APPENDIX 7-8

BIRD MONITORING PROGRAMME

Appendix 7-8 – Post-Construction Monitoring Programme

Glenard Wind Farm

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1. INTRODUCTION

This Bird Monitoring Programme has been prepared by MKO for the proposed Glenard Wind Farm, Co. Donegal.

This document provides a timeframe and monitoring schedule for the bird population of the study area during the construction and post-construction phase of the project. Breeding and wintering bird surveys were undertaken during the period September 2016 to September 2019 and January to September 2021, encompassing four full breeding seasons and three full winter seasons, as well as autumn and spring migration periods. These surveys were in line with SNH guidance entitled *"Recommended bird survey methods to inform impact assessment of onshore wind farms"* (SNH, 2017). In addition, Canavan Associates carried out field surveys at the western section of the wind farm site between October 2019 and August 2020.

The surveys undertaken to date have informed the various proposed bird monitoring measures outlined in this document.

1.1 Key Ornithological Receptors and Birds of Conservation Concern

Table 1-1 lists the Key Ornithological Receptors recorded within the study area during field surveys.

Table 1-1 Key Ornithological Receptors identified during field surveys undertaken at the Glenard Wind Farm

Common Name	Latin Name	Conservation Status
Golden Eagle	*Aquila chrysaetos*	Annex I EU Birds Directive
Golden Plover	*Pluvialis apricaria*	Annex I EU Birds Directive; SCI of nearby SPAs; BoCCI Red Listed (Breeding & Wintering Populations)
Hen Harrier	*Circus cyaneus*	Annex I EU Birds Directive
Merlin	*Falco columbarius*	Annex I EU Birds Directive
Peregrine	*Falco peregrinus*	Annex I EU Birds Directive
Whooper Swan	*Cygnus cygnus*	Annex I EU Birds Directive; SCI of nearby SPAs
Black-headed Gull	*Larus ridibundus*	SCI of Lough Foyle SPA, BoCCI Red Listed (Breeding Populations)
Common Gull	*Larus canus*	SCI of Lough Foyle SPA
Grey Heron	*Ardea cinerea*	SCI of Lough Swilly SPA
Greylag Goose	*Anser anser*	SCI of Lough Foyle SPA
Mallard	*Anas platyrhynchos*	SCI of Lough Foyle SPA
Curlew	*Numenius arquata*	BoCCI Red-Listed Species (Breeding Populations)
Kestrel	*Falco tinnunculus*	BoCCI Red Listed (Breeding Populations)
Snipe	*Gallinago gallinago*	BoCCI Red Listed (Breeding & Wintering Populations)
Woodcock	*Scolopax rusticola*	BoCCI Red-Listed Species (Breeding Populations)
Buzzard	*Buteo buteo*	Raptor Species; Schedule 4 of the Wildlife Act 1976
Sparrowhawk	*Accipiter nisus*	Raptor Species; Schedule 4 of the Wildlife Act 1976

1.2 Objectives

This document has been prepared having regard to the following objectives:

- To ensure any required pre-commencement/ pre-construction phase monitoring is scheduled to ensure any potential impacts are avoided.
- To record usage of the site by birds and interaction with operating turbines during the post-construction phase of the development.
- To monitor short-term and long-term effects on bird populations with a particular emphasis on wintering and breeding birds deemed to be of high conservation concern (Annex I; EU Birds Directive and BoCCI red list species).
- To undertake collision monitoring and corpse searches for potential bird fatalities as a result of a collision with turbine blades.
- Report on findings of post construction monitoring at the end of each monitoring year (Year 1, 2, 3, 5, 10 and 15 of the lifetime of the wind farm).

2. METHODOLOGY

2.1 Pre-construction Bird 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 wind farm. The survey will aim to identify sensitive sites e.g. nests or roosts depending on the season in question.

Monitoring will be undertaken by a suitably qualified ornithologist. The survey will include a thorough walkover survey to a 500m radius of the development footprint 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 suitable buffer e.g. 500m (as per Forestry Commission Scotland 2006; Ruddock & 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 through 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 Post-construction Bird Monitoring

Survey methods employed for post-construction monitoring will be in line with guidelines issued by the Scottish Natural Heritage (SNH, 2009). Post-construction monitoring will be undertaken in Years 1, 2, 3, 5, 10 and 15 of the lifetime of the wind farm.

Post-construction monitoring will include vantage point surveys, breeding bird surveys, hen harrier winter roost surveys and a programme of regular corpse searching during the operational phase of the wind farm project.

Bird monitoring will include the following survey methods:

- Monthly flight activity surveys: vantage point surveys.
- Breeding Bird surveys: Adapted Brown & Shepard
- Hen Harrier Winter Roost Surveys
- Targeted bird collision surveys (corpse searches) will be undertaken with trained dogs. 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 monthly during operational years 1, 2, 3, 5, 10 and 15 of the lifetime of the wind farm. The methodology for vantage point watches will follow guidelines issued by the SNH (2009) and SNH (2017). The proposed vantage point watches will adhere to a minimum of 36 hours/VP per season as per guidelines issued by SNH. Monthly visits will be undertaken between January and December inclusive. During each visit, six-hour vantage point watches will be undertaken from each fixed vantage point location. Vantage points will be undertaken from the same locations that

pre-planning surveys which informed the EIAR application of the proposed development (i.e. VPs 1a, 2a, 3a, 4, 5a, 6 & 7). Vantage point surveys will be timed to provide a spread over the full daylight period including dawn and dusk watches to coincide with the highest periods of bird activity. Behavioural categories for the observation of bird interactions with operational wind farms will be in line with terminology outlined by Meredith et al., (2002).

2.2.2 Distribution and Abundance Surveys

During monitoring years, post-construction distribution and abundance surveys will include adapted Brown & Shepard surveys. Survey methodology will be similar to methods employed for baseline EIAR surveys which will allow a comparison of data to be made for each monitoring year.

The standard approach for surveying breeding waders is outlined in Brown and Shepard (1993) and Gilbert et al. (1998). It is recommended that surveys for breeding waders should be undertaken between 08:30-18:00 with at least four visits undertaken during the core breeding period: April and July. On site surveys will consist of the surveyors walking a route within quadrats which will have been selected to survey all suitable habitat types on site and to a 500m radius from the wind farm site (where access allows). Quadrat coverage should be such that every point of suitable habitat (on site and to a 500m radius) should be surveyed to within 100m. Surveyors should spend 20-25 minutes in each 500 x 500m quadrat (or fields). These surveys will follow the same routes that were followed during pre-planning surveys.

A total of four site visits will be undertaken during the bird breeding season for each monitoring year and timed to coincide with the core breeding period April - July. Notes will be recorded on nesting and territorial behaviour and breeding signs using standard BTO codes. Non-breeding behaviour such as birds flying over the site will also be recorded.

2.2.3 Winter Distribution and Abundance Surveys

During monitoring years, Hen Harrier Roost Surveys will also be undertaken monthly during the winter season (October – March inclusive). Vantage points will utilize the same locations that were used during pre-planning surveys. Survey methodology should follow those outlined by Gilbert et al. (1998) and the 'Hen Harrier Roost Types and Guidelines to Roost Watching' (unpublished guidance document by the Irish Hen Harrier Winter Survey, 2019). These surveys will be undertaken at the same locations as during baseline EIAR surveys which informed the EIAR application of the proposed development. These surveys were conducted over suitable habitat for roosting hen harrier within 2km of the wind farm site (as per SNH 2017)

2.2.4 Collision Searches (Bird Casualties)

Surveys for bird casualties will follow survey methods broadly based on guidelines issued by the Scottish Natural Heritage (2009) and search methods adopted by Duffy & Steward, *'Turbine Search Methods and Carcass Removal Trials at the Braes of Doune Windfarm'* (Natural Research Information Note 4. Natural Research Ltd, Banchory, UK, 2008).

The study area will be visited once per month during operational Years 1, 2, 3, 5, 10 and 15 of the lifetime of the wind farm.

During each visit, the base of each operating turbine will be searched for bird corpses. The area to be searched will depend on the constructed turbine size and surrounding landscape. A trained dog and handler should be used where possible to locate corpses.

The following details will be considered during field surveys: GPS location of each bird carcass, photographic record, carcass condition (intact (carcass that is completely intact or not badly composed),

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 location, date, time, etc.

Corpse searching work will be calibrated to account for the ability to find bird corpses and likelihood of scavenging of corpses by animals. This will ensure a more accurate estimation of the total number of collision victims. To allow for this, sample bird corpses of various bird sizes will be placed within the various habitats found within proximity of the turbine locations. Carcasses will be left out in the trial areas by one worker and searched for by another two days later. A 36-hour period between laying carcasses and searching for them ensures no visual cues will be left by the carcass layer which may deter scavengers. The locations of all carcasses will be logged using GPS by the layer and the finder. Any signs of predation will be recorded. Birds will be left in place for a further four weeks before a further examination will occur in order to determine further scavenging levels. The level of scavenger activity that occurs will then be used to help calibrate the detection rate and estimate a likely percentage of collisions that may be removed by scavengers between searches.

Results of bird casualties will be incorporated into a report which will be submitted to the planning authority at the end of each monitoring year.

3. TIMEFRAME OF PROPOSED MONITORING WORKS

It is proposed to undertake bird monitoring surveys during years 1, 2, 3, 5, 10 and 15 of the wind farm operation.

Table 3-1 below describes the proposed bird monitoring work schedule for each monitoring year for the proposed wind farm development

Table 3-1 Proposed bird monitoring work schedule for each monitoring year at the Glenard Wind Farm

Survey Type	Phase	Period	No. of Visits	Survey Method
Vantage Point Surveys	Year 1, 2, 3, 5, 10 and 15	January - December	1 visit/ VP / month for each monitoring year	Seven fixed, 6-hour, Vantage Point Surveys
Distribution and Abundance Survey (Breeding Season)	Year 1, 2, 3, 5, 10 and 15	April - July	4 visits / monitoring year	Adapted Brown & Shepard Survey
Winter Distribution and Abundance Surveys	Year 1, 2, 3, 5, 10 and 15	October - March	Monthly (Oct to March) for each monitoring year	Hen Harrier Roost Survey
Corpse Searches (Bird Casualties)	Year 1, 2, 3, 5, 10 and 15	January - December	1 visit/month for each monitoring year	Targeted corpse searches at turbine bases

4. REPORTING

A report summarising the findings of the bird monitoring surveys will be submitted to the Planning Authority, where required, within three months of each monitoring year. This will provide details of the various methods employed, the results of field surveys (vantage point watches, corpse searches, distribution and abundance surveys), potential effects/impacts on birds and any recommendations that may inform additional mitigation measures during the operational phase of the wind farm project.

Maps outlining flight lines of key target species will be produced using GIS software applications to accompany the final report at the end of each monitoring year.

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