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Illaunbaun Wind Farm - Environmental Impact Assessment Report

Species and Habitat Management Plan

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1 SPECIES AND HABITATS MANAGEMENT PLAN

1.1 INTRODUCTION

This document comprises a Species and Habitats Management Plan (SHMP) accompanying the Biodiversity Chapter (Chapter 8) of the Environmental Impact Assessment Report (EIAR) for the Illaunbaun Wind Farm Scheme (hereafter referred to as the 'Proposed Development'). The purpose of this SHMP is to provide details of necessary avoidance, mitigation, enhancement, and monitoring measures as will be required to avoid significant adverse effects on species and habitats arising from construction and operation of the Proposed Development, and to ensure a positive long-term effect on biodiversity is delivered.

1.1.1 PURPOSE OF THIS REPORT

This SHMP focuses on two key biodiversity features identified within Chapter 8 of the EIAR: hen harrier (*Circus cyaneus*) and habitats of (at least) **Local (Higher Value) Importance**. Context on the ecological baseline of the Proposed Development regarding the species and habitats concerned is provided in Section 1.2 of this report. By providing detailed management prescriptions for the species and habitats concerned, this SHMP will ensure appropriate mitigation and enhancement measures are delivered for hen harrier and habitats identified in Chapter 8 of the EIAR. The SHMP should therefore be read in conjunction with Chapter 8 and its associated appendices.

This report has been prepared in reference to current best practice guidance by the suitably experienced and qualified personnel as listed in Chapter 8 of the EIAR.

This report contains information on the locations of sensitive ecological features (e.g., specially protected species) which should be treated as confidential. Access to detailed locational data shall be restricted to the project ecologist, consenting authorities, and statutory consultees as required.

The principal aims of this SHMP are as follows:

- To provide areas of optimum foraging habitat for hen harrier during the lifetime of the Proposed Development; and
- To provide good quality habitat within the Proposed Development boundary for prey species of hen harrier as well as wildlife in general through the implementation of appropriate enhancement measures.

The rationale of this SHMP is based on the results from available research on hen harriers in Ireland, as well as INIS surveyor observations on hen harriers, which were obtained during on-site winter bird surveys, on-site breeding bird surveys and extensive hen harrier surveys completed over many years and across SPAs and other important breeding hen harrier areas (e.g. the Slievefelim to Silvermines Mountains SPA (2005 – present), the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (Code: 004160) (2005 – 2022) and Slieve Beagh SPA (Code: 004167) (2007 – 2009)).

Compensatory habitat for hen harrier has been observed to be readily accepted and used by across various locations throughout Ireland, particularly when such areas of optimal habitat are

appropriately managed (McLoughlin *et al.*, 2020). Projects, such as the Proposed Development considered here, which provide compensatory habitat for hen harrier prior to construction, successfully address short to medium term habitat losses, which in turn helps sustain local hen harrier populations.

1.1.2 Project Background

A detailed description of the Proposed Development is outlined in EIAR Volume II, Chapter 5: Project Description.

1.2 Site Description

1.2.1 Overview

The Proposed Development is located in Co. Clare, approximately 4 km north-east of Milltown Malbay and approximately 5km south-east of Lahinch. The receiving environment for the Proposed Development includes agricultural grasslands (including wet grassland and heath) and coniferous forestry. There is also a lake, Lough Keagh, which is located adjacent to the Proposed Development.

The layout of the Proposed Development consists of six turbines, with the Vestas V-117 4 MW identified as the preferred option, with a hub height of 91.5m, a maximum tip height of 150m and a lowest swept height of the blades of 33m.

1.2.2 Designated Sites

Designated sites are present within the 15km precautionary Zone of Influence (ZoI) of the Proposed Development. Potential connectivity was identified between some of these sites and the Proposed Development. These sites were therefore brought forward for impact assessment in relation to the Proposed Development in Chapter 8 of the EIAR.

Two internationally designated sites are relevant to the wind farm element of the Proposed Development (see Appendix A08-01). West Clare Uplands Important Bird Area (IBA) is located approximately 3.5km south of the Proposed Development red line boundary and is designated for its hen harrier population. Mid-Clare Coast Special Protection Area (SPA) is located approximately 6.5km south-west of the Proposed Development and is designated for its assemblage of wintering waterbirds. These internationally designated sites and their relevant qualifying species therefore comprise Important Ecological Features (IEFs) of international importance considered and assessed in Chapter 8 of the EIAR.

1.2.3 Ecological Baseline: Hen Harrier

As described in Section 1.1.1, this SHMP focuses on the management of habitats for hen harrier, as identified within Chapter 8. All habitats within the extent of the Proposed Development and adjacent land are assessed for targeted management based on their use by hen harrier, and the potential effects of the Proposed Development on local hen harrier populations. Detailed information on the ecological baseline of the Proposed Development with regard to hen harrier and relevant habitats is

provided in Chapter 8 of the EIAR, Technical Appendix A08-03: Ornithology Baseline and summarised below.

Hen harrier is an Annex I species on the EU Birds Directive and is currently Amber listed in Ireland in the Birds of Conservation Concern in Ireland, due to historical declines and continued vulnerability as a result of habitat loss and persecution (Gilbert et al. 2007). It is a bird of open country that utilises almost any open terrain that contains enough small mammals or birds to support its hunting requirements (Watson 1977). In Ireland, the preferred nesting habitat is second rotation pre-thicket forestry, followed by heather/bog and post-thicket forestry with patches of heather or scrub (Barton et al. 2006). In Northern Ireland, hen harriers have also been recorded nesting in trees (Scott & Clarke 2007).

Thompson (1849) describes the hen harrier as being 'pretty generally distributed over the island'. By 1893, Usher (1893) describes the hen harrier as being 'resident and common' fifty years earlier but decreasing to the point where 'it seems now to have almost disappeared'. In 1900, Usher & Warren (1900) state it is 'still resident, but decreasing in numbers, in many mountainous districts'. By the 1950's the hen harrier was described as being 'nowadays a rare straggler' to Ireland (Kennedy et al., 1954) and sufficiently rare to merit publications of individual sightings.

In the early 1950's a recovery is believed to have begun (O'Flynn 1983) and Sharrock (1976) suggested that the population had risen to 200-300 pairs by 1972. However, by the late 1970's early 1980's the population is again believed to have declined and O'Flynn (1983) says that 'since 1978' in many areas, he has been 'unable to find any evidence of breeding'. The most recent national survey in 2022 (Ruddock et al., 2024) indicated 'further population declines and a diminished range, both in the wider countryside and within Special Protection Areas (SPAs)', with a national population estimated between just 85 and 106 breeding pairs.

Hen harriers were occasionally recorded within and adjacent to the Proposed Development during the detailed field surveys undertaken between 2022 and 2025, and during both breeding and winter seasons. Breeding season activity included adults carrying prey to nest sites (presumably to nest sites) although no nests were observed within 2 km of the nearest wind farm element of the Proposed Development. Hen harrier roost watches were conducted in the winter of 2022/23 and the winter of 2024/2025. No sightings of wintering hen harrier were observed during dusk survey efforts.

Hen harrier activity recorded during the breeding and wintering season are indicated in Technical Appendix A08-03: Ornithology Baseline.

1.2.4 Ecological Baseline: Habitats

The habitats within the Proposed Development boundary and the habitats immediately adjacent to it are collectively called the "Study Area" for the purposes of this SHMP. These habitats have been assessed in the EIAR and will be managed under the SHMP, and Tables 1.1 and 1.2 summarise them, with main habitats described on the following pages. A total of 38 habitat types (including nine types of habitat mosaic), comprising a total area of 61.18 ha and a total extent 7,028 m of linear habitats, occur within the Proposed Development.

Baseline habitats within the Study Area are presented both within and adjacent to the Proposed Development in Chapter 8 of the EIAR. All areas that will be targeted for hen harrier management are within the red line boundary.

Table 1-1: Habitat extent within the Study Area

Fossitt Code (Fossitt, 2000)	Area (ha)
Buildings and artificial surfaces	1.03
Buildings and artificial surfaces/Amenity grassland (improved)	0.53
Exposed sand, gravel or till	0.02
Spoil and bare ground	0.15
Recolonising bare ground	0.11
Recolonising bare ground/Wet grassland	0.04
Active quarries and mines	0.14
Active quarries and mines/ Recolonising bare ground	0.23
Active quarries and mines/ Other artificial lakes and ponds	0.08
Dystrophic lakes	0.40
Other artificial lakes and ponds	0.07
Improved agricultural grassland/Wet grassland	0.004
Marsh	0.10
Wet Grassland	8.63
Wet grassland/Wet Heath	2.92
Wet Heath	7.77
Wet heath/ Recolonising bare ground	0.12
Wet heath/Wet grassland	0.87
Wet heath/Wet grassland/Scrub	0.34
Wet heath/ Upland blanket bog	1.78
Wet heath/conifer plantation	1.59
Wet heath/Scrub	1.04
Upland blanket bog/Wet heath	9.53
Cutover Bog/Wet heath	0.04

Fossitt Code (Fossitt, 2000)	Area (ha)
Conifer plantation	27.77
Conifer plantation/Wet heath	0.82
Scrub	0.86
Scrub/Wet grassland	0.16
Scrub/Wet heath	0.08

Table 1-2: Wind Farm - Proposed Development Linear Habitat Lengths

Fossitt Code	Length (m)
Stone walls and other stonework	134
Earth banks	4,141
Earth banks/ Stone walls and other stonework	435
Earth banks/Treeline	30
Drainage ditches	1,260
Hedgerows	700
Hedgerows/Earth banks	246
Treeline	82

1.2.5 Basis for Hen Harrier Habitat Management Extent

To calculate the extent of habitat from which hen harrier will theoretically be excluded from during the operational phase of the Proposed Development, all areas located within the works boundary of the Proposed Development, including turbine locations and hardstands, internal roads, borrow pits, peat repository areas, construction compounds, and all other areas required for construction are considered to be subject to permanent habitat loss. Within these areas, habitats that are suitable for foraging hen harrier have been identified and quantified, to provide a basis for the identification of the extent of areas where compensatory habitat measures are required.

Note that some of these habitats have intrinsic values not linked to hen harrier (e.g. heath or scrub habitats may be important in their own right). However, as compensatory habitat management for hen harrier will also have wider biodiversity benefits, the ecological values of any habitats lost will be addressed through the proposed management for hen harrier. Habitats excluded from this calculation (i.e. those considered unsuitable for hen harrier and of no (or little) intrinsic value to biodiversity) include GA1 Improved Agricultural Grassland and BL3 Buildings and artificial surfaces.

Habitat loss calculations are shown in Table 1-3.

1.2.6 PROPOSED AREAS TO BE MANAGED UNDER THIS SHMP

As detailed in Table 1-3, below, it is estimated that construction and operation of the Proposed Development would result in the loss of 9.65 ha of potential suitable hen harrier foraging habitats. Regarding the calculation to determine the loss of conifer plantation habitat (WD4), while conifer plantations are generally considered unsuitable for foraging hen harriers, during the first eight to ten years of a conifer plantations' development these habitats can be suitable for foraging hen harrier. A 32-year forestry rotation is assumed (based on the minimum likely standard practice felling cycle), with an estimated 8-year window suitable for hen harrier foraging, equating to 25% of the rotation cycle Therefore, a calculation of 25% of the total area of forestry (to reflect the eight to ten years of potential suitability out of a 32-year forestry rotation) is applied in order to obtain a hectarage of the loss of suitable foraging habitat. As a result, the total area of forestry of 6.862 ha (see Table 1-3) was calculated to contribute a loss of habitat valued at 1.716 ha (see Table 1-3), resulting in a total habitat loss of potentially suitable hen harrier foraging habitat of 11.366 ha.

Table 1-3: Direct habitat loss arising from the Proposed Development

Fossitt Code	Area (ha)
Buildings and artificial surfaces	0.679
Buildings and artificial surfaces/Amenity grassland (improved)	0
Exposed sand, gravel or till	0
Spoil and bare ground	0.108
Recolonising bare ground	0.016
Recolonising bare ground/Wet grassland	0.023
Active quarries and mines	0.002
Active quarries and mines/ Recolonising bare ground	0.028
Active quarries and mines/ Other artificial lakes and ponds	0.015
Dystrophic lakes	0
Other artificial lakes and ponds	0.009
Improved agricultural grassland/Wet grassland	0
Marsh	0
Wet Grassland	**2.074**
Wet grassland/Wet Heath	**0.674**

Fossitt Code	Area (ha)
Wet Heath	**0.811**
Wet heath/ Recolonising bare ground	**0.046**
Wet heath/Wet grassland	**0.171**
Wet heath/Wet grassland/Scrub	**0.005**
Wet heath/ Upland blanket bog	**1.583**
Wet heath/conifer plantation	**0.672**
Wet heath/Scrub	**0.169**
Upland blanket bog/Wet heath	**3.060**
Cutover Bog/Wet heath	0
Conifer plantation	6.862 **(1.716)**
Conifer plantation/Wet heath	**0.171**
Scrub	**0.199**
Scrub/Wet grassland	**0.016**
Scrub/Wet heath	0

To achieve deliver a measurable ecological net gain in line with the principles of CIEEM (2016) and to support the local hen harrier population, this SHMP proposes an additional 20% (i.e. 2.274 ha) of suitable hen harrier foraging habitat is added to this total, through positive management of habitats currently unsuitable for Hen Harrier, which amounts to a combined managed area of suitable hen harrier foraging habitat of **13.640 ha**. Collectively this extent of managed habitat will provide sufficient foraging opportunities for hen harrier to support the existing population throughout both the breeding and wintering seasons.

1.3 Management Objectives

As outlined in Section 1.1, the purpose of this SHMP is to prescribe detailed avoidance, mitigation, enhancement and monitoring measures required to prevent significant adverse effects on species and habitats during the construction and operational phases of the Proposed Development, while achieving ecological enhancements where possible on species and habitats arising from construction and operation of the Proposed Development and achieve enhancements for these and other ecological features, specifically for hen harrier and habitats. As such, taking into consideration the ecological baseline for the Proposed Development and the potential effects of construction and operation of the scheme on ecological features identified in Chapter 8 of the EIAR, the primary objectives of this SHMP are to:

- Maintain and improve habitats within the Proposed Development area for hen harrier, such that the local conservation status of the species is maintained and improved. Meeting this objective

will be heavily reliant on maintaining and increasing the quality and extent of suitable foraging habitat for hen harrier; and

- Deliver enhancements for other habitats identified in Chapter 8 of the EIAR, such as maintaining scrub edges for passerines or retaining wetland features for amphibians, where opportunities arise, to maximise to maximise the biodiversity benefit provided by the Proposed Development.

Please note that management measures required to address habitat losses will be aligned with the management actions for hen harrier, i.e. any habitat losses arising from the Proposed Development will be offset by delivering habitat management actions that will also target habitats for the enhancement of hen harrier foraging areas.

In order to meet these management objectives, the ecological requirements of the target species and their associated habitat requirements must be understood. These objectives will be delivered through the management of the calculated 13.640 ha of suitable hen harrier foraging habitat (as identified in Section 1.2.6) and associated habitats within the Proposed Development boundary. Context on these ecological features is therefore provided below.

1.3.1 HEN HARRIER

Considering the recorded use of the Proposed Development and adjacent land for breeding and wintering hen harrier, management prescriptions for this species is underpinned by best practice guidance and understanding of the ecological requirements of hen harrier and the existing threats and pressures on this species.

Preferred foraging areas include open bog and heath, scrub, forestry and woodland edges, young forestry with open ground between trees, rough non-intensively managed upland grassland which is often wet and 'rushy', and dense, bushy hedges. Hen harriers hunt by flying within a few metres of the ground and feed on small birds and mammals. Breeding hen harriers must forage in areas with sufficient densities of prey (small birds and mammals) to support both adult birds and their young. At a microhabitat scale, hen harriers use features that provide them with cover when they are hunting, such as hedges and scrub patches.

Research into hen harrier breeding behaviour in Scotland indicates that, while breeding males travel up to 9km from nests on occasion, their home ranges averaged 8km^2 (Arroyo *et al.*, 2014). Home ranges for females were typically 4.5km^2. Males hunted mostly within 2km of the nest, whilst females hunted mostly within 300m to 1km from the nest (Arroyo *et al.*, 2009). Until relatively recently there had been little study of the habitat preferences of hen harriers in Ireland. Unplanted blanket bog and heath had been traditionally recognised as prime hen harrier habitat (Ruddock *et al.*, 2024). The value of young conifer plantation on bog for hen harrier foraging became apparent after the extensive afforestation programmes of the 1960s and 1970s (Biosphere Environmental Services, 2010). As recently as the early 2000s, the value of re-stock for foraging was unclear though it was recognised as important habitat for nesting (Norriss *et al.*, 2002). Madders (2000), studying hen harrier foraging preferences and success rates in western Scotland, found that hen harriers foraged preferentially over young coniferous forests, and selected heathland and grassland habitats ahead of closed canopy woodland. They also found that their success rate in prey capture was also highest over young conifer

forests. Madders' study included areas of improved grassland and clear fell as hunting time and success rates were lower in these habitat types than in young conifer forest.

Habitat selection for foraging by hen harriers has been investigated in various studies funded by NPWS (e.g. Irwin *et al.*, 2011; Wilson *et al*., 2009; Moran & Wilson-Parr, 2014; Ruddock *et al*., 2024). Although the preference order of positively selected habitats varied in different study areas and years, five habitats (heath/bog (H/B), hill farmland (RG), new plantation (NF), and the later stages of second rotation pre-thicket plantation (2nd F 3 & 4)) were consistently preferred by both sexes, whilst three (intensive grassland (G), mature plantation (F), and recently cleared plantation (second F1 & 2)) were consistently avoided (habitat abbreviations are given in Table 1-4). Individual females showed quite variable habitat usage, reflecting the often-restricted choices within small foraging ranges close to the nest. For males, the average rank order of habitat selected across sites and years, from most to least preferred, was NF>2ndF3>H/B>2ndF4, followed by F>2ndF1&2>G.

During surveys undertaken for Proposed Development, the majority of the foraging activity recorded continued to indicate a preference for open moorland habitats, as supported by national preferences (Ruddock *et al.*, 2024). As there is unlikely to be significant new planting on bog or heath, locally the population will depend increasingly on the presence of unplanted bog, heath and wet grassland, and pre-thicket second rotation.

This SHMP has been developed in consideration of the available information on foraging behaviours and habitat preference exhibited by hen harrier.

Table 1-4: Classification of habitat types for hen harrier assessments

Habitat Code		Description
NF	NF 2	New forestry plantation, trees 20-30cm high
	NF 3	New forestry plantation, trees c.1m in height
	NF 4	New forestry plantation, trees > 2m in height, patchy thickets
2nd F	2nd F 1 & 2	2nd rotation forestry plantation, trees 20-30cm high
	2nd F 3	New forestry plantation, trees c. 1m in height
	2nd F 4	New forestry plantation, trees > 2m in height, patchy thickets
F		Post thicket plantation
G		Grazing
RG		Rough Grazing & 'rushy' pasture
H/B		Heath / Bog
DE		Deciduous woodland & scrub
GO		Gorse

1.4 MANAGEMENT PRESCRIPTIONS

1.4.1 INTRODUCTION

The conservation habitat management prescriptions for hen harrier within this document are based on the prescriptions that are specified in the NPWS management area prescription scheme for hen harrier SPAs (NPWS, 2010, 2017, 2020), though the Proposed Development is not part of, or adjacent to, an SPA.

The prescriptions are concerned with enhancing low-level extensive grazing in agricultural grasslands, in a condition that is neither too under-grazed (leading to scrubbing up of the grassland) nor too heavily grazed, with the creation of scrub areas and edge habitats (i.e. bushy hedgerows). The intention is to ensure that grazing continues, and that appropriate management of grassland and scrub creates a favourable habitat mosaic for hen harrier.

The proposed prescriptions for effective habitat management for hen harrier are also planned to benefit a wide range of other species. Managing the land for hen harrier fits the concept of focal species modelling; by managing habitats to benefit hen harrier, a range of other beneficial outcomes can be achieved. Successful management for hen harrier would also benefit other species, such as small passerines (prey species of hen harrier), raptors, Irish hare (*Lepus timidus* subsp. *hibernicus*), other small mammal species and marsh fritillary (*Euphydryas aurinia*). The development of habitats such as blanket bog, upland heath, rivers and streams, hedgerows and trees will also be of benefit.

The ability of the management prescriptions to deliver the enhancement is imperative; especially in cases such as the Proposed Development considered here (i.e. outside SPAs), where hen harrier need the protection and stable environments afforded to pairs within SPAs to remain successful. This SHMP has been developed in the context of the available information on foraging behaviours and habitat preferences exhibited by hen harrier. The ecologist, who will supervise the implementation of the SHMP will have experience of hen harrier ecology and habitat management and will work in close association with landowners and/or land managers.

The prescriptions for the management of specific habitat types are outlined in Section 1.4.2, below, and are followed by generic prescriptions for all habitat types in Section 1.4.3. These will be delivered through targeted land management plans for all lands where the management prescriptions are to be implemented, under agreement with the land owner/manager of those lands.

1.4.2 MANAGEMENT PRESCRIPTIONS FOR SPECIFIC HABITATS

The habitats that are the subject of specific management prescriptions are as follows:

- Hedgerows, Earth Banks, and Scrub;
- Wet Grassland; and
- Improved Agricultural Grassland

1.4.2.1 HEDGEROWS, EARTH BANKS, AND SCRUB

Hedgerows and earth banks do not contribute to the overall area of land where management to optimise hen harrier foraging will be undertaken, nor do areas of native woodland (although all are important for the prey species that hen harrier prey upon).

Woody scrub (e.g. gorse, willow, alder, birch, and other species.) is one of the most beneficial habitats for hen harrier, as it supports both prey species (including passerines and small mammals) and hunting habitat. Scrub and hedgerow clearance are amongst the reported factors for the loss of viable hen harrier habitat in Ireland (e.g. O'Flynn, 1983; Ruddock *et al*., 2016; Wilson *et al*., 2009).

As part of this SHMP, existing areas of scrub and hedgerow will be retained. Small areas of established gorse or willow scrub must also be trimmed or cut back to prevent further encroachment onto grassland or access paths, but they must not be burnt or otherwise removed. The overarching objective in the management of scrub and hedgerows is to increase the overall surface area of these habitats, as this equates to increased numbers of prey species, which in turn leads to increased foraging potential for hen harrier.

Habitat management prescriptions for scrub and hedgerows are as follows:

- Existing areas of scrub and hedgerows will be increased through management;
- In open areas, or where the existing extent of scrub and hedgerows is limited, new areas or sections of this habitat should be created;
- Where there is evidence of scrub or hedgerow removal, these habitats will be reinstated as part of individual management area prescriptions;
- Any scrub areas must be fenced to prevent grazing or browsing by livestock;
- The only means of preventing further encroachment of established areas of gorse or willow scrub into grassland area or access paths and tracks will be through trimming or cutting back, either manually or mechanically. This action can be repeated annually if necessary;
- Any removal, burning, or herbicide-use on areas of established scrub must be strictly prohibited;
- Unless it is deemed necessary for safety reasons, all roadside hedgerows should only be cut outside of the bird nesting season (from the 1st of March to the 31st of August inclusive);
- Unless it is deemed necessary for the protection of overhead electricity lines, hedgerows should only be cut outside of the bird nesting season (from the 1st of March to the 31st of August inclusive);
- Hedgerow maintenance will be undertaken on a regular (annual) basis to prevent hedge overgrowth. In such cases, hedgerow trees will be left uncut and the remainder of the hedgerow cut into an "A" shape, so that it is wider at the base (at least 2m wide at the base) than at the top (hedgerows will be cut to a maximum 2.5m in height, with the exception of mature hedgerow trees, which will be allowed to grow). The regular maintenance of hedgerows is necessary in order to maintain any wildlife interest of the habitat (Benstead *et al*., 1999);

- Encroachment of scrub into grassland can be controlled by cutting back on an annual basis, if required. Cutting in this case will not encroach beyond 1.5m from the base of the hedge;
- Herbicides and pesticides will not be used, except where spot treatment is required to treat invasive species (e.g. rhododendron); and
- Hedge cuttings will be piled into heaps and left to decay naturally.

Habitats on site will be reassessed prior to the commencement of construction of the Proposed Development and, should any areas of scrub greater than one hectare in area be present, these will be broken up by cutting rides through or cutting smaller blocks out of the large area of scrub. Sufficient rides will be cut into the large area to ensure that the remaining areas of scrub do not exceed one hectare in size. Work on cutting-out rides will commence in Year One; at least 80% of the required works will be completed before the end of Year Three; and 100% before the end of Year Four.

Since bushy hedgerows are good potential foraging sites for hen harrier, hedge cutting will be restricted to the minimum-extent necessary and bushy hedges with tall shrubs will be encouraged (as opposed to heavily managed hedge lines). Any hedge cutting that does take place will be undertaken outside of the bird nesting season and therefore limited to the period from September to February, inclusive, except where cutting is required for Health and Safety requirements (for examples, where vegetation is a risk of coming into contact with electricity cables or obscuring site lines along public roads).

1.4.2.2 WET GRASSLAND

The objective of the habitat management prescriptions for Wet Grassland is to ensure the habitat, wherever it is found, is managed in a rank condition whilst not being overgrown with dead grasses or rushes. Rank condition refers to a sward with varied height and structure, providing tussocks and cover for prey species, while avoiding excessive accumulation of dead vegetation or dense, flattened rush stands. To achieve this, management prescriptions will focus on three principal activities:

- Grazing management;
- Rush management; and
- Nutrient management.

Grazing Management

Grazing of areas of wet grassland by cattle or horses/ponies or by mixed grazing is preferred. For similar plans in other areas, grazing by sheep is often allowed to continue where this has been the traditional practice, and this approach will be followed here. Cattle grazing tends to produce a more tussocky sward which is more favoured by ground nesting birds, typical prey items for hen harrier, including meadow pipit (*Anthus pratensis*) and skylark (*Alauda arvensis*) (Benstead *et al.*, 1999, Milsom *et al.*, 2001). For all areas of wet grassland that are currently grazed, this will remain the practice during the operational lifetime of the Proposed Development. For any non-grazed wet grassland habitats, grazing will be introduced in line with the management requirements detailed below. Guideline target stocking levels for rough grazing are specified below, but there is no formal lower

limit to planned stocking densities. In cases where the land is wet, consideration will be given to concentrating grazing pressure in the summer months.

Habitat management prescriptions for grazing of wet grasslands are as follows:

- Introduce light grazing, rather than cutting or topping, to areas with no stock;
- The target stocking level on rough grazing is a minimum of 0.6 LU/ hectare;
- In cases where the land is wet, concentrate grazing during the summer months; and,
- Stocking levels will be specified in the individual management area prescriptions to be prepared for each contributing landowner.

Topping of wet grassland habitats may also be required. This consists of mechanical cutting aimed at removing coarse or excessive vegetation often in wet grasslands which have been grazed or to control weeds, e.g. *Cirsium* species. Topping machinery is normally set at a higher level than other mowing machinery used in the harvesting of a fodder crop. Topping can therefore be more selective than conventional mowing (Benstead *et al*., 1999). Consideration needs to be given as to whether or not a field needs to be topped, as unnecessary topping can reduced invertebrate diversity.

Rush Management

The objective in managing rushes is to ensure rough grassland is maintained in an optimal condition for hen harrier foraging at all times. Optimal condition constitutes as dense a covering of rushes as is achievable, but not to the point where rushes are falling over or matting the ground. Rush cover in the 30–70% range is ideal. While appropriate, grazing pressure is preferred, in most cases managing rush cover will require active management. In the majority of cases, rush management will be achieved by cutting every second year. However, there will be considerable variation from site to site, and alternative cutting regimes may be more appropriate in certain cases (please see Table 1-5, below for further details).

Table 1-5: Rush Management Regimes (adapted from NPWS, 2010)

Code	Habitat Condition	Management Regimes
I	Habitats where rush cover of 30-70% is considered unlikely to be achievable, irrespective of management and perhaps in some cases undesirable (e.g. shallow limestone soils)	No cutting required
II	Swards where reversion of Improved Grassland is planned or where rush cover is less than 10%.	Allow further rush development in the early years of the management area prescription. One or two cycles of cutting commencing in Year Three may be appropriate to allow further rush development in the early years of the plan.

Code	Habitat Condition	Management Regimes
III	Swards where rush cover is 10-30% or where rushes have been topped in the past year.	One or two cycles of cutting commencing in Year Three may be appropriate.
IV	Swards where the rush cover is already in the 30-70% ranges.	In these cases, cutting/topping in Years One, Three and Five of the management area prescription could maintain the sward in the desired state.
V	Swards where rush cover is dominant (>70%) and where weed-licking with a suitable herbicide in Year One, followed by cutting/topping in Years Three and Five could be considered.	Weed licking with a suitable herbicide may provide the opportunity for the creation of a suitable sward within two or three years. However, the use of herbicides must always be subject to consideration of possible effects on water courses. No herbicide use is permitted within 5 m of a watercourse or existing hedgerow without the prior consent of NPWS.

Habitat management prescriptions for managing rushes on wet grassland are:

- In general, rushes will be cut on a two-year cycle unless there are specific reasons for a longer cycle (for example, weak rush growth);
- In most cases, active rush management will commence in Year One of the plan and will only be delayed until Year Two or Three 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;
- The use of an herbicide applied using a weed lick is permitted but not encouraged. Herbicide use will follow all statutory guidelines, be applied by trained personnel, and be carefully managed to avoid non-target impacts. This will only be considered in cases where rush growth is very dense, and cutting is impractical;
- No herbicide use is permitted within five metres of a watercourse; and
- If access difficulties prevent the active management of rushes, alternatives such as grazing will be employed.

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 management area prescription will be changed to adjust the cutting sequence for future years.

Nutrient Management

The nutrient management of areas of wet grassland consists of the avoidance of the application of chemical or organic fertiliser on the managed lands. If fertilisers have been applied to the land holding previously, then these traditional applications can be continued - provided that the resultant sward

retains the desired characteristics for optimal hen harrier foraging (for example there is tussocky, rushy grassland present which is in favourable condition).

1.4.2.3 IMPROVED AGRICULTURAL GRASSLAND

Guidelines for management area prescriptions in hen harrier SPAs allow normal agricultural practice on improved agricultural grassland to continue (NPWS, 2010, 2017, 2020). The NPWS management area prescriptions also permit wet grassland to be improved, provided it accounts for no more than 20% of the designated area on the farm concerned. Although the Proposed Development is not located within any SPA boundary, such improvement will not be encouraged on the Proposed Development under this SHMP.

To ensure lands are managed for the benefit of hen harrier for the lifetime of the Proposed Development, landowners will be required to allow improved grassland to revert to a more natural state. In such cases, a reversion program will be required, which will involve:

- Analysis of soil samples so that a baseline record of soil phosphorus and potassium exists;
- The application of chemical and organic fertilisers will cease;
- The application of lime will cease;
- Habitat enhancement works (e.g., creating rush patches, introducing wet scrapes where appropriate, and managing for native herbaceous species) will be undertaken to support prey species diversity;
- Broadcast herbicide spraying of rushes will not be permitted, although spot treatments or wipe-on treatments will be allowed. Herbicides applied using a weed lick can be used where necessary, particularly in situations where rush growth is very dense or where cutting is impractical due to steep slopes. Applications will not be at a rate that will denude fields of rushes completely. Under normal circumstances, chemical treatment of rushes will only be permitted once in a five-year plan. Wipe on treatments will only be applied in either Year One or Year Two of the management area prescriptions;
- Traditional grazing regimes (grazing regimes typical of the preceding five years) will be introduced;
- The extent of bracken (*Pteridium aquilinum*) will be controlled, if necessary, by weed licking, spot spraying, cutting, rolling, or controlled trampling with stock. Mechanical control or trampling is preferred and is most effective in May/early June. Mechanical control will need to be repeated several times to have a beneficial impact;
- Species-rich meadows will only be cut after the 15th of July each year, preferably later;
- Mowing within three metres of any hedgerow to be left until the 1st of August each year;
- No ploughing, cultivation, drainage or otherwise reclaiming of land will be undertaken;
- Conifers will not be planted;
- Trees will not be planted unless such action is prescribed in the associated land management plan;

- Recommended stocking levels as prescribed in the associated land management plan will not be exceeded;
- Supplementary feeding of livestock will not be provided in those grassland areas, except where this has been traditionally practiced; and
- There will be no dumping of waste material.

1.4.3 Management Prescriptions Common to All Habitats

1.4.3.1 Supplementary Feeding

Supplementary feeding of livestock will continue, provided excessive poaching is avoided excessive poaching refers to severe soil and vegetation damage caused by trampling, leading to bare ground and sward degradation). Sacrificial paddocks will not be permitted at any time. Supplementary feeding of round bales or from fixed feeding points is not permitted within 30 m of a watercourse. On land sloping towards a watercourse, a greater distance of 50 m must be adhered to.

1.4.3.2 Burning

The burning of vegetation or other materials within the managed area of the SHMP is not permitted at any time.

1.4.3.3 Use of Herbicides

Spraying or broadcast application of herbicide is not permitted. Spot application and wipe-on treatments are permitted to eradicate docks, thistles, ragwort, and similar noxious weeds. Rhododendron (*Rhododendron ponticum*) and conifers will be removed by cutting and herbicide treatment. Bracken will be controlled by rolling, cutting and/or by controlled cattle/equine trampling in early summer. In exceptional circumstances, control of bracken by herbicides may be permitted following consultation with the supervising ecologist and in compliance with statutory pesticide application requirements.. The use of herbicides is not permitted within 5 m of a watercourse or existing hedgerow, with the only exception being spot treatment for the control of difficult invasive species, such as Japanese knotweed (*Reynoutria japonica*) or rhododendron.

1.4.3.4 Use of Poisons or Stupefying Baits

The use of poisons or stupefying baits is not permitted under any circumstances. Hen harriers and other birds of prey can fall victim to secondary and direct poisoning.

1.4.3.5 Fence Marking

Hen harriers can fly into thin wires and fencing. Consequently, any new fencing or boundary markers will be provided in the form of hedge planting instead in place of wire fencing alone.

1.4.3.6 Shooting

Shooting (except for the legal control of vermin) will not be allowed within the management areas.

1.5 MAINTENANCE

1.5.1 TIMING

This SHMP will be implemented concurrently with the commencement of the construction phase of the Proposed Development and subsequently throughout the duration of the Proposed Development. As per the requirements of this SHMP, elements of this SHMP will need to commence in advance of physical construction works, such as finalising land management agreements with landowners within the red line boundary for targeted habitat management actions.

1.5.2 CONSENT

The managed area incorporates the pooled land holdings of multiple landowners. These landowners will retain full ownership of their lands during the operation of the Proposed Development. This direct involvement of the landowners will ensure open access to the land within which the prescriptions specified in this SHMP will be implemented.

1.5.3 PROCEDURES

This SHMP will be implemented on a specific landowner-by-landowner basis as follows:

- A meeting has been held with individual landowners to outline the general aims, objectives, and requirements of the SHMP and to ensure all are in agreement with the requirements;
- An initial audit of the individual landholdings will be conducted to establish the current land management practices, stocking rates, habitat conditions, enhancement opportunities and any limitations to habitat management; and
- A specific farm plan will be prepared for each individual landowner. These will be modelled on the NPWS Hen Harrier Farm Plan Scheme and will outline the specific prescriptions required to ensure the implementation of this SHMP. Each farm plan will include a map of the relevant landholding and a prescriptive list of actions to be undertaken and will detail the time of year when the necessary works and management measures will be undertaken.

Prescriptions for individual farm plans will be selected from the management options described herein, in reference to the baseline characteristics of the landholding and the surrounding land (as established during the audit described above).

1.6 MONITORING

1.6.1 HABITATS

The suitability of hen harrier habitat within the Proposed Development will be assessed and mapped in years 1, 2, 3, 4, 5, 7, 10 and 15 in order to identify the extent, quality and connectivity of hen harrier nesting, roosting and foraging habitats, and to identify any management issues and/or required changes in management approaches. This monitoring will ensure that long-term benefits for hen harrier are delivered and provide a long-term record of how the extent and quality of hen harrier

habitat has changed, which will be important for informing the Proposed Development and other similar projects in future.

In addition to the habitat monitoring described here, a detailed habitat evaluation programme shall be established based on the parameters for open habitats as set out in Chapter 3 of the Conservation Objectives Supporting Document: Breeding Hen Harrier (National Parks and Wildlife Service, 2022).

1.6.2 Hen Harrier

Annual hen harrier monitoring will take place throughout the construction and operational phases (Years 1, 2, 3, 4, 5, 7, 10 and 15) of the Proposed Development. This monitoring should be undertaken in accordance with best practice survey methods (Gilbert *et al.*, 1998; Hardey *et al.*, 2013; O'Donoghue, 2019) and focus on recording the number of hen harriers present during the breeding and winter seasons, with emphasis in understanding the level of foraging activity in different areas of the Study Area.

The findings of this annual monitoring should be used to guide ongoing management approaches.

1.6.3 Collision Fatality Monitoring

As specified in Chapter 8 of the EIAR, detailed collision fatality monitoring will be undertaken to confirm the accuracy of the collision risk modelling predictions made as part of the EIAR, and to guide any additional mitigation requirements. Carcasses of birds and bats likely to be associated with turbine collisions will be searched for by handlers with specially trained cadaver dogs. This monitoring will involve monthly searches of carcasses within monitoring years to ensure breeding and wintering species are accounted for. All 'feather spots' and bird carcasses will be photographed and logged in an annual fatality search report, which will be submitted to relevant stakeholders as dictated by the planning authority. Should monitoring impacts at a level that could result in significant effects on hen harrier or other Important Ecological Features, mitigation will be reviewed in consultation with the planning authority and NPWS.

1.6.4 Auditing and Reviews

Annual audits will be required to ensure the SHMP is implemented effectively. Audits will be based on a field inspection and assessment of the specific farm plan, with up to 10% of the farm plans selected each year for auditing. Each audit will assess:

- The objectives of the individual farm plan;
- The implementation of the farm plan; and
- Adherence to the requirements of the farm plan.

The auditing selection will be based upon a random sample of land management agreements, with stratification according to risk (e.g. the areas of lands under management, prior non-compliance, etc.). Notwithstanding any auditing, all individual farm plans will be reviewed every five years to identify any required amendments to ensure they are implemented effectively and deliver the target biodiversity benefits.

1.6.5 REPORTING

Reports on the direct management and maintenance of each managed area will be on an annual basis (Breeding Season Report and Winter Season Report) with reports submitted to relevant stakeholders. These reports will detail the ongoing work and maintenance being carried out to ensure optimal foraging returns from each area. The setting up of management prescriptions is not sufficient; active seasonal management of these prescriptions will be needed if the plan is to be meaningful and effective.

1.7 ROLES AND RESPONSIBILITIES

As the wind farm developer, JC Mont-Fort is ultimately responsible for the implementation of this SHMP to ensure that adverse effects on biodiversity features (notably hen harrier) are avoided and enhancements are delivered. In the event of favourable consideration of the Proposed Development application, it is anticipated that the implementation of this SHMP will be secured by means of a condition. It is understood that JC Mont-Fort will subsequently incentivise relevant landowners to adhere to this SHMP.

It is recommended that JC Mont-Fort engages a suitably qualified ecologist to oversee the implementation of this SHMP. Implementation is also likely to require the input of agricultural advisors regarding the determination of appropriate stocking levels.

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