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Bird Survey Report

Land at Dubbers,

St Austell, Cornwall

November 2025

A report by

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Report details

Site Name:	Dubbers turbines, St. Austell, Cornwall
Grid reference:	SW975562
Report date:	5th November 2025
Report author:	James Gilroy BSc (Hons), MSc
Report reviewer:	Colin Hicks BSc (Hons), MCIEEM
Report reference:	WOR-5746

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.

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1. Introduction

1.1. Background

Western Ecology have been commissioned to undertake combined summer and winter bird vantage point surveys (VP), breeding bird surveys and a nightjar survey for proposed wind turbine development.

1.2. Proposed development

The proposed development concerns construction and operation of two Vestas 117 (4.3MW) turbines with blade tip heights of 135m and a hub height of 76.5m. Associated infrastructure includes a temporary construction compound, new access tracks and hardstanding areas.

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 the southern periphery of the Lower Longstones area of the operational clay works associated with the Little Johns Pit, located approximately 1.25km to the east of the village of Nanpean, and approximately 5km to the north-west of St Austell in mid-Cornwall.

2. Survey Methodology

2.1. Desktop survey

A desktop survey was commissioned from the Environmental Records Centre for Cornwall & the Isles of Scilly (ERCCIS) - records were provided of non-statutory nature conservation sites and birds within 1km.

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

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, breeding and foraging birds.

2.3. Vantage Point Surveys

A breeding season Vantage Point Survey (VPS) have been completed between March to August 2025, to capture bird movements during the accepted breeding season. A passage/winter VPS is currently on-going and covers the period from October 2025 to February 2026. 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) and Oscar Bates, both experienced ecologists with experience of wind turbine developments and bird surveys. Surveys were undertaken from a single location (see Map 1), designed to provide sufficient coverage of the turbine envelopes and scheduled to capture a variety of times and weather conditions. Surveys lasted for 3hrs each (Table 1).

During each VPS, the surveyor recorded the species, number of individuals, duration and direction for each flight. The height of each flight was recorded at 15 second intervals using a system of four height bands:

- Band A – 0-10m – below blade sweep;
- Band B – 11-50m –blade sweep for smaller turbines;
- Band C – 51-130m – blade sweep for taller turbines; and
- Band D - >130m – above blade sweep.

The survey area of the VPS included the proposed turbine locations and visible land to all sides within a prescribed buffer (blade length + 500m) and are shown in Map 1.

Table 1. VPS times and conditions for breeding season period

Survey No.	Duration (hrs)	Surveyor	Date	Time	Weather
1	3	MR & OB	26.03.2025	10:40 – 13:40	Mild, calm, and dry. Temp: 12°C, cloud cover: 90%, wind force: 0-1 SW
2	3	MR	02.04.2025	08:10 – 11:10	Dry, sunny and calm. 8°C, cloud cover: 10%, wind force: 0-1 E
3	3	MR	16.04.2025	12:15 – 15:15	Dry, sunny and calm. 10°C, cloud cover: 25%, wind force: 1-2 W
4	3	MR	22.04.2025	07:15 – 10:15	Patchy sun and calm. 7-10°C, cloud cover: 30% and wind force: 0-1 SSW
5	3	MR	22.05.2025	10:30 – 13:30	Sunny, calm and dry. 16°C, cloud cover: <10%, wind force: 0-2 NW
6	3	MR	11.06.2025	18:30 – 21:30	Overcast, light breeze and dry. 18°C, cloud cover: 90%, wind force: 2-3SE
7	3	MR	27.06.2025	08:30 – 11:30	Dry, sunny and calm. 15-17°C, cloud cover: 30%, wind force: 2-3SW
8	3	MR	03.07.2025	17:55 – 20:55	Sunny, light breeze and dry. 18°C, cloud cover: <10%, wind force: 2-3NW
9	3	MR	24.07.2025	17:45 – 20:45	Dry, light haze and light breeze. 18°C, cloud cover: 25%, wind force: 2-3NW
10	3	MR	06.08.2025	09:15 – 12:15	Patchy sun and dry. Temp: 17°C, cloud cover: 50%, wind force: 0-1NW
11	3	MR	11.08.2025	12:45 – 15:45	Occasional drizzle, warm and moderate breeze. 22°C, cloud cover: 100%, wind force: 3-4SW
12	3	MR	20.08.2025	07:35 – 10:35	Overcast, dry and calm. 15°C, cloud cover: 90%, wind force: 0-1NE

This level of survey effort provided a total of 36hrs during the breeding bird period.

Table 2. VPS times and conditions for winter/passage period

Survey No.	Duration (hrs)	Surveyor	Date	Time	Weather
1	Currently on-going October 2025 to February 2026				
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

This level of survey effort will provide a minimum of 36hrs during the passage/wintering period.

Target species for vantage point surveys

The target bird species for the VPS were based on those species which are identified by *Natural England 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/NERC s41/BoCC 5 Red/Amber species.

Table 3. List of bird Target species for VPS at Dubbers

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

2.4. Calculation of collision risk

Wind turbine collision risk for target species has been estimated using the method outlined by NatureScot (2024), based on the report by Band (2024). Collision risk estimates have been made based on the turbine parameters of the existing turbine and the proposed turbine to enable a comparison between to the two scenarios.

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 model estimates the number of collisions through a process of five stages:

- *Stage A* uses bird survey data to establish the density of flying birds in the vicinity of the turbines, and the proportion flying at a risk height, between the lowest and highest points of the rotors;
- *Stage B* provides an estimate, based on the bird density and proportion at risk height, of the potential number of bird passages through rotors in the period in question;
- *Stage C* calculates the probability of collision during a single bird rotor transit;
- *Stage D* estimates the potential collision rate for a bird species, assuming current levels of bird use of the site, allowing for the proportion of time that turbines are not operational;
- *Stage E* takes account of the proportion of birds likely to avoid the wind farm or its turbines, either because they have been displaced from the site or because they take evasive action or are attracted to the wind farm, e.g. in response to changing habitats.

This approach is undertaken using a standardised 'master' spreadsheet into which all required data is entered and which presents the collision risk output.

Full details of this method and the master spreadsheet are available at: https://www.nature.scot/doc/guidance-using-updated-collision-risk-model-assess-bird-collision-risk-onshore-wind-farms.

Bird species biometric data for inputting into the master spreadsheet was obtained from BTO BirdFacts website (available at https://www.bto.org/learn/about-birds/birdfacts). Flight speed data was obtained using published sources, or where unavailable, using published data for comparable species. Hours of daylight during the survey periods were calculated by the master spreadsheet using the latitude of the proposed turbine.

2.5 Breeding Bird Survey

Breeding Bird Surveys (BBS) were completed by Martin Rule in April, May and June 2025, with full survey details contained in Table 4 below. The survey methodology was based on a combination of the standard Common Bird Census (CBC) methodology (Bibby et al. 2000), and the breeding bird survey methodology published by the Bird Survey & Assessment Steering Group (BSAG) (2025)[1]. CBC is a territory mapping approach used to estimate the quantity and distribution of the breeding territories of each species encountered within the survey area – in this case, land inside the red line boundary and within a 50 m buffer area around it. The breeding bird survey methodology is intended for the purpose of assessing ornithological impacts from development proposals.

[1] Bird Survey & Assessment Steering Group. (2025). Bird Survey Guidelines for assessing ecological impacts

Table 4 – breeding bird survey timings and weather conditions

Survey no.	Date	Start time	Finish time	Weather
1	22/04/2024	06:00	07:15	Temp: 6-9°C, Wind: F0-1, Cloud cover: 25%, Precipitation: none
2	16/05/2025	06:00	07:20	Temp: 11-13°C, Wind: F1-2 Cloud cover: 100% Precipitation: fine drizzle at start then cleared
3	16/06/2025	05:30	06:45	Temp: 13-5°C, Wind F1-2, Cloud cover: 100%, Precipitation: none

The conservation status of each species recorded was determined based on the following criteria:

Birds of Conservation Concern 5

Commonly referred to as the UK Red List for birds, this is the fourth review of the status of birds in the UK, Channel Islands and Isle of Man, and updates the last assessment in 2009. 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.

Red list species are those that are Globally Threatened according to IUCN criteria; those whose population or range has declined rapidly in recent years; and those that have declined historically and not shown a substantial recent recovery.

Amber list species are those with an unfavourable conservation status in Europe.

Species on the Green List fulfil none of the above criteria and are of least conservation concern.

Schedule 1 of the Wildlife and Countryside Act (1981)

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

Biodiversity Action Plan species

Species of bird are listed as Local Biodiversity Action Plan Priority Species and species are listed as species of principal importance (Section 7 of the Environment (Wales) Act 2016).

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
- Species observed but suspected to be summering non-breeder

Possible breeder

- Species observed in breeding season in suitable nesting habitat

- 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 part 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
- 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.

2.6. Nightjar surveys

A walked transect was conducted across the site and immediate surroundings. (Map 1). This transect route gave optimal coverage of the Site, allowing any potential Nightjar to be clearly seen displaying or heard churring.

Following standard RSPB guidelines, surveys were carried out by Martin Rule in the period mid-May to late July, between 30 mins before sunset to 1.5 hours after sunset and in suitable weather conditions (dry and wind less than Beaufort 3). Survey conditions are detailed below in Table 5.

Table 5. Nightjar survey dates and weather conditions.

Survey no.	Date	Time	Weather
1	11.05.2025	20.35-22.15 (sunset 20:54)	Dry, calm and occasional light showers. Temp: 13-10° C, cloud cover: 80-100% and wind force: 2-3W

2	03.07.2025	21:00-23:10 (sunset 21.32)	Overcast, calm and dry. Temp: 16-13°C, cloud cover: 100% and wind force: 1-2SW
3	24.07.2025	20.45-22.50 (sunset 21.13)	Scattered cloud, calm and dry. Temp: 16-12°C, cloud cover: 60-90% and wind force: 1-2S

2.7. Survey constraints

The survey effort covered a total period of 36hrs per period, which meets the minimum survey effort required for seasonal vantage point surveys. A robust assessment of bird activity has 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.

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.

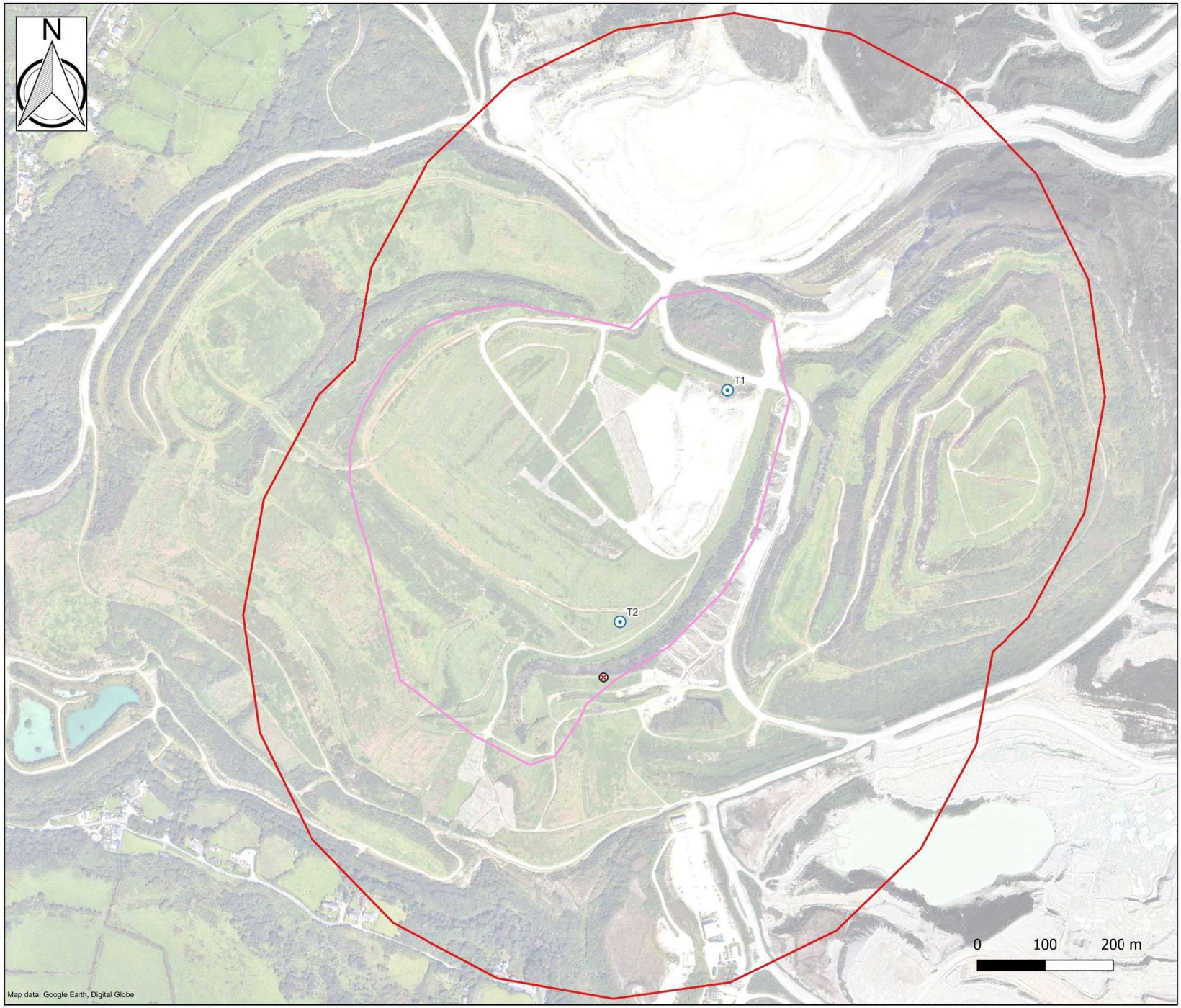
All areas of the site were readily accessible for the BBS and nightjar surveys. During the first nightjar survey rain showers were encountered approximately 45 minutes into the survey. Although the RSPB survey guidelines for nightjar surveys recommend avoiding prolonged periods of rainfall, nightjar activity was still recorded during this survey so the decision was made to continue with the survey despite the sub-optimal weather conditions.

The BBS was carried out at suitable times and during favourable weather conditions. Although the current guidelines recommend six visits which is considered necessary for complex habitats such as woodland, the three visits undertaken here provide a sound representation of bird activity at this site given the relatively simple habitat composition.

There are no significant constraints to the results of this survey.

2.6. 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 VPS included visible land to all sides within 500m+ blade length from the turbine and shown in Map 1. The survey area for the breeding bird and nightjar transects relates to the areas within 500m of the proposed turbine locations.



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Legend

Survey areas

- VP survey (blade length +500m)
- BBS & Nightjar
- Proposed turbine location
- VP surveyor location

Title: Map 1. Bird survey map

Project: Dubbers turbines, Cornwall

Checked by: CDH

Version: 01
Date: 06/11/2025

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 1km

Species Group	Taxonomic name	Common name	UK protection	Policy status	Count
Bird	*Cuculus canorus*	Cuckoo		Red[2]; NERC S.41[3]	1
	Carduelis carduelis	Goldfinch		Green	1
	Larus fuscus	Lesser black-backed gull		Amber[4]	1
	Pica pica	Magpie		Green	1
	Tadorna tadorna	Sand Martin		Cornwall RDB[5]	2
	Riparia riparia	Skylark		Red; NERC 41	3
	Hirundo rustica	Swallow		Green	1

Statutory Nature Conservation Sites (SNCS) with bird interest

There are no SNCS's within 2km.

Natural England assessed the likelihood of wind turbines to adversely impact SSSI interest features, including birds, from a varied range of developments through the use of SSSI impact risk zones. The site is not within a SSSI impact risk zone for wind farms.

Non-statutory Nature Conservation Sites (NNCS)

Longstone Downs County Wildlife Site (CWS) is situated approximately 600m to the south-east of the Assessment Site. It is designated as an area containing lowland heathland situated at the edge of an extensive china clay extraction area.

3.2. Habitat assessment

The area in which the Assessment Site is situated within is entirely man made and has a legacy of large scale ground disturbance. The Assessment Site occupies part of a flat, open plateau atop of a large and historic spoil tip, centrally located within an active china clay extraction area. Habitats across the plateaus exist as a result of experimental restoration methods using hydroseeding and predominantly involve tall, rank grassland with scattered

[2] Red listed - Birds of Conservation Concern (BoCC5)

[3] Species listed under Section 41 of the Natural Environment and Rural Communities Act (2006). These are the species found in England which have been identified as requiring action under the UK BAP. All local authorities and other public authorities in England and Wales have a duty to promote and enhance biodiversity in all of their functions.

[4] Amber listed - Birds of Conservation Concern (BoCC5)

[5] Cornwall Red Data Book (2009)

swathes of ruderal herbs. Steep embankments are present at the edges of the plateau which support scattered scrub.

The dense grassland and scattered scrub is likely to provide nesting opportunities for a variety of passerines, while there is also potential for ground nesting species of open environments to breed here. Unvegetated bare ground also provides potential nesting habitat for more specialist species such as waders. The Assessment Site currently provides poor suitability for nightjar, as these species are typically associated with heathland and woodland edge, both of which are absent.

The open nature of the plateau also provides potential foraging/loafing grounds for larger flocks of notable wintering waders species such as lapwing and golden plover, however the dense sward of the grassland may constrain the overall suitability.

The Assessment Site lacks suitability for bittern which is an interest feature of Goss Moor NNR, although there is some potential for hen harrier to be forage here, given the proximity to Goss Moor.

3.3. Bird VP surveys

VPS were completed from a location which overlooked the survey area (Map 1). This allowed robust coverage of birds transiting though the airspace of the wind farm from all directions.

Summary of winter flight activity

The passage/wintering VPS is currently on-going. This section of the report will be updated once the survey effort is completed.

Table 7 – Bird species recorded during winter VPS

Species	Total number of birds flights	Max count during single flight activity	Flight height bands
To be determined			

Summary of breeding season flight activity

Bird activity was much lower during the breeding season VP period, both in terms of species diversity and abundance.

Gull species were the most frequently recorded species group and of that, herring gull was the most regularly occurring bird. Gull flights were mostly transiting through the survey area with some occasional soaring, particularly by herring gull. Gulls were mostly in small groups of several individuals. A medium sized flock of herring gull was once recorded, comprising 32 individuals.

Red kite was recorded on two separate occasions, with activity involving an individual bird foraging over the survey area.

Buzzard was recorded during seven of the survey visits and activity mostly involved foraging over the survey area (and wider area) as well as courtship during the early April visit. The peak count was 3 birds.

Other species recorded within the survey area included skylark, wheatear and linnet. Flight details were not recorded because these birds were typically below blade height and also these species are not considered at risk from turbines. The species recorded during the breeding season VPS are detailed below in Table 8.

Table 8 – Bird species recorded during breeding season VPS

Species	Total number of birds flights	Max count during single flight activity	Flight height bands
Buzzard	32	6	B-D
Common gull	3	2	B-C
Green sandpiper	1	1	C
Herring gull	142	10	A-D
Kestrel	34	3	A-D
Lesser black-backed gull	12	4	B-D
Mallard	9	3	A-C
Peregrine	1	1	B-C
Sparrowhawk	3	1	A-C

3.4. Collision risk calculation

Calculating flight activity

Areal bird density (D_A) is the number of birds, in flight at any height at a given point in time, per unit area. D_A is most often recorded in bird seconds, which is particularly appropriate where bird numbers are low, and is usually expressed per square kilometre (km^2). Areal bird density can be calculated using the following expression:

$D_A = b / (t \times A)$ bird-seconds m^{-2}

Where:

- b = number of flight seconds from a vantage point;
- t = time (in seconds) that the vantage point is watched; and

A = area of the vantage point viewshed (km^2).

Collision risk estimates have been calculated based on parameters of the existing turbine, as well as bird biometric data, assumed nocturnal activity and assumed operational period of the turbine.

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 are presented in Tables 9-13 below. Appendix 1 provides flight maps for each of the Target species.

Table 9. Wind turbine parameters

Specification	Proposed turbine
Model	Vestas 117 4.3MW
No. of blades per turbines	3
Max chord	4m
Mean pitch angle	25°
Maximum rotor speed	15 rpm
Rotor diameter	117m
Hub height	76.5m
Maximum blade height	135m
Minimum blade height	18m

Table 10. Bird flight data for passage/winter period

Species	VPS viewshed (km^2)	Total duration of VPS (s)	Time in flight (bird-secs)	Areal bird density (bird-secs/ha^2)	Proportion flying at risk height
	A	*t*	*b*	*DA = b / (t x A)*	Q_{2R}
To be determined	1.37	129600	To be determined		

Table 11. Bird flight data for breeding season

Species	VPS viewshed (km^2)	Total duration of VPS (s)	Time in flight (bird-secs)	Areal bird density (bird-secs/ha^2)	Proportion flying at risk height
	A	*t*	*b*	*DA = b / (t x A)*	Q_{2R}
Buzzard	1.37	129600	4870	0.027	55.32%
Common gull			135	0.0008	100%
Green sandpiper			15	0.00008	100%
Herring gull			5210	0.029	75.74%
Kestrel			9995	0.057	94.74%
Lesser black-backed gull			570	0.00006	42.86%
Mallard			220	0.00002	84.62%
Peregrine			45	0.000004	100%
Sparrowhawk			80	0.000008	75%

Table 12. Biometric data for target species

Target Species	Assumed bird speed m/s[9]	Bird length (m)	Wingspan (m)
Buzzard	11.6	0.54	1.2
Common gull	13.5	0.41	1.2
Green sandpiper	12.3	0.23	0.4
Herring gull	12.8	0.6	1.4
Kestrel	10.1	0.34	0.76
Lesser black-backed gull	13.1	0.58	1.43
Mallard	18.5	0.58	0.88
Peregrine	12.1	0.46	0.97
Sparrowhawk	11.3	0.33	0.73

Table 13. Total estimated collisions from proposed turbine

Bird species	**No. of collisions during passage/winter**	**No. of collisions during breeding period**	**Combined estimated collisions per year**	**Combined estimated collisions across operational lifetime**
Survey data	*With applied avoidance rate and operational time[11]*	*With applied avoidance rate and operational time[6]*	*Estimated collisions over passage/winter and summer*	*Estimated collisions over 40 years*
Buzzard	TBC	0.6	TBC	TBC
Common gull	TBC	0.04	TBC	TBC
Green sandpiper	TBC	<0.001	TBC	TBC
Herring gull	TBC	0.6	TBC	TBC
Kestrel	TBC	1.9	TBC	TBC
Lesser black-backed gull	TBC	<0.001	TBC	TBC
Mallard	TBC	<0.001	TBC	TBC
Peregrine	TBC	<0.001	TBC	TBC
Sparrowhawk	TBC	<0.001	TBC	TBC

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

[11] Avoidance rate of 98% applied to all species except gulls. Avoidance rate of 99.5% applied to gulls. Operational rate of 85% applied to no. of collisions, as detailed in Section 2.4

3.4 Cumulative impact with nearby wind turbine developments

The cumulative impact has been considered between this proposed development with other approved turbines in the local area. This concerns the following wind turbine developments:

- PA20/09318 – single wind turbine with maximum blade tip height of 135m, Lower Longstones;
- PA21/07216 – single wind turbine with maximum blade tip height of 135m, Wheal Martyn;
- PA21/12493 – single wind turbine with maximum blade tip height of 135m, East Karslake;
- PA23/09937 – single wind turbine with maximum blade tip height of 135m, Burngullow; and
- PA23/10069 - single wind turbine with maximum blade tip height of 135m, Higher Goonamarth

This calculation has been obtained by summing the estimated number of collisions (including avoidance rates) for each individual turbine. Historic data from summer vantage point surveys (carried out by Western Ecology) was used for other turbines. Cumulative impact is detailed in Table 14 below and is expressed as a total number of collisions per annum.

Table 14. Cumulative impact of collision risk for target species for other turbines (proposed or permissioned) in local area.

Species	Total collisions per annum from 5 permissioned turbines	Total collisions per annum from Dubbers turbines[12]	Cumulative number of collisions per annum
Buzzard	0.81	0.6	1.41
Common gull	<0.001	0.04	0.041
Great black-backed gull	0.075	Not recorded	0.075
Green sandpiper	Not recorded	<0.001	<0.001
Herring Gull	2.08	0.6	2.68
Kestrel	0.88	1.9	2.78
Lesser black-backed gull	0.107	<0.001	0.108
Peregrine	0.007	<0.001	0.008
Mallard	0.031	<0.001	0.032
Sparrowhawk	0.008	<0.001	0.009

[12] The calculated number of collisions for the Dubbers turbines is based on estimates from the breeding season data. This will be updated once the full passage/winter survey effort has been completed.

3.5. Breeding bird transect survey

A total of 26 species of birds were recorded during the three breeding bird transects in April, May and June 2025. Of the 26 species recorded, 14 species are declining and included in the BoCC5 Red or Amber lists, whilst seven are also species of principal importance The remainder were common and widespread passerines. The full survey results are detailed below in Table 15.

The results indicate that the wider Assessment Site and surrounding land supports a good breeding bird assemblage, but one that is typical of the local china clay pits. The areas associated with the proposed turbine footings and construction areas supported little activity. Most of the bird activity was associated with the continuous/scattered scrub around the margins of the Assessment Site and consisted of common passerines such as chaffinch, blackbird, robin, willow warbler and wren. The open grassland areas also supported probable breeding activity from skylark and meadow pipit. Notable species such as grasshopper warbler and reed bunting were occasionally active within the tall grassland habitat, however no breeding territories were recorded. Non-breeding species such as carrion crow, pheasant, magpie, wood pigeon and two gull species were also recorded.

Table 15. Breeding bird survey results.

Species	BBS #1	BBS #2	BBS #3	Breeding evidence	Breeding status	Estimated no. of territories	Legal/policy status
Blackbird	3	6	11	Pair observed	Probable	2	Green
Blackcap	0	1	0	Bird in suitable habitat	Possible	0	Green
Blue tit	0	1	0	Bird in suitable habitat	Possible	0	Green
Carrion crow	6	2	0	None	Non-breeder	0	Green
Chiffchaff	0	0	1	Bird in suitable habitat	Possible	0	Green
Chaffinch	4	4	1	Repeated singing	Probable	2	Green
Dunnock	1	6	0	Repeated singing	Probable	1	Amber; NERC s41
Grasshopper warbler	0	2	0	Bird in suitable habitat	Possible	0	Red; NERC s41
Goldfinch	1	3	4	Repeated singing	Probable	0	Green
Great tit	0	0	1	Bird in suitable habitat	Possible	0	Green
Herring gull	2	0	0	None	Non-breeder	0	Red; NERC s41
Lesser black-backed gull	0	1	0	None	Non-breeder	0	Amber
Linnet	6	4	22	Repeated singing	Probable	1	Red; NERC s41
Magpie	3	2	2	None	Non-breeder	0	Green
Meadow pipit	0	13	6	Juveniles observed	Confirmed	2	Amber
Pheasant	1	0	1	None	Non-breeder	0	N/A - non-native
Pied wagtail	1	2	1	Repeated observation in same area	Probable	1	Green
Robin	3	9	1	Juveniles observed	Confirmed	2	Green
Reed bunting	1	2	0	Repeated singing	Probable	0	Amber; NERC s41
Skylark	4	2	1	Repeated singing	Probable	2	Red; NERC s41

Song thrush	2	2	1	Repeated singing	Probable	1	Amber; NERC s41
Sedge warbler	0	2	0	Repeated singing	Probable	0	Amber
White throat	0	1	0	Bird in suitable habitat	Possible	0	Amber
Wood pigeon	1	4	3	None	Non-breeder	0	Amber
Wren	2	4	3	Repeated singing	Probable	1	Amber
Willow warbler	2	5	1	Repeated singing	Probable	1	Amber

3.6. Nightjar survey

Nightjar activity was recorded during two of the survey visits. The full results of the Nightjar survey are detailed below in Table 16.

Table 16. Nightjar survey results

Survey no.	Number of nightjar recorded	Activity recorded	Assessment
1	2 individuals (likely a pair) associated with same territory	Churring, display flights and foraging	Despite sub-optimal wet conditions, a likely pair was observed with display flights and churring occurring during survey. Foraging activity also observed in area to south west of Turbine 2 (T2)
2	2 individuals in different locations associated separate territories	Foraging flights and churring	Single bird observed flying to/from suspected nest site (approx. 220m to south west of T2) and foraging in same area as previous survey, to southwest of T2. Another individual male heard churring some distance away, roughly north-east from T1.
3	No nightjar recorded		Nightjar have likely finished breeding and left this area.

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