The natural choice for good advice

Ornithology Report

Bear Downs Wind Farm,

Cornwall

July 2025

A report by

James Gilroy BSc (Hons), MSc, Ecologist

Western Ecology, 1 Geffery Close, Landrake, Saltash, Cornwall PL12 5HA Telephone: 0800 622 6828
email: office@westernecology.co.uk

Report details

Site address:	Bears Down Wind Farm, St Eval, PL27 7SJ
Grid reference:	SW899678
Report date:	29th July 2025
Report authors:	James Gilroy BSc (Hons), MSc
Report checked by:	Colin Hicks BSc (Hons) MCIEEM
Report reference:	WOR-5495

Declaration of compliance
BS 42020:2013

This study has been undertaken in accordance with British Standard 42020:2013 Biodiversity, Code of practice for planning and development.

Code of Professional Conduct

The information which we have prepared is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

Validity of survey data and report

The findings of this report are valid for 24 months from the date of survey. If work has not commenced within this period, an updated survey by a suitably qualified ecologist will be required.

Table of contents

1. Introduction

1.1. Background

Western Ecology have been commissioned to undertake combined summer and winter bird vantage point surveys (VP) and breeding bird surveys for a proposed repowering of an existing onshore wind farm located in Cornwall.

1.2. Proposed development

It is proposed that the 16 existing operational turbines at this site (57m tip height, 35m hub height and 44m rotor diameter) will be replaced by four modern units in nearby locations. The new units each have a hub height of 82m, blade length of 68m and a maximum blade tip height of 150m. Associated permanent infrastructure will include access tracks and a substation.

1.4. Survey aims

This report considers potential impacts of the proposed development on ornithological receptors at this site, associated with construction, operational and decommissioning phases.

This report determines the existing ornithological baseline associated with the site, identifies potential effects of predicted impacts on ornithological receptors, describe any mitigation measures required to address likely significant effects and assess the cumulative impacts associated with other operational or proposed wind farms in the local area.

1.5. Site location

The site lies within a rural area, approximately 7.2km to the south of Padstow and approximately 4.2km to the north of St Columb Major in Cornwall.

2. Survey Methodology

This assessment is informed by current guidance published by NatureScot (formerly known as Scottish Natural Heritage (SNH)) and Natural England, which is widely accepted for onshore wind farm developments across the UK. This guidance includes the following:

- Natural England TIN069 – Assessing the effects of onshore wind farms on birds - 2010
- SNH Guidance Note -Repowering onshore windfarms: bird survey requirement, 2014
- SNH Guidance Note - Recommended bird survey methods to inform impact assessment of onshore wind farms, version 2 – SNH, 2017
- SNH Draft Consultation Guidance Note - Assessing the impact of repowered wind farms on nature, 2018

To assess potential impacts on ornithological receptors for an undeveloped site, vantage point surveys are usually undertaken to inform collision risk modelling. The guidance note published in 2014 for assessing impacts of a repowering project states "*flight activity surveys should not be carried out over operational wind farms for the purpose of quantifying collision risk*", and instead recommends a desk-based assessment using historic data from nearby sites or similar sites. The draft guidance published in 2018 then states "*bird survey data across existing wind farm sites won't normally be required",* however this draft guidance has not been formally updated.

Due to uncertainties in survey requirements, this assessment adopts a combination of methods outlined in these guidance notes, utilising new field survey data and collision risk estimates for both the existing and proposed wind farm, as well as considering historic data from nearby or similar wind farm developments. A comparison is then made of bird activity and collision estimates between the existing and proposed wind farm and nearby wind farms to determine the likely impact of the proposed development upon ornithological receptors at this site.

2.1. Desktop survey

A desktop survey was commissioned in October 2023 from the Environmental Records Centre for Cornwall and Isles of Scilly (ERCCIS) which provided biological records for protected/notable bird species and non-statutory sites within 5km.

GIS datasets available from Natural England were assessed to determine the number and nature of statutory nature conservation sites within 5km.

A search of Cornwall Council's planning portal was made in October 2023 for nearby wind farm developments in the local area. Historic bird survey data was reviewed from the following wind farm developments:

- Vententonteague single turbine development – 2018;
- Scotland Corner Wind Farm development - 2015
- St Breock Wind Farm repowering – 2014

- Denzell Down Wind Farm development – 2011
- Carland Cross Windfarm repowering – 2008

2.2. Habitat assessment

Habitats within the footprint of the proposed development and at its immediate margins have been assessed for their potential to support roosting, foraging and breeding birds.

2.3. Breeding bird surveys

The survey methodology was broadly based on the breeding bird survey method, as described by the Bird Survey and Assessment Steering Group[1] (2025), and involved a walked transect at an ambling pace and stopping to scan habitat features (such as trees, dense hedgerows or reed beds). Locations of species were marked on a map together with behavioural notations.

The breeding bird survey was completed by James Gilroy, an ecologist with experience of undertaking a variety of bird surveys. Single early morning survey visits were conducted between sunrise to approximately 11:00 and during suitable weather conditions (as detailed in Table 1).

Table 1 – breeding bird survey timings and weather conditions

Survey no.	Date	Start time	Finish time	Weather
BBS#1	16/05/2025	07:05	08:45	Sunny, dry and mild. 9-11°C, wind force = 2-3 and cloud cover = <10%
BBS#2	23/05/2025	05:30	07:00	Dry, calm and sunny. 12-14°C, wind force = 0-1 and cloud cover = <10%
BBS#3	16/05/2025	08:00	09:15	Dry, overcast and breezey. 17°C, wind force = 3-4 and cloud cover = 80%

All bird registrations and behaviour notations (such as singing, carrying food or active nest) were recorded using standard BTO species codes and symbols.

Territory Mapping

The territory mapping method is based on the observation that many species during the breeding season are territorial. This is most marked in passerines where territories are often determined by conspicuous song, display and territorial disputes with neighbouring conspecifics. The expected outcome of this technique is that mapped registrations fall into clusters, approximately coinciding with territories. Records of birds just visiting the Site (e.g. gulls feeding in fields) and birds flying over the Site were also made and the records of these summarised, however these have been discounted from further analysis, given they are not breeding within the Site and are therefore not considered relevant to the assessment.

[1] Bird Survey & Assessment Steering Group. (2025). Bird Survey Guidelines for assessing ecological impacts, https://birdsurveyguidelines.org [18/02/2025]

Target species primarily consisted of ground nesting farmland birds, typically those that rely on open sightlines (such as skylark and lapwing) and are therefore vulnerable to changes in management of farmland.

Records were made of other *notable species* which were determined based on the following criteria:

- *Schedule 1 of the Wildlife and Countryside Act (1981) (as amended)* - The Wildlife and Countryside Act (WCA) 1981 affords greater protection to certain breeding species and are as such listed as specially protected under Schedule 1 of the Act;

- *Birds of Conservation Concern (BoCC) 5* - Commonly referred to as the UK Red List for birds, this is the fifth review of the status of birds in the UK, Channel Islands and Isle of Man, and updates the last assessment in 2015. Using standardised criteria, 244 species with breeding, passage or wintering populations in the UK were assessed by experts from a range of bird NGOs and assigned to the Red, Amber or Green lists of conservation concern; and

- *Biodiversity Action Plan species* - Species of bird are listed as Biodiversity Action Plan Priority Species and species listed as species of principal importance under Section 41 of the Natural Environments and Rural Communities (NERC) Act 2006.

Classification of breeding status

The results of the breeding bird surveys were assessed against the European Ornithological Atlas Committee (EOAC) criteria for breeding bird status as follows:

Non-breeding

- Flying over;
- Species observed but suspected to be still on Migration; and
- Species observed but suspected to be summering non-breeder.

Possible breeder

- Species observed in breeding season in suitable nesting habitat; and
- Singing male present (or breeding calls heard) in breeding season in suitable breeding habitat.

Probable breeding

- Pair observed in suitable nesting habitat in breeding season
- Permanent Territory presumed through registration of territorial behaviour (song etc) on at least two different days a week or more at the same place or many individuals on one day;
- Courtship and Display (judged to be in or near potential breeding habitat; be cautious with wildfowl);
- Visiting probable Nest site;
- Agitated behaviour or anxiety calls from adults, suggesting probable presence of nest or young nearby;
- Brood patch on adult examined in the hand, suggesting Incubation; and

- Nest Building or excavating nest-hole

Confirmed breeding

- Distraction-Display or injury feigning;
- Used Nest or eggshells found (occupied or laid within period of survey);
- Recently Fledged young (nidicolous species) or downy young (nidifugous species); Careful consideration should be given to the likely provenance of any fledged juvenile capable of significant geographical movement. Evidence of dependency on adults (e.g. feeding) is helpful. Be cautious, even if the record comes from suitable habitats;
- Adults entering or leaving nest-site in circumstances indicating Occupied Nest (including high nests or nest holes, the contents of which cannot be seen) or adults seen incubating;
- Adult carrying Faecal sac or Food for young;
- Nest containing Eggs;
- Nest with Young seen or heard;

2.4 Vantage Point Surveys

A series of Vantage Point Surveys (VPs) have been completed between October 2022 to March 2023 and June 2023 to September 2023, to capture bird movements during the accepted passage & wintering and summer periods. The survey methodology followed that given by Scottish Natural Heritage (SNH, 2000) in their guidance 'Recommended bird survey methods to inform impact assessment of onshore wind farms'.

The surveys were completed by Martin Rule (MR), John Blackburn (JB), Alex Stuart (AS) and James Gilroy (JG), all experienced ecologists with experience of wind turbine developments. Surveys were undertaken from two different locations (see Map 1), designed to provide sufficient coverage of the wind farm, and scheduled to capture a variety of times and weather conditions. Surveys lasted for 3hrs each (Table 1).

The survey area of the VPs included the proposed turbine locations and visible land to all sides within a prescribed buffer (blade length + 200m) and are shown in Map 1.

Table 1. Passage/winter vantage point surveys details for VP position 1 at Bears Down Wind Farm

VP position	Survey No.	Duration (hrs)	Surveyor	Date	Time	Weather
VP1	Oct-01	3	JB	15.10.22	06:00 – 09:00	Mild, blustery and dry. 14-16°C, CC=100%, WF=5-6 SW
VP1	Oct-02	3	JB	16.10.22	12:30 – 16:30	Occasional showers, calm and mild. 16-15°C, CC=80%, WF=1-2 W.
VP1	Oct-03	3	MR	21.10.22	09:30 – 12:30	Mild and blustery, occasional showers. 15-17°C, CC=60-80%, WF= 3-4SW
VP1	Oct-04	3	MR	26.10.22	09:45-12:45	Sunny, breezy and dry. 15°C, CC= 20-40% WF=2-3
VP1	Nov-01	3	MR	04.11.22	08:50-11:50	Dry, sunny and cool. 11°C, CC=40%, WF=2-3NW
VP1	Nov-02	3	MR	18.11.22	11:50-14:50	Dry, sunny and calm. 11°C, CC=30%, WF=1-2W
VP1	Dec-01	3	MR	15.12.22	08:05-11:05	Dry, cold and sunny. -2°C (-7°C with wind chill), CC=10%, WF=2NE
VP1	Dec-02	3	MR	30.12.22	08:15-11:15	Mild, blustery and occasional showers. 12°C, CC=100%, WF=3-4SW

VP1	Jan-01	3	MR	11.01.23	09:45-12:45	Overcast, dry and blustery. 10°C, CC=80%, WF=3-4SW
VP1	Jan-02	3	MR	27.01.23	10:00-13:00	Dry, cold and calm. 5°C, CC=100%, WF=0-1NE
VP1	Feb-01	3	MR	10.02.23	12:00-15:00	Cold, overcast and dry. 3°C, CC=80%, WF=2-3SW
VP1	Feb-02	3	MR	20.02.23	08:45-11:45	Overcast, low cloud, intermittent drizzle. 8°C, CC=100%, WF=1-2SW
VP1	Mar-01	3	MR	01.03.23	13:15-16:15	Dry, overcast and cold. 6°C, CC=100%, WF=1-2NE
VP1	Mar-02	2	JB	05.03.23	08:00-10:00	Dry with sunny spells. 6°C, CC=70%, WF=0-3NE
VP1	Mar-03	2	JB	11.03.23	09:30-11:30	Intermittent rain, blustery and mild. 11°C, WF=3-4SE, CC=100%
VP1	Mar-04	2	JB	19.03.23	16:00-18:00	Dry, blustery and scattered cloud. 12°C, WF=2-3W, CC=60%
Total survey hours = 45						

Table 2. Passage/winter vantage point surveys details for VP position 2 at Bears Down Wind Farm

VP position	Survey No.	Duration (hrs)	Surveyor	Date	Time	Weather
VP2	Oct-01	3	JB	15.10.22	10:00-13:00	Windy, dry with sunny spells. 14-16°C, CC= 50-70% WF=3-4 SW
VP2	Oct-02	3	JB	16.10.22	17:00-20:00	Occasional showers, mild and calm. 14-12°C, CC=60-70%, WF=2-3
VP2	Oct-03	3	JG	21.10.22	09:30-12:30	Mild and blustery, occasional showers. 15-17°C, CC=60-80%, WF= 3-4SW
VP2	Oct-04	3	MR	28.10.22	07:50-10:50	Sunny, dry and calm. 12-14°C, CC=40%, WF=1-2SW
VP2	Nov-01	3	JG	11.11.22	13:30-16:30	Mild, dry and windy. 15°C, WF=3-4S, CC=60-80%
VP2	Nov-02	3	MR	09.11.22	12:30-15:30	Dry, windy and sunny. 12°C, WF=3W, CC=50%
VP2	Dec-01	3	JG	09.12.22	12:15-15:15	Cold, dry, clear. 3°C, WF=1-2N, CC=<10%
VP2	Dec-02	3	MR	21.12.22	09:10-12:10	Dry, patchy cloud and calm. 9°C, CC=50%, WF=1-2S
VP2	Jan-01	3	JG & AS	13.01.23	12:45-15:45	Occ showers, blustery and overcast. 10°C, CC=100%, WF=3-4SW
VP2	Jan-02	3	MR	20.01.23	11:25-14:25	Dry, patchy sun and cold. 6°C, CC=60-80%, WF=0-1SE
VP2	Feb-01	3	JG	13.02.23	13:00-16:00	Dry, sunny spells and breezy. 10°C, CC=60%, WF=3-4SE
VP2	Feb-02	3	MR	23.02.23	13:50-16:50	Sunny, dry and cold. 7°C, CC=20%, WF=2-3NE
VP2	Mar-01	2	JB	05.03.23	16:00-18:00	Light rain showers, overcast. 9°C, WF=2-3NE, CC=100%
VP2	Mar-02	2	JB	11.03.23	16:00-18:00	Occasional showers, blustery, overcast. 10°C, WF=2-3W, CC=100%
VP2	Mar-03	3	MR	15.03.23	09:00-12:00	Overcast, mild, dry. 8°C, WF=1-2SE, CC=30%
VP2	Mar-04	2	JB	19.03.23	08:00-10:00	Dry, sunny and calm. 10°C, WF=1-2S, CC=50%
Total survey hours = 45						

This level of survey effort provided a total of 45hrs of VP survey during the passage and wintering bird period (October to March).

Table 3. Summer vantage point surveys details for VP position 1 at Bears Down Wind Farm

VP position	Survey No.	Duration (hrs)	Surveyor	Date	Time	Weather

VP1	June-01	3	JG	08.06.23	16:00-19:00	Warm, windy and dry. 20°C, WF=3-4E, CC=40-60%
VP1	June-02	3	JG	23.06.23	15:30-18:30	Hot, sunny and breezy with scattered cloud. 25°C, WF=3-4W, CC=40-60%
VP1	July-01	3	JG	07.07.23	09:15-12:15	Warm, sunny and breezy. 19°C, WF=3-4SE, CC=40-60%
VP1	July-02	3	JG	17.07.23	18:15-21:15	Warm and hazy with light breeze. 18-15°C, WF=2-3W, CC=60-100%
VP1	Aug-01	3	JG	16.08.23	10:15-13:15	Sunny, dry and calm. 19°C, WF=1-2N, CC=20%
VP1	Aug-02	3	JG	24.08.23	17:00-20:00	Warm, breezy and scattered cloud. 18°C, WF=3-4N, CC=60-80%.
VP1	Sept-01	3	JG	04.09.23	09:45-12:45	Hot, blustery and clear. 22°C, WF=3-4SE, CC=<10%
VP1	Sept-02	3	JG	18.09.23	12:45-15:45	Windy, dry and warm. 18°C, WF=5-6W, CC=20-40%
Total survey hours = 24						

Table 4. Summer vantage point surveys details for VP position 2 at Bears Down Wind Farm

VP position	Survey No.	Duration (hrs)	Surveyor	Date	Time	Weather
VP2	June-01	3	JG	09.06.23	16:00-19:00	Warm, humid and occ light showers. 23°C, WF=1-2E, CC=100%.
VP2	June-02	3	JG	15.06.23	18:00-21:00	Hot, sunny and hazy with light breeze. 21-18°C, WF=1-2N, CC=30-0%
VP2	July-01	3	JG	13.07.23	10:15-13:15	Mild, blustery and dry. 17°C, WF=3-4W, CC=80-100%
VP2	July-02	3	JG	27.07.23	08:45-11:45	Low cloud, drizzle and humid. 18-20°C, WF=1-2W, CC=100%
VP2	Aug-01	3	JG	17.08.23	09:15-12:15	Fine, dry and warm. 20°C, WF=2-3NE, CC=40-60%
VP2	Aug-02	3	JG	23.08.23	14:00-17:00	Sunny, hot and clear. 21°C, WF=1-2S, CC=15%
VP2	Sept-01	3	JG	13.09.23	15:00-18:00	Dry and warm with sunny spells. 19°C, WF=2-3SW, CC=20-60%
VP2	Sept-02	3	JG	25.09.23	12:00-15:00	Warm, dry and scattered cloud. 18°C, WF=2-3SE, CC=20-40%
Total survey hours = 24						

This level of survey effort provided a total of 24hrs of VPs during the summer period (April to August).

Target species for vantage point surveys

The target bird species for the VPs were based on those species which are identified by *Natural England Technical Information Note 069 (TIN 069) – Assessing the effects of onshore wind farms on birds*. Other secondary species included raptors, wildfowl, gulls and waders, with particular attention paid to Schedule 1/BAP/Red-listed species.

Table 5. List of bird Target species for summer vantage point surveys, Bears Down Wind Farm

Common name	Natural England TIN 069	Local records
Arctic tern	Y	Y
Barnacle Goose	Y	Y
Bean goose	Y	
Bewick's swan	Y	
Bittern	Y	Y
Black Grouse	Y	
Common Crane	Y	Y
Common Tern	Y	Y
Curlew	Y	Y
Dark-bellied Brent Goose	Y	

Dunlin	Y	Y
Golden Plover	Y	Y
Grey Heron	Y	Y
Hen Harrier	Y	Y
Honey Buzzard	Y	
Kestrel	Y	Y
Lapwing	Y	Y
Little Egret	Y	Y
Little Tern	Y	Y
Marsh Harrier	Y	Y
Merlin	Y	Y
Montagu's Harrier	Y	Y
Nightjar	Y	
Osprey	Y	Y
Peregrine Falcon	Y	Y
Pink-footed Goose	Y	Y
Red kite	Y	Y
Roseate Tern	Y	
Sandwich Tern	Y	
Shelduck		Y
Snipe		Y
Stone curlew	Y	Y
Tufted Duck		Y
White-fronted Goose	Y	Y
Whooper Swan	Y	Y

2.5. Calculation of collision risk

Wind turbine collision risk for target species has been estimated using the method outlined in the Scottish Natural Heritage (SNH) guidance note on calculating theoretical collision risk (SNH, 2000) and developed by Band et al. (2007). Collision risk estimates have been made based on the turbine parameters of the existing wind farm and the proposed wind farm to enable a comparison between to the two sites.

Species that are not included in the collision risk analysis are either not of conservation concern or are at low collision risk due to their flight behaviour, and/or are species which are infrequently present within the study area.

The SNH collision risk model involves three broad steps for both non-directional and directional flights:

- Stage one is the estimation of the number of bird transits through the airspace of the rotors per year/season, based on observed flight activity data and parameters of the wind farm and wind turbine design (detailed in Table 11-13).
- Stage two computes the probability of a bird being hit when making a transit through the airspace of the rotors, based biometric data of the bird species (length, wingspan and flight speed) and turbine parameters (breadth and pitch of the turbine blades and rotation speed of the turbine). Using this probability provides an estimate of the number of collisions per year/season for the wind farm but assumes that birds take no avoiding action to prevent a collision.
- Stage three applies an assumed avoidance rate to the collision probability to provide an estimated total number of collisions per year/season.

Step 1 – calculating total transits

This requires a calculation of the amount of time birds were observed flying at risk height, per unit of area surveyed. This level of flight activity is then applied to the turbine blade area in subsequent calculations of collision risk.

The area surveyed was calculated by producing a viewshed of all visible areas from the vantage point, within 200m+blade length of the existing and proposed turbines (AVP), using GIS mapping (QGIS v3.28).

A 'flight risk volume' (V_w) was calculated by multiplying the area of the wind farm by the diameter of the rotor, in this case AVP x 136m or 44m.

The volume of air swept out by the rotors (Vr) was calculated as $V_r = N \times \pi R^2 \times (d+l)$, where N is the number of turbines, d is the depth (or chord) of the rotor and l is the length of the bird.

The bird occupancy within V_w (n), was calculated by multiplying observed time at risk height by the proportion of survey time of an entire season (in this case passage/winter or spring/summer). Bird occupancy of the rotor swept volume was calculated by $n \times (V_r/V_w)$.

The time taken for a bird to make a transit through the rotor swept volume (t) was estimated by $t = (d+l)/v$, where 'v' is the assumed bird speed (m/sec).

The number of transits through the rotor swept volume (T) is therefore $T = n \times (V_r/V_w)/t$

Step 2 – collision probability

The probability that a bird transit through the rotor airspace would result in a collision was calculated for each species using a spreadsheet provided by SNH[2]. The spreadsheet models collision risk based on species specific biometrics (such as wingspan and bird length), assumed flight speed, whether the bird is gliding or flapping in flight, wind direction and various parameters associated with the proposed wind turbines. Where there was a range of potential values (e.g. for bird biometrics or wind turbine parameters) the value that results in an increased collision probability was used. For example, rotor speed is variable and has a strong influence on collision probability, in this case the maximum rotor speed was used based on the reported specifications of the model of wind turbine proposed.

Step 3 – applying avoidance rates

The predicted number of collisions is then adjusted by an assumed avoidance rate, which is typically between 95 and >99%. Guidance outlined by SNH (2018) recommends that where species specific rates are not available, an assumed avoidance rate of 98% should be applied.

However, this guidance is primarily aimed at developments of wind farms where the baseline conditions do not involve existing turbines. As this proposal concerns the repowering of a

[2] Available at https://www.nature.scot/doc/wind-farm-impacts-birds-calculating-probability-collision

wind farm that has been operational for approximately 22 years, an alternative assumed avoidance rate has been used which reflects the level of normalisation towards the turbines by the bird species. Observed bird flight activity (which exhibited clear avoidance behaviour towards the rotor swept areas) was used to help inform the applied avoidance rates. Therefore, an assumed avoidance of 99% has been applied as a standard rate.

Parameters used for the calculation

Risk height flights

For each flight of a Target species, flight duration within the survey area and category of flight height for each 30 second period (1 = below blade sweep, 2 = lower blade sweep, 3 = upper blade sweep, 4 = above blade sweep and 5 = 200m+) were recorded in a tabulated sheet, with flight line annotated on a suitable map or diagram. Only flights between height categories 2 – 4 have been used in this calculation as flight heights 1 and 5 are not considered to be at risk of collision.

Potentially active hours

The number of potentially active hours was calculated to represent the entire season for which the survey period represented (either passage/winter or spring/summer). Total number of hours was calculated using the mean number of daylight hours per month of the survey period. For species with known nocturnal and diurnal activity (in this case golden plover and lapwing), the number of potentially active hours was increased by 25%.

Pitch angle

One of the parameters used to calculate the collision probability is the mean pitch angle of the turbine blade. This parameter specifies the angle of the blade from a horizontal plane, increasing with wind speed, so the collision probability will increase as the mean pitch increases. The study by Band (2012) cites that a mean pitch angle of 25-30° provides sufficient representation of a large wind turbine. This study was based on an offshore wind farm, where mean wind speeds tend to be higher and would have resulted in higher pitch angles. A mean pitch angle of 25° was used in this study, however this is considered to be a highly conservative estimate.

Rotational period

This was calculated as the value provided by the turbines manufactures.

Operational time of the wind farm

The operational time of the turbines within the wind farm has been assumed to be 85%. This operational period is referenced from a report by the British Wind Energy Association (BWEA, 2007) which identifies the standard operational period for onshore wind turbines in the UK as being approximately 85%.

2.6. Survey constraints

Breeding bird surveys

Although a breeding bird survey usually involves up to six visits, this site has been well surveyed previously and the associated bird activity is well understood. Three surveys visits

have been carried out at this site and this is considered to be proportionate and appropriate to the aims of the survey.

VP surveys

These surveys were undertaken between 2022 to 2023. An updated site visit undertaken on 16th May 2025 confirmed that land management and baseline conditions have not changed at this site. The VP survey data therefore still remains representative of bird flight activity at this site, as per CIEEM guidelines[3].

It is recognised that the SNH guidance note published in 2014 states that collision risk estimates should not be calculated from flight activity surveys undertaken at operational wind farms. This is due to the baseline bird activity already reacting to the presence of turbines and therefore it is theoretically difficult to predict the behavioural adjustment to new turbines within the site. However, as the proposed turbines at this site are predominantly located within the envelope of the existing wind farm, it is considered that comparison of collision risk estimates between the existing wind farm and proposed wind farm will still provide a useful assessment. Furthermore, these collision estimates are then considered in conjunction with historic data from nearby or similar developments. It is this combination of data sources that helps to predict impact rather than relying solely on collision risk estimates derived from new flight activity surveys.

The collision risk model used here is based on a variety of standardised assumptions such as biometric data and turbine parameters and therefore provides a mathematical estimate of likely collision, rather than predicting factual scenarios. These estimates must then be used as a tool to inform impact assessments, while associated errors and limitations are recognised.

The positions of the VP locations were selected on the basis of providing the best visible coverage of the survey area from accessible land. Due to restrictions in the local topography this involved surveyors being placed within the survey area and it is acknowledged that the this may have had limited effect on bird species particularly sensitive to human presence. However, efforts were made to be as inconspicuous as possible by wearing suitable clothing and using hedgebank vegetation as cover. Furthermore, the baseline for this site involves frequent human presence involving turbine maintenance personnel and farm traffic and therefore bird activity at this site will be relatively normalised to human presence.

The survey effort for passage/winter surveys covered a total period of 45hrs, which meets the minimum survey effort required for seasonal vantage point surveys. The summer surveys commenced mid-way through the season due to late commissioning and as such only resulted in a total of 24hrs of survey effort, which is below the recommended 36hrs. Although a constraint to collision risk modelling, a robust assessment of bird activity has still been made, based on the variety of data sources used.

Weather conditions were suitable for all VP surveys, with sufficient visibility for adequate coverage of the survey area.

[3] CIEEM advice Note: On The Lifespan Of Ecological Reports & Surveys. April 2019.

2.7. Study area

The study area of the biological records search is within a 5km radius of the site for bird species. The survey area of the VP surveys included visible land to all sides within 200m+ blade length from each turbine and shown in Map 1.

western ECOLOGY
1 Geffery Close
Landrake
Saltash
Cornwall
PL12 5HA

Tel: 0800 622 6828
email: office@westernecology.co.uk

Legend
- VP2 survey area
- VP1 survey area
- Proposed turbine locations
- VP locations

Title: Map 1. Survey area for Bears Down Wind Farm

Project: Bears Down Wind Farm-Repowering

Checked by: CDH

Version: 01
Date: 29/07/2025

3. Results

3.1. Desktop survey

The record search returned numerous records for birds, many of which are common widespread species. Records for notable species are shown in Table 6 below.

Table 6. Notable bird species records within 2km

Common Name	UK Protection	Status	Number of records
Balearic Shearwater	NERC 41; UKBAP (P)	Red	1
Bar-headed Goose	WACA Sch 9 Pt 1		2
Barn Owl	WACA-Sch1_part1		194
Barnacle Goose	WACA Sch 9 Pt 1	Amber	4
Bar-tailed Godwit		Amber	3
Black Redstart	WACA-Sch1_part1	Amber	25
Black Tern	WACA-Sch1_part1		1
Blackbird			285
Black-headed Gull		Amber	42
Black-tailed Godwit	WACA-Sch1_part1	Red	7
Black-throated Diver	WACA-Sch1_part1; UKBAP (P)	Amber	6
Blue Tit			194
Blue-winged Teal			1
Brambling	WACA-Sch1_part1		20
Buff-bellied Pipit			1
Buff-breasted Sandpiper			1
Bullfinch		Amber	36
Buzzard			191
Canada Goose	WACA Sch 9 Pt 1		115
Carrion Crow			79
Cattle Egret		Amber	17
Cetti's Warbler	WACA-Sch1_part1		45
Chough	WACA-Sch1_part1		4
Cirl Bunting	WACA-Sch1_part1; NERC 41	Red	1
Coal Tit			68
Collared Dove			100
Common Guillemot		Amber	9
Common Gull		Amber	24
Common Redpoll		Red	2
Common Sandpiper		Amber	13
Common Scoter	WACA-Sch1_part1; NERC 41; UKBAP (P)	Red	4
Common Tern		Amber	1
Coot			5
Cormorant			28
Corn Bunting		Red	43
Corncrake	WACA-Sch1_part1; NERC 41; UKBAP (P)	Red	2
Crane		Amber	3

Crossbill	WACA-Sch1_part1		3
Cuckoo	NERC 41; UKBAP (P)	Red	32
Curlew	NERC 41; UKBAP (P)	Red	25
Curlew Sandpiper		Amber	1
Dipper		Amber	37
Dotterel	WACA-Sch1_part1	Red	3
Dunlin		Red	11
Dunnock		Amber	126
Egyptian Goose	IASO Sch2 Pt1		1
Eider		Amber	1
European Shag		Red	25
European White-fronted Goose	NERC 41; UKBAP (P)		8
Fieldfare	WACA-Sch1_part1	Red	50
Firecrest	WACA-Sch1_part1		7
Fulmar		Amber	6
Gadwall		Amber	5
Gannet		Amber	4
Glaucous Gull		Amber	2
Goldcrest			55
Golden Pheasant	WACA Sch 9 Pt 1		1
Golden Plover			36
Goldeneye	WACA-Sch1_part2	Red	1
Goldfinch			121
Goosander			4
Goshawk	WACA-Sch1_part1		1
Grasshopper Warbler	NERC 41; UKBAP (P)	Red	39
Great Black-backed Gull		Amber	14
Great Crested Grebe			1
Great Grey Shrike			1
Great Northern Diver	WACA-Sch1_part1	Amber	15
Great Spotted Woodpecker			64
Great Tit			148
Green Sandpiper	WACA-Sch1_part1	Amber	14
Green Woodpecker			15
Greenfinch		Red	73
Greenland White-fronted Goose			1
Greenshank	WACA-Sch1_part1	Amber	17
Grey Heron			55
Grey Partridge	NERC 41; UKBAP (P)	Red	40
Grey Plover		Amber	2
Grey Wagtail		Amber	67
Greylag Goose	WACA-Sch1_part2	Amber	5
Hen Harrier	WACA-Sch1_part1; NERC 41	Red	39
Herring Gull		Red	93
Hobby	WACA-Sch1_part1		17
Hoopoe	WACA-Sch1_part1		5

House Martin		Red	56
House Sparrow	NERC 41; UKBAP (P)	Red	111
Iceland Gull		Amber	5
Indet. Harrier	WACA-Sch1_part1		1
Jack Snipe			2
Jackdaw			189
Jay			59
Kestrel		Amber	63
Kingfisher	WACA-Sch1_part1		13
Kittiwake		Red	1
Knot		Amber	2
Lapland Bunting	WACA-Sch1_part1	Amber	7
Lapwing	NERC 41; UKBAP (P)	Red	54
Lesser Black-backed Gull		Amber	18
Lesser Redpoll	NERC 41; UKBAP (P)		1
Lesser Spotted Woodpecker		Red	11
Lesser Whitethroat			9
Linnet		Red	42
Little Auk			1
Little Bunting			1
Little Egret			24
Little Grebe			22
Little Gull	WACA-Sch1_part1		1
Little Owl			7
Little Ringed Plover	WACA-Sch1_part1		5
Little Stint			1
Long-eared Owl			4
Long-tailed Duck	WACA-Sch1_part1	Red	1
Magpie			111
Mallard		Amber	45
Marsh Harrier	WACA-Sch1_part1	Amber	3
Marsh Tit		Red	14
Meadow Pipit		Amber	28
Mediterranean Gull	WACA-Sch1_part1	Amber	27
Merlin	WACA-Sch1_part1	Red	43
Mistle Thrush		Red	26
Montagu's Harrier	WACA-Sch1_part1	Red	5
Moorhen		Amber	48
Mute Swan			15
Night-heron	WACA Sch 9 Pt 1		5
Nightingale		Red	1
Nuthatch			25
Ortolan Bunting			1
Osprey	WACA-Sch1_part1	Amber	10
Oystercatcher		Amber	20
Peregrine	WACA-Sch1_part1		44

Pheasant			102
Pied Flycatcher		Amber	3
Pied Wagtail			15
Pink-footed Goose		Amber	8
Pintail	WACA-Sch1_part2	Amber	2
Purple Heron	WACA-Sch1_part1		2
Quail	WACA-Sch1_part1	Amber	23
Razorbill		Amber	5
Red Kite	WACA-Sch1_part1		17
Red-breasted Flycatcher			1
Red-breasted Merganser		Amber	1
Red-legged Partridge			53
Red-necked Grebe		Red	2
Redshank		Amber	10
Redstart		Amber	5
Red-throated Diver	WACA-Sch1_part1		2
Redwing	WACA-Sch1_part1	Amber	79
Reed Bunting	NERC 41; UKBAP (P)	Amber	9
Ring Ouzel	NERC 41; UKBAP (P)	Red	4
Ringed Plover		Red	10
Ring-necked Parakeet	WACA Sch 9 Pt 1		3
Robin			260
Rock Dove			10
Rock Pipit			5
Rook		Amber	209
Rose-coloured Starling			5
Ruff	WACA-Sch1_part1	Red	5
Sand Martin			24
Scaup	WACA-Sch1_part1; NERC 41; UKBAP (P)	Red	2
Sedge Warbler		Amber	49
Shelduck		Amber	8
Short-eared Owl		Amber	43
Shoveler		Amber	35
Siskin			25
Skylark	NERC 41; UKBAP (P)	Red	69
Slavonian Grebe	WACA-Sch1_part1	Red	12
Smew		Red	1
Snipe		Amber	40
Snow Bunting	WACA-Sch1_part1	Amber	2
Song Thrush		Amber	83
Sparrowhawk		Amber	79
Spoonbill	WACA-Sch1_part1	Amber	1
Spotted Crake	WACA-Sch1_part1	Amber	1
Spotted Flycatcher	NERC 41; UKBAP (P)	Red	55
Spotted Redshank		Amber	1
Starling		Red	76

Stock Dove		Amber	43
Stonechat			30
Stone-curlew	WACA-Sch1_part1;NERC 41; UKBAP (P)	Amber	1
Swallow			134
Swift		Red	30
Tawny Owl		Amber	65
Teal		Amber	49
Tree Pipit		Red	18
Tree Sparrow	NERC 41; UKBAP (P)	Red	1
Treecreeper	NERC 41; UKBAP (P)		17
Tufted Duck			1
Turnstone		Amber	5
Turtle Dove	NERC 41; UKBAP (P)	Red	2
Water Pipit		Amber	10
Water Rail			13
Wheatear		Amber	37
Whimbrel	WACA-Sch1_part1	Red	20
Whinchat		Red	7
White Stork			1
White-fronted Goose		Red	3
Whitethroat		Amber	38
Whooper Swan	WACA-Sch1_part1	Amber	4
Wigeon		Amber	26
Willow Tit		Red	18
Willow Warbler		Amber	26
Wood Sandpiper	WACA-Sch1_part1	Amber	1
Wood Warbler	NERC 41; UKBAP (P)	Red	2
Woodcock		Red	7
Woodlark	WACA-Sch1_part1;NERC 41; UKBAP (P)		5
Woodpigeon		Amber	229
Wren		Amber	170
Wryneck	WACA-Sch1_part1		6
Yellow Wagtail		Red	2
Yellow-browed Warbler		Amber	4
Yellowhammer	NERC 41NERC 41; UKBAP (P)	Red	64
Yellow-legged Gull		Amber	1

Statutory Nature Conservation Sites (SNCS)

There are 3 Statutory Nature Conservation Sites (SNCS) within 2km of the Site, details of which are contained in Table 7 below.

Table 7. SNCS within 2km of the Site

Site name and designation type	Description	Approximate distance from this application site (measured from the closest point)

Trelow Downs (SSSI)	The Site supports a large area of dry and wet heath, valley mire communities, stands of scrub and associated wildlife.	1.1km to the east

Non-statutory Nature Conservation Sites (NNCS)

There are two NNCS located within 1km of the Site and details of these are contained in Table 8 below.

Table 8. SNCS within 1km of the Site

Site name and designation type	Description	Approximate distance from this application site (measured from the closest point)
Music Water County Wildlife Site (CWS)	This designation concerns an area of Lowland heathland and lowland fens habitat, and common lizard.	140m to the north
Denzell Downs to Menadew's Plantation CWS	The Site follows the course of the stream and links up with Menadew's Plantation on the southern side of the valley. The site was selected for Purple Moor Grass and Rush Pastures, Wet Woodland, Lowland Fens and Lowland Heathland aong with common lizard, dunnock, wavy St John's wort and badger.	450m to the south

3.2. Habitat assessment

The site of the wind farm mostly comprises fields containing intensively managed agricultural grassland, with occasional parcels scrub located at the margins of some of these fields. An access track of compacted hardcore runs through the centre of the Site. Fields are bounded by Cornish hedgebanks, most of which lack hedgerows.

The fields of grassland do not provide optimal habitat for ground nesting birds, given the frequency of silage cuts and high stocking levels.

The fields themselves provide some limited suitability for over-wintering species, however when assessed on a landscape scale in which species such as lapwing are known to be present, the site may provide some winter foraging/roosting opportunities.

3.3 VP surveys results

Vantage Point surveys were completed from two locations which overlook the survey area (Map 1). This allowed robust coverage of birds transiting though the airspace of the wind farm from all directions. The total species and frequency they were recorded at during the VP surveys are detailed below in Table 9.

Table 9 – Bird species recorded during VP surveys

Species	No. of records during passage/winter survey	No. of records during summer survey
Black-headed gull	27	3
Buzard	22	13
Common gull	28	0
Cuckoo	0	1
Curlew	1	1
Great black-backed gull	6	2
Golden plover	39	0
Grey heron	1	0
Herring gull	109	100
Kestrel	2	5
Lapwing	13	0
Lesser black-backed gull	3	5
Mallard	1	0
Mediterranean gull	1	0
Sparrowhawk	4	2

The majority of bird activity recorded during the VP surveys involved gull flights transiting through the airspace of the wind farm. Gulls were rarely recorded on the ground within the actual wind farm site, however were frequently recorded foraging and day roosting in mixed flocks in agricultural fields at edge of the survey area. Agricultural activities such as ploughing or slurry application also had an influencing factor on both frequency and number gull flights Herring gull activity mostly comprised short flights at risk height in low numbers of 1-3 birds. Other gull species exhibited similar flight patterns although were more often recorded in large flocks. All gull flights exhibited clear avoidance behaviour towards the existing turbines.

Golden plover were mostly recorded in large flocks circling over the airspace of the existing and proposed turbines. Golden plover were recorded during nine surveys between October to March, showing frequent use of the area. The largest flock recorded consisted of approximately 250 birds recorded from VP2 on 21st December 2022. Golden plover activity was associated with foraging and day roosting in nearby fields but away from existing and proposed turbines. Lapwing were recorded during only one survey and were foraging in nearby fields away from existing and proposed turbines. The largest flock of lapwing, consisting of approximately 70 birds, was recorded from VP1 on 15th December 2022. Clear avoidance behaviour was observed to the existing turbines.

Buzard and kestrel were frequently recorded foraging within the site during both summer and winter surveys and mostly at risk height, however clear avoidance behaviours was observed to the existing turbines.

Other species were seldom recorded within the site and use of turbine air space is likely to be highly limited.

3.4. Collision risk calculation

Collision risk estimates have been calculated based on parameters of the existing wind farm and the repowered wind farm, as well as bird biometric data and potential hours of activity during the season for which the surveys were undertaken.

The term bird flight is used to describe each individual bird observed in the survey area, such that a transit of the survey area by a flock of 50 birds would comprise 50 bird flights, and a transit by a single bird would be one bird flight.

Details of the collision risk estimates (using observed flight activity during 2022/23 VP survey) are presented in Tables 10-11 below.

Appendix 1 provides flight maps for each of the Target species.

Table 10 – Wind turbine parameters

Wind farm details		
Turbine details	**Existing wind farm**	**Proposed wind farm**
No of proposed turbines	16	4
No. of blades per turbines	3	3
Max chord	1.35m	4.1m
Mean pitch angle	25°	25°
Rotational period	2.14	4.29
Rotor diameter	44m	136m
Hub height	35m	82m
Blade length	22m	68m
Maximum blade height	57m	150m
Minimum blade height	13m	14m
Rotor area	1520.531 m^2	14526.72 m^2

Table 11 – Survey parameters used in collision risk calculation

Survey parameters			
Variable	**Existing wind farm**	**Proposed wind farm**	**Comments**
Viewshed area (m^2)	2477284	678871	200m buffer + blade length around turbines
Flight risk volume or Vw (m^3)	109999498	92326393	Viewshed area x risk height (rotor diameter)
Passage/winter survey (hrs)	45		Total hours in passage/winter survey
Passage/winter survey (s)	162000		45 x 3600
Passage/winter season (hrs)	1789[5]		Total hours in passage/winter season. Calculated from mean daylight per hrs month in survey season
Passage/winter season (s)	6440400		1789 x 3600
Summer survey (hrs)	24		Total hours in summer survey

[5] Increased by 25% for species with known diurnal behaviour, such as lapwing and golden plover

Summer survey secs	86400	24 x 3600
Summer season (hrs)	1818.79	Total hours in summer season. Calculated from mean daylight per hrs month in survey season
Summer season secs	6547644	1818.79 x 3600

Table 12 – Biometric data for target species

Target Species	Assumed bird speed m/s[6]	Bird length (m)	Wingspan (m)
BH	12	0.35	1.05
BZ	9	0.54	1.2
CM	13.5	0.41	1.2
CU	16.3	0.55	0.9
GB	13	0.71	1.58
GP*	17	0.28	0.72
HG	12	0.6	1.4
K.	10.1	0.34	0.76
L.*	12.8	0.3	0.84
LB	12	0.58	1.43

Table 13 – Bird flight data for passage/winter survey

Species	Total bird flights at risk height		Total time at risk height (s)		Combined time at risk height (s)
	VP1	VP2	VP1	VP2	
Black-headed gull (BH)	98	66	1175	1026	2201
Buzzard (BZ)	19	5	648	65	713
Common gull (CM)	382	61	17455	1440	18895
Curlew (CU)	2	0	20	0	20
Great black-backed gull (GB)	3	7	105	275	380
Golden plover (GP)	960	1033	10745	62285	73030
Grey heron (H.)	0	1	0	15	15
Herring gull (HG)	483	195	11357	3089	14446
Kestrel (K.)	1	1	20	30	50
Lapwing (L.)	411	0	5285	0	5285
Lesser black-backed gull (LB)	3	1	65	20	85
Mediterranean gull (MG)	1	0	25	0	25
Sparrowhawk (SH)	1	0	15	0	15

Table 14 – Bird flight data for summer survey

Species	No. of flights at risk height		Total flight time at risk height (s)		Combined time at risk height (s)
	VP1	VP2	VP1	VP2	
BH	1	5	25	115	140
BZ	8	5	310	150	460

[6] Flight speed data obtained from data provided by Pennycuick, 2001 and Alerstam et al. 2007

GB	1	1	45	15	60
HG	89	105	2252	2099	4351
K.	4	1	90	75	165
LB	6	5	180	141	321

Table 15 – Collision risk calculation for number of bird collisions for existing wind farm

Bird species	**Collision rate (%)**	**No. of collisions during passage/winter**	**No. of collisions during summer**	**Combined estimated collisions per year**
Survey data	*average collision risk derived from the SNH probability spreadsheet*	*With applied avoidance rate and operational time*[8]	*With applied avoidance rate and operational time*	*Estimated collisions over passage/winter and summer*
BH	8.8	0.175	0.021	**0.196**
BZ	9.1	0.044	0.054	**0.098**
CM	8.7	1.488	N/A	**1.488**
CU	8.7	0.004	N/A	**0.004**
GB	12.1	0.045	0.014	**0.059**
GP	6.2	7.257	N/A	**7.257**
HG	11.6	1.517	0.272	**1.789**
K.	9.9	0.004	0.024	**0.028**
L.	6.1	0.389	N/A	**0.389**
LB	11.5	0.009	2.054	**2.063**

Table 16 – Collision risk calculation for number of bird collisions for proposed wind farm

Bird species	**Collision rate (%)**	**No. of collisions during passage/winter**	**No. of collisions during summer**	**Combined estimated collisions per year**
Survey data	*average collision risk derived from the SNH probability spreadsheet*	*With applied avoidance rate and operational time*[9]	*With applied avoidance rate and operational time*	*Estimated collisions over passage/winter and summer*
BH	8.1	0.455	0.055	0.51
BZ	7.3	0.100	0.123	0.223
CM	7.6	3.665	N/A	3.665
CU	7.1	0.010	N/A	0.01
GB	9.5	0.100	0.030	0.13
GP	5.8	19.143	N/A	19.143
HG	9.8	0.739	2.074	2.813
K.	9.5	0.010	0.064	0.074
L.	5.6	1.007	N/A	1.007
LB	9.4	0.020	0.147	0.167

[8] Avoidance rate of 99% and 85% turbine operational time applied to no. of collisions, as detailed in Section 2.4

[9] Avoidance rate of 99% and 85% operational time applied to no. of collisions, as detailed in Section 2.4

3.5. Breeding bird survey results

A total of 27 species were recorded using habitats within and around the Site, which is quite typical for a site of the size and composition. The survey results including assessed breeding status and estimated number of territories for each species recorded is detailed in Table 17. Indicative territories for notable species are shown in Map 1.

Only one target species was recorded (skylark), and it assessed as a probable breeder with an estimated 3 territories located within and adjacent to the Site. Skylark appeared to be well habituated to the existing turbines, with activity frequently observed within ~20m of the turbine structures. Activity across the Site and adjacent areas included display flights, singing from perches and foraging in small groups. Activity was widespread across the site with birds frequently moving across the site. Skylark were also observed using neighbouring fields (off-site) to the Site which contained a variety of habitats including arable, silage grassland and sheep grazed grassland with wind turbines.

Twelve of the species recorded are considered notable due to current conservation status, with one of these (whitethroat) confirmed to be breeding within the Site. The remainder are widespread and common species.

The hedgerow habitat associated with the Site supported a healthy number of territories of notable species such as dunnock, whitethroat, linnet and yellowhammer. The hedgerows and scrub also supported breeding territories from common species. Some species exhibited no breeding behaviour (such as buzzard, jackdaw and herring gull) and were foraging over/within the site.

Table 17. Breeding bird survey results

Species	BBS# 1	BBS# 2	BBS# 3	Breeding evidence	Breeding status	No. of estimated territories	Legal/policy status
Blackbird	3	5	4	Pair seen	Probable	4	Green
Blue tit	2	1	4	Carrying food	Confirmed	3	Green
Buzzard	1	0	0	None	Non-breeder	0	Green
Carrion crow	4	4	3	None	Non-breeder	0	Green
Chiffchaff	1	0	0	Bird in suitable habitat	Possible breeder	0	Green
Chaffinch	0	2	0	Bird in suitable habitat	Possible breeder	0	Green
Dunnock	2	6	4	Repeated singing	Probable	3	Amber; NERC s41
Little egret	0	0	1	None	Non-breeder	0	Green
Goldfinch	0	1	1	Carrying food	Confirmed	1	Green
Herring gull	0	11	3	None	Non-breeder	0	Red; NERC s41
House martin	0	0	3	None	Non-breeder	0	Red
House sparrow	0	1	0	Bird in suitable habitat	Possible breeder	0	Red; NERC s41
Jackdaw	3	0	0	None	Non-breeder	0	Green
Kestrel	0	1	0	None	Non-breeder	0	Amber
Linnet	5	0	1	Pair seen	Probable	1	Red; NERC s41
Meadow pipit	2	1	0	Repeated singing	Possible breeder	0	Amber
Pheasant	1	1	0	None	Non-breeder	0	N/A - introduced
Pied wagtail	1	0	0	None	Non-breeder	0	Green
Robin	3	4	1	Carrying food	Confirmed	2	Green
Skylark	10	13	7	Repeated singing	Probable	3	Red; NERC s41
Stonechat	1	0	2	Fledglings seen	Confirmed	1	Green
Starling	0	1	0	None	Non-breeder	0	Red; NERC s41
Swallow	3	0	2	None	Non-breeder	0	Green
Whitethroat	3	3	3	Carrying food	Confirmed	3	Amber
Wood pigeon	0	1	0	None	Non-breeder	0	Amber
Wren	6	6	6	Repeated singing	Probable	3	Amber
Yellowhammer	2	0	1	Repeated singing	Probable	1	Red; NERC s41

3.6 Historic data from nearby wind farms

Historic bird survey data has been obtained from nearby wind farm developments that are comparable to Bears Down wind farm in terms of proposed development and/or habitat make up and landscape context.

Ventonteague turbine

This concerns an operational single turbine (blade diameter 77m with a tip height of 98.5m) located close to Carland Cross Wind Farm and approximately 15.8km to the southwest of Bear Downs Wind Farm. The turbine is situated winth agricultural land consisting of arable and managed grassland and given the landscape context, bird activity is comparable to Bears Down Wind Farm.

Bird surveys were undertaken in 2013-14 included a nightjar survey and a combination of winter VP surveys and nocturnal walkover surveys. The results of wintering and nocturnal transects and the nightjar survey are not detailed in the Environmental Statement for this development. Collision risk estimates were made for starling, merlin, golden plover and mediterranean gull. Of these, the latter two were recorded at Bears Down, with collision estimates of 2.957 and 0.001, respectively.

Scotland Corner Wind Farm

This concerns a refused application for 5 new wind turbines. The proposal was refused on the grounds of landscape and visual impacts. Scotland Corner is located approximately 3.1km to the east of Bears Down (at the closest point). This site is comparable to Bears Down in terms of habitats present and general landscape context, although the former may attract more notable bird interest due to presence of two areas of heathland close by.

Bird surveys that were undertaken involved wintering and summer season VP surveys between November 2011 to March 2012 and April to August 2013, respectively (Coriolis Energy, 2014). Winter and breeding bird transects were also undertaken during these periods. In addition, nocturnal wading bird surveys were undertaken during winter period 2012/13.

Wintering surveys recorded notable species including barn owl, common gull, golden plover, hen harrier, kestrel, lapwing, mediterranean gull, merlin, peregrine, shot-eared owl and snipe. Breeding surveys recorded notable species such as black-headed gull, cuckoo, great black-backed gull, hobby, kestrel, lapwing, lesser black-backed gull, merlin, peregrine. Short-eared owl, snipe.

The nocturnal walk over survey recorded a max count of 12 golden plover roosting within the site at night and a max count of 10 snipe. Short-eared owl, hen harrier and merline were also recorded in low numbers.

Mean collision estimates were made for target species, including those recorded at Bears Down and are detailed in Table 18 below.

Table 17 – mean collision estimates for Scotland Corner Wind Farm

Species	Mean collision estimate per season[14]
Golden plover (winter)	21.25
Kestrel (winter)	0.26
Lapwing (winter)	0.74

St Breock Wind Farm repowering

The repowering of this wind farm involved replacement of 11 existing turbines with 5 new turbines. St Breock Wind Farm is located approximately 6.38km to the east of Bear Downs Wind Farm and supports similar agricultural habitats to those at Bear Downs and is likely to support similar bird activity given the similar landscape context.

Bird surveys undertaken between September 2010 to August 2011 included breeding and winter transects, VP surveys and specific golden plover surveys (Wardell Armstrong, 2012). Winter transects recorded notable species such as merlin, kestrel, common snipe, golden plover, green sand piper, herring gull and black-headed gull. Breeding species recorded included cuckoo, skylark, grasshopper warbler, linnet and kestrel.

Golden plover surveys recorded between early October to April and were assessed to be wintering birds, using the site for feeding and as an occasional night roost. Golden plover were recorded in large flocks of up to 800 birds and activity generally involved prolonged fights above the height of the existing turbines with a small proportion of time on the ground.

VP surveys recorded flight activity from a number of target species including black-headed gull, common gull, golden plover, great black-backed gull, kestrel, lapwing, lesser black-backed gull, mallard, merlin and snipe.

Of these, collision estimates were made for the following species which were also recorded at Bears Down Wind Farm, as detailed in Table 19 below.

Table 18 – mean collision estimates for St Breock Wind farm repowering

Species	Mean collision estimate per annum[15]
Buzzard	8
Common gull	1.5
Golden plover	27.5
Great black-backed gull	0.5
Herring gull	3

Denzell Down Wind Farm

Denzell Down Wind Farm comprises 5 operational turbines (with a blade diameter of 80m and tip height of 100m) and is located in neighbouring land to Bears Down Wind Farm.

There is a minimum separation distance of approximately 470m between Denzell Downs and the proposed turbines at Bears Down. Denzell Downs supports similar habitats to those at Bear Downs and is likely to support similar bird activity given the landscape context.

[14] Using a 98% avoidance rate

[15] Using a 98% avoidance rate

Bird surveys undertaken at Denzell between December 2008 and November 2009 included autumn, winter and breeding season transects, Nightjar surveys and VP surveys (Wardell Armstrong, 2011).

Bird survey transects recorded a bird assemblage characteristic of the local area with notable species including hen harrier, merlin, hobby, peregrine, barn owl, golden plover and whimbrel, as well as a variety of breeding species such as bullfinch, cuckoo, grasshopper warbler, house sparrow, linnet, skylark and yellowhammer.

Nightjar surveys did not record any nightjar activity.

VP surveys recorded flight activity from 5 of the target species and provided collision estimates for these. Of these, golden plover was the only species recorded during the Bears Down surveys. An estimated 39.03[16] collisions per annum were predicted for golden plover.

Carland Cross Wind Farm repowering

Carland Cross Windfarm repowering involved the replacement of 15 existing turbines with 10 new turbines. Carland Cross Wind Farm is located approximately 14.08km (at the closest point) to the southwest of Bears Down and is situated within agricultural habitats comprising mostly arable land. An extent of heathland is located at the western edge of the wind farm.

Bird surveys undertaken between 2007 to 2008 included winter and breeding season transects and VP surveys (Scottish Power Renewables, 2008).

Breeding transects recorded notable breeding species such as cuckoo, skylark, meadow pipit, grasshopper warbler, linnet, bullfinch and yellowhammer. Notable species recorded during winter transects included hen harrier, merlin, peregrine and golden plover.

VP surveys recorded flight activity from a number of target species including hen harrier, merlin, peregrine, whimbrel, snipe and large flocks (up to 700) of golden plover. However, collisions estimates were only made for peregrine.

[16] using a conservative avoidance rate of 98%

References

Band, W., Madders, M., & Whitfield, D.P. (2007). Developing field and analytical methods to assess avian collision risk at wind farms. In: de Lucas, M., Janss, G.F.E. & Ferrer, M. (eds.) Birds and Wind Farms: Risk Assessment and Mitigation, pp. 259-275. Quercus, Madrid.

Band, B. (2012) Using a Collision Risk Model to Assess Bird Collision Risks for Offshore Windfarms.Guidance document. SOSS Crown Estate

Cook, A.S.C.P, Humphreys, E.M., Masden, E.A. and Burton, N.H.K., (2014). The Avoidance Rates of Collision Between Birds and Offshore Turbines. Scottish Marine and Freshwater Science, Volume 5, Number 16.

Cook, A.S.C.P., Barimore, C., Holt, C.A., Read, W.J. and Austin, G.E. (2013). Wetland Bird Survey Alerts 2009/2010: Changes in numbers of wintering waterbirds in the Constituent Countries of the United Kingdom, Special Protection Areas (SPAs) and Sites of Special Scientific Interest (SSSIs). BTO Research Report 641. BTO, Thetford. http://www.bto.org/volunteer-surveys/webs/publications/webs-annual-report

Devereux, C. L., Denny, M. J. H. & Whittingham, M. J. (2008). Minimal effects of wind turbines on the distribution of wintering farmland birds. Journal of Applied Ecology, 45: 1689-1694.

Drewitt, A. L. and Langston, R. H. W. (2006) Assessing the impacts of wind farms on birds. *Ibis*, 148: 29–42. doi: 10.1111/j.1474-919X.2006.00516.x

Edkins, Max. (2014). Impacts of wind energy developments on birds and bats: looking into the problem.

Frost, T.M., Austin, G.E., Calbrade, N.A., Holt, C.A., Mellan, H.J., Hearn, R.D., Stroud, D.A., Wotton, S.R. and Balmer, D.E. (2016). Waterbirds in the UK 2014/15: The Wetland Bird Survey. BTO/RSPB/JNCC. Thetford. http://www.bto.org/volunteer-surveys/webs/publications/webs-annual-report

Fuller, R.J. 1980. A Method for Assessing the Ornithological Importance of Sites for Nature Conservation Biological Conservation 17:229-239

Gittings, T. (2018). Derryadd Wind Farm: Collision risk modelling. November 2018.

Hotker, H, Thomsen, K & Jeromin, H (2006). Impacts on biodiversity of exploitation of renewable energy sources: the example of birds and bats – facts, gaps in knowledge, demands for further research, and ornithological guidelines for the development of renewable energy exploitation. Miachael-Otto-Institut im NABU, Bergenhusen.

JNCC, 2021. https://jncc.gov.uk/our-work/herring-gull-larus-argentatus/

Peach, W.J., Thompson, P.S. and Coulson, J.C., 1994. Annual and long-term variation in the survival rates of British lapwings Vanellus vanellus. Journal of Animal Ecology, pp.60-70.

Pearce-Higgins, J.W., Stephen, L., Douse, D., and Langston, R.H.W. (2012). Greater impacts of wind farms on bird populations during construction than subsequent operation: results of a multi-site and multi-species analysis. Journal of Applied Ecology 2012, 49, 386-394.

Percival, S. M. (2005). Birds and wind farms: what are the real issues? British Birds, 98: 194-204.

Mason, T., Whittingham, M. J., and Willis S. G. (2018). Estimating breeding numbers and productivity of Curlew and Golden Plover across the moorlands of the North Pennines and Yorkshire Dales. Durham University and Newcastle University.

Nairn, R. (2012). Do wind turbines disturb waterbirds? [Online] Available at: http://www.ciem.net/data/files/Resource_Library/Conferences/2012_Autumn_Renewables/11-Richard_Nairn.pdf

Royal Society for Protection of Birds (RSPB) (2009). Guidance Note: Distribution of breeding birds in relation to upland wind farms.

Sansom, A., Pearce-Higgins, J.W. and Douglas, D.J., 2016. Negative impact of wind energy development on a breeding shorebird assessed with a BACI study design. Ibis, 158(3), pp.541-555.

Scottish Natural Heritage (SNH) (2000). WINDFARMS AND BIRDS: Calculating a theoretical collision risk assuming no avoiding action. Guidance Note Series.

Scottish Natural Heritage (SNH) (2018). Avoidance Rates for the onshore SNH Wind Farm Collision Risk Model. 2018 v2.

Taylor, R.C. and Dodd, S.G., 2013. Negative impacts of hunting and suction-dredging on otherwise high and stable survival rates in Curlew Numenius arquata. Bird Study, 60(2), pp.221-228.

Woodward, I.D., Massimino, D., Hammond, M.J., Barber, L., Barimore, C., Harris, S.J., Leech, D.I., Noble, D.G., Walker, R.H., Baillie, S.R. & Robinson, R.A. (2020) BirdTrends 2020: trends in numbers, breeding success and survival for UK breeding birds. BTO Research Report 732. BTO, Thetford. www.bto.org/birdtrends

western ECOLOGY
1 Geffery Close
Landrake
Saltash
Cornwall
PL12 5HA

Tel: 0800 622 6828
email: office@westernecology.co.uk

Legend

Red line boundary

Approx locations of breeding territories for notable species

- Amber listed (BoCC5)
- Red (BoCC5)

D. = Dunnock
LI = Linnet
S. = Skylark
WH = Whitethroat
WR = Wren

Title: Map 1. Estimated breeding territories for notable species

Project: Bears Down Wind Farm, Cornwall

Checked by: CDH

Version: 01
Date: 17/07/2025