
**THREE OAKS RENEWABLE
ENERGY PARK
EXTENSION**

**Environmental
Statement Chapter 7:
Biodiversity**

MAY 2026



Contents

7 Biodiversity	7-2
Introduction	7-2
Consultation	7-3
Legislation, Policy, Guidance and Standards	7-4
Assessment Methodology and Significance Criteria	7-6
Assumptions and Limitations	7-15
Baseline Conditions and Receptors	7-15
Baseline Evolution	7-25
Conservation Evaluation	7-25
Primary & Tertiary Mitigation	7-31
Assessment of Effects	7-31
Secondary Mitigation	7-48
Assessment of Residual Effects	7-49
Cumulative Effects	7-50
Biodiversity Net Gain	7-50
Summary and Conclusions	7-51
References	7-54

7 **Biodiversity**

Introduction

- 7.1 This chapter presents the assessment of likely significant effects of the proposed Three Oaks Renewable Energy Park Extension (hereafter referred to as the 'Proposed Development') relating to biodiversity. The specific objectives of the chapter are to:
- describe the current ecological baseline;
 - describe the assessment methodology and significance criteria used in completing the impact assessment;
 - describe the potential effects, including direct, indirect and cumulative effects;
 - describe the mitigation measures proposed to address the likely significant effects; and
 - assess the residual effects remaining following the implementation of mitigation measures.
- 7.2 The potential effects of the Proposed Development include collision risk to birds and bats, disturbance / displacement of birds, and habitat loss / fragmentation associated with access tracks, turbine bases and cabling. Construction could affect other mammals, including badgers, through noise and disturbance.
- 7.3 This chapter has been prepared by Steve Percival of Ecology Consulting, in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (hereafter referred to as the 'EIA Regulations'). A statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this Environmental Statement (ES) is provided in Appendix 1.1 (Statement of Expertise) – Volume 4.
- 7.4 The chapter is supported by the following Figures and Appendices:

Figures:

- Figure 7.1: Internationally important statutory nature conservation sites within 30 km;
- Figure 7.2: Nationally important statutory nature conservation sites within 5 km;
- Figure 7.3: Bird baseline survey areas;
- Figure 7.4: Local wildlife sites within 2 km; and
- Figure 7.5: Ecology habitat map.

Appendices:

- Appendix 7.1: Breeding Bird Survey 2020;
- Appendix 7.2: Breeding Bird Survey 2024;
- Appendix 7.3: Wintering Bird Survey 2019–2020;
- Appendix 7.4: Wintering Bird Survey 2024 – 2025;
- Appendix 7.5: Bat Surveys 2020;
- Appendix 7.6: Bat Surveys 2024;
- Appendix 7.7: Confidential Appendix on Badgers;
- Appendix 7.8: Collision Risk Modelling Calculations;
- Appendix 7.9: Draft Breeding Bird Protection Plan;
- Appendix 7.10: Draft Species Protection Plan; and

- Appendix 7.11: Outline Landscape and Biodiversity Mitigation and Enhancement Plan (oLBMEP).

Consultation

7.5

Table 7.1 below summarises relevant consultation undertaken, the relevant points made and responses to each along with a signpost to where relevant information can be found within this ES.

Table 7.1 – Three Oaks Renewable Energy Park Extension: Summary of Consultation Responses Relating to Ecology

Reference	Comment	Response
East Riding of Yorkshire Council		
Biodiversity Officer	The nearest local wildlife site, Rudston South Local Wildlife Site (LWS), is a road verge some 200+ metres distant from the development site at its closest point. The Proposed Development lies outside the area covered by the proposed Hull and East Yorkshire Local Nature Recovery Strategy (LNRS). There are unlikely to be any in principle objections in relation to the LNRS or designated LWS. Beyond the land take, the most likely wildlife impacts of the scheme would be on bats or birds. The cumulative effects of the scheme with those from the already consented Three Oaks Renewable Energy Park will need to be considered and appropriate mitigation identified. Consideration should be given to how mitigation and enhancement for this and the initial development might be combined.	Comments noted. Cumulative effects addressed in the 'Cumulative Effects' below. Mitigation and enhancement will be delivered and integrated with the measures for the initial development (see Appendix 7.11 oLBMEP).
Nature Conservation Team	Advised that the application will be subject to the requirements of mandatory biodiversity net gain (BNG). Sets out National Validation Requirements.	BNG statutory metric calculated and measures to be delivered set out in Appendix 7.11 (oLBMEP) – Volume 4, in line with National Validation Requirements.
	No recorded international, national or locally designated nature conservation sites with a direct link or pathway to the application site. LWS should be avoided where possible. Similarly, UK BAP Priority Habitats should be avoided.	No designated nature conservation sites would be affected by the Proposed Development.

Reference	Comment	Response
		The only UK BAP habitat affected would be native hedgerow, but Appendix 7.11 (oLBMEP) – Volume 4 would deliver a net gain securing hedgerow planting.
	Policy ENV2 states that opportunities to protect and enhance landscape characteristics and features should be made the most of.	Appendix 7.11 (oLBMEP) – Volume 4 will deliver a net gain, and has been developed in collaboration with the Proposed Development's LVIA consultant.
	Ecological appraisal proportionate to the nature and scale of the development should be submitted, including an Extended Phase 1 Habitat Survey. Where it is not possible to avoid effects on protected species appropriate mitigation will be necessary.	This appraisal is presented in this chapter, including the habitat survey. Appendix 7.10 presents a Draft Species Protection Plan.
	Up to date bird survey will be required, and assessment of collision risk to birds and bats	Bird and bat survey results, including from recent surveys in 2024 / 25, are summarised in this chapter, with full details in Appendices 7.1 – 7.6 – Volume 4.

Legislation, Policy, Guidance and Standards

Legislation

7.6 The following documents have been considered in the ornithological assessment:

- The Wildlife and Countryside Act 1981;
- The Countryside and Rights of Way [CRoW] Act 2000;
- Environmental Impact Assessment Directive 85/337/EEC;
- The Conservation of Habitats and Species Regulations 2017 (the 'Habitats Regulations'), which consolidate the Conservation of Habitats and Species Regulations 2010 with subsequent amendments and translates the Birds and Habitats Directives into UK Law;

- Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the ‘EIA Regulations’);
- Protection of Badgers Act 1992;
- Natural Environment and Rural Communities Act 2006 (‘the NERC Act’); and
- Environment Act 2021.

Policy

- The Overarching National Policy Statement (NPS) for Energy 2025 revision (EN-1);
- National Policy Statement for Renewable Energy Infrastructure (EN-3) 2026;
- The National Planning Policy Framework (Ministry of Housing, Communities and Local Government, updated December 2024);
- ‘Managing Natura 2000 Sites’ (European Communities 2000), which gives guidance on the implementation of the Birds and Habitats Directives;
- East Riding Local Plan Update 2020 – 2039 Strategy Document Update (April 2025): ENV4 – International, National, and Local Sites of Importance for Biodiversity; ENV5 – Enhancing Biodiversity and Geodiversity; and
- Biodiversity policies of the East Riding Local Plan (2012 – 2029).

Guidance and Standards

- Guidelines for Ecological Impact Assessment in the UK and Ireland; Terrestrial, Freshwater and Coastal (CIEEM 2018);
- Birds of Conservation Concern (BoCC) 5: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man (Stanbury *et al.* 2021);
- Recommended bird survey methods to inform impact assessment of onshore wind farms (SNH 2017a);
- Developing field and analytical methods to assess avian collision risk at wind farms (Band *et al.* 2007);
- Avoidance rates for the onshore SNH collision risk model (NatureScot 2025);
- Assessing the cumulative impact of onshore wind energy developments (SNH 2018b);
- Assessing connectivity with Special Protection Areas (SPAs) (SNH 2016a);
- Environmental Statements and Annexes of Environmentally Sensitive Bird Information Guidance for Developers, Consultants and Consultees. Version 2 (SNH 2016b);
- Good Practice during Wind Farm Construction (Scottish Renewables *et al.* 2019);
- The UK Biodiversity Framework 2024;
- The East Riding of Yorkshire Biodiversity Action Plan (ERYBAP);
- Natural England standing advice on how to assess a planning application when there are wild birds on or near a proposed development site;
- Bird Survey and Assessment Steering Group (2023). Bird Survey Guidelines for assessing ecological impacts;
- SNH (now NatureScot) guidance on bird survey methods (SNH 2017);
- NatureScot guidance on bird disturbance distances (Goodship and Furness 2022);
- Natural England *et al.* (2021) guidance on ‘Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation’; and
- Natural England (2022) Badgers: advice for making planning decisions.

Assessment Methodology and Significance Criteria

- 7.7 The key issues for the assessment of potential ecological effects relating to onshore wind farms include the following, based on NatureScot (NS) (formerly Scottish Natural Heritage (SNH)) guidance published in 2018 but applicable across the UK:
- direct loss of ecological habitat through construction of the Proposed Development infrastructure;
 - disturbance of birds and other protected species during construction and operation (including displacement of flight activity through barrier effects);
 - mortality of birds and bats through collision with wind turbine blades or towers during operation; and
 - cumulative effects of wind farm operational disturbance and collision mortality on populations of key target ecological communities / populations.
- 7.8 Key target species for the assessment have been identified following SNH 2018a guidance using the following criteria:
- species listed on Annex 1 / 5 of the EU Birds and Habitats Directives ('European Protected Species');
 - species listed on Schedules 1 and 5 of the Wildlife and Countryside Act 1981;
 - red-listed species on the Birds of Conservation Concern list (Stanbury *et al.* 2021);
 - NERC Act priority species and habitats;
 - other specially protected species, including badger; and
 - species identified by NatureScot (SNH 2018a) as 'Priority bird species for assessment when considering the development of onshore wind farms' (plus similar species likely to occur at the Site). These include (a) species that are widespread which utilise habitats or have flight behaviours that may be adversely affected by a wind farm, and (b) as 'restricted range' species.
- 7.9 The ecological assessment has, therefore, given particular consideration to all species recorded during the baseline surveys at the Site that meet any of these criteria. As per Chapter 2 (Project and Site Description) – Volume 2 of the ES, a micro-siting allowance of 25 m for turbines 1 – 5, and 10 m for turbine 6 is sought (noting that any micro-sited turbines would be required to maintain the 50 m blade-tip buffer from bat habitat and 30 m buffer from active badger setts, unless further ecological assessment/licensing is completed). The assessment as reported in this chapter has accounted for such an allowance in its conclusions.
- 7.10 No ecological issues have been scoped out from this assessment, though, following NatureScot (SNH 2018a) guidance, the assessment focused on the key species likely to be affected by the Proposed Development.

Study Areas

- 7.11 The ecology study areas were designed to include the potential zone of ecological influence of the Proposed Development, with reference to NatureScot (SNH 2017) guidance. The Site lies within the 'Yorkshire Wolds' Natural England National Character Area. The specific study areas were as follows:

- Designated nature conservation sites: sites designated for ecological interests within 5 km of the Site (all statutory protected sites) and within 30 km (internationally important sites), see Figure 7.1 (Internationally important statutory nature conservation sites within 30 km) – Volume 3 and Figure 7.2 (Nationally important statutory nature conservation sites within 5 km) – Volume 3;
- Habitat surveys included the Proposed Development plus a 500 m buffer and additional area to include a wider zone around the first phase of the development and the site access (7.5 km²), and the bat and badger surveys included the Proposed Development plus a 100 m buffer (3.0 km²);
- Core breeding bird surveys: included a 500 m buffer from the main Proposed Development infrastructure for the core breeding bird walkover surveys (“the core breeding bird survey area”) covering a total area of 6.4 km², shown in Figure 7.3 (Bird Baseline Survey Areas) – Volume 3;
- Key species breeding surveys (“the wider breeding bird survey area”): a 2 km buffer from the main Proposed Development infrastructure, where access was possible, covering an additional 28 km²;
- Wintering bird surveys: included a 1 km buffer to provide contextual information on the area’s wintering birds, covering 11.9 km² (see Figure 7.3 (Bird Baseline Survey Areas) – Volume 3);
- Flight Activity (Vantage Point) surveys from a single vantage point, as shown in Figure 7.3 (Bird Baseline Survey Areas) – Volume 3; and
- Cumulative Effects: other developments within 20 km of the Proposed Development and within the ‘Yorkshire Wolds’ National Character Area.

Desk Study

7.12 The ecological desk study provided information on the ecological interest of the study area, including the locations of any relevant statutory protected sites and collation of data on key species such as raptors and breeding waders. Data from the following sources of information were sought:

- Natural England and Magic Map web site – statutory protected area site boundaries and citation details, protected species records and distribution of priority habitats;
- North-east Yorkshire Ecological Data Centre (NEYEDC) – protected and notable species records found within a 2 km search area around the Site, and further information on statutory and non-statutory sites (including Local Wildlife Sites) and priority habitats;
- Joint Nature Conservation Committee (JNCC) website (<https://jncc.gov.uk/our-work/special-protection-areas-overview/>) – European protected site boundaries and designations (SPA / Ramsar);
- Wetland Bird Survey annual reports (Calbrade *et al.* 2025);
- Bird Atlas 2007-11: The Breeding and Wintering Birds of Britain and Ireland (Balmer *et al.* 2013); and
- Information published in publicly available ES’s and EIA Reports for other developments in the region, including the Thornholme Fields wind farm (11_03999_STPLFE) and the Three Oaks Renewable Energy Park (22_02777_STPLF).

Baseline Field Surveys

Temporal Coverage of Baseline Surveys

7.13 All of the non-avian ecological surveys have been completed to guidance standard within the usual three-year period for which data are considered current (CIEEM 2018). The Site has,

though, been surveyed previously over a longer time period, so these older data have also been used to help inform the assessment and give the baseline a more robust, longer-term perspective. The primary non-avian ecology surveys on which this assessment relies (habitats, bats and badgers) were all carried out in 2024, though has also drawn from additional survey work in 2020 and in 2010.

- 7.14 It is usual best practice in wind farm applications to use two years of ornithological baseline data (SNH 2017). In this case, there was one full year of baseline bird data that is less than three years old available (breeding 2024 and winter 2024-25), but a further two years of older data, from 2010-11 (from the Thornholme Fields wind farm application), and from 2019-20 (Three Oaks Renewable Energy Park) were also available and were used to help inform the assessment. This provides more data over a longer time, and is therefore considered to provide a reliable baseline (especially when this is viewed in the context of the lack of change in habitats that has occurred over the survey period). As a further precautionary measure, in all cases where there was any variation between years, the maximum numbers were used as the primary source to inform the ecological assessment.

Extended Phase 1 Habitat Survey and Preliminary Ecological Assessment

- 7.15 An extended Phase 1 survey was carried out (consistent with the UKHAB habitat classification), including identification and mapping of the vegetation communities present within the study area. The study area boundary for this work included a 500 m buffer outside the Proposed Development (where access / viewing was possible). This Extended Phase 1 survey was undertaken during a site visit on 31 July 2024. Previous surveys were carried out on 29 September 2020 and 9 June 2022 for the Three Oaks Renewable Energy Park (which also covered all of the potential impact zone of the Proposed Development), and were used to inform the July 2024 survey.
- 7.16 The survey also included a habitat suitability assessment for protected species, including bats, badgers, water voles, otters, reptiles and amphibians, which informed the need for further specific surveys.

Bat Surveys

- 7.17 The bat survey programme referred to the Natural England *et al.* (2021) guidance on 'Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation'. The surveys comprised the following:
- Roost potential survey – to assess all potential roost sites within the Site and its surrounds;
 - Ground-level activity surveys – one transect-based survey each month from April-September 2020 and 2024;
 - Automated surveys at ground level – these were deployed to enable the collection of representative data across the site's habitats, from April-September 2020 and 2024; and
 - Static detectors were deployed at six locations across the survey area representative of the habitats available.
- 7.18 The surveys were carried out during April-September 2020 and 2024. Full details are provided in Appendices 7.5 (Bat Surveys 2020) – Volume 4 and 7.6 (Bat Surveys 2024) – Volume 4.

Badger Surveys

- 7.19 Previous surveys for the Three Oaks Renewable Energy Park, conducted in September 2020 and June 2022, showed that several badger setts were present in the survey area. A further survey was carried out in July 2024 to provide an up-to-date baseline for the ecological assessment of the Proposed Development. This survey covered the Site plus a 100 m buffer, following the methods of Harris *et al.* (1989) and Natural England (2022). All areas of potential value to badgers were surveyed and any evidence of badger activity recorded including details of setts and associated soil excavation, latrines and dung pits, prints, hairs, paths and foraging activity.
- 7.20 As badgers are specially protected under the Protection of Badgers Act 1992 and subject to illegal persecution, information on this species has been provided in Appendix 7.7 (Confidential Appendix on Badgers) – Volume 4. Information in this Confidential Appendix has been kept to a minimum but includes more detailed data on sett locations. The assessment of the effects that the Proposed Development may have on this species has been included within this chapter (but without identifying sett locations).

Bird Flight Activity: Vantage Point (VP) Surveys (year-round)

- 7.21 VP surveys determine flight activity within the site and its surrounds. All of these and the other bird surveys followed industry best practice guidance (SNH 2017). The VP surveys quantified the bird numbers that could potentially be at risk of collision (including roost flight observations at dawn / dusk). All flight lines of target species were mapped, and the flight height and duration of each flock / individual recorded. Observations were carried out throughout daylight hours but not in periods of reduced visibility (<3 km). Vantage point surveys were carried out for a maximum of 3 hours in a single observer session. Where one surveyor carried out two three-hour blocks concurrently, there was a gap of at least 30 minutes rest period between these surveys (to follow best practice). The following species were recorded:
- all birds of prey and owls;
 - all waders (including lapwing and golden plover) and gulls;
 - all ducks, geese, swans, cormorants, herons, coot and grebes;
 - large flocks (>100 birds) of other species (except woodpigeon and rook); and
 - any other notable species, including SNH 2018a priority species.
- 7.22 A single VP was used, to give coverage of the site, including all turbine locations and its surrounds. Computer GIS (Global Mapper v21)-generated viewsheds are shown in Figure 7.3 (Bird Baseline Survey Areas) – Volume 3. The same location was used for all surveys, with the following surveys being undertaken:
- breeding season:
 - April to August 2020 – 36 hours / VP.
 - April to August 2024 – 36 hours / VP.
 - autumn / winter:
 - September to March 2024 – 25-42 hours.
 - September to March 2019 – 20-42 hours.

- 7.23 During the VP surveys, all key target species flights were mapped and cross-referenced to a standard recording form using a numbering system, and the flight height and activity of each was recorded. To estimate flight height as accurately as possible, available reference structures were used. Heights were recorded as a raw estimate, rather than summarised to height classes. Below 10 m estimates were made to 1 m, between 10 and 20 m to 2 m, between 20 m and 50 m to 5 m, and above 50 m to 10 m. When birds were observed over an extended period, estimates of flight height were recorded every 30 seconds. Particular attention was paid to any observations of birds at rotor height (33-149.9 m above ground).

Core Breeding Bird Walkover Surveys

- 7.24 The breeding bird walkover survey of the core bird survey area followed the standard Common Birds Census methodology (Gilbert *et al.* 1998), with four surveys conducted at approximately monthly intervals during 2020 and increased to six surveys conducted at fortnightly intervals during 2024 (following emerging guidance (Bird Survey and Assessment Steering Group (2025))). These surveys covered the Site plus a 500 m buffer. The extent of the core breeding bird survey area is shown in Figure 7.3. Bird Baseline Survey Areas were carried out as follows:
- 2020 – four visits April to July; and
 - 2024 – six visits April to July.
- 7.25 All bird locations and behaviour were mapped at 1:10,000 scale, using the standard British Trust for Ornithology (BTO) Common Birds Census notation, and all species were recorded. In addition, the survey effort per unit area was standardised to maximise repeatability, with systematic recording for approximately two hours per km². The route ensured that all parts of the ornithology study area were covered to within approximately 100 m of the observer, where access was possible. The survey route was plotted onto the survey map as it was undertaken.
- 7.26 The surveys avoided strong winds, heavy rain, fog and low cloud. Birds were located by walking, listening and scanning by eye and with binoculars. Standard BTO notation was used to record the birds' activities: singing, calling, carrying nest material, nests or young found, repetitively alarmed adults, disturbance displaying, carrying food or in territorial dispute.
- 7.27 The survey data were analysed to determine spatially distinct clusters of records, equivalent to breeding territories, with the number of such territories used to calculate the breeding population for each species (Gilbert *et al.* 1998). A record in potentially suitable breeding habitat on a single visit was considered sufficient to indicate a potential breeding attempt.

Species-specific Breeding Bird Surveys (Wider Area Surveys)

- 7.28 As the survey area could be used by a range of scarce raptors, species-specific surveys of a wider buffer around the Site were undertaken for key species from April to August 2020 and 2024. These surveys comprised walkovers (where access was allowed and potentially suitable breeding habitat was present) supplemented by a series of mini-vantage points (VPs) (shorter watches from additional VPs) to cover other areas. This detects displaying or nesting behaviour during the breeding season of raptor species in accordance with methods described in Gilbert *et al.* (1998) and Hardey *et al.* (2013). These surveys recorded all Schedule 1 and Annex I raptor species, including marsh harrier, red kite, and peregrine. Five survey visits were undertaken in 2020 and eight in 2024.

Wintering Bird Field Surveys

- 7.29 The winter surveys included a field survey based on a simple 'look-see' method, counting the bird numbers within a pre-defined survey area (Gilbert *et al.* 1998). Instantaneous snapshot counts were made of each field across the survey area. Fourteen surveys were undertaken at approximately fortnightly intervals between September and March 2019-20 and 2024-25. One count of each field was made each survey day, recording the numbers of all the key species present. Any additional records made outside this time were noted as supplementary records. These snapshot counts ensured that the full range of times of day were covered in each part of the survey area. The following species were recorded:
- All ducks, geese, swans, cormorants, herons, coot and grebes;
 - All waders (including lapwing and golden plover);
 - All birds of prey and owls;
 - Large flocks (>100 birds) of other species (except woodpigeon and rook); and
 - Any other notable species.
- 7.30 The behaviour of each flock, e.g. feeding / roosting, and birds overflying were also recorded, together with an estimate of their height and direction.
- 7.31 Available habitats and crops in the survey area were mapped during the first visit and then again at approximately 2-month intervals through the survey period to determine habitat availability and account any changes during the study period.
- 7.32 Weather conditions during all observations were recorded, and visits were made to cover a representative range of visibilities, wind speeds and directions (though avoiding extreme conditions where visibility is severely limited, i.e. fog, continuous heavy rain).
- 7.33 Night surveys were not considered necessary given the habitats present (predominantly arable farmland), the lack of any likely ecological link to any statutory protected sites, and the results of the daylight surveys (which did not report any important concentration of species likely to use the site at night). Furthermore, previous surveys of the site in 2010-11 showed that bird activity at night was generally considerably less than observed during the day, and no important nocturnal bird activity was recorded (Percival 2011).

Bird Collision Risk Modelling

- 7.34 To further inform the determination of the likelihood of potentially significant adverse effects occurring, collision risk modelling was carried out for all the key target species using the recently published NatureScot (Band 2024) model. The rotor height would be 33-149.9 m above ground level. Further details are provided in Appendix 7.8 (Collision Risk Modelling Calculations) – Volume 4. The modelling included nine key species (whooper swan, pink-footed goose, golden plover, lapwing, black-headed gull, common gull, herring gull, marsh harrier and red kite).
- 7.35 The collision risk model used in this assessment was developed for NatureScot, though is used across the UK as industry best practice (Band 2024). The model runs as a two-stage process. Firstly, the risk is calculated assuming that flight patterns are unaffected by the presence of the wind turbines, i.e. that no avoidance action is taken. This is essentially a mechanistic calculation, with the collision risk calculated as the product of (i) the probability of a bird flying

through the rotor swept area, and (ii) the probability of a bird colliding if it does so. This probability is then multiplied by the estimated numbers of bird movements through the wind farm rotors at the risk height (i.e. the height of the rotating rotor blades) to estimate the theoretical numbers at risk of collision if they take no avoiding action.

- 7.36 The second stage then incorporates the probability that the birds, rather than flying blindly into the wind turbines, will actually take a degree of avoiding action, as shown to occur in all studies of birds at existing wind farms. NatureScot recommends a precautionary approach, using a value of 98% as a general default avoidance rate, 99% for some larger raptors (including red kite, Urquhart and Whitfield 2016) and 99.8% for geese (NatureScot 2025). This precautionary approach is useful as an initial filter to identify sites where collision risk is clearly not an issue, but does not necessarily provide a realistic estimate of actual likely collision rates when compared with data from existing wind farms. The magnitude of the impact was determined as a percentage increase in the existing baseline mortality (to put the potential wind farm mortality into the ecological context of the birds' population dynamics), though professional judgement was also applied in the assessment of any non-negligible magnitude collision risks predicted.
- 7.37 Details of the input data and the collision risk calculations are given in Appendix 7.8 (Collision Risk Modelling Calculations) – Volume 4. Body sizes and baseline mortality rates were taken from Robinson (2005) and Bilerman *et al.* (2026), and flight speeds from Alerstam *et al.* (2007).

Assessment Methodology

Criteria for Assessing Value (Conservation Importance)

- 7.38 Value (conservation importance) was assigned using the criteria set out in Table 7.2. Key ecological receptors included species / habitats listed on Annex I of the Habitats Directive, species specially protected under the Wildlife and Countryside Act 1981, and the Protection of Badgers Act 1992, and species / habitats included on the NERC Act Priority Species List.
- 7.39 The values (conservation importance, as defined in Table 7.2) of the ecological receptors present in the potential impact zone of the development were identified, then the magnitude of the possible impacts on those receptors determined (as described in Table 7.3).

Table 7.2: Value (conservation importance) of ecological receptors

Value	Definitions
Very High	Cited interest of SPAs, Special Areas of Conservation (SACs) and Site of Special Scientific Interest (SSSI). Cited means mentioned in the citation text for those protected sites as a species for which the site is designated (SPAs / SACs) or notified (SSSIs).
High	Other species that contribute to the integrity of an SPA or SSSI. A local population of more than 1% of the national population of a species. Any ecologically sensitive species, e.g. large birds of prey or rare birds (<300 breeding pairs in the UK). EU Birds Directive Annex 1, EU Habitats Directive priority habitat / species and / or Wildlife and Countryside Act Schedule 1 species (if not covered above). Other specially protected species.

Value	Definitions
Medium	Regionally important population of a species, either because of population size or distributional context. NERC Act species of principal importance and priority habitats (if not covered above).
Low	Any other species of conservation interest, e.g. species on the Birds of Conservation Concern red / amber lists not covered above, present in only locally important numbers.
Negligible	Green-listed species (Stanbury <i>et al.</i> 2021) or other species / habitats of favourable conservation status.

Magnitude of Impact

7.40 An impact is defined as a change of particular magnitude to the abundance and / or distribution of a population because of the Proposed Development. Table 7.3 shows the definitions of the impact magnitude classification used for this assessment.

Table 7.3: Definition of terms relating to the magnitude of ecological impacts

Magnitude	Definition
Very High	Total loss or very major alteration to key elements / features of the baseline conditions such that post development character / composition / attributes will be fundamentally changed and may be lost from the site altogether. Guide: >80% of population / habitat lost.
High	Major alteration to key elements / features of the baseline conditions such that post development character / composition / attributes will be fundamentally changed. Guide: 20-80% of population / habitat lost.
Medium	Loss or alteration to one or more key elements / features of the baseline conditions such that post development character / composition / attributes of baseline will be partially changed. Guide: 5-20% of population / habitat lost.
Low	Minor shift away from baseline conditions. Change arising from the loss / alteration will be discernible but underlying character / composition / attributes of baseline condition will be similar to pre-development circumstances / patterns. Guide: 1-5% of population / habitat lost.
Negligible	Very slight change from baseline condition. Change barely distinguishable, approximating to the “no change” situation. Guide: <1% of population / habitat lost.

Significance Criteria

7.41 The combined assessment of the magnitude of an impact and the value of the receptor was used to determine the significance of potential effects. These two criteria were cross-tabulated to assess the overall effect and significance of that effect (Table 7.4). This gives a guide as to the determination of significance, though the final assessment was still subject to professional

judgment. The significance category of each combination is shown in each cell. Shaded cells indicate potentially significant effects in terms of the EIA Regulations.

Table 7.4: Matrix of magnitude of impact and conservation value used to test the significance of effects

		CONSERVATION VALUE				
		Very high	High	Medium	Low	Negligible
MAGNITUDE	Very high	Major	Major	Major-moderate	Moderate	Negligible
	High	Major	Major	Moderate	Minor	Negligible
	Medium	Major	Major-moderate	Minor	Negligible	Negligible
	Low	Moderate	Minor	Minor	Negligible	Negligible
	Negligible	Minor	Negligible	Negligible	Negligible	Negligible

7.42 The interpretation of these significance categories were as follows:

- Negligible and minor are not normally of concern, though best practice (Scottish Renewables *et al.* 2019) will be exercised to minimise any adverse effects;
- Moderate represents a potentially significant adverse effect on which professional judgment must be made, though it is likely that mitigation will reduce it below the significance threshold; and
- Major and major / moderate represent significant adverse effects on bird populations which are regarded as significant for the purposes of EIA.

7.43 Consideration was also given in the assessment process to the NatureScot (SNH 2018a) wider countryside assessment guidance, which defines the key significance test as follows:

“An impact should be judged as of concern where it would adversely affect the favourable conservation status of a species or stop a recovering species from reaching favourable conservation status, at international or national level or regionally.”

7.44 As the baseline surveys recorded several species specially protected under Schedule 1 of the Wildlife and Countryside Act 1981, information on the breeding sites and associated flight activity of the species listed on that Schedule is provided in Appendix 7.7 (Confidential Appendix on Badgers) – Volume 4. It is important that their breeding locations are kept confidential to minimise the risk of persecution and disturbance. Following NatureScot (SNH 2016b) guidance, information contained in that Appendix has been kept to a minimum but includes all data that indicate breeding locations.

Cumulative Assessment Methodology

7.45 A cumulative ecological assessment (using the same criteria and study area as the main assessment) has been undertaken following the SNH 2018b guidance on 'Assessing the cumulative impacts of onshore wind farms on birds', considering impacts on the favourable conservation status of key receptors within the region, including specific consideration of the

National Character Area ('Yorkshire Wolds'). All schemes in Appendix 4.2 (Cumulative Long List) – Volume 4 have been considered.

Assumptions and Limitations

- 7.46 No significant information gaps have been identified. Inevitably, with any ecological survey, it cannot be guaranteed to detect all target species / individuals, and surveys cannot be fully representative of all conditions (e.g. severely reduced visibility). However, in this case, it was concluded that the baseline surveys provide a robust data set to carry out the assessment.
- 7.47 Though full access was available for the whole of the Proposed Development and its associated ownership (see Figure 7.3), access to a wider area around this was not possible because of land ownership restrictions and confidentiality issues. Buffer areas were surveyed from within the land ownership and from public rights-of-way. The land to the south of the A614 was not included in the breeding bird survey area, so a small part of the potential construction phase disturbance zone was not covered, but given its location in an already high disturbance area adjacent to a main trunk road, this is not considered to have affected the assessment.
- 7.48 As a result of these access restrictions, the breeding bird populations within the potential impact zone of the Proposed Development may have been slightly underestimated, with the size of that underestimate dependent on the detectability of the species involved. For example, lapwing and skylark, both high visible species, are less likely to have been affected in comparison with more cryptic species such as dunnock. For the purposes of the assessment, it was assumed that all population estimates that could be affected were minimum values and consideration given that slightly higher numbers could be affected. Consequently, the assessment remains robust.

Baseline Conditions and Receptors

Statutory Designations: International and Nationally Important Sites

- 7.49 There are seven statutory designated internationally / nationally important nature conservation sites in the search area around the Proposed Development (5 km for nationally important SSSIs, 30 km for internationally important European Protected SPAs, SACs and Ramsar Sites). Their locations in relation to the Proposed Development are shown in Figure 7.1 (Internationally important statutory nature conservation sites within 30 km) and Figure 7.2 (Nationally important statutory nature conservation sites within 5 km) – Volume 3. Distances are given to the nearest point of the Proposed Development:
- Boynton Willow Garth SSSI – 1.4 km NE – one of the best examples of fen carr in North Humberside, and is particularly important for the range of trees and shrubs it supports. It contains a diverse mosaic of contrasting habitats: woodland, scrub, fen and running water. It is also a site of national importance in the Geological Conservation Review.
 - River Hull Headwaters SSSI – 3.3 km SW – nationally important as the most northerly chalk stream system in Britain, with riverside grassland, woodland and fen. It also supports diverse invertebrate and breeding bird communities.
 - Greater Wash SPA – 7 km SE – marine site designated for its populations of common scoter, common tern, little gull, little tern, red-throated diver, and Sandwich tern.

- Flamborough and Filey Coast SAC – 8 km E – designated habitats including reefs, vegetated sea cliffs of the Atlantic and Baltic coasts, and sea caves.
- Flamborough and Filey Coast SPA – 10 km E – internationally important breeding seabird colony which supports the only mainland gannetry in England, the largest kittiwake colony in the UK and the largest guillemot and razorbill colonies in England.
- Hornsea Mere SPA – 18 km SE – important wetland habitat designated for its populations of gadwall and mute swan.
- River Derwent SAC – 29 km NW – riverine wetland designated primarily for its population of river lamprey but also for its riverine plant community and its populations of sea lamprey, bullhead and otter.

7.50

The potential connectivity of each of the internationally important sites (SPA / SAC) to the site is summarised in Table 7.5. This lists the qualifying features for each protected site, the distance from the Proposed Development at its closest point and an assessment of whether the Proposed Development falls within the core range of each (SNH 2016a). No qualifying features of any SPA / Ramsar site were identified that could be ecologically linked to the Proposed Development. Furthermore, the Proposed Development does not lie within any of the Natural England Impact Risk Zones for Wind Energy (DEFRA 2026). The Proposed Development would therefore not result in any Likely Significant Effect on any SPA, SAC or Ramsar site under the Habitats Regulations.

Table 7.5: Internationally Important Sites (Special Protection Areas and Special Areas of Conservation) within 30 km of the Proposed Development, their qualifying features and likely connectivity.

SPA / SAC	Distance from Proposed Development	Qualifying features	Qualifying features that could be ecologically linked to the Proposed Development
Greater Wash SPA	7 km	Common scoter, common tern, little gull, little tern, red-throated diver, and Sandwich tern	None
Flamborough and Filey Coast SAC	8 km	Reefs, vegetated sea cliffs of the Atlantic and Baltic coasts, and sea caves	None
Flamborough and Filey Coast SPA	10 km	Breeding kittiwake, gannet, guillemot, and razorbill, and seabird breeding assemblage (including puffin, fulmar, herring gull and shag)	None
Hornsea Mere SPA	18 km	Gadwall and mute swan, and also holds important numbers of little gull	None
River Derwent SAC	29 km	Riverine plant community (water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation) and its	None

SPA / SAC	Distance from Proposed Development	Qualifying features	Qualifying features that could be ecologically linked to the Proposed Development
		populations of sea lamprey, bullhead and otter	

- 7.51 Neither of the two SSSIs listed above (Boynton Willow Garth SSSI and River Hull Headwaters SSSI) have any interest features that could be ecologically linked to the Proposed Development, given the lack of any impact pathway.

Other Sites / Priority Habitats

Local Nature Reserves

- 7.52 There are no LNRs within 2 km of the Site, so none that would be affected by the Proposed Development.

Local Wildlife Sites

- 7.53 Eight LWSs are located within 2 km of the proposed development (Table 7.6). Their locations are shown in Figure 7.4 (Local Wildlife Sites within 2 km) – Volume 3. All lie outside the Proposed Development, and none would be likely to be affected by it.

Table 7.6. Local Wildlife Sites within 2 km of the Proposed Development.

Site Name	Site Ref	Grid Reference	Status	Distance and direction from Development
Rudston South	TA0565-04	TA099667- TA100658	Designated LWS	320 m NW
Zigzag Plantation	TA1065-09	TA105670	Deleted LWS	310 m N
The Belt	TA1065-10	TA110671	Deleted LWS	550 m N
Sands Wood	TA1065-12	TA130670	Deleted LWS	1.0 km NE
Thorpe Hall Grassland	TA1065-08	TA108673	Designated LWS	1.0 km N
Thorpe Estate	TA1065-07	TA113674	Designated LWS	1.1 km N
Boynton Hall Hedge	TA1065-11	TA125676- TA125672	Deleted LWS	1.2 km NE
Gypsey Race	TA1065-15	TA024728- A178668	Candidate LWS	1.2 km N

Ancient Woodland

- 7.54 There are no sites on the Ancient Woodland Register within 2 km of the Proposed Development, so none would be affected.

Other Priority Habitats

- 7.55 Deciduous woodland: this habitat is scattered over the wider area in the 2 km zone around the Proposed Development, but none within the Application Boundary itself and none that would be likely to be affected by the Proposed Development. The closest lies 800 m south-east from the site (Haisthorpe Hall).
- 7.56 Lowland fen: one site within 2 km, 1.6 km to the north-east of the Proposed Development, well outside the likely zone of ecological influence.

Protected Species Records (NEYEDC)

- 7.57 Great Crested Newt: there were no records within 2 km of the Proposed Development from searches of the NEYEDC data, Natural England licence returns and NE eDNA databases, and none within the likely zone of influence of the Proposed Development. No potentially suitable habitat was identified for this species within that zone either.
- 7.58 Barn Owl: there was one record from the NEYEDC database within 2 km of the Proposed Development, but outside the likely zone of influence for this species.
- 7.59 Brown Hare: there was a single record from the NEYEDC database (760 m west from the Proposed Development), but seen frequently across the site during the baseline bird and other ecology surveys.
- 7.60 Hedgehog: there was a single record of this species 1.2 km south-east from the Proposed Development, but given the habitats present it may use the field margins within the Proposed Development.
- 7.61 Rest Harrow (moth) *Aplasta ononaria*: there was a single record from the NEYEDC database 490 m NW from the Proposed Development, but outside the likely zone of influence.

Current Baseline

Extended Phase 1 Habitat Survey

- 7.62 The Extended Phase 1 survey map is shown in Figure 7.5 (Ecology Habitat Map) – Volume 3. Each of the Phase 1 habitats that were recorded in the survey area is described in Table 7.7. The survey area was predominantly arable farmland (94%), with smaller areas of grassland, scrub and (on the fringes of the survey area) woodland. Some of the broad-leaved woodland is a NERC Act Habitat of Principal Importance, but this is located outside the area that would be

affected by the Proposed Development. The only habitats within the Application Boundary are arable farmland and native hedgerows.

Table 7.7. Phase 1 habitats recorded in the survey area

Phase 1	Habitat	Area (ha.)	% survey area	Area within RLB (ha.)	% RLB
Cropland	Cereal crops	582.9	79.2%	20.8	87.4%
	Non-cereal crops	98.3	13.3%	1.1	4.6%
Grassland	Modified grassland	31.1	4.2%	0	0%
	Other neutral grassland	4.2	0.6%	0	0%
Heathland and shrub	Hawthorn scrub	0.9	0.1%	0	0%
Woodland and forest	Other woodland; broadleaved	3.8	0.5%	0	0%
Urban	Developed land; sealed surface	10.8	1.5%	0	0%
	Artificial unvegetated unsealed surface	4.4	0.6%	1.9	8.0%

- 7.63 The linear habitats found within the survey area are summarised in Table 7.8. Their locations are shown in Figure 7.5 (Ecology Habitat Map) – Volume 3. The hedgerows across all the survey area were largely species-poor native hedgerow dominated by hawthorn.

Table 7.8. Phase 1 linear habitats recorded in the survey area

Habitat	Length (km)	Length within RLB (km)
Native hedgerow	29.1	2.19
Species-rich native hedgerow	2.1	0

Bat Surveys

Bat Roost Potential

- 7.64 The Site has numerous trees / buildings with high bat roost potential, but these were all on the periphery of the survey area rather than within the Proposed Development site itself (see Appendix 7.5 (Bat Surveys 2020) and 7.6 (Bat Surveys 2024)).

Bat Survey Results: Walked Transects

- 7.65 The walked bat transect surveys recorded nine species in total in 2020 and six in 2024, with low record numbers for all of these. Common pipistrelle was the most frequently encountered (74 records in 2020 and 72 in 2024, 66% of the total bat records). Other less abundant species comprised: soprano pipistrelle (18 records in 2020, 6 in 2024), Daubenton's bat (7 in 2020, 3 in

2024), Natterer's bat (5 in 2020 and 1 in 2024), Brandt's bat (5 in 2020, none in 2024), whiskered bat (12 in 2020 and 4 in 2024), noctule (4 in 2020, none in 2024), Nathusius' pipistrelle (1 in 2020 and 1 in 2024) and brown long-eared bat (2 in 2020 but none in 2024).

- 7.66 The highest concentration of bat records was along the land on the northern edge of the survey area, where the hedgerows were most well-developed and diverse. Most other records were associated with hedgerow habitats.

Bat Survey Results: Static Recorders

- 7.67 The baseline bat surveys showed the survey area held generally low / moderate levels of bat activity. Nine species of bat were recorded in total during the static recorder surveys. Common pipistrelle was the most frequently recorded species, with soprano pipistrelle, Daubenton's bat and brown long-eared bat also frequently encountered, particularly during the autumn surveys. Other less abundant species comprised: Nathusius' pipistrelle, whiskered bat, Brandt's bat, Natterer's bat and noctule. Full details of the bat surveys undertaken are given in Appendices 7.5 (Bat Surveys 2020) and 7.6 (Bat Surveys 2024) – Volume 4.
- 7.68 Recent Natural England *et al.* (2021) guidance recommends the use of ECOBAT (Lintott *et al.* 2018) to standardise the determination of the relative importance of the site for its bat populations. This software tool uses percentiles to assign a bat activity comparing with data from other sites collected within the same season (within 30 days of the surveys) and within 100 km of the site. Overall activity in the survey area was classed as follows (further detail and the ECOBAT plots are given in Appendices 7.5 and 7.6):
- **High:** no species.
 - **Moderate / high:** no species.
 - **Moderate:** Nathusius' pipistrelle in 2020, Brandt's and Natterer's bats in 2024 (though for both species, the ECOBAT reference baseline was small and therefore not reliable).
 - **Low / moderate:** Soprano pipistrelle in 2020, Daubenton's and whiskered bats in 2024.
 - **Low:** Common pipistrelle, noctule and brown long-eared bat in both years, Brandt's, Daubenton's, whiskered and Natterer's bat in 2020 and soprano and Nathusius' pipistrelles in 2024.
- 7.69 The static bat recorder data also provided information on the likelihood of any important bat roosts located within or in proximity to the site. If bats were roosting on or near the site, then there would likely be bat records at, or soon after, the typical emergence times. Overall, the number of bat passes recorded during roost emergence time was low, indicating that any important roosts located within / in proximity to the survey area were unlikely. There were, however, more records of common pipistrelle around roost emergence time at Location 1. This location is the most easterly of the six, and the bats recorded here at emergence time are most likely to have originated from roosts in the woodland and buildings to the east of the Proposed Development.

Other Protected Species

Badger

- 7.70 Signs of badger activity were found during the site surveys and there is widespread suitable habitat for this species in the survey area. As this species is subject to persecution, details of their locations are given in Appendix 7.7 (Confidential Appendix on Badgers) – Volume 4.

Breeding Birds

Breeding Bird Surveys

- 7.71 The breeding bird populations found within the core survey area during each of the breeding bird surveys are summarised in Table 7.9. This Table shows the estimated number of breeding pairs recorded during each of the three survey years (2010, 2020 and 2024). Details of all the breeding bird populations in 2020 and 2024 are set out in Appendices 7.1 (Breeding Bird Survey 2020) and 7.2 (Breeding Bird Survey 2024), respectively. Data from 2010 have been sourced from the previous Thornholme Fields wind farm application ES. Overall, the breeding bird species and numbers in the survey area have been broadly similar across all three survey years, with some minor differences attributable to natural variation (given the lack of any local habitat change).

Table 7.9: Breeding Bird Populations in the Three Oaks survey area recorded in 2010, 2020 and 2024. Numbers given are overall number of breeding pairs

Species	2010	2020	2024
Red-legged Partridge	7	5	21
Grey Partridge	10	9	16
Quail	1	-	-
Pheasant	12	7	16
Buzzard	1	2	9
Kestrel	2	3	2
Lapwing	3	1	-
Rock Dove	-	-	25
Stock Dove	7	2	5
Woodpigeon	99	54	87
Collared Dove	1	-	1
Cuckoo	1	1	-
Skylark	104	108	179
Swallow	16	3	9
House Martin	2	2	7
Meadow Pipit	14	7	10
Yellow Wagtail	33	30	40

ES Chapter 7 – Biodiversity

Species	2010	2020	2024
Pied Wagtail	3	5	6
Wren	12	24	34
Dunnock	28	22	35
Robin	5	9	17
Blackbird	36	26	67
Song Thrush	6	1	11
Blackcap	1	3	4
Lesser Whitethroat	-	-	6
Whitethroat	41	40	52
Chiffchaff	1	-	4
Willow Warbler	1	-	2
Long-tailed Tit	2	4	2
Blue Tit	6	5	9
Great Tit	5	6	17
Magpie	-	-	4
Jackdaw	5	4	7
Rook	3	20	42
Carrion Crow	5	12	22
Starling	1	-	3
House Sparrow	12	1	8
Tree Sparrow	1	1	7
Chaffinch	48	48	91
Greenfinch	4	-	5
Goldfinch	19	12	22
Linnet	41	46	57
Bullfinch	1	-	-
Yellowhammer	33	44	79
Reed Bunting	4	6	37
Corn Bunting	14	31	39

Breeding Raptor Survey Results

- 7.72 No evidence was found of any key target raptor species breeding in the wider 2 km buffer in 2010, 2020 or 2024. There were occasional sightings of marsh harrier in 2020, and that species was recorded more frequently in 2024, but no birds were observed exhibiting breeding behaviour within the wider survey area.

Vantage Point Survey Results

7.73 The rates of bird flight movement observed across the Site during all the VP surveys (which inform the assessment of collision risk) are summarised in Table 7.10. This gives the flight rate per hour of observation in each season and the total number of flights. Overall flight rates of key species over the site were low, with no major differences apparent between years (though with higher numbers of pink-footed geese in winter 2024-25, more marsh harriers in the 2024 breeding season and more red kites in both these periods).

7.74 Table 7.10 also gives the percentage of flights of each species that were recorded at rotor height (33-149.9 m above ground level) over both years' baseline data.

Table 7.10: Key Species Flight Rates recorded over the VP survey area during the 2020 and 2024 breeding season and 2019-20 and 2024-25 winter season vantage point surveys

Species	Breeding 2020	Breeding 2024	Winter 19-20	Winter 24-25	Total Flights	% flights at rotor height
Canada Goose	-	-	-	0.12	5	0%
Pink-footed Goose	-	-	0.11	29.43	1,240	88%
Greylag Goose	-	0.17	1.58	1.14	111	44%
Whooper Swan	-	-	-	0.69	29	80%
Barnacle Goose	0.06	-	-	-	2	100%
Cormorant	-	0.03	0.03	0.05	4	100%
Little Egret	-	0.11	-	-	4	100%
Grey Heron	-	0.03	-	0.07	4	50%
Honey-buzzard	0.03	-	-	-	1	100%
Red Kite	-	1.08	-	0.29	51	33%
Marsh Harrier	0.31	1.53	-	0.14	72	20%
Sparrowhawk	0.19	0.06	0.11	0.10	17	31%
Buzzard	2.03	2.19	1.19	1.40	254	51%
Kestrel	0.53	0.64	0.75	0.93	108	2%
Merlin	0.06	-	0.06	-	4	25%
Hobby	0.03	0.08	-	-	4	75%
Glaucous Gull	-	-	0.03	-	1	0%
Oystercatcher	-	0.03	-	-	1	0%
Barn Owl	-	-	0.06	-	2	0%
Golden Plover	0.97	0.33	11.53	22.10	1,390	68%
Lapwing	0.03	0.03	4.78	20.71	1,044	32%
Peregrine	-	-	0.08	0.10	7	58%
Common Gull	0.56	0.69	26.56	125.55	6,274	63%
Lesser Black-backed Gull	0.92	1.06	0.03	0.33	86	31%

Species	Breeding 2020	Breeding 2024	Winter 19-20	Winter 24-25	Total Flights	% flights at rotor height
Herring Gull	36.08	27.58	123.94	173.69	14,049	55%
Great Black-backed Gull	0.03	-	0.11	-	5	88%
Black-headed Gull	0.72	0.08	28.78	33.90	2,489	70%

Wintering Birds

7.75 The results of the autumn / winter walkover surveys are summarised in Table 7.11. The Table shows the mean and peak counts recorded in each of the three survey years (2010-11, 2019-20 and 2024-25). Overall, the wintering bird species and numbers in the survey area have been broadly similar across all three survey years, with some occasional larger flocks of species such as pink-footed goose, lapwing and golden plover recorded. Common, herring and black-headed gulls were abundant in all three winters.

Table 7.11: Autumn / Winter Bird Populations recorded in the Three Oaks survey area during 2010-11, 2019-20 and 2024-25 (peak and mean counts).

Species	Mean			Peak		
	2010-11	2019-20	2024-25	2010-11	2019-20	2024-25
Canada Goose	-	-	0.4	-	-	5
Greylag Goose	4.1	-	0.4	26	-	6
Pink-footed Goose	-	3.2	66.3	-	33	560
Whooper Swan	-	-	-	-	-	-
Mallard	1.4	-	-	12	-	-
Grey Partridge	-	-	0.4	-	-	5
Grey Heron	0.2	0.1	0.1	2	1	1
Cormorant	-	-	0.2	-	-	2
Sparrowhawk	0.1	0.3	0.2	1	2	1
Marsh Harrier	-	-	0.2	-	-	1
Red Kite	-	0.1	0.6	-	1	3
Buzzard	1.1	2.6	9.9	3	7	15
Lapwing	120.5	0.3	46.9	747	3	520
Golden Plover	99.9	16.6	23.1	797	110	180
Snipe	-	0.1	-	-	1	-
Black-headed Gull	138.9	83.1	78.9	531	561	210
Mediterranean Gull	0.5	0.1	0.3	3	1	2
Common Gull	112.1	50.2	108.4	480	119	472
Great Black-backed Gull	1.1	0.3	-	3	1	-
Herring Gull	33.1	77.5	170.1	156	582	1363

Species	Mean			Peak		
	2010-11	2019-20	2024-25	2010-11	2019-20	2024-25
Caspian Gull	-	-	0.1	-	-	1
Lesser Black-backed Gull	1.6	0.3	0.3	9	3	2
Barn Owl	0.1	-	0.1	1	-	1
Tawny Owl	0.1	-	-	1	-	-
Kestrel	1.4	2.5	2.7	4	5	6

Baseline Evolution

- 7.76 The ecological baseline would not be expected to change materially between the time of survey work and the anticipated commencement of construction of the Proposed Development (early 2028). The Proposed Development is likely to continue as arable farmland until that time.
- 7.77 Appendix 4.1 (Climate Projections) – Volume 4 of the ES provides an overview of the likely changes in climatic conditions at the Site resulting from climate change across the lifespan of the Proposed Development. In relation to this chapter, the identified baseline is likely to be affected by this change, including warmer and drier summers, and warmer and wetter winters. Seasonal patterns of vegetation growth are likely to change, with consequent impacts on the species dependent on those habitats. However, as an intensively managed arable landscape, it is not considered that this will materially change the baseline over the lifetime of the Proposed Development.

Conservation Evaluation

Habitats

- 7.78 The conservation value of the habitats was determined using the criteria specified in Table 7.2. The results are summarised in Table 7.12. All habitats with very high to low value have been taken forward in the ecological assessment (i.e. only those with negligible value have been scoped out).

Table 7.12. Conservation Value of the Habitats recorded in the Three Oaks Renewable Energy Park Extension survey area

Phase 1	Habitat	EU Habitats Directive Annex 1 habitat	NERC Act Priority Habitat	Local Biodiversity Action Plan / Nature Recovery habitat	Conservation Value
Cropland	Cereal crops				Negligible
	Non-cereal crops				Negligible
Grassland	Modified grassland				Negligible

Phase 1	Habitat	EU Habitats Directive Annex 1 habitat	NERC Act Priority Habitat	Local Biodiversity Action Plan / Nature Recovery habitat	Conservation Value
	Other neutral grassland			✓	Low
Heathland and shrub	Hawthorn scrub			✓	Low
Urban	Developed land; sealed surface				Negligible
Woodland and forest	Other woodland; broadleaved		✓		Medium
Hedgerow	Native hedgerow		✓		Medium
	Species-rich native hedgerow		✓		Medium

- 7.79 No habitats were classed as very high or high value.
- 7.80 Three habitats were classed as medium conservation value: broad-leaved woodland, native hedgerow and native species-rich hedgerow. Both were classed as medium value for their listing as NERC Act Section 41 priority habitats.
- 7.81 Two further habitats were classed as low value, hawthorn scrub (a local biodiversity action plan priority habitat) and other neutral grassland (a habitat targeted for nature recovery).
- 7.82 The only habitat of value that occurs within the ecological zone of influence of the Proposed Development is native hedgerow.

Protected Species (Non-Avian)

- 7.83 The conservation value of the non-avian protected species using the survey area was determined using the criteria specified in Table 7.2. The results are summarised in Table 7.13. All species with very high to low value have been taken forward in the ecological assessment (i.e. only those with negligible value have been scoped out).

Table 7.13. Conservation Value of the Protected Species (non-avian) recorded in the Three Oaks Renewable Energy Park Extension survey area

Species	European Protected species	Wildlife and Countryside Act Sch 5 / Badgers Act sp	NERC Act Species of Principal Importance	Local Biodiversity Action Plan species	Conservation Value
Badger		✓			High
Common pipistrelle	✓	✓			High

ES Chapter 7 – Biodiversity

Species	European Protected species	Wildlife and Countryside Act Sch 5 / Badgers Act sp	NERC Act Species of Principal Importance	Local Biodiversity Action Plan species	Conservation Value
Soprano pipistrelle	✓	✓	✓	✓	High
Nathusius' pipistrelle	✓	✓		✓	High
Daubenton's bat	✓	✓			High
Whiskered bat	✓	✓		✓	High
Brandt's bat	✓	✓		✓	High
Natterer's bat	✓	✓			High
Brown long-eared bat	✓	✓	✓	✓	High
Noctule	✓	✓	✓	✓	High
Brown Hare			✓	✓	Medium
Hedgehog			✓	✓	Medium

- 7.84 No very high value species were recorded. All nine bat species were classed as high value, as they are European Protected Species. Badger was also classed as high value through its protection under the Protection of Badgers Act 1992. Brown hare and hedgehog were classed as medium value. Both are NERC Act Species of Principal Importance.

Breeding Birds

- 7.85 The conservation value of the breeding bird populations was determined using the criteria specified in Table 7.2. The results are summarised in Table 7.14. All species with very high to low value have been taken forward in the ornithological assessment (i.e. only those with Negligible value have been scoped out at this stage).

Table 7.14: Conservation Evaluation of the Breeding Bird Populations at the site (2010, 2020 and 2024)

Species	Breeding pairs (peak)	EU Ann 1	W and C Act Sch 1	Red [R] / Amber [A] List	NERC Act S41 priority sp	Conservation Value
Red-legged Partridge	21					Negligible
Grey Partridge	16			R	✓	Medium
Quail	1		✓	A		High
Pheasant	16					Negligible
Buzzard	9					Negligible
Kestrel	3			A		Low
Lapwing	3			R	✓	Medium

ES Chapter 7 – Biodiversity

Species	Breeding pairs (peak)	EU Ann 1	W and C Act Sch 1	Red [R] / Amber [A] List	NERC Act S41 priority sp	Conservation Value
Rock Dove	25					Negligible
Stock Dove	7			A		Low
Woodpigeon	99			A		Low
Collared Dove	1					Negligible
Cuckoo	1			R	✓	Medium
Skylark	179			R	✓	Medium
Swallow	16					Negligible
House Martin	7			R		Low
Meadow Pipit	14			A		Low
Yellow Wagtail	40			R	✓	Medium
Pied Wagtail	6					Negligible
Wren	34			A		Low
Dunnock	35			A	✓	Medium
Robin	17					Negligible
Blackbird	67					Negligible
Song Thrush	11			A	✓	Medium
Blackcap	4					Negligible
Lesser Whitethroat	6					Negligible
Whitethroat	52					Negligible
Chiffchaff	4					Negligible
Willow Warbler	2			A		Low
Long-tailed Tit	4					Negligible
Blue Tit	9					Negligible
Great Tit	17					Negligible
Magpie	4					Negligible
Jackdaw	7					Negligible
Rook	42			A		Low
Carrion Crow	22					Negligible
Starling	3			R	✓	Medium
House Sparrow	12			R	✓	Medium
Tree Sparrow	7			R	✓	Medium
Chaffinch	91					Negligible
Greenfinch	5			R		Low
Goldfinch	22					Negligible
Linnet	57			R	✓	Medium
Bullfinch	1			A	✓	Medium

Species	Breeding pairs (peak)	EU Ann 1	W and C Act Sch 1	Red [R] / Amber [A] List	NERC Act S41 priority sp	Conservation Value
Yellowhammer	79			R	✓	Medium
Reed Bunting	37			A	✓	Medium
Corn Bunting	39			R	✓	Medium

7.86 The survey area supports a typical range of farmland breeding birds, including a range of NERC priority species. One species specially protected under Schedule 1 of the Wildlife and Countryside Act 1981 from disturbance during breeding was found during the 2010 surveys, quail, (though not in 2020 or 2024) and given the habitat present, it is possible that others such as marsh harrier, hobby and barn owl could breed there in the future.

7.87 Fifteen breeding species were classed as medium conservation value: grey partridge, lapwing, cuckoo, skylark, yellow wagtail, dunnoek, song thrush, starling, house sparrow, tree sparrow, linnet, bullfinch, yellowhammer, reed bunting and corn bunting. All were classed as medium value because they are NERC Act Section 41 priority species. They are mostly species that have declined widely across Britain but are still common and widespread.

7.88 A further nine breeding species were classed as low value, through their listing on RSPB *et al.*'s (Stanbury *et al.* 2021) red / amber lists of birds of conservation concern.

Wintering Birds

7.89 The conservation value of the wintering bird populations was determined using the criteria specified in Table 7.2. The results are summarised in Table 7.15. This included 13 high value species (whooper swan, little egret, hen harrier, honey buzzard, marsh harrier, red kite, golden plover, Mediterranean gull, barn owl, short-eared owl, hobby, merlin and peregrine) that are EU Birds Directive Annex 1 / Wildlife and Countryside Act Schedule 1 species, five medium value species (NERC Act Section 41 priority species of conservation concern and / or present in regionally important numbers; pink-footed goose, grey partridge, lapwing, curlew, and herring gull), and 13 low value species.

7.90 All of the species with very high-low value have been taken forward in the ornithological assessment (i.e. only those with Negligible value have been scoped out at this stage).

Table 7.15: Conservation Evaluation of the Non-breeding Bird Populations at the Three Oaks survey area (2010-11, 2019-20 and 2024-25).

Species	Overall peak	>1% region	EU Ann 1	W and C Act Sch 1	Red [R] / Amber [A] List	NERC Act S41 priority sp	Conservation Value
Canada Goose	5						Negligible
Barnacle Goose (feral)	2						Negligible

ES Chapter 7 – Biodiversity

Species	Overall peak	>1% region	EU Ann 1	W and C Act Sch 1	Red [R] / Amber [A] List	NERC Act S41 priority sp	Conservation Value
Greylag Goose	26		✓		A		Low
Pink-footed Goose	560	✓			A		Medium
<i>Whooper Swan</i>	20		✓	✓	A		High
Mallard	12				A		Low
Grey Partridge	5				R	✓	Medium
Grey Heron	2						Negligible
Little Egret	4		✓				High
Cormorant	2						Negligible
Sparrowhawk	2				A		Low
Hen Harrier	1	✓	✓	✓	R		High
Marsh Harrier	1		✓	✓	A		High
Red Kite	3	✓	✓	✓			High
Honey-buzzard	1		✓	✓	A		High
Buzzard	15						Negligible
Oystercatcher	1				A		Low
Lapwing	747	✓			R	✓	Medium
Golden Plover	797	✓	✓				High
Snipe	1				A		Low
Woodcock	1				R		Low
Curlew	1				R	✓	Medium
Black-headed Gull	561				A		Low
Mediterranean Gull	3		✓	✓	A		High
Common Gull	480				A		Low
Great Black-backed Gull	3				A		Low
Herring Gull	1,363	✓			R	✓	Medium
Caspian Gull	1						Negligible
Lesser Black-backed Gull	9				A		Low
Barn Owl	1			✓			High
Tawny Owl	1				A		Low

Species	Overall peak	>1% region	EU Ann 1	W and C Act Sch 1	Red [R] / Amber [A] List	NERC Act S41 priority sp	Conservation Value
Short-eared Owl	1	✓	✓		A		High
Kestrel	6				A		Low
Merlin	1		✓	✓	R		High
Hobby	2			✓			High
Peregrine	2		✓	✓			High
Wheatear	1				A		Low

Italics indicating seen overflying only

Primary & Tertiary Mitigation

7.91 The design measures implemented to reduce the ecological effects of the Proposed Development were as follows:

- The layout has been designed to avoid more sensitive / higher value habitats as much as possible;
- The access track layout has been designed to maximise the use of existing tracks;
- Avoidance of bat preferred habitat features – a minimum 50 m buffer has been maintained between wind turbine blade tips and the nearest woodland edge, as set out in current Natural England guidance (Natural England *et al.* 2021); and
- Avoidance of badger setts – all active setts found during the baseline surveys have been avoided by a minimum 30 m buffer (Natural England 2022) by all construction works.

7.92 No Tertiary mitigation is relied upon.

Assessment of Effects

Construction

Direct Effects: Loss of Habitat (direct loss of habitat through construction of the Proposed Development)

Nature of Impact

7.93 There will be a direct loss of habitat resulting from the construction of the Proposed Development. Table 7.16 sets out the losses of each habitat that would occur as a result of the Proposed Development.

Table 7.16: Habitat loss resulting from The Proposed Three Oaks Renewable Energy Park extension

Habitat	Area / length lost	Area / length within RLB	Area / length within survey area	Condition notes	Value
Cereal crops	3.8 ha.	20.8 ha.	582.9 ha.	n/a	Negligible
Non-cereal crops	0.1 ha.	1.1 ha.	98.3 ha.	n/a	Negligible
Native hedgerow	289 m	2,190 m	29,100 m	All good condition: hawthorn dominant with occasional dog rose, elder and blackthorn.	Medium

- 7.94 The permanent land take set out in Table 7.16 above would be limited to the wind turbine foundations, access tracks, and permanent crane hardstands, which account collectively for about 22% of the total area within the Application Boundary. Additional temporary land take during construction would add further temporary habitat loss of about another 6% of the Application Boundary, which is currently all arable land.

Effects of Habitat Loss on Non-avian Ecological Receptors

- 7.95 Key non-avian species that could be impacted by the Proposed Development have been defined as those present or likely to be present in the potential impact zone of the Proposed Development. Impacts on high value species are predicted as follows:
- **Badger** – there were no records from the potential impact zone for this species (30 m), the closest sett was 100 m from the nearest part of the Proposed Development infrastructure (and 30 m from the red line boundary) but there is habitat suitable in that zone so future use of this zone cannot be ruled out. Damage to any active setts would be significant in EIA terms without mitigation. Loss of the sett (as could occur in the absence of mitigation) would result in an impact of medium magnitude on this high value receptor, which would result in an effect of major-moderate significance (Table 7.4), which would be a significant effect in EIA terms.
 - **Bats** – there would be no loss of any potential bat roosts. There would be a negligible loss of habitat in terms of their foraging ranges and preferred habitats. This very small loss of foraging habitat of negligible magnitude on high value receptors results in an impact of negligible significance (as per Table 7.4) for all the bat species affected and would not be significant.

Effects of Habitat Loss on Avian Ecological Receptors

- 7.96 Direct habitat loss will reduce habitat availability to the species breeding and foraging within the Site. The numbers breeding within the Site are shown in Table 7.17, including one key species (lapwing – 1 pair), 13 additional medium value species (grey partridge, cuckoo, skylark, starling, song thrush, dunnoek, tree sparrow, house sparrow, yellow wagtail, linnet, reed bunting, corn bunting and yellowhammer) and eight low value species (woodpigeon, stock dove, kestrel, rook, willow warbler, wren, meadow pipit and greenfinch). Additionally, though

not recorded in 2020 or 2024, a pair of quail (high value) and a pair of bullfinch (medium value) were breeding close to the Site in 2010.

- 7.97 Non-breeding birds potentially impacted by this habitat loss observed using the Proposed Development footprint included five high value species (golden plover, Mediterranean gull, marsh harrier, red kite and peregrine), though all were only recorded there infrequently and in generally low numbers (Table 7.18). Three medium value species (pink-footed goose, lapwing and herring gull) were seen there and six low value species (black-headed gull, common gull, great black-backed gull, lesser black-backed gull, sparrowhawk and kestrel). There was no evidence that the Proposed Development was important for any of these species.
- 7.98 Direct habitat loss to breeding and non-breeding birds will be a negligible magnitude impact. There would be only a very small loss of a habitat (arable farmland) that is widely available locally in an area that is not important for any of these species. This very small loss of breeding and foraging habitat of negligible magnitude on up to high value receptors results in an effect of negligible significance (as per Table 7.4) for all bird species affected and would not be significant in EIA terms.

Indirect Effects: Construction Disturbance (Noise and Visual)

Nature of the Impact

- 7.99 The estimated on-site construction period for the Proposed Development is expected to last approximately nine months. The construction works will take place throughout the year, including the summer months when the weather is more favourable and ground conditions are drier. The works will include the use of short-term temporary construction lighting, to be managed to minimise impacts as set out in Appendix 2.1 (outline Construction Environment Management Plan) – Volume 4.
- 7.100 Noise and visual disturbance associated with construction activities could potentially affect breeding and foraging species in the locality of the Site. Species that are disturbed at breeding sites are vulnerable to a variety of potential impacts that could lead to a reduction in the productivity or survival of their populations. Species subject to disturbance outside the breeding season may also feed less efficiently or resort to less favoured roosting areas, either of which may reduce their survival prospects. The potential impact will vary between species according to each species' tolerance of disturbance from human activity and the availability of suitable alternative breeding and foraging habitat.
- 7.101 The indirect impact of disturbance is likely to be highest during construction owing to the increased activity on site. Pearce-Higgins *et al.* (2012) found that red grouse, snipe and curlew densities all declined at wind farm sites during construction, whilst densities of skylark and stonechat increased. Construction also involves the presence of work personnel on site which itself can be an important source of potential disturbance. Pearce-Higgins *et al.*, for example, reported decreases in curlew density during construction of 40% and snipe by 53%. Other species, such as golden plover (Sansom *et al.* 2016), have shown to be unaffected by construction disturbance. The assessment of construction disturbance has assumed that all birds within 500 m of the Proposed Development could potentially be at risk of displacement (Percival 2005, Drewitt and Langston 2006). It should be noted that only partial displacement within this zone might be expected (Pearce-Higgins *et al.* 2009), but it is assumed for the purposes of this assessment that all birds occurring within the zone are at risk of disturbance.

For key priority species (SNH 2018a) consideration has also been given to the disturbance distances given in Goodship and Furness (2022).

- 7.102 It was assumed for the purposes of the assessment that all birds occurring within 500 m of wind turbines and other site infrastructure were at risk of disturbance during construction.

Ecological Receptor Value

- 7.103 The key non-avian species that could be impacted are the same as those that could be impacted by habitat loss, as set out above.
- 7.104 Table 7.17 shows the breeding bird populations of conservation importance (i.e. non-negligible value) found within 500 m of the proposed wind turbine locations (at risk of operational phase displacement) and within 500 m of the other associated infrastructure during the baseline surveys (at risk of construction phase displacement). This distance has been used to identify the potential disturbance zones (though also giving consideration to particularly sensitive species in a wider area around that). Additionally, though not recorded in 2020 or 2024, a pair of quail (a high value Schedule 1 species) and a pair of bullfinches (medium value NERC S41 species) were breeding within 500 m of the proposed wind turbines in 2010.

Table 7.17. Conservation Importance of Breeding Birds in the Three Oaks Renewable Energy Park Extension Potential Disturbance Zone, 2020 and 2024

Species	Peak breeding pairs <500 m from wind turbines: 2020	Peak breeding pairs <500 m from wind turbines: 2024	Peak breeding pairs <500 m from all infrastructure: 2020	Peak breeding pairs <500 m from all infrastructure: 2024	Conservation Value Within Potential Disturbance Zone
Grey Partridge	8	11	9	12	Medium
Cuckoo	1	-	1	-	Medium
Woodpigeon	27	25	39	65	Low
Stock Dove	1	3	1	4	Low
Lapwing	1	-	1	-	Medium
Kestrel	1	1	2	2	Low
Rook	-	-	-	20	Low
Skylark	71	106	89	140	Medium
Willow Warbler	-	2	-	2	Low
Wren	17	17	22	26	Low
Starling	-	2	1	2	Medium
Song Thrush	-	4	-	6	Medium
Dunnock	13	18	17	29	Medium
Tree Sparrow	1	3	1	7	Medium
House Sparrow	-	-	1	1	Medium
Yellow Wagtail	23	30	28	34	Medium

ES Chapter 7 – Biodiversity

Species	Peak breeding pairs <500 m from wind turbines: 2020	Peak breeding pairs <500 m from wind turbines: 2024	Peak breeding pairs <500 m from all infrastructure: 2020	Peak breeding pairs <500 m from all infrastructure: 2024	Conservation Value Within Potential Disturbance Zone
Meadow Pipit	3	5	5	7	Low
Greenfinch	-	2	1	5	Low
Linnet	32	33	39	49	Medium
Reed Bunting	4	18	5	30	Medium
Corn Bunting	26	30	27	31	Medium
Yellowhammer	32	49	37	64	Medium

- 7.105 Table 7.18 shows the peak wintering bird populations of conservation importance that were found within 500 m of the proposed wind turbine locations and other associated infrastructure during the baseline surveys. This distance has been used to identify the potential disturbance zone (though also giving consideration to particularly sensitive species in a wider area around that).

Table 7.18. Conservation Importance of Wintering Birds in the Three Oaks Renewable Energy Park Extension Potential Disturbance Zone

Species	Peak winter count <500 m from wind turbines: 2019-20	Peak winter count <500 m from wind turbines: 2024-25	Peak winter count <500 m from all infrastructure: 2020	Peak winter count <500 m from all infrastructure: 2024	Conservation Value Within Potential Disturbance Zone
Pink-footed Goose	0	0	5	0	Medium
Golden Plover	16	46	16	180	High
Lapwing	0	0	0	520	Medium
Black-headed Gull	450	210	453	210	Low
Mediterranean Gull	0	2	1	2	High
Common Gull	37	196	73	373	Low
Herring Gull	186	1270	362	1270	Medium
Great Black-backed Gull	0	0	1	0	Low
Lesser Black-backed Gull	0	2	2	2	Low
Sparrowhawk	0	0	0	1	Low
Marsh Harrier	0	1	0	1	High

Species	Peak winter count <500 m from wind turbines: 2019-20	Peak winter count <500 m from wind turbines: 2024-25	Peak winter count <500 m from all infrastructure: 2020	Peak winter count <500 m from all infrastructure: 2024	Conservation Value Within Potential Disturbance Zone
Red Kite	0	2	0	2	High
Kestrel	3	2	4	3	Low
Peregrine	0	1	0	1	High

Effects of Construction Disturbance: Non-avian Ecological Receptors

- 7.106 From the current baseline data, there is no evidence that any key non-avian species would be impacted by construction disturbance. However, the possibility that badgers could move into the impact zone (and therefore potentially be significantly impacted by disturbance) before construction cannot be ruled out. Disturbance to an active sett (as could occur in the absence of mitigation) would result in an impact of medium magnitude on this high value receptor, which would result in an effect of major-moderate significance, which would be a significant effect in EIA terms.
- 7.107 Therefore, pre-construction surveys will be required to inform the need for any mitigation measures to avoid what could otherwise result in a significant effect.

Effects of Construction Disturbance: Avian Ecological Receptors

- 7.108 The following section assesses the construction disturbance impacts on each key species that were found within the potential disturbance zone within the breeding season (Table 7.17) and at other times of year (Table 7.18).

Lapwing

- 7.109 A single pair of lapwing was recorded breeding within 500 m of the Proposed Development infrastructure in 2020 though not in 2024, so this species could be affected by construction disturbance during the breeding season.
- 7.110 A peak of 520 lapwing was recorded on the ground within 500 m of the Proposed Development infrastructure, so would be at risk of disturbance during construction. The only other record during two years of baseline surveys was of a flock of 97, so it is clear that this zone is not important for this species. Lapwing is a NERC Species of Principal Importance, so has been classed as medium value. Some disturbance of these birds may occur during construction, though probably not the complete displacement assumed in this worst-case assessment. Even in that worst case, displacement of up to 520 individuals infrequently using the area would be a negligible magnitude impact on a medium value receptor resulting in an effect of negligible significance, which would not be significant in EIA terms.

Golden Plover

- 7.111 A peak of 180 golden plover was recorded on the ground within 500 m of the Proposed Development infrastructure in November 2024, so would be at risk of disturbance during construction. The only other records were of smaller flocks of 16 in 2019-20 and four additional small flocks (7-45 individuals) in 2024-25, so it is clear that this zone is not important for this species. Golden plover is an EU birds Directive Annex 1 species, so has been classed as high value. Some disturbance of these birds may occur during construction, though probably not the complete displacement assumed in this worst-case assessment. Even in that worst case, an occasional displacement of up to 180 individuals would be of negligible magnitude on a high value receptor resulting in an effect of negligible significance, which would not be significant in EIA terms.

Pink-footed Goose

- 7.112 Whilst regionally important (medium value) numbers of this species were recorded within the survey area (peak 560), only a single flock of 5 was recorded within 500 m of the Proposed Development infrastructure, so would be at risk of disturbance during construction. Displacement of such a small number of a medium value species would be an impact of negligible magnitude, resulting in an effect of negligible significance, which would not be significant in EIA terms.

Mediterranean Gull

- 7.113 There was one record of a single individual of this species within 500 m of the Proposed Development infrastructure during the 2019-20 surveys and three records of 1-2 birds in 2024-25. As an EU Birds Directive Annex 1 species it has been classed as high value. Displacement of such a small number would be a negligible magnitude impact on a high value receptor resulting in an effect of negligible significance, which would not be significant in EIA terms.

Herring Gull

- 7.114 A peak of 1,270 herring gulls was recorded on the ground within 500 m of the Proposed Development infrastructure, so would be at risk of disturbance during construction. This species was mainly recorded when stubbles were being ploughed, so only used the area intermittently. Herring gull is a NERC Species of Principal Importance, so has been classed as medium value. Some disturbance of these birds may occur during construction, though probably not the complete displacement assumed in this worst-case assessment. Even in that worst case, an occasional displacement would be of negligible magnitude on a medium value receptor resulting in an effect of negligible significance, which would not be significant in EIA terms.

Scarce Raptor Species

- 7.115 Several high value raptor species (marsh harrier, red kite and peregrine) were observed using the area within 500 m of the Proposed Development during the baseline surveys. All were, however, only seen infrequently, with no evidence of breeding within the survey area or that it was important for foraging. Displacement during construction would be an impact of negligible

magnitude and would result in an effect of negligible significance on all these species, and would not be significant in EIA terms.

Quail

- 7.116 This species was breeding on farmland in the 500 m buffer zone around the Proposed Development in 2010 (though not in 2020 or 2024). This species is classed as high value because it is specially protected from disturbance during the breeding season under Schedule 1 of the 1981 Wildlife and Countryside Act. It was breeding within the potential disturbance zone in 2010 though not in 2020 or 2024. If it did return to breed in the area in the future, it could be affected by disturbance during construction (a medium-magnitude impact on a high-value species, which would be of major-moderate significance and significant in EIA terms).

Barn Owl

- 7.117 There were several sightings of this species during the surveys, though no evidence of breeding was found within 500 m of the Proposed Development in any of the three baseline survey years. It is possible that it could move into that area in the future, in which case it could be vulnerable to construction disturbance. As it is specially protected from disturbance during the breeding season under Schedule 1 of the 1981 Wildlife and Countryside Act, such disturbance would be a medium-magnitude impact on a high-value species, which would be an effect of major-moderate significance and would be significant in EIA terms.

Other Bird Species of Medium and Low Conservation Value

- 7.118 Thirteen other medium value species were recorded breeding within the potential impact zone: grey partridge, cuckoo, skylark, starling, song thrush, duncock, tree sparrow, house sparrow, yellow wagtail, linnet, reed bunting, corn bunting and yellowhammer. Disturbance during construction would be an impact of negligible magnitude for all these species given their low baseline populations within the potential disturbance zone and their large UK and regional populations. Negligible magnitude impacts on medium value species would result in effects of negligible significance which would not be significant in EIA terms.
- 7.119 The low-value species recorded during the baseline surveys were also at generally low density within the survey area. Disturbance during construction would be an impact of negligible magnitude for all these species, given their low baseline populations within the potential disturbance zone and their large UK and regional populations. Negligible magnitude impacts on low-value species would result in effects of negligible significance, which would not be significant in EIA terms.

Operation

Operational Displacement

Nature of Impact

- 7.120 There would be potential for some disturbance to key non-avian species during the operational phase of the Proposed Development, from operation and maintenance activities, but this would

be of negligible magnitude on up to high value species. This would result in effects of negligible significance, which would not be significant in EIA terms.

- 7.121 The presence and operation of wind turbines could potentially displace birds from breeding and foraging areas. They may avoid the operational wind turbines and the surrounding area due to the visual appearance of large vertical structures in the landscape, blade noise, or the presence of periodic maintenance vehicles and personnel. Displacement could result in movement into less suitable habitat, and this might reduce their ability to survive and reproduce. If not displaced, they may experience reduced foraging success or reduced productivity. Displacement effects can vary over time as habituation to the presence of operating wind turbines may occur.
- 7.122 Experience from existing wind farms has shown that many bird species are tolerant of the presence of operational wind turbines and solar panels and are not unduly disturbed by them. Some short-term displacement during wind farm operation of species such as curlew may occur following construction, but populations have subsequently re-established themselves (Bullen Consultants 2002). Most species that have been studied have not been significantly affected (Phillips 1994, Thomas 1999, Gill 2004, Devereaux *et al.* 2008, Percival and Percival, 2011). An RSPB study (Pearce-Higgins *et al.* 2012) reported partial displacement of breeding upland birds around wind turbines for a distance up to 800 m and reported significant reductions in golden plover density up to 400 m from wind turbines, though another study on the same species found no significant operational disturbance to this species (Douglas *et al.* 2011). The scale and pattern of displacement is similar to that reported for breeding waders in general (Hotker *et al.* 2006), with most studies reporting only small scale (0-200 m) displacement distances.

Ecological Receptor Value

- 7.123 Table 7.17 shows the peak breeding bird populations and their conservation values that were found within 500 m of the proposed wind turbine locations during the baseline surveys, where this distance has been used to identify the potential operational distance zone (though also giving consideration to particularly sensitive species in a wider area around that).
- 7.124 Table 7.18 shows the peak non-breeding bird populations and their conservation values that were found on the ground within 500 m of the proposed wind turbine locations during the baseline surveys, where this distance has been used to identify the potential distance zone (though also giving consideration to particularly sensitive species in a wider area around that).

Effects of Operational Disturbance on Key Species

- 7.125 The following section assesses the operational disturbance effects on each of the key bird species found within the potential disturbance zone within the breeding season (Table 7.17) and at other times of year (Table 7.18), taking into account the knowledge of the effects of wind farms on birds summarised in paragraph 7.122 above, and applying the assessment methodology given in Table 7.4. No non-avian operational disturbance effects were identified.

Lapwing

- 7.126 A single pair of lapwing was recorded breeding within 500 m of the proposed wind turbines in 2020, though not in 2024, so this species could be impacted by operational disturbance during the breeding season.
- 7.127 No lapwing were recorded on the ground within 500 m of the proposed wind turbines during winter, so would not be at risk of disturbance during operation. Lapwing is a NERC Species of Principal Importance, so has been classed as medium value.
- 7.128 Any operational disturbance to lapwing would be of negligible magnitude on a medium value receptor resulting in an effect of negligible significance, which would not be significant.

Golden Plover

- 7.129 A peak of 46 golden plover was recorded on the ground within 500 m of the proposed wind turbines in January 2025, so would be at risk of disturbance during operation. The only other records were of smaller flocks of 16 in 2019-20 and three additional small flocks (7-31 individuals) in 2024-25, so it is clear that this zone is not important for this species. Golden plover is an EU birds Directive Annex 1 species, so has been classed as high value. Some disturbance of these birds may occur during operation, though probably not the complete displacement assumed in this worst-case assessment. Even in that worst case, an occasional displacement of up to 180 individuals would be of negligible magnitude on a high value receptor resulting in an effect of negligible significance, which would not be significant in EIA terms.

Pink-footed Goose

- 7.130 Whilst regionally important (medium value) numbers of this species were recorded within the survey area (peak 560), none were recorded within 500 m of the proposed wind turbines, so would not be at risk of disturbance during operation. Any disturbance effect on this medium value species would be an effect of negligible magnitude and significance, which would result in an effect of negligible significance, which would not be significant in EIA terms.

Mediterranean Gull

- 7.131 There were two records of 1-2 individuals of this species within 500 m of the proposed wind turbines during the 2024-25 surveys and none in 2019-20. As an EU Birds Directive Annex 1 species it has been classed as high value. Displacement of such a small number of a high value species during operation would be an effect of negligible magnitude and significance, which would not be significant in EIA terms.

Herring Gull

- 7.132 A peak of 1,270 herring gulls was recorded on the ground within 500 m of the proposed wind turbines, so would be at risk of disturbance during operation. This species was mainly recorded when stubbles were being ploughed, so only used the area intermittently. Herring gull is a NERC Species of Principal Importance, so has been classed as medium value. Some disturbance of these birds may occur during construction, though probably not the complete displacement assumed in this worst-case assessment. Even in that worst case, an occasional

displacement would be of negligible magnitude on a medium value receptor resulting in an effect of negligible significance, which would not be significant in EIA terms.

Scarce Raptor Species

- 7.133 Several high value raptor species were observed using the area within 500 m of the proposed wind turbines during the baseline surveys, including marsh harrier, red kite and peregrine. All were, however, only seen infrequently, with no evidence of breeding within the survey area or that it was important for foraging. Whilst some displacement may occur during construction, this would be an impact of negligible magnitude and negligible significance on all these species, and not significant in EIA terms.

Quail

- 7.134 This species was breeding on farmland in the 500 m buffer zone around the Proposed Development in 2010 (though not in 2020 or 2024). This species is classed as high value because it is specially protected from disturbance during the breeding season under Schedule 1 of the 1981 Wildlife and Countryside Act. It was breeding within the potential disturbance zone in 2010 though not in 2020 or 2024. If it did return to breed in the area in the future, it could be affected by disturbance during operation, but this would be at most a low magnitude impact on a high-value species, which would be of minor significance and not significant in EIA terms.

Barn Owl

- 7.135 There were several sightings of this species during the surveys, though no evidence of breeding was found within 500 m of the Proposed Development in any of the three baseline survey years. It is possible that it could move into that area in the future, in which case it could be vulnerable to operational disturbance. Such disturbance would at most a low-magnitude impact on a high-value species, which would be an effect of minor significance and would not be significant in EIA terms.

Other Bird Species of Medium and Low Conservation Value

- 7.136 Thirteen other medium value species were recorded breeding within the potential impact zone: grey partridge, cuckoo, skylark, starling, song thrush, duncock, tree sparrow, house sparrow, yellow wagtail, linnet, reed bunting, corn bunting and yellowhammer. Disturbance during operation would be an impact of negligible magnitude for all these species given their low baseline populations within the potential disturbance zone, their large UK and regional populations and experience from other wind farms (Meek *et al.* 1993, Phillips 1994, Thomas 1999, Percival 2005, Devereux *et al.* 2008). Negligible magnitude impacts on medium value species would result in effects of negligible significance which would not be significant in EIA terms.
- 7.137 The low-value species recorded during the baseline surveys were also at generally low density within the survey area. Disturbance during operation would be an impact of negligible magnitude for all these species, given their low baseline populations within the potential disturbance zone and their large UK and regional populations. Negligible magnitude impacts on low-value species would result in effects of negligible significance, which would not be significant in EIA terms.

Direct Operational Effects: Collision Mortality

Bat Collision Risk

- 7.138 Collision mortality, barotrauma and other injuries to bats have all been reported at operational wind farms, though these need to be considered in the context of other forms of anthropogenic mortality. This bat collision risk assessment follows Natural England *et al.* (2021) guidance, with the key criterion being any effect on Favourable Conservation Status. Vulnerability to collision is based on relative abundance, collision risk and activity recorded at the Site.
- 7.139 For the first stage of the assessment, the Site has been assessed as follows (using the assessment criteria set out in Natural England *et al.* 2021):
- Habitat Quality – LOW – the Proposed Development did not have any likely (medium / high suitability) bat roost features within 300m of any proposed wind turbine locations and supported only low-quality foraging habitat that would be likely used by only small numbers of foraging bats (as found during the baseline bat surveys).
 - Project size – SMALL on the basis of <10 wind turbines (the Proposed Development has 6 wind turbines). However, the proposed wind turbines would be classed by Natural England *et al.* (2021) as 'large' (>100m to tip), and there are other wind energy developments within 5km, so the project size has been classed as 'MEDIUM' for this assessment on a precautionary basis.
 - Cross-tabulating these gives a score of 2, i.e. this is a LOW-RISK SITE.
- 7.140 For the Stage 2 risk assessment:
- With low site risk, and species recorded generally at only low activity levels, this gives a low risk overall. Furthermore, the Proposed Development has been designed to ensure a minimum separation of 50 m from bat foraging habitat (in this area, hedgerows), following Natural England *et al.* (2021) guidance. A low magnitude impact on each of these high-value bat species would give (from Table 7.4) an effect of minor significance that would not be significant in EIA terms.
 - Further assessment has also been carried out for each of the high collision risk bat species recorded (determined from species-specific vulnerability set out in Table 2 of Natural England *et al.* 2021, not from local abundance data). These species comprised:
 - Common pipistrelle – low activity recorded during both baseline survey years – a low magnitude impact on this high-value species would give an effect of minor significance that would not be significant in EIA terms.
 - Soprano pipistrelle – low / moderate activity recorded in 2020 and low activity in 2024. Given the primary mitigation (avoiding bat habitat features by at least 50 m), there would be only a low magnitude impact on this high-value species, which would give an effect of minor significance that would not be significant in EIA terms.
 - Nathusius' pipistrelle – moderate activity recorded in 2020 but low in 2024. Given the primary mitigation (avoiding bat habitat features by at least 50 m), there would be only a low magnitude impact on this high-value species, which would give an effect of minor significance that would not be significant in EIA terms.
 - Noctule – low activity recorded during both baseline survey years – a low magnitude impact on this high-value species would give an effect of minor significance that would not be significant in EIA terms.
 - Overall, no bat species would be likely to be significantly affected by the Proposed Development.

Bird Collision Risk

- 7.141 A number of wind farms have caused significant bird mortalities through collision, but their characteristics are very different to those at the Proposed Development. Most notably, at Altamont Pass in California and Tarifa in southern Spain, large numbers of raptors were killed through collision with wind turbines (Orloff and Flannery 1992, Janss 1998, Thelander *et al.* 2003). Such problems occurred where large numbers of sensitive species occur in close proximity to very large numbers (hundreds / thousands) of wind turbines, and usually where the wind farm area provides a particularly attractive feeding resource. For onshore wind farm sites in the UK, with similar bird densities to the Site, collision rates have generally been very low and not considered to be significant (see, for example, Percival *et al.* 2015, Percival *et al.* 2018, Percival *et al.* 2025).
- 7.142 The Proposed Development's collision risk zone was taken as the wind turbines plus a 558.5 m buffer (500 m plus blade length of 58.5 m, following NatureScot guidance). Full details of the collision risk calculations are given in Appendix 7.8 (Collision Risk Modelling Calculations) – Volume 4.
- 7.143 Reference regional population sizes were estimated from the most recently available WeBS five-year mean peak counts (Calbrade *et al.* 2025) and rare birds breeding report (Eaton *et al.* 2025). For winter gulls, the most recently published BTO Winter Gull Roost counts were used (Banks *et al.* 2007).

Nature of Impact

- 7.144 Birds that collide with a wind turbine blade are likely to be killed or fatally injured. Increased mortality rates from collision with wind turbines could potentially affect the maintenance of bird populations, particularly for species that are otherwise experiencing poor reproductive or survival levels due to other factors, e.g. food availability. The frequency of collisions with wind turbines is assumed to be dependent on the amount of flight activity across the site and the ability of birds to detect the rotating blades and take avoidance action.
- 7.145 Overhead lines would not be an issue with this development, as no new overhead wires will be required to facilitate the export of electricity generated.
- 7.146 Operational displacement and collision with wind turbines are spatially mutually exclusive (if a bird is displaced from the wind farm, it is not at risk of collision). However, the impacts of displacement may change over time, as birds initially displaced from an area may habituate to the presence of operating wind turbines and become exposed to the risk of collision. For the purpose of this assessment, a worst-case scenario has been assumed that the birds continue to fly through the wind farm site as recorded during the baseline surveys (and using the maximum flight rate observed over the survey years).
- 7.147 Table 7.19 summarises the flight rates in each period through the collision risk zone, the total number of flights through the zone and the percentage of flights at rotor height (33-149.9 m above ground). All high / medium value species with sufficient flights at rotor height are possibly at significant risk of collision (whooper swan, pink-footed goose, golden plover, lapwing, herring gull, marsh harrier and red kite), plus two additional low value species that were flying through in higher numbers (black-headed gull and common gull).

Table 7.19: Flight rates and heights through the Three Oaks Renewable Energy Park Extension collision risk zone

Species	Winter 2019-20	Breeding 2020	Breeding 2024	Winter 2024-25	Total flights	% at rotor height	Value
Whooper Swan	-	-	-	0.4	15	100%	High
Barnacle Goose	-	0.1	-	-	2	100%	Negligible
Greylag Goose	0.2	-	0.2	1.0	55	56%	Low
Pink-footed Goose	-	-	-	16.6	698	78%	Medium
Oystercatcher	-	-	0.03	-	1	0%	Low
Golden Plover	12.1	1.0	-	5.1	687	85%	High
Lapwing	4.2	0.03	-	7.8	477	83%	Medium
Black-headed Gull	24.0	0.2	0.1	23.0	1837	40%	Low
Common Gull	16.3	0.3	0.7	98.8	4771	38%	Low
Herring Gull	56.0	18.2	25.9	162.5	10426	54%	Medium
Great Black-backed Gull	-	0.03	-	-	1	100%	Low
Lesser Black-backed Gull	-	0.7	0.9	0.3	72	45%	Low
Little Egret	-	-	0.1	-	4	100%	High
Barn Owl	0.1	-	-	-	2	0%	High
Sparrowhawk	0.1	0.1	0.03	0.1	11	18%	Low
Marsh Harrier	-	0.3	1.0	0.1	51	11%	High
Red Kite	-	-	0.8	0.3	39	29%	High
Kestrel	0.6	0.4	0.5	0.9	94	0%	Low
Merlin	0.1	0.1	-	-	4	25%	High
Hobby	-	-	0.03	-	1	0%	High
Peregrine	0.03	-	-	0.1	4	50%	High

7.148 Table 7.20 summarises the collision risk analysis for each key species modelled. For further details, see Appendix 7.8 (Collision Risk Modelling Calculations) – Volume 4.

7.149 Table 7.20 gives the number of collisions predicted per year based on the precautionary NatureScot avoidance rate of 99% for red kite and marsh harrier, 99.5% for swans, 99.8% for the one goose species, 99.5% for large gulls, 99.2% for small gulls and 98% for all other species (following NatureScot 2025), the percentage increase that this would represent over the baseline mortality and an assessment of the magnitude of these effects (applying the criteria set out in Table 7.3). As a precautionary measure, the peak annual collision risk has been used for the assessment.

Table 7.20: Three Oaks Renewable Energy Park Extension Collision Risk Modelling Predictions

Species	Precautionary avoidance rate	Precautionary predicted number of collisions per year		Percentage increase over baseline mortality (peak)	Magnitude
		2019-20	2024-25		
Whooper Swan	99.5%	0	0.18	0.18%	Negligible
Pink-footed Goose	99.8%	0	0.20	0.004%	Negligible
Golden Plover	98%	2.17	0.72	0.02%	Negligible
Lapwing	98%	0.05	0.71	0.01%	Negligible
Black-headed Gull	99.2%	0.95	1.85	0.02%	Negligible
Common Gull	99.2%	1.27	5.84	0.07%	Negligible
Herring Gull	99.5%	7.90	16.3	1.38%	Low
Marsh Harrier	99%	0.15	0.42	3.02%	Low
Red Kite	99%	0	1.39	0.64%	Negligible

- 7.150 The following section assesses the operational collision risk to each of the key species that were found within the collision risk zone (Table 7.19).

Whooper Swan

- 7.151 Only two whooper swan flocks (of 7 and 8 birds) were seen flying through the collision risk zone during the baseline surveys, both in November 2024. Whooper swan is an EU Birds Directive Annex 1 species, so is of high value. Peak annual collision risk was estimated at 0.18 collisions per year (equivalent to only a 0.18% increase over the regional baseline population mortality), an impact of negligible magnitude, resulting in an effect of negligible significance that would not be significant in EIA terms.
- 7.152 There would clearly be no threat to the regional or national population of this species, so no significant adverse effect would occur, following the SNH 2018a guidance.

Pink-footed Goose

- 7.153 Pink-footed goose was classed as medium value as it was recorded within the survey area in regionally important numbers. Only nine flocks were recorded flying through the collision risk zone, in October-December 2024. Collision risk for that year was predicted as 0.20 using the precautionary NatureScot-recommended avoidance rate of 99.8%, equivalent to only a 0.004% increase over the baseline mortality. This number would be negligible in the context of the background population mortality with an annual mortality rate of 17%, from extensive shooting mortality and increasing population trend (doubling since 1995 / 96, Calbrade *et al.* 2025).
- 7.154 Evidence from existing wind farms would suggest that the actual number of collisions would be less than the model predictions. Three studies at wind farms in the UK all reported empirical pink-footed goose avoidance rates higher than the precautionary NatureScot 99.8% (with only single dead geese being recorded at all three sites over at least three years of surveys at each, Percival *et al.* 2015, Percival *et al.* 2018, Percival *et al.* 2025). A study in Denmark also reported a higher avoidance rate of 99.9% (Drachman *et al.* 2021).

- 7.155 Collision risk to pink-footed geese would therefore be an impact of negligible magnitude, resulting in an effect of negligible significance, that would not be significant in EIA terms.

Golden Plover

- 7.156 Golden plover were seen occasionally flying through the collision risk zone mainly during both winter periods, with 13 flocks recorded (8-190 individuals). Peak annual collision risk to golden plover (a high-value receptor, as an EU Birds Directive Annex 1 species) was predicted to be 2.2 per year, based on a highly precautionary 98% avoidance rate. This would represent a 0.02% increase over the baseline mortality for the regional population, so it would be an impact of negligible magnitude, resulting in an effect of negligible significance, that would not be significant in EIA terms.

Lapwing

- 7.157 Lapwing were seen regularly flying through the collision risk zone in low numbers, during both the breeding and winter periods (six flocks in total, up to 210 individuals). Peak annual collision risk to lapwing (a medium-value receptor, as a NERC Act Species of Principal Importance) was predicted to be 0.7 per year (largely as a result of a single flock of 210 circling the collision zone multiple times in November 2024), based on a highly precautionary 98% avoidance rate. This would represent a 0.01% increase over the baseline mortality for the regional population, so it would be an impact of negligible magnitude, resulting in an effect of negligible significance, that would not be significant in EIA terms.

Black-headed Gull

- 7.158 Black-headed gull was classed as low value as an amber-listed species of conservation concern. Black-headed gulls were regularly recorded overflying the survey area. Peak annual collision risk was predicted as 1.9 per year using the precautionary NatureScot-recommended avoidance rate of 99.2%, equivalent to a 0.02% increase over the baseline mortality, an impact of negligible magnitude, resulting in an effect of negligible significance, that would not be significant in EIA terms. Furthermore, recent research at operational wind farms has shown gulls to exhibit an even higher avoidance rate. Percival *et al.* (2018) reported a 99.95% avoidance rate for black-headed gull and 99.99% for gulls overall, and Skov *et al.* (2025) reported similar very low levels of collision.

Common Gull

- 7.159 Common gull was classed as low value as an amber-listed species of conservation concern. Common gulls were regularly recorded overflying the survey area. Peak annual collision risk was predicted as 5.8 per year using the precautionary NatureScot-recommended avoidance rate of 99.2%, equivalent to a 0.07% increase over the baseline mortality. This impact of negligible magnitude would be of negligible significance, which would not be significant in EIA terms. Furthermore, the actual collision risk is likely to be lower given the recent empirical evidence of gull behaviour from existing wind farms discussed above.

Herring Gull

- 7.160 Herring gull was classed as medium value as a NERC Act Species of Principal Importance. Herring gulls were regularly recorded overflying the survey area. Peak annual collision risk was predicted as 16.3 per year using the precautionary NatureScot-recommended avoidance rate of 99.5%, equivalent to only a 1.4% increase over the baseline mortality, an impact of low magnitude, resulting in an effect of minor significance, that would not be significant in EIA terms. Furthermore, the actual collision risk is likely to be rather lower given the recent empirical evidence of gull behaviour from existing wind farms discussed above.

Marsh Harrier

- 7.161 Marsh harrier is listed on Schedule 1 of the Wildlife and Countryside Act and Annex 1 of the EU Birds Directive, so is of high value. It was recorded regularly flying through the collision risk zone, though most flights (89%) were below rotor height. The peak annual predicted collision risk was 0.4 per year, equivalent to a 3.0% increase over the regional baseline mortality. Collision risk to this species would be of low magnitude, an effect of minor significance (for this high value species) and not significant in EIA terms.

Red Kite

- 7.162 Red kite is listed on Schedule 1 of the Wildlife and Countryside Act and Annex 1 of the EU Birds Directive, so is of high value. It was recorded regularly flying through the collision risk zone, though with most flights below rotor height (71%). The peak annual collision risk was predicted at 1.4 per year, equivalent to a 0.6% increase over the baseline mortality. Collision risk to this species would be of negligible magnitude, resulting in an effect of negligible significance, that would not be significant in EIA terms.

Indirect Effects: Barrier Effect

- 7.163 A further potential operational disturbance effect could be disruption to important bird flight lines (barrier effect). Birds may see the Proposed Development and change their route to fly around, rather than through it. This would reduce the risk of collision but could possibly have other effects, for example potentially making important feeding areas less attractive, by acting as a barrier to the birds reaching them, and, if diversions were of a sufficient scale, resulting in increased energy consumption. The distance needed to divert around the Proposed Development would be relatively small and would not be expected to act as a major barrier to movements and no important regularly used flight routes across the site were identified. Accordingly, the ecological consequences of any such changes in flight lines would be of negligible magnitude for all bird species, resulting in effects of negligible significance, that would not be significant in EIA terms.

Effects on Protected Sites

- 7.164 There are no likely effects of the Proposed Development on any protected sites in relation to ecology due to a lack of structural and functional connectivity.

Decommissioning

- 7.165 Effects during the decommissioning phase would be very similar to and no greater than those predicted for the construction phase as set out above.

Secondary Mitigation

- 7.166 The mitigation hierarchy has been followed throughout the design of the Proposed Development. More sensitive and high value habitats / species have been avoided where possible, and impacts minimised. The Proposed Development could, though, still result in a number of significant ecological effects, specifically construction phase disturbance to badgers, barn owl and quail. Therefore, a package of secondary mitigation measures has been proposed to reduce the magnitude of these effects, ensure no significant residual effects, and comply with the nature conservation legislation.

Mitigation of the Construction and Decommissioning Phases

- 7.167 The Applicant has committed to the production of a Construction Environmental Management Plan (CEMP) to the satisfaction of Natural England and other relevant stakeholders, before construction commences, and would follow Windfarm Good Construction Guidance, Scottish Renewables *et al.* (2019). This would be secured by way of planning condition. An Outline CEMP is included within Appendix 2.1 (outline CEMP) – Volume 4. A Breeding Bird Protection Plan (BBPP) will be required to ensure compliance with the Wildlife and Countryside Act (a) to avoid any significant effects on bird species specially protected under Schedule 1 of that Act and (b) to avoid any damage to active nests – secured by way of planning condition. A draft Breeding Bird Protection Plan is included in Appendix 7.9 – Volume 4, which requires the employment of an Ecological Clerk of Works (ECoW) to monitor compliance. A Species Protection Plan will be required to ensure compliance with both the Wildlife and Countryside Act and the Protection of Badgers Act 1992 to avoid any significant effects on species specially protected and to avoid any damage to relevant active setts / holts / hibernacula – secured by way of planning condition. A draft Species Protection Plan is included in Appendix 7.10 – Volume 4, which requires the employment of an Ecological Clerk of Works (ECoW) to monitor compliance.
- 7.168 Badgers were found during the baseline surveys and could move into the potential impact zone of the Proposed Development, including its microsite allowance, in the future. Further surveys for this species will therefore be undertaken immediately prior to construction – secured by way of planning condition. If any were found, then appropriate mitigation following Natural England (2022) guidance (avoiding potentially damaging works in close proximity to active setts, using less damaging construction techniques or if that is not possible, obtaining licences from Natural England), as set out in Appendix 7.10 (Draft Species Protection Plan) – Volume 4.
- 7.169 Given the predicted habitat losses (including native hedgerow) and the statutory BNG requirement, a Landscape and Biodiversity Enhancement Management Plan (LBMEP) will be implemented to deliver a net habitat gain – secured by way of planning condition. An outline LBMEP is included in Appendix 7.11. It will include the enhancement of 5.0 ha. of arable farmland, restoring it to species-rich grassland, creation of 0.97 ha. of ponds, and planting 414.3 m of new, and 62.7 m of restored native species-rich hedgerow. This will ensure that

habitat losses are offset through an increase in habitat quality and there will be an overall net gain.

- 7.170 A Decommissioning Environmental Management Plan, Breeding Bird Protection Plan and Species Protection Plan will be applied at the decommissioning stage.

Mitigation of the Operational Phase

- 7.171 No significant collision risk was predicted for any bat or bird species, so no mitigation is required.
- 7.172 No mitigation will be required for the operational phase of the Proposed Development.

Mitigation of Decommissioning Phase

- 7.173 Given that the effects during the decommissioning phase would be very similar to and no greater than those predicted for the construction phase, the same mitigation measures would be applied as for the construction phase.

Assessment of Residual Effects

Construction

- 7.174 Potentially significant construction phase effects were identified for badgers, quail, and barn owl. With the implementation of the secondary mitigation measures set out above, the magnitude of these effects would be reduced to low / negligible for all of these species. As a result, the residual effects on these high value species would be of minor / negligible significance and not significant in EIA terms. The residual ecological effects of the construction of the Proposed Development will be a non-significant loss of a small amount of arable farmland habitat (including 289 m of native hedgerow), and a non-significant risk of disturbance to badgers and breeding and wintering birds during construction.
- 7.175 None of these adverse effects will have any long-term impact on the integrity of the site's ecological features or the conservation status of the species found here, and no significant residual ecological effects during construction are predicted.

Operation

- 7.176 No significant ecological effects would occur during operation. The residual operational ecological effects of the Proposed Development will be a non-significant risk of disturbance, and a non-significant risk of bird and bat collision to the wind turbines.
- 7.177 None of these will have any long-term impact on the integrity of the site's ecological features or the conservation status of the species found here, and no significant residual ecological effects during operation are predicted.

Decommissioning

- 7.178 Following mitigation, the residual ecological effects of the decommissioning of the Proposed Development will be a non-significant risk of disturbance.
- 7.179 None of these will have any long-term impact on the integrity of the site's ecological features or the conservation status of the species found here, and no significant residual ecological effects during decommissioning are predicted.

Cumulative Effects

- 7.180 All the schemes in Appendix 4.2 (Cumulative Long List) – Volume 4 were considered, but only one development was identified that could likely have significant cumulative effects: Three Oaks Renewable Energy Park. Unmitigated, there would be potential for a cumulative loss of open arable habitats for ground-nesting birds. However, the LBMEP that will be delivered for that scheme will ensure that it delivers a net biodiversity benefit, and a similar scheme will accompany the Proposed Development (see Appendix 7.11 (oLBMEP) – Volume 4).
- 7.181 It was concluded, therefore, that the Proposed Development would not make any material contribution to any likely significant cumulative ecological effect.

Biodiversity Net Gain

- 7.182 The scheme must deliver BNG through habitat enhancement measures (in line with the Environment Act 2021). A BNG Plan will be required to ensure that the development delivers the statutory 10% biodiversity net gain.
- 7.183 A 10.5% habitat biodiversity net gain will be achieved through the following measures:
- Restoring most of the arable farmland affected by the temporary construction works to arable (no net change in biodiversity units (BU));
 - Restoring 5.0 ha. of arable farmland to modified grassland (moderate condition, delivering 17.3 BU); and
 - Creation of 0.97 ha of ponds (moderate condition, delivering 6.97 BU).
- 7.184 The total baseline biodiversity units is 43.8, and the post-development total is 48.4. The BNG calculation headline results are summarised in Plate 7.1. The habitat unit gain is 10.5%, exceeding the 10% requirement.
- An 11.1% hedgerow biodiversity net gain will be achieved through the planting of 414.3 m of new and 62.7 m of restored species-rich native hedgerow (moderate condition, delivering 3.19 BU).
- 7.185 Further details of the BNG plan are included in Appendix 7.11 (oLBMEP) – Volume 4.

Summary and Conclusions

- 7.186 Table 7.21 provides a summary of the effects of the Proposed Development on features of ecological interest detailed within this chapter.
- 7.187 Overall, there are not likely to be any significant residual effects on ecology as a result of the Proposed Development assuming that the mitigation measures referred to in this chapter are adopted (and which are required to ensure compliance with the nature conservation legislation). The Proposed Development would not affect the conservation status of any species / community of conservation importance, either alone or in-combination with other schemes. It would also not contribute to any Likely Significant Effect on any SPA or SAC qualifying interests (see paragraph 7.50 above). No effects would result in any breach of the Habitats Regulations.

Table 7.21: Summary of Residual Ecological Effects of the Proposed Development.

Phase of Development	Summary of Effect	Value	Magnitude	Primary & Tertiary Mitigation	Significance prior to Secondary mitigation	Secondary Mitigation Measures	Significance after Secondary mitigation	Residual Effect (in EIA terms)
Construction / Decommissioning	Habitat loss: construction of infrastructure including wind turbine foundations and access tracks	Up to high	Negligible	Avoidance of more sensitive habitats in design process.	Negligible	LBMEP will deliver BNG.	Negligible	Not significant
	Disturbance / damage to badgers and other protected species	High	Medium	Avoidance of active setts by >30m	Major-moderate	Development and implementation of SPP, to include pre-construction survey checks; if present avoid disturbing activity in proximity with species-specific buffer zone implemented.	Minor / negligible	Not significant
	Disturbance to Schedule 1 and Annex 1 breeding species	High	Medium	None	Major-moderate	Development and implementation of BBPP, to include pre-construction survey checks; if present avoid disturbing activity in proximity with species-specific buffer zone implemented.	Minor / negligible	Not significant
	Disturbance to other breeding bird species	Up to medium	Negligible	None	Negligible	Pre-construction survey and active nests avoided.	Negligible	Not significant

ES Chapter 7 – Biodiversity

Phase of Development	Summary of Effect	Value	Magnitude	Primary & Tertiary Mitigation	Significance prior to Secondary mitigation	Secondary Mitigation Measures	Significance after Secondary mitigation	Residual Effect (in EIA terms)
Operation	Displacement of birds from zone around wind turbines	Up to high	Low / negligible	None	Minor / negligible	None required	Minor / negligible	Not significant
	Mortality through bird collision with wind turbines	Up to high	Low / negligible	None	Minor / negligible	None required	Minor / negligible	Not significant
	Mortality through bat collision with wind turbines	High	Low	Design mitigation: >50 m buffer from hedgerows	Minor	None required	Minor	Not significant

References

- Alerstam, T., Rosén, M., Bäckman, J., Ericson, P. and Hellgren, O. 2007. Flight speeds among bird species: allometric and phylogenetic effects. *PLoS biology*, 5.
- Balmer, D., Gillings, S., Caffrey, B. J., Swann, R. L., Downie, I. S. and Fuller, R. J. 2013. Bird Atlas 2007-11: the breeding and wintering atlas of Britain and Ireland, Thetford: BTO.
- Band, W. 2024. Using a collision risk model to assess bird collision risks for onshore wind farms. NatureScot Research Report 909.
- Band, W., Madders, M. and Whitfield, D. P. 2007. Developing field and analytical methods to assess avian collision risk at wind farms. In *Birds and Wind Farms*. (eds. M. Lucas, de, G. F. E. Janss & M. Ferrer), pp. 15pp. Madrid: Quercus.
- Banks, A. N., Burton, N. H. K., Calladine, J. R. and Austin, G. E. 2007. Winter gulls in the UK: population estimates from the 2003/04–2005/06 Winter Gull Roost Survey. BTO Thetford.
- Billerman, S. M., B. K. Keeney, G. M. Kirwan, F. Medrano, N. D. Sly, and M. G. Smith, Editors 2026. *Birds of the World*. Cornell Laboratory of Ornithology, Ithaca, NY, USA. <https://doi.org/10.2173/bow>
- Bird Survey & Assessment Steering Group. (2025). Bird Survey Guidelines for assessing ecological impacts, <https://birdsurveyguidelines.org>. Accessed May 2026.
- Brown, A. F., and Shepherd, K. B. 1993. A method for censusing upland breeding waders. *Bird Study* 40:189-195.
- Bullen Consultants. 2002. Ovenden Moor Ornithological Monitoring - breeding bird survey 2002. Report to Powergen Renewables Ltd.
- Calbrade, N. A., Birtles, G. A., Woodward, I. D., Feather, A., Hiza, B. M., Caulfield, E. B., Balmer, D. E., Peck, K., Wotton, S. R., Shaw, J. M. and Frost, T. M. 2025. Waterbirds in the UK 2023/24. BTO/RSPB/JNCC/NatureScot.
- CIEEM. 2018. Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Winchester: Chartered Institute of Ecology and Environmental Management.
- DEFRA 2026. SSSI Impact Risk Zones (England), <https://naturalengland-defra.opendata.arcgis.com/datasets/Defra::sssi-impact-risk-zones-england/about>. Accessed May 2026
- Devereux, C. L., Denny, M. J. H. and Whittingham, M. J. 2008. Minimal effects of wind turbines on the distribution of wintering farmland birds. *Journal of Applied Ecology*, 45: 1689-1694pp.
- Douglas, D. J. T., Bellamy, P. E. and Pearce Higgins, J. W. 2011. Changes in the abundance and distribution of upland breeding birds at an operational wind farm. *Bird Study*, 58: 37-43pp.
- Drachmann, J., Waagner, S. R. and Nielsen, H. H. 2021. Pink-footed Goose and Common Crane exhibit high levels of collision avoidance at a Danish onshore wind farm. *Dansk Ornithol Feron, Tidsskr*, 115: 253–271.
- Drewitt, A.L., Whitehead, S. and Cohen, S. 2020. Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 17: Birds (Version 1.1). Joint Nature Conservation Committee, Peterborough.
- Franks, S. E., Douglas, D. J. T., Gillings, S. and Pearce-Higgins, J. W. 2017. Environmental correlates of breeding abundance and population change of Eurasian Curlew *Numenius arquata* in Britain. *Bird Study*, 64: 393-409.
- Gilbert, G., D. W. Gibbons, and J. Evans. 1998. Bird Monitoring Methods: a manual of techniques for key UK species. RSPB /BTO/WWT/JNCC/ITE/ The Seabird Group.

- Gill, J.P. 2004. Changes in Populations of Wading Birds Breeding at Dun Law Wind Farm 1999-2003. Report to Scottish Power plc, Renewable Energy Systems Ltd. & CRE Energy Ltd.
- Goodship, N.M. and Furness, R.W. 2022. Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283.
- Hardey, J., H. Q. P. Crick, C. V. Wernham, H. T. Riley, B. Etheridge, and D. B. A. Thompson. 2009. Raptors: a field guide to survey and monitoring. 2nd Edition. The Stationary Office Ltd, Edinburgh.
- Hotker, H., Thomsen, K. M. and 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. Michael-Otto-Institut im NABU, Bergenhusen: 65pp.
- Janss, G. 1998. Bird behavior in and near a wind farm at Tarifa, Spain: management considerations. NWCC National Avian - Wind Power Planning Meeting III: 110-114pp.
- Meek, E. R., Ribbands, J. B., Christer, W. B., Davy, P. R. and Higginson, I. 1993. The effects of aero-generators on moorland bird populations in the Orkney Islands, Scotland. Bird Study, 40: 140-143pp.
- Natural England (2022) Badgers: advice for making planning decisions. [Online]. Available at: <https://www.gov.uk/guidance/badgers-advice-for-making-planning-decisions> (Accessed: [5/3/26])."
- NatureScot 2025. Wind farm impacts on birds - Use of Avoidance Rates in the NatureScot Wind Farm Collision Risk Model. NatureScot Guidance. <https://www.nature.scot/doc/wind-farm-impacts-birds-use-avoidance-rates-naturescot-wind-farm-collision-risk-model> Accessed 27/1/26.
- Orloff, S. and Flannery, A. 1992. Wind turbine effects on Avian activity, habitat use, and mortality in Altamont Pass and Solano County Wind Resource Areas 1989-1991. Biosystems Analysis Inc. California Energy Commission: 160pp.
- Pearce-Higgins, J. W., Stephen, L., Douse, A. 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, 49: 386-394
- Pearce-Higgins, J. W., Stephen, L., Langston, R. H. W., Bainbridge, I. P. and Bullman, R. 2009. The distribution of breeding birds around upland wind farms. Journal of Applied Ecology.
- Percival, S. M. 2005. Birds and wind farms: what are the real issues? British Birds, 98: 194-204.
- Percival, S. M. 2007. Predicting the effects of wind farms on birds in the UK: the development of an objective assessment methodology.in M. de Lucas, Janss, G.F.E. and Ferrer, M., editor. Birds and Wind Farms: risk assessment and mitigation. Quercus, Madrid
- Percival, S.M. 2011. Thornholme Field Wind Farm Environmental Statement Chapter 8: Ornithology. Wind Prospect Ltd.
- Percival, S. M. and Percival, T. 2011. Knab's Ridge Wind Farm: Post-construction breeding bird surveys 2010. Report to RWE Npower Renewables Ltd.
- Percival, S. M., Percival, T. and Piner, S. 2013. Kelburn Wind Farm: Post-construction Phase Breeding Bird Surveys 2013. Report to RES UK & Ireland Ltd.
- Percival, S.M., Percival, T. and Lowe, T. 2018. Goole Fields Wind Farm, East Yorkshire: post-construction phase bird surveys 2017-18. Ecology Consulting report to Innogy Renewables UK.
- Percival, S.M., Percival, T. and Lowe, T. 2022. Goole Fields 2 Wind Farm, East Yorkshire: Post-construction Year 5 Bird Surveys 2021-22. Ecology Consulting report to RWE Renewables Ltd. <https://www.ecologyconsult.co.uk/s/Ecology-Consulting-Goole-Fields-II-Year-5-Post-construction-2021-22-Final-Report.pdf>
- Percival, S.M., Percival, T. and Piner, S. 2015. Hellrigg Wind Farm: Goose Refuge Monitoring Report Winter 2014-15. Ecology Consulting report to RWE Innogy UK <https://www.ecologyconsult.co.uk/s/Ecology-Consulting-Hellrigg-Goose-Monitoring-Scheme-2014-15>

- Percival, S.M., Percival, T., Hoit, M., Langdon, K. and Percival, E.C. 2025. Jack's Lane Wind Farm and Goose Refuge: Pink-Footed Goose Post-Construction Monitoring 2024-25 (Year 10). Ecology Consulting report to Jack's Lane Wind Farm Ltd. <https://www.ecologyconsult.co.uk/s/Jacks-Lane-winter-goose-report-2024-25-FINAL.pdf>
- Phillips, J. F. 1994. The effects of a windfarm on the Upland breeding bird communities of Bryn Tittli, Mid-Wales: 1993-94. RSPB Report to National Windpower.
- Robinson, R.A. 2005. BirdFacts: profiles of birds occurring in Britain & Ireland (BTO Research Report 407). BTO, Thetford (<http://www.bto.org/birdfacts>).
- Sansom, A., Pearce-Higgins, J. W. and Douglas, D. J. T. 2016. Negative impact of wind energy development on a breeding shorebird assessed with a BACI study design. *Ibis*, 158: 541-555,
- Scottish Natural Heritage. 2016a. Assessing Connectivity with Special Protection Areas (SPAs) - Version 3. Vol. Version 3. SNH Guidance.
- Scottish Natural Heritage. 2016b. Environmental Statements and Annexes of Environmentally Sensitive Bird Information Guidance for Developers, Consultants and Consultees. Version 2. SNH Guidance.
- Scottish Natural Heritage. 2017. Recommended bird survey methods to inform impact assessment of onshore wind farms. SNH Guidance. SNH, Battleby.
- Scottish Natural Heritage. 2018a. Assessing Significance of Impacts from Onshore Wind Farms Outwith Designated Areas. SNH.
- Scottish Natural Heritage. 2018b. Assessing the cumulative impacts of onshore wind farms on birds. Guidance. SNH.
- Scottish Renewables. 2019. Good Practice during Wind Farm Construction. v.4.
- Stanbury, A., M. Eaton, N. Aebischer, D. Balmer, A. Brown, A. Douse, P. Lindley, N. McCulloch, D. Noble, and I. Win. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114:723-747.
- Thelander, C. G., Smallwood, K. S. and Rugge, L. 2003. Bird risk behaviours and fatalities at the Altamont Pass Wind Resource Area: Period of performance: March 1998-December 2000. National Renewable Energy Laboratory Report: 92pp.
- Thomas, R. 1999. Renewable Energy and Environmental Impacts in the UK; Birds and Wind Turbines. In Thesis submitted for Master of Research degree in Environmental Science, University College London., MSc: University College London.
- Urquhart, B., and Whitfield, D. P. 2016. Derivation of an Avoidance Rate for Red Kite Suitable for Onshore Wind Farm Collision Risk Modelling. Natural Research Report.
- Woodward, I., Aebischer, N., Burnell, D., Eaton, M., Frost, T., Hall, C., Stroud, D. and Noble, D. 2020. Population estimates of birds in Great Britain and the United Kingdom. *British Birds*, 113: 69-104