

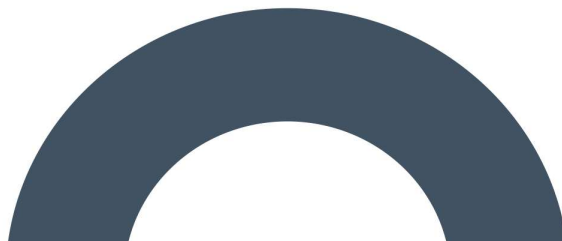


APPENDIX 7-7

BIRD MONITORING PROGRAMME

Bird Monitoring Programme

Carrow Wind Farm



DOCUMENT DETAILS

Client **Carrow Renewable Energy Ltd**

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1. INTRODUCTION

1.1 Background

This Bird Monitoring Programme has been prepared by MKO for the proposed Carrow Wind Farm. It provides a timeframe and monitoring schedule for the bird population in the study area during the operational phase of the project, informed by surveys undertaken to date. Bird surveys were undertaken from April 2021 to May 2023. Key ornithological receptors (KORs) in the study area 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 study area and their interaction with operating turbines
- To monitor short-term and long-term effects on bird populations in the study area, 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 extended 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.

1.2 Key Ornithological Receptors

Table 7 - 7 - 1 lists the key ornithological receptors (KORs) recorded within the Wind Farm Study Area during surveys conducted from April 2021 to May 2023 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 & Raptor & SCI of Slievefelim to Silvermines Mountains SPA (Breeding Populations)
Peregrine Falcon	<i>Falco peregrinus</i>	Annex I & Raptor (All Seasons)
Kestrel	<i>Falco tinnunculus</i>	Red List (breeding) & Raptor (All Seasons)
Snipe	<i>Gallinago gallinago</i>	Red List (breeding & wintering) (Wintering Populations)
Woodcock	<i>Scolopax rusticola</i>	Red List (Breeding Populations)
Buzzard	<i>Buteo buteo</i>	Raptor (All Seasons)
Sparrowhawk	<i>Accipiter nisus</i>	Raptor (All Seasons)

2. METHODOLOGY

2.1 Pre-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 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 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 species-specific buffer of this location in line with best practice guidance (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

Operational monitoring will be undertaken in Years 1, 2, 3, 5, 10 and 15 of the lifetime of the wind farm, following SNH (2009) guidance. The surveys that will be undertaken are:

- > Vantage Point Surveys
- > Collision Searches (Bird Casualties)

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 NatureScot (2025). The proposed vantage point watches will adhere to a minimum of 36 hours/VP per season as per guidelines issued by NatureScot. Monthly visits will be undertaken for 12 consecutive months during each monitoring year, with surveys commencing at the start of the breeding season (April) or the start of the winter season (October). During each visit, six-hour vantage point watches will be undertaken from each 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 Project (i.e. VPs 1, 2, 3, 4 & 5)¹. 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).

¹ The adequacy of the vantage point viewsheds will be monitored throughout the lifetime of the wind farm.

2.2.2 Collision Searches (Bird Casualties)

Carcass searches for bird casualties as a result of collision with turbines will follow survey methods broadly based on guidelines issued by the SNH (2009) and search methods adopted by Duffy and Steward (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 carcasses. The area to be searched will be based on the turbine size and surrounding landscape. A trained dog and handler should be used to locate carcasses. Edkins (2014) recommends the "search width should be equal to the maximum rotor tip height". Given a turbine rotor tip height 185 meters the search area surrounding the base of the turbine would be taken as a radius of 92.5 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.

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 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, 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.

2.2.3 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	Year 1, 2, 3, 5, 10 and 15	Every month	1 visit per vantage point per month for each monitoring year	Five 6-hour vantage point surveys
Collision Monitoring Surveys	Year 1, 2, 3, 5, 10 and 15	Every month	1 visit per turbine per month for each monitoring year	Targeted searches at turbine bases

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 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.

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 species-specific buffer of this location (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 (i.e. Year 1, 2, 3, 5, 10 and 15). 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 Plan2: Data relevant to biodiversity and ecosystems, including conservation needs, is widely accessible and standardised.

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