



APPENDIX 7-7

BIRD MONITORING PROGRAMME

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1. INTRODUCTION

1.1 Background

This Bird Monitoring Programme has been prepared by MKO for the Slieveacurry Renewable Energy Development. It provides a timeframe and monitoring schedule for the bird population at the Site during the construction and operational phases, informed by surveys undertaken to date. Bird surveys were undertaken from October 2020 to September 2025. Key ornithological receptors (KORs) were identified based on these surveys.

The objectives of the Bird Monitoring Programme are:

- To ensure any required construction phase monitoring is scheduled to avoid impacts on birds of conservation concern during the construction phase.
- To record birds using the Proposed Wind Farm Site and their interaction with operating turbines.
- To monitor short-term and long-term effects on bird populations in the Proposed Wind Farm Site, with a particular emphasis on birds of high conservation concern (birds listed on Annex I of the EU Birds Directive or on the Red List of Birds of Conservation Concern in Ireland).
- To undertake collision monitoring for potential bird fatalities as a result of a collision with turbine blades.
- To report on the findings of monitoring at the end of Years 1, 2, 3, 5, 10 and 15 of the operational life of the wind farm.
- To ensure any required decommissioning phase monitoring is scheduled to avoid impacts on birds of conservation concern during the decommissioning phase.
- To monitor the Proposed Enhancement Site to assess the effectiveness of the measures implemented as detailed in the Biodiversity Management and Enhancement Plan (BMEP) included as Appendix 6-4 of the Environmental Impact Assessment Report (EIAR) and to also aid adaption and implementation of improved methods and measures as they emerge.

1.2 Key Ornithological Receptors

Table 7 - 7 - 1 lists the key ornithological receptors (KORs) recorded within the Proposed Wind Farm Site during surveys conducted from October 2020 to September 2025 inclusive. These species form the basis of the Bird Monitoring Programme.

Table 7 - 7 - 1 Key ornithological receptors identified during surveys

Species	Scientific Name	Conservation Status
Hen harrier	<i>Circus cyaneus</i>	Annex I of Birds Directive
Golden plover	<i>Pluvialis apricaria</i>	Annex I of Birds Directive
Merlin	<i>Falco columbarius</i>	Annex I of Birds Directive
Peregrine falcon	<i>Falco peregrinus</i>	Annex I of Birds Directive
Osprey	<i>Pandion haliaetus</i>	Annex I of Birds Directive
Kestrel	<i>Falco tinnunculus</i>	Red List with respect to breeding populations
Snipe	<i>Gallinago gallinago</i>	Red List with respect to breeding and wintering populations
Red Grouse	<i>Lagopus lagopus</i>	Red List with respect to breeding populations
Buzzard	<i>Buteo buteo</i>	Conservation interest

Species	Scientific Name	Conservation Status
Sparrowhawk	<i>Accipiter nisus</i>	Conservation interest

2. METHODOLOGY

2.1 Pre-construction and Construction Monitoring

It is proposed that construction works will commence outside the bird nesting season (1st of March to 31st of August inclusive) to avoid the most sensitive time of the year for most bird species with the potential to use the site and its environs.

Pre-commencement confirmatory surveys will be undertaken prior to the initiation of works at the Proposed Wind Farm Site. The survey will aim to identify sensitive sites (e.g. nests or roosts). Any requirement for construction works to run into subsequent breeding or winter seasons following the commencement of works will be subject to a repeat of the pre-construction bird surveys. These surveys will be conducted once per month during the breeding season (April to July) and once at the start of the winter season (October).

Monitoring will be undertaken by a suitably qualified ornithologist. The survey will include a thorough walkover survey to a 500m radius of the permanent development footprint if the Proposed Project and/or all works areas. If winter roosts or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring at the beginning of the first winter or breeding season of the construction phase. If the roost/nest is found to be active during the construction phase no works shall be undertaken, works will cease within a species-specific buffer of this location in line with best practice guidance (e.g., Forestry Commission Scotland, 2006; Goodship and Furness 2022; Ruddock and Whitfield, 2007). No works shall be permitted within the buffer until it can be demonstrated that the roost or nest is no longer occupied.

All site staff and subcontractors will be made aware of any restrictions to be imposed by means of a toolbox talk and a map of the 'no-work zone' will be made available to all construction staff. The restricted area will also be marked off using hazard-tape fencing to alert all personnel on site to the suspension of works within that area.

2.2 Operational Monitoring

Survey methods employed for operational monitoring will be in line with guidelines issued by the Scottish Natural Heritage (SNH, 2009). Operational monitoring will be undertaken in Years 1, 2, 3, 5, 10 and 15 of the lifetime of the Proposed Project. The surveys that will be undertaken are:

- Flight activity surveys: vantage point surveys
- Breeding Raptor Surveys
- Targeted bird collision surveys (corpse searches) will be undertaken. The surveys will include detection and scavenger trials, to correct for these two biases and ensure the resulting data is robust.

2.2.1 Vantage Point Surveys

Vantage point surveys will be undertaken to monitor flight activity within a 500m radius of the Proposed Turbines. The objective of the surveys is to provide information on bird use of the area and interactions with turbines after construction of the wind farm that can be compared to pre-planning data.

Vantage point surveys will be conducted from four fixed locations that were used during pre-planning surveys (VP1, VP2, VP3, and VP4) in order to provide complete coverage of all Proposed Turbines. Should vantage point locations need to be moved, a viewshed analysis will be conducted to ensure there is still comprehensive coverage of the 500m radius of Proposed Turbines at the new locations. Surveys will be conducted monthly.

Survey methodology should follow NatureScot (2025) and any revisions to the same. Behavioural categories for the observation of bird interactions with operational wind farms will be in line with terminology outlined by Meredith *et al.*, (2002). The surveyor should collect data on bird observations and flight activity from the scanning arc of 180° to a 2km radius at the fixed vantage point locations for two 3-hour watches separated by a minimum 30-minute break (i.e., 6 hours total) per month. Surveys should be spread over the full daylight period, including dawn and dusk watches to coincide with the highest periods of bird activity. Dusk surveys should end one hour after sunset and dawn surveys should begin one hour before sunrise.

Flight activity of target species will be mapped and recorded as per three defined flight bands chosen in relation to the dimensions of the turbines as built: below rotor swept height, at the rotor swept height and above rotor swept height, in this case 0-25m, 25-175m, and 175+m. When a target species is detected, the location of the bird will be recorded on a map and the surveyor will provide the following details: time, species, number of birds, activity/behaviour, the primary habitat used (and secondary and tertiary habitat if applicable) and any other notes of interest.

2.2.2 Breeding Raptor Surveys

Breeding raptor surveys will be undertaken to establish whether a hen harrier breeding attempt was initiated and subsequently, whether it was successful. The objective of the surveys is to provide information on hen harrier use of the area for breeding after construction of the wind farm that can be compared to their breeding activity in pre-planning data. Surveys should be conducted at the known nest site location in each monitoring year, or at additional locations if it is believed that the hen harrier nest may have moved to a new location.

Survey methods should follow Hardey *et al.* (2013) or any revisions to the same or updated guidance. Up to four visits are necessary: (1) to establish hen harrier occupancy, (2), to establish if an active nest is present, (3) to check if young have hatched and (4) to check if young have fledged. During any visit, when a hen harrier is detected, the location of the bird will be recorded on a map and the following details will be recorded: time, species, number of birds, breeding activity/behaviour, the primary habitat used (secondary and tertiary habitat if applicable) and any other notes of interest (such as male or female).

2.2.3 Collision Monitoring

Carcass searches for bird casualties as a result of collision with Proposed Turbines will follow survey methods broadly based on guidelines issued by the SNH (2009) and search methods adopted by Duffy and Steward (2008). It is proposed to undertake a minimum of one visit per month during each survey year by a trained dog and handler, where possible. During each visit, searches will be undertaken at each operating turbine location by a trained dog and handler. Edkins (2014) recommends the "search width should be equal to the maximum rotor tip height". Given a turbine rotor tip height of 175 meters the search area surrounding the base of the turbine would be taken as a radius of 87.5 meters centred on the turbine base. This area will be the subject of target searches for bird casualties. Searches will incorporate the use of transects spaced at 10m intervals apart with the observer covering 5m on either side for each transect. Locations and coordinates of transect routes will be confirmed using a portable GPS recording device. Recording sheets will be used to document bird carcasses encountered in the field.

If a bird carcass is found, the following details will be recorded: GPS location of each bird carcass, photographic record, carcass condition (intact - carcass that is completely intact or not badly decomposed; scavenged - evidence that the carcass was fed upon by a scavenger/predator; or feather spot - ten or more feathers indicating predation or scavenging or two or more primary feathers must be present to consider the carcass a casualty), distance from the turbine, date and time.

Carcass removal trials and searcher efficiency trials will be undertaken to account for the ability of the dog to find bird carcasses and the likelihood of scavenging of carcasses by animals. This is done to ensure a more accurate estimation of the total number of collision victims. During carcass removal trials, a carcass is placed in a study area periodically and is monitored for a set number of days or until scavengers remove the carcass. A determination on carcass removal is made when no body parts containing flesh or bone or >10 disarticulated feathers can be found. During searcher efficiency trials, a number of carcasses

are placed in a study area by one worker, then searched for by the dog later. The result of these trials is a correction factor that can be applied to the results of the carcass searches.

2.2.4 Monitoring of Proposed Enhancement Site

The Proposed Enhancement Site 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 adaptation and implementation of improved methods and measures as they emerge, or intensification of successful measures deployed from farm plan to farm plan.

The monitoring measures will include:

- The enhancement areas 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 (six hours in duration). These surveys will be undertaken once a month March to August inclusive, at each enhancement area, each year.
- Passerine point counts will be undertaken monthly from April to September inclusive in each year at each of the hen harrier habitat 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 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.

Following commencement of the BMEP, the efficacy of the enhancement measures will be reviewed yearly. Analysis of the data collected will be the basis for a review of the measures and techniques employed. This analysis will be contained in an annual report. 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.

Additional monitoring measures will include:

- **Habitat scoring** The proposed hen harrier habitat enhancement areas will be scored based on the Hen Harrier Project scorecards for Bog and Heath (Areas A, B, C, D, E, F, G, H, I and J) and Grassland (Areas 1 and 2). Scoring will be carried out based on the methods outlined in the Hen Harrier Project guidance documents for each habitat type. Scoring will be carried out between May 15th and August 31st as per these methods.
- **Vegetation sampling** A number of fixed relevé sites (i.e. permanent quadrats) will be set up in the proposed hen harrier habitat enhancement lands. Data will be recorded prior to the commencement of the enhancement plan 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 annually following the commencement of the BMEP in place to establish the extent of habitat improvement resulting from management practices.

Reports detailing the monitoring works carried out, the results obtained and a review of their success, along with any suggestions for amendments to the plan will be prepared and submitted to the planning authority yearly following commencement of the plan. The farm plan agreements and enhancement area plan agreements will provide for such amendments.

2.2.5 Summary

Table 7 - 7 - 2 summarises the proposed bird monitoring schedule for each monitoring year.

Table 7 - 7 - 2 Proposed bird monitoring schedule

Survey	Year	Period	Visits	Survey Method
Vantage Point Surveys	Operational years 1, 2, 3, 5, 10 and 15	Each month of the year	Once monthly to each survey location (VP 1, 2, 3, and 4)	6-hour vantage point surveys, following NatureScot (2025)
Breeding Raptor Surveys	Operational years 1, 2, 3, 5, 10 and 15	April to July inclusive	Once monthly to each survey location	6-hour vantage point watches, following Hardey <i>et al.</i> (2013)
Collision Monitoring	Operational years 1, 2, 3, 5, 10 and 15	Each month of the year	Once monthly to each turbine	Carcass searches following SNH (2009) and search methods adopted by Duffy and Steward (2008).
Enhancement Areas Hen Harrier Surveys	Every Year	March to August inclusive	6 visits per year	12 fixed, 6-hour, Vantage Point Surveys. One at each enhancement area.
Passerine Surveys	Every Year	April to September inclusive	6 visits per year	Country-side bird survey methodology at each of the 12 enhancement areas
Habitat Mapping, Habitat Scoring and Vegetation Sampling	Every Year	Annually	Once per year for each enhancement area	As described in Section 2.2.4

2.3 Decommissioning Monitoring

It is proposed that decommissioning works will commence outside the bird nesting season (1st of March to 31st of August inclusive) to avoid the most sensitive time of the year for most bird species with the potential to use the site and its environs.

Decommissioning surveys will be undertaken prior to the initiation of works at the Proposed Wind Farm Site. The survey will aim to identify sensitive sites (e.g. nests or roosts). Any requirement for decommissioning works to run into subsequent breeding or winter seasons following the commencement of works will be subject to a repeat of the decommissioning bird surveys. These surveys will be conducted once per month during the breeding season (April to July) and once at the start of the winter season (October).

Monitoring will be undertaken by a suitably qualified ornithologist. The survey will include a thorough walkover survey to a 500m radius of the permanent built infrastructure footprint of the Proposed Project and/or all works areas. If winter roosts or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring at the beginning of the first winter or breeding season of the construction phase. If the roost/nest is found to be active during the construction phase no works shall be undertaken, works will cease within a species-specific buffer of this location (e.g. Forestry Commission Scotland, 2006; Goodship and Furness 2022; Ruddock and Whitfield, 2007) in line with best practice. No works shall be permitted within the buffer until it can be demonstrated that the roost or nest is no longer occupied.

All site staff and subcontractors will be made aware of any restrictions to be imposed by means of a toolbox talk and a map of the 'no-work zone' will be made available to all construction staff. The restricted area will also be marked off using hazard-tape fencing to alert all personnel on site to the suspension of works within that area.

2.4 Reporting

A report summarising the findings of bird monitoring surveys will be submitted to the Planning Authority at the end of each monitoring year. The report will provide the results of the surveys and discuss potential impacts on birds (particularly KORs) and any recommendations that may inform additional mitigation measures during the operational phase of the wind farm project.

2.5 Sharing Ecological Data

As a measure to support conservation research and policy, it is proposed to submit the monitoring survey data and information to the National Biodiversity Data Centre (NBDC) and to BirdWatch Ireland to contribute to the upcoming bird atlas (2027) on relevant ecological records, for example, information on the location of breeding territories and nest sites of bird species of conservation concern (e.g., Red-List Species as per the most recent BoCCI). The submission of the data will follow relevant standards and will be provided in the preferred NBDC excel template. This measure will be fulfilled within three months of each monitoring year, as relevant, in the event of a successful application. This commitment ensures the project is contributing to the aims of Objective Four, Outcome 4B of the Ireland's 4th National Biodiversity Action Plan: Data relevant to biodiversity and ecosystems, including conservation needs, is widely accessible and standardised.

3. BIBLIOGRAPHY

Duffy, K. and Steward, M. (2008). Turbine search methods and carcass removal trials at the Braes of Doune windfarm. Natural Research Information Note 4, Natural Research Ltd, Banchory, UK.

Edkins, M.T. (2014). Impacts of wind energy developments on birds and bats: looking into the problem. Report to FPL Energy, Florida, USA.

Forestry Commission Scotland (2006). Forest operations and birds in Scottish forests – the law and good practice. Forestry Commission Scotland, Scotland.

Goodship, N.M. and Furness, R.W. (2022). Disturbance distances review: an updated literature review of disturbance distance of selected bird species. NatureScot Research Report 1283, Inverness, Scotland.

Hardey, J., Crick, H.Q.P., Wernham, C.V., Riley, H., Etheridge, B. and Thompson, D.B.A. (2013). Raptors: a field guide for surveys and monitoring [3rd Edition]. The Stationary Office, Edinburgh.

Hen Harrier Project (2021) Hen Harrier Programme Field Guidance for scoring Bog and Heath. Oranmore, Co. Galway.

Hen Harrier Project (2021) Hen Harrier Programme Field Guidance for scoring Species Rich Grassland. Oranmore, Co. Galway.

NatureScot (2025). Recommended bird survey methods to inform impact assessment of onshore wind farms. Scottish Natural Heritage, Inverness, Scotland.

Meredith, C., Venosta, M. and Resson, R. (2002). Cordington *Wind Farm Avian Avoidance Behaviour Report 2002*. Biosis Research Project.

Ruddock, M. and Whitfield, D. P. (2007). A review of disturbance distances in selected bird species. Natural Research, Banchory, UK.

SNH (2009). Monitoring the impact of onshore wind farms on birds. Scottish Natural Heritage, Inverness, Scotland.

SNH (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Scottish Natural Heritage, Inverness, Scotland.