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Appendix 23.10

Habitat and Species Management Plan

Ove Arup & Partners International Ltd.

North Irish Sea Array (NISA)

Offshore Wind Farm

ElAR Appendix 23.10 – Habitat and Species Management Plan (HSMP)

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1. INTRODUCTION

1.1. Background

This report, which has been prepared by Woodrow APEM Group on behalf of Ove Arup & Partners International Ltd., presents a Habitat and Species Management Plan (HSMP) for the onshore infrastructure of the proposed North Irish Sea Array (NISA) Offshore Wind Farm development. The onshore infrastructure consists of a landfall site at Bremore, north of Balbriggan, Co. Dublin, a grid facility, also at Bremore, and a 220 kV underground cable route, approximately 33-35km in length, running from the grid facility to a grid connection point at an existing substation located at Belcamp, Co. Dublin. The majority of the cable route is within public roads, with several distinct locations where the route deviates offline from the road to cross watercourses or major roads.

This report relates to the onshore development area and is relevant only to the parts of the onshore development area outside the public road network and existing hardstanding, including at the following locations (see EIAR Volume 7 Figure 23.1 to Figure 23.8):

- Landfall site
- Grid facility
- Wx10 (Aldrumman Stream)
- Blakes Cross North including water crossing Wx11 (Ballough Stream)
- Blakes Cross South including water crossings Wx12 (Deanestown Stream) and Wx13 (Ballyboghill Stream)
- M1 crossing
- Water crossing Wx20 (Gaybrook Stream)
- Water crossing Wx22 (Sluice Stream); and
- Existing 220kv substation at Belcamp.

The purpose of this HSMP is to provide a comprehensive guide detailing the prescribed reinstatement and biodiversity enhancement measures relevant to the onshore development area, offering insights and instructions for contractors regarding habitat and species management practices. This should be read in conjunction with Environmental Impact Assessment Report (EIAR) Volume 4, Chapter 23 Biodiversity (hereafter referred to as the Biodiversity Chapter) and the landscape plans for the grid facility and the Blakes Cross North locations (included as planning drawings 281240_MCR_ONS_GF_DR_YE_1010 *Grid facility Landscape Plan* and 281240_MCR_ONS_GF_DR_YE_1011 *Blakes Cross North Landscape Plan* in Appendix 7.1 of the EIAR). Ecological enhancement measures outlined in this HSMP should not be considered compensatory measures in the context of the requirements of Article 6(4) of the Habitats Directive, as they do not compensate for impacts that would adversely affect the integrity of any European Site.

1.2. Overview

This HSMP sets out the methods to manage habitats affected by the onshore development area in order to benefit biodiversity, taking into consideration the mitigation measures set out in the Biodiversity Chapter. Additionally, the HSMP sets out management measures of the habitat enhancement areas at the grid facility and Blakes Cross North. Management measures included in the HSMP are set out to benefit the following habitats and ecological features:

- Habitats – semi-natural grasslands (including wet grassland, dry calcareous and neutral grassland, dry meadows and grassy verges), hedgerows and woodland
 - Grassland restoration and management along the cable route and at construction compounds using the hay transfer method;
 - Sowing a species rich grassland seed mix at the grid facility at Bremore and at Blakes Cross North (i.e. where the route deviates offline crossing the Ballough Stream);
 - Planting a riparian grass and herb mix in the attenuation basin located west of the compensation substation at the grid facility;
 - Planting hedgerow around the periphery of the grid facility, and supplementary planting around the existing hedge at Blakes Cross North;
 - Planting trees and woodland around the periphery of the grid facility;
- Breeding birds – yellowhammer (*Emberiza citronella*) and meadow pipit (*Anthus pratensis*)
 - Enhancement and management of habitat for yellowhammer and meadow pipit at the grid facility and Blakes Cross North.
- Non-native invasive species
 - Treatment and disposal of invasive plant species not listed on the 3rd schedule of the Habitats Regulations S.I. 477 of 2011.

Although the HSMP focuses on the features outlined above, the measures proposed will have overarching benefits for a wide range of local flora and fauna, particularly invertebrates (e.g. pollinators) and mammals (including foraging bats).

2. HABITATS

The following sections set out measures to reinstate, enhance and manage semi-natural grasslands, hedgerows and woodland within the onshore development area. A full management and monitoring schedule for habitats is provided in **Section 5.2**. Habitats recorded at each offline section are shown on EIAR Volume 7 Figures 23.17 to Figure 23.25.

The primary areas of temporary habitat loss within the onshore development area are:

- At the landfall site, vegetation clearance and habitat removal during construction will occur under the working footprint of the development which includes the landfall site horizontal directional drilling (HDD) compound (c. 7,500m²), HDD compounds measuring c. 1,500m² either side of the Dublin-Belfast railway crossing, the onshore export cable, and permanent wayleaves. At the landfall site, where the onshore export cable passes through hedgerows or treelines, the width will be narrowed to approximately 17m
- At the grid facility, vegetation clearance and habitat removal during construction will occur under the working footprint of the development which includes the grid facility infrastructure measuring 35,000 m², a temporary contractor compound, and surrounding landscape and the grid facility

biodiversity planting area, described in this HSMP, will occupy the remainder of the lands available at the grid facility site; and

- At the offline sections of the onshore cable route, as set out in **Section 1.1**, habitat removal during construction will involve the working corridor, HDD compounds measuring c. 1,500m² at M1 crossing and at any offline watercourse crossings where HDD will be used. The proposed development includes the construction of temporary construction and contractor compounds; one of which is located at Blakes Cross South in an arable field, and the other two are at the landfall site and grid facility, as mentioned above, with each ranging in size between 9,500m² and 12,500m². The working corridor for offline sections of the onshore cable route will be 18m in width to allow for the excavation of the trench, storage of topsoil and subsoil arisings plus a temporary haul road for the movement of the excavation equipment and general installation vehicles for the delivery of materials such as ducting, protective covers and bedding. Where the onshore cable route passes through hedgerows or treelines, the width will be narrowed to approximately 11m.

Two areas of biodiversity enhancement within the onshore development area are:

- The grid facility; and
- Blakes Cross North.

2.1. Grassland Reinstatement

Grassland reinstatement mainly pertains to temporary habitat loss along the onshore cable route that will primarily occur at offline sections of the onshore development area. Temporary habitat loss largely occurs in arable fields and agricultural grassland which are habitats that have been ecologically valued as local (lower) importance. However, temporary loss of semi-natural grasslands (i.e. dry calcareous and neutral grassland, dry meadows and grassy verges) will occur under the working footprint of the onshore development area at Blakes Cross South, M1 crossing, water crossing Wx22 (Sluice Stream) and Belcamp substation.

Section 23.6.1.3 of the EIAR states in relation to the protection of semi-natural grassland that:

Reseeding of grassland habitats will be implemented using hay transfer. This is an effective near-natural solution for grassland restoration¹ which avoids importing a seed mix and instead utilises the existing seed bank and seed resource. Adjacent, or nearby, grassland similar to the grassland that is being removed will be cut when grasses and flowering plants are in seed. These cuttings will be laid over the reinstated bare ground for natural colonisation. This method will be used, but not limited to, the following scenarios: at the margins of arable and agricultural grassland fields, at field boundaries where drainage ditches and hedgerows are crossed, at watercourse riparian edges if HDD has not been used and at temporary compound locations where semi-natural grassland is present.

Hay transfer is considered to be a nature-based solution developed for grassland restoration and reinstatement that is achieved by the transfer of recently mown green or dry grassland cuttings originating from donor sites, in this case the grassland being removed or nearby similar grassland, with a desired species composition, to areas that are being reinstated (i.e. receptor sites). In addition to introducing propagules of grassland specialist species, the transfer of plant material can also help

¹ Orsolya Valko, O., Radai, Z. and Deak, B. (2022) Hay transfer is a nature-based and sustainable solution for restoring grassland biodiversity. Journal of Environmental Management Vol. 311

suppress the growth of weeds. Additionally, it has the added advantage of potentially transferring invertebrates and non-vascular plants from donor sites, which allows for a more complete restoration of a natural grassland ecosystem (Valkó *et al.*, 2022). The method by which hay transfer will be carried out is set out below along with measures to assess its success through monitoring.

2.1.1. Method

The following steps have been derived from Valkó *et al.* (2022) and Wagner *et al.* (2021), as well as the Great Irish Grasslands – Grassland Management Website² for green hay transfer.

- Donor sites of high quality in terms of semi-natural grassland species richness, in this case the grassland being removed or adjacent similar grassland, will be identified and selected as close to the receptor sites as possible;
- Donor sites, i.e. area of grassland removal or adjacent similar grassland, will be checked for grass and wildflower seed production from July onwards, in order to avoid cutting hay too late in the season. (*Note: cutting should ideally take place outside the bird breeding season, which is 01 March to 31 August, inclusive*);
- Vegetation at the donor sites will be cut in early-September when flowering plants are in seed (*Note: conditioner mowers or silage harvesters should be avoided as this may result in seed loss*);
- Cut vegetation, or green hay, will be transferred to the receptor sites which will represent bare soil following soil reinstatement post-construction;
- Once at the receptor sites, hay will be spread at a thickness of approximately 10cm over the bare soil covering all areas to be reinstated;
- The spread hay will be rolled using a ring roller (e.g. lawn roller) in order to ensure good contact between the seeds in the hay and the soil. If this is not possible, the hay will be raked manually;
- The spread hay will be left in-situ, and only removed (if necessary) following a period of one week.

2.1.2. Monitoring

Areas where grassland reinstatement is recommended under the working footprint at Blakes Cross South, M1 crossing, water crossing Wx22 (Sluice Stream) and Belcamp substation are outside of the control of the developer post-construction. As a result, there will be no post-construction monitoring at these locations. It is expected that following hay transfer, natural recolonisation of these areas will continue due to the existing seed bank within the soil and surrounding vegetation present.

2.2. Grassland Enhancement

Habitat enhancement measures at the grid facility will comprise the sowing of a species rich grassland seed mix within appropriate grassland areas (measuring an area of 33,483m²), as well as the planting of a riparian grass and herb mix in the attenuation basin (measuring an area of 6,411m²). At Blakes Cross North, an additional area of species rich grassland will be sown measuring 5,500m².

² Great Irish Grasslands – Grassland Management Website. Available at: <https://www.greatirishgrasslands.ie/learn-more-about-grasslands/grassland-management/> [Accessed February 2024].

The provision of these habitats will have overarching benefits for a number of species, including breeding farmland birds such as yellowhammer and meadow pipit (see **Section 3.1**), by supporting pollinators and invertebrate populations that will provide a food resource during the breeding period.

2.2.1. Species rich grassland

Species rich grassland seed mixtures will preferably be sourced locally, or at a minimum, consist of species that are of native Irish origin, and which are well-suited to the soil conditions. According to Section 23.6.1.3 of the EIAR, the following species, or similar native species, will be included in the seed mix:

The species rich grassland seed mix will include Festuca rubra, Festuca rubra subsp. Commutate, Poa pratensis, Poa trivialis, Alopecurus pratensis, Phelum pratense, Plantago lanceolata, Prunella vulgaris, Achillea millefolium, Daucus carota, Leucanthemum vulgare, Galium verum, Rumex acetosella, Lotus corniculatus, Rhinanthus minor, Trifolium repens and Trifolium pratense, Centaurea nigra, Hypochaeris radicata, Anthriscus sylvestris, Vicia sepium, Lathyrus pratensis, Conopodium majus.

2.2.1.1. Method

The steps regarding soil preparation, sowing, and management provided herein have been partially informed by the Magnificent Meadows Website³, recommended by NatureScot.

- A short vegetation sward in the recipient sites will be created the preceding autumn and spring prior to sowing. The objective is to create bare ground (at least 50%) as all wildflower and grass seed require contact with the soil, as well as a low level of competition with any vegetation already present;
- The soil will be prepared through disk and/or grass-harrowing. Tine harrows can also be used to remove grass thatch;
- Where areas of arable crop production are to be replaced with species rich grassland, bare ground will be created in early July by cultivating the field without sowing any crops (*Note: creating bare ground may stimulate the growth of problematic vegetation such as ragwort, dock and creeping thistle that may need to be controlled*);
- Herbicide application will not be used, but if absolutely necessary, a non-drip weed wipe will be used to control invasive species;
- Seed mixtures will be spread between late-July and early-September as this is the time when most grassland plants will shed seed;
- Seed will be dispersed manually but should be blended with dry sand or another inert biodegradable substance to increase volume. Additionally, this material should contrast in colour with the soil to visually indicate the areas where the seed has been distributed;

³ Magnificent Meadows Website (Recommended by NatureScot). Available at: <http://www.magnificentmeadows.org.uk/advice-guidance/section/how-can-i-restore-or-recreate-a-meadow> [Accessed February 2024].

- A seed hopper may be used to scatter seed in larger areas, however machines will need to be modified with additional agitators as brush harvested seed tend to contain stalks and leaves (i.e. 'chaff') that can lead to clogging;
- An application rate of 4g/m² will be adopted unless otherwise stated by the seed supplier;
- A ring roller will be used on the treated area immediately after the seed has been spread in order to ensure good contact between the seed and the soil;
- Vegetation growth (particularly clump-forming grasses) will need to be restricted during autumn of the first year through cutting, or if practical, light grazing by livestock (*Note: mowing will take place outside the bird breeding season, which is 01 March to 31 August, inclusive*);
- Light grazing may be repeated following the first winter after seeding (if practical), in order to control the growth of grasses (*Note: care should be taken to ensure that livestock do not cause damage to the seeded areas*);
- Any grazing livestock used to control vegetation growth will be removed during the flowering period (April to July) in order to allow flowers to bloom;
- An annual mowing regime will be established, beginning in the second autumn following seeding (i.e. once one year has elapsed). This regimen will employ a disk mower to mow newly seeded areas, timing the activity outside the bird breeding season (i.e. after 31 August);
- Cuttings will be removed from the site immediately following mowing, or alternatively, cuttings will be saved as hay and removed in the form of bales;
- Field margins or strips, measuring a minimum of 3m in width, will be left unmown in order to provide nectar and pollen for pollinators in the early Autumn period, while flowering plants will retain their seed heads throughout the winter period, providing a valuable food resource for birds throughout the year.

2.2.1.2. Monitoring and measures of success

Monitoring of the success of reseeded areas will be undertaken and reported annually. This will involve periodic inspections over the first year followed by annual monitoring for the next two years. Additional monitoring will occur in Year 5. Success will be measured by achieving a grass to broad leaf herb ratio of at least 50:50 post-seeding.

Evaluation of vegetation structure and species composition will be conducted using 2m x 2m quadrats in July of each monitoring year in Year 1, 2, 3 and 5 post re-seeding, coinciding with the peak flowering period for most plants. Any necessary remedial actions, such as reseeded or stabilizing the ground, will be identified, and addressed within one year of each monitoring visit.

2.2.2. Riparian grass and herb mix

A proposed attenuation basin (2-3m deep) will be located at the grid facility in order to hold water in the event of high rainfall, and control runoff. Attenuation basins often support aquatic vegetation, both emergent and submerged, along the edges and shallow sections of the pond. In addition to enhancing biodiversity, attenuation basins can provide for the treatment of pollutants, through biological uptake (TII, 2014). Any naturally occurring vegetation will be supplemented by the planting of a riparian grass and herb mix. Section 23.6.1.3 of the EIAR states the following regarding the species designated for planting:

This riparian grass and herb mix will include Juncus effusus, Ranunculus peltatus, Sagittaria sagittifolia, Potamogeton natans, Mentha aquatica, Ceratophyllum demersum, Glyceria maxima, Hydrocharis morus-rane, Sparganium erectum, Berula erecta, Filipendula ulmaria, Callitriche platycarpa, Lychnis flos-cuculi, Myosotis scorpiodes, Iris pseudacorus, Alisma plantago-aquatica, Althaea officinalis, Berula erecta, Filipendula ulmaria, Mentha aquatica, Glyceria fluitans, Lychnis flos-cuculi, Myosotis scorpiodes, Alisma plantago-aquatica, Althaea officinalis.

2.2.2.1. Method

According to SEPA (2009) guidance pertaining to Riparian Vegetation Management, aquatic plants can be established from the following sources:

- Plants taken from the wild where species are abundant and permission has been obtained from landowners;
- Plants supplied by an approved nursery;
- Seeds collected from the wild where the species is abundant and permission has been obtained from landowners;
- Seeds supplied by an approved wildflower seed mix supplier.

Taking individual plants from the wild where the species is abundant, and permission has been obtained is often the most effective way of obtaining plants. However, plants must be taken from a suitable site that is free of invasive species seeds, rhizomes or fragments. The following steps will be adopted during planting:

- The attenuation basin will be divided up into planting zones based on water depth. Emergent vegetation (e.g. *Sparganium erectum*) can be planted in shallow areas around the pond edge, while submerged vegetation (e.g. *Ranunculus peltatus*) can be introduced to deeper areas where water levels are more stable;
- Vegetation will be planted by hand during the spring;
- If plants are taken from a donor site, they will be dug out by spade and planted immediately into shallow water or moist areas of the attenuation basin, ensuring they are planted firmly into the bed (*Note: when transporting plants, it is important that they are kept in water or wrapped in paper towels*);
- Submerged plants will be tied to stones (where water levels allow), released and allowed to sink to the bottom of the basin to root;
- Reedbeds already established within the basin will be encouraged to expand by pegging to the ground the tips of mature non-flowering shoots;
- Sowing of seed and planting of bare soil (i.e. around the slopes of the basin and the 1.5m perimeter) will be undertaken in spring, in order to encourage the establishment of seedlings;
- Where seeds are sown on bare soil, the soil will be prepared by incorporating a friable subsoil (easily crumbled or broken into small, loose particles) with small amounts of topsoil;

2.2.2.2. Monitoring and measures of success

Monitoring will adhere to the established schedule for grassland restoration and enhancement, involving regular inspections throughout the initial year. During these inspections, any weed or

invasive species will be identified for removal. At this stage it will be determined whether a mowing regime will be necessary for the perimeter of the attenuation basin owing to the establishment of tussock forming grasses or problematic vegetation. A visual appraisal of the planted area will be continued annually over the following two years, and again during Year 5. Any necessary remedial actions will be identified and reported on annually and addressed within one year of each monitoring visit.

2.3. Hedgerow and Tree Planting

Further habitat enhancement measures along the proposed development will comprise the planting of hedgerows around the periphery of the grid facility (166m), as well as supplementary planting (400m) of hedgerow at Blakes Cross North, which will mirror existing hedgerows at this location. The aim of this is to create a double hedgerow that will provide additional habitat for breeding birds, with the establishment of herbaceous vegetation at the base of hedgerows providing potential nest sites for yellowhammer (see **Section 3.1**). A native woodland species mix will also be planted around the periphery of the grid facility, measuring a total area of 8,325m². This will assist in mitigating the visual impact of the new infrastructure.

In addition to implementing enhancement measures, all retained hedgerows will be safeguarded by establishing a 3m setback from the edge of the hedgerow vegetation, ensuring protection from construction activity. This setback requirement also applies to the siting of temporary and permanent access tracks.

The following subsections set out the measures to establish, monitor and maintain hedgerows, trees and woodland within the onshore development area.

2.3.1. Hedgerows

The following sets out measures to plant, establish and maintain hedgerows at the grid facility and Blakes Cross North. Plants will be of native origin or Irish provenance, preferably grown from locally sourced seeds. Section 23.6.1.3 of the EIAR states the following regarding the species designated for planting:

*Hedgerow planting will include the following species *Alnus glutinosa*, *Prunus spinosa*, *Ilex aquifolium*, *Rubus fruticosus*, *Corylus avellana*, *Rosa canina*, *Euonymus europaeus* and *Crataegus monogyna*.*

2.3.1.1. Method

A total length of 566m of hedgerow will be planted, with 166m allocated to the grid facility and an additional 400m designated for supplementary planting at Blakes Cross North. The following steps will be adopted during planting:

- Planting will be undertaken in the appropriate season (October to March) using bare root stock (i.e. whips) avoiding periods following heavy rain or periods of frost;
- Areas for hedgerow laying will be marked out using wire or twine (area of c. 1.2m in width);
- The ground between twines will first be prepared by scraping away vegetation with a mini-digger or small excavator;

- Plants will be protected from drying out by keeping plants in a bag until needed;
- Planting will be performed in double staggered rows, with c. 33cm between the rows and the same between each plant. All eight species will be incorporated in 30m sections (*Note: for biodiversity it is important that no one species makes up more than 70% of the total number of plants*);
- Species like hawthorn (*Crataegus monogyna*) will be planted as trees every 10-15m in order to enhance hedgerow structure (*Note: these may need to be protected as trees using tree guards*);
- Planting will be performed to the same depth, with stems exposed and roots buried;
- Organic mulching (e.g. wood chip, straw) will be used around plants in order to control the growth of competing vegetation;
- If hedgerows are to be planted in areas with livestock, a fence will be placed along the length of the newly laid hedgerow (*Note: some areas may also require protection from rabbits*);
- Hedgerows will be watered during the first year to assist with establishment (*Note: watering to be adapted based on weather conditions*);
- Light pruning will be adopted during the establishment phase (Years 1-5) in order to shape the hedge and encourage denser growth at the base;
- Herbicide application will not be used, but if absolutely necessary, a non-drip weed wipe will be used to control invasive species.
- Failed or dead plants (identified during monitoring) will be replaced the following planting season.

2.3.1.2. Monitoring and measures of success

Periodic inspections will be undertaken within the first-year post-planting, in order to assess growth and identify failed plants or invasive species. Annual monitoring will continue for the following two years, during which time, hedgerows will be subject to a condition assessment following the Heritage Council's Hedgerow Appraisal System⁴. This will assist in identifying management issues pertaining to weed control, gaps that need to be filled, as well as any fencing damage (where required). A final assessment will be conducted during Year 5, at which time hedgerows should meet the criteria for 'Adequate' to 'Favourable' condition. Any necessary remedial actions will be identified and addressed within one year of each monitoring visit.

2.3.2. Trees and woodland

The following sets out measures to plant, establish and maintain a woodland species mix around the periphery of the grid facility. Similar to hedgerows, plants will be of native origin or Irish provenance, preferably grown from locally sourced seeds. Section 23.6.1.3 of the EIAR states the following with respect to the tree species to be planted:

*Tree planting will include *Alnus glutinosa*, *Betula pubescens*, *Ilex aquifolium*, *Pinus sylvestris*, *Prunus padus*, *Prunus avium* and *Quercus robur*. This planting will have an understory and shrub planting of *Prunus spinosa*, *Rosa canina* and *Euonymus europaeus*.*

⁴ Heritage Council – Hedgerow Appraisal System. Available at: <https://www.woodlandsofireland.com/hedgerow-appraisal-system/> [Accessed February 2024].

2.3.2.1. Method

The site designated for planting will measure a total area of 8,325m². Some key considerations prior to planting include the planting mixture used, design and planting patterns as well as tree spacing requirements. According to the Woodlands of Ireland⁵, a robust and varied pattern tends to work best, with a combination of planted clumps and open areas being recommended. There are six main variables used to develop planting patterns that include:

- Species composition of clumps;
- Clump size and location;
- Spacing of overstorey, understorey and minor species in adjacent clumps;
- Spacing of overstorey, understorey and minor species with clumps;
- Size of gaps between clumps;
- Size and location of larger open areas.

Given the current scenario, where planting serves two main objectives: to enhance biodiversity and to mitigate visual impacts resulting from the new infrastructure, the density and structure of tree planting has not been prescribed here. In broad terms, planting will encompass the following steps:

- Planting will be undertaken between October and March when trees are dormant and less likely to get damaged. Planting will be avoided following periods of heavy rain or periods of frost;
- Ground preparation will be limited to inverted mounding, shallow ripping, pit planting or auger planting;
- Trees will be left to mature without cutting and protected with a tree guard;
- The control of competing vegetation such as grasses and bramble will be controlled through organic mulching (e.g. wood chip, straw) or trampling where practical;
- Any invasive plant species growing on site will be controlled as per the methods outlined in **Section 4**;
- Leaf litter and dead wood arising naturally or from management of the woodland will be left in-situ in order to create habitat for invertebrates.

2.3.2.2. Monitoring and measures of success

As per the monitoring of hedgerows, periodic inspections of newly planted woodland will be undertaken within the first year. The primary aim of these inspections will be to assess growth, identify failed plants or invasive species, and determine whether competing vegetation will need to be controlled. Annual monitoring will continue for the following two years, with a final assessment conducted during Year 5. Any necessary remedial actions will be identified and addressed within one year of each monitoring visit.

⁵ Woodlands of Ireland – Native Woodland Scheme Information Note No. 5. Available at: <https://www.woodlandsofireland.com/native-woodland-information-notes/> [Accessed February 2024].

3. BREEDING BIRDS

3.1. Yellowhammer and Meadow pipit

Breeding yellowhammer were recorded at all offline sections of the onshore development area, nesting in grassy field margin vegetation, hedgerows and ditches adjacent to arable fields. The greatest densities were recorded at the landfall site, grid facility and Blakes Cross North (see EIAR Volume 7 Figure 23.27 to Figure 23.35). Breeding meadow pipit, a ground-nesting species nesting in rank and tussocky grassland within the onshore development area, were recorded at the landfall site, grid facility, water crossings Wx10 (Aldrumman Stream) and Belcamp substation. The greatest densities were recorded at the landfall site and grid facility (see EIAR Volume 7 Figure 23.27 to Figure 23.35).

As previously outlined in preceding sections, habitat enhancement measures will be implemented across the grid facility and Blakes Cross North areas to benefit breeding birds, particularly yellowhammer and meadow pipit, which are red-listed as a species of conservation concern in Ireland (BoCCI4: 2020-2026)⁶.

While preferences in nesting habitat vary between studies (Dunn *et al.*, 2010; Stoate *et al.*, 1998) it has been shown that the majority of yellowhammer nest sites occur along the field boundary interface, in hedgerows or herbaceous vegetation in field margins, as well as vegetated ditches (Bradbury *et al.*, 2000). In addition to creating nesting habitat through the planting of replacement hedgerow features (i.e. at the grid facility), the proposed supplementary planting of hedgerows at Blakes Cross North, designed to mirror existing hedgerows at this location, will further enhance the structure and biodiversity of hedgerow habitats in this area.

A varied, food-rich environment is crucial for these species, to maintain a stable population size and for yellowhammer it has been implied that the early selection of breeding territories is strongly influenced by the quantity of nearby spring and summer foraging habitat (Catfolis, 2020) in particular grassy margins, which have been shown to be significantly selected for feeding nestlings, relative to all other habitat types examined, other than hedgerows and ditches (Perkins *et al.*, 2002). Measures such as sowing species-rich grassland seed mixes and leaving field margins unmown, will attract invertebrates, while retaining the seed head on unmown flowering plants will provide an essential food source for both species throughout the winter.

The combined habitat enhancement measures outlined in this HSMP will contribute to the conservation of yellowhammer, meadow pipit and other passerine species within the proposed development areas. Key habitat management actions that will maximise these benefits include:

- Reinstating grassland habitat at the margins of arable and agricultural grassland fields within the footprint of the onshore infrastructure and cable route of the proposed development (see **Section 2.1**);
- Sowing a species rich grassland mix at the grid facility and Blakes Cross North (see **Section 2.2**);
- Leaving field margins or strips, measuring a minimum of 3m in width, in order to provide nectar and pollen for pollinators in the early Autumn period, while flowering plants will retain their seed

⁶ Gilbert, G., Stanbury, A. & Lewis, L. (2021). Birds of Conservation Concern in Ireland 2020 –2026. *Irish Birds*, 9: 523–544.

heads throughout the winter period, providing a valuable food resource for birds throughout the year;

- Planting of replacement hedgerow at the grid facility, and supplementary planting of hedgerow at Blakes Cross North (see **Section 2.3**);
- Annual monitoring of these habitat enhancement measures for the first two years post-construction and subsequent monitoring in Year 5.

A full management and monitoring schedule for habitats that will benefit breeding birds is provided in **Section 5.2**.

4. NON-NATIVE INVASIVE SPECIES

Terrestrial non-native invasive species, which are not listed on the 3rd schedule of the Habitats Regulations S.I. 477 of 2011, were recorded within the onshore development area. These include the high impact species cherry laurel (*Prunus laurocerasus*), medium impact species butterfly bush (*Buddleja davidii*), rock cotoneaster (*Cotoneaster horizontalis*) and Himalayan honeysuckle (*Leycesteria Formosa*), and low impact species montbretia (*Crocasmia X crocosmiflora*), snowberry (*Symphoricarpos albus*), and winter heliotrope (*Petasites fragrans*). See Table 1 below and EIAR Volume 7 Appendix 23.7 for locations of terrestrial non-native invasive species. Terrestrial non-native invasive species will be removed where they occur within the working construction footprint at the landfall site, grid facility, along the onshore cable route and at the existing Belcamp substation.

Although Himalayan balsam (*Impatiens glandulifera*) was observed at two locations outside the proposed development boundary (c. 47m east of Blakes Cross North at its nearest location), it is not anticipated that any activities will require its removal in these areas. Nevertheless, if works necessitate their removal, appropriate treatment and control measures will be implemented for this 3rd Schedule species and have been included in this plan as a precautionary measure. See EIAR Volume 7 Figure 23.17 to Figure 23.20 for Himalayan balsam locations.

Table 1. Locations of terrestrial non-native invasive species recorded

Common name	Scientific name	3rd Schedule ⁷	Impact level	Location ⁸	
				X co-ordinate	Y co-ordinate
Himalayan balsam	<i>Impatiens glandulifera</i>	Y	High	719851.2	752256.6
Himalayan balsam	<i>Impatiens glandulifera</i>	Y	High	719727.9	765757.6
Butterfly bush	<i>Buddleja davidii</i>	N	Medium	719025.2	748985.5
Butterfly bush	<i>Buddleja davidii</i>	N	Medium	719043.9	748980.4
Butterfly bush	<i>Buddleja davidii</i>	N	Medium	719014.6	748799.3
Butterfly bush	<i>Buddleja davidii</i>	N	Medium	719925.7	761520.8
Butterfly bush	<i>Buddleja davidii</i>	N	Medium	718512.6	757550.6
Butterfly bush	<i>Buddleja davidii</i>	N	Medium	719910.7	752249.8
Butterfly bush	<i>Buddleja davidii</i>	N	Medium	721023.3	741817.5

⁷ listed on the 3rd Schedule of the Habitats Regulations S.I. 477 of 2011

⁸ Reference system IRENET95 Irish Tranverse Mercator

Common name	Scientific name	3rd Schedule ⁷	Impact level	Location ⁸	
				X co-ordinate	Y co-ordinate
Butterfly bush	<i>Buddleja davidii</i>	N	Medium	719227.1	741324.4
Butterfly bush	<i>Buddleja davidii</i>	N	Medium	721157.5	741198.5
Butterfly bush	<i>Buddleja davidii</i>	N	Medium	719756.4	750901
Butterfly bush	<i>Buddleja davidii</i>	N	Medium	720014	763049.4
Butterfly bush	<i>Buddleja davidii</i>	N	Medium	719836.5	752348.1
Butterfly bush	<i>Buddleja davidii</i>	N	Medium	721149.7	741218.4
Butterfly bush	<i>Buddleja davidii</i>	N	Medium	721055.5	740711.7
Butterfly bush	<i>Buddleja davidii</i>	N	Medium	720024.5	741020.6
Cherry Laurel	<i>Prunus laurocerasus</i>	N	High	719876.8	752461.6
Cherry Laurel	<i>Prunus laurocerasus</i>	N	High	721020.5	741798.5
Cherry Laurel	<i>Prunus laurocerasus</i>	N	High	718790.1	756851.7
Cherry laurel	<i>Prunus laurocerasus</i>	N	High	719864	752572.6
Cherry Laurel	<i>Prunus laurocerasus</i>	N	High	719646.6	755208.9
Cherry Laurel	<i>Prunus laurocerasus</i>	N	High	720978.6	745729.6
Cherry Laurel	<i>Prunus laurocerasus</i>	N	High	719791.8	752095.4
Cherry Laurel	<i>Prunus laurocerasus</i>	N	High	719393.8	764683.6
Cherry Laurel	<i>Prunus laurocerasus</i>	N	High	721053.9	741870.6
Cherry laurel	<i>Prunus laurocerasus</i>	N	High	719986.6	753886
Cherry laurel	<i>Prunus laurocerasus</i>	N	High	720754.2	746475.3
Cherry laurel	<i>Prunus laurocerasus</i>	N	High	719783.7	750948.4
Cotoneaster Rock	<i>Cotoneaster horizontalis</i>	N	Medium	719650.9	751371.5
Montbretia	<i>Crocsmia X crocosmiiflora</i>	N	Low	719810.5	765009.3
New Zealand broadleaf	<i>Griselinia littoralis</i>	N	Not assessed	719381.2	764707.8
Snowberry	<i>Symphoricarpos albus</i>	N	Low	719318.1	755820.7
Snowberry	<i>Symphoricarpos albus</i>	N	Low	719437	749718.4
Snowberry	<i>Symphoricarpos albus</i>	N	Low	719707.3	750373.1
Winter heliotrope	<i>Petasites fragrans</i>	N	Low	719806.5	751515.7
Winter heliotrope	<i>Petasites fragrans</i>	N	Low	719789.4	751352.7
Winter heliotrope	<i>Petasites fragrans</i>	N	Low	719769.4	751383.4
Winter heliotrope	<i>Petasites fragrans</i>	N	Low	719790.2	751348.3
Winter heliotrope	<i>Petasites fragrans</i>	N	Low	721022	741792.9
Winter heliotrope	<i>Petasites fragrans</i>	N	Low	719967.6	753746.4
Winter heliotrope	<i>Petasites fragrans</i>	N	Low	719787.8	751364.9
Winter heliotrope	<i>Petasites fragrans</i>	N	Low	719857.9	751767.5
Winter heliotrope	<i>Petasites fragrans</i>	N	Low	721104.2	743883.6

4.1. Treatment

The below sub-sections outline measures that will be implemented for the safe removal and disposal of non-scheduled species, as well as measures to treat and control Himalayan balsam in the event that works necessitate their removal.

4.1.1. Cherry laurel

The following general recommendations will be adhered to as part of the treatment plan for cherry laurel:

- The leaves of cherry laurel are thick with cyanide, and therefore gloves will be worn during all stages of treatment and removal;
- Disposal options will be in place prior to any treatment works taking place, and any reproductive plant material will be disposed of following NRA (2010) Guidelines;
- Equipment, clothing and footwear will be checked thoroughly following treatment and cleaned if necessary.

Removal of this species will be carried out through physical and chemical means that will require a combination of treatments. These treatments have been informed by the Invasive Species Ireland (ISI) (2008) Best Practice Management Guidelines⁹ that includes the following.

- Stumps will be cut by hand or chainsaw, cutting as close to the ground as possible;
- The cut material will be chipped and/or removed to an appropriately licensed waste facility in order to prevent regrowth;
- Stumps will be directly treated with herbicide following cutting. This will be achieved by applying herbicide to the freshly cut wound. Glyphosate (20% solution), triclopyr (8% solution) or ammonium sulphate (40% solution) are known to be effective during suitable weather conditions (i.e. dry weather). The herbicide concentrations used and timings of applications vary according to which chemical is used (*Note: In accordance with the Plant Protection Product Regulations, only those Plant Protection Products authorised for professional use in Ireland will be employed*).

4.1.2. Butterfly bush, rock cotoneaster and Himalayan honeysuckle

Where avoidance of these medium impact species is impractical, management methods will also include a combination of physical and chemical treatments. Digging or hand picking of young butterfly bush is only recommended where there are minor infestations, as the grubbing of plants (i.e. physical removal) can provide ideal conditions for the germination of seeds (NRA, 2010). Similarly, young rock cotoneaster seedlings can be effectively pulled however larger plants will develop multiple stems from the large root mass making it difficult to remove the whole plant. As with cherry laurel, a combination of physical and chemical treatments will be employed for the removal of these medium impact species. This will consist of the following:

⁹ ISI (2008). Best Practice Guidelines for *Rhododendron* (*Rhododendron ponticum*) and Cherry Laurel (*Prunus laurocerasus*). Invasive Species Ireland. Available at: <https://invasivespeciesireland.com/wp-content/uploads/2012/01/Rhododendron-BPM.pdf> [Accessed March 2024].

- Small infestations of young plants can be dealt with physically; however, care should be taken to minimise soil disturbance when hand picking or digging, particularly when dealing with butterfly bush;
- Larger plants will be cut back to a basal stump (*Note: for butterfly bush and rock cotoneaster cutting and treatment is recommended during active growth, which ranges from late-spring to early-summer and spring to autumn, respectively*);
- The cut material will be chipped and/or removed to an appropriately licensed waste facility in order to prevent regrowth;
- Cut stumps will be treated immediately with a systematic herbicide mix that is painted on to the stump. The herbicide concentrations will vary according to which chemical is used.
- Foliar application of triclopyr or glyphosate may be adequate for limited infestations of
- younger butterfly bush, but should be followed up at 6 monthly intervals (*Note: Only a registered professional user can apply Plant Protection Products that are authorised for professional use*)

4.1.3. Montbretia, snowberry and winter heliotrope

According to NRA (2010) Guidelines, the physical treatment of low impact species like montbretia and winter heliotrope is often challenging due to the risk of reinfestation and further spread, and only practical where infestations are limited in extent. Where this is the case, entire stands of montbretia and winter heliotrope will be excavated and buried (to a depth of 2m), incinerated or disposed of at an appropriately licensed waste facility. For winter heliotrope this may require follow up treatments by herbicide. Due to the risk of reinfestation a number of follow up visits will be required over a two-year period to identify any regrowth. Where larger stands occur an application of glyphosate-based herbicide will be applied using a weed wipe applicator or spot treatment (*Note: In accordance with the Plant Protection Product Regulations, only those Plant Protection Products authorised for professional use in Ireland will be employed*).

Where snowberry cannot be avoided, it will be treated through the following means:

- Small and young plants will be pulled manually;
- Flat areas will be mown to ground level and the cuttings removed so that they do not sprout any new plants;
- An opaque tarp will be applied to the ground where areas have been cut. This will prevent snowberry photosynthesising, which will cause root systems to die after a year of covering.

4.1.4. Himalayan balsam

Himalayan balsam, a native to the western Himalayas, is a 3rd schedule species, and subject to restrictions under the Habitats Regulations S.I. 477 of 2011. Where works necessitate their removal, or any newly established stands are identified, the following pre-treatment measures will be implemented:

- Himalayan balsam will be fenced off with a perimeter of no less than 10m or at the point where they adjoin roads or built infrastructure, whichever is nearest;
- Signage will be placed on these areas to clearly state no entry of any kind is permitted during and after treatment;

- All footwear and equipment will be cleaned prior to arrival to and upon departure from areas infested with Himalayan balsam.

Removal of this species will be carried out through physical or chemical treatment, the details of which are outlined in the following sub-sections.

4.1.4.1. Mechanical or physical treatment

Mechanical treatment usually requires good access where a lawnmower can be utilised for cutting. The plant must be cut below the lowest node to prevent regeneration. Smaller infestations can be pulled up by hand, as the roots are shallow.

As persons involved in treating Himalayan balsam will have close contact with an easily spread, scheduled invasive species, entry and departure from infested areas will be subject to strict biosecurity controls. Removal to landfill will only be required when seeds are present in waste. The following guidelines for mechanical/physical treatment will be followed:

- Any worker that must enter an infested area will only be allowed to leave the site through a decontamination area, comprising of a brush down area. This area will have only one entry and exit point so complete control of the movement of workers is possible;
- Removal of plants by mowing should be conducted prior to flowering in June;
- Physical removal of plants by hand should be conducted prior to flowering in June, preferably after a period of rain;
- Vegetation removed should be disposed of at a licensed landfill or burnt;
- The disposal of invasive plants should not lead to a further risk of spread and should be carefully controlled, particularly near watercourses;
- Material containing seeds should be taken to a licensed landfill facility or incinerated;
- Incineration of waste material must occur in lines with relevant legislation (Section 32 of the Waste Management Act, 1996 to 2008; Section 4 of the Air Pollution Act 1987; and relevant local authority bylaws).

4.1.4.2. Chemical treatment

Chemical treatment should be implemented by either a contracted invasive species control specialist or the relevant competent authority.

Currently, the preferred types of herbicides to be used in the treatment of Himalayan balsam are Glyphosate and 2,4-D Amine, although, 2,4-D Amine is not recommended for use near water¹⁰. Generally, if either is applied as the treatment option, it will need to be reapplied for several years after the first application and consistently monitored to ensure the plant control measures have been effective¹¹.

¹⁰ Kelly, J., Maguire, C.M. & Cosgrove, P.J. (2008). Best Practice Management Guidelines Himalayan Balsam *Impatiens glandulifera*. Prepared for NIEA and NPWS as part of Invasive Species Ireland. Available at: <https://invasivespeciesireland.com/wp-content/uploads/2012/01/Himalayan-Balsam-BPM.pdf> [Accessed February 2024].

¹¹ Bibby, H. (2018). Invasive plant species: Japanese Knotweed, Himalayan Balsam, Giant Hogweed and Skunk Cabbage. Prepared for Farm Advisory Service, Scotland. Available at: <https://www.fas.scot/downloads/tn697-invasive-plant-species/> [Accessed February 2024].

The following guidelines for chemical treatment will be followed:

- Any worker that must enter an infested area will only be allowed to leave the site through a decontamination area, comprising of a brush down area. This area will have only one entry and exit point so complete control of the movement of workers is possible;
- Herbicide should ideally be applied during active growth in April to May and repeated annually and monitored for at least 5 years where no regrowth has taken place;
- Where there is sensitive adjacent vegetation, a weed-wipe may be used for a more precise spray;
- Repeated treatment (chemical or physical) will be required for a period of at least 5 years;
- Monitoring will be required during mid-spring and mid-summer to assess sapling regrowth.

5. IMPLEMENTATION

5.1. Responsibilities

All management tasks outlined in this HSMP will be undertaken by the developer and/or EirGrid and/or ESB subject to agreement, or by a suitably qualified contractor acting on their behalf. Ecological monitoring and reporting of management tasks will be undertaken by a suitably qualified and experienced ecologist. Monitoring results will be reported on an annual basis in Year 1, 2, 3 and 5 post-construction, and any remedial actions will be identified within these reports.

Treatment of non-native invasive plant species will be undertaken by a horticulturist with experience in the identification of, and licenced for the removal of, invasive species. The treatment of invasive species with herbicide will be undertaken by personnel who have demonstrated compliance with the Plant Protection Product Regulations.

5.2. Management and Monitoring Schedule

Table 2. Management and monitoring schedule

Feature	Management Task	Management Schedule	Reporting Criteria	Reporting Schedule
Habitats – Grassland	Reinstatement of grassland habitat within the onshore development area using hay transfer	September in the first-year post-construction	Recruitment success, identification of invasive species for removal, and any remedial actions required	Within one year of reinstatement
	Sowing 38,983m ² of species rich grassland at grid facility and Blakes Cross North	Between late-July and early September in the first-year post-construction	Recruitment success, identification of invasive species for removal, and any remedial actions required	Within one year of seeding
	Annual mowing of newly sown grassland (leaving margins and strips)	Every autumn throughout lifespan of project	-	-

Feature	Management Task	Management Schedule	Reporting Criteria	Reporting Schedule
	Planting 6,411m ² of riparian grass and herb mix at the attenuation basin	Spring in the first-year post-construction	Recruitment success, identification of invasive species for removal, and any remedial actions required including the establishment of a mowing regime	Within one year of planting
	Annual monitoring of reinstated and newly sown grassland areas (including attenuation basin)	Every July during Years 2, 3 and 5	Species composition and recruitment success at recipient sites	Once a year during Years 2, 3 and 5
Habitats – Hedgerows and woodland	Planting 566m of hedgerow at the grid facility and Blakes Cross North	Between October and March in the first-year post-construction	Growth and any remedial actions required including the removal/replacement of failed plants	Within one year of planting
	Planting 8,325m ² of a native woodland mix around the periphery of the grid facility	Between October and March in the first-year post-construction	Growth and any remedial actions required including the removal/replacement of failed plants and the control of competing vegetation	Within one year of planting
	Light pruning of hedgerows during the establishment phase (Years 1-5)	Years 1-5 post-construction	-	-
	Annual monitoring of newly planted hedgerows and woodland	Annually during Years 2, 3 and 5	Condition assessment and identification of any remedial issues (e.g. filling gaps, fencing)	Once a year during Years 2, 3 and 5
Yellowhammer and Meadow pipit	Annual monitoring of yellowhammer and meadow pipit habitat will be integrated into the monitoring activities focused on grassland and hedgerows	Every autumn during Years 2,3 and 5 (following mowing of grasslands)	Condition assessment of hedgerows and grassland, ensuring the provision of grassland margins and strips	Once a year during Years 2, 3 and 5
Non-native invasive species	Pre-construction surveys	Prior to construction	Species presence, distribution and extent	Prior to construction
	Treatment and management of invasive species	Prior to construction where species cannot be avoided, and throughout lifespan of project as required	-	-

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