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Desktop Study and Survey Methodology

Proposed Ballykett Wind Farm, Co. Clare.

Greensource

November 2022

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1. Methodology

1.1 Scientific Nomenclature: Conventions

Species nomenclature follows the standard form of the common name, followed by the binomial, on the first instance of usage in the text or the first instance of usage in a table. Thereafter, for any subsequent usage, common names only are used.

1.2 Desktop Study

An initial desktop study was carried out by MWP prior to the commencement of the field surveys.

The desktop study provided the opportunity to gain an understanding of the bird populations' occurring within the study area via an investigation of the habitats present and previous species records. The study area includes lands directly affected by the project, as well as habitats that may be geographically distant from the project but whose avian interests may be indirectly affected by the various phases of the project from construction through to decommissioning.

Available ornithological information and data was reviewed, including:

- Ordnance Survey Ireland (OSI) aerial photography and 1:50000 mapping, and other sources of online aerial imagery
- Review of online web-mappers: National Parks and Wildlife Service (NPWS), National Biodiversity Data Centre (NBDC).
- Review of Bird Atlases: (Sharrock, 1976; Lack, 1986; Gibbons *et al.*, 1993; Balmer *et al.*, 2013).
- Review of Birds of Conservation Concern in Ireland (BoCCI) 2020-2026 (Gilbert *et al.*, 2021).
- Review of BirdWatch Ireland I-WeBS (Irish Wetland Bird Surveys) site information.
- General ornithological information available from BirdWatch Ireland (www.birdwatchireland.ie).
- Irish Bird Reports and the journal *Irish Birds*, published by BirdWatch Ireland.
- Review of the 2015 National Survey of Breeding Hen Harrier in Ireland Report (Ruddock *et al.* 2016).
- Other information sources and reports footnoted throughout the report.

1.3 Criteria for Identifying Target Species

Target species are typically those species which are afforded a higher level of legislative protection, or which are considered to be more sensitive to potential impacts from wind farm developments by virtue of their behaviour (SNH, 2017). Target species should be restricted to those likely to be affected by wind farms (SNH, 2017).

A reconnaissance survey was undertaken by the Project Ornithologist prior to the commencement of bird surveys to review the habitats occurring and the general landscape character of the study area in the context of its potential ornithological importance.

The results of the comprehensive desk-top study, in conjunction with the site reconnaissance survey, were used to identify target bird species which were considered likely to occur. These target species formed the main focus of the bird surveys undertaken.

With regards to drawing up the target species list for Ballykett Wind Farm, the SNH (2017) guidance was referred to. This guidance outlines important sources of potential target species. Additionally, Special Conservation Interest (SCI) species for SPAs located within a 20 km radius of the site were considered using guidelines provided by SNH 'Assessing Connectivity with Special Protection Areas (SPA)' (SNH, 2016) to assess the core foraging distances of certain species and potential connectivity between the site and SPAs. In conjunction with the findings of the desk-top study, the target species list was drawn from:

- Annex I of the Birds Directive
- Species protected under the Fourth Schedule of the Wildlife Acts 1976-2012 (buzzards, eagles, falcons, harriers, hawks, kites, osprey, owls)
- Red-listed birds of Conservation Concern (Gilbert *et al.*, 2021).
- Special Conservation Interest (SCI) species of SPAs within a 20 km radius of the site

As outlined above and as set out in SNH (2017), target species typically comprise those species which are afforded a higher level of legislative protection and should be restricted to those likely to be affected by wind farms. Therefore, only red-listed species have been included as target species, unless the species meets one of the other target species selection criteria as outlined above e.g., Annex I. However, to ensure other species which may potentially be sensitive to wind farms were not missed during surveys, all other species of gull, wader, duck, diver, goose, swan, cormorant and heron were included as secondary species. It is generally considered that passerine species are not significantly impacted by wind farms (SNH, 2017); however, their presence was recorded to provide a complete picture of bird usage of the site.

1.4 Field Surveys

Initial recce walkovers of the site were carried out in October 2020 to assist in determining the scope and extent of the surveys. Field surveys were undertaken from October 2020 to gather detailed information on bird distribution, abundance and flight activity to predict the potential effects of the wind farm proposal on birds. All surveys were carried out in accordance with Scottish Natural Heritage Guidance (2017).

The field surveys comprised two main elements: vantage point (VP) surveys to gather flight data for target species, and targeted distribution and abundance surveys undertaken to gain an understanding of the bird species occurring in the area which may be subject to impacts from the development.

The field surveys comprised of vantage point surveys and targeted distribution and abundance surveys comprising of:

- Walkover transect surveys
- Hinterland surveys
- Wintering wildfowl surveys
- Hen Harrier Roost Watches
- Breeding Birds of Prey

Bird surveys have been ongoing at the Ballykett Wind Farm site since Winter 2020.

Season 1.	Winter 2020-21	October 2020 to March 2021
Season 2.	Summer 2021	April to September 2021

Season 3.	Winter 2021-22	October 2021 to March 2022
Season 4.	Summer 2022	April to September 2022

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1.4.1 Vantage Point (VP) Surveys

Vantage point (VP) surveys were carried out by suitably qualified personnel (Appendix 1: Surveyor Profile) on a monthly basis between October 2020 and September 2022. The overall aim of these surveys was to quantify the level of target species flight activity within the flight activity survey area. The flight activity survey area was taken to be that area encompassing the potential development area, extending out to a distance of 500 m beyond the development boundary.

1.4.1.1 Selection of VP Locations

Vantage points are ideally located on elevated areas, or other areas, which provide clear views over the study area. Achieving maximum visibility over as much of the site as possible is important for these surveys. Two Vantage Point (VPs) locations were selected to cover the site achieving as much visibility as possible and these two locations were visited monthly during the winter and summer periods.

In order to minimise observer effect on bird behaviour, VPs should ideally be located outside the survey area but should be located as close as possible. SNH (2017) stipulates that where VPs are located within the study area, they should not be used simultaneously with other VPs which overlook them to minimise potential observer effect on birds.

Two VP locations (VP1-2) were selected for coverage of the proposed Wind Farm Site and were surveyed over all seasons. The location of each VP using latitude and longitude co-ordinates are provided **Table 1**, below.

Table 1: Vantage point locations at the proposed Ballykett wind farm site.

VP No.	Latitude, Longitude
1	52.669486, -9.4402428
2	52.659296, -9.4672430

Each VP was watched for a total of six hours per month. This resulted in a total of 12 survey hours per month and 72 survey hours in total over each season. The watches were divided into three-hour periods for each individual watch.

1.4.1.2 Viewshed Analysis of VPs

According to SNH (2017), vantage point viewsheds should extend to 2km. Viewshed analysis was undertaken for each VP location to determine visual coverage of the survey area. Viewsheds were set to observer height of 2m showing a view of everything over 25m height. Viewsheds encompassed a 2km radius with 360° view. Each viewshed was then cropped to an 180° arc showing the relevant direction of view..

Viewsheds from each VP showing the extent of site coverage are provided in **Figure 1** below.

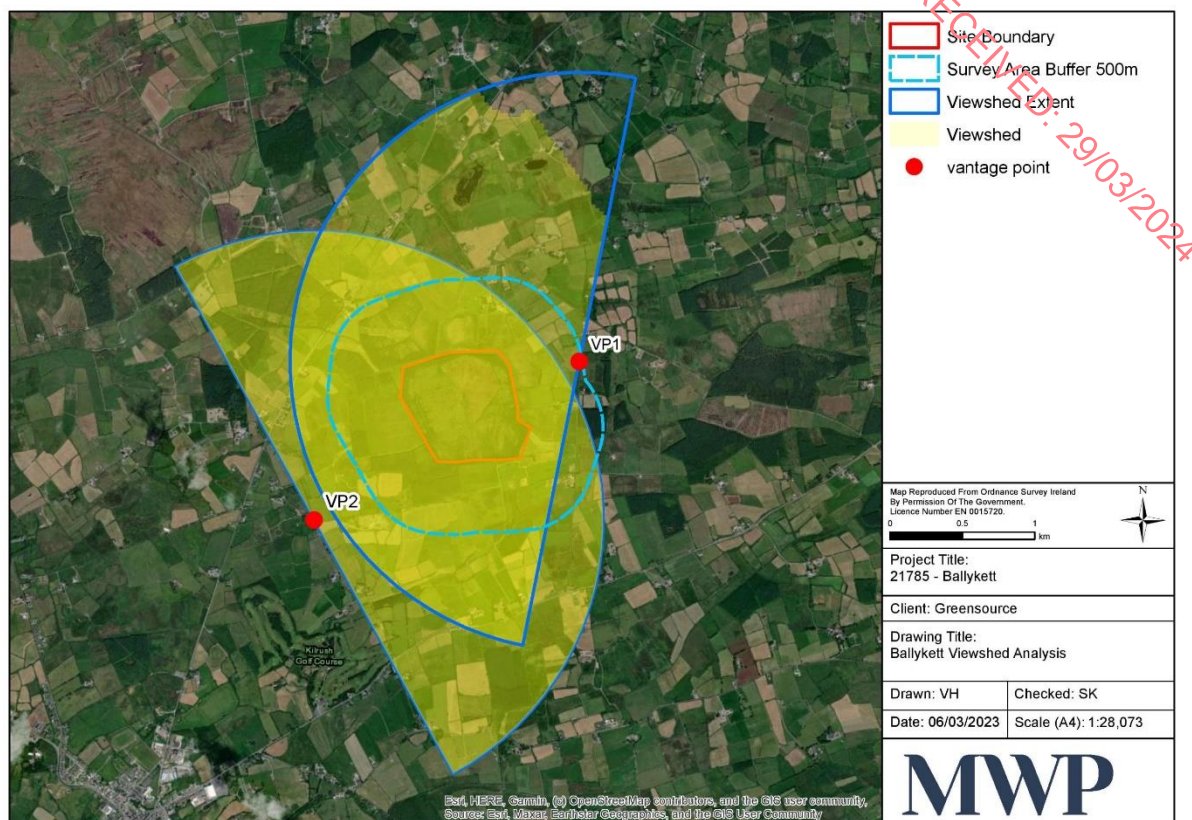


Figure 1: Vantage Point locations, with the flight activity survey area 500m buffer, viewsheds from each VP and the site boundary.

1.4.1.3 Recording of Flight Data

Target species are typically those species that are afforded a higher level of legislative protection, or which are more sensitive to potential impacts from wind farm developments by virtue of their behavior (SNH, 2017). The target species list was drawn from:

- Annex I of the Birds Directive (2009/147/EC)
- Special Conservation Interests (SCI) of Special Protection Areas (SPA) within 20 km radius of the development site
- Fourth Schedule species protected under the Wildlife Acts 1976-2012 (Buzzards, eagles, falcons, harriers, hawks, kites, osprey, owls)
- Red-listed birds of Conservation Concern (BoCCI)

During VP surveys the flight behavior of target species was recorded. Behavior of secondary species was also recorded; however, recording of secondary species was subsidiary to recording of target species (SNH, 2017).

At the time of each species observation the following information was recorded:

- The time that the bird was detected
- The flight duration(seconds) within various flight height categories (0-20m, 20-50m, 50-100, 100-180m and >180)
- Sex and age of the bird(s) (adult/juvenile), where possible to determine

- Type of activity/behavior such as hunting, flying, displaying etc.
- Estimation of actual flight height
- Habitat(s) where the bird was observed
- Weather conditions at time of sighting including wind speed, direction, degree of visibility.

Once an initial sighting was made, each target or secondary species was observed until lost from view. Flight paths were recorded as observed, including where birds travelled or were observed outside of the flight activity survey area; such that all flight activity within the broader landscape was encompassed.

1.4.1.4 Recording of Other Species

During the VP surveys, counts of non-target/secondary species were also recorded where recording did not infringe on recording of target/secondary species flight data.

1.4.2 Distribution and Abundance Surveys

1.4.2.1 Transect Surveys

A transect survey is a survey along a defined route within the study area. The overall aim of the transect surveys was to assess general bird distribution throughout the site and gather data on bird usage of the site. Transect surveys were completed for breeding birds in summer 2021 and for wintering birds in winter 2021/22 and were carried out as close as possible to Common Bird Census (CBS) methodology within the site confines

The transect route was selected to provide representative coverage of all habitats, both open and closed, occurring within the Site boundary e.g., clear-fell forestry, young/mature forestry, scrub, improved agricultural grassland, etc. The transect route followed an existing landowner access track through areas of forestry and scrub across the center of the subject Site.

During each transect survey, all passerines and target bird species seen or heard, typically within 100m of the route, were recorded, although the topography of the landscape often allowed for the detection of birds at greater distances. One transect route was used for the site (see **Figure 2**, below).

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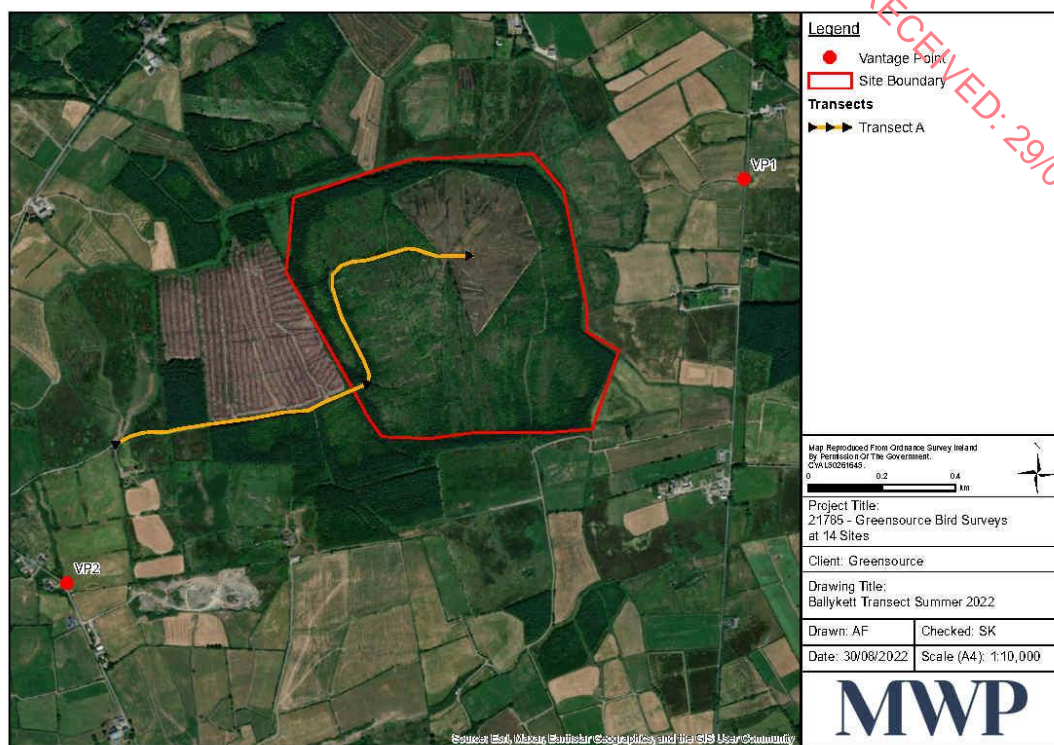


Figure 2: Transect survey route and the site boundary

1.4.2.2 Hinterland Surveys

A driven survey of the hinterland surrounding the proposed development site to a 5km radius, was carried out over each season, summer and winter. Surveyors travelled roads throughout the region, regularly stopping at locations where good views were afforded over suitable habitats for feeding wildfowl, waders or hunting/breeding habitats for Heh Harrier or other birds of prey, to record all bird species of interest seen in fields or habitats around the proposed development area. The purpose of these counts is to gain a better understanding of the birds utilising surrounding habitats outside of the site and to gather data on those species frequenting the region which may or may not traverse the site.

1.4.2.3 Wintering Wildfowl Surveys

Wetland sites within 5km of the wind farm were surveyed during winter 2020/2021, 2021-2022 and remain ongoing in winter 2022/2023. The survey area extends 5km from the wind farm site and exceeds the 500m radius distance for foraging wildfowl and the 1km radius recommendation for roosting wildfowl surveys stipulated by SNH (SNH, 2017).

These surveys provide information on the distribution and abundance of wildfowl and wader species within the wider region. These surveys supply better knowledge of areas within the wider region of the wind farm where a buildup of large flocks could occur to forage and/or roost over the winter season.

Counts were undertaken during daylight hours at suitable vantage points for wetland sites with 5km of the site boundary (Appendix 9).

1.4.2.4 Hen Harrier Roost Surveys

Hen Harrier Roost surveys were carried out over the winter seasons 2020-2021 and 2021-2022 at known historical roost sites within 5 km of the site boundary (source of data: Irish Hen Harrier Winter Survey). Methodology followed that used in the Irish Hen Harrier Winter Roost Survey (O'Donoghue 2019).

1.4.2.5 Breeding Birds of Prey Surveys

During summer months bird of prey territories (Hen Harrier, Merlin, Kestrel, Sparrowhawk & Buzzard), were searched for within the site and around the outer 500m buffer zone within 2km radius where suitable habitats existed. These surveys were carried out in April and again in May/June of the 2021 and 2022 breeding seasons.

2. Existing Environment

2.1 Site Location

The proposed wind farm site is located in southwest County Clare, approximately 3.5 km northeast of Kilrush. The site can be accessed via a local road R483 which travels northeast from the N68 National Road in Kilrush (see **Figure 3** below). The proposed development site comprises mainly commercial forestry, clearfell and an area of peatland.

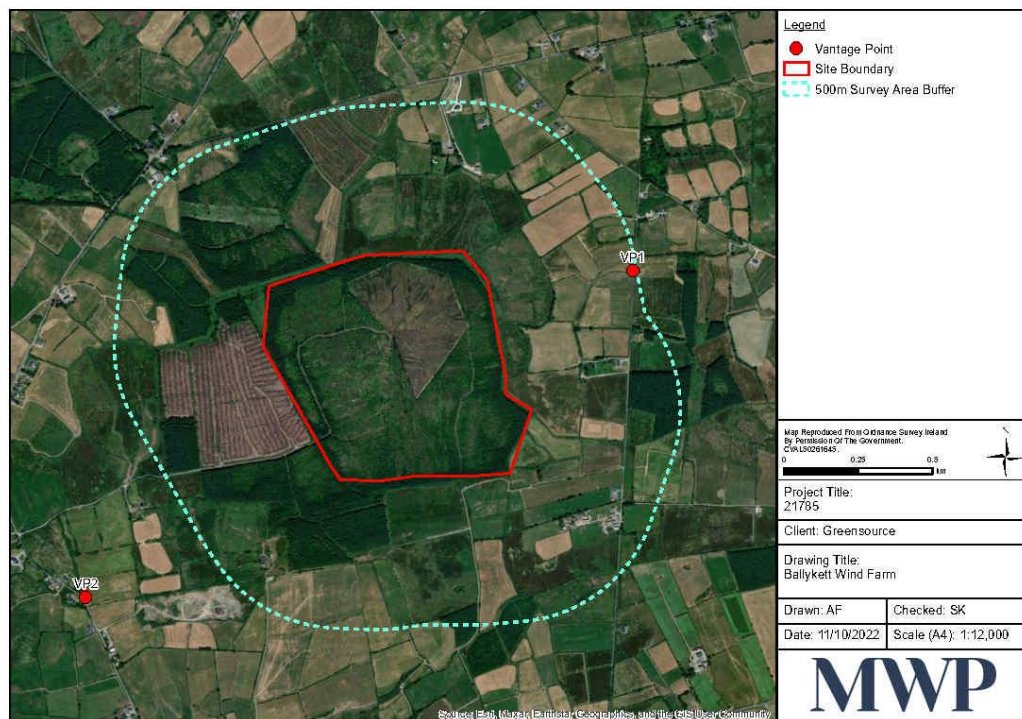


Figure 3: Ballykett wind farm site overview

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2.2 Natura 2000 Designated Sites

2.2.1 Special Protection Areas (SPAs)

The European Union Directive on the Conservation of Wild Birds, known as the Birds Directive (Directive 2009/147/EC) requires Member States to designate legally protected areas for the conservation of endangered or migratory species of bird, as listed on Annex I of the Directive. These areas are known as Special Protection Areas (SPAs) and, since 1994, all SPAs form part of the Natura 2000 network of protected sites. The EU Birds Directive is implemented in Irish law under the European Communities (Birds and Natural Habitats) Regulations 2011.

An on-line search for SPAs within 20 km of the proposal site was carried out to identify any potential 'connectivity' between the site and SPAs, and to assess whether pathways exist through which the proposal could impact on qualifying interest species, as recommended in the guidance document 'Assessing Connectivity with Special Protection Areas (SPAs)' (SNH, 2016). Within this Scottish Natural Heritage (SNH) guidance document, core foraging ranges from nest-sites and roost-sites are published for both the breeding and winter seasons for the bird species frequently encountered when considering wind farm development proposals. SNH recommends that typically the core foraging range should be used when determining whether there is connectivity between the proposal and qualifying interest species. Core foraging ranges for wind farm sensitive species can range from <5 km to 20 km (SNH, 2016).

An on-line search determined that there are four SPAs within 20 km of the site, as outlined in **Table 2**. Please see **Figure 4** below.

Table 2: Special Protection Areas (SPAs) within a 20 km radius of the development site.

Designated Site	Distance from wind farm site	Qualifying Interests
River Shannon and River Fergus Estuaries SPA (004077)	4.6 km southwest of the site	<ul style="list-style-type: none"> Cormorant (<i>Phalacrocorax carbo</i>) [A017] Whooper Swan (<i>Cygnus cygnus</i>) [A038] Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] Shelduck (<i>Tadorna tadorna</i>) [A048] Wigeon (<i>Anas penelope</i>) [A050] Teal (<i>Anas crecca</i>) [A052] Pintail (<i>Anas acuta</i>) [A054] Shoveler (<i>Anas clypeata</i>) [A056] Scaup (<i>Aythya marila</i>) [A062] Ringed Plover (<i>Charadrius hiaticula</i>) [A137] Golden Plover (<i>Pluvialis apricaria</i>) [A140] Grey Plover (<i>Pluvialis squatarola</i>) [A141] Lapwing (<i>Vanellus vanellus</i>) [A142] Knot (<i>Calidris canutus</i>) [A143]

Designated Site	Distance from wind farm site	Qualifying Interests
		<ul style="list-style-type: none"> Dunlin (<i>Calidris alpina</i>) [A149] Black-tailed Godwit (<i>Limosa limosa</i>) [A156] Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] Curlew (<i>Numenius arquata</i>) [A160] Redshank (<i>Tringa totanus</i>) [A162] Greenshank (<i>Tringa nebularia</i>) [A164] Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] Wetland and Waterbirds [A999]
Mid-Clare Coast SPA (004182)	9.1 km northwest of the site	<ul style="list-style-type: none"> Cormorant (<i>Phalacrocorax carbo</i>) [A017] Barnacle Goose (<i>Branta leucopsis</i>) [A045] Ringed Plover (<i>Charadrius hiaticula</i>) [A137] Sanderling (<i>Calidris alba</i>) [A144] Purple Sandpiper (<i>Calidris maritima</i>) [A148] Dunlin (<i>Calidris alpina</i>) [A149] Turnstone (<i>Arenaria interpres</i>) [A169] Wetland and Waterbirds [A999]
Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161)	17.3 km northeast of the site	<ul style="list-style-type: none"> Hen Harrier (<i>Circus cyaneus</i>)
Illaunonearaun SPA (004114)	18.2 km west of the site	<ul style="list-style-type: none"> Barnacle Goose (<i>Branta leucopsis</i>) [A045]

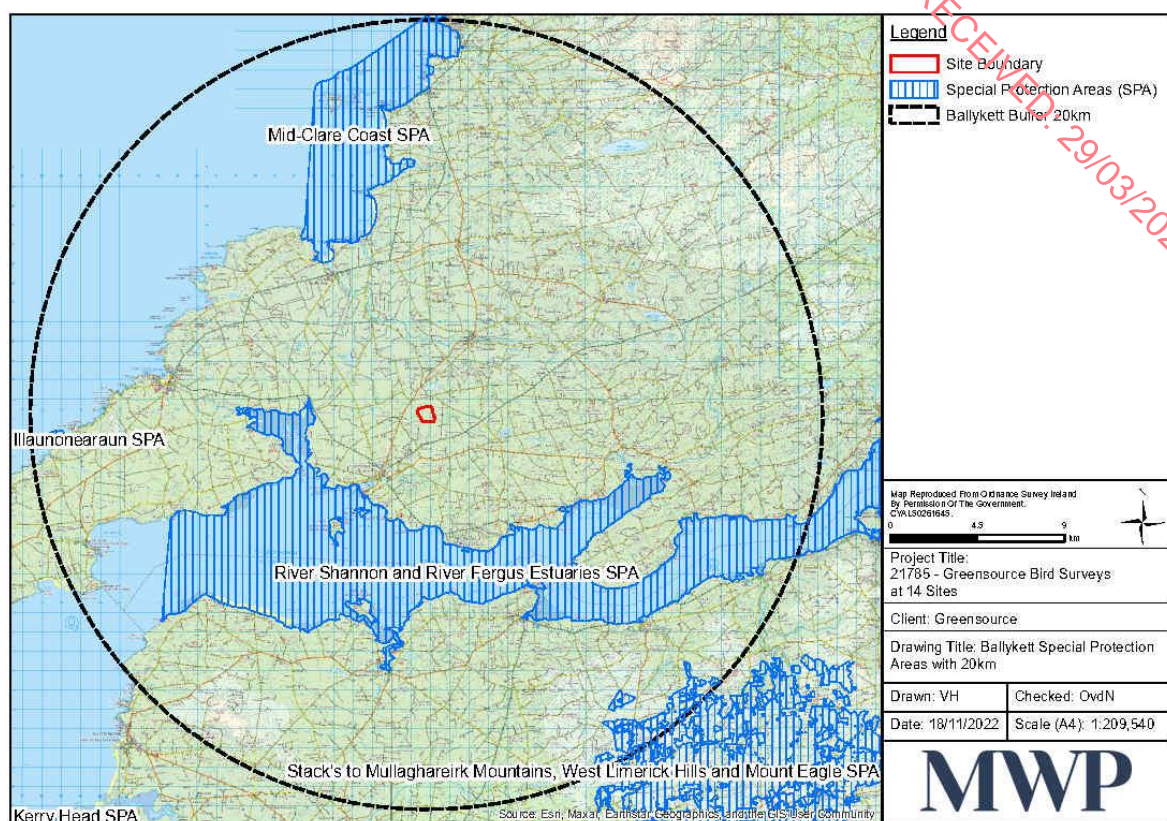


Figure 4: SPA sites within 20 km of the proposed wind farm site boundary

2.3 Ramsar Sites/Important Bird and Biodiversity Areas (IBAs)

The Convention on Wetlands, also known as the Ramsar Convention, is an intergovernmental treaty which aims to conserve and protect wetlands and their resources around the world¹. It was ratified by Ireland in 1984 and came into force on 15th March 1985. While this convention is not legislation, it is an international treaty. Ireland presently has 45 sites designated as Wetlands of International Importance, with a surface area of 66,994 hectares. The desk-top review concluded that there are no Ramsar sites within 20 km of the site boundary.

The Important Bird and Biodiversity Areas (IBAs) Programme, overseen by Birdlife International, aims to identify, conserve and protect those areas throughout the world considered to be of the greatest significance to bird populations². The desk-top review concluded that there are two IBA sites within 20 km of the site boundary: 'West Clare Uplands'³, approximately 8.7 km northeast of the site, and 'Shannon and Fergus Estuaries'⁴, approximately 5.6 km southwest of the site.

2.4 I-WeBS Sites

I-WeBS (Irish Wetland Bird Survey) is a joint project between BirdWatch Ireland and National Parks and Wildlife (NPWS) in which specific wetland sites are surveyed (BirdWatch Ireland, 2019). In order to count the wetland birds, a 'look-see' method (Bibby *et al*, 2000) is used in which all birds present within a pre-defined area are

¹ <http://www.ramsar.org/>

² <http://www.birdlife.org/worldwide/programmes/important-bird-and-biodiversity-areas-ibas>

³ <http://datazone.birdlife.org/site/factsheet/27333>

⁴ <http://datazone.birdlife.org/site/factsheet/588>

counted. The aim of these surveys is to monitor non-breeding birds in Ireland and contribute to population counts. The information is also important to help assess the quality of these wetland areas (BirdWatch Ireland, 2019). The bird groups to be counted for I-WeBS consist of swans and geese, ducks, divers, waders and gulls. Counts are made once per month from September to March annually (BirdWatch Ireland, 2019).

There are a total of four I-WeBS sites within 20km of the windfarm site. See **Table 3**, below.

Table 3: I-WeBS sites within 20km of the wind farm site

I-WeBS Site	Site code
Shannon & Fergus Estuary Aerial	OH410
Tullaheer Lough	OH008
Mid-Clare Coast (Mal Bay - Doonbeg Bay)	OH902
Farrihy Lough	OH007

2.5 BirdWatch Ireland Bird Sensitivity Tool

A Bird Sensitivity Mapping Tool for wind energy development was developed by BirdWatch Ireland and provides a measured spatial indication of where protected birds are likely to be sensitive to wind energy developments. The tool can be accessed via the National Biodiversity Data Centre Website (www.biodiversityireland.ie) and is accompanied by a guidance document (McGuinness *et al.* (2015)). The criteria for estimating a zone of sensitivity (i.e., 'low', 'medium', 'high' and 'highest') is based on a review of the behavioural, ecological and distributional data available for each species.

A review of this mapping tool determined that no bird sensitivity ratings, as above, have been assigned to the area within which the proposed wind farm is encompassed.

2.6 Bird Atlas Records and Distribution

Bird Atlas 2007-11: The breeding and wintering birds of Britain and Ireland' (Balmer *et al.*, 2013) is the most recent comprehensive work on wintering and breeding birds in Ireland. Previous Bird Atlases have been the primary source of information on the distribution and abundance of British and Irish birds prior to Bird Atlas 2007–11. The three previously published atlases were:

- Sharrock, J.T.R. (1976) The atlas of breeding birds in Britain and Ireland.
- Lack, P.C. (1986) The atlas of wintering birds in Britain and Ireland.
- Gibbons, D.W., Reid, J.B. & Chapman, R.A. (1993) The new atlas of breeding birds in Britain and Ireland: 1988-1991.

The entire wind farm site lies within hectad R05. **Table 4** presents Breeding Bird Atlas data for potential target species recorded within this hectad.

Table 4: Breeding Bird Atlas data (R05) with breeding status⁶

Species Name	Breeding Atlas (68-72)	Breeding Atlas (88-91)	Breeding Atlas (07-11)	Conservation Status ⁴
Barn Owl (<i>Tyto alba</i>)	Possible	-	-	RL, IV
Black-headed Gull (<i>Larus ridibundus</i>)	Confirmed	Seen	-	AL, SCI
Buzzard (<i>Buteo buteo</i>)	-	-	Possible	IV
Common Tern (<i>Sterna hirundo</i>)	-	Seen	-	BD, AL
Coot (<i>Fulica atra</i>)	Probable	-	-	AL
Cormorant (<i>Phalacrocorax carbo</i>)	-	-	Present	AL, SCI
Corn Crake (<i>Crex crex</i>)	Probable	-	-	BD, RL
Curlew (<i>Numenius arquata</i>)	Probable	Seen	Present	RL, SCI
Dunlin (<i>Calidris alpina</i>)	-	-	Present	SCI, RL
Great Black-backed Gull (<i>Larus marinus</i>)	-	Seen	-	
Great Crested Grebe (<i>Podiceps cristatus</i>)	-	-	Present	AL
Grey Heron (<i>Ardea cinerea</i>)	Confirmed	Seen	Present	
Hen Harrier (<i>Circus cyaneus</i>)	-	-	Present	BD, AL, SCI, IV
Herring Gull (<i>Larus argentatus</i>)	Probable	Seen	-	AL
Kestrel (<i>Falco tinnunculus</i>)	Confirmed	Breeding	Possible	RL, IV
Kingfisher (<i>Alcedo atthis</i>)	-	-	Present	BD, AL
Lapwing (<i>Vanellus vanellus</i>)	-	-	Present	RL, SCI
Little Egret (<i>Egretta garzetta</i>)	Present	-	Present	BD
Little Grebe (<i>Tachybaptus ruficollis</i>)	Confirmed	-	Possible	
Long-eared Owl (<i>Asio otus</i>)	Possible	-	Confirmed	IV
Mallard (<i>Anas platyrhynchos</i>)	Probable	Breeding	Present	AL
Common Gull (<i>Larus canus</i>)	-	Seen	Present	
Moorhen (<i>Gallinula chloropus</i>)	Confirmed	Breeding	Confirmed	
Mute Swan (<i>Cygnus olor</i>)	Confirmed	-	-	AL
Northern Gannet (<i>Morus bassanus</i>)	-	Seen	-	AL
Oystercatcher (<i>Haematopus ostralegus</i>)	Probable	Seen	Present	RL

⁶ Breeding status: Seen = recorded; Possible = possible breeding; Probable = probable breeding; Confirmed = confirmed breeding; - = not recorded; Non-B = non-breeding; Breeding = breeding

⁷ Conservation Status: BD = Annex I of the Birds Directive; RL = BoCCI Red-listed; AL = BoCCI Amber-listed; SCI = Species Conservation Interest of nearby SPA; IV = protected under Schedule IV of the Wildlife Act

Species Name	Breeding Atlas (68-72)	Breeding Atlas (88-91)	Breeding Atlas (07-11)	Conservation Status ⁴
Peregrine Falcon (<i>Falco peregrinus</i>)	-	-	Confirmed	BD, IV
Redshank (<i>Tringa totanus</i>)	-	-	Present	SCI
Red-throated Diver (<i>Gavia stellata</i>)	-	-	Present	BD, AL
Ringed Plover (<i>Charadrius hiaticula</i>)		Seen	Present	SCI
Ruddy Turnstone (<i>Arenaria interpres</i>)	-	-	Present	SCI, AL
Sandwich Tern (<i>Sterna sandvicensis</i>)	-	Seen	-	BD, AL
Shag (<i>Phalacrocorax aristotelis</i>)	-	Seen	Present	AL
Shelduck (<i>Tadorna tadorna</i>)	Confirmed	-	Probable	SCI, AL
Snipe (<i>Gallinago gallinago</i>)	Probable	Breeding	Confirmed	RL
Sparrowhawk (<i>Accipiter nisus</i>)	Confirmed	Seen	Present	IV
Teal (<i>Anas crecca</i>)	Confirmed	-	Present	AL, SCI
Tufted Duck (<i>Aythya fuligula</i>)	-	-	Present	AL, SCI
Whooper Swan (<i>Cygnus cygnus</i>)	-	-	Present	SCI, BD, AL
Wigeon (<i>Anas penelope</i>)	-	-	Present	SCI, AL
Woodcock (<i>Scolopax rusticola</i>)	Probable	Possible	Present	RL

Table 5 below presents Wintering Bird Atlas data for potential target species recorded within this hectad.

Table 5: Wintering Bird Atlas data (R05) with wintering status.

Species Name	Wintering Atlas (81-84)	Wintering Atlas (07-11)	Conservation Status ⁵
Bar-tailed Godwit (<i>Limosa lapponica</i>)	Present	-	BD, RL, SCI
Black-headed Gull (<i>Larus ridibundus</i>)	Present	Present	AL, SCI
Black-legged Kittiwake (<i>Rissa tridactyla</i>)	Present	-	RL
Black-tailed Godwit (<i>Limosa limosa</i>)	-	Present	SCI, RL
Cormorant (<i>Phalacrocorax carbo</i>)	Present	Present	AL, SCI
Curlew (<i>Numenius arquata</i>)	Present	Present	RL, SCI
Dunlin (<i>Calidris alpina</i>)	Present	Present	SCI, RL
Golden Plover (<i>Pluvialis apricaria</i>)	Present	-	SCI, BD, RL

Species Name	Wintering Atlas (81-84)	Wintering Atlas (07-11)	Conservation Status ⁵
Great Crested Grebe (<i>Podiceps cristatus</i>)	-	Present	AL
Greater Scaup (<i>Aythya marila</i>)	Present	-	RL
Greenshank (<i>Tringa nebularia</i>)	Present	Present	SCI, AL
Grey Heron (<i>Ardea cinerea</i>)	-	Present	
Hen Harrier (<i>Circus cyaneus</i>)	-	Present	BD, AL, SCI, IV
Herring Gull (<i>Larus argentatus</i>)	Present	-	AL
Kestrel (<i>Falco tinnunculus</i>)	Present	Present	RL, IV
Kingfisher (<i>Alcedo atthis</i>)	-	Present	BD, AL
Lapwing (<i>Vanellus vanellus</i>)	Present	Present	RL, SCI
Little Egret (<i>Egretta garzetta</i>)	-	Present	BD
Little Grebe (<i>Tachybaptus ruficollis</i>)	Present	Present	
Mallard (<i>Anas platyrhynchos</i>)	Present	Present	AL
Common Gull (<i>Larus canus</i>)	Present	Present	AL
Moorhen (<i>Gallinula chloropus</i>)	Present	Present	
Mute Swan (<i>Cygnus olor</i>)	Present	-	AL
Oystercatcher (<i>Haematopus ostralegus</i>)	Present	Present	RL
Redshank (<i>Tringa totanus</i>)	Present	Present	SCI
Red-throated Diver (<i>Gavia stellata</i>)	-	Present	BD, AL
Ringed Plover (<i>Charadrius hiaticula</i>)	-	Present	SCI
Ruddy Turnstone (<i>Arenaria interpres</i>)	Present	Present	SCI, AL
Shag (<i>Phalacrocorax aristotelis</i>)	-	Present	AL
Shelduck (<i>Tadorna tadorna</i>)	Present	Present	SCI, AL
Snipe (<i>Gallinago gallinago</i>)	Present	Present	RL
Teal (<i>Anas crecca</i>)	Present	Present	AL, SCI
Tufted Duck (<i>Aythya fuligula</i>)	-	Present	AL
Whooper Swan (<i>Cygnus cygnus</i>)	Present	Present	SCI

Species Name	Wintering Atlas (81-84)	Wintering Atlas (07-11)	Conservation Status ⁵
Wigeon (<i>Anas penelope</i>)	Present	Present	SCI, AL
Woodcock (<i>Scolopax rusticola</i>)	-	Present	RL

2.7 NPWS Rare and Protected Species Dataset

An information request was sent to the NPWS requesting records from the Rare and Protected Species Database for the hectad R05 encompassing the proposed wind farm site. Records of hen harrier and peregrine were obtained from the NPWS (18th November 2022). The following information was provided in relation to peregrine:

- Peregrine falcon: Two occupied nest sites were recorded during the 2017 National Peregrine Survey. These nest sites were not recorded/unknown in the previous National Survey in 2002.

2.8 Identification of Target Species

The following table (**Table 6**) outlines those species for which past records exist and which meet one or more of the target species selection criteria as outlined in **Section 1.3** above. Wind farm sensitive species meeting the selection criteria that were not identified as having previously occurred within the relevant hectad during the desk-top study search, such as buzzard, were also included as target species on a precautionary basis. The conservation status/level of protection afforded to each species is also included.

Table 6: Identification of target species.

Target Species	Conservation Status	Typical Habitat ⁶	Target Species for Site Y/N
Barn Owl (<i>Tyto alba</i>)	BoCCI Red-listed/ Wildlife Acts	Breeding Breeds in ruined buildings, such as castles and to a lesser extent in outbuildings (barns/sheds). Will use special nest boxes. Breeding success heavily dependent on the availability of suitable prey Wintering Largely resident, though young birds will wander in search of new territories	Y
Buzzard (<i>Buteo buteo</i>)	BoCCI Green-listed/ Wildlife Acts	Breeding Widespread breeding species. Nests in trees and sometimes on cliffs, usually with access to open land including farmland, moorland and wetland Wintering Largely resident	Y
Cormorant (<i>Phalacrocorax carbo</i>)	BoCCI Amber-listed/ Wildlife Acts/SCI	Breeding Breeds in colonies mainly around the coast of Ireland, with some birds breeding inland. Birds on the coast breed on cliffs whilst those inland, in trees Wintering	Y

⁶ birdwatchireland.ie

		Winters at sea and inland	
Curlew <i>(Numenius arquata)</i>	BoCCI Red-listed/Wildlife Acts/SCI	<p>Breeding Nests on the ground in rough pastures, meadows and heather. Not a common breeder but found in most parts of the country.</p> <p>Wintering Winters in a wide range of wetland habitats (coastal and inland) and other good feeding areas including damp fields.</p>	Y
Golden Plover (<i>Pluvialis apricaria</i>)	Annex I EU Birds Directive/BoCCI Red-listed/Wildlife Acts/SCI	<p>Breeding Breed in heather moors, blanket bogs & acidic grasslands. Distribution limited to the uplands of northwestern counties in Ireland</p> <p>Wintering Throughout the winter, Golden Plovers are regularly found in large, densely packed flocks, and in a variety of habitats, both coastal and inland. Their distribution is widespread in Ireland</p>	Y
Hen Harrier (<i>Circus cyaneus</i>)	Annex I EU Birds Directive/BoCCI Amber-listed/Wildlife Acts/SCI	<p>Breeding Breeding birds are confined largely to heather moorland and young forestry plantations, where they nest on the ground</p> <p>Wintering Spends winter in more coastal and lowland areas throughout Ireland hence most easily seen on the coast in the winter months</p>	Y
Kestrel (<i>Falco tinnunculus</i>)	BoCCI Red-listed/Wildlife Acts	<p>Breeding A widespread breeder throughout the country. Nests in trees, buildings or in cracks in cliffs. Will use old crows nests. Found in wide variety of open habitats including coasts, moor land, farmland, wetlands, roadside verges and town parks</p> <p>Wintering Largely resident within breeding territory. Some birds move within the country, especially down from the uplands</p>	Y
Kingfisher (<i>Alcedo atthis</i>)	Annex I EU Birds Directive/BoCCI Amber-listed/Wildlife Acts	<p>Breeding Kingfishers breed in tunnels dug in vertical banks along streams and rivers</p> <p>Wintering A very sedentary species, Kingfishers rarely move from their territories. However, some may move to lakes and coasts during extended spells of poor weather</p>	Y
Lapwing (<i>Vanellus vanellus</i>)	BoCCI Red-listed/Wildlife Acts/SCI	<p>Breeding They breed on open farmland, and appear to prefer nesting in fields that are relatively bare (particularly when cultivated in the spring) and adjacent to grass</p>	Y

		<p>Wintering Wintering distribution in Ireland is widespread. Large flocks regularly recorded in a variety of habitats, including most of the major wetlands, pasture and rough land adjacent to bogs</p>	
Long-eared Owl (<i>Asio otus</i>)	Wildlife Acts	<p>Breeding Breeds in lowlands throughout Ireland, usually in a stand of conifers</p> <p>Wintering Largely resident, though young birds will wander in search of new territories. During winter, may occasionally gather in communal roosts of between 5 and 30 birds</p>	Y
Merlin (<i>Falco columbarius</i>)	Annex I EU Birds Directive/ BoCCI Amber-listed/ Wildlife Acts	<p>Breeding Breeds in areas of peat bogs and conifer plantation.</p> <p>Wintering Widespread but scarce in peatlands and coastal locations</p>	Y
Peregrine Falcon (<i>Falco peregrinus</i>)	Annex I EU Birds Directive / BoCCI Green-listed/ Wildlife Acts	<p>Breeding Breeds on coastal and inland cliffs. Most birds on the coast breed on the south, west and north coasts, coastal breeding on the east coast is limited by the availability of suitable nesting cliffs. Most inland birds breed on mountain cliffs but will also breed at lower levels</p> <p>Wintering Resident in Ireland but shows some movement away from its breeding areas in the winter. Can be found on the coast, especially on estuaries where they hunt water birds. Some birds move into cities. Wintering birds may also comprise individuals which have arrived from Britain or even further afield</p>	Y
Snipe (<i>Gallinago gallinago</i>)	BoCCI Red-listed/ Wildlife Acts/SCI	<p>Breeding Nests on the ground, usually concealed in a grassy tussock, in or near wet or boggy terrain</p> <p>Wintering Highly dispersed distribution in winter. They forage across a variety of wetland and damp habitats. Particularly high concentrations are found on the fringes of lowland lakes</p>	Y
Sparrowhawk (<i>Accipiter nisus</i>)	BoCCI Amber-listed / Wildlife Acts	<p>Breeding Probably the most common bird of prey in Ireland. Widespread in woodland, farmland with woods, larger parks and gardens</p> <p>Wintering Resident in Ireland. Can be seen throughout the country</p>	Y
Whooper Swan (<i>Cygnus cygnus</i>)	Annex I EU Birds Directive/ Wildlife Acts	<p>Breeding The Whooper Swans that are present in Ireland each winter nest in Iceland during the summer. Each year a small number of Whoopers stay in</p>	Y

	BoCCI Amber-listed/ Wildlife Acts/SCI	Ireland for the summer and there have been occasional breeding records on lakes in the midlands and northwest Wintering Most on lowland open farmland around inland wetlands, regularly seen while feeding on grasslands and stubble	
Woodcock (<i>Scolopax rusticola</i>)	BoCCI Red-listed / Wildlife Acts	Breeding Nests on the ground in forests and woodland, usually well camouflaged amongst dead leaves and low vegetation Wintering Wider distribution in winter, occurring in woodland, also scrub and some open areas (bracken and heather-covered hills)	Y

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