Appendix 6F

Invasive Species Report

MWP

Invasive Alien Plant Species Site Assessment Report and Management Plan

Ballycar Wind Farm

Ballycar Green Energy Ltd

January 2024

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MWP, Engineering and Environmental Consultants
Address: Reen Point, Blennerville, Tralee, Co. Kerry, V92 X2TK,
www.mwp.ie

1. Introduction

Ecologists from Malachy Walsh and Partners, Engineering and Environmental Consultants (MWP) were commissioned to produce an assessment of the potential impacts of the proposed Ballycar Windfarm on the flora and fauna of the receiving environment as part of an Environmental Impact Assessment Report (EIAR). This Invasive Alien Plant Species Site Assessment Report and Management Plan has been produced as part of this assessment. The objectives of this report are below.

- Document the location and extent of Invasive Alien Plant Species (IAPS), particularly those listed on the Third Schedule to the European Communities (Birds and Natural Habitats) Regulations, 2011 to 2015 (as amended).
- Provide a *preliminary* Invasive Alien Plant Species Management Plan that complies with Planning and Environmental Requirements.

2. Legislative Background

The legislative framework governing the control of IAS includes:

- Regulation (EU) No. 1143/2014 of the European Parliament and Of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species;
- Wildlife Acts, 1976 to 2021, as amended;
- European Communities (Birds and Natural Habitats) Regulations, 2011 to 2021 (as amended);
- Planning and Development Act (2000) (as amended);
- Planning and Development Regulations 2001 to 2023 (as amended); and
- 3rd National Biodiversity Action Plan, for the period 2017 – 2021.

While the Planning and Development Acts, 2000 (as amended) do pertain to IAS, it is the provisions of the Wildlife Acts and the Birds and Natural Habitats Regulations that are most relevant; their pertinent provisions are summarised in Sections 2.1 and 2.2, hereunder.

2.1 Wildlife Acts, 1976 to 2021 (as amended)

Section 52(7)(c) of the Wildlife Act, 1976, as inserted by 56(d) of the Wildlife (Amendment) Act, 2000 reads as follows:

'*Any person who— [...] plants or otherwise causes to grow in a wild state in any place in the State any species of flora, or the flowers, roots, seeds or spores of flora, ['refers only to exotic species thereof'][...] otherwise than under and in accordance with a licence granted in that behalf by the Minister shall be guilty of an offence*.'

2.2 European Communities (Birds And Natural Habitats) Regulations, 2011 To 2021 (as amended)

Japanese knotweed (*Fallopia japonica*), and other invasive plant species, are listed as Invasive Alien Plant Species in Part 1 of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011, as amended).

Failure to comply with the legal requirements set down for plant species listed in Part 1 of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011, as amended) can result in either civil or criminal prosecution, with very severe penalties accruing. The relevant sections of the regulations are reproduced below.

'*49(2) Save in accordance with a licence granted [by the Department of Arts, Heritage and the Gaeltacht], any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in any place [a restricted non-native plant], shall be guilty of an offence*.'

'*50(1) Save in accordance with a licence, a person shall be guilty of an offence if he or she […] offers or exposes for sale, transportation, distribution, introduction or release—*

a) [any restricted non-native animal or plant species],

b) anything from which an animal or plant referred to in subparagraph (a) can be reproduced or propagated, or

c) a vector material listed in the Third Schedule, [which includes] soil or spoil taken from places infested…'

2.3 Due Diligence Defence

Regulation 49 (3) states:

'[...] it shall be a defence to a charge of committing an offence under paragraph [...] (2) to prove that the accused took all reasonable steps and exercised all due diligence to avoid committing the offence.'

2.4 Prohibition and Legal Sanction Pertaining to Target Species

Regulation 67(2) states that a person who commits an offence, under Regulation 49, is liable:

'(a) on summary conviction, to a Class A fine ['"class A fine" means a fine not exceeding €5,000'] or imprisonment for a term not exceeding six months, or both, or (b) on conviction on indictment, to a fine not exceeding €500,000, or imprisonment for a term not exceeding three years, or both.'

3. Site Overview

The study area for the proposed Ballycar Windfarm covers an area of c. 407 ha and is situated *c.* 3 km north of Limerick city and suburbs within the townlands of Glennagross, Cappateemore East, Ballycannan West, Ballycannan East, Ballycar South and Ballycar North. Situated within a rural landscape (c. 60 m – 262 m OD), lands within the study area are primarily managed for agriculture and commercial forestry. The topography of the study area primarily slopes southwards, with lands typically less intensively managed for agriculture in the upland areas, which is also where the most commercial forestry is located.

The condition and ecological importance of habitats within the study area varied. Remnant areas of upland blanket bog and wet heath occur but these areas are fragmented likely due to the expansion of commercial forestry and intensive agricultural practices. Wet grassland and dry-humid acid grassland habitats also occur and while the majority of these areas show signs of extensive cattle activity (trampling, over-grazing, exposed peat/soils), some areas are species-rich and not as intensively grazed.

4. Methodology

4.1 Desk Study

A search of species records held by the National Biodiversity data centre (NBDC[1]) within the R56 hectad overlapping the study area was carried out. This search included records for non-native plants listed in the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015). The search also included species not listed on the Third Schedule but considered 'Medium-Impact' and 'High-Impact' invasive species.

4.2 Field Survey

Multi-disciplinary walkover surveys were completed at the study area between June of 2021 and June 2022. Invasive Alien Plant Species (IAPS) surveys were completed at the proposed wind farm site, the proposed grid connection route (GCR), and sections of the proposed turbine delivery route (TDR). During surveys, the presence of any IAPS was documented, including GPS location, species type and the extent of infestation. Particular focus was given to species listed on the Third Schedule of the of the European Communities (Birds and Natural Habitats) Regulations 2011 to 2015 (SI 477 of 2011, as amended). The surveys were based on best practice guidance, in this case, on methodology outlined in NRA, 2010.

5. Results

5.1 Desk Study

The NBDC database held records for a number of invasive species within the R56 hectad overlapping the study area. Documented records of high-impact invasive species listed on the Third Schedule included giant hogweed (*Heracleum mantegazzianum)*, Himalayan balsam (*Impatiens glandulifera)*, and Japanese knotweed (*Fallopia japonica).* Documented records of medium-impact invasive species listed on the Third Schedule include Himalayan knotweed (*Persicaria wallichii)*. Invasive species recorded in the NBDC database that are not listed on the Third Schedule include sycamore (*Acer pseudoplatanus)* and winter heliotrope (*Petasites fragrans)*.

5.2 Field Survey

During ecological field surveys of the site, two invasive species listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) were recorded; Japanese knotweed and Himalayan balsam. Cherry laurel (*Prunus laurocerasus)* was also recorded within the study area. While this species is not listed under the Third Schedule, it is considered to be a High-Impact invasive species. See **Figure 1** below for a map of infestations and **Table 1** for a list of grid coordinates.

Table 1: Location and description of known infestations within the study area

Site	Species	Coordinates (X, Y) (ITM)
1	Cherry Laurel	554991, 664170
2	Cherry Laurel	555075, 664114
3	Cherry Laurel	555123, 663959

[1] H4ttps://maps.biodiversityireland.ie/Map

Site	Species	Coordinates (X, Y) (ITM)
5	Japanese Knotweed	554734, 663627
6	Himalayan Balsam	554773, 663485 – 554791, 663463
7	Himalayan Balsam	554817, 663252 – 554807, 663200
8	Himalayan Balsam	554959, 663144 – 554970, 663076
9	Himalayan Balsam	554964, 663069 - 554958, 663116
10	Himalayan Balsam	555157, 663111 – 555042, 663079
11	Himalayan Balsam	554949, 662985 – 554979, 663058
12	Himalayan Balsam	555153, 663052 – 555159, 663030
13	Himalayan Balsam	555160, 663023 – 555150, 662998
14	Himalayan Balsam	554987, 662971 – 555013, 662965
15	Himalayan Balsam	554942, 662969 – 554933, 662954
16	Himalayan Balsam	554968, 662849 – 554957, 662900
17	Himalayan Balsam	555126, 662813 – 554922, 662855
18	Cherry Laurel	554977, 662972
19	Cherry Laurel	555028, 662959
20	Cherry Laurel	555116, 662942
21	Himalayan Balsam	555158, 662994 – 555154, 662950
22	Himalayan Balsam	555160, 662941 – 555298, 662917
23	Himalayan Balsam	554915, 662599 – 554914, 662648
24	Himalayan Balsam	554946, 662519 – 554940, 662520
25	Himalayan Balsam	555159, 662407 – 555270, 662395
26	Himalayan Balsam	555170, 662609 – 555475, 662609
27	Himalayan Balsam	555555, 662418 – 555904, 662385
28	Himalayan Balsam	555996, 662300 – 556002, 662330
29	Himalayan Balsam	555498, 662773 – 555574, 662746
30	Japanese Knotweed	55492, 662542
31	Himalayan Balsam	556674, 662098 – 556701, 662108

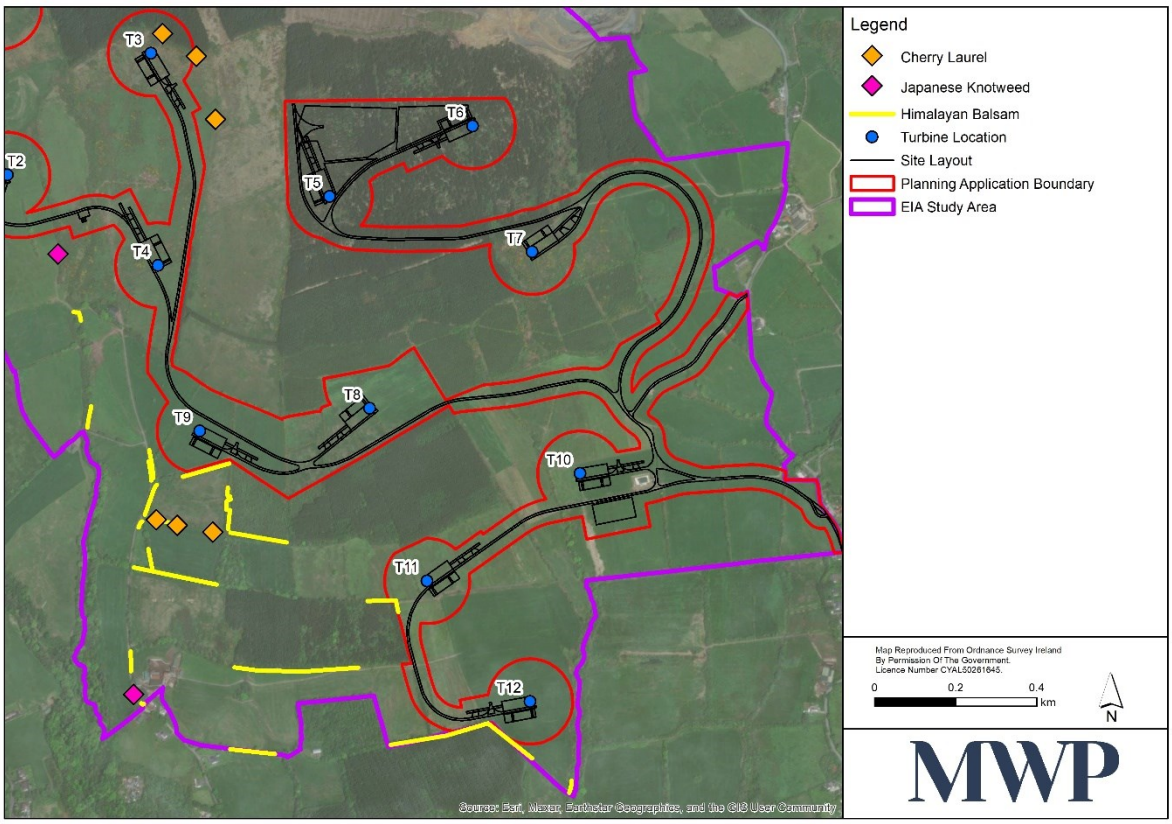

Figure 1: Map of Occurrence of invasive alien plant species found within the study area.

5.3 Himalayan Balsam (*Impatiens glandulifera*)

Himalayan balsam is a non-native terrestrial plant and a member of the *Balsaminacea* family that originated from the Himalaya region of Asia. Since its introduction as a garden plant, this species has rapidly spread across Ireland, primarily along watercourses but it can also take hold in areas of damp soil (damp woodland, wet grassland, etc.). This species produces dense bushes of pinkish-red translucent stems with green lance-shaped leaves and abundant white – pink flowers. This species is spread via seed dispersal. A single plant can produce over 2,000 seeds which are explosively released from seed pods when the seed pods are disturbed. This method of dispersal is aided by seeds being easily spread via watercourses. This means that this species can spread quickly and at a distance from the parent plant.

Himalayan balsam is classified as a high impact species. It is a tall, shade-tolerant species that forms dense stands, particularly along watercourses, outcompeting native species. When it dies back in the autumn, it leaves the ground bare and vulnerable to erosion.

Extensive infestations of this species were recorded within the study area, mainly within in the centre and in the south/ southwest section of the study area (see **Figure 1**). It was also recorded in one location along the turbine delivery route, in proximity to Node 10. Water is the primary method of dispersal for this species within and likely downstream of the study area given that the majority of infestations were located on the banks of drainage ditches. See **Plate 1** below for examples of Himalayan balsam infestations.

Plate 1: Extensive Himalayan balsam infestations along drainage ditches within the study area (top) and an example of new infestations occurring within the study area (bottom).

5.4 Japanese Knotweed (*Fallopia japonica*)

Japanese knotweed is a herbaceous perennial plant that can grow to heights of 2-4 m. In summer, it produces dense bushes of purplish bamboo-like stems with large, triangular leaves. It has robust creeping rhizomes (roots) and is spread primarily by fragmentation and dispersal of its roots or stems. Its flowers cannot produce viable seed, as only female Japanese knotweed plants have been recorded to date in Ireland.

Japanese knotweed is classified as a high impact species. This species can dominate an area by forming dense stands, out-competing other native plants. Fragments of the plant will set roots and grow to form new plants, allowing the plant to spread very quickly in areas that are frequently disturbed. The rhizomes are very extensive and can grow to 3 m deep and spread up to 7 m horizontally underground. It can quickly establish and dominate in new areas. It dies back in winter and can therefore leave areas exposed to erosion.

This species was recorded growing in the centre of a farm track along the east boundary of an improved agricultural grassland field, in the western section of the study area. It was noted that the infestation was not established as only three plants were recorded which were no more than 20 cm tall. It is likely that this species was introduced recently to the site in contaminated material used to build the farm track. See Plate 2 below.

Plate 2: Early infestation of Japanese knotweed, not yet established. Located on a farm track within a field which has been colonised by vegetation in parts. This infestation is accessible to cattle.

A second infestation was recorded within a hedgerow lining a farm track, in close proximity to the farm holding located to the southeast of the study area. The infestation comprised of a single but established *c.* 1.5 m tall plant growing outwards from the hedgerow. See Plate 3 below.

Plate 3: Japanese knotweed growing outwards from the hedgerow over farm track.

5.5 Invasive Alien Plant Species Listed on Invasive Species Ireland National Biodiversity Data Centre Database

Cherry laurel (*Prunus laurocerasus)* was recorded within the study area. This species was recorded in six locations, along hedgerows and field boundaries towards the centre and north of the study area. Cherry laurel is a non-native, ever-green plant that forms dense thickets. This species is typically spread by birds eating the fruit and dispersing seeds but can also propagate via cuttings where branches left in appropriate conditions can potentially root and form new plants.

While cherry laurel is not listed under the Third Schedule, it is considered a high impact invasive species.

No other invasive species listed in Section 5.1 were recorded within the study area.

6. Management Measures

6.1 Oversight of Measures

An invasive plant species specialist and an Ecological Clerk of Works (ECoW)/Project Ecologist will oversee the implementation of management measures as outlined in this preliminary IAPS management plan.

A site-specific detailed IAPS Management Plan will be developed by a specialist and/or the Project Ecologist and incorporated into the finalised Contractors CEMP. This detailed plan will incorporate the findings of pre-construction surveys for invasive plant species, which will be carried out within the proposed development site, along the route of the proposed grid connection and at all TDR nodes and/or anywhere where vegetation removal or trimming is required. This management plan will be in place for the duration of the construction phase of the development.

6.2 General Management Measures

The general approach to management of IAPS on-site will comprise two main elements; containment of spread and eradication on-site. These are outlined in the following sub-sections.

6.2.1 Containment

Containment of spread will be the initial step and main priority of the IAPS management plan. The primary risk of spread is considered to be during the construction phase. Prior to finalising the IAPS Management Plan and prior to the commencement of any development works, the footprint of the works will be re-surveyed to ensure that any proliferation of IAPS is noted and recorded. Containment of infested areas will be achieved by establishing 'Exclusion zones' around the stands of IAPS within or adjacent to the development area and by implementing the following measures;

- Re-survey to establish the extent of IAPS within the development area;
- Installation of adequate 'exclusion zones';
- Toolbox talks will be carried out to communicate measures to all personnel;
- Personnel will be informed of their legal obligations to prevent the spread of IAPS, and of the penalties that apply;
- Works inside the exclusion zones, not directly associated with the IAPS Management Plan, will not be permitted;
- Removal of vegetation/soil from the exclusion zones will be carried out only by appropriately qualified and experienced personnel, and will be supervised by the ECoW/Project Ecologist to control the potential spread of infested soil/material from the exclusion zones to other areas.

6.2.2 Eradication

It will be necessary to eradicate any stands of invasive plant species from the construction footprint effectively to prevent spread and colonisation of other areas. For all invasive plant species, the preferred and most effective method of control will depend on timing of works, cost, and duration of control process. The following sections discuss the species-specific control options for the IAPS recorded in the study area. If required, arrangements will be made to work with the neighbouring landowners where possible, to manage IAPS extending away from the development area. Where possible, invasive plant material and contaminated soil will remain on-site and be treated. The movement of certain invasive plant material out of a site (in this case potentially Japanese knotweed

and Himalayan balsam) will require a licence from the NPWS under Section 49 of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended).

6.3 Site-specific Management Measures

The following sub-sections outline measures that will be incorporated into the finalised IAPS Management Plan for the site. The Management Plan that will be prepared can remain a ''Live'' document, and as such will be reviewed on a regular basis, and updated where required (conditions on site may change between time of IAPS surveys completed at the study site and future construction phase surveys for the project).

The management measures for Himalayan balsam and Japanese knotweed have been adapted from '*The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads'* (NRA, 2010).

6.3.1 Management of Himalayan Balsam

6.3.1.1 Physical Control

In order to avoid inadvertently spreading this species, physical control will only be employed prior to the development of the seed-pods (April or early May). This prevents the disturbance of seed-pods and subsequent explosive seed dispersal.

Hand-pulling is the recommended method for the physical removal of this species as this species is shallow-rooted. Care will be taken to ensure that the plant is effectively pulled in order to prevent re-growth, as anything left above the lowest node could potentially regenerate. The majority of infestations occur on drainage ditches, including the inside bank. Therefore, care will be needed to ensure an area has been effectively cleared. Plants will be bagged after being pulled. Bagged plants will be contained in an exclusion zone within the site boundary and allowed to decay for a minimum period of 18 months.

6.3.1.2 Chemical Control

Given that the majority of infestations occur in proximity to water, chemical control is only recommended if the herbicide is approved for use within an aquatic environment. However, these herbicides are typically not as effective as those herbicides which can be utilised outside of the aquatic environment, hence physical control is the preferred treatment option. Should chemical control be used, plants will be sprayed in the spring before flowering but late enough to ensure that germinating seedlings have grown up sufficiently to be adequately covered by the spray.

6.3.2 Management of Japanese Knotweed

The desired option to treat Japanese knotweed generally is to control the infestation in-situ with herbicide over a period of time (typically 3-5 years). As this is not always a feasible option, excavation of infested material may be necessary to prevent the spread of Japanese knotweed. Excavated material may be either buried on-site at an appropriate depth (at least 5 m) or removed from site to an appropriately licensed facility. It is possible to treat the excavated knotweed and infested soil in a bund on-site.

At the time of surveys, the two infestations are considered to be quite small. However, the extent of underground growth will need to be established. It is considered feasible that the plant material and associated contaminated soil can be excavated and buried at the appropriate depth (at least 5 m) at a suitable location on site.

Any works relating to IAPS at the site will be carried out and overseen by a Japanese knotweed specialist. Any excavations required will be supervised by the same, to ensure rhizome identification, and all contaminated material is removed.

6.3.2.1 Trial Pits and Test Trenching

As this infestation was likely introduced to the site via contaminated material used to construct the farm track, a programme of Trial Pits and Test Trenching will be implemented in this area in order to confirm that there is no underground growth. The trial pits and test trench programme will follow the following methodology:

- All machinery, equipment, tools, materials and work-wear will be cleaned down prior to works being carried out.
- A minimum of one trial pit will be opened within the infestation location in order to determine the rhizome depth directly underneath the infestation.
- Open up trenches, working inwards from the boundary of the 7 m buffer zone.
- Excavated material will be placed in a dumper, or on a solid surface such as metal sheeting or plywood boards.
- The trial holes - trenches will be carefully inspected along the faces and bases for evidence of Japanese knotweed rhizome. If Japanese knotweed rhizomes are encountered the investigation will proceed with further vertical excavation to establish their overall depth/extent.
- If Japanese knotweed rhizome is encountered, all details of the rhizome material present in each test trench and trial pit will be recorded.
- The excavated material will be carefully replaced back into the pit, or trench on completion, marking the limits of each trench, and treating the entire trench as being clean, or infested (if Japanese knotweed underground growth present).
- Wash down all machinery, equipment, tools, materials and work-wear at each trench and pit location, on completion, ensuring run off is contained within the infested area (if rhizome material encountered).
- If Japanese knotweed is encountered mark extent, and record with GPS etc.
- If Japanese knotweed is encountered at any of the locations, and the rhizome spread cannot be established, it will be assumed that the spread is 7 m.
- Compile the results of the trial pit and test trench programme into report form, and circulate to the relevant personnel.

The containment measures outlined in Section 6.2.1 above and the bio-security measures outlined in Section 6.4 below will be in place throughout these operations.

Where Japanese knotweed underground growth is recorded during the Trial Pit and Test Trenching outlined above, the following options are available.

- Option 1: Deep burial to at least 5 m;
- Option 2: Burial in containment cell, to at least 2 m;
- Option 3: Bund method;
- Option 4: Removal off site.

6.3.2.1.1 Option 1: Deep Burial

- Identify site and ensure that the location of burial site will have sufficient area to accommodate the Japanese knotweed infested material.
- Apply for relevant licenses (NPWS, Waste).
- Install Japanese knotweed bio-security measures at excavation, and burial site.

- Carry out investigation checking for services, ducting, water etc.
- The Japanese knotweed contaminated material will be buried with at least 5 m cover of inert material.
- Dig excavations will be designed by an engineer.
- The material will be covered with root barrier membrane, before backfilling it to 5 m deep with inert fill, clean topsoil, or appropriate backfill.
- If required, to protect the root barrier membrane, either side of the cell membrane will be levelled off, and a layer of sand/other suitable material will be installed.
- A GIS survey of the footprint of the top of the cell will be carried out, digitally mapped and recorded, and provided to the client for incorporation into the deeds of the lands.
- Following best practice guidelines, the cell location will be accurately mapped, recorded and incorporated into the property's documents. Permanent signs will be erected to inform of the nature and quantities of the buried waste.

6.3.2.1.2 Option 2: Burial in a containment cell, to at least 2 m

In some situations where burial is the preferred disposal method but it is not possible to bury Japanese knotweed to 5 m, it may be completely encapsulated into a root barrier membrane cell. The following are the requirements for this method;

- Source suitable location of cell. The cell will be;
    - Located in a level area, having well drained and stable ground conditions, good soil depth and a low water table.
    - In a location which will have no underground services.
    - In an area of the site where no future disturbance or development is anticipated.
    - In a position where any long term settlement of the material within the cell will not have an adverse impact on any surfaces, formations or structures.
- Apply for relevant licenses (NPWS, Waste).
- The final size of the cell will be dictated by the results of the test trenching programme, which can be carried out prior to any excavations at the site. All contaminated material within the site boundary will be removed to the cell.
- Cell construction;
    - Designed by engineer and Japanese knotweed specialist.
    - Excavate to desired levels, a minimum of 2 m of backfill will be installed over the surface of the cell. Cell depth/size will be developed by engineer, with a 2 m capping layer of inert soil or material over.
    - Proprietary root-barrier membrane as the enclosing material of the proposed underground infested soil containment cell.
    - The ground at the cell will be levelled using fine sand, to provide a soft surface for the protection of the underside of the membrane.
    - A continuous layer of root barrier membrane, in the largest practical sheet sizes, will be placed across the full extent of area to be protected, in a single operation.

- Ensure that there are no holes or gaps in the membrane, and that any dressing around, objects or surfaces are carried out in compliance with the manufacturer's instructions.
- All seams will be sealed in compliance with the manufacturer's instructions.
- On vertical and sloping surfaces the membrane will be held in position, and protected from damage, by a continuous heavy gauge geotextile membrane, plywood sheeting/other, fitted to both sides of the root barrier membrane.
- For optimum membrane protection a sand layer can be placed above the membrane across the base of the cell, to protect it from damage from machinery and plant movements into and within the cell.

All material transferred to the cell will be spread evenly across the cell footprint and compacted, in layers of 300 – 500 mm, with the material height raised evenly throughout the filling process.

Vegetation will be deposited in the deepest part of cell. Infested material/layers rolled in. As described, all materials will be deposited in the cell. However, if it the case that debris and boulders will not be deposited in the cell, these will be subject to hygiene treatment (washed/screened with enclosed area).

Bio-security requirements and site set up will be installed prior to transfer of infested material to the cell. On completion of the transfer operations the wash down area at that location will be decommissioned, and all material within it transferred to the containment cell.

Following best practice guidelines, the cell location will be accurately mapped, recorded and incorporated into the property's documents. Permanent signs will be erected to inform of the nature and quantities of the buried waste.

6.3.2.1.3 Option 3: Bund Method

Where local conditions mean that you cannot use deep burial/cell method as an option, it may be possible to create a Japanese knotweed bund. A bund is a shallow area of Japanese knotweed contaminated soil. Typically the bund will be between 0.5 m and 1 m deep. The bund can either be raised, or placed within an excavation, to make the surface flush with the surrounding area. The purpose of the bund is to move the Japanese knotweed to an area of the site that is not used. The following will be carried out when using this method;

- Source the location of the bund(s). The area will have to be set aside for a minimum of three to five years to allow for the treatment of Japanese knotweed at this location.
- Apply for relevant licenses (NPWS, Waste).
- Position away from any watercourses/trees/structures etc.
- Install root barrier membrane underneath infested material (if the site is clean/Japanese knotweed free).
- Rhizome growth will be near the surface.
- Base of bund will be made up of subsoil layer/lowest amount of rhizome.
- Treat re-growth (herbicide).

6.3.2.1.4 Removal Off Site

- Identify a landfill that that will accept the waste, ensuring that the facility is licensed/permitted to receive the waste (e.g. Drehid waste facility in Kildare (Bord na Móna)).
- The landfill will require sufficient notice to prepare/to accept the waste/have the capacity to receive the waste.

- Site specific licensing required from the National Parks and Wildlife Service to permit the off-site movement of the Japanese knotweed.
- A soil testing programme will have to be carried out (Waste Acceptance Criteria WAC analysis), to ensure that there is no other hazardous waste material contained in the infested soil.
- Compliance requirements under the relevant Waste Management Acts.

Haulage

Great care will be taken to avoid losing material en-route to the landfill site, or other location. The following will be adhered to during transport of Japanese knotweed material to land fill site;

- Only a licensed waste carrier can legally transport the waste to the landfill.
- Limit access areas to vehicles involved in moving the Japanese knotweed.
- The vehicles will be decontaminated before they leave the site.
- If the quantities are small (which is likely the case in this instance), material can be 'double-bagged' in heavy duty waste bags.
- Larger quantities that are being moved in skips or trailers will require lining and covering of the skip/trailer with suitable membrane.
- Fill trucks up to a maximum of 20 cm below the top.
- Clean vehicles before using them to move Japanese knotweed.
- Clean the trucks/containers after it has finished moving soil (use a pressure washer and stiff haired brushes to clean the vehicle, thoroughly scouring any areas that might retain rhizome material). Particular attention must be paid to tyre treads and wheel arches. Any material dislodged during this process must be included within the Japanese knotweed waste. This method will be carried out in a designated wash out area/over a root barrier membrane layer or hard surface that can contain and collect the material washed off. This material/washout will not let be allowed to enter/contaminate drains, ditches or watercourses.

6.4 Biosecurity Measures

6.4.1 During Construction

If works are required within the exclusion zones (infested area(s), i.e. during the removal or treatment of areas that are within the footprint of the proposed development) the following bio-security measures will be implemented:

All work within the exclusion zones will be carefully planned, in co-ordination with, and under the strict supervision of, an IAPS specialist.

- All unnecessary work within the exclusion zone will be avoided. The exclusion zone cannot be used for access, or parking area for vehicles or personnel.
- No soil, vegetation, rubbish or any other material will be removed from the exclusion zone, unless under the strict supervision of IAPS specialist.
- Any vehicles operating within the exclusion zones will be cleaned thoroughly when entering and/leaving the exclusion zone(s):

- A designated wash-down area will be set up at a suitable access point/location within the exclusion zone(s).
- The cleaning area(s) will be positioned, so that run-off will drain back into the exclusion zone(s).
- Vehicles will be cleaned of all earth and loose sediments, with particular attention paid to tyre treads, tracks, wheel arches and hinged joints.
- All tools, materials and work wear will be inspected, and cleaned as necessary, with particular attention paid to footwear and hand tools.
- All removed or disturbed plant material will remain within the exclusion zone, and will be removed from site/treated as contaminated material.

Habitat restoration will be achieved as soon as possible after the construction phase to prevent the encroachment of invasive species. Exposed areas that are slow to recolonise will be planted with native species.

6.4.2 Introduction Prevention

The proposed development and associated construction activities will aim to prevent IAPS from arriving on site, and/or prevent the spread of IAPS by implementing strict controls, supervised by the on-site Ecological Clerk of Works (ECoW)/Project Ecologist. Prevention is the most effective management measure that can be taken with regard to IAPS.

Prevention measures will include raising awareness with project personnel, and ensuring that good site hygiene practices are employed for the movement of materials into, out of and around the site.

The following outlines the Construction Best Practice that will be in place for the duration of the construction phase of the proposed development;

- To reduce the likelihood of invasive species being introduced to the site from quarries, the aggregate will be crushed stone which will be biologically inert and would not be expected to have a seed bank. Any soil and topsoil required on the site will be sourced from a stock that has been screened for the presence of any invasive species and where it is confirmed that none are present;
- Good construction site hygiene will be employed to prevent the introduction and spread of problematic IAPS (e.g. Himalayan knotweed, Himalayan balsam, Japanese knotweed, etc.) by thoroughly washing vehicles prior to leaving/entering any site;
- All plant and equipment employed on the construction site (e.g. excavator, footwear, etc.) will be thoroughly cleaned down using a power washer unit prior to arrival on site/leaving site to prevent the spread of IAPS;
- All washings will be undertaken in areas with no potential to result in the spread of invasive species. This process will be detailed in the contractor's method statement.

The measures followed to avoid the spread of IAPS will follow guidelines issued by the National Roads Authority '*The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads*' (NRA 2010).

Non-native species control will be practised according to the following IFI documents, noting that some works components are located in the proximity of watercourses draining the site, or drains that feed these watercourses:

- IFI Bio-security Protocol for Field Survey Work (IFI, 2010);
- Disinfection of scuba diving equipment (IFI, 2011);
- Invasive species bio-security guidelines for boaters (IFI, 2013).

6.5 Monitoring and Treatment

6.5.1 Other Re-Growth

The aims of the management plan for the site seek to ensure that all infested areas are dealt with in a manner that ensures that there is no re-growth. There remains a risk that some viable material will avoid detection and will be left within the works areas. In such an instance, it is essential that the material is identified and treated appropriately, as soon as possible. Therefore, monitoring and treatment control programmes will be put in place for both the construction and post-construction stages of the development.

6.5.2 Construction Stage Monitoring and Treatment

Construction activity can pose a high risk of disturbing and dispersing infested soil. Notwithstanding the Bio-Security measures that will be in place, no procedure can be deemed as completely bio-secure, and there is always a possibility that viable invasive plant material can be spread elsewhere, either inadvertently or by outside interventions. Therefore, strict site management procedures and regular inspections of the works site will be deployed throughout the construction stage of the site development programme. The contractor will prepare bio-security procedures and a works inspection programme, for the approval of, and monitoring by, an invasive plant species specialist prior to any construction commencing on site.

6.5.3 Post-Construction Stage Monitoring and Treatment

The following measures will be incorporated into the finalised IAPS Management plan:

Monitor site to check for re-growth.

- If invasive plants are detected then treat appropriately.
- The site will be surveyed in the early and late growing season of each year for three consecutive years during operational phase. A review will be carried out following each year of survey. If no invasive plant species are detected in April / May of each year, then a second survey will be carried out in July / August, to look for late season growth.

6.6 Management of Other Invasive Alien Plant Species

As outlined in Section 5.2 above, cherry laurel (*Prunus laurocerasus)* was also recorded within the study area. While cherry laurel is not listed under the Third Schedule, care will be taken to prevent the spread of this species, following the guidelines set out by the NRA (2010) regarding the management of and removal of invasive plant species.

The measures outlined by Invasive Species Ireland[2], which is cited by NRA (2010), for the management of rhododendron (*Rhododendron ponticum*) and cherry laurel will be applied to the management of this species.

[2] http://invasivespeciesireland.com/wp-content/uploads/2012/01/Rhododendron-BPM.pdf

7. Conclusion

In summary, two IAPS listed on the on the Third Schedule of the of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011, as amended) were recorded within the study area; Himalayan Balsam (*Impatiens glandulifera*) and Japanese Knotweed (*Fallopia japonica*). Infestations of Himalayan Balsam were extensive, recorded within the core proposed wind farm area and along the proposed turbine delivery route. Japanese knotweed was recorded in two locations within the study area: a small infestation of not-yet-established plants on a farm track, and a more mature but single plant located in a hedgerow bounding a farm track.

The implementation of measures outlined in this preliminary IAPS Management Plan, will avoid the spread of these species, which is an offence under Regulations 49 and 50, as a result of the proposed development of Ballycar Windfarm. Furthermore, all infestations will be eradicated from the development site, including those outside the footprint of construction works, prior to the commencement of the construction phase.

This is an outline IAPS Management Plan. This plan will be updated and included in the finalised Construction Environmental Management Plan (CEMP) for the proposed development.

8. References/Bibliography

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