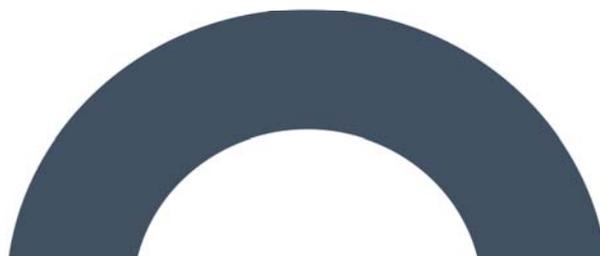


Appendix 7-7 – Bird Monitoring Programme

Croagh Wind Farm





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1. INTRODUCTION

This Bird Monitoring Programme has been prepared by MKO for the proposed Croagh Wind Farm, Co. Leitrim/Sligo.

This document provides a timeframe and monitoring schedule for the bird population of the study area during the post-construction phase of the project. Breeding and wintering bird surveys were undertaken during the period September 2017 to September 2019 encompassing two full breeding seasons and two full winter seasons, as well as autumn and spring migration periods, in line with SNH guidance on recommended bird survey methods to inform impact assessment for onshore wind energy developments (SNH, 2017). 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 lists the Key Ornithological Receptors recorded within the study area during field surveys.

Table 1 Key Ornithological Receptors identified during field surveys undertaken at the Croagh Community Wind Farm

| Common Name | Latin Name | Conservation Status |
|---------------|----------------------------|---|
| Whooper Swan | <i>Cygnus cygnus</i> | Annex I; EU Birds Directive, |
| Golden Plover | <i>Pluvialis apricaria</i> | Annex I; EU Birds Directive, BoCCI Red List & Irish Wildlife Act |
| Hen Harrier | <i>Circus cyaneus</i> | Annex I; EU Birds Directive; BoCCI Amber List & Irish Wildlife Act. |
| Merlin | <i>Falco columbarius</i> | Annex I; EU Birds Directive; BoCCI Amber List & Irish Wildlife Act. |
| Red Grouse | <i>Lagopus lagopus</i> | BOCCI Red Listed with regard to Breeding Populations |
| Woodcock | <i>Scolopax rusticola</i> | BOCCI Red Listed with regard to Breeding Populations |
| Buzzard | <i>Buteo buteo</i> | Raptor Species; Schedule 4 of the Wildlife Act 1976 |
| Sparrowhawk | <i>Accipiter nisus</i> | Raptor Species; Schedule 4 of the Wildlife Act 1976 |
| Kestrel | <i>Falco tinnunculus</i> | Raptor Species; Schedule 4 of the Wildlife Act 1976 |
| Snipe | <i>Gallinago gallinago</i> | BoCCI Amber Listed, Bio-indicator Species for Hen Harrier |

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 impacts on breeding birds 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 collision with turbine blades.
- › Report on findings of post construction monitoring at the end of each monitoring year (Year 1, 2, 3, 5, 10 & 15 of the life time of the wind farm).

2.1 Methodology

2.2 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 surveys will be undertaken prior to the initiation of works at the wind farm.

A breeding bird survey will be undertaken between April and July. 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, where access allows. If breeding activity of birds of high conservation concern is identified, the nest site will be located, and earmarked for monitoring at the beginning of the first breeding season of the construction phase. If it is found to be active during the construction phase no works shall be undertaken within a 500m buffer (Forestry Commission Scotland 2006; Ruddock & Whitfield 2007) in line with best practise. No works shall be permitted within the buffer until it can be demonstrated that the 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.

2.3 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 life time of the wind farm.

Post-construction monitoring will include ongoing breeding bird surveys, winter surveys and a programme of regular corpse searching of birds that may potentially collide with operating turbines during the operational phase of the wind farm project.

Bird monitoring will include the following survey methods:

- › Vantage Point Surveys
- › Distribution & Abundance Surveys (Particular focus on breeding and wintering hen harrier and upland breeding waders)
- › 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.

Vantage Point Surveys

Vantage point surveys will be undertaken monthly during operational years 1, 2, 3, 5, 10 and 15 of the life time of the wind farm. Methodology for vantage point watches will follow guidelines issued by the SNH (2009) & SNH (2017). The proposed vantage point watches will adhere to a minimum of 36 hours/VP during the breeding survey season as per guidelines issued by SNH. Monthly visits will be undertaken during monitoring years. During each visit, six-hour vantage point watches will be undertaken from a fixed vantage point location that offers an un-interrupted view of the study area. Vantage points will be undertaken from the same locations that pre-planning surveys which informed the EIAR application of the proposed development (i.e. VP1, VP3, VP4). 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).

Distribution & Abundance Surveys

During the breeding season, post-construction distribution & abundance surveys will incorporate a combination of Adapted Brown & Shepherd surveys and transect surveys (Bibby et al., 2000) as well as Breeding Raptor surveys within 2km of the development site with a particular emphasis on breeding hen harrier (Hardey et al., 2013). 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.

During Adapted Brown & Shepherd surveys and transect surveys within 500m, particular attention will be paid to upland breeding waders (e.g. curlew) as well as breeding hen harrier, although all bird species and breeding activity will be recorded. The standard approach for surveying upland breeding waders is outlined in Brown and Shepherd (1993) and Gilbert et al. (1998). 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 development/planning boundary (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 field). Four visits will be timed to coincide with the core survey period April – July during monitoring years. 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.

In addition, shortened vantage point watches will be undertaken within 2km of the development site, in areas of suitable breeding habitat, to survey for breeding raptors within the wider area (e.g. hen harrier) in line with Hardey et al., (2013). Aural and visual registrations will be recorded during field surveys.

Hen Harrier Roost Surveys

As recommended by Gilbert et al (1998), hen harrier roost surveys will be undertaken during the winter season (October – March). Survey work will be undertaken in accordance with methods devised by Hardey et al. (2013) and the 'Irish Hen Harrier Winter Roost Survey' (unpublished document coordinated by members of NPWS). Surveys will take place on a monthly basis between October and March. The surveys will focus on area of potential winter roosting habitat within a 2km radius of the proposed development area.

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).

It is proposed to undertake a minimum of one visit per month during each survey year. During each visit, searches will be undertaken at each operating turbine location by a team of two surveyors. A plot measuring 130m x 130m from the centre of each turbine location will be the subject of targeted 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.

Alternatively, a trained dog and handler may be used where possible to locate any carcasses.

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 will help to prevent disturbance from discouraging scavengers from attending the trial plots. The locations of all carcasses will be logged using GPS by the layer and the finder. Any signs of scavenging will be recorded. Birds will be left in place for a further two weeks before a further examination will occur in order to determine further scavenging levels. The level of scavenging which 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 issued in a final report 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 & 15 of the wind farm operation.

Table 2 below describes the proposed bird monitoring work schedule for each monitoring year for the proposed wind farm development

Table 2 Proposed bird monitoring work schedule for each monitoring year at the Croagh Wind Farm

| Survey Type | Phase | Period | No. of Visits | Survey Method |
|---|--------------------------|--------------------|--|--|
| Vantage Point Surveys | Year 1, 2, 3, 5, 10 & 15 | January - December | 3 visits / month | Three fixed, 6-hour, Vantage Point Surveys |
| Distribution & Abundance Survey (Breeding Season) | Year 1, 2, 3, 5, 10 & 15 | April - July | 4 visits / monitoring year | Adapted Brown & Shepherd Survey/Walked transect/Raptor VP Survey |
| Hen Harrier Roost Surveys | Year 1, 2, 3, 5, 10 & 15 | October - March | 6 visits / month | Hardey et al. (2013) and the 'Irish Hen Harrier Winter Roost Survey' (unpublished document coordinated by members of NPWS) |
| Corpse Searches (Bird Casualties) | Year 1, 2, 3, 5, 10 & 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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