APPENDIX 6-5

BIODIVERSITY MANAGEMENT PLAN

Planning and Environmental Consultants

Biodiversity Management Plan

Knockshanvo Wind Farm

DOCUMENT DETAILS

Client:	**FuturEnergy Knockshanvo Designated Activity Company**
Project Title:	**Proposed Knockshanvo Wind Farm, Co. Clare**
Project Number:	**200513**
Document Title:	**Biodiversity Management Plan**
Document File Name:	**BMP F – 2024.08.21 - 200513**
Prepared By:	**MKO** **Tuam Road** **Galway** **Ireland** **H91 VW84**

Planning and Environmental Consultants

Rev	Status	Date	Author(s)	Approved By
01	Final	21/08/2023	RW/PM	PR/PC

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1. INTRODUCTION

1.1 Background

This Biodiversity Management Plan (BMP) has been prepared in support of the Environmental Impact Assessment Report (EIAR) produced for the proposed Knockshanvo Wind Farm Development. The Proposed Development will comprise of 9 No. turbines with a limited tip height range of 179.5 metres to 185 metres and all associated foundations and hardstanding areas, access roads and entrance(s) including upgrade of existing site roads and provision of new roads, 110kV electrical substation and wind farm control building(s), underground cabling, borrow pit(s), electrical cabling for 110kV grid connection, amenity works, biodiversity enhancement areas, temporary construction compounds, a permanent meteorological mast, temporary transition compound and upgrades to roads along the turbine delivery route. A full description of the Proposed Development is available in Chapter 4 of this EIAR.

Where the term 'Plan' is used in this document, this refers to the Biodiversity Management Plan.

1.1.1 Statement of Authority

This Plan was prepared by Rachel Walsh, Senior Ecologist, who has over 4 years' ecological consultancy experience, having worked on Appropriate Assessments and Ecological Impact Assessments for a range of project types, including renewable energy infrastructure, water services infrastructure and transport infrastructure, and Patrick Manley, Senior Ornithologist, who has 8 years' ecological consultancy experience, having worked on Ecological Impact Assessments for a range of project types, including renewable energy infrastructure. This report has been reviewed by Pat Roberts B.Sc. (Env.) MCIEEM, Principal Ecologist, who has over 18 years' experience in ecological assessment and consultancy and Padraig Cregg, Principal Ornithologist, who has over 12 years' experience in ecological assessment and consultancy.

1.1.2 Objectives

The objectives of this Biodiversity Management Plan are as follows:

- To provide biodiversity enhancement within the Proposed Development site, by creating additional peatland habitats within the site which link up existing peatland habitats, including Gortacullin Bog Natural Heritage Areas (NHA), thereby improving habitat connectivity and offsetting the loss of 0.9 hectares (ha) of fragmented and degraded wet heath habitat for the Proposed Development,
- Planting of approx. 1.7km of linear vegetation within the proposed Wind Farm Site in order to increase hedgerow and treeline habitat, bolster wildlife corridors and offset the loss of hedgerow and treeline habitat associated with the Proposed Development.
- To provide a management and monitoring plan to ensure the success of the proposed biodiversity measures.
- Create supporting habitat for hen harrier through forestry felling and peatland restoration.
- Maintain existing supporting habitat for hen harrier.
- Improve the value of the proposed enhancement lands for foraging hen harriers

1.1.3 Habitat Loss as a Result of the Proposed Development

1.1.3.1 Direct Habitat Loss

The following paragraphs detail the habitats identified as Important Ecological Features in Chapter 6 of the EIAR which will be lost for the Proposed Development.

Approximately 0.9 hectares (ha) of degraded wet heath (HH3) will be lost to accommodate the Proposed Development. These areas are found in isolated patches amongst conifer forestry in the footprint of turbines 8 and 9 and associated roads.

It will be necessary to remove 0.45ha of peripheral oak-ash-hazel woodland within the footprint of the proposed access road from the southeast of the proposed Wind Farm site. This woodland is an area of peripheral woodland adjacent to conifer plantations.

It will be necessary to remove approximatley 920m of hedgerow/treeline (WL1/WL2) habitat to accommodate the turbine delivery route and proposed access route from the southeast.

1.1.4 Hen Harrier

Whilst the dominant habitat across much of the Wind Farm Site is mature forestry; open habitat along the northern margins of the site was utilised by foraging hen harrier during the breeding season, as per EIAR Appendix 7-4, Figure 7.4.2. A hen harrier territory was recorded during the 2019, 2020, 2022 and 2023[1] breeding seasons within the Wind Farm Site.

The potential for effects on hen harrier was assessed in full within the Ornithology chapter of the EIAR including the potential loss of foraging habitat. It is noted in Section 7.6.2.1 of the EIAR that the potential area of displacement/avoidance (i.e. 58.57ha) is likely to result in a long-term significant negative effect (EPA, 2022). Therefore, taking into consideration this predicted impact and the significance of the study area to foraging hen harrier; a hen harrier compensation and enhancement plan has been devised to create suitable foraging and breeding habitat for the species within the East Clare area. A total of 54.2ha of compensation lands is being proposed for the benefit of hen harrier. A further 46.5ha of upland grassland and peatland is also proposed for enhancement and safeguarding for foraging hen harrier. These lands are currently in the process of signing Option to Lease agreements.

A key component of the measures proposed is the creation of new habitat through the permanent felling of forestry and restoration of the underlying peatland. The habitat loss will be compensated with new habitat at a ratio of near 1:1. Additionally, enhancement lands are also proposed to improve the productivity of the surrounding habitat for foraging hen harrier. The compensation and enhancement areas, totalling 100.7ha, are located in an area where no existing or permitted wind farms are proposed and where the available habitat within the area can be maximised, as per Figure 3-1.

1.1.4.1 Assessment of potential foraging (indirect) habitat loss for Hen Harrier

The habitat loss calculation was undertaken with reference to the location of breeding attempts, the suitability of the habitats surrounding proposed turbine locations and the likely distance turbines will be avoided by hen harrier.

[1] Confirmed breeding in 2019 and 2023; probable breeding in 2020 and 2022.

The majority of the foraging recorded onsite was recorded during the breeding season and these records are likely associated with the hen harrier territory on-site. All turbines within the Wind Farm Site are included in this habitat loss calculation as the location of these turbines overlaps with potential foraging habitat.

The decline in hen harrier populations in Ireland is a result of human-related pressures, in particular habitat modification and loss. Research carried out by University College Cork identified a 'possible' reduction in breeding success within 1km of turbines. The conclusion of a 'possible' reduction in breeding success rather than one of greater certainty was due to the analysis of breeding success being found to be statistically non-significant (Wilson *et al.,* 2015). Notwithstanding this, if it is assumed that hen harrier shows some level of avoidance of turbines with the associated habitat loss, it reasonably follows that avoidance would be more pronounced the closer the hen harrier was to the turbine. This was found to be the case in a multi-site study at twelve wind farms in Britain (Pearce-Higgins *et al.*, 2009). This study investigated the distance turbines were avoided by various species including hen harrier. It was reported in hen harrier that there was a reduction of 52.5% in activity within 500m of operating wind turbines and significant avoidance within 250m.

In this habitat loss calculation, it was assumed that there would be total avoidance of a buffer zone with a 250m radius of the proposed wind turbine (in line with the result of Pearce-Higgins *et al.*, 2009). The assumption of 100% avoidance within 250m of proposed wind turbines has been previously proposed in other recent planning permission applications for wind farm developments in the Republic of Ireland, following consultation with the National Parks and Wildlife Service (NPWS), most notably on an application by DP Energy Ireland Ltd. for a proposed six-turbine wind farm in Buttevant, Co. Cork (Pl. Ref. No. 13/05885) and an application for a six-turbine extension to a previously permitted eight-turbine development by Esk Windfarm Ltd. on a site near Nad, Co. Cork (Pl. Ref. No. 14/05602). In addition, the planning application for the Meenbog Wind Farm in Co. Donegal (Pl. Ref. No. PL05E.300460) similarly included a displacement calculation that assumed 100% avoidance within 250m of proposed wind turbines. The development comprised the construction of nineteen turbines. This application was submitted directly to An Bord Pleanála (ABP) through the SID process. ABP granted planning permission for that project and in doing so, accepted the habitat displacement calculation methodology and mitigation strategy.

Closed canopy forestry does not provide suitable habitat for hen harrier. As such, areas of this habitat have not been included in the calculation of habitat displacement. As the amount of closed canopy forestry within 250 metres of the proposed turbines varies with the rotational cycle of forestry, calculations have been made using Coillte felling plans to determine the average amount of potentially available hen harrier habitat that will be unavailable on an annual basis throughout the operational phase of the wind farm.

Based on the precautionary assumption that hen harrier will avoid all areas within 250 metres of a turbine and having calculated the amount of foraging habitat available on an annual basis (taking into account Coillte forestry management practices), the estimated quantum of habitat from which hen harrier will be displaced is **58.57 hectares**.

Taking into consideration this predicted impact and the study area's significance to foraging hen harrier; a habitat compensation and enhancement plan has been devised to create suitable foraging and breeding habitat for the species within the area.

2. ROLES AND RESPONSIBILITIES

The developer (FuturEnergy Knockshanvo DAC) will appoint a group / body to oversee the preparation of the farm / landholding level plans. The appointed group / body will operate independently of the developer and will be responsible for providing each farmer / landowner with an agricultural consultant and ecologist. The plan developed will be specific to the farm / landholding in question and will be developed in consultation with the landowner and included/ referred to in the Option Agreement. FuturEnergy Ireland has an in-house Land team that looks after sourcing suitable lands, liaising with the landowner and agreeing commercial terms. The commercial terms include a list of standard land (habitat) management measures that will be used when preparing the landowner / landholding specific Biodiversity Farm Plan ("the Farm Plan").

The Option to Lease Agreement is legally binding and is exercisable a minimum of 3 years prior to commencement of construction, subject to a final grant of planning, free from any court proceedings, and the process of developing the Farm Plan will be implemented upon exercise of the agreement. This allows for the land management measures to be implemented prior to and during the construction phase of the development to ensure that the habitat will be available to displaced foraging hen harrier when the wind farm becomes operational.

The farm / landholding level plan will be specific to each farmer / landowner and will employ measures for management of lands such as those provided in Schedule 1 of the Option Agreement/Lease (provided as an Appendix). The farm / landholding level plan will clearly set out the land (habitat) management measures that must be implemented to ensure discharge of the agreed lease payments. The Farm Plan will include a timeline for auditing of the farm, the frequency of audit visits will be based on the aims of the plan and on advice of the agricultural consultant and ecologist. The findings of the audits will be submitted to the developer and to the local authority for their records and to demonstrate compliance with the commitments made in the planning application for the Proposed Development.The objectives of the Farm Plan will be linked to a timeline / milestone for achievement of the improved or new hen harrier foraging habitat. The auditing of the landholdings will evaluate the achievement of the Farm Plan objectives against the agreed timeline / milestones. In some cases where objectives are not being achieved or where progression is not following the agreed timeline amendments to the land management prescriptions may require revision. However, where it is apparent that the landowner is not implementing the land management measures or breaching the terms of the lease agreement leading to failure to enhance habitat for hen harrier, the developer will be notified immediately. The developer will review the audit report and, depending on the findings of the review, may withhold all or part of the agreed payments to the landowner concerned. The lease agreement also provides the developer with step in rights to ensure the measures are implemented, in the event the landowner doesn't perform their duties under the agreementThe landowner can continue to use the land for farming subject to certain conditions which shall be set out in the Lease and in the Farm Plan. This agreement does not impact on famers single farm payments and / or other participating schemes that do not interfere with or negatively impact on the objectives of the biodiversity management plan and the Farm Plans.

2.1 Timelines

The term of the lease agreement will be the lifetime of the wind farm once operational plus an additional 3-5 years before operation commences. This is likely to be a term of 35 – 40 years for most wind farm developments. The Landowner Option to Lease agreements for the Proposed Development have been executed and the landowners have contractually agreed to the management of their lands for biodiversity.

3. MANAGEMENT MEASURES

3.1 Hen Harrier Enhancement Measures

3.1.1 Identification of Lands

Alternative lands were sought within 2km of the 2023 hen harrier nest location (within the Wind Farm Site) by carrying out a desk-based review of available maps and aerial photography in conjunction with liaison with the land agent, project manager and other members of the project team. The desk exercise focussed on identifying lands that are not currently suitable for foraging hen harrier or that may currently be marginally suitable but can be improved through changes in land management. The current area of agricultural land undergoing the process of signing Option to Lease agreements is 100.7 ha (within 2 km). These are lands that are subject to commercial forestry practices and agricultural practices, to facilitate grazing by animals and the production of fodder such as hay and silage. The lands were selected based on location, within 2km of the nest location, current suitability for feeding hen harrier i.e. not suitable or low suitability and capable of being enhanced for hen harrier.

3.1.2 Permanent Forestry Removal and Restoration

It is proposed to permanently fell c. 54.2 hectares of forestry and to restore the underlying peatland. This measure ensures the provision of high-quality replacement peatland habitat in compensation for the loss of predominantly sub-optimal commercial forestry. Commercial forestry is associated with lower breeding success, is only of limited value to hen harrier while young and is of little to no ecological value once its canopy closes at c.12 years old. Please refer to Figure 3-1 for location details. The dominant habitat recorded within these parcels of land was commercial forestry. Management prescriptions to be implemented by the developer include:
Open Peatland Restoration Measures

- The identified area of existing forestry will be permanently removed. The timber, brash and stumps will be collected and removed off-site. The area will be allowed to revert to peatland habitat. This process will be aided by drain blocking as discussed below. This will create suitable foraging habitat for hen harrier and its associated prey species. Pre-mature felling of forestry will be undertaken before the first breeding season of the construction phase of the project programme. This would allow time (i.e. min. three growing seasons) for the clear-felled site to revegetate in advance of the operational phase. Thereby ensuring replacement habitat would be available should the predicted displacement effect occur.
- A hydrology/hydrogeology study will be undertaken to map the movement of ground and surface water to inform the requirement for drain blocking. Forestry drainage channels will be blocked where necessary, using peat dams or plastic dams, as appropriate. In flat areas drain blocks should be placed every 15 metres and more frequently when accounting for a slope. When drains are blocked this reinstates the waterlogged conditions which are crucial for the survival of peatland plants. These works will be subject to a separate planning application if required.
- Self-seeding conifers originating as windblown seedlings from adjacent and nearby commercial conifer plantations, are a threat to the viability of the compensation and enhancement area. They gradually take hold, and if unmanaged, would eventually make the area unsuitable for nesting/foraging hen harrier. Habitat maintenance of the area will involve the eradication of self-seeding conifers, and removal off-site. It is envisaged that the compensation areas will require maintenance twice during the life of the wind farm, once after approximately 10 and 20 years. The monitoring outlined in Section 4 below will monitor the level of encroachment by self-seeding conifers and will bring the scheduled removal forward as required.

- No invasive species were recorded onsite during the February 2020 site visit. A confirmatory pre-commencement survey for invasive species will be undertaken as part of preparatory work. In the event of any invasive species being recorded within the area identified for enhancement measures, an invasive species management plan will be put in place to eradicate any stands of such species.
- Herbicides will not be used for the eradication of self-seeding trees and will not be relied upon for the clearance of invasive species.
- Enhancement and maintenance works will be undertaken outside of the nesting season as per the Wildlife Acts 1976 – 2023 as amended. A suitably qualified ornithologist will be present at the removal of all woody vegetation, to ensure that identified breeding bird sites are avoided. If breeding activity of birds of high conservation concern is identified, no works shall be undertaken within a species-specific buffer (as per Goodship and Furness, 2022) in line with best practice, until it can be demonstrated that the nest is no longer occupied.
- The felling license for these lands will be applied for in tandem with the felling license application that will be required to facilitate the construction of the wind farm within the proposed development area. The felling license will include management prescriptions for the felling of the forestry. Following felling, these compensation lands will be managed for the benefit of hen harrier and peatland restoration.
- If at any point, hen harrier are identified to be nesting on any part of the compensation or enhancement lands, the wind farm development company in cooperation with the individual landowner will provide for the protection of the nest site.
- The use of poisons or stupefying baits is not permitted within compensation or enhancement lands. Hen harriers and other birds of prey can fall victim to secondary and direct poisoning.
- Native vegetation around the perimeter of the northern plot, as well as a row of conifers along the southeastern boundary, will be retained as shown in Figure 3-2. The existing linear features as depicted will be gapped up using native tree and hedgerow species that are representative of the species present in the local area.

3.1.3 Management of Farmland for Hen Harrier

In addition to the hen harrier compensation and peatland restoration plan areas, local landowners have been engaged to manage their land for the benefit of hen harrier. The farmland is predominantly wet heath and wet grassland with frequent stands of rushes (*Juncus spp.*), gorse and scrub. Hedges border fields and fringe the roads that provide access to the management areas. Please refer to Figure 3-1 for location details.

An area totalling c. 46.5 hectares of farmland has been identified for retention and enhancement measures. This area is located between c. 2 and 4 kilometres from the traditional hen harrier territory within the Wind Farm Site. The programme will aim to safeguard existing hen harrier habitat and promote the creation of new and improved supporting habitat for hen harrier and their prey. The programme will broadly follow the approach taken by the Hen Harrier Project (www.henharrierproject.ie).

The developer has entered Option to Lease agreements with landowners to manage land for the benefit of hen harrier. The Option Agreement is exercisable a minimum of 3 years prior to commencement of construction and measures will be put in place in advance of the first breeding season of the construction phase of the project programme. Thereby ensuring management measures are in place should the predicted displacement of foraging hen harrier from the development footprint occur.

The prescriptions are concerned mainly with maintaining low-level extensive grazing in bog and heath areas, the maintenance of rough wet upland grassland in a condition that is neither too overgrown nor too heavily grazed (preferably through low-intensity grazing) and the retention and creation of scrub

areas and edge habitats (i.e. bushy hedgerows). The intention is to ensure that appropriate grazing continues and that appropriate management of grassland, scrub and bog creates a favourable habitat mosaic for hen harrier prey species. The measures will be overseen by the developer and where necessary will be developed by the wind farm development company as provided for in the management agreements.

The wind farm operator will be responsible for having these managed lands audited to ensure the prescriptive measures have been implemented before funds are released to landowners. The costs of dynamic implementation measures will be borne by the wind farm operator. To aid with the practical implementation of management prescriptions and to facilitate the audit process individual farm plans will be created for each landowner if planning permission is granted and will be updated at regular intervals throughout the lifetime of the wind farm. Please refer to Section 3-4 for further details. Audits will be undertaken annually for the 35-year lifetime of the wind farm. Please refer to Section 4 for further details.

The sections below provide an outline of the range of measures that would be included in the Farm Plans. On receipt of a successful grant of planning permission for the Proposed Development, the NPWS would be consulted as part of the finalisation of the Farm Plans. The proposed management prescriptions will focus on the following areas:

- Grazing regime;
- Scrub and hedgerows;
- Wet grassland and peatland;
- Rush management;
- Delayed topping/mowing;
- Reduction/cessation of fertiliser application; and
- Planting of native trees.

3.1.3.1 Grazing Regime

The hen harrier project field guidance[2] states *"Sward structure is an important contributor to both prey numbers and prey accessibility. Rush tussocks create foraging and nesting opportunities for small rodents along with meadow pipits and other ground nesting birds. Sward structure responds well to management and significant progress can be made in a single growing season".* The overall aim of the grassland management will be to create foraging and nesting opportunities for hen harrier prey species through changes to the grazing regime by changes to the length of time lands are grazed, and reduction or increase in stocking density as deemed appropriate to develop and/or enhance foraging habitat for hen harrier. The specific detail of the grazing regime will be developed on a land holding by land holding basis and included in the Farm Plan.

3.1.3.2 Scrub and Hedgerows

Hen harrier shows a strong preference for foraging in dense hedgerows ideally 3 to 4 metres wide. The individual farm plans and the enhancement area plans will include for the restoration of suitable hedgerows to these conditions. The costs of these measures will be borne by the developer. These will be widened by parallel planting of native hedgerow species. Restoring hedgerows will increase the availability of foraging habitat locally and establish connectivity between otherwise discrete land parcels. To ensure biodiversity; restored hedgerows should contain a minimum of two (woody plant) species per 10 metres. Suggested woody plant species could include hawthorn, blackthorn, willow spp., and holly. Existing vegetation will not be cleared to plant the new hedgerow and under no circumstance will herbicides be used. New hedges will be protected from grazing. Habitat management prescriptions for scrub and hedgerows are outlined below:

[2] *Hen Harrier Programme Field Guidance for scoring Species Rich Grassland Ver. 2 June 2021* http://www.henharrierproject.ie/HHPSRGGuidance.pdf *(last accessed 9th May 2024)*

- Retain existing areas of scrub and hedgerows;
- Where there is evidence of scrub or hedgerow removal (since 2016), these habitats will be reinstated as part of individual farm plans;
- Hedgerow/liner strips of scrub that occur along the road that intersects the management area will be widened to 3-4 metres by parallel planting of native hedgerow species;
- In open areas or where the extent of scrub and hedgerows is limited, create new areas of habitat;
- In open areas or where the extent of scrub and hedgerows is limited, allow expansion of native hardwood scrub;
- Trim established areas of gorse or willow scrub as the only means of preventing further encroachment onto grassland or access paths and tracks. Repeat annually as necessary;
- Prevent any removal, burning or herbicide use on areas of established scrub;
- If deemed necessary for road safety reasons, cut roadside hedgerows outside of the bird nesting season (March 1st – August 31st);
- If deemed necessary for the protection of overhead electricity lines, cut hedgerows outside of the bird nesting season (March 1st – August 31st);
- Hedgerow maintenance is permitted to prevent the hedge "escaping". In such cases, hedgerow trees should be left uncut, and the remainder of the hedgerow cut into an "A" shape, i.e. wider at the base than at the top;
- Encroachment of scrub onto grassland can be controlled by cutting on annual basis if required. Cutting in this case should not come closer than 1 metre from the base of the hedge;
- Herbicides and pesticides will not be used within 5 metres of an existing hedgerow; and
- Hedge cuttings will be piled into heaps and left to decay naturally.

New foraging habitat will not be created at the expense of existing supporting habitat, e.g. those habitats that are likely to support the highest density of prey species: including brambles, bilberry and heather.

3.1.3.3 Wet Grassland and Peatland

The principal method for managing grassland and peatland habitats as suitable habitats for hen harrier is the use of low intensity grazing, and regular inspection to ensure no self-seeding conifers are becoming established on these habitat areas. Low intensity grazing will be maintained, to ensure cover for prey species is present. Landowner farm plans will set a stocking density of no greater than 0.15 livestock units per forage hectare for seven consecutive months within the calendar year, as per the Department of Agriculture, Food and the Marine recommendation. Habitat management prescriptions for wet grassland and peatland are outlined below:

- In general, maintain stocking levels of no greater than 0.15 livestock units (LU) per forage hectare;
- In the specific case of blanket bog maintain stocking levels of up to 0.10 LU/ha;
- No new forestry planting on the bog and heath areas within the enhancement area will be permitted;
- Self-seeded conifers invading open areas of bog and heath will be removed;
- Heath and bog habitats will be surveyed at least once every two years to ensure that new seedlings are removed;
- Participating landowners will remove any self-seeding conifers as they appear or as they are noticed and can also be removed by the windfarm development company as provided for in the farm plan agreements.
- On areas of wet grassland, the application of chemical or organic fertiliser will be prohibited;

- All rhododendron or other invasive species must be removed in Year 1 of the plan. Ongoing control will be required in each subsequent year. Acceptable control methods are cutting/pulling;
- Consideration will be given to the creation of shallow pools 30- 50 cm deep to provide spawning sites for amphibians; and
- In cases where the land is wet, concentrate grazing during the summer months.

3.1.3.4 Rush Management

The objective in managing rushes is to maintain rough grassland in the optimal condition for hen harrier. Optimal condition constitutes as dense a covering of rushes as feasible, but not to the point where rushes are falling over or matting the ground. Rush cover in the 30 – 70% range is ideal. Habitat management prescriptions to be included in the farm management plan for managing rushes on wet grassland are outlined below:

- In general, rushes will be cut on a 2-year cycle unless there are specific reasons for a longer cycle, e.g. weak rush growth.
- In most cases, active rush management will commence in year 1 of the plan and should only be delayed until year 2 or 3 where improved grassland is in reversion, where rush growth is very weak or where the rushes were cut or treated with herbicide in the year prior to joining the scheme.
- On farms with a large area of rushy wet grassland (> 10 hectares), active rush management can be delayed on a portion of the area until Year 2 of the farm plan. The area where active rush management is to be delayed for this reason should not normally exceed 50% of the wet grassland component of the farm.
- The planned rush management will be reviewed on an annual basis to determine if it is having the desired effect. If it is found during an annual inspection that rush recovery has been stronger or weaker than had been originally anticipated, the farm plan will be changed to adjust the cutting sequence for future years and provisions for these amendments will be included in the Farm plan management agreements. These details have been consented to by the consenting landowners.

3.1.3.5 Delayed topping/mowing

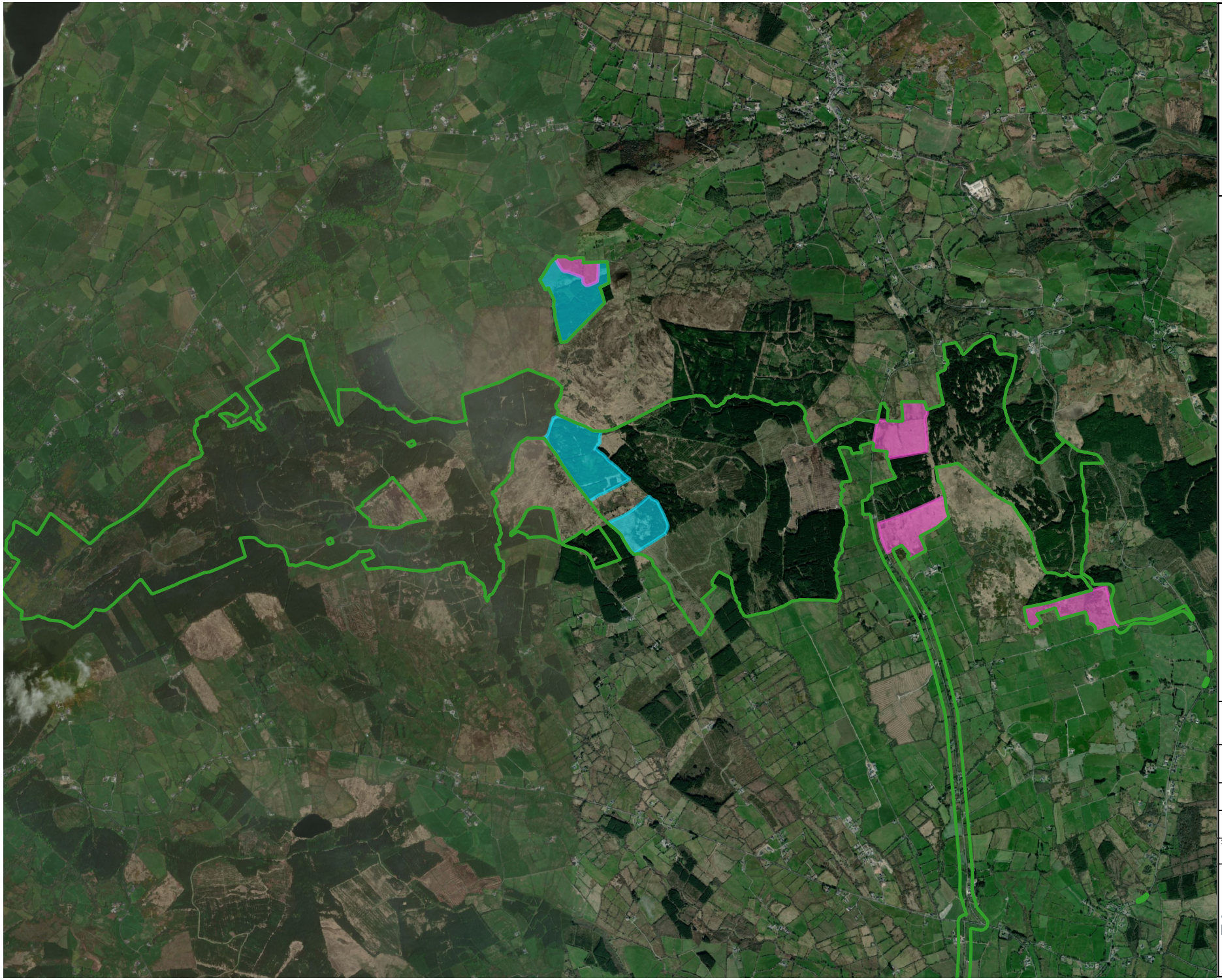
Topping or mowing will not be carried out during the period 1st March – 31st August inclusive to avoid disturbance and mortality or injury of ground-nesting bird species and other wildlife. The availability of tussocky rushes and multi-layered swards is key to supporting the prey species of birds and small mammals favoured by hen harrier. However, individual landholdings may be allowed, on the advice of the ecologist and agricultural advisor, to top or mow grasslands during the period referenced above. Any such allowance/deviation would be written into the Farm Plan.

3.1.3.6 Reduction/cessation of fertiliser application.

The requirements for reduction or cessation of the application of fertilisers would be determined by soil testing and survey carried out by the agricultural advisor to inform the individual farm plan. This measure would aim to increase the species and structure diversity of the grassland sward through reduced nitrate application. This measure would also assist in meeting the requirements of the Nitrates Directive and improve the quality of surface water run-off to streams and drains locally.

3.1.3.7 Planting of native trees

This would be a measure that would be subject to suitable soil and land availability to develop small orchards or woodlands on the landholding and subject to the landowners' agreement to implement same. The specific measures for each landholding will be developed into the Farm Plan in consultation with the landowner after planning permission has been achieved for the development.



Map Legend

- EIAR Site Boundary
- Hen Harrier Compensation and Enhancement Lands (Wet Heath / Grassland)
- Hen Harrier Compensation and Enhancement Lands (Forestry)

N

Drawing Title
Hen Harrier Compensation and Enhancement Lands

Project Title
Knockshanvo Wind Farm

Drawn By	Checked By
RW	RW
Project No.	Drawing No.
200513	Fig 3-1
Scale	Date
1:40,000	21.08.2024

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: ww.mkoireland.ie

3.1.4 Additional Benefits for Lesser Horseshoe Bat

The Hen Harrier enhancement land located to the north of the Proposed Development Site, as shown in Figure 3-1 and Figure 3-2 below, is located within the mapped potential foraging range of the Lesser Horseshoe Bat roosts designated under Danes Hole, Poulnalecka Special Area of Conservation (SAC), according to the site-specific conservation objectives document. It is anticipated that the works proposed in this plot will result in enhanced habitat for Lesser Horseshoe Bats which may use the plot for commuting.

As shown on Figure 3-2, existing linear features along the perimeter of the conifer plantation, consisting of treelines, hedgerows and scrub will be retained, in addition to 1- 2 rows of conifer trees along the southeast boundary. The retention of these features will ensure that lesser horseshoe bat potentially utilising the edges of the conifer plantation for foraging and commuting can continue to do so even after the plantation is felled to facilitate peatland restoration. Access for felling operations will be via the existing access to the plot along the road to the northwest of the site and will not require removal / fragmentation of the vegetation to be retained along the perimeter of the plantation.

The enhancement measures proposed for hen harrier include gapping up of hedgerows, retention and enhancement of scrub and land use management measures such as cessation of the use of pesticides, reduction in fertiliser application and lower stocking density. These enhancement measures will also benefit lesser horseshoe bat in the wider landscape around the proposed Wind Farm site through improved ecological and landscape connectivity but also through increased invertebrate availability as the diversity of plants within the plot and linear features increases. The existing linear features depicted in Figure 3-2 will be gapped up using native tree and hedgerow species that are representative of the species present in the local area. Where it is possible to do so the species will be sourced locally and will be of local provenance.

> *According to the Lesser Horseshoe Bat Species Action Plan 2022-2026 (NPWS & VWT 2022), The optimal foraging habitats for this species are deciduous woodlands, riparian vegetation and mature hedgerows within a few kilometres of a roost. In the absence of woodland, areas of scrub close to roosts are important and should be retained. Conifer plantations are used for commuting and some foraging, where there are deciduous trees associated with the plantation, but are less suitable than mixed and deciduous stands. Dietary studies have highlighted the importance of grazed pastures, particularly in winter.*

The Plan includes the following Action:

> *4.2c ACTION: Incentivise farmers to plant suitable hedgerows under AECM and AECM Co-operative Projects especially within 2.5km of a roost. Incentives should also be available for the retention and enhancement of existing hedgerows associated with roosts*

In line with the Lesser Horseshoe Bat Action Plan quoted above, it is proposed to replace edge habitat comprising monocultural stands of sitka spruce with native species. This will be of greater benefit than the currently existing forestry plot which is of a continuous age structure. This will provide greater foraging potential with the planting of native deciduous species which will attract pollinators and other insects.

Drawing Title
Habitat Enhancement for Lesser Horseshoe Bat

Project Title
Proposed Knockshanvo Wind Farm, Co. Clare

Drawn By	Checked By
RW	PR
Project No.	Drawing No.
200513	Figure 3-2
Scale	Date
1:4,000	21.08.2024

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: ww.mkoireland.ie

3.2 Hedgerow and Woodland Replanting

As described in Section 1.2.1, there will be loss of approx. 920m of hedgerow/treeline habitat to accommodate the access road from the southeast and the turbine delivery route accommodation works and transition compound. As discussed in Chapter 6 of the EIAR, 50m of this figure will comprise sections of treeline which will be lost along the southern boundary of the temporary transition compound, which will be replanted. It is proposed to replant the hedgerow lost to the proposed access road and turbine delivery route accommodation works (880m) by replanting 1,170m of hedgerow along this road which will also provide a net gain in hedgerow length. The locations of hedgerow which will be lost and replanted are shown in Figure 3-3.

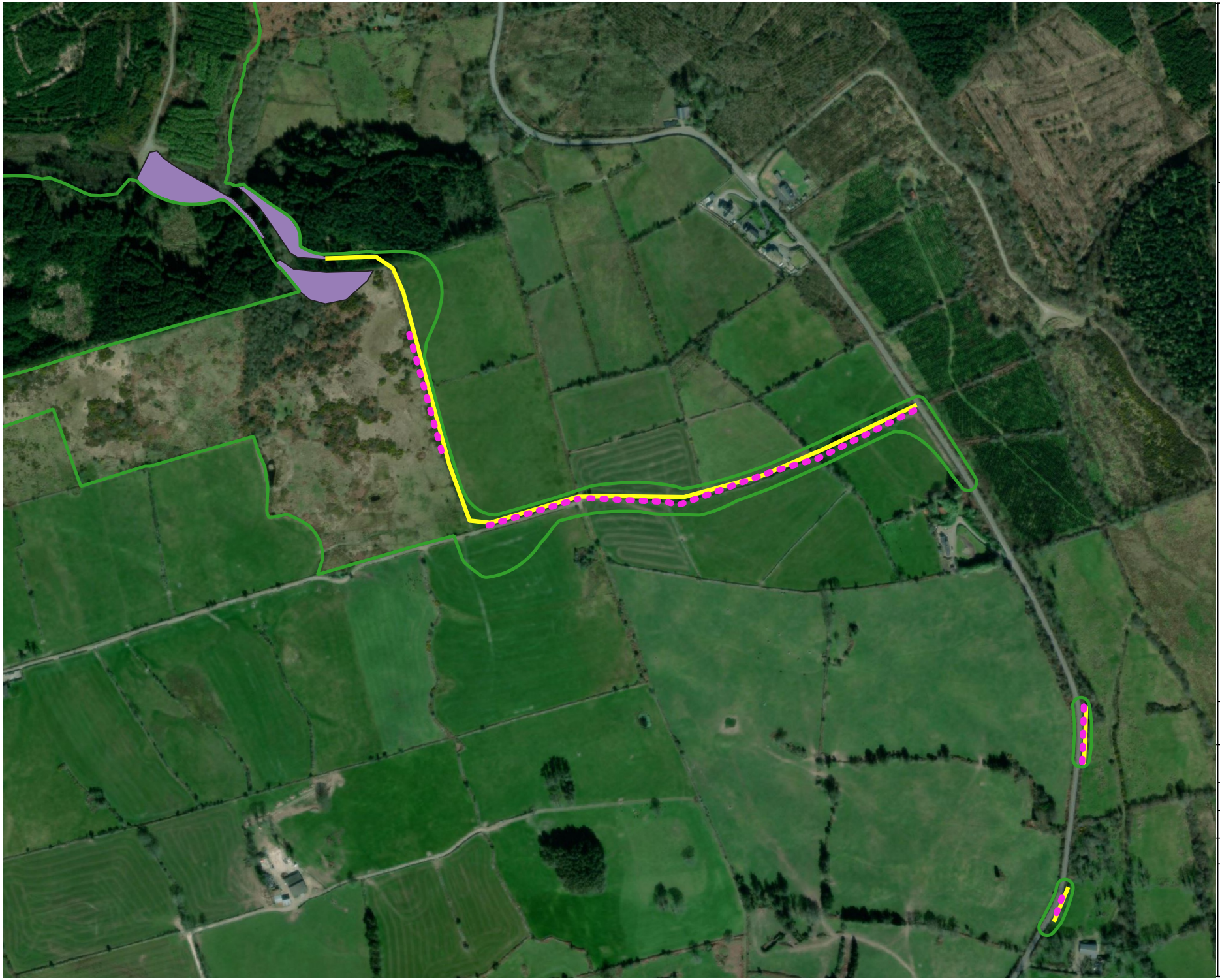
Species to be planted will include those which are present in the local area as found during field surveys. Whips and advanced nursery stock will be sourced locally where possible.

As described in Section 1.2.1, there will be a loss of 0.45ha of peripheral oak-ash-hazel woodland lost to accommodate the wind farm access road and turbine blade delivery. Once delivery of turbines is complete, it is proposed to replant this area, either side of the new wind farm access road, with woodland comprised of a similar species composition for a total of approx. 0.9ha. This will result in a linear woodland which will be similar in nature to that being lost. The proposed replanting area is shown in Figure 3-3.

3.2.1 Maintenance of Newly Planted Hedgerow and Trees

In order to facilitate the successful establishment of the new hedgerow and woodland area to be planted within the Proposed Development site, and to promote biodiversity value of the new hedgerow and woodland, the following measures are proposed:

- During spring and autumn maintenance periods, all trees will be checked and adjusted/replaced as required, and any dead wood present removed back to healthy tissue and mulch added, if required. Where tree stakes and ties are no longer required, these will be removed to avoid damage to the tree;
- During the first growing season, all standard trees/ semi-mature trees will be watered regularly during any prolonged dry periods during the growing season (i.e. in April, May, June, July and August). During the second growing season, the trees will be kept well-watered as often as required, particularly during June, July and August.
- Once mature, the hedgerows will be cut no more often than every 3 years. Hedgerows to be cut into an 'A' shape.
- No spraying of any kind is to be used on or along hedgerows, including fertiliser, herbicide, or pesticide.



Drawing Title
Hedgerow and Woodland Replanting

Project Title
Proposed Knockshanvo Wind Farm, Co. Clare

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RW	RW
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200513	Figure 3-3
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1:6,000	21.08.2024

MKO
Planning and Environmental Consultants
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Ireland, H91 VW84
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email:info@mkoireland.ie
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3.3 Implementing the Measures

The Option to Lease Agreement and associated schedules sets out the purpose of the lease and a broad suite of measures for land management. This option to lease places a legal obligation on the landowner to comply with the requirements of the developer upon exercising the lease option. In other words, there is a legal document in place that allows the developer to implement land management measures to benefit biodiversity with particular emphasis on hen harrier foraging habitat.

The responsibility for implementing the measures will lie with the landowner in the first instance once the Farm Plan has been prepared and agreed. It is proposed that all Farm Plans will have been prepared and adopted within 12 months of the exercise of the lease.

The agents / group appointed by FuturEnergy Knockshanvo DAC will be responsible for preparing / overseeing the preparation of the Farm Plans and a specific suite of measures for the areas of forestry. The agents / group will also assume responsibility for auditing the land holdings, determining if the measures are achieving the desired results and, where necessary, amending the Plan to achieve the required results. The Farm Plan and auditing programme will be in place for the operational lifetime of the proposed wind farm plus a further period of 3-5 years before operation commences.

FuturEnergy Knockshanvo DAC will assume overall responsibility for the implementation of the proposed measures through appointing agents / group that includes agricultural and ecological specialists. FuturEnergy Knockshanvo DAC will be responsible for agreed payments to landowners, payment of specialist agents / group and payment for provision of materials etc. as set out in the lease options. FuturEnergy Knockshanvo DAC or their agents will also be responsible for ensuring compliance with planning conditions and engaging with statutory bodies and advisory agencies as required.

The steps to implementation of the Project BMP are as follows:

- Prepare the tender documents and issue tender notice for the agricultural and ecological specialists to administrate and implement the biodiversity management measures.
- Appoint the successful tenderer and agree final terms including scope of work.

3.3.1 Agricultural Lands

Agricultural and Ecological Specialists will commence survey work of agricultural lands which will include, as a minimum, the following:

- Survey and classification of habitats present within each landholding. Habitat classification will follow 'A Guide to Habitats in Ireland'.
- Survey and classification of soils within each landholding.

The agricultural and ecological survey results will be used to prepare the Farm Plan specific to each land holding. The Farm Plan will set out the land holding specific measures such as:

- Landholding specific stocking density and grazing regime.
- Hedgerow management / planting.
- Determining fertiliser application levels or whether cessation of fertiliser application is required.
- Set targets / outcomes that will be audited on an annual basis.

3.3.2 Forestry lands

The forestry lands will require the preparation of, and submission to the Forest Service, a felling licence. Upon grant of the felling licence the conifer plantation will be felled and trees (including brash and stumps) will be removed off-site. The management plan for the forestry lands will be prepared and will include aims and objectives for the lands. The management plan will set out specific management prescriptions to encourage the regeneration of heath / grassland vegetation. An audit programme will be included in the management plan to ensure that targets / outcomes are being achieved.

4. MONITORING

4.1 Monitoring of Hen Harrier Compensation and Enhancement Lands

The plans will be the subject of ongoing monitoring to assess the effectiveness of the measures proposed and employed and to contribute to advances in habitat management methods, which can be applied to future similar projects. The monitoring can also aid adaption and implementation of improved methods and measures as they emerge, or the intensification of successful measures deployed from farm plan to farm plan. The Farm Plan and auditing programme will be in place for the operational lifetime of the proposed wind farm plus a further period of 3-5 years before operation commences. Details of monitoring responsibilities for the hen harrier compensation and enhancement areas are provided in Section 3.4. The monitoring measures will be conducted annually during the operational lifetime of the wind farm and will include, as relevant:

- The areas proposed for compensation and enhancement will be the subject of ongoing monitoring during the operational phase of the Wind Farm to ensure it is offering supporting habitat for breeding hen harrier. The ongoing monitoring will take place during the breeding bird season. The monitoring will seek to identify whether hen harrier are utilising the areas under active management for foraging and will be conducted by way of vantage point surveys. These surveys will be undertaken once a month March to August inclusive, each year.
- Passerine point counts will be undertaken monthly from April to September inclusive in each monitoring year at each of the compensation and enhancement areas. The monitoring aims to investigate to what extent enhancement measures e.g. seed crops, increase the availability of prey species for hen harrier.
- Areas of favourable hen harrier foraging habitat (i.e. scrub, blanket bog, wet heath and heather banks) within the compensation and enhancement areas should be accurately mapped and should be monitored annually to check that the areas so covered have not altered in size and that the grazing regime that is in place is maintaining the current state of these habitats (i.e. neither poaching nor overgrowth of open areas is occurring). As well as mapping, this monitoring will be recorded by means of fixed-point photography.
- Vegetation sampling: A number of fixed relevé sites (i.e. permanent quadrats) will be set up in the enhancement areas. Data will be recorded prior to the commencement of habitat enhancement activities. The character of each relevé will be recorded (e.g. species proportions present using Domin scale, vegetation structure) and photographs will be taken of each relevé from a fixed point. These relevés will then be re-examined yearly following the commencement of the plan in place to establish the extent of habitat improvement resulting from management practices.

The efficacy of the enhancement measures employed will be reviewed yearly following commencement of the plan. Analysis of the data collected will be the basis for a review of the measures and techniques employed. Should any adjustments to the plan be deemed necessary or advisable, these should be undertaken in consultation with the NPWS prior to any alterations to the plan.

In addition to the above, monitoring of proposed new hedgerow and replanting areas, as shown in Figure 3-3, will be monitored to ensure successful establishment. Monitoring will be carried out at the end of the growing season during years 1,2,3,5 and 10 after initial planting. The purpose of the monitoring of these areas will be:

- To ensure successful establishment of replanted hedgerow species and of planted trees within the proposed woodland.

- To prescribe any additional or alternative management requirements to ensure successful establishment of trees/shrubs.
- To ensure that any failed plants are replaced.

4.2 Auditing

The developer will ultimately be responsible for the implementation of the management measures and audits. Audits will be required to ensure the effectiveness of the compensation and enhancement plans. They are essential to ensure adequate plan quality, compliance, and control. Audits will be based on a field inspection and the assessment of the farm plans.

Farm plans will be audited each year. The audit will assess:

- Objectives of the individual farm plan;
- Implementation of the plan; and
- Adherence to requirements of the farm plan.

Individual farm plans will be reviewed every five years.

5. Conclusions

The successful implementation of the measures outlined above will produce more favourable foraging habitat for local hen harrier than is currently available within the Wind Farm Site. The removal of the forestry will improve connectivity between hen harrier foraging habitats present within the Gortacullin Bog NHA and the foraging habitat to the south of the NHA. The dynamic management approach proposed will be monitored to both ensure as many benefits as possible are provided for hen harrier and to contribute to advances in habitat management methods. The proposed compensation and enhancement measures for hen harrier will also have knock on benefits for peatland habitat restoration and lesser horseshoe bat.

The measures described in this BMP will serve to offset the loss of wet heath, oak-ash-hazel woodland and hedgerow/treeline associated with the Proposed Development. The plan provides for sufficient habitat restoration to ensure no net permanent loss of these habitats occur.

The success of these measures will be evaluated through a detailed monitoring and reporting programme. Following the implementation of the measures outlined in this report to offset the loss, there will be no residual net loss of these habitats as a result of the proposed development. There will be a net gain in peatland habitats and peatland habitat connectivity as a result of the Proposed Development.

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APPENDIX

Exhibit: Biodiversity Enhancement Measures

This exhibit outlines a comprehensive list of measures aimed at enhancing the biodiversity value and providing a foraging habitat for the hen harrier on the land subject to the Option Agreement between the Landowner and the Grantee. The Grantee may request the implementation of any of the following measures, as described herein, during the option period and the subsequent lease term. The actual measures to be implemented on the lands shall be further refined and detailed in the Biodiversity Farm Plan (the farm plan), which will be drafted after a detailed survey of the lands is conducted.

1. Works for Biodiversity Conservation / Enhancement:

The Grantor agrees, upon request by the Grantee, to carry out any works required for the purposes of conserving or improving biodiversity, in accordance with the Grantee's reasonable directions. The cost of such works, if necessary, shall be borne by the Grantee. Failure to implement such works may lead to non-payment of the lease rent and/or termination of the lease.

2. Access for Monitoring and Implementation:

The Grantor shall allow access to the Property by the Grantee or their appointed agents for the purposes of survey, monitoring and/or implementation of measures for conserving or improving biodiversity within the Property.

3. Land (Habitat) Management Measures:

The Grantor shall implement the following land management measures, which may include;

a. **Grassland Management:** Possible changes to the length of time lands are grazed, and reduction or increase in stocking density as deemed appropriate for biodiversity conservation. A stocking density of between 0.10LU and 1.40LU per hectare may be sought during the months of September to March. Advice on such requirements will be set out in the farm plan to prevent poaching or churning of lands.

b. **Rush Management:** No spraying rushes with glyphosate or other herbicides. This is important for ground nesting species such as hen harrier.

c. **Delayed Topping/Mowing:** To preserve habitats for nesting birds and other wildlife during the period 1 March – 31 August Inclusive. This is particularly important for ground nesting species such as hen harrier.

d. **Hedgerow Management:** Encouraging the establishment and preservation of hedgerows for nesting and sheltering wildlife. This may include additional planting (gapping up) of hedgerows to encourage dense growth and the exclusion of mechanical management of hedgerows such as use of a flail.

e. **Scrub Development:** Encouraging the growth of scrubland to provide diverse habitats for various species. Allowing hedgerows at suitable locations, to be agreed with the landowner, to expand into small pockets of scrub woodland. Scrub encroachment into grasslands would be discouraged through the continued use of grazing animals.

f. **Reduction in Fertilizer Application:** Reducing or ceasing the use of fertilizers in certain areas to promote biodiversity. The requirements for reduction or cessation of the application of fertilisers would be determined by soil testing and survey carried out to prepare the individual farm plan. The aim of this measure would be to allow a diversity of grassland species including soft rush to be present in the grassland sward. This measure would also assist in meeting the requirements of the Nitrates Directive and improve the quality of surface water run-off to streams and drains locally.

g. **Planting of Native Trees and Fruit Trees:** Adding native trees to gap up hedgerows or creating small orchards to support wildlife. This would be a measure that would be subject to suitable soil and land availability to develop small orchards or woodlands on the landholding and subject to the landowners agreement to implement same.

4. Prohibited Activities:

The Grantor shall not carry out or permit any of the following activities on the Property:

a. Burning Areas of Vegetation.

b. Removal of Hedgerows.

c. Planting of Conifers.

d. Land Drainage.

e. Organizing, Allowing, or Engaging in Recreational Activities Involving Off-road or Racing Vehicles.

f. Unapproved Use of Herbicides, Pesticides, or Rodenticides.

g. Turf Cutting.

5. Non-interference with Biodiversity Management:

The Grantor shall not do or permit to be done anything upon the Property that would interfere or be likely to interfere with the Grantor's management of lands for biodiversity granted by the lease agreement.