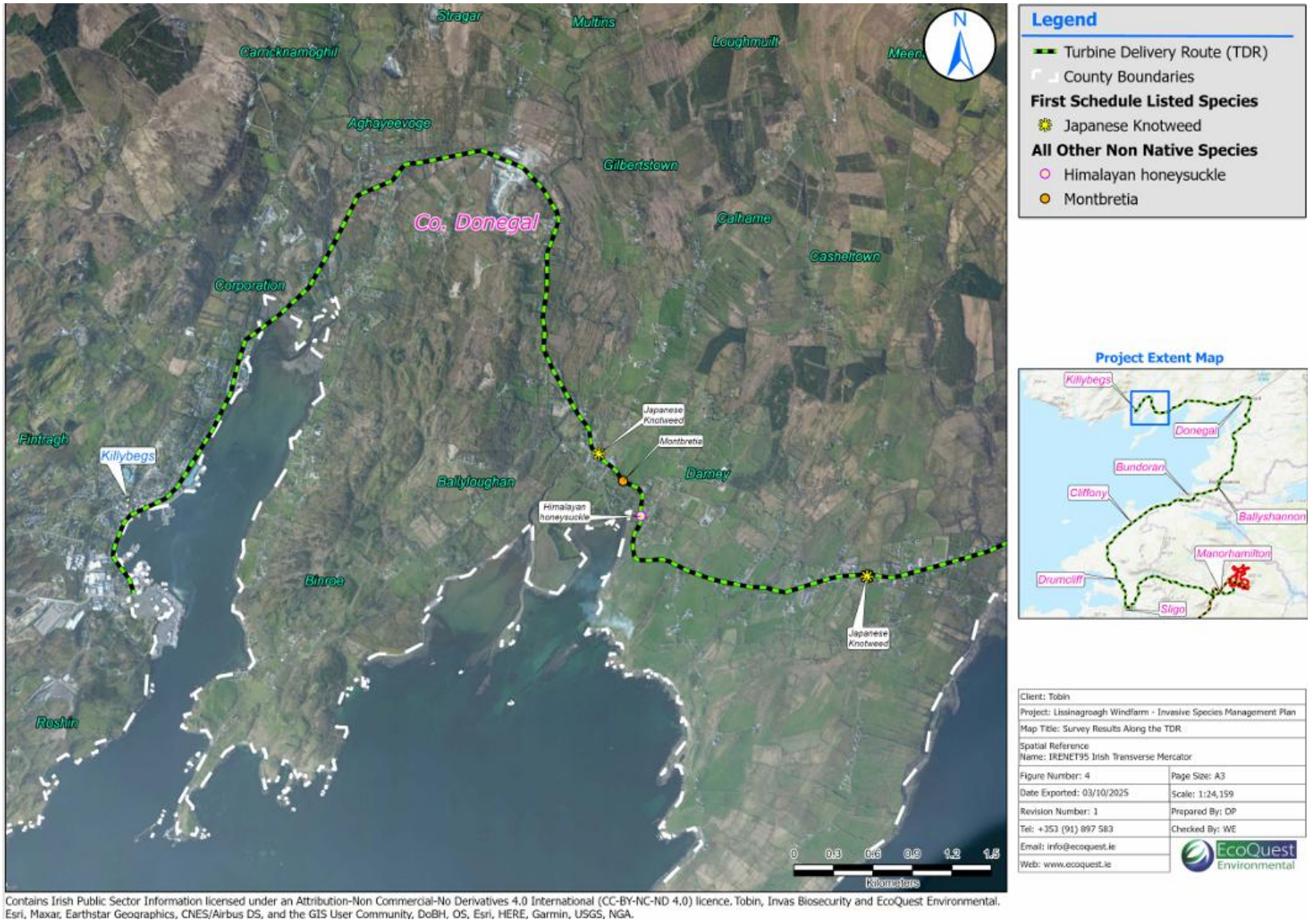

Figure 4.3: Invasive Species Survey Results Along the TDR provided to INVAS by Tobin in October 2025.

5. MANAGEMENT RECOMMENDATIONS

Within the development area boundary, construction activities will be required for the installation of the underground cables and construction of other associated infrastructure. These activities will require soil clearance, excavation and management which has the potential to result in the spread of IAS. Himalayan balsam, Japanese knotweed and Rhododendron are all regulated under the First Schedule of S.I. 374/2024, while Knotweed is also included in the Second Schedule of the same regulation restricting the movement of vector materials containing these species. On this basis, control and management of these IAS is required by the project and suitable options are presented in the sections below. These management options will prevent any accidental spread of the IAS infestations.

A comprehensive long-term Management Plan area should consider prioritising certain species and areas in the region for targeted IAS control and treatment. This IAS control campaign should commence immediately to ensure optimum periods for management prior to the initiation of ground works associated with this project, with an initial focus on those Regulated species detected. Because of what appears to be a relatively limited distribution of some other unregulated IAS in the survey area, it would be prudent to also prioritise control efforts against these as this could result in their significant control within or even eradication from the project area, at minimal cost.

5.1. Prevention / Early Detection Rapid Response (EDRR) / Biosecurity

It is of fundamental importance that construction activities are not a vector for the spread of alien invasive plants and animals. This IASMP should be strictly adhered to by all personnel involved in the works. In advance of construction work commencing within the area, Site-Specific Management Plans shall be prepared for each IAS infestation where any ground works or access is required in these areas and their associated buffer zones. Further biosecurity guidance is outlined in Section 6 of this document. These Plans shall provide guidance on biosecurity, traffic management, excavation and disposal methods to be employed in each case. The Plans shall be designed, implemented and supervised by suitably qualified personnel in advance of any site access.

Prevention, EDRR and Biosecurity will provide a low-cost solution with low ecological impact for all IAS throughout the project area. This will involve sustained monitoring, biosecurity facilities (boot brushes) and site-specific biosecurity plans during any planned works in areas in close proximity to any infestations. This will also involve the implementation of a project

wide Management Plan to prevent any accidental or unintentional spread or dispersal of IAS. In the case of listed First Schedule plant species, should these species be observed in a proposed work zone, the area is to be fenced off and appropriately signed to prohibit unauthorised access. A site-specific Management Plan should be prepared with advice being sought from the Project Ecologist or a third party regarding the best management practice options for the site.

5.2. Japanese knotweed Management Options Prior to the Commencement of the Construction Phase

5.2.1. Foliar herbicide application

It is recommended that foliar herbicide application using a Glyphosate based product that is approved for use in and near water for the management of Japanese knotweed as part of the Lissinagroagh Windfarm. Foliar herbicide management should follow the manufacturers guidelines and be carried out by suitably trained staff, in possession of the relevant qualifications and wearing suitable PPE. Spraying will be carried out at a rate of 5liters/ha using knapsacks fitted with low pressure drift beta nozzles. An inert dye (super signal blue) will be mixed with the solution to ensure all plants at the site are treated. Extra care should be taken where infestations are located among or in close proximity to non-target plant species or any watercourse. Due to the extent of underground rhizome growth and its highly invasive capacity, control of Knotweed following herbicide treatment in a single season is rarely possible. It generally takes three to four seasons of herbicidal treatment to deplete the rhizome reserves and to effectively control the target vegetation. Records of herbicide use must be maintained in accordance with relevant legislation. It is anticipated that natural vegetation regeneration will take place following the herbicide management practices and no enrichment or planting will be required.

Following herbicide management, all treatment site and any other possible areas of infestation should be resurveyed for Knotweed growth for the next three to four years (through to the proposed commencement of construction activities). This will be carried out in June/July each year with any required follow up herbicide treatment taking place between August and October of the same year. Herbicide treatment will follow the same process as outlined above. Strict biosecurity protocols must be adhered to in all follow up surveys and treatments. Based on INVAS's considerable experience dealing with the control of all Knotweed species countrywide, its preferred management option for Knotweed within this development project,

prior to the commencement of construction activities is a sustained treatment with an approved herbicide and monitoring post treatment.

Table 5.1: Proposed management schedule for the recommended management approach for Japanese knotweed recorded as part of the proposed Lissinagroagh Windfarm project.

Year	Timing	Description of works	Treatment
2026	June/July	Survey	None
2025	August/October	Survey and treatment	Foliar herbicide application
2026	June/July	Survey	None
2026	August/October	Assessment of regrowth and retreatment	Foliar herbicide application
2027	June/July	Survey	None
2027	August/October	Assessment of regrowth and retreatment	Foliar herbicide application
2028	June/July	Survey	None
2028	August/October	Assessment of regrowth and retreatment	Foliar herbicide application
2029+	June/July	Survey and retreatment as necessary	Foliar herbicide application in August/October

5.3. Japanese knotweed Management Options Prior to the Commencement of the Construction Phase

Herbicide management will provide an adequate level of control to prevent the 'spread and dispersal' of Knotweed on site provided no other interference takes place. If infested areas or their buffer zones must be accessed by personnel or machinery additional measures will be required to prevent any unintentional movement of Knotweed vector material. Below is a description of the subsequent control options for the Knotweed infestations recorded on site where development will take place or additional access or interference with Knotweed infestations is required.

For the client's preferred control option, a full site-specific Management Plan outlining the specific actions for each stage of the operation will be provided, in advance of the works.

5.3.1. Excavation and disposal off-site option

This would require site operations to excavate all Knotweed plants and associated contaminated soil. The soil and plant material would be carefully loaded onto bio secure trucks that would transport the contaminated material to the appropriately licenced landfill. Strict biosecurity protocols would be adhered to at all times during this process.

It is deemed prudent to remove soil in the infested areas to a depth of at least 1.8 metres and 7 metres from the last visible plant in order to be certain that no rhizomes remain in the soil

following excavation operations. Where the site boundaries restrict the removal of a 7 metre buffer zone, vertical root barrier membrane must be put in place to remove the risk of regrowth from contaminated soil remaining on site.

In the case of buildings and boundaries close to Knotweed infestations, excavation depths and distances would be authorised by a suitably qualified engineer. The material would be disposed of at a licenced landfill subject to acquiring a licence for soil movement from the NPWS.

Detailed records of all operations will be maintained throughout the project. These records will specifically focus on the exact areas 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 Knotweed demarcated areas, and the operation of cleaning and disinfection facilities provided at each area.

5.3.2. Excavation and disposal on-site option

Deep burial in an on-site containment cell can be used in certain scenarios. Excavation must remove all Knotweed rhizome material and would be carried out in the same manner as for the '*Excavation and disposal off-site'* method.

The site selection would take into account services, landscaping, transport routes, possibility of erosion and the future use of the site. The distance for contaminated material to be transported throughout the site would be minimised with the deep burial site located as close as possible to the site of infestation. If the burial site is located in a different area to the infestation, biosecurity measures would be put in place including decontamination facilities and designated work and haulage areas.

Prior to excavation, the invasive plant material would be treated with a non-persistent herbicide and left in situ for the herbicide's prescribed "active" period. The disposal site would require the construction of a containment cell made from root barrier membrane. Once filled with Knotweed contaminated material the cell shall be sealed and then buried beneath 5 metres of inert backfill or uncontaminated soil. This method would map the location of the containment cell but would not require an ongoing management plan.

5.3.3. Excavation and bunding option

Disposal of Knotweed contaminated waste using deep burial in a licenced landfill can be expensive. A preferential method may be to use a Knotweed bund where suitable land is available. A bund is an area of ground that is cordoned off and where the contaminated soil is

placed on top of a root barrier membrane, to a depth not exceeding 1 metre. The bund would be constructed using a proprietary root barrier membrane, which is a reinforced, impermeable, polyethylene membrane and should have a life expectancy of at least 50 years. The aim of this disposal method is to isolate contaminated soil and encourage Knotweed regrowth, which can then be treated with approved herbicides. A tracked excavator would be used to remove the soil and plant material from the infested areas to a depth of at least 1.8 metres below ground level. The soil and plant material would be carefully loaded onto bio secure trucks that would transport the material to the appropriate location on the bund site. Strict biosecurity protocols shall be adhered to at all times during this process and a long-term herbicide management plan would be put in place. A protective fence would be placed around the bund and fitted with appropriate warning or information signage. This fence may be put in place before or after the bund construction operation. Access to the completed bund would be restricted to authorised persons. Any 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).

5.3.4. Excavation and soil screening option

Screening is a process that is offered by some companies in the United Kingdon (UK). This method involves excavating all of the contaminated soil before passing it through a screening machine that extracts the heavy rhizomes. The second phase of this process would pass the soil along a belt where the remaining fragments are extracted by hand. This method can greatly improve the site and is far less intrusive as there is no transfer of soil from the infested site. However, this method does not carry a guarantee of eradication and can be a time consuming, expensive process.

An eradication guarantee cannot be provided with this method as all minor rhizome fragments may not be removed from the soil. This may result in the regrowth of rhizomes throughout the site which would necessitate further treatment. An ongoing management plan (herbicide/further screening) would also be required for this option.

5.3.5. Currently recommended Knotweed management option for the construction phase

Knotweed throughout the development area should continue to be managed by foliar herbicide application to prevent any immediate ‘spread or dispersal’ of these species, as outlined above. While ongoing herbicide control will deplete the underground rhizome reserves and reduce the risk of accidental spread, additional management options will be required in advance of any

construction works. As the project progresses and the development of infrastructure is required, the recommended management option for soils infested with Knotweed, is excavation for disposal off-site. Key areas where cable installation or infrastructure development will require all areas with Knotweed infested soils to be managed using this method. Although 'excavation for disposal off-site' is broadly the most suitable option, this will be reviewed in advance of any construction activities and final site-specific requirements for each area will be confirmed, depending on the extents of infestations and proposed development in each area. This management option for Knotweed will also be aligned with any final landscape reinstatement plans for the development area. The final management option for Knotweed will be reviewed and agreed upon with input from the relevant stakeholders including Local Authorities, Landowners, Coillte, the National Parks and Wildlife Service (NPWS) and any other stakeholders.

5.4. Himalayan Balsam Management Options

5.4.1. Balsam Bashing or Manual Removal of Himalayan Balsam Plants

While Himalayan balsam is susceptible to control by herbicide, its biology and natural weaknesses lend themselves well to a method of manual control known as 'balsam bashing'. Successful control and eradication can be achieved where a coordinated 3-year balsam removal programme is followed, with follow up monitoring. This involves the initial manual removal of the plant from the ground when it is about 1m tall and before any flowers or seeds have been produced, normally in May or early June. The fact that the roots are so shallow means that they can be easily removed from the soil by gently pulling on the stem. Once the plant is removed, the plant is broken to ensure that it will not flower and set seed. The broken plants can be left *in situ* to decay naturally or can be gathered and brought to a composting facility. It is essential that a second balsam removal operation is conducted at the treatment location in July and August of the same year. This reflects the fact that balsam seeds in the soil from the previous year, i.e., seeds that had not yet germinated, will be stimulated to germinate and grow by the removal of the earlier generation of shade-giving balsam plants. If not removed, these plants will flower and set seed in autumn, thus further adding to the soil seed reserve.

As Himalayan balsam seeds can live for more than one season, it is important to repeat the manual control operations again in the following year. This will ensure that no new seeds are added to the soil seed bank and will further deplete the seed reserve that was laid down prior to the commencement of control operations at the treatment location. Experience with similar operations in Ireland has shown that dense stands of Himalayan balsam are commonly recorded in the second year of control. However, once no plants have set seed since operations commenced (and no seeds are introduced from upstream or adjacent to the treatment area), very few balsam plants should emerge in the third year of treatment, although monitoring and selective plant removal will be required.

Table 5.2: Proposed management schedule for the recommended management approach for Himalayan balsam recorded as part of the proposed Lissinagroagh Windfarm project.

Year	Timing	Description of works	Treatment
2026	May/June	Survey and management	Manual management
2026	July	Survey and management	Manual management
2026	August/September	Survey and management	Manual management
2026	June/July	Survey and management	Manual management
2026	August/October	Survey and management	Manual management
2027	June/July	Survey and management	Manual management
2027	August/October	Survey and management	Manual management
2028	June/July	Survey and management	Manual management
2028	August/October	Survey and management	Manual management
2029+	June/July	Survey and retreatment as necessary	Manual management

5.4.2. *Himalayan Balsam Management Options Prior to the Commencement of the Construction Phase*

Manual management will provide an adequate level of control to prevent the 'spread and dispersal' of Himalayan balsam on site provided no other interference takes place. If infested areas or their buffer zones must be accessed by personnel or machinery additional measures will be required to prevent any unintentional movement of Himalayan balsam material. Below is a description of the subsequent control options for the Himalayan balsam infestations recorded on site where development will take place or additional access or interference with infestations is required. For the client's preferred control option, a full site-specific Management Plan outlining the specific actions for each stage of the operation will be provided, in advance of the works.

5.4.3. *Excavation and disposal off-site option*

This would require site operations to excavate all Himalayan balsam infested soil. The soil and plant material would be carefully loaded onto bio secure trucks that would transport the contaminated material to the appropriately licenced landfill. Strict biosecurity protocols would be adhered to at all times during this process.

It is deemed prudent to remove soil in the infested areas to a depth of at least 300mm from the last visible plant in order to be certain that no seeds remain in the soil following excavation operations. The material would be disposed of at a licenced landfill subject to acquiring a licence for soil movement from the NPWS.

Detailed records of all operations will be maintained throughout the project. These records will specifically focus on the exact areas 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 demarcated areas, and the operation of cleaning and disinfection facilities provided at each area.

5.4.4. *Excavation and disposal on-site option*

Deep burial in an on-site containment burial pit can be used in certain scenarios. Excavation must remove all Himalayan balsam infested soil and would be carried out in the same manner as for the '*Excavation and disposal off-site'* method.

The site selection would take into account services, landscaping, transport routes, possibility of erosion and the future use of the site. The distance for contaminated material to be transported throughout the site would be minimised with the deep burial site located as close

as possible to the site of infestation. If the burial site is located in a different area to the infestation, biosecurity measures would be put in place including decontamination facilities and designated work and haulage areas.

Prior to excavation, the invasive plant material would be managed to remove any flowering plants and prevent seeding in the area. The disposal site would require the construction of a containment pit with no requirement for root barrier membrane. Once filled with Himalayan balsam contaminated material, the pit shall be sealed and then buried beneath 3 metres of inert backfill or uncontaminated soil. This method would map the location of the containment pit but would not require an ongoing management plan.

5.5. Rhododendron Management Options

5.5.1. Herbicide management option

Herbicide control can be highly successful in managing Rhododendron in combination with other mechanical methods. Prior to the site clearance works the sapling growth of the Rhododendron would be targeted and spot sprayed with suitable glyphosate-based herbicide solution. Foliar herbicide management should follow the manufacturers guidelines and be carried out by suitably trained staff, in possession of the relevant qualifications and wearing suitable PPE. Spraying will be carried out at a rate of 5liters/ha using knapsacks fitted with low pressure drift beta nozzles. An inert dye (super signal blue) will be mixed with the solution to ensure all plants at the site are treated. Extra care should be taken where infestations are located among or in close proximity to non-target plant species or any watercourse. Records of herbicide use must be maintained in accordance with relevant legislation. It is anticipated that natural vegetation regeneration will take place following the herbicide management practices and no enrichment or planting will be required.

5.5.2. Manual / Mechanical option

All mature growth would be flailed or uprooted with a mechanical digger or excavator and removed to a designated area where it would be mulched and rendered suitable for removal to a licenced landfill or through deep burial on site. All material to be retained on site for deep burial must be at least three metres below finished ground level. No impermeable root barrier membranes would be required for this method. The methodology would have the advantage of removing the entire root system of the plant thereby reducing the risk of cross contamination with other soils.

5.5.3. Combined mechanical and herbicide option

Herbicide application combined with manual methods have proven highly successful in the management of Rhododendron. This method has proven to be highly successful in the fight against Rhododendron and involves causing damage to the stem of the plant and directly applying a 14% herbicide solution. Rhododendron plants should be left in-situ with basal damage to the outer layer caused by hatchets of saws. This should be immediately followed by the targeted application of the herbicide solution. This method can result in the complete death of the target plant without the need for foliar spraying. Control using herbicide application would be required at least four weeks prior to any mechanical control works.

5.5.4. Monitoring post-treatment

Follow up monitoring following the combined herbicide and mechanical treatment should be carried out 6 to 8 weeks post treatment with a second round of combined management scheduled for that time. Monitoring will be required in the areas where works took place 12 months after the completion of mechanical removal works on site. Any plants or sapling growth that are observed at this time shall be recorded, mapped and scheduled for retreatment (Table 3.4).

5.5.5. Recommended management option for Rhododendron

Rhododendron throughout the development area shall be managed by the combined manual and direct herbicide application method. The direct herbicide method in advance of the construction phase will prevent any immediate 'spread or dispersal' of this species. This shall follow all manufacturers guidelines and shall be carried out by suitably qualified personnel wearing the correct PPE. While herbicide control may reduce the risk of accidental spread, additional management options will be required in advance of any construction works. As the project progresses and the installation of cables and development of infrastructure is required, the recommended management option for soils infested with Rhododendron, is excavation for disposal on-site. Rhododendron will be excavated, mulched and disposed of on-site Strict biosecurity procedures will be required throughout the management works, including the use of covered biosecure trucks during transport of any Rhododendron plant material.

Although 'excavation for disposal on-site' is the most suitable option during the construction works, this will be reviewed in advance of any construction activities and final site-specific requirements will be confirmed, depending on the extents of infestations and proposed development in each area. The final management option for Sea buckthorn will be reviewed

and agreed upon with input from the relevant stakeholders including Local Authorities, Landowners, Coillte, the National Parks and Wildlife Service (NPWS) and any other stakeholders.

Table 5.3: Proposed management schedule for Rhododendron.

Year	Timing	Description of works	Treatment
2025	All year round	Manual control with direct herbicide application	Combined manual and herbicide application
2026	All year round	Manual control with direct herbicide application	Combined manual and herbicide application
2026*	6 to 8 weeks prior to mechanical control	Manual control with direct herbicide application	Combined manual and herbicide application
2026*	6 to 8 weeks post herbicide application	Mechanical management	Removal of plants and root systems before on-site chipping and disposal off site or deep burial.
2027*	12 months post mechanical control	Survey and herbicide retreatment as necessary	Herbicide treatment of sapling regrowth with follow up mechanical control 6 to 8 weeks post treatment
2028*	12 months post mechanical control	Survey and retreatment as necessary if additional regrowth was recorded in 202	Herbicide treatment and mechanical management if required.

*: Treatment undertaken as required and any treatment requirements will be aligned with commencement of construction activities within the development area

6. CONCLUSION

The ecological survey data provided by the client has been reviewed. The study area is characterised by dense pockets of non-native and IAS. This Invasive Species Management Plan provides the basis for the treatment, eradication or disposal of contaminated material. The recommendations contained in this plan form the basis for the management of IAS by the Client and their contractors during the works. This plan may be updated on foot of further surveys which may be carried out in due course.

The survey data has been mapped, recommendations for the control or eradication of IAS have been derived and are documented in this invasive species management plan. Biosecurity measures to prevent the potential spread of invasive species have also been derived and are documented in this plan. The contents of this plan are to be strictly adhered to by all personnel involved with the proposed works.

Of the species identified, the presence of Japanese Knotweed, Himalayan Balsam and Rhododendron are all First Schedule species within the works corridor. As a result, there is a legal requirement that treatment measures are prepared and enacted in advance of works commencing. Mitigation measures to prevent the spread of IAS have been outlined in this report.

7. BIOSECURITY

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

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 (*Reynoutria japonica*), Giant knotweed (*Reynoutria sachalinensis*), Bohemian knotweed (*Reynoutria x bohemica*), Giant hogweed (*Heracleum mantegazzianum*) and Himalayan balsam (*Impatiens glandulifera*). The above species are listed in the Third Schedule (Part 1) of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011) (as amended) and some are included among the list of 88 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 IAPS 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 in aquatic situations is to promote and implement good biosecurity practice.

7.1. Biosecurity Standard Operating Procedure for Personnel and Equipment

This Biosecurity SOP applies to all equipment (hand tools and PPE) that are used during operations to control 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 employed by the Council and will deliver an improved biosecurity system that will help limit the introduction and spread of IAPS during ongoing control operations.

All staff, be they Council or contract, that are involved in the control of IAPS should have access to cleaning and disinfection facilities that include, but is not limited to:

- detailed guide to proper cleaning and disinfection procedure, and instructions for making the correct disinfection concentration;
- clean water and Virkon Aquatic tablets or powder for the disinfection of equipment and PPE;

- hard-bristle brush;
- disposable non-latex gloves for equipment and PPE; and
- plastic bags and cable ties (for disposing of IAPS material removed from equipment).

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

Before commencing operations, a 1% Virkon Aquatic disinfection solution (10g Virkon Aquatic powder or 1 tablet in 1 litre of clean water) should be prepared for personnel working in infested areas. The disinfectant solution will remain pink in colour while it is still active. Additional clean water should be readily available for washing and for making up further disinfection solutions.

Best biosecurity practice will be achieved by ensuring that the following guidelines are adhered to when planning IAPS operations:

- Where possible, schedule operations so that uncontaminated sites can be accessed before sites that are known or suspected to support IAPS.
- Clean and disinfect all equipment prior to the commencement of operations.
- Clean and disinfect all equipment when moving between sites.
- Report suspected IAPS to personnel responsible for the control operations, accompanied by the location (GPS coordinates) and good quality photographs.

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 each site.

- Put on disposable gloves before cleaning and disinfecting the equipment.
- Visually inspect all equipment that has come into contact with water for evidence of attached IAPS material, or adherent mud or debris. Remove any such material before cleaning and disinfecting the equipment and leaving the site.
- Dispose of any IAPS material taken from the equipment using the plastic bags provided.
- Spray equipment with the disinfection solution to the point of run-off. Do not rinse in clean water for at least 15 minutes.

- Use the hard-bristle brush to remove all mud and debris from boots and equipment. Then spray with the prepared disinfectant solution onto the cleaned surfaces to the point of run-off. 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. Wipe down this PPE with an absorbent cloth soaked in the prepared disinfectant solution.

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

- Remove disposable gloves and dispose of safely.

7.2. Biosecurity Standard Operating Procedure for light equipment (including hand-held tools, spraying equipment, sampling devices, strimmers)

Mobilisation

- All staff should have access to clean equipment prior to arrival on site.
- Designated work routes and any known invasive species infestations on or along the work site must be clearly demarcated before operations commence.

Operations

- Staff should avoid any known invasive species infestations and be watchful for any undocumented or unrecorded infestations.
- Staff or equipment will not unnecessarily encroach into any demarcated invasive species areas that they have had to enter or work close to.
- Staff will clean and disinfect their equipment when they exit an invasive species infested site.

Cleaning/Disinfection Post-operations

On completion of any field operation or when moving from one location to another, staff must clean and disinfect all equipment using the following protocol:

- Put on disposable gloves before cleaning and disinfecting equipment.
- Visually inspect all equipment for evidence of attached invasive species material or adherent mud or debris. Remove any such material before disinfecting the equipment.
- During inspection and cleaning, pay particular attention to places where invasive species could be accidentally trapped or obscured.

- Safely dispose of any invasive species material taken from the equipment in the plastic bags.
- Used equipment that has come into contact with water must be wiped down with an absorbent cloth soaked a 1% solution of Virkon Aquatic or another proprietary disinfectant.
- For heavily soiled boots and PPE, use the hard-bristle brush to remove mud and debris, and then spray with the disinfectant solution or use the Boot Bath to wash the soiled equipment in.
- If returning to the depot at the end of the day, it may be more efficient to conduct the more thorough cleaning operations at this facility.
- Remove disposable gloves and dispose of safely.

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

7.3. Biosecurity Standard Operating Procedure for light Machinery (including quad bikes, vehicles, lawnmowers)

Mobilisation

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

Operations

- Staff should avoid any known invasive species infestations and be watchful for any undocumented or unrecorded infestations.
- Staff or machinery will not unnecessarily encroach into any demarcated invasive species areas.
- Staff will clean machinery when they leave an invasive species-infested site that they have had to enter or work close to. Where areas with invasive species are present that operators cannot avoid these sites should be treated before operations commence treated before operations commence and be accompanied by a site-specific Biosecurity Plan

Cleaning/Disinfection Post-operations

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

- Put on disposable gloves before cleaning and disinfecting equipment.
- Visually inspect all light machinery for evidence of attached invasive species material or adherent mud or debris. During inspection and cleaning, pay particular attention to

places where the seeds, fragments of invasive species or water could lodge or be accidentally trapped or concealed.

- Safely dispose of any invasive species material taken from the light machinery in plastic bags.
- Light machinery must be transported back to the depot or to a suitable location for thorough cleaning and/or disinfection.
- Before leaving a work site or location, all light machinery must be given at least a cursory cleaning. This will remove potentially contaminated material that could become detached during transit.
- Where light machinery or parts thereof (e.g. wheels of vehicles or quads) have come into contact with water (where invasive pathogens could be present), the affected parts should be sprayed with a 1% Virkon Aquatic solution or another proprietary disinfectant, using a knapsack with a high-volume nozzle, before leaving that site.
- On arrival at the depot in the evening or on completion of an operation, all light machinery must be further cleaned with a high-pressure steam cleaner, with water $\geq$ 45ºC or, alternatively, be power-hosed with cold water and then sprayed with a 1% Virkon Aquatic solution or another proprietary disinfectant using a knapsack with a high-volume nozzle. Ensure the wheels, undercarriage and anywhere that invasive species could be concealed or where water could be lodged, are cleaned. (This operation can be completed at some roadside garages, if facilities are not available at the depot.)

7.4. Biosecurity Standard Operating Procedure for Heavy plant (including tractors, trailers, low loaders, tracked vehicles, flails, dumpers, dredgers - wheeled and tracked, excavators)

Mobilisation

- All plant must arrive on site having been cleaned and disinfected. All commissioned plant that is arriving from abroad or from other parts of the country must be accompanied by a current certificate of disinfection.
- Designated work routes and any known invasive species infestations on or along the work site must be clearly demarcated before operations commence.

Operations

- Plant operators should avoid any known invasive species infestations, where possible, and be watchful for any undocumented or unrecorded infestations.
- Staff or plant will not unnecessarily encroach into any demarcated invasive species areas.
- Staff will clean plant on every occasion that it is removed from an infested site that they have had to enter or work close to. Where areas with invasive species are present that operators cannot avoid these sites should be treated before operations commence and be accompanied by a site specific Biosecurity Plan

Cleaning/Disinfection

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

- When leaving a work site, ensure that any water is drained from any water-retaining compartments.
- Visually inspect all plant for evidence of attached invasive species material or adherent mud or debris. During inspection and cleaning, pay particular attention to places where water could lodge or where seeds or fragments of invasive species could be trapped or concealed. Particular attention must be paid to the cleats of tracked machines as these can accumulate large amounts of potentially contaminated soil. The tracks and buckets must be cleaned with a power washer, using clean water, before removing the machines from the site.
- Safely dispose of any invasive species material taken from the equipment in the plastic bags.
- Before leaving the work site or location, all plant must be given at least a cursory cleaning, with a power washer and using clean water. This will remove potentially contaminated material that could become detached during transit.
- On arrival at the depot in the evening or on completion of an operation, all plant must be further cleaned with a high-pressure steam cleaner, with water $\geq$ 45ºC or disinfected with a 1% Virkon Aquatic solution or another proprietary disinfectant, using a knapsack with a high-volume nozzle. Ensure the wheels, undercarriage and anywhere that invasive species could be concealed or where water could be lodged, are cleaned. (This operation can be completed at some roadside garages, if facilities are not available at the depot.)
- Where steam cleaning is not available, the plant should be power-hosed with cold water and then sprayed with disinfectant using a knapsack with a high-volume nozzle.

8. REFERENCES

Department of Arts, Heritage, Gaeltacht and the Islands, National Biodiversity Plan (2002)

Invasive Species Ireland (2008). Best Practice Management Guidelines for Japanese knotweed

NRA, (2010). Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads. Revision 1, December 2010

Environment Agency, (July, 2013). Managing Japanese knotweed on development sites - the knotweed code of practice

OPW (2019): Environmental Guidance: Drainage Maintenance and Construction

TII (2020). The Management of Invasive Alien Plant Species on National Roads – Technical Guidance GE-ENV-01105. December 2020. Transport Infrastructure Ireland

TII (2020). The Management of Invasive Alien Plant Species on National Roads – Standard GE-ENV-01104. December 2020. Transport Infrastructure Ireland

Department of Housing, Local Government and Heritage, Ireland's Draft 4th National Biodiversity Action Plan (2022)

Official Journal of the European Union L186 (2022). Commission Implementing Regulation (EU) 2022/1203 of 12 July 2022 amending Implementing Regulation (EU) 2016/1141 to update the list of invasive alien species of Union concern. Volume 65: 10 -13.

European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024)

Connemara Green, Inspiring Action for Conservation, Rhododendron Control Training Video https://connemaragreen.ie/watch-this-video-on-rhododendron-control-in-killarney-national-park/

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